Permeable Pavement installed at the Green at Parkside - a new community park that treats roadway runoff

DISTRICT OF COLUMBIA

2015 NONPOINT SOURCE POLLUTION PROGRAM

ANNUAL REPORT

April 2016

District of Columbia
Department of Energy and Environment
Watershed Protection Division

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Executive Summary

In accordance with Section 319 of the Federal Clean Water Act, this report documents the activities and accomplishments by the District of Columbia 319 non-point source (NPS) Program. The Department of Energy and Environment (DOEE) is the lead agency for administering Section 319, including the 319(h) Grant. In this responsibility, DOEE helps to protect and improve District water quality by promoting and funding best management practice implementation and tracking, stream restoration efforts, education and outreach, and other measures to reduce NPS pollution loads.

In fiscal year 2015, the District received $1,040,870 through the Environmental Protection Agency's 319(h) Grant and matched the grant with $693,916 to support the District's NPS pollution reduction activities. In calendar year 2015, the District completed the installation of five RiverSmart Schools projects, audited 1,071 homes through the RiverSmart Homes program, and installed 595 rain barrels and 133 rain gardens through this program. These projects reported implementing best management practices resulting in pollutant load reductions of 214 pounds/year nitrogen and 17 phosphorus. DOEE has targeted three sub-watersheds for more intensive restoration efforts. These targeted watersheds are Hickey Run, Texas Avenue Tributary, and Nash Run. Restoration activities in these watersheds funded by 319 and other funding sources has resulted in stormwater retrofits treating 789 acres in Hickey Run; 6.7 acres in Texas Avenue Tributary; and 16 acres in Nash Run.

Mission and Goals of the District of Columbia's Nonpoint Source Program

The mission of the District of Columbia's Nonpoint Source Program is to prevent and control nonpoint source pollution in the District's watersheds. Employing both regulatory and non-regulatory approaches, the Program works to safeguard the city's water and soil resources as well as the health and welfare of citizens using those resources.

Long-term goals and short-term milestones to mark progress toward those goals are outlined in the *District Nonpoint Source Management Plan II: Addressing Polluted Runoff in an Urban Environment* (2000). The Department of Energy and Environment completed a new draft Nonpoint Source Management Plan in September of 2013. The plan was finalized in the summer of 2014. The plan is aimed at reducing nonpoint source pollution from urban runoff, construction, and hydrologic/habitat modification and includes:

- Supporting activities that reduce pollutant loads from urban runoff, construction activity, combined sewer overflows, and trash disposal, for the purpose of attaining present designated uses by 2025 and future designated uses by 2035;
- Supporting and implement activities that strive to restore and maintain healthy habitat, species diversity, and water flows to all of the tributaries of the Anacostia River by 2025, and to all surface waters of the District of Columbia by 2035, by restoring degraded systems and preserving healthy and threatened ones;
- Coordinating NPS Management Program efforts with other District, federal and private sector programs, and adjoining jurisdictions to provide the best delivery of services to prevent and control nonpoint source pollution in the District of Columbia with the resources available;
- Supporting programs that aim to prevent nonpoint source pollution from individual actions, by carrying out effective information and education campaigns that reach at least 5,000 individuals each year to targeted audiences who live, work, teach, or visit in the District of Columbia and its watersheds; and
- Implementing programs that aim to increase nonpoint source pollution runoff prevention practices on private property reaching at least 1,000 properties per year.

DC's Nonpoint source management program has also created three detailed Watershed Implementation Plans (WIPs) for three major watersheds in the District. All of these plans, including the *Oxon Run WIP* (2010), *Rock Creek WIP* (2010), and the *Anacostia WIP* (2011) have been approved by the EPA. Additionally, the District participated in the development of the Army Corps of Engineers facilitated Anacostia Watershed Restoration Plan which was released to the public in April of 2010. These plans lay out waterbody impairments, technically appropriate implementation projects, and timelines that guide DOEE in its work.

The Department of Energy and Environment (DOEE) assesses the health of all significant waterbodies in the District, and prioritizes water quality improvement efforts based on data gathered from water quality monitoring. DOEE then characterizes waterbody impairments and threats; these characterizations are included in the District of Columbia's Section 305(b) reports as required by the federal Clean Water Act. The reports describe many of the District waterbodies as not supporting their swimmable (primary contact recreation) and fishable (fish consumption) designated uses.

Urban stormwater runoff is a prevalent source of pollutants to District of Columbia waterbodies. Primary nonpoint source pollutants of concern include nutrients, sediment, toxicants (Heptachlor Epoxide and DDE), pathogens and hydrocarbons. The few waterbodies that partially or fully support a designated use are also threatened by nonpoint source pollutants. Processes to prioritize subwatersheds for nonpoint source implementation in the District can be found in the Watershed Implementation Plans referenced above. To properly address the water quality problems associated with the District's urban environment, the District has created a new Nonpoint Source Management Plan. The new document outlines a comprehensive strategy for managing nonpoint source pollution in an urban environment in an effort to restore beneficial uses. The new Plan sets new goals and objectives including specific milestones for when they will be achieved.

Figure 1 - A bioretention cell and cistern at a church in the Anacostia watershed

This annual report is written in response to *Sections 319 (h)(8) and (11) of the Clean Water Act (33 USC 1329)*, for the purpose of documenting progress made in fiscal year 2013 by the District of Columbia in implementing its *Nonpoint Source Management Plan II: Addressing Polluted Runoff in an Urban Environment* (2000).

Goal One: Support activities that reduce pollutant loads from urban runoff, construction activity, combined sewer overflows, and trash disposal

The District works to improve water quality in its rivers and streams through direct action and also through regulatory efforts. The Branches within the Watershed Protection Division responsible for regulatory management are the Technical Services Branch and the Inspection and Enforcement Branch.

These branches aim to ensure that any development or construction activities occurring within the District properly control potential erosion or runoff from their sites and properly adhere to all federal and city laws relating to floodplains and waterways. In addition, they ensure that Best Management Practices (BMPs) are installed correctly and receive appropriate maintenance and upkeep.

Additionally DOEE's Water Quality Division, Monitoring and Assessment Branch works to verify improvements in the water quality of District streams through its monitoring efforts.

