Annual Report for FY12

NPDES Municipal Separate Storm Sewer System Permit

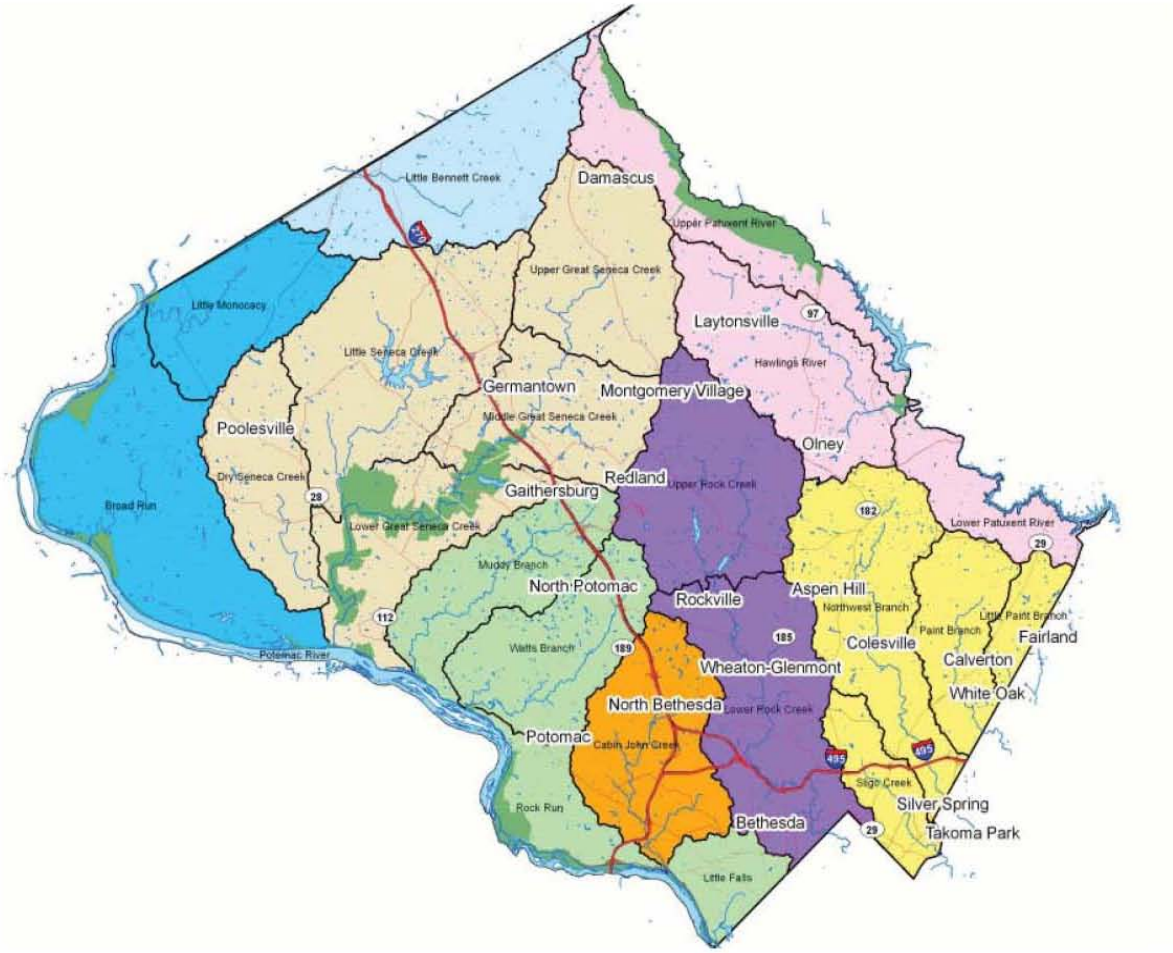

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Table of Contents

LIST OF ACRONYMS

BMP	Best Management Practice
CIP	Capital Improvement Program
USACE	U.S. Army Corps of Engineers
DEP	Department of Environmental Protection
DGS	Department of General Services
DPS	Department of Permitting Services
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
ESC	Erosion and Sediment Control
ESD	Environmental Site Design
GIS	Geographic Information System
IBI	Index of Biological Integrity
MCPS	Montgomery County Public Schools
MDE	Maryland Department of the Environment
MDP	Maryland Department of Planning
MEP	Maximum Extent Practicable
MNCPPC	Maryland National Capital Park and Planning Commission
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
SWM	Stormwater Management
USGS	U.S. Geological Survey
WSSC	Washington Suburban Sanitary Commission
WIP	Watershed Implementation Plan

LIST OF FIGURES

Page

LIST OF TABLES

Page

LIST OF ATTACHMENTS

ATTACHMENT 1.. COMPACT DISK WITH THE FOLLOWING ELECTRONIC FILES
APPENDIX A Annual Report Databases

MDENPDES12.accdb Required information in ACCESS 2000 database

- A. GIS Storm Drain System Mapping Associated With GIS Coverage (Part III.C.1), 1998 through February 2013
- B. Urban Best Management Practices Associated with GIS Coverage (Part III.C.2)
- C. Impervious Surfaces Associated with GIS Coverage (Part III.C.3)
- D. Watershed Restoration Project Locations Associated with GIS Coverage (Part III.C.5)
- E. Monitoring Site Locations Associated With GIS Coverage (Part III.C.4.)
- E.1. Monitoring Site Locations- Use for Multiple Land Use Values in the Drainage Area
- E.2. Monitoring Site Locations- Use for Multiple Stormwater BMPs in the Drainage Area
- F. Chemical Monitoring (Part III.H.1.a)
- G. Pollutant Load Reductions Associated With GIS Coverage (Part III.J.)
- G.1. Additional Pollutants (Part III.J.)
- G.2. Pollutant Load Reductions Associated With GIS Coverage (Part III.H.1.a.iv.)
- G.3. Additional Pollutants(Part III.H.1.a.iv.)
- H. Biological and Habitat Monitoring (Part III.H.1.b., and c.)
- I. Illicit Discharge Detection and Elimination (Part III.E.3)
- J. Responsible Person Certification (Part III.E.2.b)
- K. Quarterly Grading Permit Information Associated with GIS Coverage (Part III.E.2.c)
- L. Fiscal Analysis (Part III.I)

Appendix B. MDE Letter Approving the Strategy after review.
Appendix C. *MCPS Report to the County on MS4 Activities in FY 2012.*
Appendix D. Implementing_ESD_Report_FINAL_110910.pdf
Appendix E Zoning Code ESD changes
Appendix F. *Field Findings Supplemental,* Center for Watershed Protection, July 13, 2011.
Appendix G. Updated SWP3 Plans for County Facilities
Appendix H Watershed Outreach Efforts in Montgomery County FY12
Appendix I. DEP Summary Notes for DEP/MDE Meeting October 2011
Appendix J. DEP Summary Noted from DEP/MDE Meeting November 2012
Appendix K. Breewood Fact Sheet
Appendix L. *NPDES Water Chemistry Monitoring in the Breewood Tributary of Upper Sligo Creek 2009-2010*
Appendix M. Watershed Restoration Project Monitoring
Appendix N. Montgomery County NPDES 2003 Annual MS4 Report
Appendix O. Watershed Implementation Plan for Polychlorinated Biphenyls in the Northeast and Northwest Branches of the Nontidal Anacostia Watershed

MONTGOMERY COUNTY MARYLAND
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) DISCHARGE PERMIT

I. BACKGROUND

The Montgomery County Department of Environmental Protection's (DEP) submission to the Maryland Department of the Environment (MDE) fulfills the annual progress report requirement as specified in Part IV of Permit Number 06-DP-3320 MD0068349 (the Permit). The five-year Permit term began February 16, 2010 covering stormwater discharges from the MS4 in Montgomery County, Maryland (the County). This is the third report in this current permit cycle (February 16, 2010- February 15, 2015) and covers the County's Fiscal Year 2012 (FY12) for July 1, 2011 to June 30, 2012.

Significant accomplishments in the County's stormwater management program during FY12 are highlighted in the Overview. The report itself has been organized based on the headings in the Permit's Part III, Standard Permit Conditions, to document implementation of required elements. Information required by the Permit's Attachment A, Annual Report Databases, Parts A. through L. can be found electronically on the compact disc (CD) submission in Appendix A.
The DEP Watershed Management Division (WMD) has primary responsibility for the majority of the Permit requirements, including interagency coordination, annual reporting, source identification, discharge characterization, monitoring, stormwater facility inspection and maintenance enforcement, illicit discharge detection and elimination, watershed public outreach, watershed assessment and restoration. The DEP WMD is also responsible for assessment of stormwater controls, and for tracking progress towards meeting the County's Total Maximum Daily Load (TMDL) urban stormwater wasteload allocations (WLAs) in applicable watersheds. The DEP Division of Solid Waste Services (DSWS) is responsible for all solid waste related programs, including programs to increase awareness of waste reduction and recycling. The Department of Permitting Services (DPS) is responsible for the County's Stormwater Management (SWM) and Erosion and Sediment Control (ESC) Programs. The Department of Transportation (DOT) is responsible for storm drains, road and roadside maintenance. The Department of General Services, (DGS), DEP's DSWS, and DOT are responsible for their respective property maintenance activities at County-owned Depot facilities covered under the NPDES General Permit for Storm Water Discharges Associated with Industrial Facilities.

The Permit required DEP to develop and submit a countywide implementation plan within one year of Permit issuance to identify how the County would achieve Permit requirements within the five year permit cycle. In February 2011, DEP submitted the draft Montgomery County Coordinated Implementation Strategy (the Strategy) and associated Watershed Implementation Plans to MDE with the 2010 MS4 Annual Report. The Strategy presents the restoration and outreach initiatives that are needed to meet the watershed-specific restoration goals and water quality standards, and is referenced frequently in this report. Specifically, the Strategy provides the planning basis for the County to:

1. Meet TMDL WLAs approved by the U.S. Environmental Protection Agency (EPA).

2. Provide additional stormwater runoff management on impervious acres equal to 20% of the impervious area for which runoff is not currently managed to the maximum extent practicable (MEP).

3. Meet commitments in the *Trash Free Potomac Watershed Initiative 2006 Action Agreement* which include support for regional strategies and collaborations aimed at reducing trash, increasing recycling, and increasing education and awareness of trash issues throughout the Potomac Watershed.

4. Educate and involve residents, businesses, and stakeholder groups in achieving measurable water quality improvements.

5. Establish a reporting framework that will be used for annual reporting as required in the County's Permit.

6. Identify necessary organizational infrastructure changes needed to implement the Strategy.

The MDE approved the Strategy in July 2012. The approval letter can be found attached to this report as Appendix B. A final version of the Strategy, Watershed Implementation Plans, and supporting documents which reflect MDE and public comments are publicly-accessible on DEP's website at:
http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/dep/water/wris.asp#plans

The MDE modified the County's second round Permit effective January 26, 2004 to add six small localities as co-permittees for coverage under the Phase 2 of the NPDES MS4 Permit Program. These included five municipalities: the Towns of Chevy Chase, Kensington, Poolesville, and Somerset, and Chevy Chase Village; and one special tax district, the Village of Friendship Heights. For the third round Permit, MDE added the Montgomery County Public Schools (MCPS) as a co-permittee.

II. OVERVIEW

Permit Administration

The Permit requires the County to designate an individual to act as liaison with the MDE for Permit implementation. The Permit also requires the County to submit an organizational chart detailing personnel and groups responsible for major NPDES program tasks. An updated organization chart and contact information is shown in Table III.A.1. These are the contacts as of March 2013.

Legal Authority

The Permit requires the County to maintain adequate legal authority in accordance with NPDES regulations 40 CFR Part 122 throughout the term of the Permit.

In July 2010 and March 2011, the County Council passed legislation that brought the County's stormwater management ordinance into compliance with the Maryland Stormwater Management Act of 2007 and associated state implementing regulations adopted in 2010

Source Identification

The Permit requires the County to submit information for all County watersheds in geographic information systems (GIS) format with associated tables.

The County continues to improve its storm drain mapping to facilitate the identification of pollution sources from the MS4. The County's storm drain inventory can be found in Appendix A, Part A., on the CD attached to this report. It includes new storm drain features added in FY12 as part of the new construction approval process. The storm drain database also contains 1,404 drainage areas delineated in 2008 for all major storm drain outfalls (defined as >24") in the County. For FY12, DEP also added a completed inventory of all MCPS storm drain systems.

The DEP's Urban Best Management Practices (BMP) database as of June 30, 2012 with associated coverage is included in Appendix A, Part B. The DEP's monitoring locations and locations of watershed restoration projects are also included electronically in Appendix A, Parts C. through I.

The County's impervious area associated with GIS coverage, as of 2009, is included in Appendix A, Part C. In FY12, DEP continued to digitize and update impervious areas for the Permit requirements and the County's stormwater utility charge, the Water Quality Protection Charge (WQPC), based on 2010 aerial photography. The DEP is also working to update the drainage areas of all stormwater BMPs. When complete, DEP will submit an updated layer of County impervious area, BMP drainage areas, and an updated analysis of controlled versus uncontrolled impervious areas. This work should be completed by FY14.

Discharge Characterization

The DEP conducts monitoring required under this section at the Breewood Tributary within the Anacostia Watershed and in the Clarksburg Town Center drainage within the Seneca Watershed. Detailed results are presented in the report section titled '**Assessment of Controls**' set forth below.

Management Programs

Stormwater Management (SWM) Facility Maintenance

The Permit requires the County to conduct preventative maintenance inspections of all SWM facilities (BMPs) on at least a triennial basis.

The DEP continues to inspect SWM facilities under Montgomery County jurisdiction on a triennial basis, and assesses repair and maintenance needs. The DEP also documents the number of maintenance inspections and enforcement actions. During FY12, DEP performed inspections of 1,248 SWM facilities to assess repair and maintenance needs. The DEP also performed 16 unscheduled inspections in response to public complaints, at facilities being considered for transfer into DEP's Stormwater Facility Maintenance Program or to assess conditions after a large storm event. During FY12, 1,667 SWM facilities were maintained by either the County through the DEP maintenance program or by the private owner of the facility.

The MCPS Division of Maintenance upgraded and repaired existing underground and above ground SWM facilities in the year 2012, in preparation for transferring maintenance responsibility to the DEP in accordance with a Memorandum of Understanding (MOU) signed by both parties in 2007. Several facilities remain to be transferred; this work is expected to be completed during FY 2013. The MCPS also performed nonstructural maintenance on aboveground SWM facilities, and maintained several underground SWM facilities not eligible for transfer to the county.

Implementing Maryland's Stormwater Management Act of 2007

The Permit requires the County to implement SWM design policies, principles, methods, and practices found in the *2000 Maryland Stormwater Design Manual* and provisions of Maryland's *Stormwater Management Act of 2007*. The Permit requires the County to modify its SWM ordinances, regulations and new development plan approval processes within one year after State adoption of regulations; April 24, 2009, with an effective date of May 4, 2009. The Permit also requires the County to review local codes and ordinances to identify impediments to and opportunities for promoting ESD to the MEP within one year, and to remove those impediments within two years of the Permit's issuance.

In July 2010 and March 2011, the County Council passed legislation amending the County's SWM ordinance to require nonstructural stormwater BMPs to the MEP for new development and redevelopment projects approved by DPS. The Bill brought County stormwater management requirements into compliance with the Maryland Stormwater Management Act of 2007 and the state implementing regulations adopted 2010.

In 2010, County consultants prepared a final report, *Implementing Environmental Site Design in Montgomery County*, which summarized how the County's codes, regulations, programs, and policies may need to be updated to allow the use of Environmental Site Design (ESD) and low impact development (LID) techniques to the MEP. The most significant updates required will be accomplished through the Zoning Code rewrite, underway by the Planning Department of the Maryland- National Capital Park and Planning Commission (M-NCPPC). The Planning Department is currently conducting staff and public review of the rewrite, and plans to transmit a draft to the County Council in May 2013.

The DPS has been working with its fellow agencies and some members of the SWM construction community through the Policy and Design Committee and the New Products Committee on design and maintenance aspects of various ESD practices. The goal is to assure that these practices provide cost-effective designs that provide maximum runoff reduction and pollutant removal but without increasing average maintenance cost per facility. This is critical since the decentralized nature of the ESD approach results in many more structures per site that must be inspected to assure aesthetic (i.e. trash and invasive plant removal) as well as continued function.

Erosion and Sediment Control (ESC)

The Permit requires the County to maintain an acceptable ESC program, including implementing program improvements identified in any MDE evaluation of the County's application for the delegation of ESC enforcement authority, conduct responsible personnel certification classes and report quarterly information on earth disturbances exceeding one acre or more.

In FY12, the DPS performed 11,191 ESC inspections. Enforcement actions included 248 NOVs, and 105 civil citations which collected $55,750. The DPS continues to conduct "responsible personnel certification training" three times a year as required by the Permit. The DPS also continues to report to MDE quarterly information on earth disturbances exceeding one acre or more.

The MDE performed a 2012 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 in October and November of 2011. During the evaluation, MDE Water Management Director, Jay Sakai stated that "MDE's field inspection of active construction sites in Montgomery County found most to be in good condition and in compliance with erosion and sediment control requirements. Based on the effectiveness of the County's program, I am pleased to grant you request for continued delegation of erosion and sediment control authority. This delegation becomes effective July 1, 2012. Continuation beyond June 30, 2014 requires reapplication to MDE by October 1, 2013."

Illicit Discharge Detection and Elimination (IDDE)

The Permit requires the County to implement an inspection and enforcement program to ensure that all discharges to and from the MS4 system that are not composed entirely of stormwater are either permitted by MDE or eliminated. The Permit requires the County to field screen 150 outfalls annually, conduct routine surveys of commercial and industrial areas, and maintain an enforcement program to address discharges, dumping and spills.

In late March and early April 2012, DEP performed outfall screening in the Bethesda main stem of the Lower Rock Creek subwatershed. The DEP screened a total of 193 outfalls, and found that 43 had dry weather flows, of which 21 had elevated water quality parameters that suggested illicit discharges. Follow up investigations were conducted. Two discharges were found to be water line leaks and were repaired by Washington Suburban Sanitary Commission (WSSC). Six discharges were tracked back to, and referred, to a federal facility, the Ft. Detrick, Forest Glen Annex (formerly known as Walter Reed). Source tracking was unsuccessful in the areas of the other 13 outfalls. The DEP did distribute 19 storm water discharge educational letters to local businesses in the area of one of the impaired outfalls.

The DEP continued to work with the Center for Watershed Protection (CWP) to track three illicit discharges found during the FY11 IDDE investigation in the Sligo Creek subwatershed. During the subsequent investigations, high ammonia discharges in two drainage areas were traced to commercial sites, and were found to originate from air conditioner condensate where ammonium chloride is used as an anti-microbial agent in the Heating Ventilation and Air Conditioning (HVAC) system. In FY13, DEP is continuing to work with CWP to attempt to quantify the extent of ammonia pollution from HVAC sources in the Sligo Creek subwatershed.

The DEP also conducted closed circuit television inspections (CCTV) of Sligo Creek outfalls found to have possible illicit discharges in FY11. Although progress was made in tracking the discharges further up the storm drain lines toward the sources, no sources were actually confirmed. The DEP is working to secure contractual services to continue the CCTV inspections in FY13.

Enforcement Actions

For FY12, DEP's Division of Environmental Policy and Compliance (DEPC) investigated 208 water quality issues (127 complaints and 81 sanitary sewer overflows) and 20 hazardous materials incidents. DEPC's investigations resulted in 31 formal enforcement actions, including14 civil citations with fines totaling $7,000, 17 notices of violation (NOVs) and 27 warnings.

The DEP continues to support its Illegal Dumping Hotline 240-777-3867 ("DUMP"). During FY12, there were 450 complaints of illegal dumping, which resulted in the issuance of 47 formal enforcement actions, including 11 civil citations with fines totaling $5,500, 36 NOVs and numerous warnings. 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.

Trash and Litter

The Permit requires the County to meet its obligations under the *Potomac River Watershed Trash Treaty*, including trash abatement program implementation, education, and evaluation.

The Strategy includes trash reduction work plans designed to meet the Potomac Trash Free Treaty goals and the MS4 wasteload allocations for the 2010 Anacostia Trash TMDL. 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 campaign include ongoing education and outreach for recycling and litter reduction, mass media outreach campaigns, and litter removal from streets, stormwater ponds, and transit stops.

During FY12, the County initiated a significant litter source control effort through the adoption of the Carryout Bag Law. The Law went into effect on January 1, 2012 and requires retail establishments to charge 5 cents for each paper and plastic bag used for customer purchases. The Law is expected to divert a large volume of plastic bag litter that is currently found in streets, parks, and waterways. The first year projections for the Carryout Bag Law were for $1.5M based on population and per person average plastic bag use. In the first six months of 2012, $1.07M was collected from about 900 retailers, representing over 21 million non-reusable bags purchased in the County. Future revenues will be compared to this baseline level to determine if consumers are decreasing their use of plastic and paper bags and thus decreasing the potential for bag litter in local streams and waterways.

The DEP also continued to monitor instream quantities and types of litter in local streams to track reductions resulting from the County's anti-litter and trash management programs. During FY11, DEP contracted with the Metropolitan Washington Council of Governments (MWCOG) to conduct post TMDL trash monitoring in the Anacostia and to survey trash in 10 Lower Rock Creek tributaries. By the end of FY12, MWCOG had completed three cycles of post TMDL trash monitoring in the Anacostia, submitted the report ***Lower Rock Creek Tributaries Bandalong Litter Trap Site Feasibility and Trash Summary***, developed a draft protocol for a 'windshield' survey for potential use by volunteers to estimate the amount of trash on roadsides, and had begun the development of a survey for trash-reduction efforts by apartment and commercial property managers. The DEP is evaluating these results for potential refinements of its litter reduction programs.

Property Management

The Permit requires the County to 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 a NPDES General Permit for Stormwater Associated with Industrial Activities. Table II-1 shows County facilities covered under the General Permit, which was administratively extended in 2007 by MDE.

Table II-1. County Facilities Covered under the Maryland General Discharge Permit for Storm Water Associated with Industrial Activities	
Name Of Facility/ Responsible Agency	Watershed/Acreage
Colesville Highway Maintenance Depot (DOT)	Anacostia/Paint Branch; 12 acres
Damascus Highway Maintenance Depot (DOT)	Potomac/Great Seneca: 1.4 acres
Gaithersburg: Highway Maintenance Facility (DOT)	Potomac/Rock Creek; 26 Acres
Gaithersburg: Heavy Equipment Maintenance Operations Center (EMOC) (DGS)	
Gaithersburg: Transit Services (co-located with EMOC) (DGS)	
Poolesville Highway Maintenance Facility (DOT)	Potomac/Dry Seneca Creek 4 Acres
Seven Locks Automotive Service Center (DGS)	Potomac/Cabin John Creek: 19 Acres
Bethesda Highway Maintenance Facility, Sign Shop and Signal Shop (DGS)	
Kensington Small Transit Service Maintenance Facility at Nicholson Court	Potomac/Rock Creek
Silver Spring/Brookville Road Highway Maintenance Facility (DOT)	Potomac/Rock Creek: 18 Acres
Silver Spring/Brookville Road Transit Center/ Fleet Maintenance Center (DGS)	
Shady Grove Processing Facility (DEP)	Potomac/Rock Creek; 43 out of 52.5 acres
Gude Landfill (DEP)	Potomac/Rock Creek; 120 acres
Oaks Landfill (DEP)	Patuxent/Hawlings River (355) and Potomac/Rock Creek;(190)

Yearly inspections of County facilities covered under the General Permit generally show adequate attention to reducing pollutant runoff from the facilities. In FY12, DGS hired a consultant to develop and update the Stormwater Pollution Prevention Plans (SWP3) for all facilities. All the County facility operating agencies; DOT, DGS, and DEP, delivered yearly training on the General Permit requirements to all employees.

Also in FY12, the County completed several environmental compliance Capital Improvement Program (CIP) initiatives. The Gaithersburg Heavy Equipment Maintenance and Operations Center, Transit Services and Highway Maintenance facilities are being relocated and completely rebuilt, with plans for improvements in stormwater quality, paving, materials handling and transit related maintenance. The Colesville Highway Maintenance Depot, which is within an environmentally sensitive portion of the Anacostia watershed, has begun construction of a permanent salt storage barn, which will enable the covered storage of 10,000 tons of sand/salt material, and also allow the trucks to be loaded under cover. The Colesville Depot has also added two bioretention areas, two Baysaver water quality structures, and a sand filter to improve

the stormwater quality from the facility. The County also began construction of stormwater improvements at the Silver Spring /Brookville Road Depot, which will add two Baysavers, and trench drains to treat runoff from the Transit maintenance facility area. At the Damascus Depot the County completed improvements to the salt storage domar roof, and removed outdated salt handling equipment.

The MCPS conducted P2 training for staff, prepared and implemented storm water pollution prevention plans at industrial sites, and continued to implement an Integrated Pest Management Program (IPM) program at all facilities. The MCPS also incorporated ESD stormwater management into construction projects.

Road Maintenance

The Permit requires the County to continue to implement a program to reduce pollutants associated with road maintenance activities.

Street Sweeping:
In FY12, the County continued its streetsweeping program, focusing on twice monthly sweeping of 229 miles in selected arterial routes, removing 322 tons of material. The sweeping frequency provides equivalents for impervious acerage control and pollutant reduction credit as specified in the Maryland Department of the Environment's (MDE's) June 2011 Draft "*Accounting for Stormwater Wasteload Allocations and Impervious Acerage Treated*" guidance document. For FY12, the County controlled an impervious acerage equivalent of 19.5 acres and reduced 484 pounds of Total Nitrogen (TN) and 193 pounds of Total Phophorous (TP).

Also during FY12, the County completed annual sweeping for all residential routes. In FY12 the County swept a total of 4,046 residential curb miles, removing 916 tons of material. However, MDE does not provide for impervious acre credit for once only frequency streetsweeping.

Inlet Cleaning:
For FY12, DOT reported cleaning 811 storm drain inlets, 127 storm drain pipes, and 14,382 linear feet of storm drain, collecting 367 tons of material at a cost of $275,392.

Use of Herbicides:
The County's roadside noxious weed spraying program is conducted by Montgomery Weed Control Inc., a cooperative weed control program between Montgomery County Department of Economic Development, Agricultural Services Division, and the Maryland Department of Agriculture, Plant Protection and Weed Management Section. The County uses no other pesticides or any fertilizers for roadside vegetation management.

Application of Sand and Salt:
The DOT reported 15,200 tons of salt and 3,800 tons of sand for a total of 19,000 tons of sand and salt as well as 122,031 gallons of salt brine applied to County roadways during December through March of FY12. In 2009, DOT had begun a salt brine pilot program on 240 lane miles of primary roads. Salt brine is a 23% salt solution created in a brine maker that has a lower freezing point than salt. In 2010, over 400 lane miles of both primary and secondary roads received salt brine applications using contracted and County equipment. For the 2011-2012

winter season DOT purchased additional salt brine making equipment and storage tanks and expanded the salt brine treatment program to over 800 lane miles of primary, secondary and some neighborhood roads.

Public Education and Outreach

The Permit requires the County to implement a public education and outreach program to reduce stormwater pollutants.

In FY12, DEP continued to expand its education and outreach programs to meet Permit requirements as outlined in the Strategy public outreach and stewardship work plan (POSWP). The POSWP identified eight major areas of stormwater impact education, including pet waste management, lawn stewardship, anti-littering, stormwater awareness, and establishing a volunteer Stream Stewards program.

The DEP tracks details on watershed outreach events, and has included event information in the Permit required Annual Report Database, Part D, found electronically in Appendix A. The goal for the DEP program is to eventually quantify pollutant reductions associated with behavior changes from its education and outreach programs.

In FY12, DEP hosted or participated in 71 outreach events, an increase of 45% from the previous year. Nearly 6,400 attendees were directly educated, more than double the face to face efforts in FY11, and quadruple since FY10. One FY12 outreach highlight was organizing a second annual Community Clean Water Summit, which addressed key topics including stream health, stormwater pollution and litter reduction. Also in FY12, DEP developed and launched the Stream Stewards program, to train volunteers to further County watershed and stormwater objectives in their communities. The DEP continued contractual resources to support volunteer watershed groups for capacity building and training workshops, including scholarships for participation in the regional Chesapeake Watershed Forum in fall 2012.

The DEP continues its mass media anti-littering campaign by using radio ads, facebook and twitter, community blogs and listservs, local newspapers and magazines and websites. The DEP is also collaborating on the regional Potomac Treaty anti-littering campaign by using the regional message on advertisements on transit buses and at transit bus stops.

Watershed Assessment

The Permit requires the County to conduct a systematic assessment of water quality within all of its watersheds, including identification of water quality improvement opportunities, and the development and implementation of plans to control stormwater discharges to the MEP.

During 2004, DEP began the watershed inventory in the Great Seneca and Muddy Branch watersheds as cooperative efforts with the United States Army Corps of Engineers (USACE) and the City of Gaithersburg. The study was delayed due to limited Federal funding, but is expected to be completed in 2013.

The DEP has begun a Task Order to assess conditions and identify projects within the Lower Monocacy, Patuxent River, Upper and Lower Potomac Direct, and the remaining portions of Seneca watershed (Dry Seneca and Little Seneca). The watershed assessment will begin in the Spring of 2013 and will be completed by the end of 2014. These assessments will include identification of LID opportunities, stormwater pond retrofits, new stormwater control opportunities, and potential stream restoration.

In February 2010, DEP partnered with the USACE - Baltimore District, MWCOG, Prince George's County, the District of Columbia, the M-NCPPC, MDE, and Maryland Department of Natural Resources (DNR) to release the final Anacostia River Watershed Restoration Plan and Report (ARP). Currently, DEP is developing a project management plan with the USACE. The continued partnership will work towards completing an Anacostia River Ecosystem Restoration Feasibility Study to assess and design restoration opportunities identified in the ARP.

In 2011, DEP conducted biological and habitat watershed screening at established monitoring stations in the Anacostia watershed. Anacostia stations have been monitored since 1995 to assess the health of the Anacostia subwatersheds, track the cumulative changes in stream conditions and document the cumulative effects of watershed restoration projects. To date there does not appear to be a strong correlation between watershed restoration projects and fish and benthic IBI scores in the Anacostia subwatersheds.

Watershed Restoration

The Permit requires the County to implement practices identified in its watershed assessments to control stormwater discharges to the MEP.

Meeting the Permit Impervious Control Requirement:
The County's second generation Permit issued in 2001 required the County to restore a watershed or combination of watersheds equaling 10% of Montgomery County's impervious area not treated to the MEP. Stormwater BMP CIP projects completed through FY10 achieved stormwater control of 1,091.4 impervious acres. Stream restoration of 20 stream miles added an additional equivalent impervious acreage treatment of 1,055.1 acres, based on the MDE draft guidance *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* published in June 2011. The total impervious control added through CIP watershed restoration programs was 2,146 impervious acres, meeting the 10% watershed restoration requirement of 2,146 acres in the County's second generation Permit, at a cost of $21,932,346.

The DEP has an aggressive watershed restoration projects program to meet the current Permit's requirement to add control to 20% of the impervious areas not currently controlled to the MEP (4,292 impervious acres, as determined during development of the Strategy). Projects completed through FY12 have added 140 acres of impervious control. Projects under construction during FY13 will treat an additional 177 acres of uncontrolled impervious area. The DEP also has numerous projects in design, which are projected to treat another estimated 1,614.32 acres of impervious area.

The remaining impervious control will be accomplished by implementing projects identified through watershed assessments as potential future projects, Intercounty Connector mitigation and stewardship projects, and redevelopment. Projects will be selected through DEP's watershed planning process for further design and implementation to control the remaining 2,221 impervious acres required by the Permit. The DEP also continues to investigate possible equivalent impervious acre credit for alternative nonstructural BMPs such as tree planting and reforestation.

Meeting Wasteload Allocations in Watersheds with EPA approved Total Maximum Daily Loads: The Permit also requires the County to report progress toward meeting any applicable WLAs developed under EPA approved TMDLs in watersheds where restoration has occurred. The Strategy used the Watershed Treatment Model (WTM) to verify pollutant baseline loads in TMDL watersheds, and estimate pollutant load reductions by SWM BMPs and retrofits constructed after TMDL baseline years. The DEP then added nutrients and sediment reductions from stream restoration projects using efficiencies provided in MDE's June 2011 *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated.* The County stormwater control and watershed restoration initiatives implemented after the TMDL baselines for County watersheds have removed an estimated 176 Billion MPN/year of *E.coli*, 24,231 Billion MPN/year *Enterococci*, 457 tons/year of sediment, 9,965 lbs/year of nitrogen, 1,471 lbs/year of phosphorus, and 7,431 lbs/ year of trash from the watersheds with WLAs. Since 2010, the baseline year of the Chesapeake Bay TMDL, an estimated 1,563 lbs of nitrogen, and 395 lbs. of phosphorous have been removed from Countywide stormwater runoff.

Funding Sources
During FY12, the County continued to identify funding sources to support project implementation. The six-year SWM Capital Improvement Project (CIP) budgets for FY11-FY16 and FY13-FY18 reflect the significant increase in implementation that will be needed to meet the Permit requirement for adding runoff management. The approved (May 2012) FY13-18 SWM CIP budget for FY13 is $25,000,000 compared to the approved (May 2011) FY11-16 SWM CIP budget of $11,445,000 for FY12 and $8,888,000 for FY11.

The approved FY13-FY18 SWM CIP Program totals $235 million, an increase of $128.7 million, or 121 percent from the amended approved FY11-FY16 program of $106.3 million. This increase in stormwater management activity will be financed primarily through water quality protection bonds. The debt service for these bonds will be supported by the County's Water Quality Protection Fund (WQPF), its stormwater utility. The CIP budget assumes $60 million in State aid based on the State's expressed interest in enacting legislation to support stormwater management retrofits and restoration efforts.

RainScapes Program
The DEP's RainScapes program, funded by the WQPF, promotes and implements environmentally friendly landscaping and small scale stormwater control and infiltration projects on residential, institutional, and commercial properties to reduce stormwater pollution and achieve water quality benefits. DEP offers technical and financial assistance to encourage property owners to implement eligible RainScapes techniques, such as rain gardens, tree planting, rain barrels, and conservation landscaping. The RainScapes program consists of RainScapes Rewards, a rebate program, and the RainScapes Neighborhoods Program, which

evaluates targeted neighborhoods for County installed on-lot stormwater runoff reduction approaches. To date in FY12, over 12.77 impervious acres are being controlled for at least the first inch of rainfall, with many projects controlled up to the 1 year storm event.

In order to reach as many private property stakeholders as possible, the RainScapes program includes significant outreach and training components. The RainScapes for Schools program provides native plants, soil, pots and educational materials to MCPS high school horticulture classes to support instruction on the use of plants in stormwater management. The RainScapes for Landscape Professionals program provides training on project requirements and installation, including specifics of site drainage assessment, rain garden design, and also provides hands on project building opportunities. The DEP also provides workshops focused on RainScapes Rewards Rebate qualified practices. From 2008- 2012, these workshops have reached 1,040 residents. In addition, DEP is evaluating how to expand partnership efforts with local watershed and environmental groups to benefit the RainScapes program.

Assessment of Controls

The Permit requires that the County use discharge characterization monitoring and additional monitoring data required under the Permit to assess "the effectiveness of stormwater management programs, County watershed restoration projects, and to document progress towards meeting wasteload allocations (WLAs) indicated in the Total Maximum Daily Loads (TMDLs) approved by the U.S. Environmental Protection Agency (EPA) for watersheds or stream segments located in the County". The Permit specifically requires monitoring where the cumulative effects of watershed restoration activities (the Breewood Tributary) and the effectiveness of stormwater management practices for stream channel protection (Clarksburg Special Protection Area) can be assessed.

Watershed Restoration Assessment

During 2011, DEP continued pre-restoration water chemistry monitoring in the Breewood Tributary, located in the Sligo Creek subwatershed of the Anacostia. Water samples were collected at an instream station and a stormwater outfall station for a total of 25 storms and 29 baseflow (dry weather) events during 2009 -2011. For each station, baseflow mean concentrations (MC) were calculated for all Permit required parameters over the three-year monitoring period. MCs were also calculated for total petroleum hydrocarbons (TPH) and *Enterococcus* during first flush stormflow.

Storm event mean concentrations (EMCs) represent the weighted average pollutant concentrations based on samples collected at discrete intervals during a storm. EMCs were calculated and averaged over the three-year monitoring period for each parameter except TPH and *Enterococcus*. Mean storm EMCs, baseflow MCs, and storm MCs (for TPH and *Enterococcus)* can be found in Table III-H3 below. The average EMCs and MCs of each parameter at each station were compared:

- Storm samples generally had more concentrated pollutants at the outfall than at the instream station.

- At the instream station, flow type (i.e. baseflow or storm flow) had mixed impacts on pollutant concentrations.

- At the outfall, no clear trends in pollutant concentrations by flow type were found.

In 2010 and 2011, DEP performed physical habitat assessments in the Breewood Tributary. Pre-restoration monitoring will establish a baseline for comparison with future habitat assessments. Results indicate that the habitat is *fair*, receiving a score of 71 (out of a possible 200) in 2010 and a score of 86 in 2011. The poor riffle quality, high embeddedness values, bank instability, and narrow riparian zone all had a deleterious effect on the overall habitat score in the tributary.

Stormwater Management Assessment

Maryland Design Manual Monitoring in Clarksburg:
The DEP submitted 2011 monitoring results for the developing Newcut Road Neighborhood tributary to Little Seneca Creek "test" area in the Clarksburg SPA as compared to results from the undeveloped Sopers Branch, Little Bennett subwatershed "control" area to evaluate the effectiveness of the Maryland Design Manual criteria to protect the stream channel. Development in the test area's drainage is mostly complete, and ESC BMPs are being converted to SWM BMPs. There is a small portion of the test area at the downstream end that was undergoing new construction in 2011. The land uses in the Sopers Branch control area remained unchanged.

The natural hydrology of the test area has been altered dramatically by the development process. On average, the overall amount of precipitation infiltrating into the ground or lost via evapotransporation has steadily declined in the test area while remaining fairly constant in the control area. The construction phase of development has impacted the test area channel morphology due to channel straightening, down-cutting, and enlargement. The ability of SWM BMPs to mimic pre-construction hydrologic conditions will be evaluated once the construction process has been completed and the SWM BMPs are on-line.

Program Funding

The Permit requires that the County submit annual expenditures for the capital, operation, and maintenance expenditures in database format specified in Permit Section Part IV. The required database is included in electronic format on CD in Attachment A. During FY11, the reported costs associated with Permit requirements were $30,302,225.

Total Maximum Daily Loads

The Permit requires development of implementation plans showing how the County will meet the MS4 WLAs for any EPA approved TMDLs within one year of EPA approval. The County Strategy addressed all existing TMDLs in September 2009, the baseline for the Strategy. Since the baseline date, EPA has approved additional TMDLs; a bacteria TMDL in the Lower Monocacy (2009), the trash TMDL in the Anacostia (2010); sediment TMDLs for Seneca Creek,

Rock Creek and Cabin John Creek (2011), and a polychlorinated biphenyl (PCB) TMDL for the Northeast and Northwest branches of the nontidal Anacostia River (2011). Reductions expected from implementation of the Strategy will allow the County to meet the WLAs for sediment in the Rock Creek and Cabin John Watersheds. DEP is currently developing a watershed study and implementation plan for the Seneca Creek that will address its sediment TMDL. A TMDL implementation plan for PCBs for the Northeast and Northwest branches of the nontidal Anacostia River is attached to this report as Appendix O.

The MDE approved the Strategy in July 2012. The DEP will work with MDE throughout the rest of this Permit cycle to address any potential inconsistencies between the approach used in the Strategy relative to the MDE guidance published after the Strategy was submitted or to more recent State modeling results and EPA approved TMDLs.

Special Programmatic Conditions

Tributary Strategy

The Permit encourages the County to assist in implementation of the Tributary Strategy designed to meet the nutrient and sediment reduction goals for the Chesapeake Bay. The Strategy included estimates for local project implementation to meet Bay restoration goals for nitrogen and phosphorus.