Technical Services Branch

TSB works with multiple stakeholders across the private and public sectors. It evaluates environmental regulatory obligations for every building permit including all commercial and residential parcel projects, linear public right of way (ROW) projects, and in-stream designs. Reviewers determine each applicable obligation and work with the designer to ensure compliance. They review demolition, excavation, grading, and site design plans for erosion and sediment control measures, hotspot concerns, post construction land cover designations, stormwater best management practices (BMPs), and floodplain management considerations. In some cases, where an applicant proposes compliance with rainwater harvesting for non-potable use the reviewer evaluates the project's mechanical electrical plumbing design to ensure adequate consideration has been given to human health. The reviewer evaluates geotechnical reports to consider opportunities for infiltration. Reviewers ensure projects with land disturbance in excess of one acre file notice with EPA and maintain an approved storm water pollution prevention plan on site. Sites greater than 5,000 square feet but under one acre are now required to provide "Good Housekeeping Notes" on their SWM plan.

The District is a leader in the development of regulations, guidance, and enforcement tools that are highly protective of the receiving waterbodies. An early adopter of erosion and sediment control regulations, enacted in 1987, the District regulates all land disturbance over 50 square feet and requires on-site SWM for land disturbances over 5,000 square feet. Regulations and compliance tools were expanded in 2003 to incorporate the first flush concept.

In 2013, a major overhaul to these regulations and compliance and enforcement tools was completed, which set a 1.2 inch retention standard for development projects disturbing an area equal to or greater than 5,000 square feet. This obligation could be met through onsite controls, a combination of on-site and off-site retention, or paying a fee-in-lieu for not meeting the stormwater retention standard.

Fiscal year (FY) 2015 was the first full year that projects had to comply with all aspects of the 2013 stormwater regulations. To facilitate this transition, Technical Services instituted a regular biweekly half-day meeting for all plan reviewers. These meetings provide a technical forum to clarify procedures, work through regulatory nuances, discuss challenging site cases, examine compliance presentation strategies, and generally ensure consistency across reviewers. Plan reviewers find review times have increased significantly per project. DOEE hired two additional plan reviewers to help with the work load. DOEE, with staff support from the Center for Watershed Protection (CWP), continued to develop and deliver monthly training on compliance. Compliance training included General Retention Compliance, Large Storm Design Constraints, and Specialized BMP Design sessions on green roofs, permeable paving and rainwater harvesting, as well as sessions on ROW compliance.

FY 2015 also marked the first full year of DOEE reviews of the green area ratio (GAR), the new zoning requirements for environmental high-performance landscape elements. DOEE hired two landscape architects to conduct these reviews. DOEE created the GAR compliance process and a standalone guidance manual to support GAR plan submission, review and inspection. In 2015 DOEE developed and held three GAR training sessions to support applicants, DOEE staff, as well Department of Consumer and Regulatory Affairs and Zoning reviewers and inspectors. A local non-profit, Casey Trees, added a regular charrette process for the GAR to provide greater hands-on guidance to applicants.

TSB staff, with staff support from CWP, continues the development of training sessions. Special BMP training sessions focused on unique practices such as green roofs, permeable pavements, and rainwater harvesting will be offered in 2016, as will an online self-paced introductory course.
TSB worked with the DDOT in its development of green street standards and specifications to ensure DDOT green standards harmonized with DOEE SWM guidelines. DDOT green infrastructure standards

were published in April 2014 and are now a required component of any District street creation or reconstruction project.

Technical Services staff worked with DOEE's SWM Division to develop an online database to track the submission of plans for regulatory compliance and voluntary retrofits. This allows an integrated and transparent review, approval and inspection process for erosion and sediment control, SWM, floodplain, and GAR plans, and stormwater retention credit and stormwater fee discount applications. In 2015 DOEE required that stakeholders use this online database as part of the compliance process, a transition that was supported by additional training.

Over this period, the TSB and Inspection and Enforcement Branch (IEB) staff also worked with OP and the Zoning Administrator to develop the permitting process for the GAR. These staff also continued to develop the guidance manual and training materials. During the initial review months, staff met regularly to exchange reviews and discuss compliance to ensure consistency among reviewers.

In FY2015 the Technical Services Branch accomplished the following:

- Reviewed 3,597 building permit applications and plans for regulatory compliance;
- Approved 1,684 building permit applications and plans for regulatory compliance;
- Reviewed 178 building permit applications and plans for stormwater management compliance;
- Approved 150 building permit applications and plans for stormwater management compliance;
- Processed 41 Environmental Impact Screening Forms (EISFs) after they were reviewed for regulatory compliance;
- Provided 7,550 customers with technical assistance;
- Filed 54 EPA Stormwater Notices of Intent (NOIs) for construction activities with land disturbance one acre and greater;
- Aided the District Department of Transportation in developing their green infrastructure standards (http://ddot.dc.gov/publication/ddot-green-infrastructure-standards-2014);
- Began work on an update to the District's Erosion and Sediment Control Guidebook;
- Reviewed 30/65/90 percent maximum extent practicable (MEP) submissions for 15 DDOT projects;
- Reviewed 88 Green Area Ratio submissions; and
- Provided 76 training on new regulation and guidance materials through a combination of internal and public workshops.

Figure 2 – Inlet protection keeping sediment from a construction site with poor sediment control out of District waterways

In addition to these regulatory actions, engineers from the Technical Services Branch represent the District on regional and national committees, and regularly attend relevant trainings on new stormwater technologies. They also attend regional workshops related to stormwater control and Chesapeake Bay restoration efforts. Some examples of this include:

- Committee Participant

- Chesapeake Bay Program (CBP) Urban Stormwater Work Group
- CBP BMP Verification Review Panel
- American Society of Civil Engineers low impact development (LID) Technical Committee
- DC Flood Risk Management (Silver Jackets) Team Meetings
- District of Columbia Erosion and Sediment Control Guidebook Revision (DOEE)
- DC CRS Program Overview Meeting
- Mitigation Working Group Quarterly Meeting/Conference Call
- DOEE and National Capital Planning Commission (NCPC) Coordination Meeting
- National Disaster Resilience Competition (NDRC) Collaborative Planning Team Conference Call
- District Recovery Operations Guide Initial Coordination Meeting
- National Capital Region Critical Infrastructure Dependency Project Meeting

- Presenter
  - Green Area Ratio Training (DOEE)
  - Seventh Annual Bay-Wide Stormwater Retreat