The DEP agreed to serve as the local liaison for scheduling meetings related to Maryland's Chesapeake Bay Watershed Implementation Plan (WIP) process. The DEP coordinated with the local MS4 Phase 2 permittees (Cities of Gaithersburg, Rockville, and Takoma Park and the Department of Parks) in this State-led process. The DEP organized two public information meetings (April 2011 and October 2011) on the WIP process and local involvement.

On September 14, 2011, MDE provided the pollutant load allocations by source necessary for the Montgomery County stakeholders to begin next steps in developing the Phase II WIP to meet Chesapeake Bay restoration goals. The DEP submitted the ***Montgomery County MD MS4 Phase II WIP***, which included the County's plan and the plans from the four MS4 Phase 2 permittees, to MDE on November 18, 2011. The County's portion of the WIP is based on the Strategy, which ultimately shows that the County can achieve the Maryland WIP Phase II nutrient reductions in 2017 and 2020. The County's submittal is posted at the MDE web site for the WIP Phase II process:
http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Pages/WIPPhaseIICountyDocuments.aspx

Comprehensive Planning

The Permit requires the County to "cooperate with the MNCPPC during the development and completion of the Water Resources Element (WRE) of the County'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)". The County was an active partner during the development of the WRE Functional Plan, providing data and technical review

for the water, wastewater, and stormwater requirements. The WRE Functional Plan was approved and adopted by the Montgomery County Planning Board in September 2010. The report is available in electronic format at: http://www.montgomeryplanning.org/environment/water_resources_plan/documents/WaterResourcesfunctionalplan_web.pdf

The County has continued its cooperation with the MNCPPC through the interagency workgroup for the Permit-required evaluation of County codes to assure 'ESD to the MEP' and during the development of local ordinance changes to meet the requirements of the State's Stormwater Management Act of 2007. The County agencies are routine participants for review and comment as Sector Plan and Master Plan documents are being developed.

Next Steps for FY13

During FY13, the County is continuing to make progress in a number of Permit required areas:

Revising Data Layers and Pollutant Loads Reductions

The County MS4 impervious area, impervious area treated to the MEP, and pollutant loads were all calculated for the Strategy using data available to DEP in 2009. The DEP is continually working to improve the accuracy of its stormwater management and watershed restoration information. Since the Strategy was submitted in February 2011, DEP has digitized and updated County impervious areas for the WQPC using 2010 aerial photography, including adding driveways and building polygon layers. The DEP has also updated the urban SWM BMP database by adding over 1,000 SWM BMPs, and is now working to update the urban SWM BMP drainage areas. The updated impervious layer will be used in combination with the updated SWM BMP drainage areas to provide a corrected MS4 area boundary and impervious acres calculation. The updated layers and revised information will be submitted with the FY13 MS4 annual permit report in February 2014. The County has also updated the Maryland Department of Planning (MDoP) land use from the year 2002 to 2010 to use in revising pollutant loads based on land use.

Treatment to the MEP

In June 2011, subsequent to the Strategy development and submittal, MDE released guidance for determining impervious area and pollutant load baselines, impervious area control and wasteload reductions for SWM BMPs. To address inconsistencies between the MDE guidance and the County Strategy, and to develop more accurate baselines using improved data, DEP will re-analyze its baseline of impervious area treatment and pollutant load reductions, and recalculate goals needed to meet the Permit requirements. This re-analysis will be included in the FY13 report due February 15, 2014.

Funding

The County recognizes the funding challenges presented by the requirements of the Permit. For FY11, County residents in detached single family homes were assessed $70.50 per equivalent residential unit (ERU). Homeowners with attached single family homes (townhomes) are assessed 1/3 of an ERU or $23.27. In FY12, the County Council approved an increase in the WQPC for FY13 from $70.50 per ERU to $92.60 per ERU.

During FY12, the County has been working to modify the current assessment structure of the WQPC. Currently, multi-family residential areas and associated non residential properties that drain to residential stormwater facilities are assigned the WQPC. Bill 34-12, Stormwater management- Water Quality Protection Charge, was introduced to the County Council on November 27, 2012. Bill 34-12 would subject all properties not otherwise exempt under state law to the WQPC. The WQPC for residential properties would have a maximum but would be tiered by amount of impervious per property. The Bill incentivizes installation of stormwater practices by reducing the WQPC for property owners who install such practices.
The proposed Bill exempts certain property owners that are able to demonstrate substantial financial hardship and provides for a phase-in of certain increases to the WQPC. A public hearing was held on Bill 34-12 on January 15, 2013 and the Bill is undergoing subsequent Executive and Council review during the remainder of FY13.

Implementation Rate

The County also recognizes the significant challenge in implementing watershed restoration projects quickly enough to meet the Permit requirements within the current five-year cycle. In FY13, DEP obtained contractual support critical to accelerating the watershed restoration project implementation rate. One contract is for comprehensive water resources engineering, which will provide support in all aspects of watershed restoration, project design, analysis, and construction, including engineering need to successfully implement stream restoration, stormwater management facility (new and retrofit) , and ESD projects. The second contract is for a MS4 Permit implementation consultant team that will provide program management support in planning, implementing, tracking, monitoring and oversight of watershed restoration projects, including watershed assessments.

III. STANDARD PERMIT CONDITIONS

A. Permit Administration

An updated organization chart and contact information is shown in Table III-A1. These are the County's contacts as of March 2013.

Table III-A1. Organization Chart for Montgomery County Permit-Required Programs

Part III. Standard Permit Elements	**RESPONSIBLE PARTY**			
	Department	***Name***	***Title***	***Telephone***
A. Organization Chart	*DEP/WMDC*	Pam Parker	*Senior Planning Specialist*	240-777-7758
B. Legal Authority	*OCA*	Walter Wilson	*Associate County Attorney*	240-777-6759
C. Source Identification				
1. Storm Drain GIS	*DEP/WMD*	Craig Carson	*Manager*	240-777-7709
	DPS	Yung-Tsung Kang	*Senior IT Specialist*	240-777-6636
2. Urban Best Management Practices GIS	*DEP/WMD*	Amy Stevens	*Manager*	240-777-7766
3. Impervious Surfaces GIS	*DEP/DO*	Vicky Wan	*IT Manager*	240-777-7722
4. Monitoring Locations	*DEP/WMD*	Keith Van Ness	*Senior Water Quality Specialist*	240-777-7726
D. Discharge Characterization (as described in Part III H. Assessment of Controls)				
E. Management Programs				
1. Stormwater Management				
1.a. Stormwater Facility Inspections and Maintenance	*DEP/WMD*	Amy Stevens	*Manager*	240-777-7766
1.b Stormwater Management Permitting and Plan Review- Implement *2000 Maryland Stormwater Design Manual*, and provisions of Maryland's *Stormwater Management Act*	*DPS*	Richard Brush	*Manager*	240-777-6343
2. Erosion and Sediment Control	*DPS*	Derek Isensee	*Manager*	240-777-6344
3. Illicit Connection Detection and Elimination Program	*DEP/DEPC*	Steve Martin	*Field Program Manager*	240-777-7746
4. Trash and Litter	*DEP/WMD*	Pam Parker	*Senior Planning Specialist*	240-777-7786
	DEP/DSW	Dan Locke	*Division Chief*	240-777-6402

Table III-A1. Organization Chart for Montgomery County Permit-Required Programs				
Part III. Standard Permit Elements	**RESPONSIBLE PARTY**			
	Department	***Name***	***Title***	***Telephone***
Property Management	*DGS*	David E.Dise	*Director*	240-777-9910
Road and Roadside Maintenance	*DOT*	Keith Compton	*Highways Services Division Chief*	240-777-7607
Public Education	*DEP/WMD*	Meosotis Curtis	*Manager*	240-777-7786
	DEP/WMD	Ryan Zerbe	*Watershed Outreach Planner*	240-777-7744
F. Watershed Assessment				
Countywide Monitoring	*DEP/WMD*	Keith Van Ness	*Senior Water Quality Specialist*	240-777-7726
Assessments and Project Implementation	*DEP/WMD*	Craig Carson	*Manager*	240-777-7709
G. Watershed Restoration				
Assessments and Project Implementation	*DEP/WMD*	Craig Carson	*Manager*	240-777-7709
Annual Reporting	*DEP/WMD*	Pam Parker	*Senior Planning Specialist*	240-777-7758
H. Assessment of Controls (also see D. Discharge Characterization)				
H.1. Watershed Restoration Assessment				
Water Chemistry Monitoring	*DEP/WMD*	Pam Parker	*Senior Planning Specialist*	240-777-7758
Biological and Physical Habitat Monitoring	*DEP/WMD*	Keith Van Ness	*Senior Water Quality Specialist*	240-777-7726
Design Manual Criteria Evaluation	*DEP/WMD*	Keith Van Ness	*Senior Water Quality Specialist*	240-777-7726
	DPS	Leo Galanko	*Senior Permitting Services Specialist*	240-777-6242
H.2. Stormwater Management Assessment				
Geomorphology/Hydrologic	*DEP/WND*	Keith Van Ness	*Senior Water Quality Specialist*	240-777-7726
I. Program Funding	*DEPC/WMD* *DEP/WMD* *DPS* *DOT* *DOT* *DGS*	Stan Edwards Steve Shofar Richard Brush Ligia Moss Keith Compton David Dise	*Division Chief* *Division Chief* *Division Chief* *Senior Engineer* *Division Chief* *Director*	240-777-7748 240-777-7736 240-777-6310 240-777-7514 240-777-7607 240-777-9910
J. TMDL	*DEP/WMD*	Meosotis Curtis	*Manager*	240-777-7711
Part IV. Program Review and Annual Progress Reporting	*DEP/WMD*	Pam Parker	*Senior Planning Specialist*	240-777-7758
Part V. Special Programmatic Conditions	*DEP/WMD*	Meosotis Curtis	*Manager*	240-777-7711

DEPARTMENT ADDRESSES:

DEP/DEPC: *Department of Environmental Protection/ Division of Environmental Policy and Compliance*
255 Rockville Pike, Ste 120, Rockville MD 20850

DEP/DO: *Department of Environmental Protection/ Director's Office*
255 Rockville Pike, Ste 120, Rockville MD 20850

DEP/WMD: *Department of Environmental Protection//Watershed Management Division*
255 Rockville Pike, Ste 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

DPWT/DHS: *Department of Public Works and Transportation/Division of Highway Services*
101 Orchard Ridge Dr. 2nd Flr. Gaithersburg MD 20878

DPWT/DO: *Department of Public Works and Transportation/Division of Operations*
101 Orchard Ridge Dr. 2nd Flr. Gaithersburg MD 20878

OCA: *Office of the County Attorney*
101 Monroe St. 3rd Floor, Rockville, MD 20850

B. Legal Authority

The County continues to maintain all authority required to meet the requirements of the MS4 permit.

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. The County is continuing its oversight, inspection, and enforcement authority over these five municipalities: the Towns of Chevy Chase, Kensington, Poolesville, and Somerset, and Chevy Chase Village; and one special tax district, the Village of Friendship Heights. The contacts for these municipalities are shown in Table III-B1.

Table III-B1. List of Contacts for Municipalities Co-permittees

Municipality	Contact Name and Title	Address	Telephone
Chevy Chase Village	Shana R. Davis-Cook, Manager	Village Hall 5906 Connecticut Avenue Chevy Chase, MD 20915	301-654-7300
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, Director of Public Works	3710 Mitchell St. Kensington, MD 20895	301-949-2424
Town of Poolesville	Wade Yost, Town Manager	P.O. Box 158 Poolesville, MD 20827	301-428-8927
Town of Somerset	Jeffrey Slavin, Mayor	4510 Cumberland Avenue Chevy Chase, MD 20815	301-654-1258

The MDE added MCPS as a co-permittee for the County's MS4 permit issued February 2010. The County and MCPS entered into a MOU which defined relative roles and responsibilities concerning Permit requirements. Through this MOU, the County agreed to continue facilities inspections and structural maintenance on SWM BMPs at MCPS sites and to coordinate annual Permit reporting. The MCPS agreed to provide annual updates on all efforts to reduce runoff impacts from MCPS sites and facilities. The MCPS has provided a detailed annual report on MS4 related activities. Information on MCPS MS4 related activates is included in this report where appropriate. The MCPS entire report can be found in the CD attachment to this report as Appendix C, *MCPS Report to the County on MS4 Activities in FY 2012.*

The MCPS has designated the following staff responsible for coordination on NPDES MS4 permit issues; Brian Mullikin, Environmental Team Leader, Division of Maintenance, and Agustin Diaz, Environmental Specialist, who are responsible for implementing stormwater management programs.

C. Source identification

The following information is submitted for all County watersheds in Geographic Information Systems (GIS) format as required by the Permit in Part IV. and Attachment A, Annual Report Databases, Parts A.-L. The information can be found in this report's CD attachment in Appendix A, MDENPDES12.accdb, Parts A-L.

C.1. Storm Drain System

The County's storm drain inventory is found in Appendix A, MDENPDES12.accdb, Part A. Storm Drain System Mapping Associated with GIS Coverage. Each storm drain feature type is a feature class. Each feature class is a table in the database including both spatial and attribute information.

The storm drain inventory was compiled from three sources. It includes data captured by DPS during the new construction approval process from 2002 until January 10, 2013. DPS has digitized storm drain features for approximately 33 public and 44 private storm drain permits since FY11. The effort added about 1,578 points (headwall, manhole, inlet, and outfall) and 1,714 lines (channel, culvert, and pipe) to the existing storm drain inventory. The storm drain inventory also contains 1,404 drainage areas delineated in 2008 for all major storm drain outfalls (defined as >24") in the County. The outfall drainage areas are used to help investigate and track sources of illicit discharges in the county. Thirdly, the inventory contains information for all storm drain outfalls on or immediately adjacent to MCPS property with associated drainage area.

C.2. Urban Best Management Practices

The County's Urban BMP database as of June 30, 2012 with associated coverage can be found in Appendix A, MDENPDES12.accdb, Part B. Urban Best Management Practices (BMPs) Associated with GIS Coverage. There are 4,497 records in this database, shown by structure type in Table III-C1. The greatest numbers of structures are Oil Grit Separators (679), Flow Splitters (649), Sand filters (593), and Dry Ponds (581).

There are a few data fields in the Urban BMP database with consistently missing data or data irregularities. Explanation for why data is missing follows:

Drainage Area (DA) –Some structure drainage areas have not yet been delineated due to changes in the County's asset management system and a backlog of data entries. Furthermore, pretreatment and diversion devices have been assigned identical DA's to their parent SWM BMPs and are not delineated separately.

Built Date – No date was recorded for many of the pre-1996 structures, and cannot be determined from existing paper files. DEP is making an effort to add built date data for the facilities entered into the database after 1996. Those facilities where a date cannot be determined have an entry date of 01/01/1111.

Structure Type – The MDE structure type designated as "Other" is frequently used by DEP. An explanation of how DEP classifies structures with an MDE "Other" structure type is included in general comments.

Permit Number – The DEP has included a "place-holder permit number" for the facilities that were built prior to 1986 which do not have a permit number. Because many of these facilities were built prior to Montgomery County's authority to permit such facilities, DEP will not be able to recover a permit number from the paper files for it is not known if a permit number existed. This place holder number is "0000000000" and reflects DEP's final attempt to recover the data from the paper files. All original permit numbers known for the facilities built prior to 1986 were 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 DPS in order for those facilities to be entered into their database system. The DEP has kept this permit number in order to allow interface with the DPS database. There are also data missing in the permit number field for facilities built after 1986. The DEP will focus to pull the permit number from the paper files and as-built plans to populate this field.

ADC Map –The DEP made a concerted effort to populate the ADC Map field with the most recent ADC Map Book locations. The DEP's efforts specifically focus on those facilities that lack the MD grid coordinate data as it is understood that ADC map book location can be used in place of the Maryland grid coordinates. The DEP continues to default to populating this field when MD grid coordinates are not available.

RCN – The DEP's new asset and maintenance management system requires a number for all number fields. Those records with an RCN of "0" are records where the RCN was not provided in the paper files.

Construction Purpose – This is a new field for FY12 and the data must be created for all existing BMPs. The DEP will populate the data for the MS4 FY14 annual report.

Impervious Area – This is a new field for FY12 and the data must be created for all existing BMPs. The DEP will populate the data for the MS4 FY14 annual report.

Last Inspection Date - This is a new field for FY12. The data reported is for the scheduled month of inspection. Actual inspection date is now being tracked in a separate field in DEP's database (where it previously was not), and DEP will begin reporting out the actual date with the FY14 report.

WQ Volume – This is a new field for FY12 and the data must be created for all existing BMPS. The DEP will populate the data for the MS FY14 annual report.

Table III-C1. Total Number of Stormwater BMP Facilities by Structure Type Designation

Practice Type	Code	Description	Number
Attenuation Swale	SW	Includes dry swales, wet swales, grass swales, and ESDSW	12
Bioretention	BR	Includes Bioretention, microbioretention (ESDMB), and raingarden (ESDRG)	117
Detention Structure	DP	Includes dry ponds	581
Dry Well	DW	Includes dry wells, stormchambers, raintank, and ESDDW	109
Extended Detention, Dry	EDSD	Dry ponds with extended detention	62
Extended Detention, Wet	EDSW	Wet ponds with extended detention	156
Flow Splitter	FLSP		641
Hydrodynamic Structure: Oil Grit Separator	OGS	Includes Oil Grit Separators and water quality inlets	679
Hydrodynamic Structure: BaySaver	BS	Baysavers	90
Hydrodynamic Structure: Stormceptor	SC	Stormceptors	219
Infiltration Basin	IB	Includes infiltration basins with quality and quantity control	60

Table III-C1. Total Number of Stormwater BMP Facilities by Structure Type Designation			
Infiltration Trench	IT	Includes, infiltration trench with quality and quantity control, and buried surface fed,	566
Other	OTH	Includes structure types not identified by an MDE code, including stormfilters, aquafilters, aquaswirls, bayseparator-flowsplitters, Snouts, Treeboxes, Vortecnics, Vortsentry, and V2B1	158
Porous Pavement	PP	Includes porous concrete, asphalt, and pavers, and ESDPERMP	5
Wet Pond	WP	Includes retention ponds and wet ponds	43
Sand Filter	SF	Includes surface sand filters and underground sand filters	593
Shallow Marsh	SM	Includes all constructed wetlands, artificial wetlands, shallow wetlands, and wetlands with extended detention	115
Underground Storage	UGS	Includes underground storage vaults, pipes, and storage pipes with infiltration	291
		Total Number of Facilities	4,497

C.3. Impervious Surfaces

The County's 2009 impervious area with associated coverage can be found in Appendix A, MDENPDES12.mbd, Part C. Impervious Surfaces Associated with GIS Coverage. This impervious information was used to develop the Strategy.

Since that submittal, based on 2010 aerial photography, DEP is digitizing and updating impervious areas for the MS4 Permit and the WQPC. There will be updated layers for driveways and building polygons. The updated impervious layer will be submitted with the FY13 MS4 annual permit report in February 2014.

C.4. Monitoring Locations

The GIS coverage and associated attribute information for locations established for chemical, biological, and physical monitoring of watershed restorations efforts required in Part III.H. Assessment of Controls, (Tables E., E.1., and E.2.; Monitoring Site Locations) can be found in Appendix A, MDENPDES12.accdb, Part E., E.1., and E.2. Monitoring Site Locations Associated with GIS Coverage.

C.5. Watershed Restoration

The GIS coverage and associated attribute information for watershed restoration projects proposed, under construction and completed with associated drainage areas can be found in Appendix A, MDENPDES12.accdb, Part D. Water Quality Improvement Project Locations Associated with GIS Coverage.

D. Discharge Characterization

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 SWM programs and watershed restoration projects and to document progress towards meeting WLAs indicated in the TMDLs approved by the EPA for watersheds or stream segments located in the County. Discharge characterization results and County progress towards meeting WLAs can be found in Appendix A, MDENPDES12.accdb, Parts F., G., G.1., G.2., and H. Details about this monitoring can be found in Part III. H. Assessment of Controls.

E. Management Programs

E.1. Stormwater Management Program

Facility Inspections and Maintenance:
The data reported for FY12 represents DEP's inspection and maintenance responsibilities as defined in County Code and Permit section III.E.1. The DEP's inspections and maintenance programs are funded through the WQPF.

Triennial Inspections:
The DEP is responsible for inspecting over 4,400 SWM facilities. Each facility is on a 3 year inspection cycle (triennial inspections). To accomplish the inspection requirements, DEP has separated the County in three Inspection Regions, (i.e., Region 1 is eastern region, Region 2 central region, Region 3 western region). The DEP contractors conduct the triennial inspections.

During FY12, DEP performed inspections in Region 1 and 3. During this period, 1,423 facilities were due for their triennial inspection. 1,248 inspections were conducted by contracted inspectors to assess repair and maintenance needs for SWM facilities under Montgomery County jurisdiction. During the FY12 reporting period, the inspection services contract terminated in October 2011 and a new contract was not executed until April 2012. This 6 month delay resulted in a reduction in the number of inspections completed. As of November 1, 2012, DEP's new contractor has completed 92% of the inspections due in FY12 and has approximately 175 more to finish.

Table III-E1 shows the total number of completed inspections by facility type and ownership for the FY12 reporting period. The majority of the inspections occurred at four structure types—ponds (258), filtering systems (222), oil/grit separators (217), and other types (196). The DEP also requires the inspection of flow splitters at the time of any stormwater facility; these inspections are included in the "Other" category. In FY12, DEP also performed a total of 16 unscheduled inspections. These occurred in response to public complaints, at facilities being considered for transfer into DEP's Stormwater Facility Maintenance Program (SWFMP), and to assess conditions after a large storm event.

Table III-E1. Total Number of Initial Inspections by BMP Facility Type and Ownership			
BMP Facility Type	**Publicly Owned**	**Privately Owned**	**Total**
Environmental Site Design	0	0	0
Filtering Systems[1]	26	196	222
Stormwater Infiltration	28	126	154
Oil/Grit Separators	60	157	217
Proprietary Hydrodynamic[2]	31	71	102
Stormwater Ponds[3]	35	223	258
Underground Storage	9	58	67
Stormwater Wetlands	6	26	32
Open Channel Systems	0	0	0
Other[4]	15	181	196
Total Number of Inspections	***210***	***1,038***	***1,248***

[1] This includes all aboveground and underground sand filters, proprietary filters such as Stormfilters, and Chapter 3 bioretention

[2] This includes BaySaver, Stormceptor, vortechnices, and other proprietary hydrodynamic devices

[3.] This includes all dry and wet ponds, and ponds with extended detention

[4]This includes all other type of devices not captured, including flow splitters

Maintenance:

The DEP SWFMP ensures that all SWM facilities in the County are maintained properly. Unless specified in a SWM facility maintenance agreement, all maintenance is the responsibility of the property owner. In 2003, the County enacted legislation giving DEP the authority to perform structural maintenance, including cleaning of underground facilities, on residential and associated non-residential SWM facilities. In order for DEP to have the legal ability to perform the maintenance, the private owner of the facility must have an executed maintenance agreement with the County. Once executed, DEP is the sole entity responsible for structural maintenance; the property owner remains responsible for nonstructural maintenance. Of the 4,497 facilities in the maintenance program, there are over 2,700 facilities that are structurally maintained by DEP. Of these, over 1,400 are privately owned (e.g., facilities that serve residential properties) and over 1,300 are publicly owned (i.e., facilities that serve public schools).

During FY12, 1,667 SWM facilities were maintained by either the County through the DEP maintenance program or by the private owner of the facility. Table III-E2 provides numbers of repairs and maintenance at facilities during FY12 and a narrative summary is included below.

Privately Maintained Facilities:
Property owners of aboveground SWM facilities are issued a NOV if a facility has deficiencies that require corrective action. Typically the deficiencies are noted during the triennial inspection. Property owners are then given 60 days to complete the maintenance and/or repairs specified in NOV. The DEP's SWM facilities inspectors on average complete two follow-up inspections per aboveground facility while the facility is under repair, typically with the property owner or property manager and the repair contractor. Each owner and the owner's repair contractor are required to hold a pre-construction meeting with DEP inspectors to ensure the facility will be maintained properly. The DEP inspectors then complete a final inspection to ensure the work was completed and the facility was maintained or repaired properly. The DEP notifies the property owner once the work is completed to satisfaction. The DEP is also responsible for enforcing nonstructural maintenance requirements for aboveground facilities where DEP performs the structural maintenance.

During FY12, 339 aboveground SWM facilities were maintained by the private owner, a final inspection was conducted by DEP, and the facilities were considered in compliance and properly functioning. This number includes those facilities where the property owner is only responsible for nonstructural maintenance. Additionally, DEP issued 250 NOVs for correction of deficiencies noted during the triennial inspection. Of the 250 NOVs, 206 were corrected during FY12. These facilities are also counted in the 339 total number referenced above. The remaining 133 aboveground stormwater management facilities that had maintenance completed in FY12 were from NOVs issued by DEP during the previous fiscal year (FY11).

The DEP requires owners of underground SWM facilities to perform an annual maintenance cleaning each year. Property owners of underground SWM facilities are given 45 days to complete the cleaning. The DEP inspectors perform a final inspection on each facility to ensure it was maintained properly. The DEP notifies the property owner once the work is completed to satisfaction.

In FY12, 438 underground facilities were privately maintained to DEP's satisfaction. Any repairs identified were also completed at that time.

DEP Maintained:
In FY12, DEP performed structural maintenance on 209 aboveground SWM facilities, using a general contractor. During the FY12, the aboveground maintenance contract terminated, however, and maintenance work slowed considerably. A new contract was executed in April 2012. The reduced number of facilities maintained for FY12 is due to the contract change. The DEP experienced about a 4 month delay in issuing routine repair and preventive maintenance work and the new general contractor is still working on eliminating the backlog.

The DEP's maintenance program also performs routine sand filter maintenance on all facilities in the maintenance program. Additionally, 114 surface sand filters had routine sand filter maintenance (i.e., scarification) performed by DEP and 11 facilities had regular mowing and trash removal performed by DEP contractors.

The DEP cleans all underground SWM facilities annually. During FY12, DEP performed the cleaning and made necessary repairs on 567 underground facilities. In addition, 29 facilities located at County Depots are cleaned twice a year.

Table III-E2. FY12 Repairs and Maintenance	***Number of Facilities***
Privately Owned and Maintained	
Aboveground	339
Underground	438
DEP Structurally Maintained	
Aboveground	209
Routine Sand Filter Maintenance	114
Underground	567
Total Number of Facilities Maintained	**1,667**

Co-Permittee Structural and Nonstructural Maintenance on SWM BMPS-MCPS:
The MCPS Division of Maintenance upgraded and repaired existing underground and above ground SWM facilities in 2012. The MCPS is preparing the facilities for transfer of maintenance responsibility to the DEP in accordance with a MOU signed by both parties in 2007. Several facilities remain to be transferred; this work is expected to be completed during FY13.

The MCPS currently contracts much of the above ground nonstructural maintenance on SWM facilities. In 2012, MCPS began the process of training our maintenance staff to do the nonstructural maintenance by sending 8 staff members to DEP's Stormwater Facility Maintenance Contractor Training class at Montgomery College in July 2012. The MCPS's goal is to perform the majority of the required nonstructural maintenance in-house. The MCPS also performed nonstructural maintenance on aboveground SWM facilities, and maintained several underground facilities not eligible for transfer to the county. The entire cost of the FY12 MCPS SWM facility maintenance and inspection program was $296,707

Stormwater Management Plan Review and Permitting-Complying with the Maryland Stormwater Management Act of 2007:
The Permit requires the County to implement the SWM 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*. The Permit requires the County to modify its SWM ordinances, regulations and new development plan approval processes within one year after State adoption of regulations; April 24, 2009, with an effective date of May 4, 2009.

In July 2010, the County Council passed Bill 40-10 (the Bill) amending the County's stormwater management ordinance to require management of stormwater runoff through the use of nonstructural BMPs to the MEP for new development and redevelopment projects approved by DPS. In response to MDE concerns that a portion of the Bill was less restrictive than State law, the Bill was further amended in March 2011 to limit certain alternative SWM measures to redevelopment only. The Bill then brought County SWM requirements into compliance with the Maryland Stormwater Management Act of 2007 and the State implementing regulations adopted

in 2010. The DPS has been reviewing all development projects submitted since then to assure compliance with the 2007 Stormwater Design Manual. Consequently, there has been a considerable increase in type and number of nonstructural practices for new development and redevelopment in the County.

Stormwater Management Plan Review and Permitting- Incorporating ESD
The Permit also requires the County to review local codes and ordinances to identify impediments to and opportunities for promoting ESD to the MEP within one year, and to remove those impediments within two years of the Permit's issuance.

In December 2010, the County released the report Implementing Environmental Site Design in Montgomery County, which summarizes how the County's codes, regulations, programs, and policies may need to be updated to allow the use of ESD and low impact development techniques to the MEP. The most significant barriers, gaps and opportunities were identified in the County's Zoning Ordinance and the Development Review Process. The review is summarized in Table III E-3. The Report is included in the CD Attachment as Appendix D and is publicly available on the County's website at:
http://www.montgomerycountymd.gov/content/dep/downloads/Implementing_ESD_Report_FINAL_110910.pdf

Table III-E3. Summary of General Findings

Significant Barriers, Gaps, or Opportunities	Fewer but Important Barriers, Gaps, or Opportunities
• Ch 59. Zoning • Development Approval Process	• Ch 22. Fire Safety Code • Ch 26. Housing and Building Maintenance Standards • Ch 49. Streets and Roads • Ch 50. Subdivision of Land • Commercial-Residential ZTA
Limited Barriers, Gaps, or Opportunities	**No Barriers or Gaps**
• Ch 8. Buildings • Ch 22A. Forest Conservation - Trees • Ch 40. Real Property • Ch 41.Recreation and Recreation Facilities • Ch 58. Weeds • Trees, Approved Technical Manual (MNCPPC)	• Chapter 14. Development Districts • Chapter 18A. Environmental Sustainability • Chapter 21. Fire and Rescue Services • Chapter 24B. Homeowners' Associations • Chapter 27A. Individual Water Supply and Sewage Disposal Facilities • Chapter 36. Pond Safety • Chapter 44. Schools and Camps • Chapter 45. Sewers, Sewage Disposal and Drainage • Chapter 54A. Transit Facilities • Chapter 56. Urban Renewal and Community Development • Guidelines for Environmental Management of Development in Montgomery County (Maryland National Capital Park and Planning Commission)

In 2007, the M-NCPPC Department of Planning began a review and rewrite of the County's antiquated zoning code, Chapter 59, as ordered by the Montgomery County Council. The Planning Department worked with a consultant, a citizen's advisory group (Zoning Advisory Panel), and with other County agencies to accomplish the rewrite. A completed Consolidated Draft was released July 2012. The rewrite sections were reviewed as they became available, first by the Planning Department, then by other County Agencies, and then by the Zoning Advisory Panel and general public. A summary of ESD code review recommendations and how they were addressed during the Zoning Code rewrite can be found on the CD attachment to this Report as Appendix E. Language to address these changes is now incorporated into Consolidated Draft.

There is ongoing additional opportunity for comment during the Public Hearing Draft Review period, and in future Planning Board and County Council review processes. Table III-E4, below, shows the timeline for the Planning Department zoning code rewrite.

Table III-E4. Draft Zoning Code Rewrite Timeline	
Stage 1, Zones Section	
December 2011	Consultant provides draft section on agricultural, residential, commercial, industrial and mixed use zones.
December 2011- March 2012	Zones section is reviewed by the Planning Department, County Agencies and public interest groups
June 2012	Public hearing Draft released
Stage 2-Process and General Development Standards Sections	
January 2012	Draft process section due
March 2012	General Development Standards Section due
March –May 2012	Review by the Planning Department, County agencies and public interest groups.
Complete Zoning Code Rewrite Draft	
July 2012	Consolidated Draft (Public Hearing Draft) released
Summer- Fall 2012	Planning Department work sessions
December 2012- January 2013	Finalize Planning Board Consolidated Draft
TBD	Draft to the County Executive and County Council for review

Additional Efforts to Incorporate ESD

The DPS has been working with its fellow agencies and some members of the stormwater management construction community through the Policy and Design Committee and the New Products Committee on design and maintenance aspects of various ESD practices. The goal is to assure that these practices provide cost-effective designs that provide maximum runoff reduction and pollutant removal but without increasing average maintenance cost per facility. This is critical since the decentralized nature of the ESD approach results in many more structures per site that must be inspected to assure aesthetic (i.e. trash and invasive plant removal) as well as continued function.

Executive Branch (DPS, DOT, and DEP) and Planning Board agencies have worked together since early this year on Streamlining the Development Process, with a public meeting on recommendations on November 27th, 2012.
http://permittingservices.montgomerycountymd.gov/DPS/streamlinedevelopment/StreamliningDevelopment.aspx

The recommendations presented to Council in September 2012 identified areas for improvement including publication of approved ESD technologies to facilitate implementation, adopting guidelines for use of ESD practices in the right of way, and completing and publishing Context-Sensitive Road Designs. The last item has already been addressed by DOT, with notes that identify the need within a given context for additional cross-section width to accommodate features such as master plan bikeways, accessory turn lanes, and stormwater management facilities: http://www2.montgomerycountymd.gov/DOT-DTE/Common/Standards.aspx. The standards include approved lists for major (large) and minor (small) street trees varieties.

E.2. Erosion and Sediment Control

The Permit requires the County to implement improvements identified in MDE's biennial evaluation of the County's ESC program. The biennial evaluation determines whether MDE will delegate sediment and erosion control enforcement authority. During the 2012 biennial evaluation, which took place in October and November of 2011, MDE Director, Jay Sakai stated that "MDE's field inspection of active construction sites in Montgomery County found most to be in good condition and in compliance with erosion and sediment control requirements. Based on the effectiveness of the County's program, I am pleased to grant you request for continued delegation of erosion and sediment control authority. This delegation becomes effective July 1, 2012. Continuation beyond June 30, 2014 requires reapplication to MDE by October 1, 2013."

In FY12, 11,191 ESC inspections were performed. Enforcement actions included 248 NOVs, and 105 civil citations which collected $55,750. In February, 2011, the County Council passed legislation increasing the maximum fines for erosion and sediment control violations from $500 for an initial offense and $750 for a repeat offense to $1,000, which is the maximum amount allowed under State law for a civil penalty. By increasing the maximum fine, the County signals its commitment to protect streams and water resources to all sediment control permit holders.

Responsible Personnel Certification:
At least three times per year, the DPS, Land Development Division, Sediment and Storm Water Section conducts a "Responsible Personnel Certification" course. Documentation on these courses can be found in Appendix A, MDENPDES12.mbd, Part J. Responsible Personnel Certification.

Quarterly Grading Permits:
Quarterly grading permit information for earth disturbances in the County of one acre or more can be found in Appendix A, MDENPDES12.mbd, Part K. Quarterly Grading Permit Information.

E.3. Illicit Discharge Detection and Elimination (IDDE)

The Permit requires the County to implement an inspection and enforcement program to ensure that all non-stormwater discharges to the municipal separate storm sewer system are either permitted by MDE or eliminated. 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.

For the FY12 monitoring season, DEP performed outfall screening in late March and early April 2012 in the Bethesda Main Stem of the Lower Rock Creek subwatershed (Figure III-E1). DEP screened a total of 193 outfalls with 43 having dry weather flows and 20 being piped streams. Screening teams walked the entire length of the stream beds within the subwatershed to identify all outfalls. This method allowed DEP to identify 153 outfalls that were previously not mapped. In addition to the permit required water chemistry parameters, DEP checked dry weather flows

for ammonia, potassium and fluoride. Errors in outfall location or type, and locations of unidentified outfalls were also reported.

Of the 43 outfalls found to have dry weather flow, 21 had elevated readings for water quality parameters that suggested illicit discharges, and follow up investigations were conducted. Two discharges were found to be water line leaks and were referred to WSSC. Six discharges were tracked back to, and referred, to a federal facility, the Ft. Detrick, Forest Glen Annex (formerly known as Walter Reed). Source tracking was unsuccessful in the areas of the other 13 outfalls. The DEP conducted outreach to local businesses in the area of one of the impaired outfalls by sending 19 stormwater discharge educational letters.

For FY13, DEP will continue outfall screening in the Lower Rock Creek Watershed and has plans to screen outfalls along the Kensington Branch and Coquelin Run tributaries.

The DEP experience continues to show high level of efforts required to track down illicit discharges. This has prompted a cooperative effort with the Center for Watershed Protection (CWP) in the hopes of increasing the likelihood of identifying and eliminating sources of water pollution through the storm drain system.

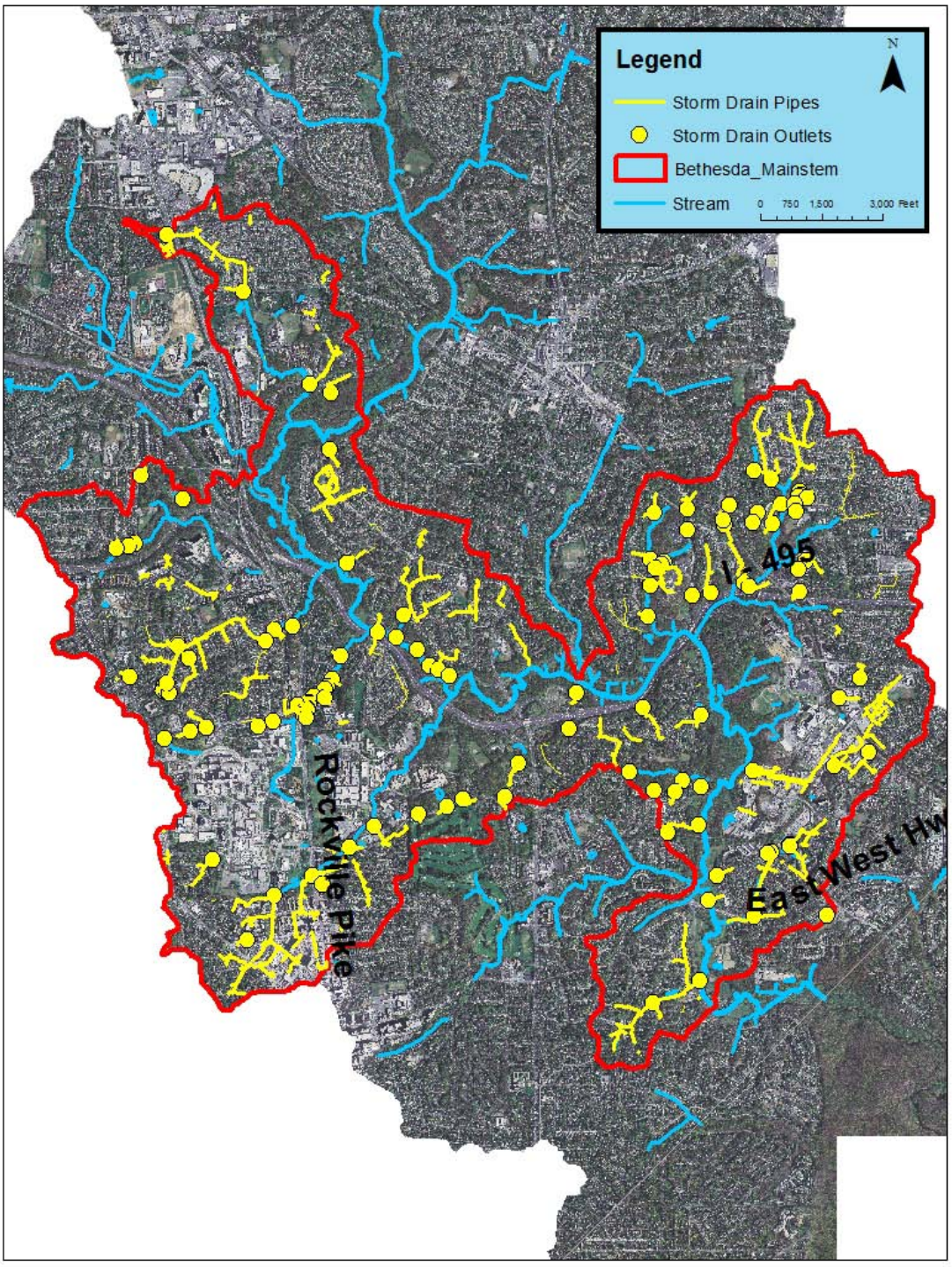


Figure III-E1. FY12 Outfall Screening – Bethesda Main Stem of Lower Rock Creek Watershed

Continuing IDDE Investigations in the Sligo Creek Watershed
In FY11, DEP partnered with the CWP in a pilot project to screen outfalls and conduct IDDE investigations in the County's Sligo Creek subwatershed following the CWP's Illicit Discharge Detection and Elimination Manual, a screening tool developed to support and guide MS4

communities. The results of that project were summarized for the County's FY11 MS4 Annual Report. During the project, two large drainages in the Sligo Creek subwatershed; the Bennington Avenue outfall and the Maple Avenue outfall, were identified as having potential illicit discharges, but a detailed investigation was beyond the scope of the initial project. For FY12, CWP obtained funding from the Marpat Foundation to conduct a pollution source detection and elimination project in these two drainages. A report of the investigation can be found in the CD in Appendix F, *Field Findings Supplemental*, and is summarized below.

Project Summary

The Bennington outfall drainage is 115 acres with its headwaters in downtown Silver Spring and its outfall east of Bennington Dr (Figure III-E3). The Maple Ave drainage is over 550 acres with its headwaters in Northeast District of Columbia and its outfall south of the intersection of Maple Ave and Sligo Creek Parkway in Montgomery County. The Bennington outfall consists of two 48" concrete pipes (Figure III-E2a) and the Maple Ave outfall consists of two 72" concrete pipes (Figure III-E2b). Both drainage areas have complex underground piping systems.

(a) **(b)**

Figure III-E2(a). Bennington Outfalls and (b) Maple Ave. Outfalls

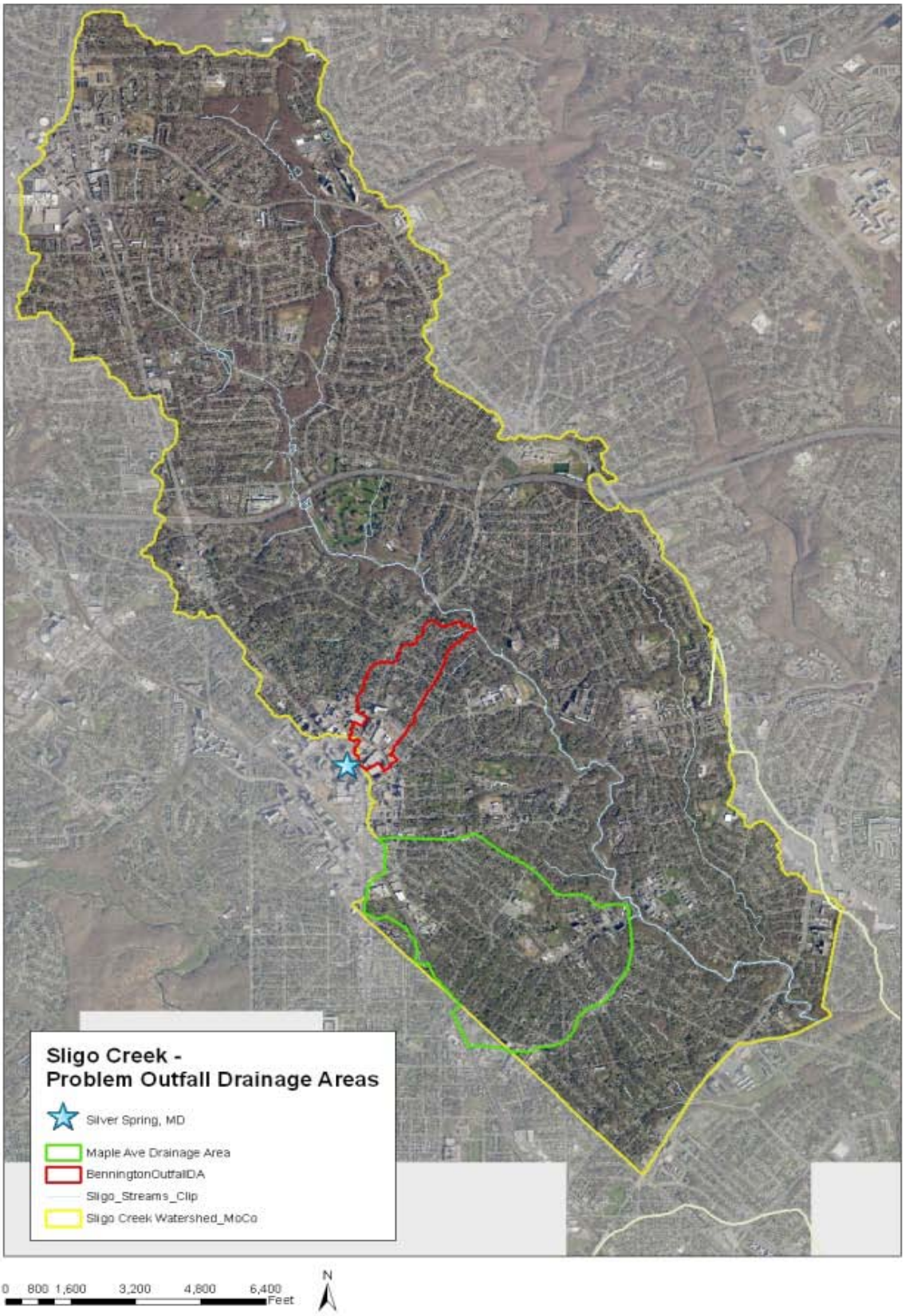


Figure III-E3. Location of Problem Outfall Drainages in the Sligo Creek Watershed, Montgomery County, MD

The study attempted to identify all potential land-based sources of transitory illicit discharges as well as intermittent and continuous pollution sources that often are the result of the underground intermingling of the sanitary and storm drain systems (e.g. leakage from sanitary pipes into the storm drain network, illicit connections, etc.). The study divided each storm drain network into a series of segments and conducted dry-weather screening at major stormwater pipe junctions, attempting to determine potential sources of major and minor pollution problems.

In the Bennington outfall drainage area, pollution sources were primarily isolated north of Spring Street in the highly urbanized section of downtown Silver Spring. Several illicit discharges, hotspots and other concerns were of note in this area:

- Ammonia discharges were traced to two commercial sites, and were found to originate from air conditioner condensate where ammonium chloride is used as an anti-microbial agent in the HVAC system.
- Multiple exceedances for detergents were also detected in downtown Silver Spring. The source for the exceedances was not determined due to difficulties tracking underground flow in the storm drain system.
- Several potential hotspots were identified, primarily in the solid waste storage areas of commercial establishments, where leaking dumpsters, and spillage from restaurant grease barrels were noted.

In the Maple Avenue drainage area, several additional areas of concern were noted:

- Several discharges tested had elevated levels of ammonia and/or detergents that suggest sanitary sources of contamination. Efforts to isolate many of the discharges were unsuccessful due to difficulties tracking storm drain flows above ground, inadequate and inaccurate storm drain mapping, transient nature of the discharges, and property accessibility issues.
- One flow with high pollutant concentrations was tracked through the storm drain network to a floor drain of an elementary school, where it is likely tied into an HVAC system which uses an ammonium chloride anti- microbial agent.

For FY13, DEP will work with CWP under contract to further study and quantify the extent of pollution from anti-microbial agents used in rooftop HVAC systems. Limited sampling conducted by CWP suggests pollution loading for nitrogen, copper and zinc, but specific management measures and products that contribute to the problem are unknown.

Additional Efforts in FY12 to Track Sligo Creek Discharges with Closed Circuit TV Cameras (CCTV)

The DEP performed storm drain CCTV inspections in three storm drain areas as a follow up to the IDDE pilot project. The follow ups occurred at three locations but were unsuccessful in identifying specific sources. For FY13, DEP budgeted additional funds to conduct additional CCTV investigations in these areas.

In October 2011, DEP worked for two days with a DOT crew to conduct a CCTV investigation of an outfall that daylights at Rampart Way, Silver Spring , MD, below the Wheaton Westfield Mall. The results of the investigations were inconclusive. The CCTV limited cable line length and the lack of manholes along the route limited the ability of the team to track discharges to

their sources, and instead only provided information on general flow directions. DEP did perform dye testing in buildings in the vicinity of the storm drain lines found to have flow, but were unable to find any cross connections

From April 2011 to June 2011, DEP performed three investigations into suspect discharges near the Silver Spring International School, located near Wayne Avenue and Sligo Creek Parkway, where the joint DEP/CWP investigation initially found discharges with high ammonia and bacteria. The DEP met with MCPS personnel and used CCTV and dye testing to try and discover the source of the problem. Dye testing did not confirm any problems within the school, and MCPS's CCTV line was too short to pinpoint any discharges. Further follow up with DOT's CCTV line provided more information on the direction of the flow, but the flow track was eventually lost under a parking lot without accessible manholes.

In June 2011, DEP and a DOT crew used CCTV on a small section (around 100') of stormwater pipe under the intersection of Greenbriar Drive and Dale Drive to try and determine the source of another discharge discovered during the joint DEP/CWP 2011 investigation. No sewer cross-connection was found and DEP was unable to find the source of the flow.

Water Quality Investigations during FY12
For FY12, the DEP Division of Environmental Policy and Compliance (DEPC) investigated 208 water quality issues :127 complaints, 81 sanitary sewer overflows (SSOs) and 20 hazardous materials incidents, which resulted in 31 formal Enforcement Actions (14 civil citations with fines totaling $7,000 and 17 NOVs) and 27 warning letters. The formal enforcement actions are summarized in Table III-E5.

Table III-E5. FY12 Enforcement Actions

No.	Case Number	Date Issued	$ Fine	Case Type	Case Sub-Type	Citation #
1	25207	7/13/11	$500	Stormwater	Pollutant Discharge	0Z33852665
2	25176	7/26/11	$500	Water Quality	Surface Water - Sewage	4Z33852676
3	25176	7/26/11	$500	Water Quality	Surface Water - Sewage	5Z33852677
4	25588	12/19/11	$500	Stormwater	Pollutant Discharge	6Z39883178
5	25785	1/11/12	$500	Stormwater	Pollutant Discharge	1Z39883152
6	25785	1/11/12	$500	Stormwater	Pollutant Discharge	2Z39883153
7	25693	2/9/12	$500	Stormwater	Pollutant Discharge	2Z39883230
8	25693	2/9/12	$500	Stormwater	Pollutant Discharge	1Z39883229
9	25963	2/9/12	$500	Stormwater/Hazmat	Assistance Requested (19-50)	2Z39883230
10	25963	2/9/12	$500	Stormwater/Hazmat	Assistance Requested (19-50)	1Z39883229
11	26005	4/13/12	$500	Stormwater	Pollutant Discharge	1Z39882032
12	26005	4/13/12	$500	Stormwater	Pollutant Discharge	6Z39882030
13	26005	4/13/12	$500	Stormwater	Pollutant Discharge	0Z39882031
14	26468	6/12/12	$500	Stormwater	Pollutant Discharge	2Z39882033
15	25143	7/6/11	NOV	Stormwater	Pollutant Discharge	N/A
16	25241	7/15/11	NOV	Stormwater	Pollutant Discharge	N/A

17	25138	8/11/11	NOV	Stormwater	Pollutant Discharge	N/A
18	25394	8/30/11	NOV	Stormwater	Pollutant Discharge	N/A
19	25488	9/29/11	NOV	Stormwater	Pollutant Discharge	N/A
20	25604	10/27/11	NOV	Stormwater	Pollutant Discharge	N/A
21	25588	10/31/11	NOV	Stormwater	Pollutant Discharge	N/A
22	25680	11/21/11	NOV	Stormwater	Pollutant Discharge	N/A
23	23934	12/15/11	NOV	Stormwater	Pollutant Discharge	N/A
24	25753	12/21/11	NOV	Stormwater	Pollutant Discharge	N/A
25	25884	2/29/12	NOV	Stormwater	Pollutant Discharge	N/A
26	25995	3/8/12	NOV	Stormwater	Pollutant Discharge	N/A
27	26111	3/15/12	NOV	Stormwater	Pollutant Discharge	N/A
28	25995	4/26/12	NOV	Stormwater	Pollutant Discharge	N/A
29	26447	6/7/12	NOV	Stormwater	Pollutant Discharge	N/A
30	26489	6/7/12	NOV	Stormwater	Pollutant Discharge	N/A
31	26548	6/21/12	NOV	Water Quality	Surface Water - Sewage	N/A

The DEP works with WSSC to perform follow-up site visits for reported SSOs in Montgomery County, and performed 81 of these site visits in FY12. The purpose to these follow-up site visits is to verify the SSO has been eliminated, ensure adequate cleanup and treatment of all affected areas, and ensure adequate public notice has been posted in affected areas. Also, DEP is continuing to work with WSSC's Fats, Oils and Grease (FOG) Program regarding disposal of restaurant grease. Improper disposal can have direct effects on water quality in local sewer lines, storm drains, and streams.

Illegal Dumping

The DEP continues to support its Illegal Dumping Hotline 240-777-3867 ("DUMP"). During FY12, there were 450 complaints of illegal dumping, which resulted in 47 formal enforcement actions (11 civil citations with fines totaling $5,500 and 36 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 removal and proper disposal of trash and debris and proper storage (i.e. under cover) of other materials.

E.4. Trash and Litter

FY12 County Trash Reduction Initiatives:

The DEP continues to implement the enhanced trash reduction components of the Strategy to meet the Permit requirements for progress toward the, Potomac Trash Free treaty goals and the Anacostia trash TMDL. The Strategy outlines a number of cost-effective litter control methods to meet targeted reductions. Efforts include recycling education, enforcement, the Carryout Bag Law, anti-litter campaigns, and increased litter removal from County "hot spots", such as Transit stops. Litter control enforcement begins with the County's Call Center (MC311) which receives calls from County residents reporting litter problem areas. MC311 then coordinates a response among County departments, and outside agencies such as the MCPS and M-NCPPC.

The County is also working with the Anacostia Watershed Restoration Partnership, the Alice Ferguson Foundation, and other regional partners to implement additional initiatives that will help the region meet the goal of a Trash Free Potomac and the Anacostia TMDL for trash. This regional effort has produced a unified message for advertising in print media, on buses, and on bus shelters in Montgomery County. The DEP's outreach and education programs for anti-littering can be found in Section III.E.7, Public Outreach and Education.

Carryout Bag Law
On January 1, 2012, the County's Carryout Bag Law went into effect. The Carryout Bag Law charges 5 cents for each paper and plastic bag that a customer takes from certain retail establishments to carry purchases out. The County continues outreach efforts for its 'Bring Your Bag, Fight Litter' campaign via web information: http://www.montgomerycountymd.gov/bag/ and follow up from MC311 inquiries. The DEP ensures that the retailer has the correct information about how to implement the Bag Tax and submit payments. The Department of Finance is responsible for enforcement of the Bag Law. Restaurants that use paper bags for carryout food do not need to charge the fee. From January through September, 2012, the DEP received 332 inquiries about the Carryout Bag Law and 22 inquiries regarding the restaurant exemption.

Revenues from Carryout Bag Tax (January-June 2012)
The first year projections were for $1.5M based on population and per person average plastic bag use. In the first six months of 2012, $1.07M was collected from about 900 retailers, representing over 21 million non-reusable bags that were purchased by County residents. Future revenues will be compared to this baseline level to quantify reduced use of non-reusable bags and thus reduced potential for bag litter in local streams and waterways.

Recycling Initiatives:
In calendar year (CY) 2011, Montgomery County's overall recycling rate was 57.6 %, an increase from 43.6 % in FY10. The County has a goal to recycle 70 percent of all waste generated in the County by 2020.

The DEP's Division of Solid Waste Services (DSWS) continues to conduct extensive outreach, education, training and enforcement programs to increase awareness of waste reduction and recycling. During FY12, DSWS staff and Recycling Program volunteers participated in 360 outreach and education events, providing 31,528 people with assistance and information on waste reduction, recycling, buying recycled, composting, grasscycling and other topics. The County continues to use a corps of dedicated volunteers in the Recycling Volunteer Program to educate residents on the benefits of recycling. Together, the volunteers contributed nearly 1,772 hours of direct service with an estimated value of $44,300. More detailed information on DSWS's outreach activities and other trash and litter reduction measures can be found in the Division's Quarterly Reports, posted at: http://www6.montgomerycountymd.gov/swstmpl.asp?url=/content/dep/solidwaste/news/monthly_reports.asp

In FY12, DSWS conducted 8,896 on-site consultations to businesses, organizations and government facilities providing technical assistance, hands-on guidance, and specific recommendations on setting up, maintaining, and expanding waste reduction, recycling, and buying recycled programs.

The DSWS continued efforts to educate residents of single-family homes and multi-family properties, and businesses about the additional types of materials that can now be recycled in the County including durable/reusable plastic containers, tubs, lids, pails, buckets, flower pots and empty non-hazardous aerosol cans, as well as coated paper including milk and juice cartons, frozen food boxes and juice and drink boxes. The DSWS constantly monitors the recycling markets to identify potential future opportunities to remove additional materials from the waste stream. In FY12, the County expanded its recycling program to include #1 PET thermoform plastics, such as clamshell containers, trays, deli containers, domes, cups and lids for recycling.

DOT Programs:
The County's **Adopt-A-Road Program** supplies 345 community groups with supplies in exchange for their voluntary service of picking up trash and litter along roadways. 106 groups reported 521 clean ups, picking up a total of 1687 bags of trash in FY12. 91 groups reported 842 clean ups, picking up a total of 2042 bags of trash in FY11.

The County's **Storm Drain Marking Program** offers materials to community groups wishing to mark storm drains with reminders about preventing litter and other pollution. In FY12, a total of 100 drains were marked. In FY11, there was less demand, and a total of 48 drains were marked.

Trash Hot Spots
Transit stops (bus stops) are prime litter hotspots. A dedicated DOT program to remove trash dumped at transit stops around the County netted a total of 419.7 tons of trash with a budget of $474,900.

The County's central call center (Montgomery County 311) tracks all calls related to litter on County roads, and clean up is handled by DOT. This information is conveyed to the County's Police Force in order to increase surveillance of these roadside hotspots.

Trash Removal at Stormwater Facilities:
The County contracts the removal and characterization of trash from 11 stormwater management ponds maintained by the County (Figure III-E5). A total of 12,306 pounds of trash and debris (including aluminum, plastic, and glass containers, plastic bags, organic debris, tires, Styrofoam and paper) were removed in FY12. This is an increase of 2,785 pounds of trash over that removed in FY11.

In FY12, as shown in Table III-E6 and Figure III-E4, by weight most of the material removed was organic debris (e.g. leaves, twigs, and branches). In the 'other' category, recyclable materials (aluminum, glass and plastic bottles, styrofoam and paper) comprised the bulk found. These materials could easily have been removed from the waste stream through the County's recycling program. Future trash source control efforts will need to focus on additional ways to keep these

recyclables from entering waterways. There were 35 pounds of plastic bags collected at the ponds in FY11 and 55 pounds of plastic bags collected in FY12. The Carryout Bag Law which went into effect on January 1, 2012 (FY12) does not yet appear to have affected the weight of bags at the ponds.

Table III-E6. Trash Removed from County Stormwater Management Facilities in FY12

Date	Ponds Cleaned	Aluminum weight (lbs)	Glass bottles weight (lbs)	Oil quart containers weight (lbs)	Plastic Bags weight (lbs)	Plastic Bottles weight (lbs)	Styrofoam & Paper weight (lbs)	Tires weight (lbs)	Organic Debris weight (lbs)	Total Weight (lbs)
8/1/2011	10	111	201	5	9	36	8	45	800	1214
9/1/2011	3	186	43	4	2	38	5	0	4080	4358
12/1/2011	10	100	48	3	9	27	8	0	4100	4295
2/1/2012	10	111	180	4	9	35	8	45	1400	1791
5/1/2012	11	81	16	4	26	124	211	75	105	642
Grand Total	**44**	**589**	**489**	**18**	**55**	**259**	**240**	**165**	**10485**	**12300**

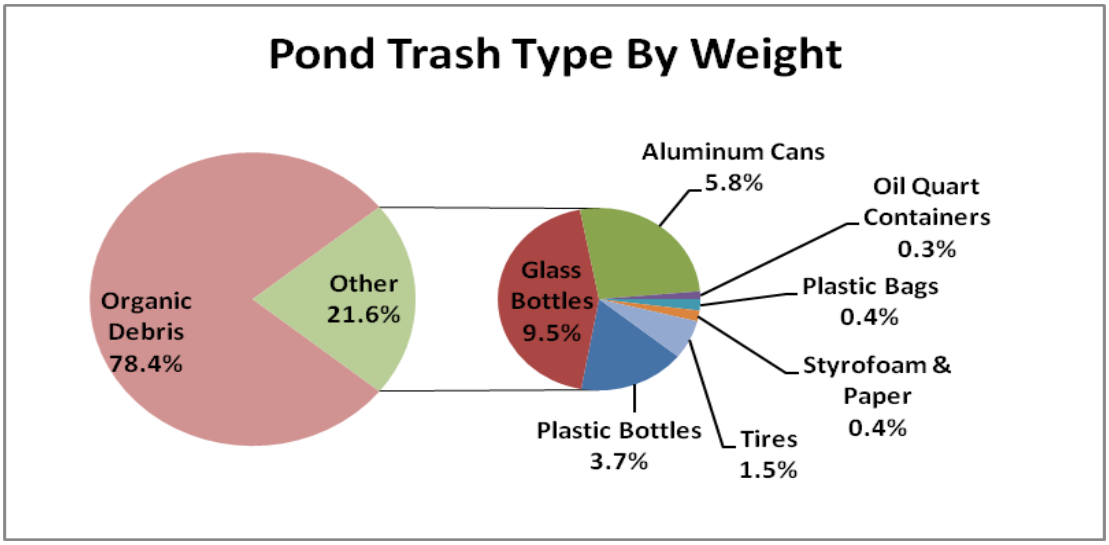


Figure III-E4. Pond Trash Collected in FY12 by Type

Figure III-E5. Contractors Removing Trash from County Regional Stormwater Management Facilities

Storm Drain Inlet and SWM Practices:
DEP continues to test and revise storm drain inlet configurations designed to capture trash, organic debris and sediment at the curbside without impacting flow capacity within the storm drain system. The most recent inlet designs are currently being installed within the Stewart April Tributary in the Lower Paint Branch. This is the same tributary that was monitored for watershed restoration for the County's second Permit.

The designs include eight modified storm drain inlets, along with six curb extensions and two bio-swales, to reduce trash, debris, and other pollutants that would otherwise flow into the Paint Branch of the Anacostia. When completed, the project will include an additional modified storm drain inlet and four more bio-swales. Once installed, inlet cleaning schedules and other aspects of facility performances will be evaluated, and reported. More information on the White Oak modified storm drain inlets is available on the DEP website:
http://www.montgomerycountymd.gov/dectmpl.asp?url=/Content/dep/water/whiteoak.asp

Post-TMDL Monitoring:
The DEP continues via contract with MWCOG to conduct trash monitoring and assessment in the Anacostia and Rock Creek. FY12 highlights included:

- Completion of three cycles of post-TMDL trash monitoring in the Anacostia. The Anacostia tributary monitoring follows the same protocols for stream-level and land-based surveys as those used for trash TMDL development. There is not yet a trend showing reductions in trash type or amount.
- Completion of analysis for potential installation of instream trash traps at 22 candidate road crossings in Lower Rock Creek tributaries. Factors included stream trash level, accessibility, availability of points for securing trash traps, stream velocity, presence of overhead power lines, and site visibility (for outreach potential).
- Development of a 'windshield' survey with potential for use by volunteers to drive through areas and estimate amount of trash on roadsides. The MWCOG has surveyed

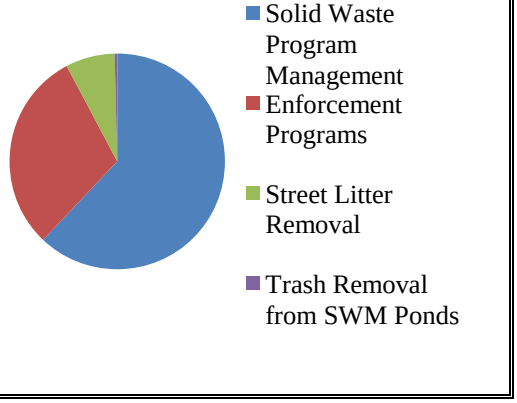
over 130 miles of roads to characterize and count trash along the roadside and then compare with trash type and count determined through a drive by survey.

- Continued development of a potential survey for trash-reduction efforts by apartment and commercial property managers.

Cost of Trash Reduction Efforts:
For FY12, the County invested an estimated $6,985,718 in trash reduction strategies and programs (Table III-E7).

Table III-E7. Estimated FY12 Trash Reduction Costs

Program	**FY11 Cost**
Solid Waste Management	$4,334,020
Enforcement Programs	$2,109,857
Street Litter Removal	$514,900
Trash Removal from Stormwater Ponds	$26,941
Total	**$6,985,718**



E.5. Property Management

Table III-E8 lists the County facilities covered under the MDE General Discharge Permit for Storm Water Associated with Industrial Activities (the General Permit). The MDE accepted Notices of Intent (NOI's) for these facilities in March 2003 for coverage until November 30, 2007. The MDE published a draft General Permit in October 2012 and these facilities will be required to file NOIs within (30) days after the revised General Permit is final.

For most of the facilities, DGS has the overall responsibility for meeting the requirements of the General Permit, including updates to the facilities' stormwater pollution prevention plans (SWP3s). Agencies housed at the facilities are responsible for implementing portions of the SWP3s that relate to their operations, and include: DOT (Division of Highway Services (DHS) and Division of Transit Services (DTS)); DEP (DSWS and WMD); 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.

The DSWS is responsible for meeting the General Permit requirements at the Gude and Oaks Landfills and the Shady Grove Processing Facility. The DSWS Compliance Officer is responsible for ensuring environmental compliance at Solid Waste operational facilities.

Table III-E8. Status of County Facilities Covered under the Maryland General Discharge Permit for Storm Water Associated with Industrial Activities		
Name Of Facility/ Responsible Agency	Watershed/Acreage	Most Recent Pollution Prevention Inspection and/or Plan (Electronic File included on CD enclosed)
Colesville Highway Maintenance Depot (DOT)	Anacostia/Paint Branch; 12 acres	Stormwater Pollution Prevention Plan updated in FY12. Annual inspections in FY12.
Damascus Highway Maintenance Depot (DOT)	Potomac/Great Seneca: 1.4 acres	Stormwater Pollution Prevention Plan updated in FY12. Annual and semi-annual inspections in FY12.
Gaithersburg: Highway Maintenance Facility (DOT)	Potomac/Rock Creek; 26 Acres	Stormwater Pollution Prevention Plan updated in FY12. Monthly and Annual inspections in FY12.
Gaithersburg: Heavy Equipment Maintenance Operations Center (EMOC) (DGS)		
Gaithersburg: Transit Services (co-located with EMOC) (DGS)		
Poolesville Highway Maintenance Facility (DOT)	Potomac/Dry Seneca Creek 4 Acres	Stormwater Pollution Prevention Plan updated in FY12. Annual and semi-annual inspections in FY12.
Seven Locks Automotive Service Center (DGS)	Potomac/Cabin John Creek: 19 Acres	Stormwater Pollution Prevention Plan updated in FY12. Monthly and Annual inspections in FY12.
Bethesda Highway Maintenance Facility, Sign Shop and Signal Shop (DGS)		
Kensington Small Transit Service Maintenance Facility at Nicholson Court	Potomac/Rock Creek	Stormwater Pollution Prevention Plan updated in FY12. Monthly and Annual inspections in FY12.
Silver Spring/Brookville Road Highway Maintenance Facility (DOT)	Potomac/Rock Creek: 18 Acres	Stormwater Pollution Prevention Plan updated in FY12. Monthly and Annual inspections in FY12.
Silver Spring/Brookville Road Transit Center/ Fleet Maintenance Center (DGS)		
Shady Grove Processing Facility (DEP)	Potomac/Rock Creek; 43 out of 52.5 acres	Stormwater Pollution Prevention Plan updated annually. Quarterly Inspections performed in FY12
Gude Landfill (DEP)	Potomac/Rock Creek; 120 acres	Stormwater Pollution Prevention Plan updated annually. Quarterly Inspections

		performed in FY12
Oaks Landfill (DEP)	Patuxent/Hawlings River (355 acres) and Potomac/Rock Creek(190 acres)	Stormwater Pollution Prevention Plan updated annually. Quarterly Inspections performed in FY12

All County facilities have regular stormwater pollution prevention (P2) inspections on at least an annual basis. Many are inspected monthly or quarterly. In FY12, DGS and DOT managed sites consistently had the following P2 related needs, as shown in Table III-E9:

Table III-E9. FY12 Pollution Prevention Needs at County Facilities Covered Under the State General Discharge Permit for Storm Water Associated with Industrial Activities

Pollution Prevention Need	**Action Taken**
SWP3 plans need to be updated	Third party (consultant) inspections and draft for updated SWP3 plans were completed in December 2011. Updated plans were finalized in May 2012.
Depot lots need more frequent sweeping	Operating agencies will try to sweep monthly
More frequent (daily) housekeeping inspections and small spill clean-up	Facility personnel are trained annually in proper spill clean-up and preventative housekeeping.
Sites need better storage facilities for equipment	Recommended capital improvements are being evaluated for implementation.
Additional secondary containment for storing some products	Operating agencies installed appropriate secondary containments in FY12. Steps are being taken to improve housekeeping and fluid storage procedures.
Covered storage areas for loose gravels and similar materials with retaining walls separating each product.	Recommended capital improvements are being evaluated for implementation.
Most sites need to be repaved and resurfaced	
SWM facilities need more frequent inspection	Underground SWM facilities at all depots are inspected and cleaned twice annually with additional maintenance as necessary by DEP's Stormwater Maintenance and Inspection program
Improved storage area for waste oil recycling was recommended for the Poolesville Depot	Covered storage area for the solid waste receiving area is being evaluated.
Need for improved storage for scrap tires was noted at the Gaithersburg Equipment Maintenance Operations Center	Facility is being relocated In FY13 and will have improved material storage areas.

Table III-E9. FY12 Pollution Prevention Needs at County Facilities Covered Under the State General Discharge Permit for Storm Water Associated with Industrial Activities	
Pollution Prevention Need	**Action Taken**
Parking lot cleaning and inlet protection needed at the Transit area of the Brookville Depot	The County is currently evaluating contractors to clean the depot parking lots. The contractor selected will clean the lots using inlet protection to prevent the wash water from entering the storm drain. New stormwater quality structures are being added to the Transit bus area at the Brookville Depot.

The DSWS quarterly P2 inspection reports indicate that the Oaks and Gude Landfills and the Shady Grove Processing Facility are in good shape. Litter is picked up on the sites and along the perimeter fence lines regularly and the landfill berms are well vegetated. The Gude Landfill has a few persistent stormwater depressions and leachate seeps that are repaired promptly. The Shady Grove Processing Facility storm drain inlet screens had some partial blockage from blowing leaf and grinding debris, and were cleaned. Cleaning of three of the stormceptor SWM BMPs were put on a quarterly cleaning schedule (from biannual) to facilitate structure function and sediment removal. Additional trash capture bags were installed on storm drain grates and traps at the Shady Grove Processing Facility, and the site outfall was redone with rip rap and gabion baskets in FY12.

In FY12, DOT, DGS, and DEP continued to deliver yearly training on the General Permit requirements to all facility operation employees. Operation specific training, incorporating annual P2 inspection findings, was delivered at each facility location. Assessments, needs and improvements were covered in this training as well as ways to reduce hazardous substances, pollutants, or contaminants.

In 2008, new CIP funding dedicated to environmental compliance was added to the DGS budget. In 2012, the following environmental compliance CIP initiatives were accomplished:

- Updated SWP3s were developed and in use by May 2012 after a thorough inspection of each DOT and DGS facility by a third party consultant. The Plans highlight SWP3 responsibilities per agency so that each agency can dedicate funding to maintain and operate in such manner to prevent the potential of product runoff. Additional CIP funding will be appropriated for follow up design and construction of mitigating measures. The updated SWP3s can be found in the CD in Appendix G.
- As part of the Smart Growth County Initiative, the Gaithersburg Heavy Equipment Maintenance and Operations Center, Transit Services and Highway Maintenance facility are being completely rebuilt, and will be relocated to a new site in the winter of 2012-13. The newly constructed facility provides for improvements in stormwater quality, paving, material handling and Transit maintenance.
- The Colesville Highway Maintenance Depot has begun construction of a permanent salt storage barn, which will enable the covered storage of 10,000 tons of sand/salt material,

and also allow the trucks to be loaded under cover. The project also adds two bioretention areas, two Baysaver water quality structures, and a sand filter to improve the storm water quality. In addition, repairs and improvements were made to the Truck wash facility.

- Construction of the Silver Spring /Brookeville Road Depot stormwater improvements has begun, which will add two Baysaver water quality structures, and trench drains to improve the water quality from the Transit maintenance facility area.
- Roofing improvements to the salt storage domar, and removal of some outdated salt handling equipment have been completed at the Damascus Depot.

County Co-Permittees Property Management:

Town of Poolesville

The Town of Poolesville is the only one of the six small municipal co-permittees that is required to have a General Permit NOI. 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 SWP3 for the site. The Town's Public Works Director is responsible for the SWP3 on this site and conducts weekly inspections to assure compliance. The Town reported no changes for FY12.

MCPS

The MCPS must submit a General Permit NOI for its school bus maintenance yards (Shady Grove, Randolph, Clarksburg, West Farm, and Bethesda Depots). During the FY12, MCPS evaluated the SWP3s and Spill Prevention, Control and Countermeasure (SPCC) Plans for all five facilities. Annual inspections have been conducted at the sites and recommendations for improvement implemented. In addition, MCPS maintains fifteen underground heating fuel storage tanks at fourteen facilities. In FY12, MCPS spent $125,776 on facility pollution prevention.

The MCPS is responsible for training employees in positions that have particular potential for stormwater pollution, primarily maintenance and transportation staff. During FY12, MCPS began performing more in depth in-house stormwater and pollution prevention training for staff in the Fleet and Facilities Maintenance Division. To date, 12 staff members, mainly auto technicians, have received such training within the division of Fleet Maintenance and 190 from Facilities Maintenance, with the remainder to be completed in FY13. The MCPS goal is to initially train all current MCPS maintenance staff, as well as begin a program of re-training on a regular basis for new and current maintenance employees. FY12 costs for employee P2 training was $6,968.

The MCPS continues to implement its existing IPM program at all schools, centers and facilities, with an emphasis on physical rather than chemical measures for pest control, in accordance with MCPS Regulation ECF-RB, Pesticides Use in Schools. Under Maryland Law, only licensed and registered pest control workers may apply 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 and 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. The MCPS IPM staff work with facility occupants to stress the need for proper sanitation measures and structural exclusion to

control pests, using pesticides only when all other measures have failed. The MCPS also has a process to pre-qualify contractors that may be used to perform athletic field maintenance at high school athletic fields in order to have more centralized controls in place over fertilizer and herbicide applications, if necessary. In FY12, MCPS spent $17,000 on IPM.

The MCPS has also 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 operational BMPs in all school cafeterias.

E.6 Road Maintenance

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.

Montgomery County Street Sweeping Program:
The DOT oversees a street sweeping program using both DOT and DEP funding. In FY12 , the DOT funded residential routes and the DEP funded arterial routes for streetsweeping.

The DOT sweeps 56 residential routes shown in Figure III-E6 at least once per year. Sweeping begins each year early in spring to pick up sand left over from winter storm applications. Nineteen of these routes have been designated as priority residential routes based on the average tons per curb mile collected during annual street sweeping activities, the likeliness of inadequate or no stormwater management based on age of development, and MDE identification of 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 in Figure III-E7.

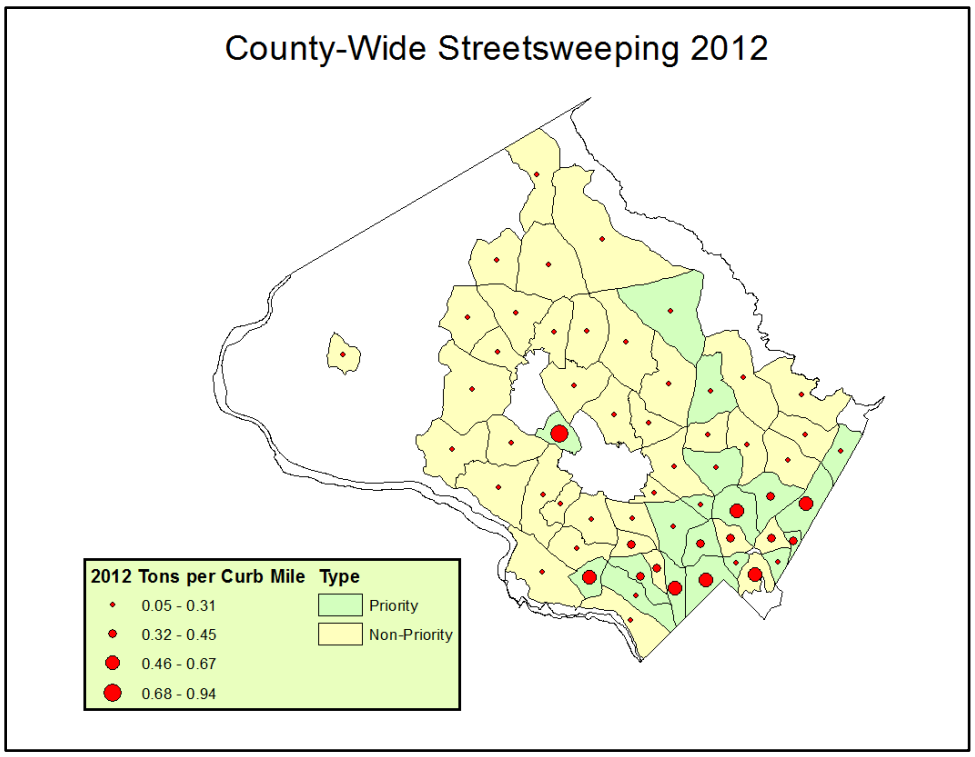


Figure III-E6. Countywide Street Sweeping

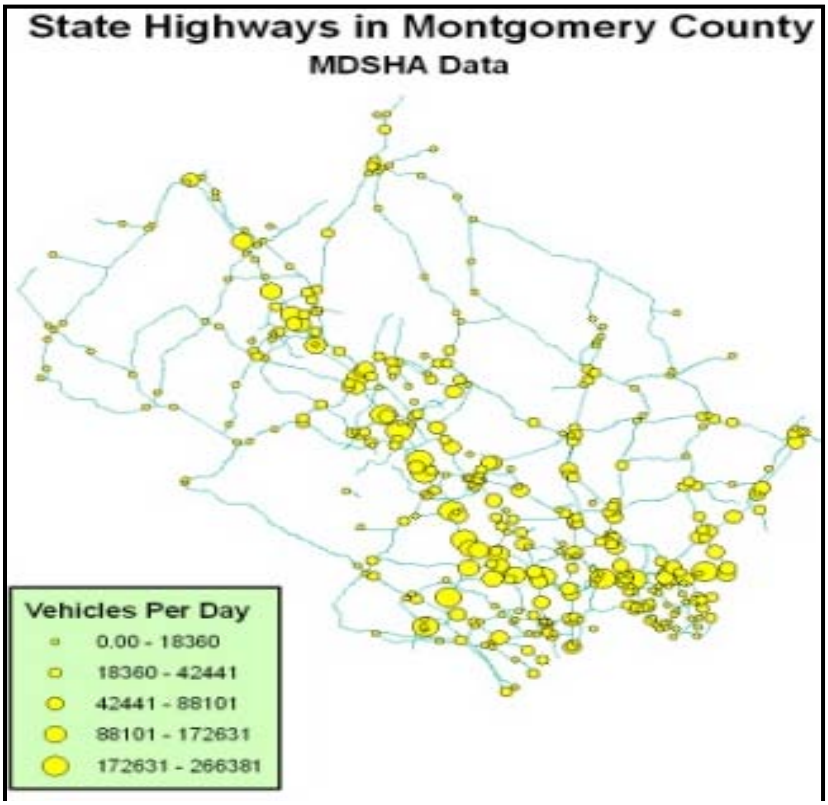


Figure III-E7. Annual Average Daily Traffic 2010

Sweeping is scheduled so that the priority routes are swept first to more effectively recover material applied during winter storms. Some rural areas in the western and northern portions of the County are not included in any of the routes and are not generally swept. The relatively low amount of vehicle traffic and the lack of curbs in these areas make street sweeping impractical. Roadways in Gaithersburg, Rockville and Takoma Park are swept by each municipality as part of their Phase 2 MS4 Permit.