- Single Workshop/Training
  - Annual Association of State Floodplain Manager (ASFPM) Conference
  - Federal Emergency Management Administration (FEMA) Elevation Certificate
  - Annual Conference of Maryland Association of Floodplain and Stormwater Managers (MAFSM)
  - DOEE In-House Training on Stormwater Management Guidebook and Compliance Spreadsheets
  - Climate Adaptation and Water Workshop
  - Workshop on Quantifying Infrastructure Risk from Climate Change
  - Hatch Mott MacDonald Climate Resilience & Sustainability Workshop
  - DOEE Climate Adaptation Workshop

- Courses Taken
  - Integrating Urban Agriculture & Urban Stormwater Management Workshop @ UDC (Cooperative Extension)
  - Canopy Connections: Urban Forests for Public Good (Casey Trees)
  - GAR Training (DDOE)
  - MD ESC Responsible Person Certificate
  - Confined Space Entry Training
  - Green Roofs for Healthy Cities three day Green Roof Boot Camp
  - Low Impact Development Webinar (Compost BMPs)
  - Stormwater Management Modeling Course by Urban Watersheds Research Institute
  - Swale and Filter Strip Design Workshop-NC State University

Figure 3 - An inspection of a newly installed green roof

Inspection and Enforcement Branch

IEB inspects construction sites throughout the District to make sure they are in compliance with District regulations. DOEE also regularly inspects existing SWM facilities to ensure that they are in working order and are properly maintained. In addition, IEB is responsible for investigating citizen complaints relating to soil erosion and drainage problems and recommending appropriate solutions.

DOEE performs outreach to industrial and construction facilities through workshops, brochures, and site inspections. Inspection and Enforcement personnel use inspections to promote awareness of the proper methods of facility maintenance for stormwater regulation compliance. To aid facilities in ensuring proper maintenance of SWM facilities, DOEE has established and published guidelines for their proper maintenance.

In FY 2015 IEB accomplished the following:

- Conducted 2,258 inspections at construction sites for enforcement of erosion and sediment control (ESC) and SWM regulations.
- Took 91 enforcement actions, including Stop-Work Orders and Notice of Infractions, Notice of Violation and Maintenance Notices to strengthen enforcement activities.
- Inspected 1,152 SWM facilities to ensure proper functioning.
- Developed a new reporting format for self-certification of SWM maintenance reporting by contractors and SWM BMP owners or their agents.
- Added two new inspector positions.
- Continued to develop outreach and guidance materials, including brochures, web material and presentations.
- Continued development of a green roof documentary and brochure and green infrastructure (GI) technical assistance by developing a GI List of Contractors and GI seasonal web bulletins.

Figure 4 - A sewer overflow in Pinehurst Branch

DOEE continues to work on automating inspection forms and using best practices to enable inspections and data management in the field for all inspection and enforcement activities. This effort is dependent upon the development of a new web-based database and field tablets that will manage inspection reports, enforcement notices and records of inspection and other events related to ESC, SWM, SWM maintenance enforcement, and erosion and drainage related complaints. These changes are expected to streamline regulatory operations by allowing inspectors to have a complete inspection history of any sites while in the field.

Monitoring and Assessment Branch

Every year the District monitors 36 waterbody segments to determine the health of these waterways according to the Clean Water Act. The District's water quality standards assign each of these waterbodies designated uses and numeric and narrative criteria that must be met if a waterbody is to support its assigned uses. Current monitoring shows that the District's waterways do not support their designated uses related to human health or quality of habitat for aquatic life. No waterbody monitored by the Water Quality Division fully supported all of its designated uses. The water quality of the District's waterbodies continues to be impaired. The sources with major impacts on District waters are combined sewer overflows (CSO) and urban runoff/storm sewers.

Table 1 – Tracking activities that reduce pollutant loads from urban runoff, construction activity, combined sewer overflows, and trash disposal

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% of 2020 Goal achieved
Objective 1a: To reduce pollutant loads in targeted watershed	Milestone 1: Install LIDs in targeted watersheds	Number of BMPs Installed			
		3	117	N/A	N/A
		Area Treated			
		19.06	38.0	N/A	N/A
	Milestone 2: Monitor water quality of all District streams	Number of streams monitored			
		3	4	N/A	N/A
		Number of pollutants monitored			
		30	30	N/A	N/A
	Milestone 3: Produce annual report of state of the District's waterways	Number of reports			
		1	2	N/A	N/A
Objective 1b: To review, permit, and inspect all BMPs installed in the District	Milestone 1: Review all erosion & sediment and stormwater permit applications	Number of permits reviewed			
		3,264	3,597	N/A	N/A
		Number of permits approved			
		2,882	1,684	N/A	N/A
	Milestone 2: Inspect all permitted BMPs	Number of site inspected			
		5,326	2,237	N/A	N/A
		Number of sites in compliance			
		724	436	N/A	N/A
	Milestone 3: Keep a tracking database of permitted BMPs	Total Number of BMPs Installed			
		3,893	4,065	N/A	N/A
		Number of new sites with BMPs			
		211	172	N/A	N/A

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% of 2020 Goal achieved
Objective 1c: To increase the number of water bodies meeting water quality standards	Milestone 1: Install LIDs in watersheds with approved Watershed Implementation Plans	Number of BMPs Installed			
		229	418	N/A	N/A
		Area Treated (acres)			
		289.9	173	N/A	N/A
	Milestone 2: Monitor District streams for water quality improvements	Number of streams monitored			
		25	25	N/A	N/A
		Number of pollutants monitored			
		30	30	N/A	N/A
	Milestone 3: One water quality improvement	Measured or calculated water quality improvement			
		0	0	N/A	N/A

Goal Two: Support and Implement Activities that Restore and Maintain Healthy Habitat, Species Diversity, and Water Flows to All District Tributaries

WPD's PRB is the District's lead in undertaking activities that directly protect and restore stream and wetland habitat. Additionally, DOEE's Fisheries and Wildlife Division surveys and assesses wildlife habitat in the District and the Water Quality Division's Planning and Permitting Branch reviews and issues water quality certifications for projects impacting wetlands and waterways and develops regulations to complete these projects.