The DEP funds sweeping of selected routes, known as "arterial" routes, shown in Figure III-E8. The arterial routes are larger roads with more commercial activity, traffic and more observed trash. These routes total 229 curb miles, are swept at night when traffic volumes are low. Sweeping is only done on segments of the roads without residential housing because of noise considerations.

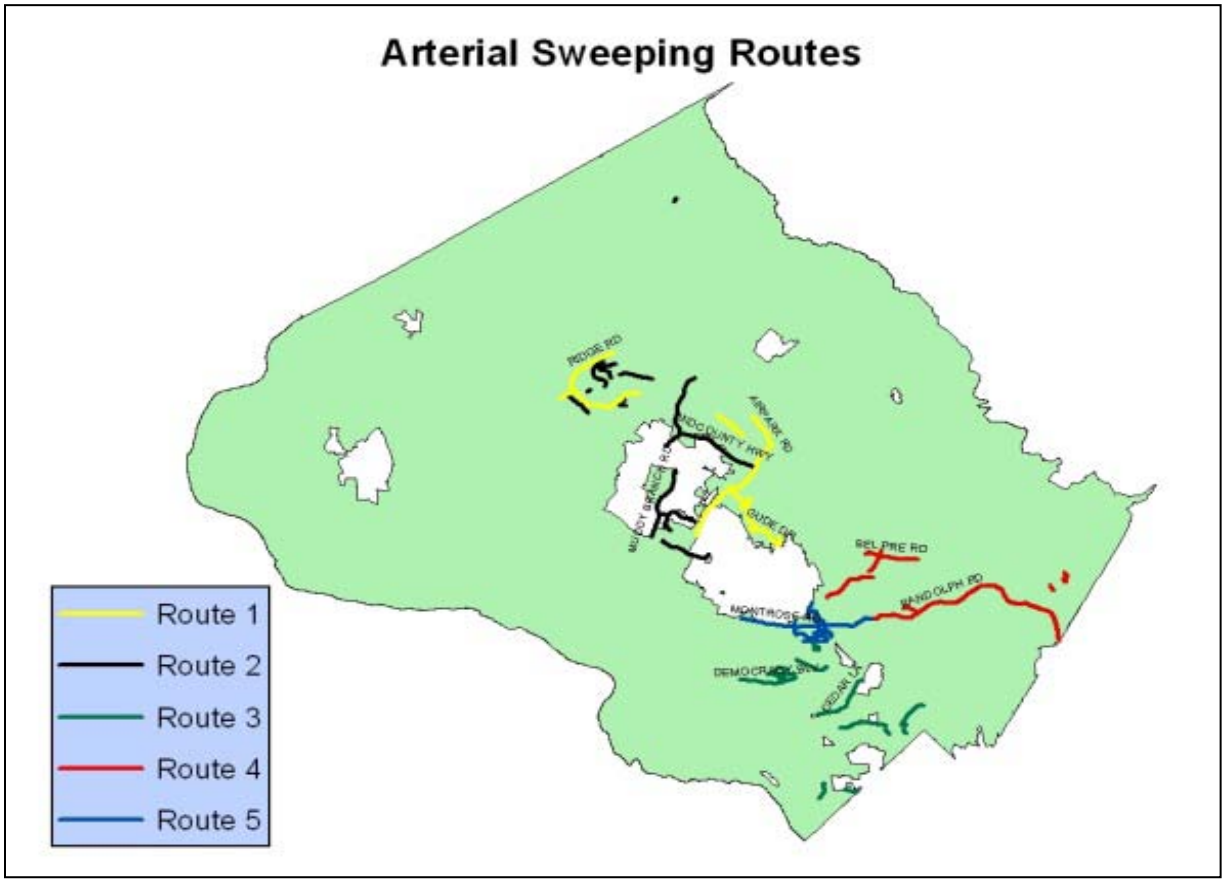


Figure III-E8. Montgomery County Arterial Street Sweeping Routes

A summary of the County's FY12 street sweeping program is shown in Table III- E10.

Table III-E10. Summary of County's FY12 Street Sweeping Program

Category	Materials Removed (tons)	Curb Miles Swept	Tons Material/ Curb Mile	Cost per ton	Cost per curb mile	Total Cost
Priority Residential Routes	436.73	1262.46	0.35	$211.02	$73	$92,159.58
Non-Priority Residential Routes	480.57	2784.58	0.17	$422.99	$73	$203,274.34
Arterial Routes 15 cycles	322.93	3440.55	0.09	$426.17	$40	$137,622.00
Totals	1240.23	7487.59				$433,055.92
County Average Tons Material/Curb Mile			0.20			

Beginning the last three months of FY12 (April, May and June), DEP began sweeping the arterial routes twice monthly. Because the total cost per mile for sweeping arterial routes is approximately half that for residential routes, DEP was able to increase total miles swept by 27% while only increasing total program cost by 19% in FY12. This difference will be greater in FY13 when more months will reflect the new policy. The twice per month frequency allows the County to claim credit under MDE guidance for controlling stormwater runoff and pollution from impervious surfaces under the Permit.

Figure III-E9 shows the tons of materials removed annually by street sweeping based on route type for records available, from 1999 to present. The tons of sand and salt applied were not reported for FY09 and FY10. In 2002, no County street sweeping was conducted due to lack of funding. The amount of material removed seems directly related to the amount of de-icing material applied, which is largely determined by the amount of winter precipitation. More snow and ice increases the need for application of sand to the roads, which then becomes more available for collection during street sweeping. The winter of 2011-12 was very mild and relatively little sand was applied to the roads, resulting in less material removed in all route categories

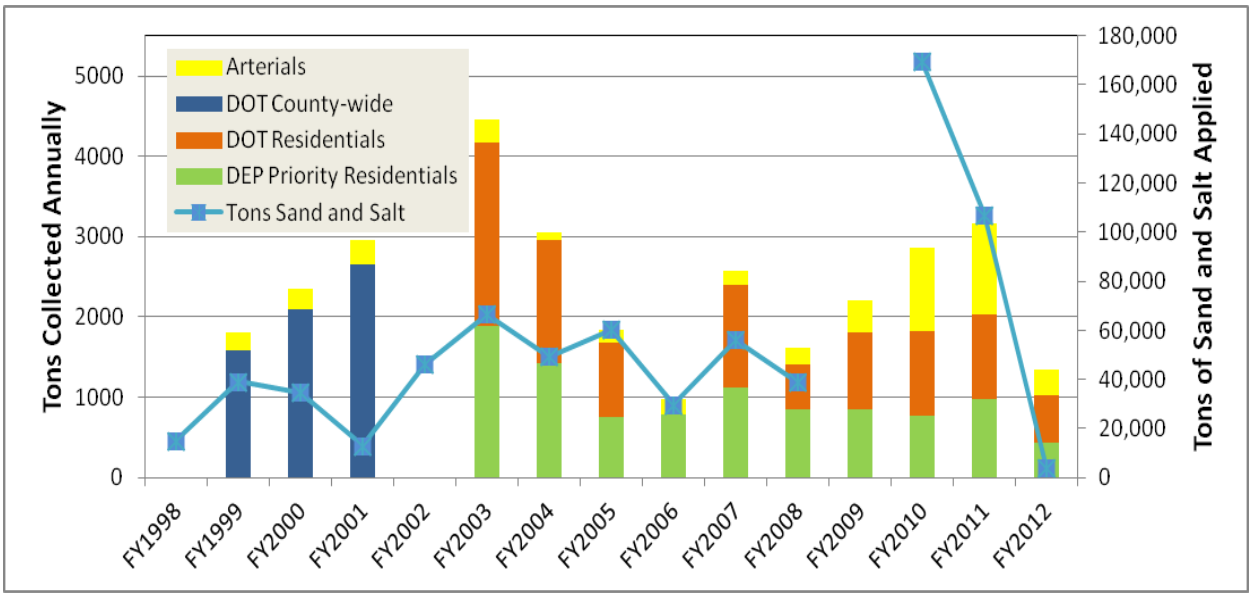


Figure III-E9. Tons of Material Applied During Winter Activities and Collected by Street Sweeping 1998-2012

Figure III-E10 below shows the mileage swept per year by route category. In FY12, the increase to twice per month for the arterial routes resulted in an increase in total miles swept. More miles were swept in FY12 than any prior year except for FY09 A further increase is forecast for FY13 as DEP continues to fund arterial route sweeping twice per month.

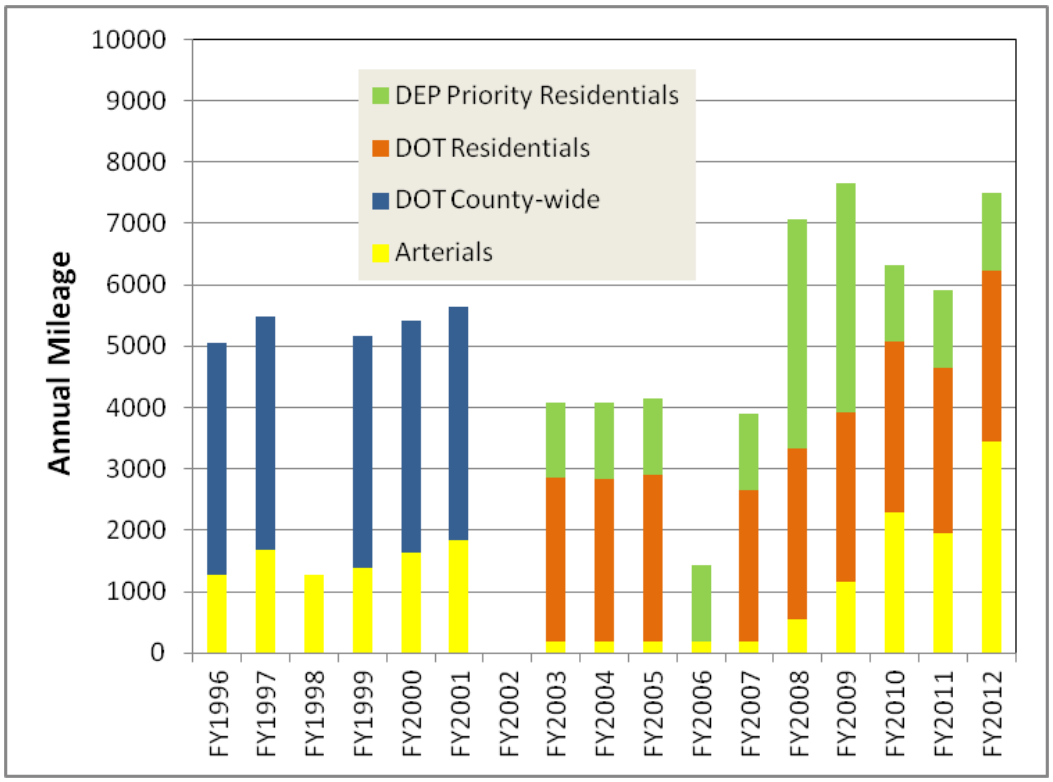


Figure III-10. Annual Montgomery County Street Sweeping Mileage 1996-2012

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

As previously stated, in FY12 the County began sweeping 229 miles of roadway identified as arterial routes twice monthly. This sweeping frequency allows the County to take credit for stormwater control for impervious acreage equivalent and also stormwater pollutant load reductions both Countywide and in applicable 8 digit watersheds with approved TMDLs. Table III-E11. shows the miles of arterial routes, along with the percent of the total arterial routes, for each watershed. Impervious acreage credit were calculated according to MDE's June 2011 Draft Guidance "*Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated*", Section VI. An Equivalent Impervious Acre. Pollutant load reductions were calculated in accordance with Section V. Alternative Restoration Credits, 1. Street Sweeping, a.Mass Loading Approach.

Table III-E11. Arterial Street Sweeping by Watershed

MD8DIG	Watershed	Miles	Percent of Total Miles	IA Credit (acres)	TN Removal (lbs)	TP Removal (lbs)	TSS removal (tons)
21311080	Upper Patuxent	0.1	0.1%	0.0	0.3	0.1	0.1
21402020	Potomac Direct	28.8	12.5%	2.4	60.5	24.2	12.1
21402050	Anacostia	28.7	12.5%	2.4	60.5	24.2	12.1
21402060	Rock Creek	86.4	37.7%	7.3	182.6	73.0	36.5
21402070	Cabin John Creek	26.9	11.7%	2.3	56.8	22.7	11.4
21402080	Seneca Creek	58.3	25.4%	4.9	123.0	49.2	24.6
2140302	Lower Monocacy	0.1	0.1%	0.0	0.3	0.1	0.1
	Total	229.4	100.0%	19.5	484.1	193.7	96.8

Notes:
IA= Impervious Area
TN=Total Nitrogen
TP=Total Phosphorus
TSS=Total Suspended Solids

Inlet Cleaning:

For FY12, DOT reported cleaning 811 storm drain inlets cleaned, 127 pipes cleaned, and 14382 linear feet of storm drain, collecting 367 tons of material at a cost of $275,392. Table III-E12., below, compares the DOT inlet cleaning program from 2006-2012.

Table III-E12 . DOT Inlet Cleaning, 2006-2012

Year	# Inlets Cleaned	Linear Ft. Cleaned	Debris Collected	Cost
FY12	811	14,382	367	$275,392
FY11	1,191	17,604	107	$269,593
2010	2,011	24,128	181	NR
2008	1,741	20,892	157	NR
2006	1,485	11,880	NR	NR

Roadside Vegetation Management:
The County's roadside weed spraying program for noxious weeds is conducted by Montgomery Weed Control Inc. 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-E13. shows the amount of herbicides applied along County roadways from 2009-2012:

Table III-E13. Herbicide Usage by Montgomery Weed Control Inc. on Montgomery County Rights of Way

Purpose	2012	2011	2010	2009
State-mandated Treatment for Noxious Weeds	4.78 Gal Clopyralid 4.55 Gal Glyphosate	5.20 Gal. Clopyralid 4.55 Gal. Glyphosate	7.53 Gal. Clopyralid 2.57 Gal. Glyphosate	9.06 Gal. Clopyralid 3.49 Gal. Glyphosate
Program Cost	$22,000	$20,000	Not available	Not Available
Note: Herbicide use is directly correlated to growing conditions for each season				

Winter Weather Materials Application:
The DOT reported 15,200 tons of salt and 3,800 tons of sand for a total of 19,000 tons of sand and salt as well as 122,031 gallons of salt brine were applied to County roadways during FY12. The sand and salt deicing operations cost $1,343,380 in FY12. Table III-E14, below, compares DOT winter weather deicing materials from FY10-FY12.

Table III-E14. DOT Winter Weather Deicing Material Usage From FY10-FY20

	FY12	FY11	FY10
Salt, tons	15,200	85,600.00	169,633 sand and salt combined
Sand, tons	3,800	21,400.00	NR
Salt Brine, gallons	122,031	NR	NR

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 on-line 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.

In 2009, DOT began a salt brine pilot program on 240 lane miles of primary roads. Salt brine is a 23% salt solution created in a brine maker and stored in tanks until used. Brine has a freezing point of -6 degrees F and continues to work when salt, which loses effectiveness at 20 degrees F, does not. A contractor sprays the salt brine on highways two hours to two days prior to the onset of frozen precipitation to prevent snow and ice from bonding to pavements. In 2010, over 400 lane miles of both primary and secondary roads received salt brine applications using contracted and County equipment. In the 2011-2012 winter season, DOT purchased additional salt brine making equipment and storage tanks and developed the salt brine treatment program to include 678 lane miles of primary, secondary and some neighborhood roads. Salt brine application is approximately 60 gallons per lane mile, for a total of 40,677 gallons of salt brine to spray one round of 678 lane miles. In FY12, DOT sprayed three times for a total of 122, 031 gallons. The cost to treat roadways using all methods of application was $1,343,380.

E.7. Public Education and Outreach

Compliance Hotline:
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 illicit discharges and spills. More information on the County's central call center is found on the 311 home page at: http://www3.montgomerycountymd.gov/311/Home.aspx

Watershed Outreach:
The Permit requires the County to develop and implement a public outreach and education program focuses on stormwater pollutant reduction with specific goals and deadlines. To meet this requirement, the County developed a public outreach and stewardship work plan (POSWP) as part of the County's overall Strategy, submitted to MDE in FY11.

The POSWP document outlines eight specific outreach priorities for the current Permit cycle. The priorities include: Pet Waste Management, Lawn Stewardship, Anti-Littering, Stormwater Awareness, establishing a Volunteer program, Riparian Reforestation, Roof Runoff Reduction and Parking Lot Recharge. In the POSWP, each priority is summarized in a practice sheet which 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. In FY12, DEP continued implementing an anti-littering campaign and started developing a Stream Stewards volunteer program and a pet waste management program.

FY12 Outreach Events
Stormwater outreach and education projects for FY12 are included in the electronic (CD) Attachment to this report in Appendix A. MDENPDES12.accdb, Part D. Watershed Restoration Project Locations with GIS Coverage. The DEP events focused on targeting audiences, increasing stormwater awareness, encouraging directionally correct measures, and establishing baseline information through surveys. The baseline information will help guide POSWP

implementation and follow-up measures. The 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.

In FY12, DEP hosted or participated in 71 outreach events, an increase of 45% from the previous year. Nearly 6,400 attendees were directly educated, more than double the face to face efforts in FY11, and quadruple since FY10. DEP's presence in the community conducting watershed outreach has increased 326% since FY10.

During FY12, the DEP again worked with its partner agencies to conduct the second annual Community Clean Water Summit, which addressed key topics including stream health, stormwater pollution and litter reduction. 25 exhibitors participated in the Summit, including representatives from all County's watershed groups (8). There were 185 participants. In a follow up survey (6 months) of changes in behavior, 28 attendees responded to the survey (15% return rate). Of those that responded, 65% reported they participated in a stream cleanup after having attended the summit. Approximately 76% of the 28 that responded had encouraged others to participate in a cleanup or environmental improvement activity. 24% of the respondents indicated that it changed the way they thought about their actions or behaviors and their effect on the environment.

Stream Stewards Volunteer Program

DEP's large increase in watershed outreach was facilitated in part by the addition of another outreach planner. The new position focused on volunteer coordination, including the development and launch of the Stream Stewards program. The Stream Stewards Program is a tiered volunteer program, which trains volunteers to further County watershed and stormwater objectives in their communities. The program begins with an introduction and overview of stormwater pollution issues and solutions. Following appropriate DEP training, volunteers can become:

- Watershed Ambassadors – Assist DEP at outreach events throughout the County, which allows DEP to reach more citizens.
- Watershed Speakers – Represent DEP at speaking engagements throughout the County and alert DEP to new outreach opportunities.
- Watershed Keepers –help DEP during clean-ups, tree plantings, or Adopt a County installed environmental site design practice and ensure it is maintained and functioning properly.

The Stream Stewards program includes a program brochure, orientation presentation and volunteer handbook. DEP technical staff were involved in the development of the training programs for the three volunteer tiers. Although created late in FY12, DEP conducted training for 21 volunteers who contributed a total of 82 hours of service to DEP. The DEP is developing new publications on stormwater friendly actions for residents and is translating outreach material into Spanish. The publications and translations will be completed and reported in FY13.

County Watershed Groups

Local stormwater groups are vital partners in raising awareness on stormwater pollution reduction and behavior change. The DEP's outreach strategy includes a significant level of effort working with local watershed groups to expand community stormwater outreach as well as help empower and promote the organizations.

During FY12, there were seven groups which were actively recruiting members and conducting special activities including adopt-a-road and watershed clean-ups and invasive plant work days. These groups include the Eyes of Paint Branch, the Friends of Sligo Creek, the Neighbors of Northwest Branch, the Rock Creek Conservancy, the Little Falls Watershed Alliance, the Friends of Cabin John Creek , and the Muddy Branch Alliance. In the Seneca Watershed, there was a less formal group working together as the Seneca Watershed Partnership. In FY12, the Friends of Cabin John and the Seneca Watershed Partnership made significant strides towards becoming 501-c3 non-profit organizations with Board of Directors.

For FY12, the DEP focused on tracking litter removal and community outreach by the watershed groups. One group, the Muddy Branch Alliance, established in FY11, has won several awards this past year for their efforts, including:

- Working with 200 volunteers on 11 events
- Supporting and hosting a number of clean up events to support the Alice Ferguson Foundation, Greenway Traisl, and local faith organizations through 'Faithfully Picking Up the Potomac'
- Sponsoring an Adopt a Road segment
- Arranging for Davey Rogner, from the nonprofit organization, PickUp America to speak at a local high school
- From their 15 trash cleanup events collecting 134 bags of trash, and beginning an evaluation of how to deal with dumping of large items in streams such as shopping carts, tables, couches, tires, and scrap metal.

The Little Falls Watershed Alliance has been in existence since the early 2000. . Their accomplishments from FY12 include:

- Spent over 1,000 hours clearing acres of parkland from invasive vines and other nuisance weeds.
- Utilized over 500 volunteers to remove nearly 200 bags of trash from the creek and surrounding areas.
- Met with County and District government officials and participated during the State's legislative session to advocate for stronger trash control legislation, environmental measures and a bag fee bill.
- Restored streamside meadowland
- Worked on a forest restoration project that will serve as an outdoor classroom for students at a local elementary school.

Developing Additional Capacity in Watershed Groups
In FY12, DEP continued efforts in building watershed groups' capacity. Through this effort, each of the eight watershed groups completed an organizational assessment to evaluate programmatic and organizational capacities. The results provided insight into the strengths and weaknesses of each group and identified areas for improvement. The DEP requested that each group follow up with its Board members on the assessment results and consider developing plans to address weaknesses and build on strengths.

The DEP provided funding for one representative from each watershed group to attend the annual Chesapeake Watershed Forum (CWF) sponsored by the Alliance for the Chesapeake Bay. The CWF sessions are geared to provide information on grass roots approaches for watershed outreach and implementation. After the CWF, the attendees provided to DEP feedback which is being used to enhance future capacity building assistance efforts.

The FY12 contractual efforts included other training and stewardship opportunities for the watershed groups. There were two train-the-trainer workshops focused on conservation landscaping (27 attendees) which led to finished conservation landscape projects. . Additional activities included storm drain marking and initial steps for a pilot project with installation of pet waste stations on common ownership property.

Efforts to Provide Outreach to Culturally Diverse Communities
The DEP continued to identify and participate in activities to reach out to the County's culturally diverse communities in FY12. The 2010 census showed that 50.7 % of Montgomery County residents identified themselves as other than non-Hispanic white, reflecting the increasing ethnic diversity in the County. The DEP participated in five events in FY12 recognized for attracting varied demographic and ethnic participants. These included the County Fair, the World of Montgomery festival; Montgomery Housing Partners Green Club, Camp Ahava ESD tour and the White Oak Recreational center dedication (Figure III-E11). The DEP also began translating three more publications focused on stormwater pollutant reductions into Spanish, to be completed in FY13.

Figure III-E11. Students at Camp Ahava Learning about Sligo Creek Through the Enviroscape Model and Examining Porous Concrete

Outreach in the Breewood Tributary

The DEP is implementing multi-faceted efforts, including project implementation, monitoring, and watershed education and outreach in the Breewood Tributary to meet the Permit requirement for watershed restoration (see Section III.H.1). The DEP held an Earth day cleanup in FY12. For this event, staff utilized volunteer services and had approximately 15 participants despite significantly wet weather. The DEP worked with the M-NCPPC Weed Warrior program to remove invasive plants and trash on parkland, collecting 24 bags of debris. The event also included a walking tour of the Breewood tributary, a demonstration of stormwater monitoring equipment (Figure III-E12) and a rain barrel raffle.

Figure III-E12. Contractor and Staff Educating Residents/Volunteers on the Stormwater Monitoring Equipment in Breewood

Anti Litter Campaign

During FY12, the DEP continued to highlight the need to reduce litter in our local streams using a variety of radio, print, and electronic advertising. Radio ads were conducted from July through December 2011, during which nineteen 30-second ads and thirty one 10-second ads ran on the local radio station WTOP. Ads ran for 2 weeks in every month for a total of 12 weeks. The 10 second ads ran at the end of traffic reports, to capture listeners already tuned in for those reports.

The DEP used the regional anti-litter campaign ads on the sides of 80 Ride-On buses and in 95 bus shelters in strategic places in the down county area (Figure III-E13). These ads were located primarily in the Rock Creek and Anacostia watersheds where the largest contribution of litter and trash had been previously identified. Both types of ads ran for a total of 12 weeks at two different intervals; from mid-July to mid October 2011, and from March through May, 2012. At the time of this report, the ads' impact on social behavior change was not measured. Tracking activity from all these sources was difficult, but assumptions were made based on contractor provided information (Direct Media, Clear Channel Outdoor, and The Gazette Newspapers).

Figure III-E13. Ride On Bus Ad Displayed During the Second Round of Regional Anti-Litter Campaign

My Green Montgomery Website

In FY12, DEP created a new user friendly website called My Green Montgomery (www.mygreenmontgomery.com). The site is intended as a one stop shop for all things "green". The site includes a calendar for community group events and a blog section used by many of the local watershed groups. The website creation also includes subject specific cable spots. In FY12, a water resources video series was created showcasing the RainScapes program (rain barrels and rain gardens), the Arcola Avenue "Green Streets" project which integrates environmentally friendly landscaping and LID practices into roadway design to treat and absorb rainfall runoff, local stream restoration projects, and actions citizens could take to reduce stormwater impacts. The cable spots were 3-4 minutes and also run routinely on Montgomery County Cable.

Summary of Stormwater Outreach Efforts
Table III-E15 presents a summary of stormwater outreach efforts in FY12:

Table III-E15. Stormwater Outreach Efforts in FY12	
Project Participants	#
Volunteers through Stream Stewards	21
Volunteer hours through Stream Stewards	82
# of participants for Clean Water Summit	185
# of watershed groups working towards incorporation	2
# of watershed groups assisted	8
# of Residents directly reached	6,400
Materials and Events	
# of publications (print, web, other) produced:	10
# of publication copies printed	15,000
# web hits on online publications	69,000
# media hits (e.g., newspaper articles, TV and radio stories, etc.) facebook, listservs, twitter, blogs	400,000
# of Events hosted or attended	71

Table III-E16 shows statistics on total DEP website information trends. Visits to the DEP site increased about one-third from FY11 to FY12. The dramatic increase in page views corresponds to RainScapes and SWM maintenance program e-newsletters in FY12 which direct traffic directly to the page. Visits for information related to stormwater pollution around the home increased 61% from FY11 to FY12

Table III-E16. FY12 DEP Web Traffic Trends				
Out of 500 most popular web pages				
Rank FY11	Rank FY12	Page Topic	FY12 Visits	Visits % increase from FY11
1	1	Solid Waste Collection services	88,019	32%
5	7	DEP Home Page	30,643	75%
50	14	RainScapes Main page*	12,139	233%
26	21	Watershed Main page	8,288	106%
40	25	RainScapes Rebates	7,201	54%
71	26	RainScapes Techniques*	6,703	320%
130	41	Stormwater Facility Maintenance*	3,949	502%
63	54	NPDES –MS4 page	3,061	126%

67	64	Residential Stormwater Awareness Page (Stormwater Pollution Main Page)	2,423	41%
81	68	Water Quality Protection Charge	2,153	137%
93	69	RainScapes Manuals	2,143	167%
95	79	RainScapes Resources	1,761	59%
100	88	Welcome to Your Watershed (mapping)	1559	77%
147	95	Watershed Restoration Projects Main	1,378	129%
153	102	Introduction to Watersheds Main	1280	123%
160	132	Stormwater - What you can do	855	61%

RainScapes Program Outreach

RainScapes for Schools and the RainScapes for Schools Growing program entered its 3rd year in FY12. Since inception in FY10, the Growing program has provided native plants, soil, pots and educational materials to MCPS high school horticulture classes to support instruction on the use of plants in stormwater management. Plants from the program have been used in community based projects and in RainScapes classes as take home materials. RainScapes for Schools projects have included both conservation landscapes and rain gardens for curriculum support and runoff reduction (Figure III-E14). Some schools have done more than one project; for each of the three years (FY10, FY11, FY12), the program has been able to support four schools projects.

In FY12, DEP continued to train local designers and contractors on RainScapes project requirements and installation, including specifics of drainage site assessment, rain garden design, and also provided hands on project building opportunities through the RainScapes for Landscape Professionals Program.

The DEP RainScapes team continued to provide workshops focused on RainScapes Rewards Rebate qualified practices. From 2008- 2012, these workshops have reached 1040 residents, averaging 240 participants each year (2009-2012). In addition, DEP is evaluating how to expand partnership efforts with local watershed and environmental groups to benefit the RainScapes Neighborhoods, RainScapes for Schools and RainScapes Rewards components of the program.

FY12 Highlights of RainScapes Outreach include:

- Provided outreach and education materials to over 1000 residents, business owners, and stakeholders at 37 local and regional events as well as staffing the Montgomery County Fair DEP booth which reached many more people.
- Offered training on site assessment and rain gardens to students of the National Capitol Watershed Stewards Academy and the Faith Based Watershed Stewards Academy, reaching 35 students.

- Presented the RainScapes Program to a national audience of Stormwater professionals and regulators at the Low Impact Development Symposium which was held in Philadelphia, fall 2011.
- Sponsored a RainScapes tour of publically accessible RainScapes and CIP LID retrofit projects. The tour information was web accessible and a variety of watershed group volunteers staffed the sites to field questions of tour visitors.
- Published RainScapes Design Manuals online, providing resources to a wide audience, detailing how to create the many forms of RainScapes.
- Materials were created to provide information on invasive species and were widely distributed at the County Fair.
- Developed a professionally oriented template on Permeable Pavers and published on DEP's website. This template provides construction guidance for design and installation of permeable interlocking concrete paving (PICP) systems that are installed to capture the roof runoff and retain the water that falls on the driveway or other areas.

Figure III-E14. Students at Pine Crest Elementary Installing a Rain Garden

F. Watershed Assessment

The DEP continues to systematically develop watershed assessments by evaluating current water quality and identifying and ranking structural, non-structural and programmatic watershed restoration opportunities for each County watershed. Full watershed assessments will include field investigations, prioritized project (action) inventories with structural and non-structural project concepts, and cost estimates. Watershed implementation plans include results from the watershed assessments, with more detailed implementation planning and schedules to meet regulatory and programmatic targets to control stormwater discharges to the MEP.
The Strategy was developed from implementation plans or pre-assessments for each of the County's 8-digit watershed groupings. These are shown in Table III-F1. The final version of the Strategy can be found online at:
http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/dep/water/wris.asp#plans .

Implementations plans were developed for those watersheds with existing EPA approved TMDLs, or in the case of Muddy and Watts Branch, for which watershed assessments and project inventories had been previously compiled. These plans were used for Strategy development to identify BMPs, quantify treatment by those practices, determine the watershed restoration potential of implemented BMPs, evaluate the ability of the watersheds to meet applicable TMDLs though identified restoration practices, and provide schedules and cost estimates. More information on implementation plan development for EPA approved TMDLs is shown in Part III. J. Total Maximum Daily Loads.

Pre-assessments were developed for the Dry Seneca and Little Seneca (combined) subwatershed of the Seneca Creek watershed, Lower Potomac Direct watershed (all other subwatersheds except Muddy and Watts Branch) and the Upper Potomac Direct watershed. These include a description of environmental conditions, potential problems, and preliminary restoration areas identified by desk top analysis.

The status and schedule of watershed restoration planning is shown in Table III-F2. As shown in Table III-G8., in Section III.G. Watershed Restoration, below, DEP budgeted $749,130 in FY11 and $502,244.23in FY12 for watershed assessment and planning.

Table III-F1. Montgomery County Watershed Groupings and Plans

Watershed grouping	Implementation Plan	Pre-Assessment
Anacostia	X	
Rock Creek	X	
Cabin John Creek	X	
Seneca Creek		
Great Seneca (including Clopper Lake)	X	
Dry Seneca and Little Seneca		X
Lower Monocacy	X	
Upper Potomac Direct (West of Seneca Creek, not described in any other grouping)		X
Lower Potomac Direct (East of Seneca Creek, not described in any other grouping)		
Muddy Branch and Watts Branch	X	
All other subwatersheds		X
Patuxent (Triadelphia/Brighton Dam and Rocky Gorge)	X	

Table III-F2. Status of Montgomery County Watersheds' Assessments

8 Digit Watershed	Planning Subwatershed	CCIS=County Coordinated Implementation Strategy	TMDLs
Anacostia	All	Anacostia Watershed Restoration Plan (ARP)(2010) CCIS Draft Watershed Implementation Plan (2011) Project Implementation Ongoing *Revise Implementation Plan FY17*	Bacteria (2002) Sediment (2007) Nutrients (2008) Trash (2010)
	Paint Branch	Upper Assessment (1997) Lower Assessment (2006)	
	Little Paint Branch	Addressed under the ARP	
	Northwest Branch	Assessment (2000)	
	Sligo Creek	Addressed under the ARP	

Table III-F2. Status of Montgomery County Watersheds' Assessments			
8 Digit Watershed	**Planning Subwatershed**	**CCIS=County Coordinated Implementation Strategy**	**TMDLs**
Rock Creek		CCIS Draft Watershed Implementation Plan (2011) Watershed Assessment (2001) Implementation (Action) Plan (2001) Project Implementation Ongoing *Revise Implementation Plan FY15*	Bacteria (2002)
Cabin John Creek		CCIS Draft Watershed Implementation Plan (2011) Watershed Assessment (2004) Project Implementation Ongoing *Revise Implementation Plan FY16*	Bacteria (2002) Sediment (2011)
Seneca Creek	ALL	*Develop Implementation Plan FY13*	Sediment 2011
	Great Seneca Creek (including Clopper Lake)	CCIS Draft Watershed Implementation Plan (2011) MC-USACE Draft Watershed *Assessment (Final expected 2013)* Project Implementation Ongoing	Clopper Lake : Phosphorus and Sediment (1998)
	Dry Seneca and Little Seneca	CCIS Draft Pre-Assessment (2011)	
Lower Monocacy		CCIS Draft Watershed Implementation Plan (2011) *Develop Implementation Plan FY13*	Sediment (2009) Bacteria (2009)
Upper Potomac Direct	Little Monocacy and Broad Run	CCIS Draft Pre-Assessment (2010) *Develop Implementation Plan FY14*	
Lower Potomac Direct	**ALL**	*Develop Implementation Plan FY2013*	
	Rock Run and Little Falls	CCIS Draft Pre-Assessment (2010) *Develop Implementation Plan FY14*	
	Muddy Branch	CCIS Draft Implementation Plan 2011for Muddy and Watts Branch MC-USACE Draft Watershed Assessment (Final expected 2013) Project Implementation Ongoing	
	Watts Branch	CCIS Draft Implementation Plan 2011 for Muddy and Watts Branch Watershed Assessment (2006)	
Patuxent	**ALL**	CCIS Draft Pre-Assessment and Implementation Plan (2011) *Revise Implementation Plan FY14*	

Table III-F2. Status of Montgomery County Watersheds' Assessments			
8 Digit Watershed	**Planning Subwatershed**	**CCIS=County Coordinated Implementation Strategy**	**TMDLs**
	Rocky Gorge Reservoir	CCIS Draft Pre- Assessment and Implementation Plan (2011)	Phosphorus (2008)
	Hawlings River (tributary to Rocky Gorge)	Assessment (2003) Action Plan (2003) Under Implementation	
	Triadelphia Reservoir	CCIS Draft Pre- Assessment and Implementation Plan (2011)	Phosphorus and Sediment(2008)

Status of Watershed Assessments:
Great Seneca and Muddy Branch Watersheds Study
During 2004, the County began the watershed inventories in the Great Seneca and Muddy Branch watersheds as cooperative efforts with the 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 delayed due to limited Federal funding, but is expected to be completed in 2013.

DEP has begun a Task Order to assess and identify projects within the remaining watersheds: Lower Monocacy, Upper and Lower Potomac Direct, and the remaining portions of Seneca watershed (Dry Seneca and Little Seneca). These watershed assessments will begin in the Spring of 2013 and will be completed by 2014. These assessments will include identification of LID opportunities, stormwater pond retrofits, new stormwater control opportunities, and potential stream restoration.

Anacostia River Restoration Plan (ARP) (February 2010)
The final report for the most recent inter-jurisdictional restoration of the Anacostia, Anacostia River Watershed Restoration Plan and Report, was completed in February 2010 (http://www.anacostia.net/plan.html). Currently, DEP is developing a project management plan with the USACE. The continued partnership will work towards completing an Anacostia River Ecosystem Restoration Feasibility Study to assess and design restoration opportunities identified in the ARP. The inventory of project opportunities and possible enhancements identified through the ARP provided the basis for the County's watershed implementation plan to meet Permit WLAs, trash reduction requirements, and contribute toward the County impervious area restoration goal. The primary focus will be stream restoration, riparian and upland reforestation, and wetland creation or restoration.

Watershed Screening:
The DEP uses the multi-metric Index of Biological Integrity (IBI) countywide to develop narrative ratings of biological conditions in water bodies. The IBI is calculated by monitoring location based on species--either benthic insects or fish-and is reported as a Benthic Index of Biological Integrity (BIBI) and a Fish Index of Biological Integrity (FIBI). Typically, the higher the index, the higher the quality of biological conditions at that monitoring location. The DEP identifies narrative categories based on the distribution of the IBI scores and how the scores compare with scores at the least-impaired stations in the County. Biological conditions in the water body are then described as *excellent*, *good*, *fair*, and *poor*. Similarly, the numeric scores for habitat conditions at monitored stations are also ranked and assigned a narrative category.

The water chemistry, biological community and stream habitat and conditions are monitored at representative stations in all County watersheds on a rotating basis over a 5 year cycle. The County categorizes the monitored subwatersheds as impaired or unimpaired by analyzing and comparing the BIBIs, FIBIs and habitat condition scores. BIBIs only are used in smaller drainage areas of less than 300 acres. The small streams in these subwatersheds typically support pioneering fish species only, which, because of their adaptability to changing habitat and flow conditions, are not reliable indicators for rating impairments.

The Anacostia watershed was monitored in 2011. There are stations within the Anacostia that have been monitored since 1995 to assess the health of the subwatersheds, track changes in stream conditions and document any cumulative effects of watershed restoration projects. Maps of the benthic and fish monitoring station can be seen in Figures III-F1 and III-F2. However, no general trends in BIBI or FIBI are evident among the four subwatersheds. The complete report presenting the results of the 2011 monitoring of the Anacostia subwatersheds can be found on the CD attached to this report in Appendix P.

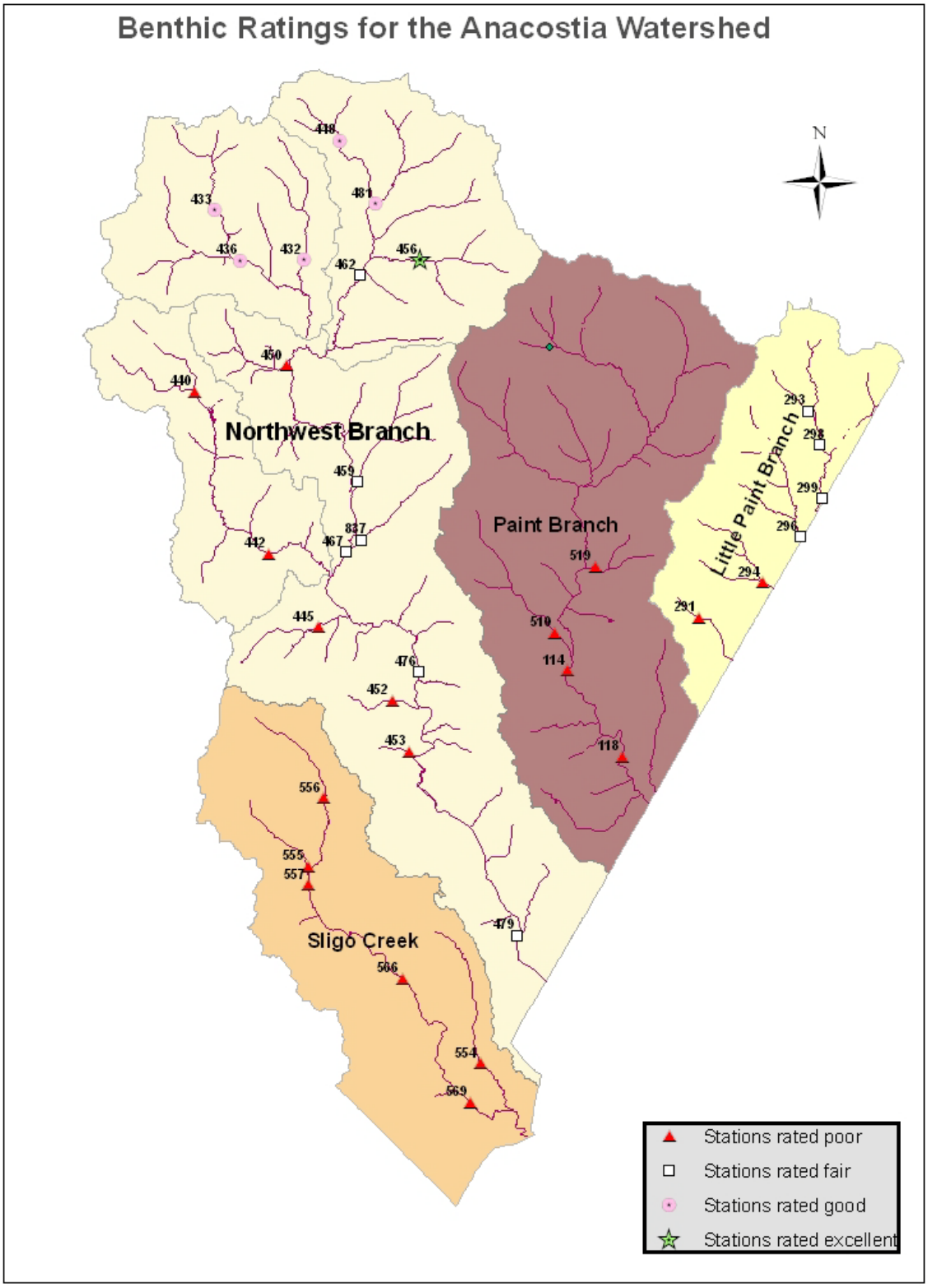


Figure III-F1 Locations of Benthic Monitoring Stations in the Anacostia

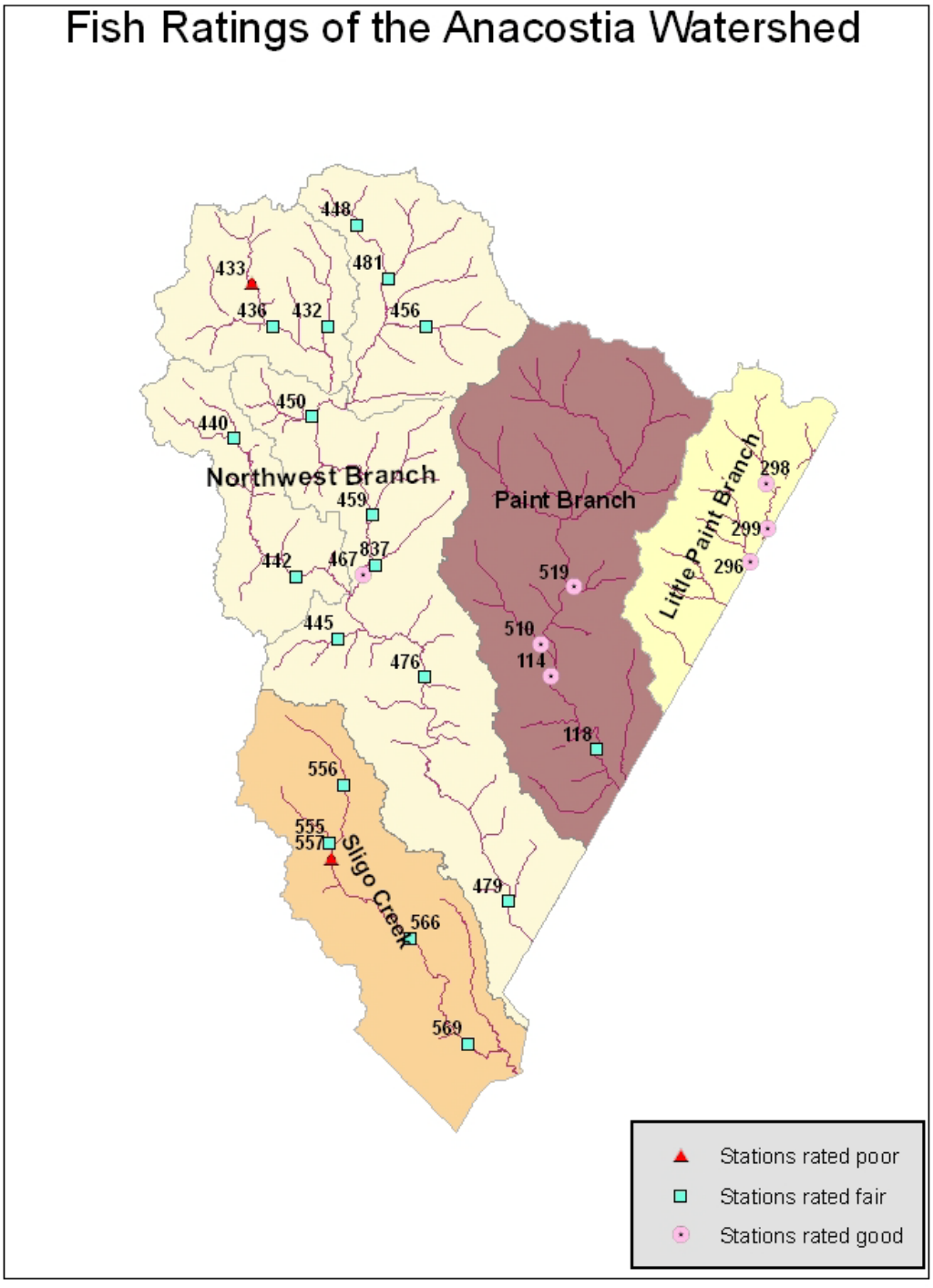


Figure III-F2. Locations of Fish Monitoring Stations in the Anacostia

Sligo Creek is the smallest of the four Anacostia subwatersheds. It has experienced the longest period of stream restoration and stormwater retrofits, with the oldest projects dating to the mid 1980's. Results from the Sligo Creek subwatershed for the last three monitoring cycles (2000, 2009, and 2011) are highlighted below:

Sligo Creek BIBI

The percentages of BIBI Scores in the Sligo Creek watershed were all in the poor category for the sites monitored Figure III-F3. Despite the more than 20 years of restoration efforts, these stations have not displayed a substantial change in BIBI scores over the study period. Nor was there any obvious trend for improving scores over years among these four stations.

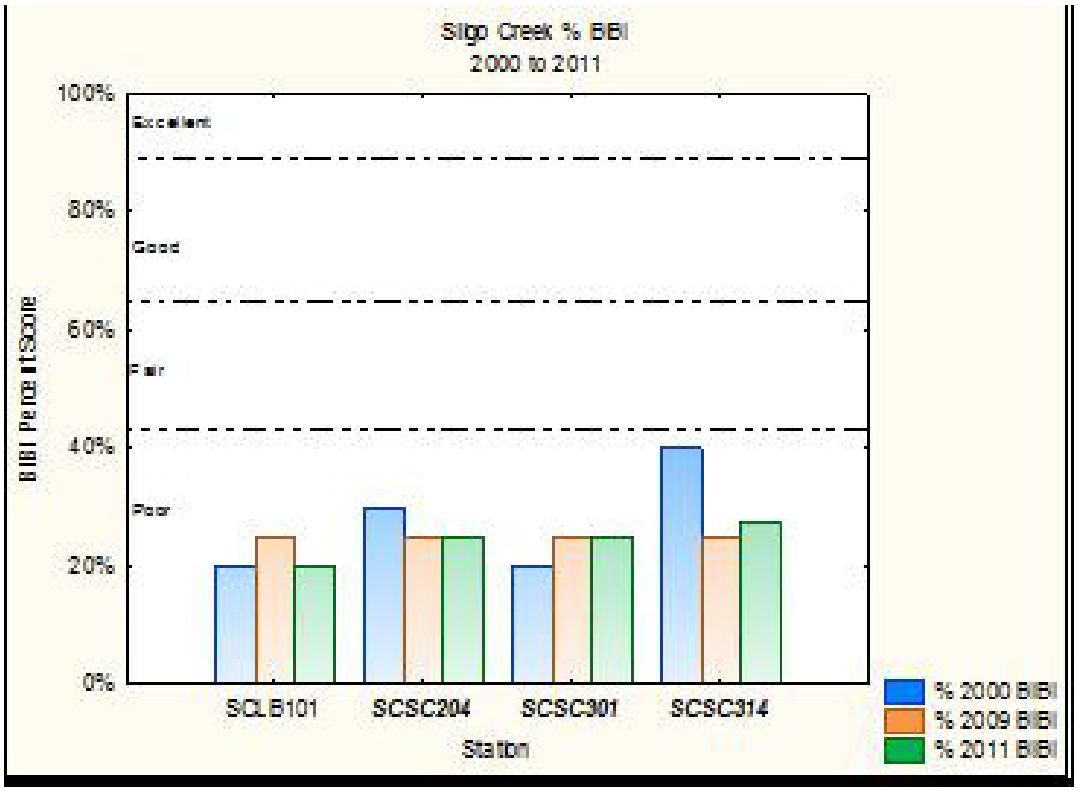


Figure III-F3. BIBI Percentages at Sligo Creek Stations from 2000-2011

Sligo Creek FIBI

FIBI scores ranged from 2.1(Poor) to 3.0 (Fair) in 2011 (Figure III-F4). From 1990-2007, 19 native fish species were directly stocked in the lower reaches of Sligo Creek since a downstream barrier prevented natural recolonization.

Three stations had their highest score in 2011 among the three monitoring periods. Increased scores can be partially attributed to an increase in the number of Riffle/Benthic insectivores, which increased from 7% in 2000/2003 to 26% in 2011. The Tessellated Darter, Longnose Dace and Blue Ridge Sculpin were collected in limited numbers in 2000/2003. The Tessellated Darter and Longnose Dace were encountered with greater regularity during 2011, but no Blue Ridge Sculpin were found at the monitored stations.

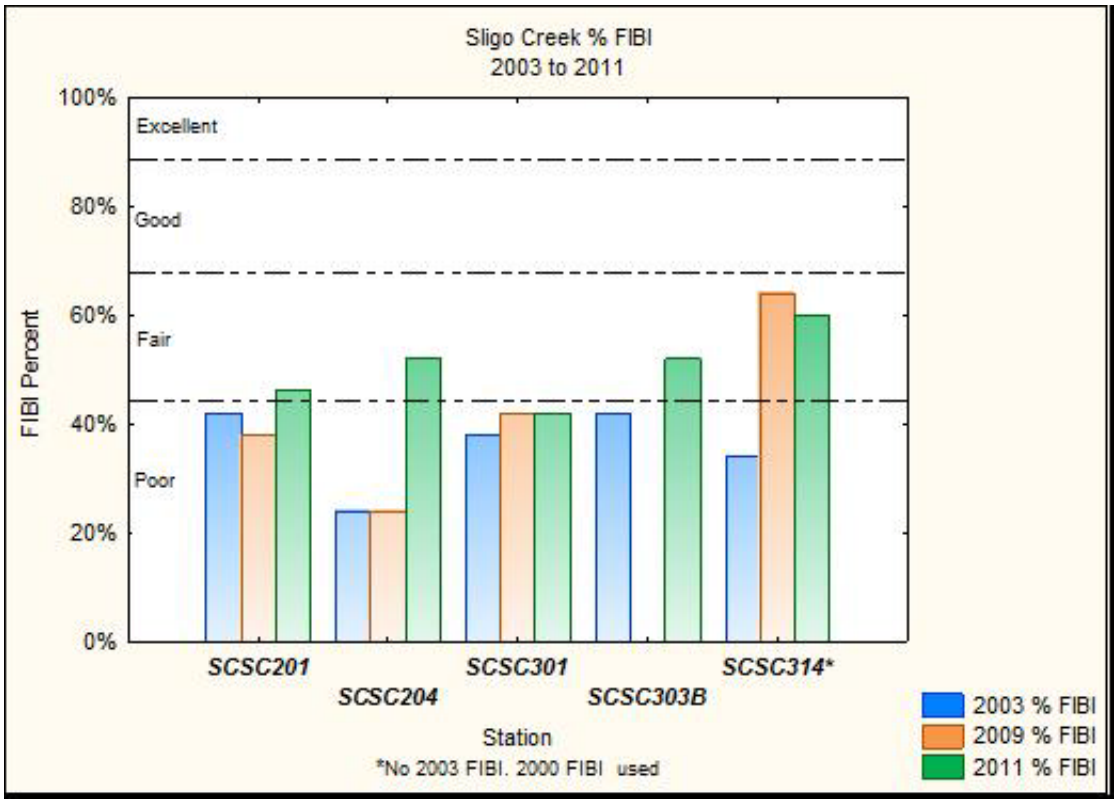


Figure III-F4. FIBI Percentages at Sligo Creek Stations, 2003-2011

G. Watershed Restoration

The DEP is implementing projects identified in watershed assessments to make progress towards controlling stormwater discharges to the MEP and reducing stormwater pollutant loads. Projects include adding SWM BMPs, restoring stream valleys, improving water quality, and addressing damage created by under controlled urban stormwater runoff and pollution. The DEP is continually assessing emerging stormwater control guidance and improving baseline data critical to watershed planning to ensure that the most beneficial, cost effective projects are selected for implementation.

Figure III-G1 shows the County area, and included impervious surfaces, subject to the Permit. The Permit's Attachment A, Annual Report Databases requires submittal of Table C. Impervious Surfaces Associated With GIS Coverage and Table D. Water Quality Improvement Project Locations Associated With GIS Coverage. The required data can be found in Appendix A, MDENPDES12.mbd, Parts C-D.

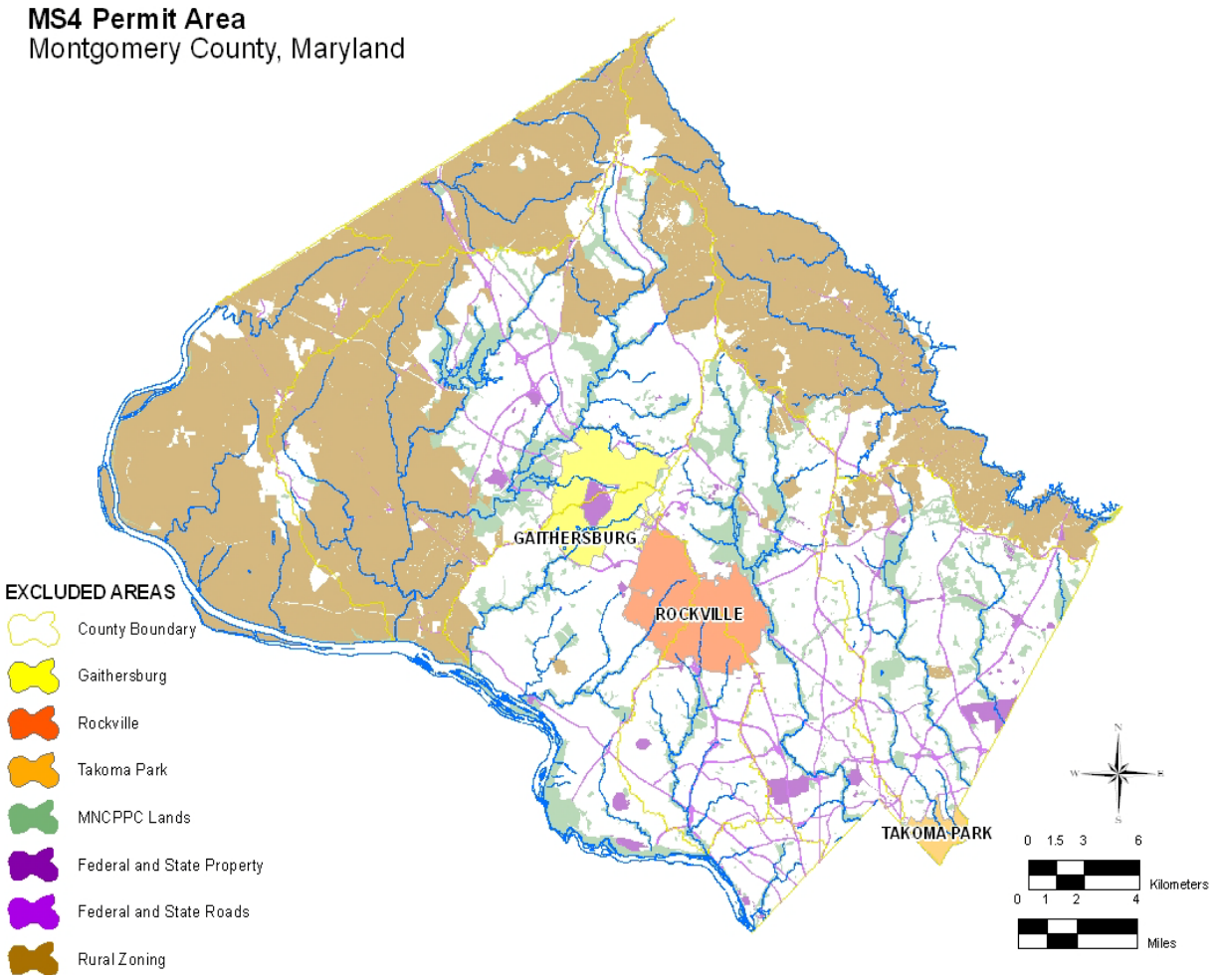


Figure II-G1. County Area Subject to the MS4 Permit

Table III-G1 below provides information on the current status (FY12) of controlled/restored vs. uncontrolled impervious surface areas in the County.

Table III-G1.FY 12 Impervious Acreage Restoration Goal Progress Summary

Description	Area in Acres
Total County Area	324,552
Total Area of Impervious Surface	35,965
Total County Area Subject to MS4 Permit (1)	138,649
Total County Impervious Area Subject to MS4 Permit	25,119
County MS4 Impervious Area with Effective Stormwater Management	3,661
Under or Uncontrolled Impervious Area Subject to MS4 Permit	21,458
2001 MS4 10% Impervious Goal	2,146
Stormwater Controls Added through FY10	2,146
2010 MS4 20% Impervious Restoration Goal	4,292
Stormwater Control added in FY11	24
Stormwater Control added in FY12	116
Remaining Impervious Area to be Restored by 2015 to Meet Current MS4 Permit Requirements	4,152

1. Exclusions include: Certain zoning codes, parklands, forests, municipalities with own stormwater management programs, state and federal properties, and state and federal maintained roads

Achieving the 2001 MS4 Permit Watershed Restoration Goal:
The County's second generation Permit issued in 2001 required the County to restore a watershed or combination of watersheds equaling 10% of Montgomery County's impervious area not treated to the MEP. The calculated 10% watershed restoration goal was 2,146 acres. County SWM BMP CIP projects completed through FY10 achieved control of 1,091 impervious acres. Based on the MDE draft guidance published in June 2011, DEP calculated that stream restoration of 20 stream miles added an additional equivalent impervious acreage treatment of 1,055 acres. The total impervious control added through CIP watershed restoration projects was 2,146 impervious acres, meeting the 10% watershed restoration requirement. Total project costs were $21,932,346. No additional projects have been added during FY12 to the detailed list of projects included with the FY11 NPDES MS4 Annual Report.

Establishing the Current Permit 20% Impervious Control Requirement:
The Permit requires the County to add stormwater runoff management for an impervious acreage equivalent to 20% of the County's impervious acreage not currently controlled to the MEP. The Strategy guides County progress towards meeting its Permit requirements. The 20% impervious numeric goal (4,292 acres) was derived using land use from 2002, facilities in the Urban BMP database and associated drainage areas as of September 2009, and impervious cover as of 2009.

In June 2011, subsequent to development of the County Strategy, MDE released guidance for documenting and tracking impervious area stormwater runoff control and wasteload reductions for retrofits. The DEP met with MDE in October 2011 to discuss and resolve differences between the MDE guidance and assumptions used in developing the Strategy. The DEP summary from that meeting and the assumptions that will be used for future accounting of impervious treatment to the MEP can be found in Appendix I.

In FY12, DEP worked on improving the accuracy of baseline data integral to Strategy development including reanalyzing the County's impervious area coverage, and entering backlogged data for hundreds of new SWM BMPs. The DEP is also updating and correcting SWM BMP's drainage areas, both for the new BMPs and for existing BMPs. Once the stormwater facilities and their associated drainage areas are QA'd and finalized, DEP will be able to recalculate the County's MS4 impervious area coverage and pollutant loads

Implementation Rate
On November 16, 2012, DEP met with MDE to discuss the County's progress and approach towards meeting the Permit's impervious acre control and pollutant reduction requirements. A meeting summary of that meeting is included on the CD as Appendix J. The DEP has experienced hurdles when designing, and building restoration practices to the MEP including: resident/property owner input, physical property constraints, utility constraints, permitting, and constructability. The DEP will provide MDE post implementation documentation assessing MEP for each specific restoration site after site constraints are considered. The DEP is also evaluating all stormwater ponds built prior to 1986 (pre-1986) to determine if they meet the 2000 Maryland Stormwater Management Manual criteria. If the criteria are met, DEP will assume full impervious acre control rather than partial control based on the Water Quality Volume captured. This evaluation of the pre-1986 stormwater ponds will be completed in FY14.

The DEP has moved forward with contractual arrangements to help address the significant challenges to implementing watershed restoration projects quickly enough to meet the Permit requirements within the current five-year cycle. In FY12, DEP advertised two Request for Proposals (RFPs) to obtain contractual support critical to accelerating the watershed restoration implementation rate. One RFP is for comprehensive water resources engineering, which will provide support in all aspects of watershed restoration, project design, analysis, and construction, including engineering need to successfully implement stream restoration, stormwater management facility (new and retrofit) , and ESD projects. The second RFP is for a MS4 Permit implementation consultant team that will provide program management support in planning, implementing, tracking, monitoring and oversight of watershed restoration projects, including watershed assessments. The contracts were awarded in FY13 and numerous task orders are planned during the next two fiscal years to cover necessary projects and programs.

Current Implementation Status to Meet the Permit Impervious Restoration Goal:
In FY12, DEP continued aggressively designing and constructing watershed restoration projects to further address stormwater control requirements for the Permit. Table III-G2 below presents a synopsis of the projects completed, under construction or in design that will be applied towards the current Permit impervious area controlled requirement. There are a total of 736 projects with an anticipated impervious area controlled of 1,930.96 acres.

Table III-G2. FY12 Summary of Watershed Restoration Projects Completed, in Construction, and in Design for Compliance with the 2010 MS4 Permit		
Project Status	**Number of Projects**	**Impervious Area Controlled (Acre)**
Completed	73	107.37
In Construction	4	177*
In Design	93	1,614.32*
RainScapes Rewards Completed Projects	506	11.01**
RainScapes Neighborhoods Completed Projects	61	1.76**
Arterial Street Sweeping	n/a	19.5
Total	**736**	**1,930.96**

*The impervious area control for projects in design and under construction is an estimate and may not reflect the final project computations
** Final impervious area treated through RainScapes Rewards and RainScapes Neighborhood projects do not include Conservation Landscape Practices and Tree Planting as more guidance in accounting for the equivalent impervious credit is required. Credit for those practices will be taken in the FY13 MS4 Annual Report

Table III-G3 below provides detail on completed County projects with associated impervious area. Through FY12, DEP completed watershed restoration projects to add stormwater control to 107.37 acres of impervious area to be applied towards the Permit restoration goal.

Table III-G3. FY12 Watershed Restoration Projects Completed for Compliance with the 2010 MS4 Permit:			
Watershed and Project	**Total Drainage Area (Acre)**	**Impervious Area Controlled(Acres)**	
Anacostia River Total	54.32		80.97
Low Impact Development (LID) Project Total:	**32.51**		**14.60**
Arcola Avenue Green Streets - LID - 11 BMPs SWM#6B			
Forest Estates Right of Way LID - 24 BMPs			
White Oak LID (Lockwood Drive and Stewart Lane) 8 storm drain inlet modifications, bioswales)	12.69	7.24	
Pavement Removal Total:	**0.09**		**0.09**
Arcola Avenue Green Streets - LID - 8 projects	0.01	0.01	
Stormwater Pond Retrofit Total:	**21.72**		**3.54**
Peachwood I	21.72	3.54	
Stream Restoration Total:	**Not applicable**		**58.08**

Table III-G3. FY12 Watershed Restoration Projects Completed for Compliance with the 2010 MS4 Permit:			
Watershed and Project	**Total Drainage Area (Acre)**	**Impervious Area Controlled(Acres)**	
Batchellors Forest - Batchellors Run East - Bank Erosion, Reforestation, Fish Blockage	Not applicable	6.34	
Bryants Nursery Run I - Unstable Stream Channel	Not applicable	8.71	
Bryants Nursery Run II - Unstable Stream Channel	Not applicable	8.71	
Upper Northwest Branch - Mainstem	Not applicable	21.65	
Stream Restoration Completed by DOT Total:	**Not applicable**		**4.65**
Road Culvert Stabilization - 821 McCeney Avenue (McCeney at Harper)	Not applicable	0.40	
Road Culvert Stabilization - Burnt Mills Avenue at Hoyle Avenue	Not applicable	0.75	
Stream Bank Stabilization through Gabion Walls - Woodman Ave Median	Not applicable	0.00	
Stream Restoration - Bucknell Drive Median Stream Channel	Not applicable	3.50	
Stream Restoration through Gabion Walls - 9512 Columbia Blvd	Not applicable	0.00	
Cabin John Creek Total	Not applicable		1.25
Stream Restoration Completed by DOT Total:	Not applicable		**1.25**
Stream Restoration - 9014 Marseille Drive	Not applicable	1.25	
Potomac Direct	Not applicable		10.81
Stream Restoration Total:	Not applicable		**10.56**
Little Falls - Somerset	Not applicable	5.28	
Little Falls III	Not applicable	5.28	
Stream Restoration Completed by DOT Total:	Not applicable		**0.25**
Road Culvert Stabilization - Circle Drive at Spring Drive	Not applicable	0.25	
Rock Creek Total	Not applicable		12.49
Low Impact Development (LID) Project Total:	Not applicable		**1.43**
Aspen Hill Library 2 BMPs	Not applicable		
Kensington Park Library 4 BMPs	Not applicable		
Stream Restoration Total:	Not applicable		**10.06**
Joseph's Branch Phase 3B Spruell Drive	Not applicable	10.06	
Stream Restoration Complete by DOT	**Not applicable**		**1.00**
Stream Outfall Restoration - 4305 Havard Street	Not applicable	1.00	
Seneca Creek Total	Not applicable		1.85
Stream Restoration Completed by DOT Total:	Not applicable		**1.85**
Road Culvert Replacement - Davis Mill Road at Wildcat Road Culvert	Not applicable	1.00	

Table III-G3. FY12 Watershed Restoration Projects Completed for Compliance with the 2010 MS4 Permit:			
Watershed and Project	**Total Drainage Area (Acre)**	**Impervious Area Controlled(Acres)**	
Road Culvert Replacement - Prathertown Road Culverts	Not applicable	0.35	
Stream Restoration - 9412 Emory Grove Road	Not applicable	0.50	
Total for All Watersheds	**54.32**		**107.37**
Note: Impervious Acre controlled for Stream Restoration based on MDE Guidance, June 2011.			

Projects currently under construction and recently completed will treat another 177 acres of uncontrolled impervious area, and are presented in Table III-G4 below.

Table III-G4. Summary of Watershed Restoration Projects Under Construction FY12		
Watershed and Project	**Proposed Impervious Drainage Area (Acre)***	
Anacostia River Total		18.36
Low Impact Development (LID) Project Under Construction Total		**11.00**
Dennis Avenue Green Streets	11.00	
Stormwater Pond Retrofit Under Construction Total		**7.36**
Fairland Ridge Dry Pond	7.36	
Cabin John Creek Total		46.46
Stream Restoration Under Construction Total		**46.46**
Lower Booze Creek	46.46	
Rock Creek Total		112.20
New Stormwater Pond Under Construction Total		**112.20**
NIH Pond	112.20	
Total for all Watersheds		**177.02**
*The proposed impervious drainage area is an estimate and does not reflect the final project computations		

Figure III-G2 below shows the FY12 stream restoration project close to completion in Lower Booze Creek of the Cabin John Watershed. At this point, riparian area plantings were underway.

Figure III-G2. Lower Booze Creek Stream Restoration Project Under Construction (Photo taken: 3/22/12)

A summary of projects under design are presented in Table III-G5. The DEP has 28 LID projects, two new stormwater ponds, 55 stormwater pond retrofits and 10 stream restoration projects currently in design, projected to treat another estimated 1,614.32 acres of impervious area. The DEP anticipates constructing approximately 40 projects in FY 14.

Table III-G5. Summary of Watershed Restoration Projects Under Task Order for Design FY12

Watershed and Project	**Number Of Projects**	**Proposed Impervious Drainage Area (Acre)***	
Anacostia River Total	**38**		**338.05**
LID Project in Design	23	57.12	
Stormwater Pond Retrofit in Design	9	163.96	
Stream Restoration in Design	6	116.97	
Cabin John Creek Total	**2**		**7.60**
New Stormwater Pond in Design	2	7.60	
Potomac Direct Total	**16**		**275.00**
LID Project in Design	2	3.03	
Stormwater Pond Retrofit in Design	11	218.30	
Stream Restoration in Design	3	53.67	
Rock Creek Total	**8**		**76.91**
LID Project in Design	2	2.82	
Stormwater Pond Retrofit in Design	5	49.49	
Stream Restoration in Design	1	24.60	
Seneca Creek Total	**31**		**916.76**
LID Project in Design	1	1.96	
Stormwater Pond Retrofit in Design	30	914.80	
Total for All Watersheds	**95**		**1,614.32**

LID=low impact development
*The proposed impervious drainage area is an estimate and does not reflect the final project computations

Table III-G6 presents a summary of projects identified through watershed assessments as potential future projects. Projects will be selected through the DEP's watershed planning process for further design and implementation to meet the remaining 2,361 impervious acre needed to meet the 2010 MS4 Permit restoration goal.

Table III-G6. Summary of Watershed Restoration Potential Opportunity Projects Identified for Future Consideration			
Watershed and Potential Opportunity Project Type	**Number of Projects ***	**Proposed Impervious Area Treated(Acre) †**	
Anacostia River Total	**922**		**5,661**
LID Project	411	2,695	
New Stormwater Pond	7	66	
New Wetland	34	3	
Stormwater Pond Retrofit	226	1,258	
Stream Restoration	244	1,640	
Cabin John Creek Total	**29**		**817**
LID Project	9	66	
Stormwater Pond Retrofit	5	86	
Stream Restoration	15	665	
Lower Monocacy River Total	**1**		**1**
LIDD Project	1	1	
Potomac Direct Total	**68**		**2,340**
LID Project	9	13	
Stormwater Pond Retrofit	17	1,399	
Stream Restoration y	43	929	
Rock Creek Total	**62**		**1,742**
LID Project	26	422	
New Stormwater Pond	3	497	
Stormwater Pond Retrofit	18	220	
Stream Restoration	17	603	
Rocky Gorge Reservoir Total	**26**		**932**
LID Project	9	91	
Stormwater Pond Retrofit	3	87	
Stream Restoration	14	755	
Seneca Creek Total	**110**		**1,808**
LID Project	11	75	
Stormwater Pond Retrofit	65	699	
Stream Restoration	34	1,035	
Triadelphia Reservoir/Brighton Dam Total	**1**		**2**
LID Project Potential Opportunities	1	2	
Total for all Watersheds	**1,219**		**13,463**

LID=low impact development
* The Potential Opportunity Projects have not been determined to be fully feasible and some may be dropped during the planning design stage
† The proposed impervious drainage area is an estimate and does not reflect final project computations.

Highlights of FY12 Watershed Restoration Projects:

Hollywood Branch Steam Restoration Project:
The Hollywood Branch Stream Restoration Project was identified during the prior Permit cycle as a project required to meet watershed restoration goals. The Project has not been completed, but the County did successfully meet the 10% impervious area restoration goal with other projects. The Hollywood Branch Stream Restoration will be completed during the current Permit term.

This project will mitigate stream degradation caused by past suburban development without adequate stormwater controls. Hollywood Branch is located in an eastern Montgomery County suburb and is a second order tributary to Paint Branch (a tributary of the Anacostia River). The DEP developed stream restoration concept plans for the 2.5 mile long reach and conducted the first public meeting in 2009. The project is currently in final design and DEP is submitting required permits. Due to the timing of the final design, the stream closure has postponed the instream construction for this project until summer of 2013. Stream restoration goals include: stabilizing erosive areas, improving floodplain access, enhancing riparian conditions, enhancing stream conditions and improving overall aquatic resources.

Public Property LID:
The County's LID Inventory of Publicly Owned Facilities (Phases I and II) assessed, and prioritized LID opportunities at 53 County owned facilities, three County roadways and five public schools. Progress in FY11 included construction of six LID devices at the Aspen Hill and Kensington Park libraries, bioretention facilities at Ridgeview Middle School, within the public Right-of-Way along Arcola Avenue, and Amherst Avenue (Figure III-G3.), and completion of 60% design plans for LID retrofit projects in the Breewood residential neighborhood. Success in these efforts requires close coordination with DGS which is responsible for facility renovations and with DOT which is responsible for operations at the road maintenance and transit depots.

Figure III-G3. **Completed Arcola Avenue Green Streets Curb Extensions (Photo taken 12/22/11)**

The DEP has been identifying other opportunities to incorporate LID practices within County road right of ways. DEP then coordinates construction of the practices with DOT as they perform scheduled maintenance and roadway improvements. DEP is drafting technical standards for some practices, which will facilitate implementation and reduce overall costs for using these practices as retrofits.

The DEP also produced a final report detailing LID retrofit opportunities at 70 county schools and maintenance facilities. The DEP is working with MCPS to implement LID retrofit projects. During FY12, DEP began an assessment of an additional 61 schools located within the Little Seneca Creek, Rock Creek, Little Falls, Cabin John, Muddy Branch, Watts Branch, and Little Bennett subwatersheds. The DEP anticipates having a project inventory completed by the end of FY13.

In 2010, DEP executed a memorandum of agreement with MCPS to define relative responsibilities related to stormwater management issues at public schools. These include adding ESD stormwater management components (RainScapes for Schools as well as CIP projects) and also education of MCPS staff to increase understanding of how these types of practices function and to facilitate correct non-structural maintenance by MCPS. MCPS completed 29 stormwater projects in FY12 that incorporated ESD to the MEP, as required by new storm water management regulations, through the use of vegetative roofs, bioretention and bio filtering facilities, micro bioretention structures, porous pavements and other innovative devices, at a cost of $2,423,132.

Private Property LID - RainScapes Program

The DEP's RainScapes program promotes and implements environmentally friendly landscaping and small scale stormwater control and infiltration projects on residential, institutional, and commercial properties to reduce stormwater pollution and achieve measurable water quality benefits. The DEP offers technical and financial assistance (funded by the County's WQPC) to encourage property owners to implement eligible RainScapes techniques, such as rain gardens, tree planting, rain barrels, and conservation landscaping. As a program overall, over 12.78 impervious acres are being controlled as of the end of 2012 for at least the first inch of rain; many projects controlled up to the 1 year storm event.

As of FY12, the program has been developed into a multi-strand program consisting of five identifiable program elements. All program elements are designed to provide information and training to residents and landscape professionals, as well as incentives and project delivery to Montgomery County sites.

RainScapes Rewards provides rebates to residents to implement qualified small scale stormwater projects. In FY12, 144 new RainScapes Rewards projects were reviewed for residential and private institutional properties. 91 projects were accepted, including 10 tree canopy projects. The RainScapes Rewards projects in FY12 met or exceeded the water quality volume control for an additional 3.5 acres of previously uncontrolled impervious area.

By the end of calendar year 2012, 411 RainScapes Rewards Rebate projects have been completed in the County since the start of the program, with a broad geographic distribution. RainScapes Rewards Rebate projects are providing a visible presence for stormwater management on private lots across the County and are serving to raise both public awareness and action. Canopy tree and conservation landscape projects, while not having a direct metric to measure their impervious area stormwater control contribution, represent 43% of installed projects. Figure III-G4 shows a summary of RainScapes Rewards project locations that have been installed Countywide as of the end of FY12.

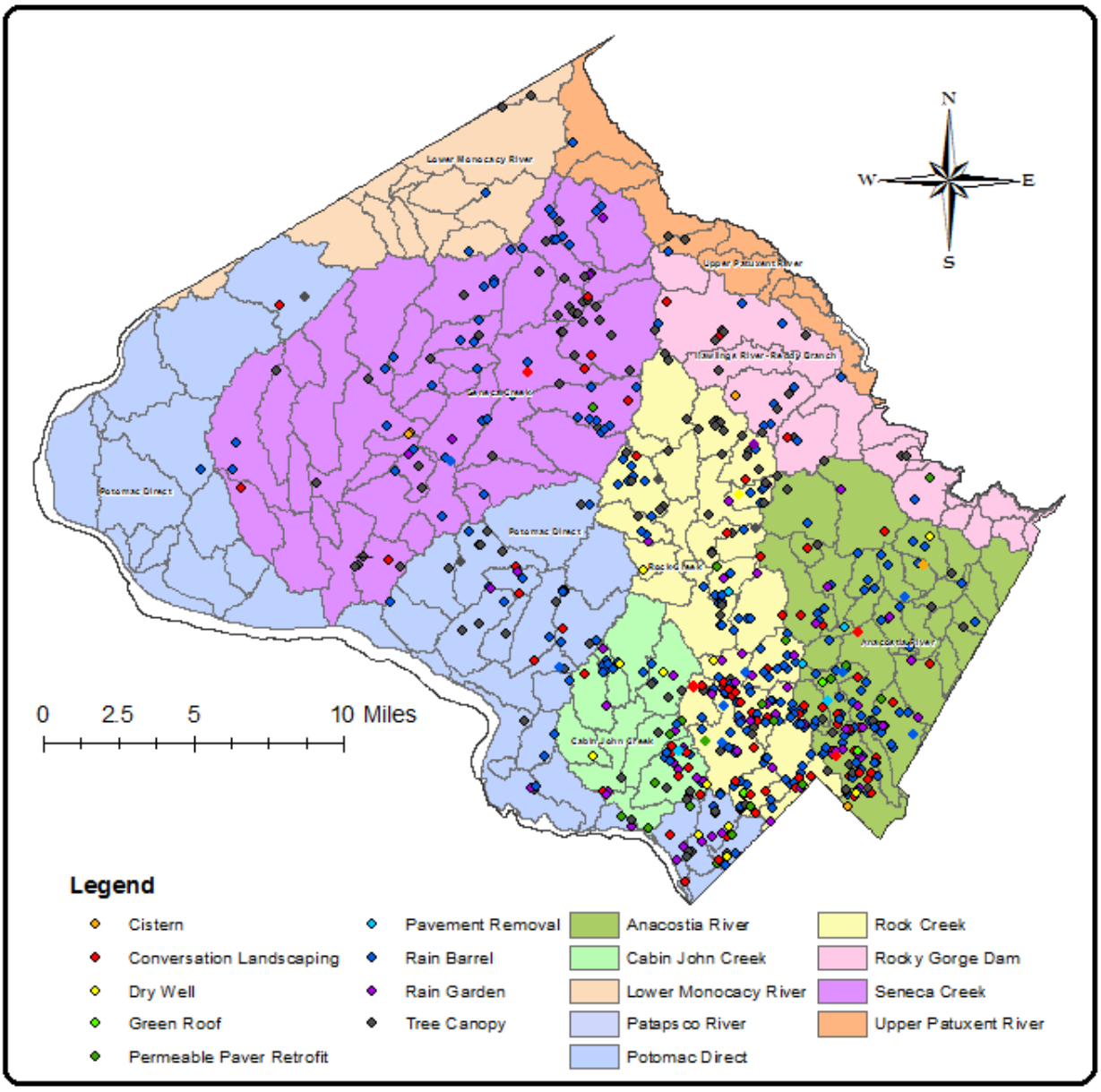


Figure III-G4. RainScapes Rewards Projects Countywide Through FY12

RainScapes Neighborhoods Program evaluates small, targeted neighborhood-scale catchments for on-lot stormwater runoff reduction installed by DEP and affiliated watershed groups. This program element targets neighborhoods in priority watersheds with active citizens' group or watershed organizations to leverage education and outreach efforts. Current priority watersheds are in the Anacostia and Rock Creek. Projects locations considerations are also combined when possible with the DOT ROW and DEP watershed restoration projects (for example, Breewood Tributary, Forest Estates and Sligo Park Hills), in order to maximize the amount of runoff reduction achievable. The Program has a goal of 30% participation within a catchment area.