Stream and Wetland Restoration

Stream restoration and wetland restoration is the act of modifying a waterway or marsh to improve its environmental health and habitat. All District streams face similar threats from urbanization due to high stormwater flows from impervious surface runoff. Erosion of the banks and beds of an urban stream is the stream's way of adjusting to accommodate the new geomorphological flow regime it is experiencing. Stream restoration attempts to create a new channel that is in stasis with the flows it conveys.
In FY 2015, DOEE continued to work towards construction on several existing projects, performed pre- and post-restoration monitoring at completed and future restoration sites, and constructed two stream restoration projects. WPD currently has 15,200 linear feet of restored stream under post-restoration monitoring and has over 10,000 linear feet of stream reaches in the design phase process to be restored in FY2016.

Figure 5 - Photo monitoring of Springhouse Run prior to restoration

Springhouse Run Stream Restoration

Springhouse Run is a remnant of one of the original tributaries to Hickey Run, a tributary of the Anacostia River, with a drainage area of 152 acres. The majority of the tributary is stable, although it is highly altered and armored in most areas. The armoring has resulted in a stream with poor habitat value and very limited ability to trap sediment and uptake nutrients.

WPD coordinated the design of a stream and habitat restoration for Springhouse Run, which was completed in late 2014. The stream will be reconnected to its historic floodplain and its sinuosity will be restored. This project reach measures approximately 1,800 feet in length and lies entirely within the U.S. National Arboretum.

An additional component of this project is to construct bioretention facilities in the parking areas near the Arboretum Visitor Center. This project is being funded in part with EPA 319 funds. The project was advertised for construction bids in the Spring of 2015 and the contract is expected to be awarded in early 2016. DOEE expects the project to be completed by the end of 2016.

Nash Run Stream Restoration

In FY2014 DOEE and its design contractor completed designs for a 1,400-linear-foot stretch of restoration work on Nash Run, a tributary of the Anacostia River. The project will include an upstream floatable trash trap and will utilize floodplain reconnection design to create a 55-foot-wide low floodplain

bench along the stream corridor. The project will also include an enlarged mid-reach culvert to minimize flood risk and increase likelihood of fish passage to the upper portion of the restoration reach.

The Nash Run restoration construction contract was awarded in FY2015 is expected to commence in early 2016. When complete the project will be a tremendous improvement to the surrounding neighborhood and the Anacostia River. The restoration project will reduce the estimated 32 tons per year of bank erosion, improve stream connectivity to its floodplain, increase the riparian cover along the stream, add wetland area to the stream corridor, and significantly reduce the stream's contribution of trash and debris in the Anacostia River.

Watts Branch Stream Restoration

The Watts Branch Stream Restoration Project was completed in early FY2012 and since that time DOEE has monitored the project to determine its effectiveness at achieving its design objectives. Similar to other restored stream projects, DOEE is using a combination of activities to monitor the restoration project. Restoration monitoring consists of photographic and vegetative surveys and geomorphic assessments. DOEE awarded a grant to the Metropolitan Washington Council of Governments (MWCOG) to monitor macroinvertebrates in Watts Branch pre- and post-restoration. MWCOG's monitoring has shown an improvement in the number and diversity of fish and macroinvertebrates since the restoration (see Table Two and Figure Six below).

Table 2 - Watts Branch Macroinvertebrate Data Pre-and Post-Restoration

Site (Upstream to Downstream)	Number of Taxa		Number of Ephemeroptera		Rating	
	Pre-restoration	Post-restoration	Pre-restoration	Post-restoration	Pre-restoration	Post-restoration
Watts Branch 1	19	24	1	0	Poor	Poor
Watts Branch 2	15	20	0	1	Very Poor	Very poor
Watts Branch 3	17	15	1	1	Very Poor	Poor
Watts Branch 4	14	26	0	2	Poor	Fair
Watts Branch 5	15	25	1	3	Poor	Fair

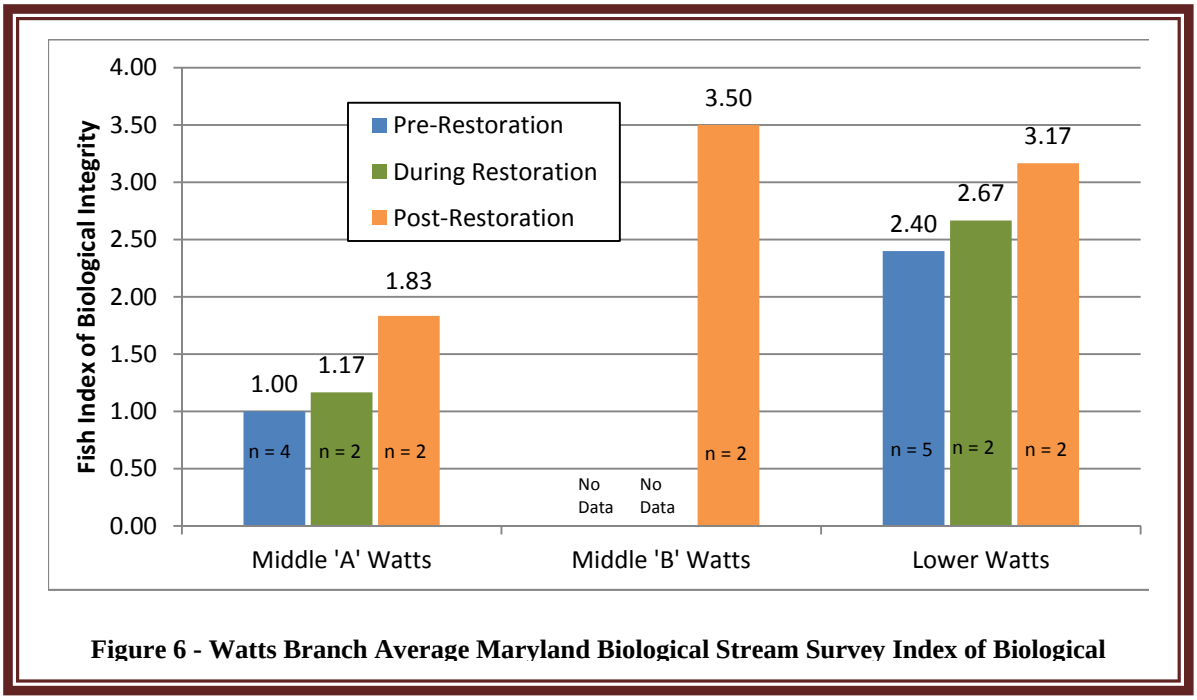

Figure 6 - Watts Branch Average Maryland Biological Stream Survey Index of Biological

Pope Branch Stream Restoration and Sewer Line Replacement

DC Water completed the lining and repair of the sewer line in the Pope Branch stream valley in FY 2014. In FY 2015 DC Water awarded the contract for stream restoration this area and construction will commence in January 2016. Stream restoration work will connect the stream to its historic floodplain level and create a series of pools and riffles throughout the corridor ensuring that high flow events spread out on the floodplain.

MWCOG was awarded a grant in early FY2013 to perform both pre- and post-monitoring at Pope Branch for several factors, including water quality, storm flow, bacterial source tracking, and macroinvertebrates. The monitoring by MWCOG, combined with the monitoring to be conducted by DOEE staff post-restoration, will help demonstrate the effectiveness of the proposed restoration design technique.

Alger Park Stream Restoration

In FY 2014, DOEE contracted the 100% design project for a stream restoration for a tributary of the Texas Avenue Tributary. This project will restore 1,540 linear feet of one of the most degraded stream valleys in the District by managing stormwater upland and by improving water quality, bank stability, and habitat.

In FY 2015, DOEE moved the stream project to full 100% designs, began working with DDOT to maximize installation of LID practices in public space, and through the RiverSmart Homes program expanded LID practices on private properties throughout the watershed. In FY 2016 the project will go through contracting for construction with an anticipated start date of in early FY 2017.

Linnean Park and Linnean Gully Stream Restorations

In FY14, DOEE completed the installation of an RSC system in Linnean Park that restored 1,000 linear feet of in-stream habitat. The Linnean Park tributary was a highly degraded perennial stream that was degraded by stormwater runoff from a 24.5-acre watershed dominated by single family homes and wide suburban streets.

Figure 7 - Linnean Gully under construction

This project, partially funded by a National Fish and Wildlife Foundation grant, is being intensely monitored to better understand the efficacy of the RSC restoration approach. Prior to construction, the University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory completed pre-installation monitoring for concentrations of nutrients, sediment, metals, bacteria, flow volume and velocity, water temperature, and habitat health. The investigators released a report documenting the results of the pre-restoration monitoring and have begun post-restoration monitoring of the project area. The project is using a paired monitoring approach, studying the same set of parameters in Spring Valley, a stream and watershed of similar character that will be restored in the near future. DOEE is also performing photo monitoring of the project area to document the stability of the RSC over time. The initial results of post-restoration monitoring will be published in FY 2016.

Figure 8 - An exposed sewer line in Spring Valley

In FY 2015 DOEE completed the construction of an RSC in Linnean Gully; a steep gully created by stormwater running directly off the end of Linnean Avenue NW, DC, leaving exposed a tangle of sanitary sewer pipe, storm sewer pipe, and a water main. The contributing watershed is 31 percent impervious within an 8.6 acre urban residential neighborhood containing. In December 2014, DOEE and its sub-grantee completed restoration designs and submitted them to municipal and federal permitting agencies for their review and approval.

Spring Valley Stream Restoration

In FYs 2014 and 2015 DOEE collected pre-restoration monitoring data for the 1,100 linear-foot-long Spring Valley Park tributary. Additionally DOEE staff performed outreach to the community to inform them about this project and encourage them to adopt practices on their properties to reduce stormwater runoff to the stream. This design-build project is expected to be under contract in FY 2016.

Wetland Protection

The Water Quality Division's Planning and Permitting Branch undertook a major effort in 2014 and 2015 to further protect the District's wetlands. The Branch selected a contractor that has begun work delineating wetlands throughout the District which has not been done since 1997. The new information will be mapped using geographic information system technology to accurately create digital maps that will be publically available. Making the map electronically available will aid developers in knowing if they may impact potential wetlands, and aid the District in identifying areas with potential for wetland restoration. The map should be finalized in calendar year 2016.

Table 3 – Tracking activities that strive to restore and maintain healthy habitat, species diversity, and water flows to all District tributaries

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% of 2020 Goal Achieved
Objective 2a: To restore 5 miles of stream by 2025	Milestone 1: To restore two miles of stream by 2020	Miles of stream restored			
		0.55	0	2	27.50%
	Milestone 2: Restore additional three miles of stream by 2025	Miles of stream restored			
		N/A	N/A	N/A	N/A
Objective 2b: To add 100 wetland acres by 2035 bringing the total acres of wetlands in the District from 280 acres to 380 acres	Milestone 1: Increase wetland acres by 50 acres by 2025	Acres of wetland created			
		0.68	0.00	70	0.97%
	Milestone 2: Increase wetlands by an additional 50 acres by 2035	Acres of wetland created			
		N/A	N/A	N/A	N/A
Objective 2c: To protect all the District's wetlands by 2035	Milestone 1: Identify and document all District wetlands	Number of wetlands identified			
		48	48	N/A	N/A
		Total wetland acres			
		280	280	N/A	N/A
	Milestone 2: Updated wetland regulations	# of updated regulations			
		0	0	N/A	N/A
	Milestone 3: Protect District wetlands from degradation, encroachment, or destruction	acres of wetlands protected			
		280	280	N/A	N/A

Goal Three: Coordinate NPS Management Program Efforts with Other District, Federal and Private Sector Programs, and Adjoining Jurisdictions

DOEE is not a landowning or landholding agency, thus strategic partnerships with both governmental and private entities are vitally important to make the agency's watershed protection and restoration work a success. DOEE has strong partnerships with all District government agencies, which ensures that municipal projects throughout the District are implemented under the same vision of watershed protection and restoration. Secondly, DOEE works with federal partners, including the Park Service and the National Arboretum, to ensure that streams are adequately protected and prioritized for restoration efforts. Finally, DOEE collaborates with a wide array of private groups, both for-profit and nonprofit, to ensure that projects and programs and designed and implemented effectively.

District of Columbia Agencies

All District agencies operate as state, county, and municipal agencies collectively thus expediting "state-wide" partnerships focused on NPS management and watershed restoration. There are multiple avenues for agencies to coordinate work. Below are descriptions of the key District agencies with whom DOEE has partnered over the past year to ensure that the District effectively mitigates NPS pollutants.