In FY11, the RainScapes Neighborhoods program began installing projects in Glen Echo Heights and the Town of Garrett Park to treat 1.19 impervious acres by installing 11 rain garden and conservation landscape projects. In FY12, DEP completed installation of residential rain gardens in Garrett Park , and began outreach, site assessments, and design in the Sligo Park Hills, Forest Estates, Breewood, Wheaton Woods, Ken Gar and the Town of Chevy Chase neighborhoods. Many projects will move into design and construction phases for FY13. Figure III-G5 shows the locations of FY12 RainScapes Neighborhood projects.

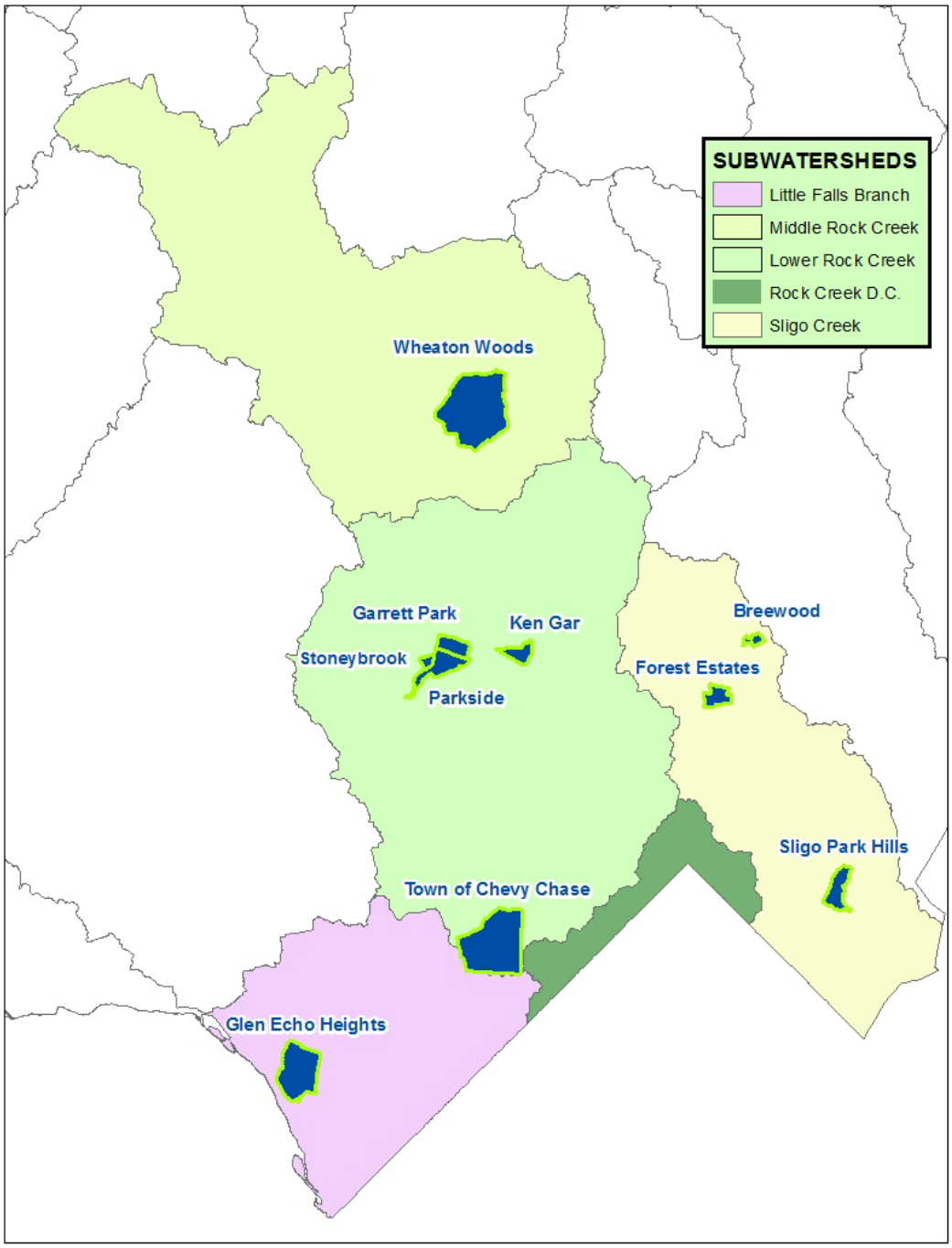


Figure III-G5. Locations of FY12 RainScapes Neighborhoods

FY12 Watershed Restoration Costs:
The Permit requires the County to submit estimated costs and actual expenditures for watershed restoration program implementation. Table III-G8 shows a summary of FY10, FY11 and FY12 costs for both watershed assessments and watershed restoration projects.

Table III-G8. FY10 –FY12 Capital Improvement Program Costs for Watershed Assessment and Restoration			
Fiscal Year (FY)	FY10	FY11	FY12
Total annual cost for watershed assessment	$433,800	$749,130	$502,244.23
Total annual cost for watershed restoration	$2,942,100	$3,904,222	$8,168,571
Total Costs	$3,375,900	$4,653,352	$8,670,815.26

During FY12, DEP continued to identify funding sources to support project implementation. The six-year SWM CIP budgets for FY11-FY16 and FY13-FY18 reflect the significant increase in implementation that will be needed to meet the Permit requirement for adding runoff management. As shown in Tables III-G9 and III-G10, the approved budget for FY13 is $25,000,000 compared to $11,445,000 for FY12 and $8,888,000 for FY11.

The approved FY13-FY18 SWM Program totals $235 million, an increase of $128.7 million, or 121 percent from the amended approved FY11-FY16 program of $106.3 million. This increase in stormwater management activity will be financed primarily through water quality protection bonds. The debt service for these bonds will be supported by the County's WQPF. The budget assumes $60 million in State aid based on the State's expressed interest in enacting legislation to support stormwater management efforts.

Highlights of the FY13-FY18 SWM CIP Budget include expanded construction of stormwater management facilities, retrofits of old stormwater management facilities, repairs to damaged stream channels and tributaries in stream valley parks and priority watersheds, and structural repairs to County maintained stormwater management facilities. The DEP will also expand the design and construction of /LID SWM facilities, County facilities, roads and schools.

Table III-G9. Department of Environmental Protection FY11-16 Stormwater Management (SWM) Capital Improvement Program (in $000s) (Approved May 2011)							
Project Type	**CIP Cycle Total**	**FY11**	**FY12**	**FY13**	**FY14**	**FY15**	**FY16**
SWM Retrofit	52,010	*1,785*	*2,425*	*11,000*	*11,500*	*14,400*	10,900
Public Property Low Impact Development	27,975	*3,475*	*4,900*	*4,900*	*4,900*	*4,900*	4,900
Miscellaneous Stream Valley Improvement	8,370	*1,395*	*1,395*	*1,395*	*1,395*	*1,395*	1,395
SWM Facility Planning	7,025	*925*	*1,200*	*1,350*	*1,350*	*1,100*	1,100
SWM Retrofit Anacostia	1,645	*0*	*175*	*450*	*510*	*510*	0
Major Structural Repair	9,250	*1,300*	*1,350*	*1,600*	*1,650*	*1,650*	1,700
Total	**$106,275**	***$8,880***	***$11,445***	***$20,695***	***$21,305***	***$23,955***	**$19,995**

Table III-G10. Department of Environmental Protection Approved (May 2012) FY13-18 Stormwater Management (SWM) Capital Improvement Program Budget (in $000s)							
Projects	**CIP Cycle Total**	**FY13**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**
SWM Retrofit	*127,010*	*11,710*	*19,700*	*20,600*	*20,000*	*25,000*	*30,000*
SWM Retro-Government Facilities. Low Impact Development	*11,425*	*1,125*	*1,900*	*2,100*	*2,100*	*2,100*	*2,100*
SWM Retrofit- Roads	*49,425*	*6,015*	*7,410*	*9,000*	*9,000*	*9,000*	*9,000*
SWM Retrofit Schools	*20,100*	*1,270*	*1,010*	*3270*	*4,850*	*4850*	*4,850*
Miscellaneous Stream Valley Improvement	*9,870*	*2,070*	*2,070*	*2,070*	*1,220*	*1,220*	*1,220*
SWM Facility Planning	*6,750*	*1,150*	*1,150*	*1,150*	*1,100*	*1,100*	*1,100*
SWM Retrofit Anacostia	*1,620*	*310*	*310*	*310*	*230*	*230*	*230*
Major Structural Repair	*8,800*	*1,350*	*1,450*	*1,500*	*1,500*	*1,500*	*1,500*
Total	**235,000**	**25,000**	**35,000**	**40,000**	**40,000**	**45,000**	**50,000**

Progress Towards Meeting Wasteload Allocations for EPA Approved TMDLs:
The Permit requires development of implementation plans to meet County MS4 WLAs for any EPA approved TMDL in County watersheds within one year of EPA approval. The County must also report progress towards meeting those WLAs where watershed restoration is occurring. Implementation plan development is addressed in Part III. J. Total Maximum Daily Loads of this report.

The County successfully submitted its Strategy to meet Permit requirements, include the TMDL WLAs in February 2011, one year after issuance of the Permit. The Strategy used the WTM to verify pollutant baseline loads in TMDL watersheds, and estimate pollutant load reductions of a variety of completed and planned watershed restoration structural, non-structural and programmatic 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 *Montgomery County Coordinated Strategy, Appendix B, Modeling Framework*, which can be found on the DEP website (http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/dep/water/wris.asp).

Table III-G11, below summarizes watershed-specific TMDLs and pollutant reductions achieved by watershed restoration projects constructed after TMDL baseline data date. The reductions include nutrients and sediment reductions from stream restoration projects using efficiencies provided in MDE's June 2011 *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated*. The FY12 pollutant load reduction information can also be found in this report's electronic (CD) attachment in Appendix A, MDENPDES11.mbd, Parts G., G.1., and G.3.

The Strategy land cover loading rates and BMP reduction efficiencies do not match those published in the subsequent June 2011 MDE guidance. DEP has been working to update impervious area data, along with updating the Urban BMP database to include over one thousand new structures with their delineated drainage areas. Once the data is complete, DEP will run the WTM again and address the inconsistencies by correcting the WTM assumptions. This iterative approach will refine the current pollutant reduction estimates and lead to a clearer picture of the reductions associated with the County's watershed restoration efforts.

Table III-G11 Montgomery County TMDL Summary by Impairment

Impairment	Watershed	Issue Date	Pollutant	County MS4 Baseline Load	Annual Allocation	Units	WLA_{SW} 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%	0.40%	2003
	Rock Creek	2007d	Enterococci	453,669	18,195	(Billion MPN/yr)	96.0%	2.60%	2003
	Anacostia River	2007b	Enterococci	247,809	29,978	(Billion MPN/yr)	87.9%	4.70%	2003
	Lower Monocacy River	2009e	*E. coli*	67,452	9,848	(Billion MPN/yr)	85.4%	0.02%	
Sediments	Anacostia River	2007a	TSS	7,682	1,101	(tons/yr)	87.5%	3.00%	1997
	Triadelphia Reservoir	2008b	TSS	29	29	(tons/yr)	0.0%	0.30%	2003
	Clopper Lake	2002	TSS	13	13	(tons/yr)	0.0%	0.00%	2002
	Lower Monocacy River	2009d	TSS	172	68	(tons/yr)	60.8%	0.10%	2003
	Seneca Creek	2011	TSS	5,735	3,185	(tons/yr)	44.6%	5.50%	2004
	Rock Creek	2011	TSS	8,667	5,345	(tons/yr)	38.3%	6.30%	2004
	Cabin John Creek	2011	TSS	3,143	2,430	(tons/yr)	22.7%	1.60%	2004
Nutrients	Anacostia River	2008a	Nitrogen	206,312	38,959	(lbs/yr)	81.8%	5.81%	1997
	Anacostia River	2008a	Phosphorus	20,953	3,947	(lbs/yr)	81.2%	6.30%	1997
	Upper Patuxent (Triadelphia Reservoir)	2008b	Phosphorus	438	373	(lbs/yr)	15.0%	0.02%	2003
	Rocky Gorge Reservoir	2008b	Phosphorus	4,268	3,628	(lbs/yr)	15.0%	0.23%	2003
	Clopper Lake	2002	Phosphorus	101	55	(lbs/yr)	45.4%	0.00%	2002
Trash	Anacostia River	2010	Trash	228,683	-	lbs/yr removed	100.0%	4.42%	2010
PCB	Anacostia River- Non Tidal-NWB	2011	PCB	134.5**	2.56	g/yr	98.1%		
PCB	Anacostia River- Non Tidal-NEB	2011	PCB	112.57**	1.53	g/yr	98.6%		

Adapted from "2010 Status of Approved Stormwater Wasteload Allocations for NPDES Regulated Stormwater Entities in Montgomery County," April 27, 2010 by Jeff White, MDE

*Percent reduction of pollutant by BMPs completed after the TMDL baseline data collection period, as of FY12

**For all known NPDES stormwater discharges in Montgomery County portions of the NEB and the NWB, as identified in the TMDL

H. Assessment of Controls

The Permit requires the County to assess the effectiveness of its stormwater management program and control measures. Pre-restoration and post restoration watershed monitoring, including chemical, physical and biological monitoring is used to assess implemented control measures. 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. The DEP is responsible for requirements under this section of the Permit

Breewood Tributary Restoration Project:
In 2009, the MDE approved DEP's proposal for the Breewood tributary to conduct monitoring required in Part III.H.1, Watershed Restoration Assessment to monitor the results from the proposed comprehensive restoration effort in this small drainage area. The tributary location within the Sligo Creek subwatershed of the Anacostia River watershed is shown in Figure III-H1. Figure III-H2 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 35 percent impervious located in upper Sligo Creek within the Anacostia Watershed.

The catchment is predominantly medium density (quarter acre) residential, with a condominium complex, townhouse development, senior living center, high school and church located within the drainage area. Two primary roads, University Boulevard and Arcola Avenue contribute runoff in the upper portions of the catchment. The residential roads are curb and gutter designed streets supporting the residential development located in the middle and lower sections of the Breewood tributary. The majority of the stormwater runoff from the impervious areas is not controlled and has led to the severely unstable stream channel responsible for transporting sediment, and other associated pollutants downstream

The DEP's Breewood Tributary Restoration Project is an innovative comprehensive management approach which will link neighborhood outreach and upland watershed source control measures including LID practices with stream and wetland restoration to achieve measurable water quality improvements. The outreach efforts will focus on increasing resident awareness and their active stewardship to protect the tributary and associated local park from trash and runoff pollutants.

The DEP is currently designing 14 right of way LID practices along residential roads and promoting RainScapes techniques to address runoff from 54 residential properties. The project will then enter a second phase with a 1,200 foot stream restoration project, and a LID project on a larger private property bordering the residential properties. A summary of projects proposed for the Breewood tributary can be found on DEP's website at: http://www.montgomerycountymd.gov/content/dep/downloads/BreewoodFactSheet.pdf and is attached in the CD in Appendix K.

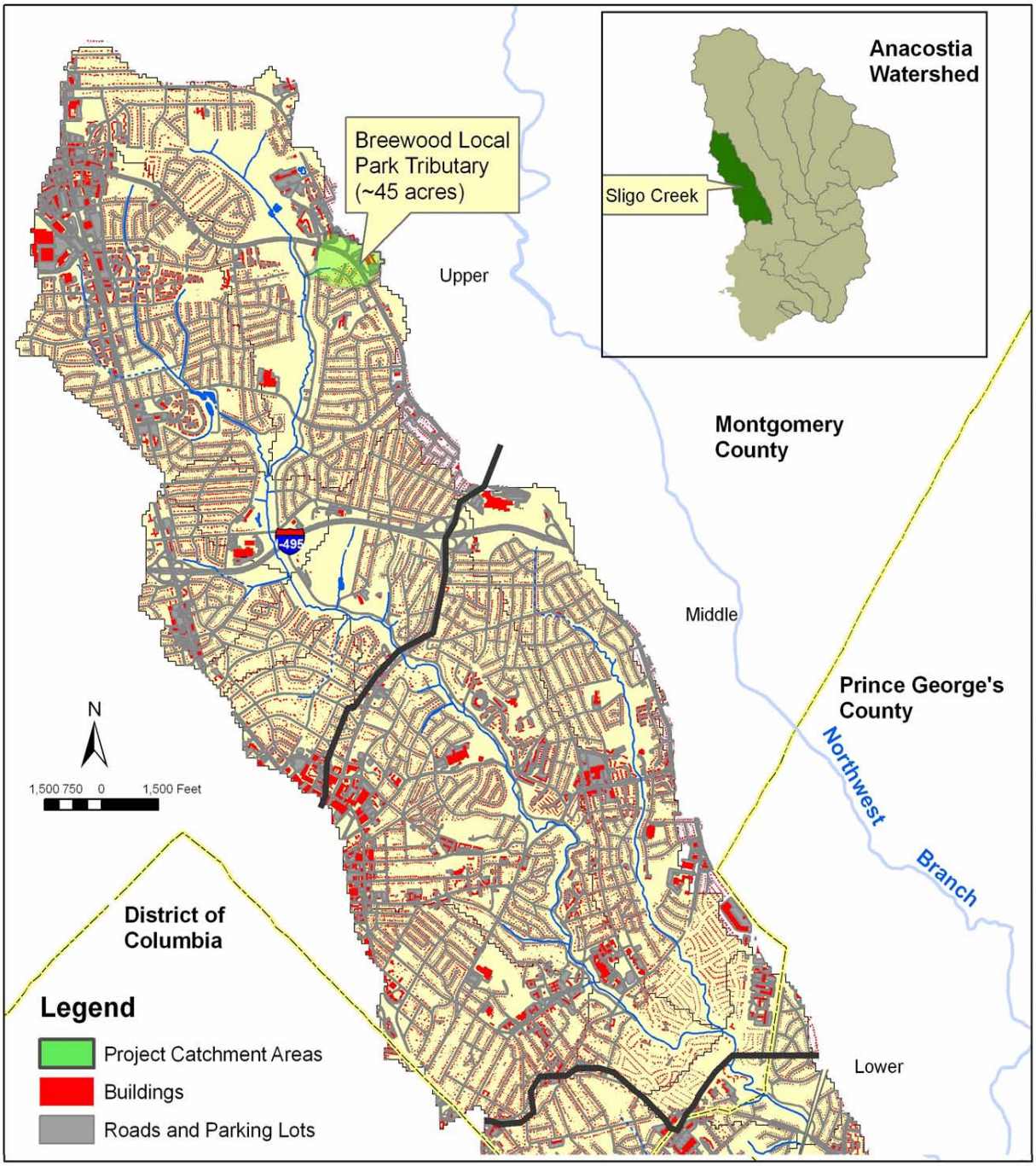


Figure III-H1. Location of the Breewood Tributary Within the Sligo Creek Subwatershed of the Anacostia

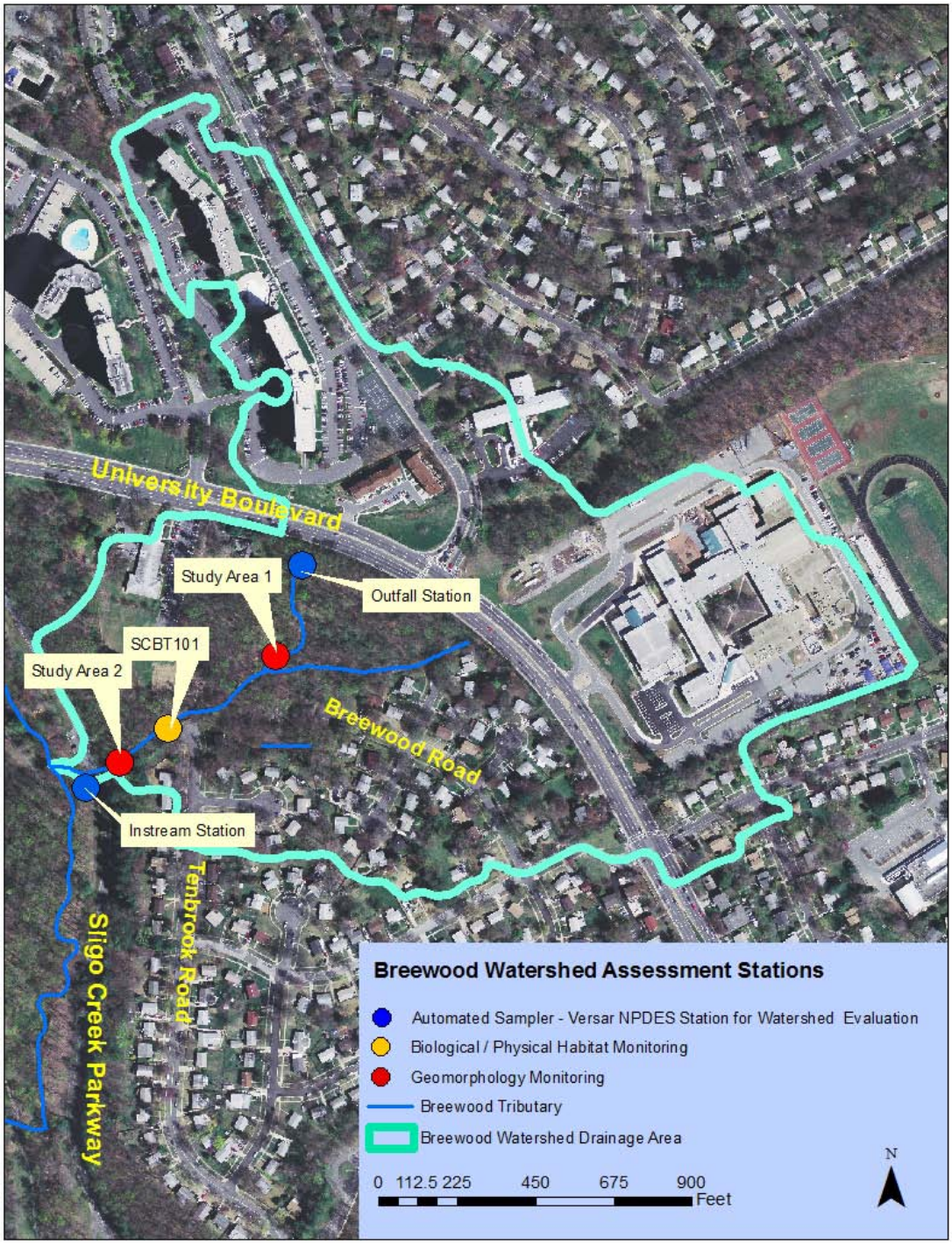


Figure III-H2. Locations of Stream Chemistry, Biological, Physical Habitat and Geomorphology Monitoring Stations, Breewood Tributary of Sligo Creek.

H.1. Watershed Restoration Assessment

Breewood Tributary Chemical Monitoring

During 2011, DEP continued water chemistry monitoring in the Breewood tributary at one storm drain outfall draining University Boulevard and points north (the outfall station) and an instream station downstream of a culvert underneath Sligo Creek Parkway (the instream station), as shown in Figure III-H2. Table III-H1 shows the drainage area to each water chemistry station. Table III-H2 shows the contribution of impervious land uses to total impervious area in the drainage area. A continuously recording rain gauge is located at the Wheaton Branch stormwater ponds in Silver Spring, approximately 1 mile southwest of the monitoring stations.

Table III-H1. Drainage Area to Breewood Water Chemistry Monitoring Stations

Location	Acres
Total DA to the outfall water chemistry station	16.9
Total DA to the instream water chemistry station	62.9
Total DA	63

Table III-H2. Summary of Percent Impervious Area by Land Use Within the Breewood Tributary Drainage Area (Metropolitan Washington Council of Governments 2008) Approximate.

Impervious Land Use Category	**% of Total Impervious in the Breewood Tributary**
1. Roads	**38**
a. State/Federal	23
b. Local	15
2. Parking Lots:	**32**
a. Public/Institutional	22
b. Private	10
3. Roofs	**22**
a. Public/Institutional	9
b. Private (Non-Single Family)	2
c. Single Family Homes	11
4. Other	**8**
a. Single Family Driveways	4.6
b. Sidewalks	3.4
Total Acres of Impervious Surface	14.89
Avg. Impervious Cover (%)	33.13%
No. of Single Family Homes	51

The Permit required chemical monitoring data is included electronically in Appendix A, MDENPDES12.accdb, Part F. The summary report *NPDES Water Chemistry Monitoring in the Breewood Tributary of Upper Sligo Creek 2009-2011* is also included electronically as Appendix L.

The region experienced 13.8% higher rainfall amounts during 2009 than in an average year. Conversely, in 2010, rainfall was 3.6% less than in an average year. Annual rainfall returned to above average amounts (14.1% above average) in 2011. The higher than normal total quantity of rainfall for 2011 included local contributions from the remnants of Hurricane Irene (August 27) and Hurricane Lee (September 5-10), which respectively resulted in 115% and 98% higher monthly totals in August and September for Maryland. A plot of statewide average rainfall measured during 2009-2011 is shown in Fig. III-H3.

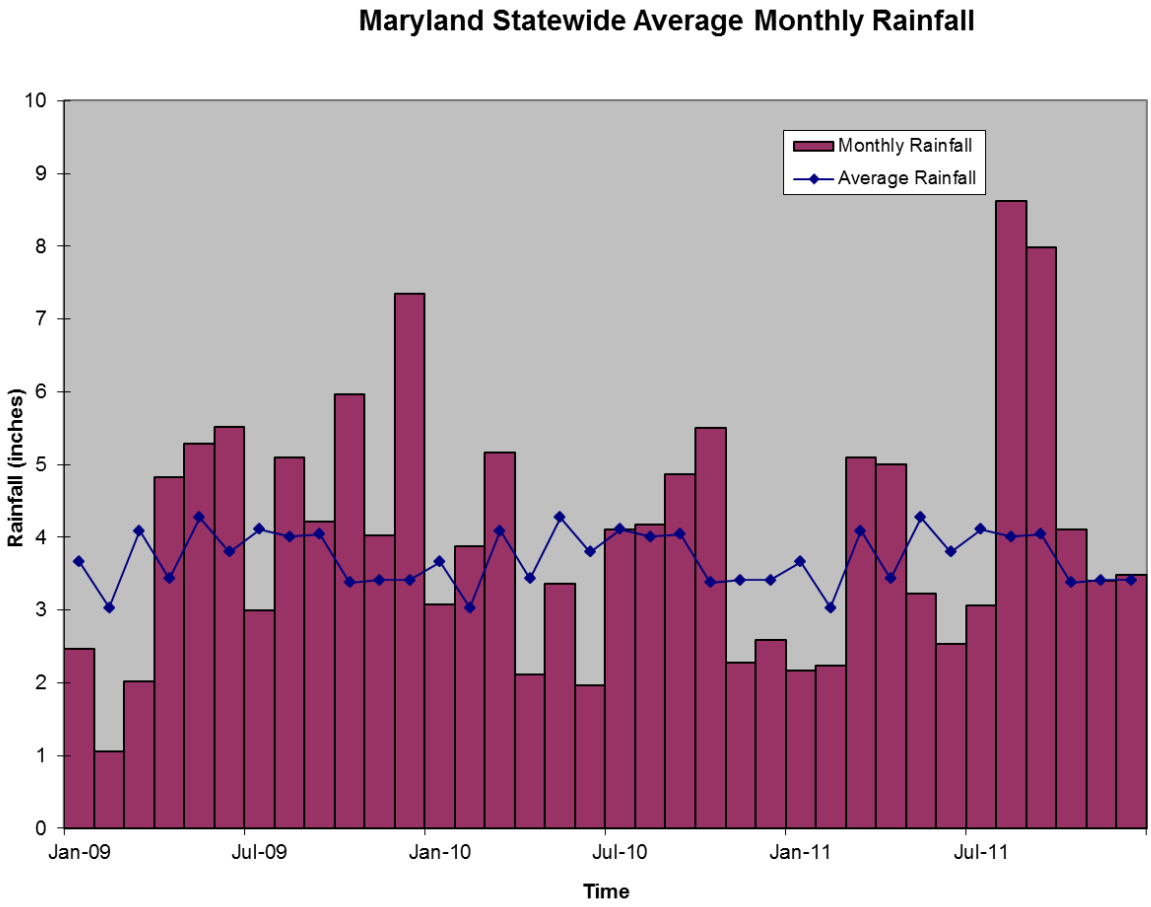


Figure III-E3. Statewide Maryland long-term monthly average rainfall (1971-2000) and statewide average rainfall for each individual month 2009-2011 (Northeast Regional Climate Center, 2009-2011).

The 16.9 acres of drainage to the outfall station represent 27% of the total 63 acres to the instream station. Under normal conditions, there was no dry weather flow present at the outfall station. The outfall station drains an area with significant directly connected impervious including major roadways and parking lots compared to the more heterogeneous land uses, including large forested and lawn areas, which drain to the instream station.

The relatively smaller drainage area to the outfall compared to the larger drainage area to the instream station affected flow rate, total stormflow volume, and response of flow to rainfall. Flow rate in volume per time and total stormflow volumes were usually greater at the instream station than at the outfall. There were nine isolated instances (during both monitored and non-monitored storms) for which the outfall showed higher instantaneous flow rate than at the instream station during the monitoring period. Flow rates at the outfall station during these episodes were mostly in the low range (1 to 5 CFS). In these cases there was much more rapid runoff and concentration of flow from the highly impervious and piped area above the outfall, resulting in a large peak flow and stage. The peak flow was possibly attenuated within the stream channel down to the instream station which is also receiving drainage from a less impervious area with greater infiltration and a reduced peak flow from that area. Larger rainfall events that produce greater flow rates would negate the attenuation. As expected, for rain events in the catchment, the first appearance of flow at the outfall preceded rise in stream height at the instream station.

Hydrology Modeling:
The permit requires that rainfall to runoff characteristics of the contributing watershed be evaluated using a standard, accepted hydrology model. Montgomery County will be producing a Hydrologic Engineering Center River Analysis System (HEC-RAS) model of the Breewood Tributary watershed as part of the stream restoration design process. This model is at 30% design stage as of September 2012 and should be completed in 2013.

Summary of Water Chemistry Monitoring Results
Station installation, water chemistry monitoring (e.g., metals, nutrients), water quality monitoring (e.g., pH, specific conductivity, temperature, dissolved oxygen), continuous flow logging, and continuous rainfall logging were conducted according to methods described in the Breewood Tributary Monitoring Quality Assurance and Quality Control Plan (Hage and Jones 2010). Field teams collected baseflow samples monthly and conducted automated storm runoff monitoring at a target rate of three events per quarter, for a total of 25 storms and 29 baseflow events during 2009 -2011.

For each station, baseflow mean concentrations (MC) were calculated for all Permit required parameters over the three-year monitoring period. MCs were also calculated for total petroleum hydrocarbons (TPH) and *Enterococcus* during first flush stormflow.

Storm event mean concentrations (EMCs) represent the weighted average pollutant concentrations based on samples collected at discrete intervals during a storm. EMCs were calculated and averaged over the three-year monitoring period for each parameter except TPH and *Enterococcus*. Mean storm EMCs, baseflow MCs, and storm MCs (for TPH and

Enterococcus) can be found in Table III-H3 below. The average EMCs and MCs of each parameter at each station were compared:

- Storm samples generally had more concentrated 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 higher at the outfall than at the instream station.

- At the instream station, flow type (i.e. baseflow or storm flow) had mixed impacts.
  - Mean storm EMCs were higher than baseflow MCs for BOD, TKN, total phosphorous (TP), total suspended solids (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.
  - First flush storm MCs were the same as baseflow MCs for TPH.

- Evaluation of the impact of flow type at the outfall is difficult.
  - The outfall station was generally dry, except following rainfall or other non-storm episodic discharges. Baseflow samples could only be obtained on a few occasions. In these samples, the baseflow MCs for Enterococcus and TPH were lower than stormflow MCs. The lack of consistent flow could be due to lack of infiltration in the highly impervious drainage area.

Table III-H3. Mean Storm EMC's and Baseflow MCs (mg/l; ± 1-sigma standard deviation) in Breewood Tributary, 2009-2011

Analyte	Mean Storm EMC		Baseflow MC	
	Outfall	Instream	Outfall	Instream
BOD 5	5.6 ± 4.5	4.6 ± 2.9	13.1 ± 10.2	0.2 ± 0.8
TKN	1.009 ± 0.735	0.926 ± 0.537	2.845 ± 2.638	0.130 ± 0.280
Total Phosphorus	0.038 ± 0.069	0.069 ± 0.138	0.000 ± 0.000	0.000 ± 0.000
Nitrate+Nitrite	0.357 ± 0.267	0.609 ± 0.325	1.806 ± 2.508	2.662 ± 0.199
TSS	63.0 ± 68.5	167.2 ± 147.9	36.4 ± 23.2	3.3 ± 4.4
Total Cadmium	0.00001 ± 0.00003	0.00002 ± 0.00008	0.0000 ± 0.0000	0.00000 ± 0.00000
Total Copper	0.032 ± 0.020	0.024 ± 0.013	0.220 ± 0.266	0.010 ± 0.017
Total Lead	0.008 ± 0.007	0.012 ± 0.013	0.006 ± 0.003	0.001 ± 0.003
Total Zinc	0.085 ± 0.057	0.055 ± 0.038	0.438 ± 0.626	0.016 ± 0.008
TPH	4 ± 4	2 ± 3	4 ± 3	2 ± 3
Enterococcus	7,430 ± 18,301	895 ± 2,131	1,245 ± 1,661	271 ± 564
Hardness	35 ± 20	47 ± 17	174 ± 156	106 ± 9

Analysis of the data collected by this project is intended to evaluate the effectiveness of watershed restoration efforts at improving hydrology and water quality. Because none of the planned restoration work has taken place yet, the data now serve to document baseline conditions. In the future, a variety of approaches will be employed to evaluate project effectiveness, including analyzing changes in hydrograph sensitivity to rainfall and annual pollutant loadings. While difficult, reducing hydrological impacts is better understood and more easily documented than reducing pollutant concentrations in urban streams. As annual loads depend on concentration and flow volume, changes in watershed hydrology that reduce stormflow volume may have more effect on annual loads than concentration changes.

Data collected from individual storms with similar rainfall characteristics will be examined to see whether completed watershed restoration projects reduce currently seen impacts. Total flow volumes for similar total rainfall events or peak flow levels for a specific rainfall amount can also be compared pre and post restoration. DEP will also try to compare rainfall to flow volume results from the Breewood Tributary to other similarly sized drainage areas.

Because the drainage areas of the instream and outfall stations have very different characteristics and different restoration approaches will be employed in each area, the water chemistry data in the form of EMCs from the two stations will be evaluated separately to determine whether decreases in pollutant concentrations associated with restoration efforts can be identified. Estimated annual loading values will be evaluated to determine changes in overall pollutant contributions at both stations.

The 2011 pre-restoration total annual pollutant loads for TN, TP and TSS were calculated for the Breewood tributary. Results are reported in the CD attachment to this report, Appendix A., MDENPDES12.accdb., Part G.2. Pollutant Loads Associated with GIS Coverage, and shown in Table III-H4.

Table III-H4. Pre-Restoration 2010 Total Annual Pollutant Loads in the Breewood Tributary

Pollutant	**Units**	**Instream**	**Outfall**
Total Nitrogen	lbs/year	460	180
Total Phosphorus	lbs/year	4	7
Total Suspended Solids	lbs/year	79,600	12,043
Biochemical Oxygen Demand (5-day)	lbs/year	1,383	943
Cadmium	lbs/year	0	0
Copper	lbs/year	15	5
Lead	lbs/year	6	1
Zinc	lbs/year	31	16
Total Petroleum Hydrocarbons	lbs/year	0	309
Enterococcus		783,440	2,737,613

Breewood Tributary Biological Monitoring:

In March 2010, a biological monitoring station, SCBT101, was established and monitored in the Breewood tributary. As shown in Figure III-H2, the station is located upstream of the Sligo Creek Parkway and the instream water chemistry monitoring station. Station SCBT101 is monitored each spring for benthic macroinvertebrates. No fish monitoring is conducted because of the extremely small drainage area of the tributary.

The County uses a Benthic IBI (BIBI) to assess stream conditions at SCBT101. Pre-restoration benthic community analysis will be compared with post-restoration data to help evaluate watershed restoration success. Eight metrics of benthic macroinvertebrate community composition and function are analyzed. The metrics include examining the percentage of functional feeding groups (FFGs) present, evaluating taxa richness, taxa composition, and pollution tolerance. Each measurement responds in a predictable way to increasing levels of stressors. Changes in the metrics will be seen as the biological community improves and may be seen before the overall BIBI score increase.

Functional Feeding Group (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 bioassessment 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 (U.S. EPA 2008). Other FFGs include scrapers and predators. Scrapers scrape and graze on diatoms and other algae, are sensitive to environmental degradation and are associated with high quality streams. Predators attack and consume other insects and macroinvertebrates.

In 2010, the BIBI score for the tributary was 14 out of a possible 40, indicating a *poor* benthic community. Only six taxa were present, indicating low species richness. Shredders accounted for only 2% of the total sample collected at SCBT101 and no scrapers were found. Collector gatherers accounted for 57% of the sample collected at SCBT101. Filterers accounted for 3% and predator organisms composed 38% of the total sample.

In 2011, the BIBI score for the tributary was 18 out of a possible 40, indicating a *fair* benthic community. There were fourteen taxa present, indicating moderate species richness. Shredders accounted for 11% of the total sample collected at SCBT101 and no scrapers were found. Collector gatherers accounted for 52% of the sample collected at SCBT101. Filterers accounted for 6% and predator organisms composed 31% of the total sample.

Figure III-H4 shows the average proportion of each FFG at SCBT101 and in a reference stream reach, the Good Hope tributary to Paint Branch (PBGH108). The benthic community of PBGH108 was rated *good* in 2010 and *fair* in 2011. Note that the relative percentage of predator taxa decreases and the percentages of filterer, shredder, and scraper taxa increases with an increase in benthic community rating.

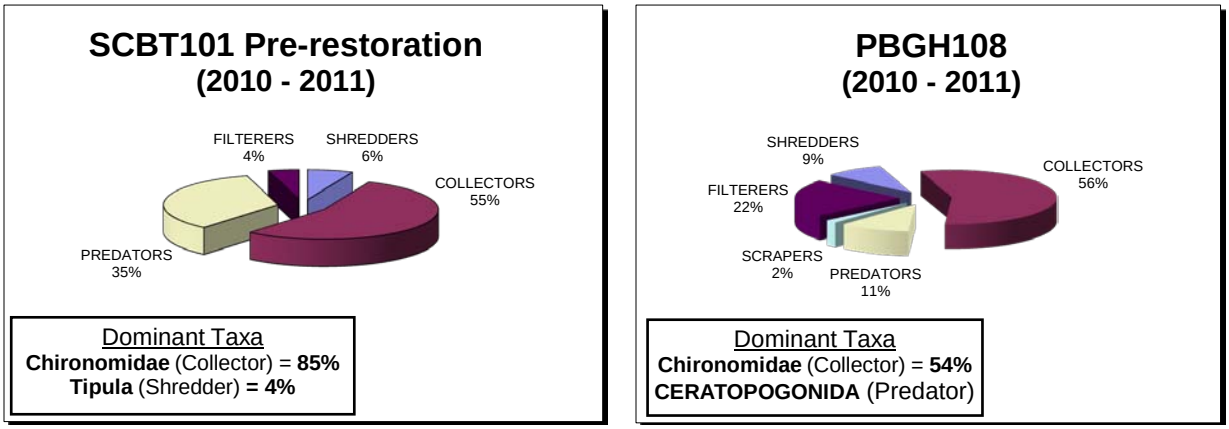


Figure III-H4. Functional Feeding Group Comparison in the Breewood Tributary (SCBT101) and in the Good Hope Tributary (PBGH108).