District Department of Transportation (DDOT)

Over the past year DOEE has coordinated closely with the Infrastructure Project Management Administration (IPMA) of DDOT, which manages the large DDOT roadway construction projects and plays a key role in planning and permitting LID work in the public space throughout the District. Some areas of coordination include the following:

- Partnering on the design, construction, and monitoring of LID retrofits as a part of the RiverSmart Washington project
- Developing and publishing green infrastructure standards and specifications for the right-of-way
- Performing analysis on roadway design projects to determine the maximum extent practicable for LID retrofits
- Constructing permitted LID retrofits in the right-of-way

Figure 9 - Tree box bioretention cells along O Street NW

Furthermore, DOEE has worked with the Urban Forestry Administration (UFA) within DDOT on three major efforts. First, DOEE is developing new ESC guidelines and is working with UFA to develop measures that reduce construction's impact on existing trees, to be completed in FY 2016. Second, DOEE and UFA partnered on a project to develop and implement tree planting plans on District school and parklands that resulted in 1,400 trees planted. Lastly, DOEE and UFA are working together to put on a tree canopy summit in early FY 2016.

Department of General Services (DGS)

DOEE has partnered with two groups within DGS. Over the past year, the Sustainability & Energy Division, which develops and executes energy conservation and sustainability initiatives for District properties, has received DOEE and EPA funding to install LID at existing buildings and innovative stormwater practices for new construction. In FY 2014, DOEE funds helped pay for the construction of more than 30 bioretention tree boxes along O Street NW and a cistern at Brookland Middle School.

Additionally, DOEE has worked with DGS's Office of Contracting and Procurement (OCP). OCP manages all contracts related to DOEE projects and those on other District government property, with the exception of DDOT properties and District of Columbia Public Library facilities. In FY 2015 reporting period, OCP managed several contracts for the design and installation of LID practices and stream restoration.

Department of Parks & Recreation (DPR)

DPR provides quality urban recreation and leisure services for residents and visitors to the District. DPR supervises and maintains area parks, community facilities, swimming pools and spray parks, and neighborhood recreation centers. In FY 2015 DOEE and DPR partnered on tree planting efforts on DPR lands, urban vegetable gardens, and a memorandum of understanding for the installation of LID on several other DPR parcels. DOEE will contract this LID effort in FY 2016.

Office of Planning (OP)

OP performs planning for neighborhoods, corridors, districts, historic preservation, public facilities, parks and open spaces, and individual sites. In addition, OP engages in urban design, land use, and historic preservation review. OP also conducts historic resources research and community visioning, and manages, analyzes, maps, and disseminates spatial and U.S. Census data. In FY 2015 DOEE has worked with OP on targeted planning efforts around the Van Ness/University of the District of Columbia in the Soapstone watershed, on developing a comprehensive plan for small District parks (less than one acres in size), and on Sustainable DC grant efforts to plant trees on school and park parcels.

District of Columbia Public Schools (DCPS)

DCPS is a school system that provides pre-kindergarten through high school educational programming for 45,000 students. DOEE works with DCPS and the DC Office of the State Superintendent of Education (OSSE) to ensure that environmental education is integrated into classroom programming. Each year, DOEE trains a select group of District teachers to help them better integrate watershed education lesson plans into their daily curriculum and ensure students receive "meaningful watershed education experiences" through grants to nonprofits. Additionally, DOEE worked with DCPS to plant trees on school parcels and helped retrofit several schools through DGS renovations.

Figure 10 – Rain barrels at Ludlow Taylor Elementary School

Federal Agencies

The federal government owns large tracts of land throughout the District, particularly in waterway corridors. Therefore the District's relationship with its federal agencies is essential to ensure NPS pollution is mitigated to the maximum extent practicable. The federal presence in the District is dominated by large federal buildings in the central core of the District with large tracts of park space throughout the remainder of the District.

Department of the Interior

DOEE works and partners with different branches of DOI including the Park Service in the National Capital Region and the U.S. Fish and Wildlife Service (FWS) to plan and implement restoration projects, in particular stream restoration projects, as many of the District's stream miles lie on Park Service owned and managed land.

In FY 2015, DOEE worked with the Park Service to apply for grant funding to install LID retrofits in the parking area of the Carter Barron tennis center and amphitheater and restore the Fort Dupont Watershed. Additionally, DOEE discussed with the Park Service expedited permitting and partnering on future restoration efforts. The FWS was also a partner with the planned LID retrofit work at the Carter Barron amphitheater because of the presence of the Hays Spring amphipod in the area around the restoration project.

U.S. Department of Agriculture (USDA)

DOEE is presently partnering with the National Arboretum, managed by USDA, to implement an LID and stream restoration project on the Arboretum's grounds. The LID project will capture and filter stormwater from the parking areas near the Visitor's Center, and the stream restoration project at Springhouse Run, a tributary of Hickey Run and the Anacostia River. DOEE and the Arboretum hope to replicate similar projects in future years. This project should be completed in FY 2016. Furthermore, DOEE worked with the National Resource Conservation Service to contract the installation of LID at MacFarland Middle School in the RiverSmart Washington project area which was completed in FY 2015.

Figure 11 – Fish monitoring in Springhouse Run

U.S. Environmental Protection Agency (EPA)

DOEE and EPA have partnered for many years to ensure that the District meets federal law and guidelines related to NPS management. DOEE and several branches of the EPA partner to ensure that the District is meeting all of its local and federal obligations, as well as working in a manner that is in concert with regional and national efforts.

DOEE receives funds from the EPA Region III 319 Grant Program annually to implement its NPS management projects, and DOEE participates in annual conferences and meetings to remain current with NPS work around the Region. Furthermore, DOEE coordinates with the Region III Municipal Separate Storm Sewer System (MS4) Program to implement activities required under its 2012 MS4 permit. Finally, the District receives funds from the EPA Chesapeake Bay Program for Bay Program goal implementation activities that work to restore the health of the Chesapeake Bay.

U.S. Geological Survey (USGS)

USGS presently operates several water monitoring stations around the District, with financial support from DOEE, that measure water height, flow, and various water quality parameters including, but not limited to, temperature, dissolved oxygen, and turbidity. The District pays a cost share for the maintenance of the gage stations.

Non-Governmental Organizations

The District works with many local non-governmental organizations (NGOs) to accomplish mutual goals of cleaner waterways and a more livable city. DOEE works primarily with regional NGOs, universities, religious institutions, and environmental nonprofits.

Regional NGOs

There are two primary regional NGOs that the District partners with, Metropolitan Washington Council of Governments (MWCOG) and the Interstate Commission on the Potomac River Basin (ICPRB).

In June 2006, the MWCOG board adopted a resolution that established a new Anacostia Watershed Restoration Partnership (AWRP). The AWRP created the Anacostia Watershed Restoration and Protection Plan, which quantifies Anacostia restoration goals, specifies an implementation timeline, and provides explicit measurements of progress, with appropriate recognition and incorporation of related planning activities. In FYs 2014 and 2015 MWCOG performed macroinvertebrate sampling and fish surveys to document the District's progress towards restoration of its waterways. This survey included pre-restoration monitoring for several streams and pre- and post-restoration monitoring data for Watts Branch. A summary of the monitoring in Watts Branch can be found in Table 2. Additionally, DOEE is an active partner in ICPRB, a regional organization working to enhance, protect, and conserve the water quality and associated land resources of the Potomac River basin.

Universities

Over the past year the District has partnered with universities in several ways. In FY 2015 DOEE has been an active participant in University of the District of Columbia's LID workgroup led by its Center for Agriculture, Urban Sustainability, and Environmental Sciences. DOEE has also worked with the University of Maryland in FY 2014 and 2015 to monitor several District streams to examine the effectiveness of stream restoration practices through a grant provided by DOEE. The monitoring results will be available in FY 2016.

Nonprofit Partners

Nonprofit partners are vital to DOEE's work to reduce NPS pollution. Most commonly, DOEE, through a competitive grant process, funds local nonprofits to increase youth education and awareness about watershed protection, implement LID projects, and manage rebate programs for LID installations.

Nonprofit partners provide a valuable service to communities throughout the District and DOEE will continue to partner with a wide array of nonprofits to help fulfill our NPS management obligations.

Non-profit partners that DOEE worked with in FY 2014 and 2015 include the following:

- The Anacostia Watershed Society, which administers DOEE's RiverSmart Rooftops and RiverSmart Communities grants and trains volunteers through its Watershed Stewardship Academy
- The Anacostia Riverkeeper, which has installed cisterns on several religious institutions on behalf of DOEE
- Groundwork Anacostia, which oversaw a grant to retrofit a park with stormwater LID
- The nonprofits grantees that oversee aspects of the RiverSmart Homes program including Casey Trees, the Alliance for the Chesapeake Bay, and DC Greenworks
- The nonprofits that oversee environmental education grants including Project Learning Tree, the District of Columbia Environmental Education Consortium, the Earth Conservation Corps, Living Classrooms, the Alice Ferguson Foundation, and Nature Bridge

Table 4 - Tracking activities that coordinate NPS efforts with other District, federal and private sector programs, and adjoining jurisdictions

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 3a: To work with local and regional partners on NPS management issues	Milestone 1: Partner with District agencies for NPS projects	Number of partnership projects annually			
		4	8	N/A	N/A
Objective 3b: To participate in partnership and planning meetings	Milestone 1: Participate on regional committees or planning meetings	Number of meetings			
		50	60	N/A	N/A
		Number of joint committees annually			
		25	25	N/A	N/A
	Milestone 2: Demonstrate two programmatic partnership successes annually	Number of successful partnerships			
		4	2	14	42.9%
Objective 3c: To participate on Region 3 & Bay Program Technical Advisory Committees	Milestone 1: Join technical committees	Number of committees participating on annually			
		16	25	N/A	N/A

Goal Four: Support Programs that Aim to Prevent Nonpoint Source Pollution from Individual Actions by Carrying out Effective Information and Education Campaigns

Almost 650,000 people currently reside in the District. Additionally, the city hosts millions of visitors each year, including tourists and those that work in the District but live outside its border. Without educated and engaged residents and visitors, the District will not be able to achieve its pollution reduction goals. A citizenry educated about NPS pollution reduction techniques is important because they will:

- Modify their behavior and adopt environmentally sensitive practices;
- Advocate for stronger laws and regulations and for funds to enforce them; and
- Help care for practices installed by the District.

Because education is critical to the District's efforts, DOEE sponsors and conducts environmental education and outreach activities targeted at teachers, environmental educators and students throughout the District. These programs and resources include the following efforts.

Conservation Education (Project Learning Tree)

Project Learning Tree (PLT) is an internationally recognized program that trains educators in innovative techniques for exploring a wide range of environmental concepts with students and teaching critical thinking skills that lead to environmental stewardship (grades K-12). DOEE offers PLT training workshops free to those that request it.

Figure 12 - Students learning about water quality monitoring

Teacher Training Workshops

Workshops in environmental education provide teachers and informal educators with environmental curricula that support the District teaching and learning standards and provide students with meaningful environmental education experiences via outdoor activities and events. The Carnegie Academy for Science Education, the local outreach arm of the Carnegie Institution of Washington, worked with DOEE and OSSE on the Environmental Literacy Summer Institute. Teams of teachers from DCPS and DC Public Charter Schools reviewed the Next Generation Science Standards and the District's Sustainable DC initiatives to create curriculum unit plans that link national standards and the Environmental Literacy Framework. These units were field tested during the 2014-2015 school year.

DC Environmental Literacy Plan

In FY 2015, DOEE continued to collaborate with stakeholders to implement the District Environmental Literacy Plan. In partnership with nonprofit organizations, DOEE drafted an Environmental Literacy Framework for District schools, a grade-by-grade approach for integrating environmental education into the curriculum. Teachers from Sustainable DC Model Schools, which are exemplary schools that already include environmental programming, helped develop the framework as well as pilot the framework in FY15. Two of the eight model schools were DOEE RiverSmart schools. This framework will help identify the best places in school curriculum where DOEE programming will fit. This project will also coordinate Green Career Expos for high school students to learn about green jobs and summer internships.

In July 2014, Mayor Vincent Gray signed into law the Sustainable DC Omnibus Amendment Act. One of its seven subtitles is the "Environmental Literacy Plan Adoption Act," which creates a new program and staff within OSSE to further develop and implement the Environmental Literacy Plan first developed under the Healthy Schools Act. In FY 2015 OSSE hired staff to implement the Environmental Literacy Plan, which will bring environmental education, including meaningful outdoor experiences, to District youth.

District of Columbia Environmental Education Consortium (DCEEC)

DOEE helps to organize a network of environmental educators throughout the District so that ideas and resources can be shared among them. The D.C. Environmental Education Consortium (DCEEC) provides opportunities for networking, event coordination, and program partnering among its members. The members provide environmental expertise, professional development opportunities, curricula and resources, and hands-on classroom and field studies to District schools.