Other metrics were used to characterize the benthic macroinvertebrate community of the Breewood tributary. The biotic index, which measures tolerance to organic pollution, was 6.59 (out of 10), indicating a relatively high tolerance to organic pollution. In addition, 85% of the benthic macroinvertebrate taxa in the Breewood assessment were members of the Chironomidae (midge) family, which tend to be tolerant of pollution and other environmental stressors (Pedersen and Perkins 1986; Jones & Clark 1987). The BIBI score analysis also includes determining the presence of ephemerella, plecoptera, and trichoptera (EPT) taxa (commonly known as mayfly, stonefly, and caddisfly) which are sensitive species commonly associated with high quality streams. In the Breewood tributary benthic macroinvertebrate sample, there were very few EPT taxa present.

Breewood Tributary Physical Habitat Assessment:
In 2010 and 2011, DEP performed physical habitat assessments at SCBT101. Pre-restoration monitoring will establish a baseline for comparison with future habitat assessments. Results indicate that the habitat is *fair*, receiving a score of 71 (out of a possible 200) in 2010 and a score of 86 in 2011. The poor riffle quality, high embeddedness values, bank instability, and narrow riparian zone all had a deleterious effect on the overall habitat score in the tributary. As a first order headwater stream, the tributary has a high frequency of riffles and minimal channel alteration; factors that had a positive impact on the overall score. An increase in riffle quality was observed in 2011, which contributed substantially to the overall increase in habitat score. A non-functioning storm drain outfall was observed near the upper end of the station, which results in overland flow from Tenbrook Drive being channeled into the stream.
Figure III-H5 shows a comparison of the Breewood tributary BIBI and habitat conditions with those in the Paint Branch reference stream reach in Spring of 2010 and 2011.

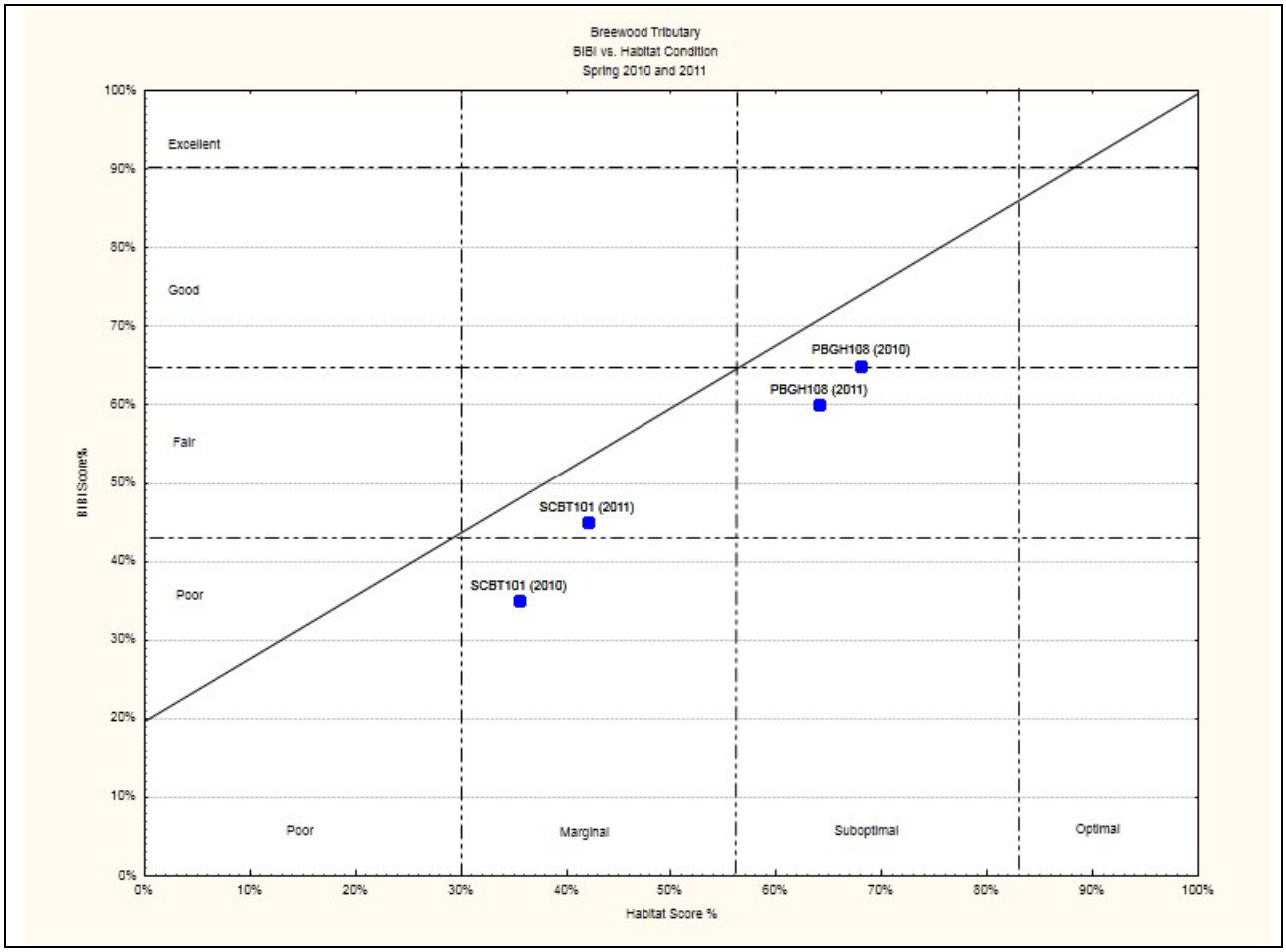


Figure III-H5. BIBI vs. Habitat Condition at Breewood Tributary and Reference Stream, Spring 2010 and 2011.

In-situ water chemistry measurements were made in the Breewood tributary and the reference stream concurrent with the physical habitat assessment. As shown in Table III-H5, most water quality parameters (dissolved oxygen, pH and temperature) were within the normally expected range at SCBT101 and the reference stream. Conductivity was the only parameter which differed among the streams, being elevated (566 umhos) at SCBT101 compared to less than 200 umhos at the reference stream. Conductivity values will continue to be tracked to evaluate if this is a consistent pattern and therefore a chronic influence on the benthic community.

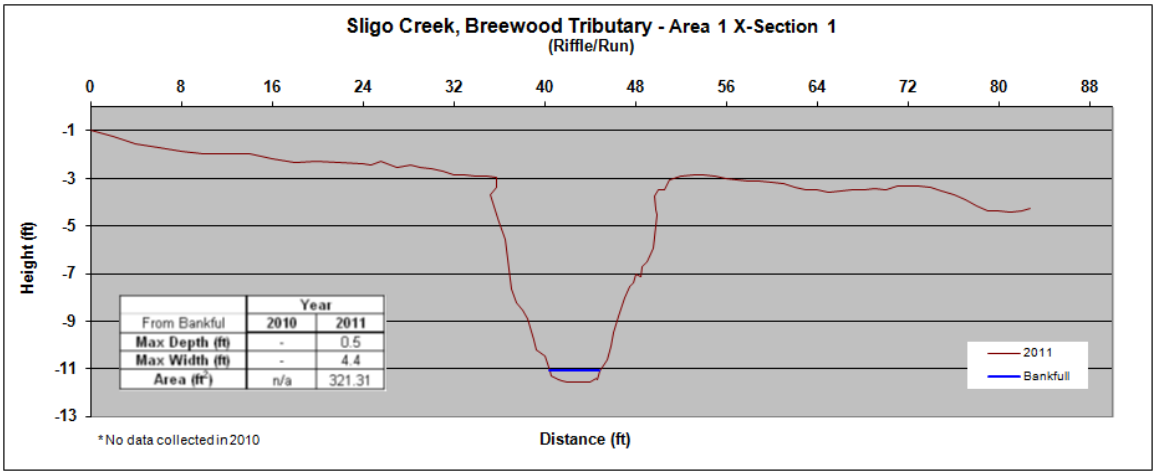
Table III-H5. In-Situ Water Chemistry Results at Breewood Tributary (SCBT101) and at the Good Hope Tributary (PBGH108) Reference Stream

STATION	Type	Benthic Community rating	Date	Dissolved Oxygen (>5mg/l)	%Dissolved Oxygen Saturation	pH	Conductivity (<= 300 umhos)	Air Temp. (deg C)	Water Temp. (deg C)
SCBT101	Benthic	Poor	5/7/2010	8.73	87	7.30	566	21	15.4
SCBT101	Benthic	Fair	3/9/2011	10.57	87	7.83	727	5	7.8
PBGH108	Benthic	Good	4/22/2010	10.69	90	6.24	166	12	11.0
PBGH108	Benthic	Fair	4/22/2010	10.60	104	6.79	143	17	14.4

Breewood Tributary Physical Geomorphic Assessment:

In 2010, DEP established Study Area 2 for physical geomorphic monitoring (20-bankfull widths) in 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. A second study area (Study Area 1) was established in 2011 and extends from the outfall channel below University Boulevard to the Breewood tributary. Study area locations are shown in Figure III-H2.

Figure III-H6 provides representative cross section views of Study Area 1. The average particle size of the channel substrate below the bankfull channel height was 0.062mm, which is classified as fine sand. This area of the stream is predominated by riffles and runs (riffles accounted for 39% of the reach surveyed and runs accounted for 38% of the reach surveyed). The results of the survey indicate a degraded channel with low sinuosity, and high erosion potential.



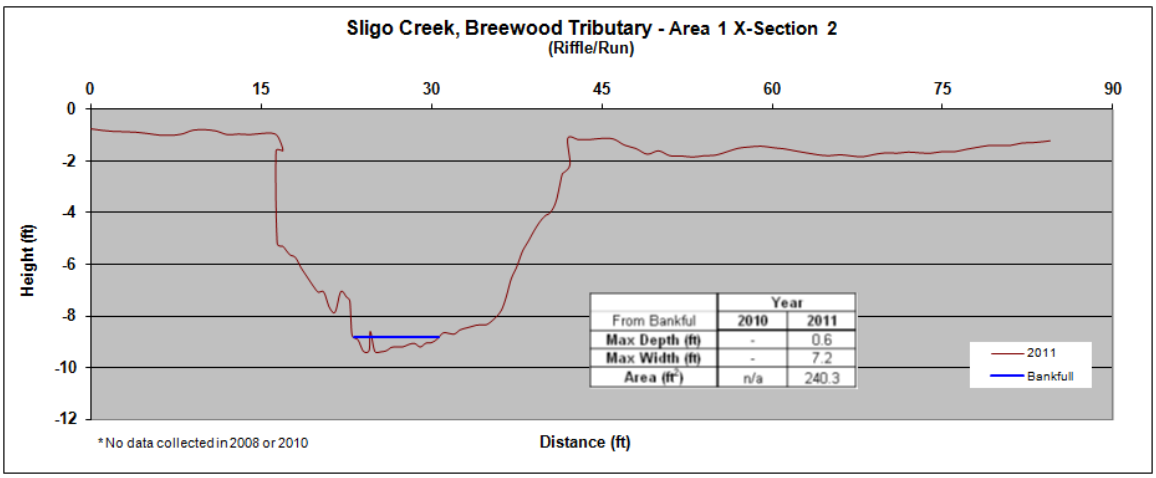
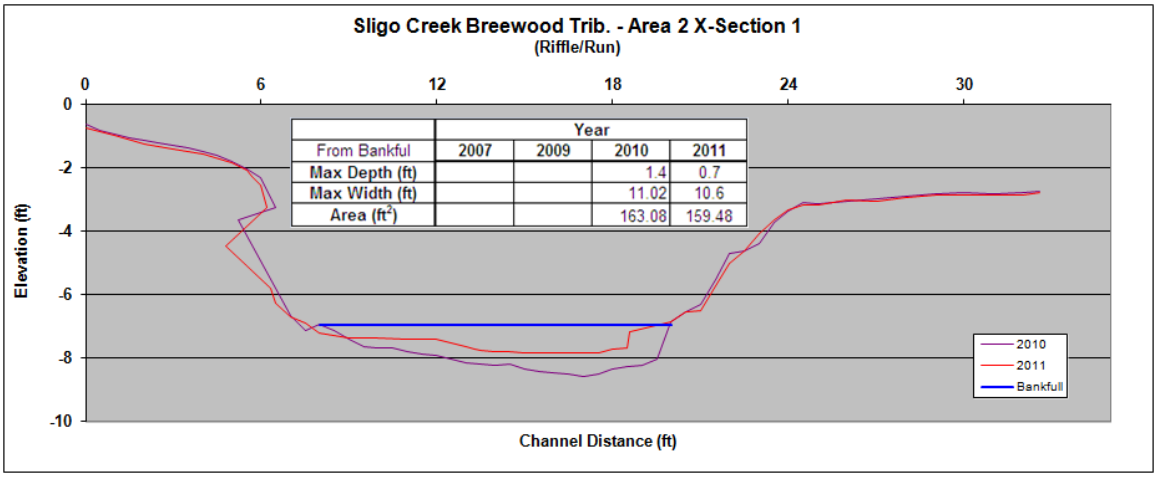


***Figure III-H6. Representative Cross Sections From Breewood Tributary, Study Area* 1.**

Figure III-H7 provides representative cross section views of Study Area 2. The average particle size of the channel substrate below the bankfull channel height was 2.8mm in 2010, which is classified as very fine gravel. In 2011 the average particle size of the channel substrate below the bankfull channel height was 12mm, which is classified as medium gravel. This area of the stream is predominated by riffles, which accounted for 54% of the reach surveyed in 2010 and 50% of the reach surveyed in 2011. The results of the survey also indicate a degraded channel with low sinuosity, and high erosion potential.



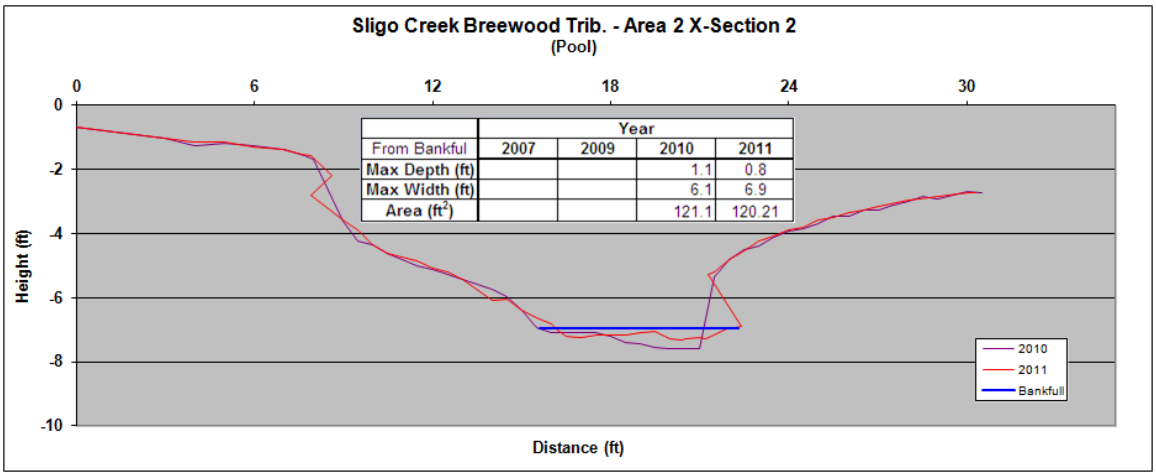


Figure III-H7. Representative Cross Sections From Breewood Tributary, Study Area 2.

Figure III-H8 provides a photograph of a representative cross-section with Study Area 1, demonstrating the severe down-cutting that has occurred in this part of the Breewood tributary.

Figure III-H8. Downstream View of Sligo Creek, Breewood Tributary, Study Area 1- Cross Section 1.

Summary of Biological and Physical Monitoring:
The 2010 and 2011 monitoring results provide evidence that the Breewood tributary is impaired and will likely benefit from stream restoration. Monitoring will continue annually to evaluate improvements to the biology and habitat that are anticipated as a result of the restoration efforts.

Watershed Restoration Project Monitoring:
In addition to the Permit-required monitoring, DEP conducts monitoring of all of its stream restoration projects and some associated stormwater retrofits to determine how future projects will be designed and built to ensure a positive impact on the aquatic ecosystem.

The DEP conducts monitoring beyond the baseline requirements set forth by the regulatory agencies to ensure all project goals are met. During FY12, DEP produced summaries of monitoring results from restoration projects located in the Anacostia subwatersheds of Northwest Branch and Paint Branch, the Rock Creek subwatersheds of Upper and Middle Rock Creek, the Potomac Direct subwatershed of Little Falls, and the Rocky Gorge Dam subwatershed of the Hawlings River. The summary report *Watershed Restoration Project Monitoring* is also included electronically as Appendix M. Table III-H6. is an example summary for the Hawlings River Stream Restoration project.

Table III-H6. Hawlings River (Rocky Gorge Dam Watershed) Stream Restoration - Summary of Project Goal Results

Summary of the Restoration Monitoring Results

The County's watershed restoration projects were generally successful in achieving their goals. However, as shown in Figure III-H9, certain goals were more easily and more quickly achieved than others. Wetland creation had the highest success rate (100%), and improvement in the benthic macroinvertebrate communities had the lowest success rate (35%) through FY12.

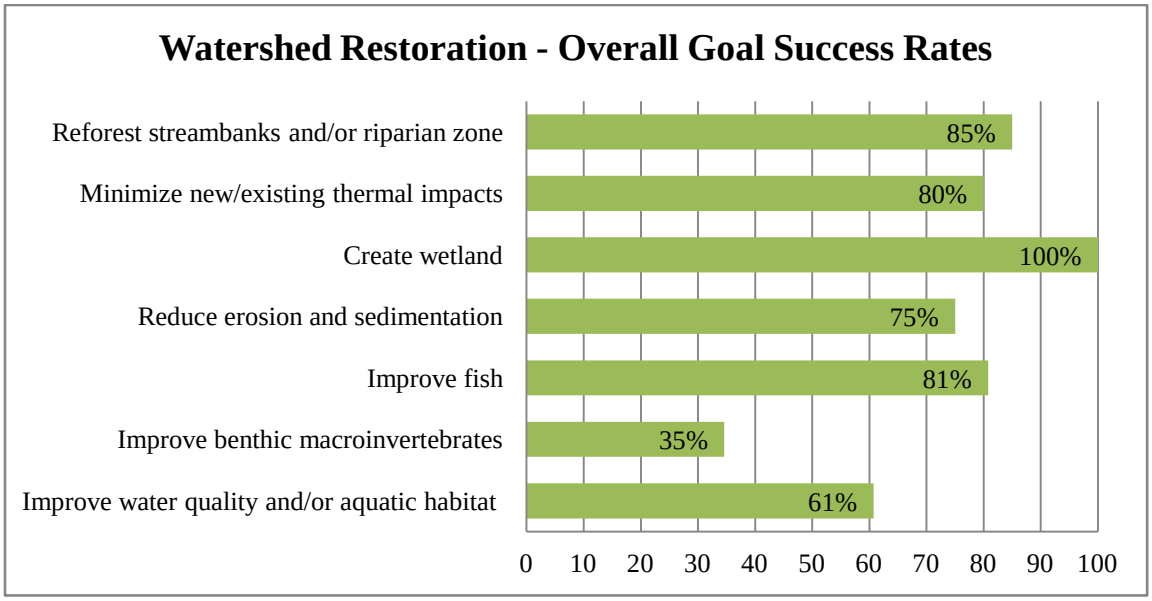


Figure III-H9– Relative Success of Watershed Restoration Project Goals for Projects Highlighted in FY11 and FY12 MS4 NPDES Reports. (Percent Success = Sum of all numeric scores divided by the sum of total possible scores for each goal in Table 1.2.11).

Reforest Streambanks and/or riparian zone

Botanical reforestation efforts have had an overall 85% average success rate for projects highlighted so far. Tree plantings were more successful when larger caliper sized trees were planted. In Turkey Branch, trees planted were smaller caliper sizes, and the majority later died as a result of deer browse, deer rub, and/or invasive plants and vines. Conversely, the Northwest Branch project, with similar deer and invasive plant conditions, had the majority of the planted trees survive. These trees were of a larger caliper size, which likely helped ensure their establishment. Invasive plants and vines were a problem in general at most of the restoration sites. Maintenance may be needed at some of the projects to remove invasives and/or replant.

Minimizing new/existing thermal impacts

Stormwater pond projects highlighted so far have an 80% average success rate at minimizing new temperature impacts to receiving streams. Wet pond stormwater facility retrofit projects tended to be more successful mitigating temperature impacts when there was adequate shading. Also, the Gum Springs parallel pipe proved to be very successful at mitigating temperature impacts from the Oak Springs stormwater pond by diverting and cooling the water underground.

A number of stormwater management pond projects were observed to have significantly warmer downstream stream temperatures as compared to upstream of the pond. However, monitoring data was not collected prior to the pond construction or retrofit, so it is not possible to know if the thermal impacts are as a result of the project or whether they were pre-existing. The Gum Springs Farm pond for example, exhibited higher temperatures observed downstream versus upstream of the pond, but the same temperature relationship existed prior to the pond being constructed. Improvements in restoration monitoring planning for future projects will allow the County to better document pre-existing conditions in order to more accurately understand how stormwater pond projects affect receiving stream temperatures.

Wetland Creation

Wetland and amphibian habitat creation projects were very effective in producing straightforward, easily monitored results. The goal of creating wetland habitat was 100% successful for projects highlighted so far. Wetlands were typically constructed and planted where there was no existing wetland. Monitoring demonstrated establishment of wetland plants, soils, hydrology, and amphibians, usually within the first year after construction. There were a few projects that reported issues with invasive plants negatively impacting the native wetland plantings and hydrology.

The Stream Valley Drive vernal pool monitoring documented how large tree branches were utilized by spotted salamanders (obligate vernal pool species) to attach their egg masses to. These branches were not included in the design plans; they either fell in naturally or were placed unofficially. It is recommended that placing branches for habitat enhancement should become an adopted practice in the design and construction of temporary pools and wetlands.

Reduce Erosion and Sedimentation

Most projects were successful in stabilizing streambanks to reduce erosion and sedimentation, with a 75% average success rate. However, most projects were limited with how much bank grading could be done in order to avoid impact to streambank trees.

Improving Fish and Benthic Macroinvertebrates

Almost all projects that aimed to improve aquatic communities showed difficulty improving the benthic macroinvertebrates (35% average success rate). This could be related to how benthics are more sedentary (less mobile) and not able to re-colonize quickly and easily. Out of the 21 projects examined in FY11 and FY12, only three resulted in a clear improvement in the benthic community, while three others showed only slight improvements. Sligo Creek (as reported in the FY11 Permit report) has shown improvement in the benthic macroinvertebrate community, but only after more than 10 years of projects and monitoring.

Improving the fish community was a much more attainable goal, with an 81% average success rate (Figure III-H9.) It should be noted that the projects that failed to achieve this goal (Little Falls III and Stream Valley Drive) were also reported to lack the necessary hydrology to support a diverse fish population. Lack of flow, especially during the summer, can prevent fish from migrating and surviving—resulting in a pioneer-dominated community with very low fish abundance and diversity. Stream restoration therefore, may not have an effect on the quality of

fish populations in smaller, low-flow stream systems. In these small stream systems, it may be better to rely on benthic macroinvertebrates and/or stream salamanders to show water quality and habitat improvements.

Improving Water Quality and Aquatic Habitat
In 61% of the projects, aquatic habitat assessment scores improved following restoration. However, in some cases, the habitat scores decreased after restoration.

This may be related to the age and approach used in the restoraton project. Stream restoration practices have evolved to integrate more natural materials and "soft" techniques, also known as natural channel design. Projects built prior to 2003 were generally limited to "hard" stream restoration techniques and these techniques were focused mainly on installing rock stabilization (armor) rather than habitat improvement. Armoring typically does not provide the habitat enhancement that vegetative practices do. While the large, angular rocks provide protection against high flow velocities, they can become fish blockages during normal baseflows and lack smaller void space for benthic macroinvertebrates, fish, and stream salamanders to seek refuge and lay eggs.

The DEP observed a slight difference in overall success between the projects built with natural channel versus armor design (Figure III-H10), with natural channel design slightly more successful in achieving the restoration goals.

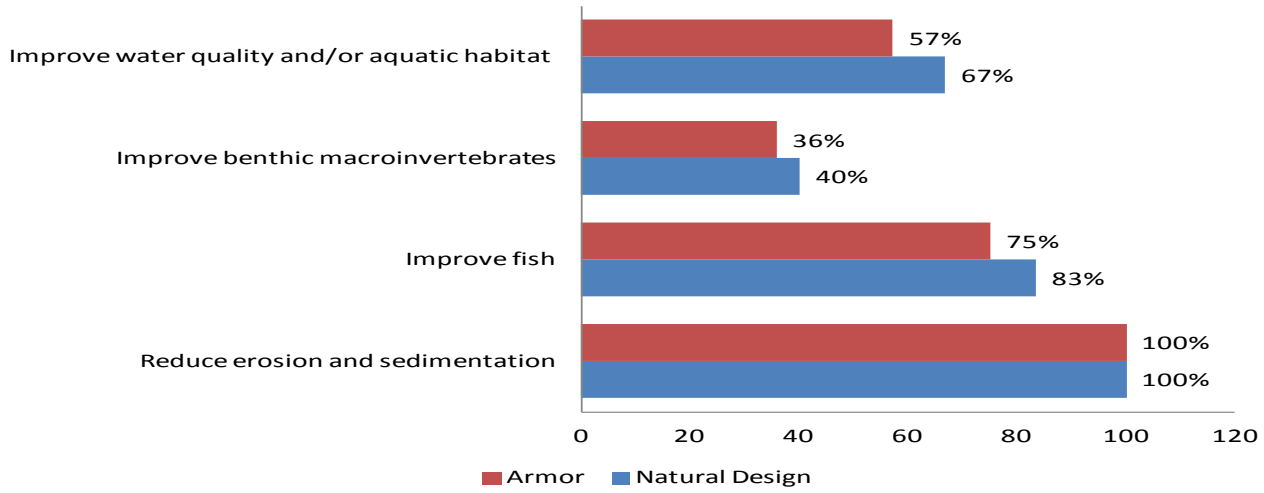


Figure III-H10. Relative Success of Stream Restoration Project Goals for Different General Restoration Design Approaches.

Conclusions From Restoration Monitoring
Montgomery County's watershed restoration monitoring program has evolved over the years to collaborate more with the design of the projects themselves. In the early days of the program, monitoring was more of an afterthought, resulting in lack of pre-construction data or lack of relevant data in general. Projects are now typically developed with a clear set of quantifiable

goals that can be monitored. Monitoring conducted prior to the construction of a project aids in the design of the project. There is now adequate time to collect necessary pre-construction data and ensure a sampling design that fits the design of the specific project. Reports on the results of monitoring watershed restoration projects will be available on the DEP web site when completed.

H.2. 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 (SPA). Specific monitoring requirements include an annual stream profile and survey of permanently mounted cross-sections, and comparison to baseline conditions.

The DEP established monitoring stations in two drainage areas; a "positive control" where the drainage area will remain undeveloped and mostly forested and 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). Monitoring follows the methods as described in the County's 2003 NPDES Report, attached to this report as Appendix N. Figure III-H11 shows the locations of these two areas and their contributing drainage areas. In Figure III-H11, the control area is shown in yellow and labeled "Soper's Branch". The test area is shown in red and 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 twice per year to monitor biological conditions, habitat and physical-chemical data. Benthic macroinvertebrates are monitored during the spring index period (March 15 through April 30) and fish are monitored during the summer index period (June 1 through October 31).

Figure III-H11 also shows the locations of three other areas monitored as part of the Clarksburg Monitoring Partnership (CMP), a consortium of local and federal agencies and universities. Two additional test areas were selected for the CMP: one area also in the Newcut Road Neighborhood (shown as Trib109) and one in the Cabin Branch Neighborhood (shown as Cabin Branch). One additional control area (shown as Crystal Rock) was set up in an existing developed area in Germantown. All the test and control areas have USGS flow gages installed where continuous stream flow data is being collected. Two rain gages monitor area rainfall and document local rainfall intensities to correlate rainfall to stream flow.

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 since 2004. The CMP is also using Light Detection and Ranging (LiDAR) imagery to provide greater resolution in mapping landscape changes at this smaller drainage area scale than is possible using traditional aerial photography

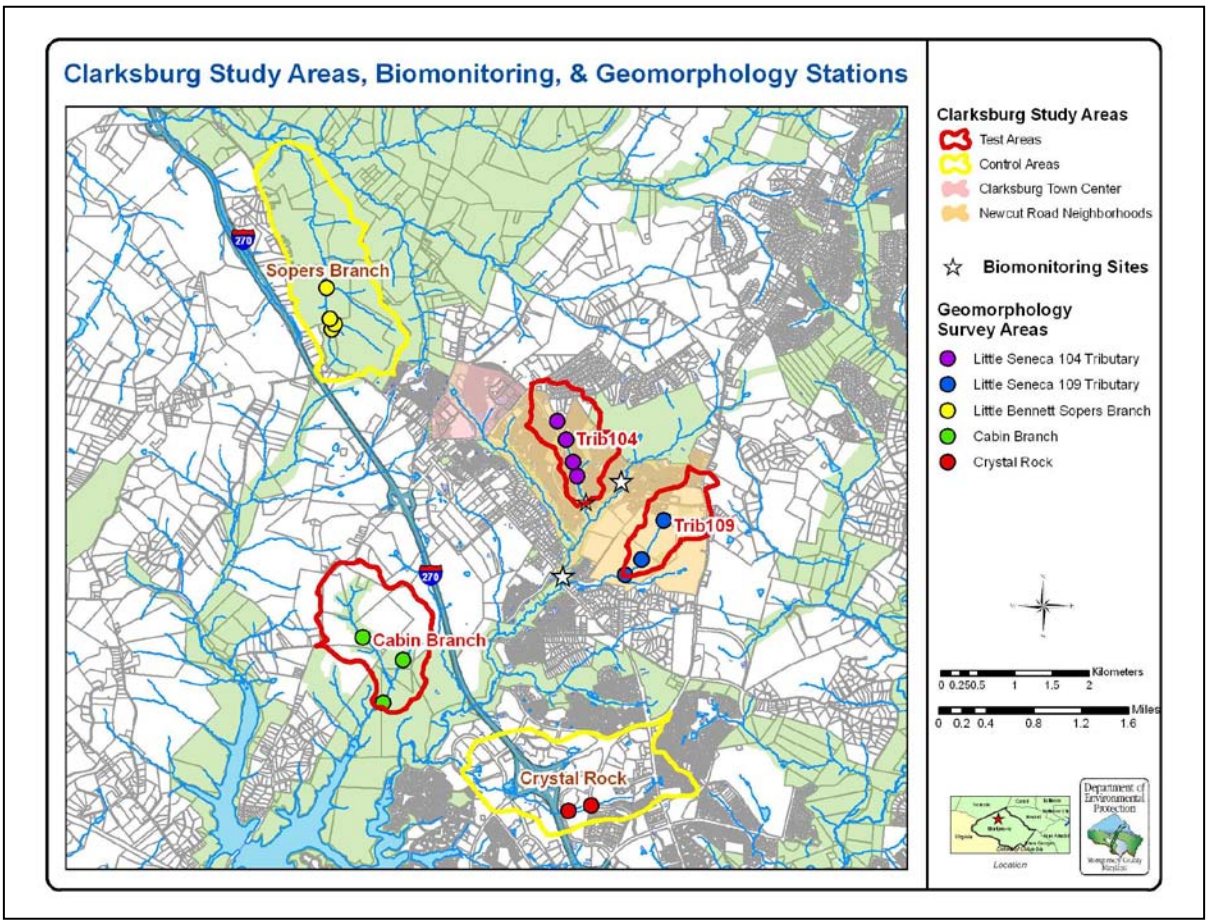


Figure III-H11. Location of the Clarksburg Monitoring Partnership three test areas and two control areas. Also included are biological monitoring stations and geomorphic survey locations.

The DEP performs additional physical stream characteristic and biological stream monitoring throughout the Clarksburg SPA to study the cumulative effects of development. The County annual SPA report includes the results of stream and BMP monitoring and presents a comprehensive analysis of all available biological, chemical, and physical data collected from 1994 through the current reporting calendar year. The County SPA Report and Technical Appendices are available on the Montgomery County website at: http://www.montgomerycountymd.gov/dep/water/spareports.asp

Status of Development in the Clarksburg SPA Permit Required Test Area:
The drainage catchment to the test area (LSLS104) primarily contains two developments. The Greenway Village Phase I and II are completed, and ESC structures have been mostly converted to SWM structures. The Clarksburg Village Phase I is currently transitioning from construction to post construction with many properties largely stabilized, and ESC structures being converted to SWM structures. There is a small portion of the test area at the downstream end that was undergoing new construction in 2011. The land composition in the control area drainage catchment remains unchanged.

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 could be accurately captured, two rain gages were established for the Clarksburg Monitoring Partnership at Black Hill Regional Park in Cabin Branch and Little Bennett Regional Park in Soper's Branch. The data collected provides statistics on pattern and amount of rainfall, storm durations, storm mean intensity, and storm peak intensity.

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 five flow gages is presented in Table III-H7

Table III-H7 Descriptions of the Five USGS Stream Gages in the Clarksburg Study Area.

Gage Id. Number	Name	Date Started	DA (mi^2)	DA (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	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

Annual runoff from stream gages in the test area (USGS gage 01644371) and the 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 evapotransporation 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, 2006, 2007, 2008, 2009, 2010 and 2011. Water Years cover the period from October 1 of one year to September 30 of the next year.

The 2011 USGS Water Data Report for the two stream gages is available at:
http://wdr.water.usgs.gov/wy2011/pdfs/01643395.2011.pdf (Soper's Branch control area)
http://wdr.water.usgs.gov/wy2011/pdfs/01644371.2011.pdf (Little Seneca Creek test area)

Summary information on stream characteristics at the test area and the control area will be provided in the 2011 Special Protection Area Report. The report will be available on the Montgomery County website at:
http://www.montgomerycountymd.gov/dep/water/spareports.asp.

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 stream gaging station (Doheny et al. 2006). Changes in the TOC of a drainage area can be useful in understanding stream response to impervious area increase. When the conversion process to SWM BMPs has been completed in the test area, TOC will be evaluated to determine if the test area response to rainfall has changed compared to the control area. In this report, we evaluated TOC during the construction period in the test area (USGS Water Years 2008 through 2011). Table III-H8 shows the TOC for the developed test area (LSLS104) stream gage and the control area (LSLB101) stream gage.

Table III-H8. Time of Concentration in Minutes for Water Years 2008-2011

	Control Station (LSLB101)	**Test Station (LSLS104))**
Mean	186	78
Max	1160	550

During the construction period (October 1, 2007 thru September 30, 2011), the TOC was evaluated at the control area stream gage (LSLB101) and at the test area stream gage (LSLS104). On average, the test area tributary responded twice as fast as the control area for the same range of storms exceeding ½" of rainfall (see Figure III-H12).

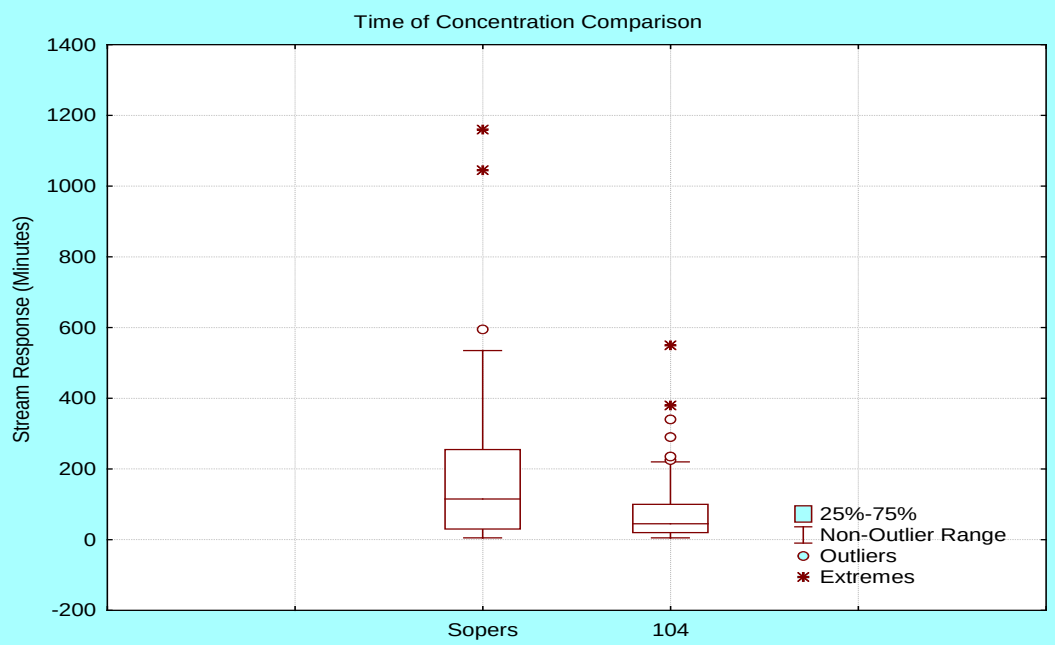


Figure III-H12. Comparison of Time of Concentration (TOC) at the control area (LSLB101) stream gage and at the test area (LSLS104) stream gage for rainfall greater than 1/2" in 24 hours.

Stream Geomorphology Monitoring:
Figures III-H13A and B provide survey locations for the stream geomorphology monitoring in the test area tributary and in the 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 become 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.

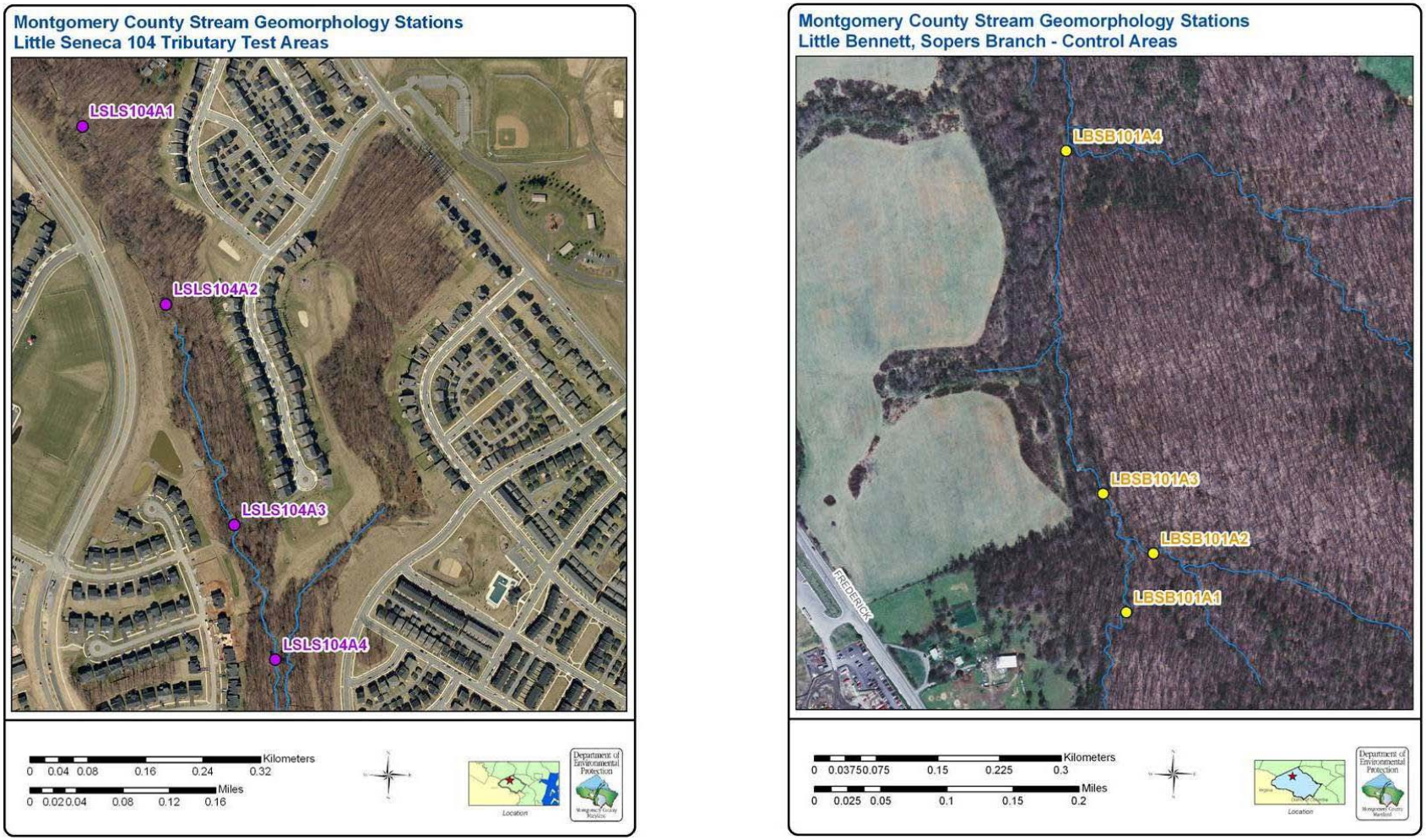


Figure III-H13. Geomorphology Survey Locations: Test Area (A), Control Area (B)

Data Analysis and Interpretation:
As development alters an area's surface hydrology, rainfall infiltration will decrease and stormwater runoff will increase, with corresponding higher peak flows and receiving stream channel scouring. The eroded material is carried away and deposited downstream (aggradation). As the development site stabilizes, the receiving stream enters an erosional phase where the overland sediment supply is reduced and geomorphic readjustment takes place (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. Table III-H9 summarizes sinuosity indices and survey information for the test area (LSLS104) and the control area (LBSB101). Data are shown for the furthest downstream survey area within each reach.

Evaluation of sinuosity over time documents a difference between the test and control stations. Sinuosity is the ratio between the length of the stream and the corresponding length of the stream valley. A ratio of 1:1 would indicate a very straight and channelized stream. From 2003 to 2006 sinuosity ratios went from 1.4 to 1.0. This would be consistent with the increased annual runoff to the test area. After SWM began to be functional in late 200,8 the ratio began to increase slightly, and is currently at 1.22. The sinuosity of the control area channel has remained more consistent than in the test area throughout the monitoring period.

The average particle size (D-50) for substrate material in the test area exhibited an increase at the most downstream study area. Increased runoff rates may be flushing the finer particles downstream, while the coarser, parent material aggregates of the stream channel are left in place. Increased impervious may also result in a system which prevents sediment from entering the system naturally. To reach equilibrium, sediment is removed from the stream channel in one location and deposited downstream in another area.

Cross sections from the test area illustrate this process in Figure III-H14. 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 (Figure III-H14). Changes are most evident in the lower portion of the cross section profiles, at or below frequent storm elevation.

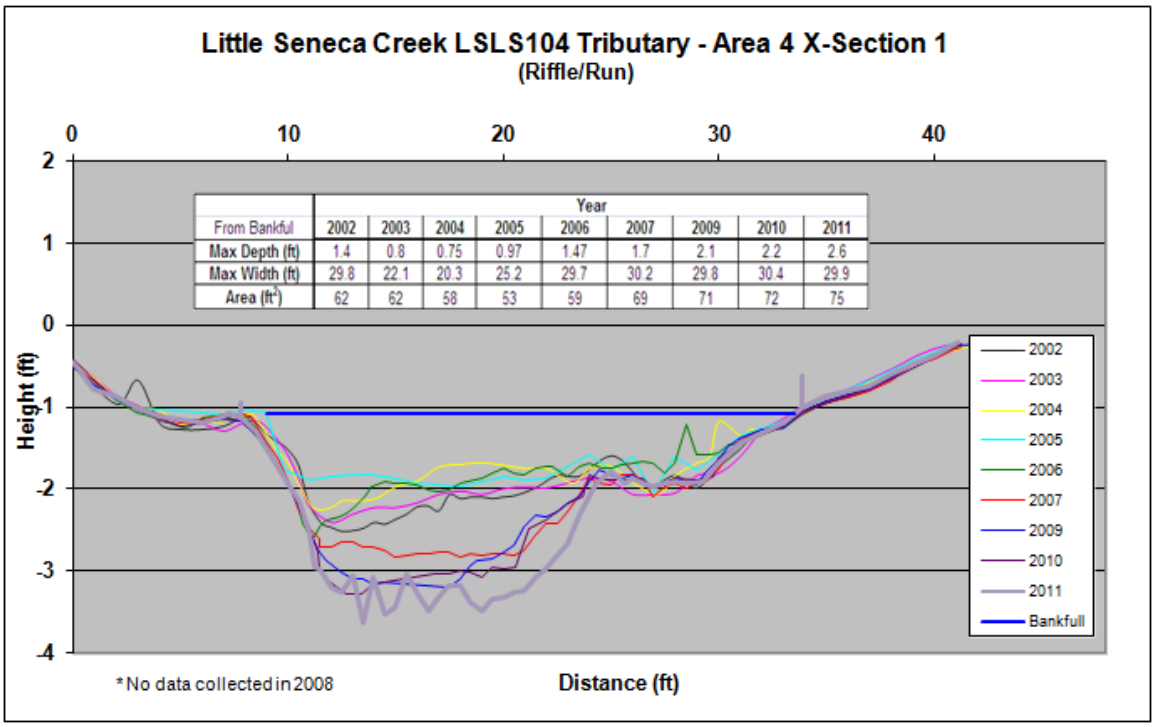
In contrast, representative sections from the control area showed little yearly change (Figure III-H15).

Table III-H9. Sinuosity indices and survey information for test area (LSLS104) and control area (LBSB01). Data are shown for furthest downstream survey areas within each reach

	Sinuosity							
Year	'03	'04	'05	'06	'07	'09	'10	'11
Test Area (LSLS104) A4	1.4	1.4	1.3	1.0	1.0	1.2	1.3	1.2
Control Area (LBSB101) A4	1.1	1.1	1.0	1.2	1.2	1.1	1.2	1.4

	Total Longitudinal Slope (%)							
Year	'03	'04	'05	'06	'07	'09	'10	'11
Test Area (LSLS104) A4	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4
Control Area (LBSB101) A4	1.1	0.9	1.5	1.4	1.4	1.5	1.2	1.3

	D50 (mm)							
Year	'03	'04	'05	'06	'07	'09	'10	'11
Test Area (LSLS104) A4	8.2	5.7	5.7	7.1	8.5	14	20	0.062
Control Area (LBSB101) A4	16	0.062	8.7	14	9.2	0.062	0.062	0.062
	Particle							
Year	'03	'04	'05	'06	'07	'09	'10	'11
Test Area (LSLS104) A4	Med. Gravel	Fine Gravel	Fine Gravel	Fine Gravel	Med. Gravel	Med. Gravel	Coarse Gravel	Fine Gravel
Control Area (LBSB101) A4	Coarse Gravel	Silt/ Clay	Med. Gravel	Med. Gravel	Med. Gravel	Fine Gravel	Fine Gravel	Fine Gravel



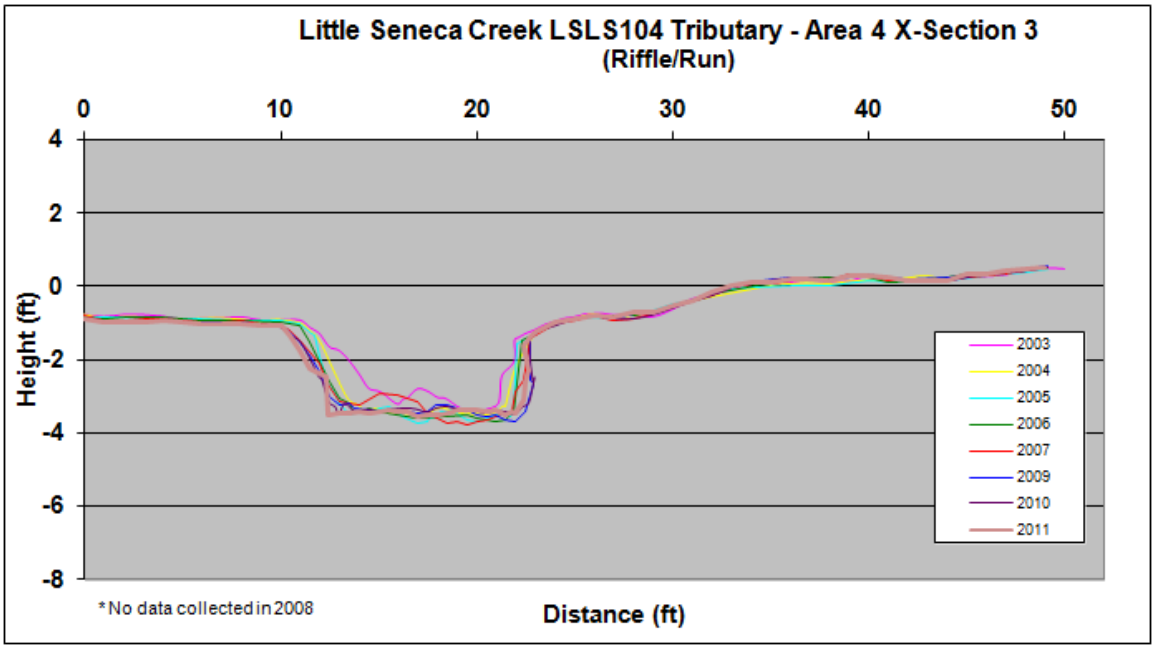


Figure III-H14. Representative cross sections from the test area (LSLS104), cross section location 4 (most downstream location). Cross sections are both measured in riffle/run features.

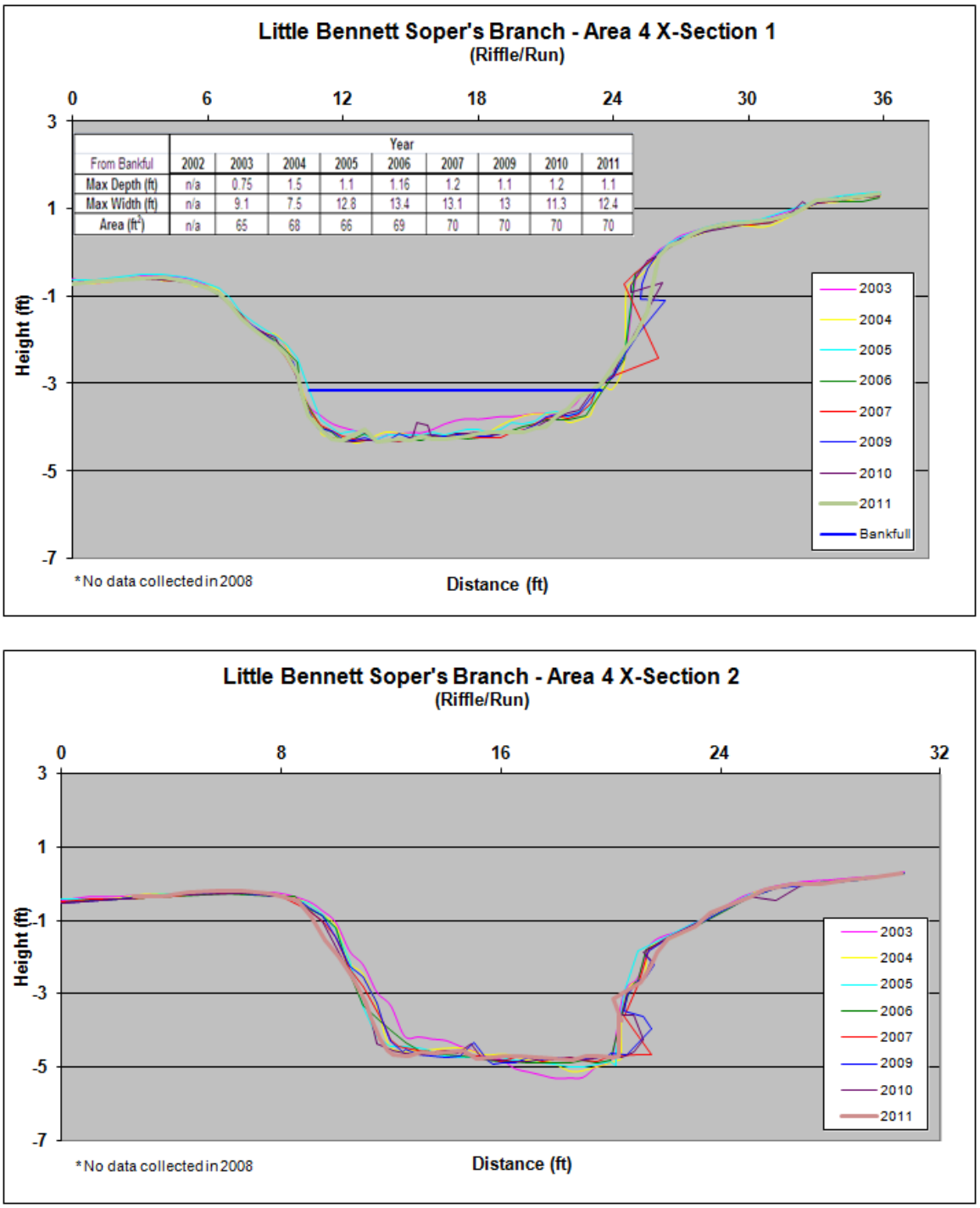


Figure III-H15. Representative cross sections from the control area, cross section location 4 (most downstream location). Cross sections both measured in riffle/run features.

Figure III-H18 shows results of longitudinal profiles, looking parallel to the stream channel, for the test area (LSLS104). The stream bed elevation in the test area tributary has shown considerable instability since construction was initiated, and features frequently change as sediment loads move through the system. The channel depth and channel width at the downstream study area continue to increase in response to changes in hydrology. An examination of the percent of riffle/run to percent pool at the test and the control sites revealed no observable trends.

The results presented are preliminary as the ESC control devices have not all been converted to SWM structures. Post-construction monitoring has not yet been completed. However, from the preliminary results it appears that the construction phase of development has impacted the test area channel morphology as evinced by straightening, down-cutting, and enlargement of the channel.

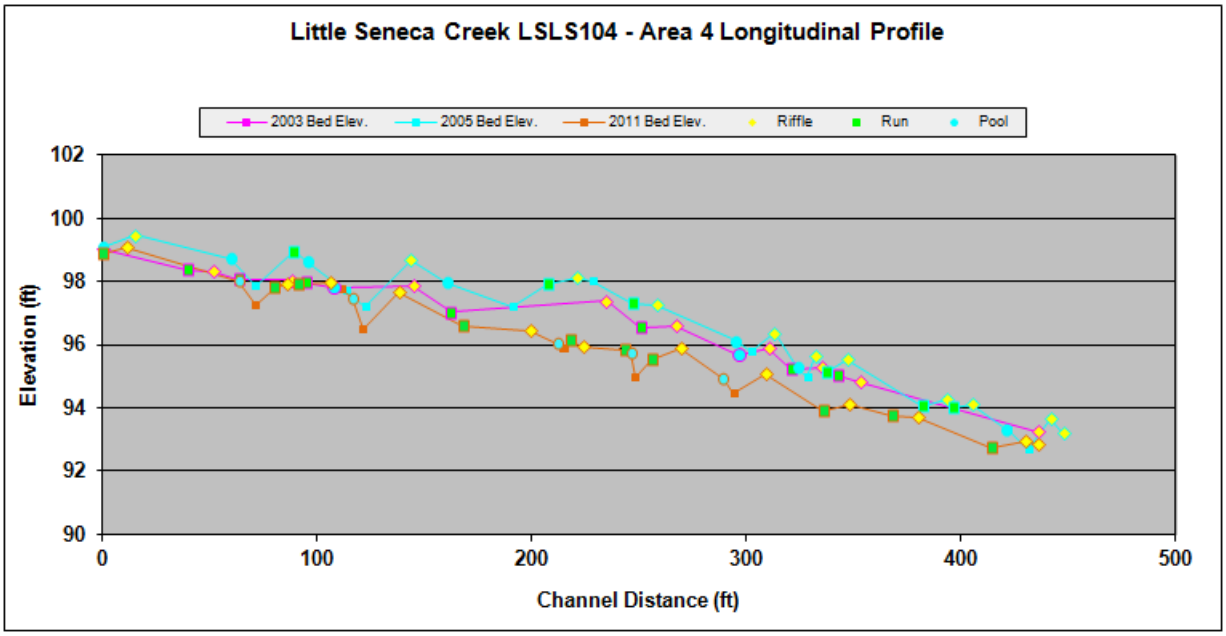


Figure III-H16. Longitudinal profiles test area (LSLS104), cross section location 4 (most downstream location).

I. Program Funding

The Permit requires that the County submit annual funding for the capital, operation, and maintenance expenditures in database format specified in Permit Section Part IV Attachment A, MDENPDES12.mbd, Parts A-L. The required database is included in electronic format in Appendix A, MDENPDES12.accdb., Part L. Fiscal Analysis. A discussion of the CIP budget for stormwater management including watershed assessment and restoration is presented in Section III.G Watershed Restoration.

During FY12, the reported total funding associated with Permit requirements was $30,302,225. It does not include operational DOT and DGS costs associated with property management, pollution prevention, because these agencies do not have a way to separate out these specific costs from their other operating costs. As a comparison, the total budgeted in FY11 was $30,097,236 with an increase of .70%.

Table III-I1. Total Funding for County MS4 Related Programs By Fiscal Year (in 000s).

Fiscal Year (FY):	FY0	FY11	FY12
Total Budgeted	$27,415	$30,097	$30,302
Increase between fiscal years		9.7%	.70%

J. TMDLs

The Permit requires development of implementation plans to meet County MS4 WLAs for any EPA approved TMDLs in County watersheds within one year of EPA approval. The final revised Strategy includes implementation plans for all those watersheds groupings which have one or more EPA-approved TMDLs prior to June 2009.

A summary of the Strategy's projected progress towards MS4 water quality requirements is presented in Table III-J1. For TMDL planning purposes, the County is delineated into 8 watershed groupings based on the eight-digit USGS hydrologic unit codes (HUCs). Figure III-J1 shows those watersheds with MDE identified impairments and EPA-approved TMDLs as of January 2012.

Table III-J1 – Summary of the Strategy's Progress Toward MS4 Water Quality Requirements

Table III-J1.

Countywide Watersheds

Summary of Implementation Plan schedule with expected MS4 permit area WLA compliance endpoints

	2015	2017	2020	2025	2030	Permit/ TMDL Targets 2017	Permit/ TMDL Targets 2020
Impervious Area Treated (acres)	4,302	6,014	7,722	10,518	11,154	6,008	7,723
% of Impervious Area Treated by ESD	18%	34%	47%	60%	63%		
Impervious Area Treatment Cost (Million $)	305	622	987	1,687	1,884		
% of Cost for ESD	53%	66%	70%	80%	80%		
Nitrogen (% Reduction)	18%	25%	36%	46%	51%	9%	20%
Phosphorus (% Reduction)	17%	23%	34%	44%	46%	12%	34%
Sediment (% Reduction)	23%	34%	54%	60%	62%	20%	37%
Bacteria (% Reduction)	11%	15%	20%	28%	30%		
Trash (% Reduction)	18%	26%	33%	41%	42%		

Assumptions:
1. Does not inclde repeated Outreach and Education costs beyond FY2015
2. Does not include an inflatoin multiplier

The MDE approved the Strategy in July 2012. The approval letter can be found attached to this report as Appendix B. The County will continue to work with MDE to address any potential technical issues in the Strategy that are inconsistent with MDE modeling efforts. A final version of the Strategy incorporating MDE and public comments including the Watershed Implementation Plans and supporting documents are publicly available on the DEP website at: http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/dep/water/wris.asp#plans

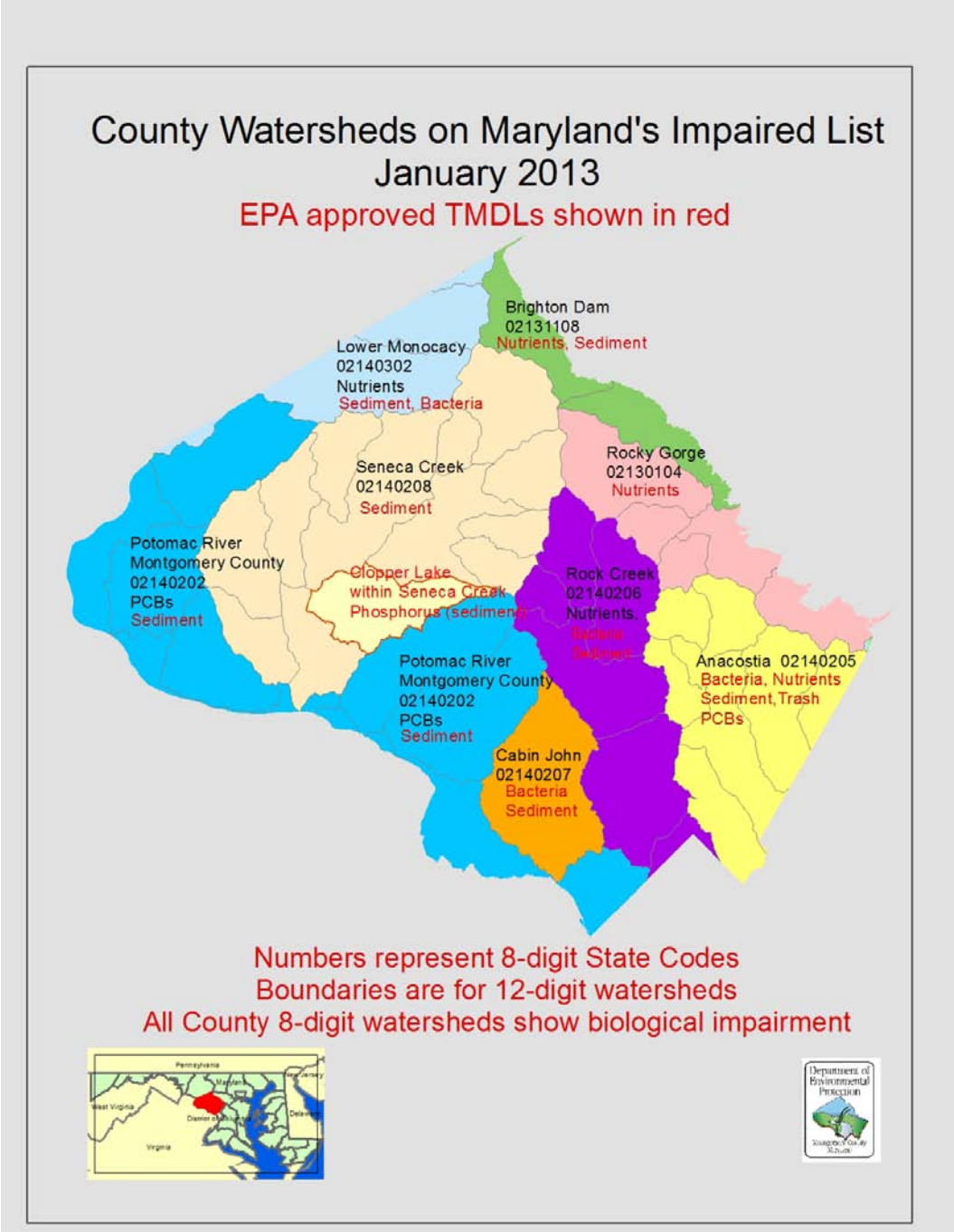


Figure III-J1. County Watersheds with impairments and EPA approved TMDLs.

TMDLs Issued Since June 2009:

Lower Monocacy Watershed:
The EPA approved a TMDL for bacteria (E.coli) for the Lower Monocacy Watershed in December 3, 2009. The Lower Monocacy Watershed Implementation Plan submitted with the Strategy does not contain an implementation plan for bacteria since EPA approval occurred after work began on the Strategy. The bacteria TMDL implementation plan has not been developed because of that watershed's low priority for restoration. The watershed has only a small amount of land area under the County's MS4 Permit area (10%) and only 8% impervious, with mainly excellent to good existing stream biological and habitat conditions. There are other County areas with more immediate stormwater retrofit needs and EPA approved TMDLs, including the Patuxent and Seneca Creek watersheds.

Cabin John, Rock Creek, and Seneca Creek Watersheds:
The EPA approved sediment TMDLs for the, Cabin John, Rock Creek, and Seneca Creek watersheds on September 20, 2011. Table III-J2. below compares the baseline loads, WLAs and % reductions specified by the Cabin John and Rock Creek Sediment TMDLs.

Table III-J2. Cabin John Watershed and Rock Creek Sediment TMDL

Cabin John Sediment TMDL		**Rock Creek Sediment TMDL**	
Baseline Load MC Phase I (tons/year)	3143.6	Baseline Load MC Phase I (tons/year)	8666.7
WLA (tons/year)	2430.1	WLA (tons/year)	5345
Target reduction (tons/year)	713.5	Target reduction (tons/year)	3322
% reduction	22.7	% reduction	38.3%

The County's Strategy will achieve adequate sediment reductions in Cabin John and Rock Creek watersheds to allow the County to meet the new sediment WLAs. Tables III- J3 and 4 show the sediment reductions that will be achieved by the Strategy.

Table III-J 3. Summary of the Implementation Plan Schedule For the Cabin John Creek Watershed with Expected TMDL Compliance Endpoints

Fiscal Year		2015	2017	2020	2025	2030
Impervious Treated (acres)		187	380	570	1,018	1,018
ESD (% Impervious)		52%	72%	78%	87%	87%
Cost (Million $)		23	65	114	215	219
ESD (% Cost)		92%	91%	86%	90%	88%
% Reduction from baseline	TN	21%	27%	39%	55%	58%
	TP	20%	26%	35%	49%	51%
	TSS	6%	17%	60%	91%	100%
	Bacteria	16%	22%	27%	40%	40%
	Trash	6%	12%	19%	34%	34%

Table III-J 4. Summary of the Implementation Plan Schedule For the Rock Creek Watershed with Expected TMDL Compliance Endpoints

Fiscal Year		2015	2017	2020	2025	2030
Impervious Treated (acres)		1,541	1,961	2,381	3,625	3,989
ESD (% Impervious)		17%	28%	36%	57%	61%
Cost (Million $)		87	172	262	566	658
ESD (% Cost)		70%	79%	79%	89%	90%
% Reduction from baseline	TN	24%	30%	38%	55%	61%
	TP	25%	30%	38%	54%	60%
	TSS	38%	50%	92%	100%	100%
	Bacteria	21%	27%	33%	50%	55%
	Trash	17%	24%	31%	50%	55%

For the Seneca Creek watershed, the Strategy reflects a combination of the Great Seneca Creek WIP and the Dry Seneca and Little Seneca Pre-Assessments. These plans do not show that the Strategy meets the reductions required by the Seneca Creek sediment TMDL. During FY13, the DEP will work to complete a unified Seneca Creek Watershed Assessment which will address the County MS4 area sediment WLA.

Anacostia River Nontidal PCB TMDL
EPA approved a PCB TMDL for the Northeast and Northwest branches of the nontidal Anacostia watershed on September 30, 2011. The County has developed a draft implementation plan to address the County PCB WLA in the TMDL. The County's draft implementation plan can be found in the electronic attachment to this report as Appendix O.

The DEP attempted to identify potential sources, both historic and existing, of PCBs, by examining zoning information, historical records, specific industries, stormwater BMPs, LEPC data and the use of PCB contaminated caulk in older buildings. Because PCB production ceased in 1979, identifying past sources of contamination is problematic. The most efficient options for removing PCBs from the watersheds appear to be targeting caulk in older buildings, investigating industrially zoned areas, and testing materials trapped in SWM BMPs.

Chesapeake Bay TMDL:
Information on the County's Phase II WIP submittal for the Chesapeake Bay TMDL is presented below in Part V. Special Programmatic Conditions.

Monitoring Watershed Flow and Water Chemistry
During FY12, the United States Geological Service (USGS) began analyzing results of the water quality data collected during water years 2005 through 2011(each water year begins on October 1 of the previous calendar year and ends on the following September 30) from the Anacostia River in Maryland and Rock Creek in Washington, D.C. This includes the data being collected through cost-share with the DEP in support of the Permit TMDL program. There are some gaps in the datasets due to discontinued or interrupted records. Water-quality data included concentrations of nutrients, suspended sediment, and *E. coli* bacteria, as well as continuous monitoring for physical parameters, water temperature, specific conductance, pH, concentration of dissolved oxygen and turbidity, at each station. Loads and yields, estimated from water-quality data, were also presented.

The report, **USGS Open-File Report 2013-1034:** Water Quality in the Anacostia River, Maryland and Rock Creek, Washington, D.C.: Continuous and Discrete Monitoring with Simulations to Estimate Concentrations and Yields of Nutrients, Suspended Sediment, and Bacteria, is available at http://pubs.usgs.gov/of/2013/1034.

This water-quality data and analysis provides baselines for conditions prior to accelerated implementation of multiple stormwater controls in the watersheds. Both Montgomery and Prince George's Counties are currently in the process of enhancing stormwater controls in both watersheds. Annual yields were estimated for suspended sediment, total nitrogen, total phosphorus, and *E.coli* bacteria using the U.S. Geological Survey model LOADEST with hourly time steps of turbidity, flow, and time. Yields of all four parameters were within ranges found in other urbanized watersheds in Chesapeake Bay. Annual yields for all four watersheds over the period of study were estimated for suspended sediment (65,500 –166,000 kilograms per year per

square kilometer; kg/yr/km2), total nitrogen (465 - 911 kg/yr/km2), total phosphorus (36 - 113 kg/yr/km2), and *E. coli* bacteria (6.0 – 38 x 1012 colony forming units/yr/km2). Results were similar to loads determined by previous studies for the Northeast and Northwest Branch stations of the Anacostia River.

Figure III-J2 shows a summary of the monthly discharge data for the Northeast Branch of the Anacostia. This station is downstream of the DEP supported station on Lower Paint Branch.

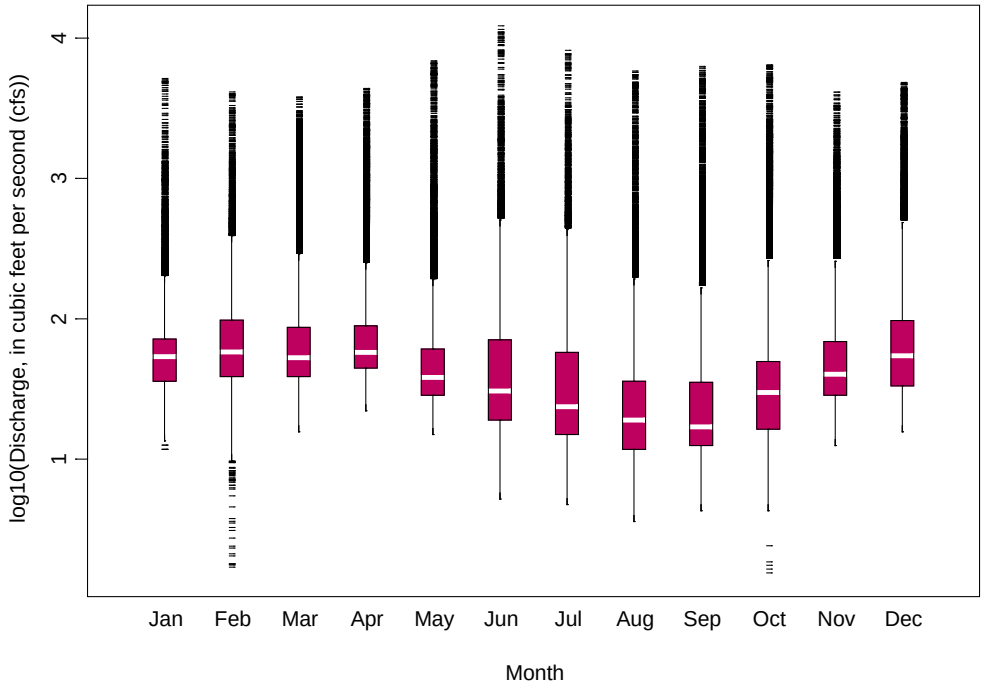


Figure III-J2. Boxplots of Monthly Summaries of 15 Minute Interval Discharge Data for the Northeast Branch of the Anacostia River (USGS Station 01649500) for Water Years 2005-2011

Summary of Water Quality Data at Lower Paint Branch.

Water quality showed strong seasonal patterns (Fig. III-J3) that were not necessarily reflected in the monthly discharge data. . The growth of bacteria is very closely related to temperature, so as expected, numbers of *E. coli* followed seasonal temperatures very closely. Concentrations of SS appeared to start to increase during the spring months, and had the highest ranges in concentrations during the summer. TP, and to a lesser extent, TN, followed similar patterns to SS, strongly indicating that particulates were the dominant transport phases for nutrients in these urbanized streams. This is consistent with earlier observations for the Anacostia River (Miller, Gutiérrez-Magness, and others, 2007). Increases in nutrients in the summer are likely related to increases in fertilizer usage but may also relate to increases in sediment sources, as nitrogen and particularly phosphorus are primarily transported in particulate phases. Possible explanations for increases in SS could be increases in development activities during the warmer months and (or) increases in the energy in flows during spring freshets that could change bank-erosion patterns, but neither of these connections were investigated in the current study.

The length of record was not sufficient to determine trends for any of the water-quality parameters; within confidence intervals of the models. Initial discussion with USGS indicated the need for a minimum of 10 years of continuous monitoring data to assure that trends could be statistical determined. The DEP intends to continue funding the stations at Lower Paint Branch and Rock Creek through this Permit cycle. In FY13, the DEP added water chemistry monitoring at the USGS flow gauge station in Sligo Creek of the Anacostia to provide additional data as watershed restoration projects and programs proceed in that subwatershed.

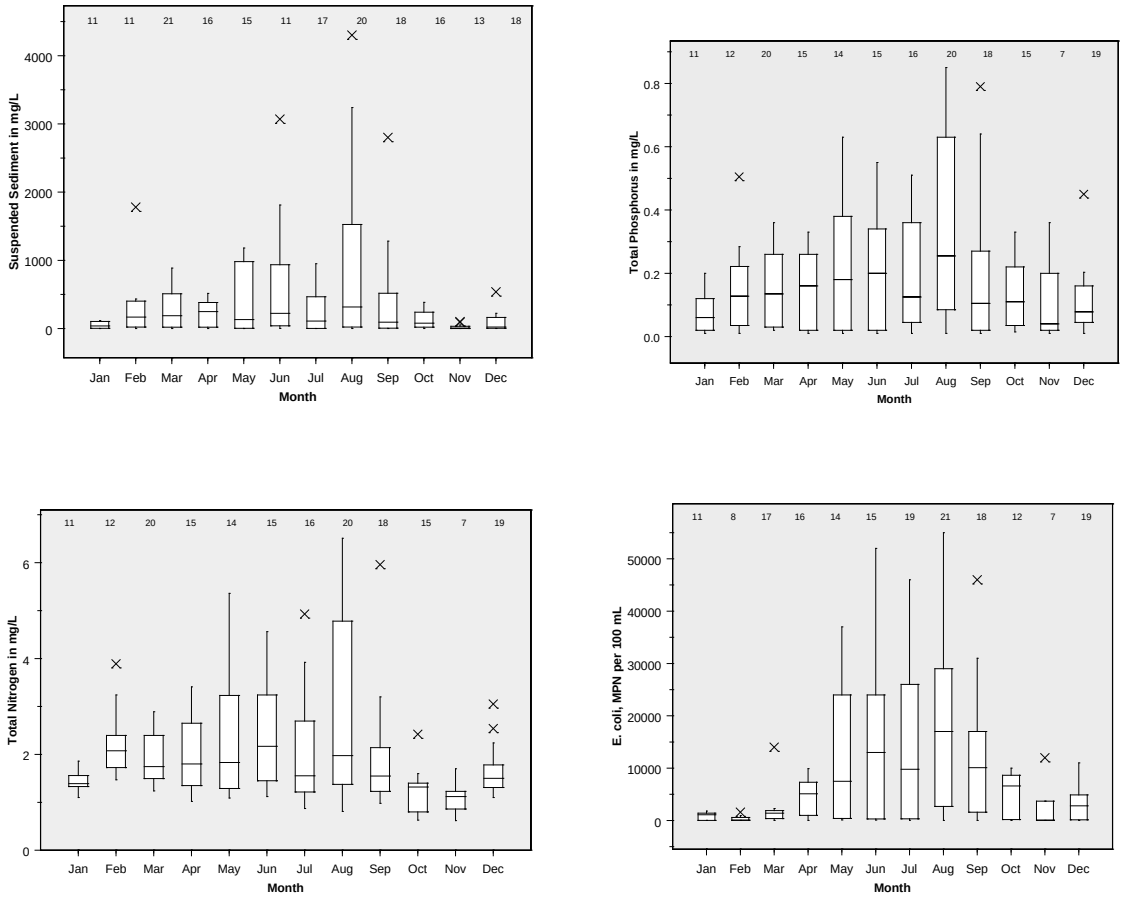


Figure III-J3. Boxplots of monthly summaries of discrete water-quality data for Paint Branch near College Park, MD (USGS Station 01649190) for water years 2008 to 2011. Concentrations of (A) suspended sediment in mg/L, (B) total nitrogen in mg/L, (C) total phosphorus in mg/L, and (D) E. coli in most probably number of viable cells.

IV. ANNUAL REPORTING

Annual progress reports are required under 40 CFR 122.42(c). This Permit report fulfills this requirement.

V. SPECIAL PROGRAMMATIC CONDITIONS

A. Tributary Strategy

The DEP agreed to serve as the local liaison for scheduling meetings related to Maryland's WIP process. The DEP organized two public information meetings (April 2011 and October 2011) on the WIP process and local involvement. Information presented and attendees at the two public information meetings are posted at:

http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Pages/MontgomeryTeam.aspx

On September 14, 2011, the MDE provided the loads allocation by source necessary for the Montgomery County stakeholders to begin next steps in developing the Phase II WIP. The DEP agreed to compile and submit to MDE a joint document which included the County's implementation plan and those for the four MS4 Phase 2 permittees in the County. These are the cities of Gaithersburg, Rockville, Takoma Park, and the MNCPPC-Department of Parks.

The County submitted the **Montgomery County MD MS4 Phase I/ II WIP Contributions** to MDE on November 18, 2011. The County's portion of the WIP is based on the Strategy submitted to MDE on February 15, 2011. More details on the County Phase II WIP will be provided in the FY12 Permit annual report. The Strategy was developed to achieve the stormwater nutrient reductions published in the Maryland Phase I WIP. The Strategy shows that the County can achieve the MD Phase II WIP nutrient reductions for 70% implementation by the year 2017 and 100% implementation by the year 2020 The report is posted on the State's web site at:

http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Pages/WIPPhaseIICountyDocuments.aspx

During FY13, the DEP will continue to coordinate with the Phase 2 MS4 Permit localities as MDE moves forward with the next phase in the Bay WIP process. This includes webinars and workshops for local government representatives on technical issues identified during the WIP Phase II development and in anticipation of data and analytical approaches for the Bay Model to meet the 2017 progress evaluation.

B. Comprehensive Planning

The Permit requires the County to "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)". The County was an active partner during the development of the WRE Functional Plan, providing data and technical review for the water, wastewater, and stormwater requirements. The WRE Functional Plan was approved and adopted by the Montgomery County Planning Board in September 2010. The report is available in electronic format at:

http://www.montgomeryplanning.org/environment/water_resources_plan/documents/WaterResourcesfunctionalplan_web.pdf

The County has continued its cooperation with the MNCPPC through the interagency workgroup for the Permit-required evaluation of County codes to assure 'ESD to the MEP' and during the development of local ordinance changes to meet the requirements of the State's Stormwater Management Act of 2007. The County agencies are routine participants for review and comment as Sector Plan and Master Plan documents are being developed.