In FY 2015 DOEE and DCEEC hosted their ninth annual D.C. Teacher's Night at the U.S. Botanic Garden. Over 200 teachers registered and those in attendance and learned about environmental programming from approximately 30 exhibitors representing local environmental and science education organizations. The teachers met with local environmental educators for connection with environmental education opportunities both inside and outside the classroom. Participants also took part in hands-on experiments and left with lesson plans for their classrooms.

Figure 13 - Students enjoying an outdoor learning experience

The District held its fourth annual Growing Healthy Schools Week, which is the fusion of DC School Garden Week and DC Farm to School Week. Growing Healthy Schools Week highlights the interrelated goals of these two former weeks and reflects the components of the recent Healthy Schools Act, which encourages linkages between farm-to-school and school garden programs.

Growing Healthy Schools Week celebrates school gardens and farm-to-school programs throughout the District. During the week, school staff worked with local nonprofits, farms and chefs to coordinate inspiring activities aimed at engaging the broader community, increasing environmental literacy, building program capacity, and connecting students to their food.

The Anacostia Environmental Youth Summit

The Anacostia Environmental Youth Summit is a District-wide showcase that spotlights youth voice, demonstrates environmental literacy, and encourages stewardship for the Anacostia and Potomac rivers and the Chesapeake Bay. By exemplifying an ethic of stewardship and responsible action, the Youth Summit emphasizes youth leadership and innovation. In FY 2015 the sun was shining and the event was a huge success with 10 schools and 420 students participating.

Meaningful Watershed Educational Experiences (MWEEs)

As part of DOEE's sub-grant program, several initiatives were funded for non-profit partners to create MWEEs for hundreds of District youth. In FY 2014 the grant program focused on students in wards 7 and 8. Alice Ferguson Foundation and partners Living Classrooms of the National Capital Region and Nature Bridge began a pilot project in which fifth grade students spend three days and two nights in a natural setting learning about the environment. In FY 2015 the MWEE program was expanded to reach the entire District and reached an additional 821 students. In Table 5 Objective 2d sets a goal of reaching

5,000 students through overnight meaningful watershed experiences. The District fell well short of this goal for several reasons including:

- There are only approximately 4,200 5th graders so the goal was never attainable;
- 2015 was the first year that the program was offered city-wide. There were logistical issues with ramping up the effort; and
- Even if running well, the program could not be expected to reach 100 percent of the students because of absences and parents not signing permission slips.

We proposed in future years to change the objective goal to 2,100 students annually.

RiverSmart Schools

RiverSmart Schools works with applicant schools to install LID practices to control stormwater. These practices are specially designed to be functional as well as educational in order to fit with the school environment. Additionally, schools that take part in the RiverSmart Schools program receive teacher training on how to use the sites to teach to curriculum standards and how to properly maintain the sites.

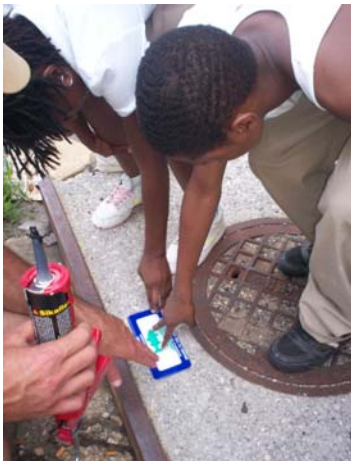

Figure 14 - Students marking a storm drain

In FY 2015 WPD accomplished the following:

- Provided 27 teachers with a four-day workshop on RiverSmart schools site usage and programming;
- Conducted 16 classroom visits and provided seven boat trips to support integration of watershed lessons for the RiverSmart Schools project at each participating school; and
- Engaged students, teachers, and volunteers in community work days to construct and maintain designed schoolyard conservation sites. Two hundred students from two schools participated in eight community work days.

DOEE also completed the construction of five RiverSmart Schools projects: LAMB charter school, Bethune Day Academy, Washington Yu Ying, Seaton ES, and the British School of Washington. DOEE also helped maintain two previous RiverSmart School projects over this reporting period.

Storm Drain Marker Program

In FY 2015, WPD installed 621 storm drain markers throughout the District. WPD reached out to five colleges/universities along with multiple community and service groups and a few residents to organize storm drain marking events. A group of girl scouts blanked targeted areas with many storm drain markers as a part of a capstone project.

Outreach on Pet Waste and Enforcement of Pet Waste Regulations

In FY 2015 DOEE distributed thousands of instructional pamphlets at media/public events throughout all eight wards of the District. DOEE also worked with the Department of Public Works (DPW) and DDOT to install approximately 200 pet waste signs across the District. DOEE continued to evaluate pet waste education and outreach efforts to better understand the pollution prevention achieved as a result. This research will be completed by the end of calendar 2016.

Integrated Pest Management and Nutrient Management

DOEE has developed a robust outreach and education program on integrated pest management (IPM) and nutrient management. DOEE's IPM and nutrient management program is intended to inform the public about the proper use and disposal of pesticides and the use of safer alternatives. The program provides education and outreach activities to property owners and managers about environmentally sound practices with regard to the use of pesticides in the yard or garden and the introduction of "good" pests into the

landscape. Through DOEE's Nutrient Management Program, the property owners receive education regarding the proper amount of fertilizer to use on a lawn. In addition to fertilizer use, this program addresses the proper way to mow, the proper use of mulch, and the effects of applying too much mulch. Furthermore, the DOEE Pesticide Management Program trains commercial applicators in the legal and safe application of pesticides and herbicides. Commercial applicators must receive a certification through the program to legally apply pesticides and herbicides in the District. A part of this program involves the use of IPM.

Figure 15 - A trash trap collecting litter in Watts Branch

Trash Removal

In 2010, the District and the State of Maryland promulgated a TMDL for trash for the Anacostia River. These loads were calculated based on stream and shoreline transect sampling performed by the Anacostia Watershed Society through a grant from DOEE. All loads were attributed to illegal dumping. For the District's portion of watershed, an annual load allocation totaling 20,048 pounds was assigned.

Some of the tools the District are applying to meet the goals of the trash TMDL include education and outreach, stream and shoreline clean-ups and new regulations and enhanced enforcement. In 2014 and 2105, AFF worked on a DOEE grant-funded project which includes implementing an education and outreach campaign throughout the District's portion of the Anacostia River watershed. Through this two-year grant, AFF conducted a study to assess the effectiveness of the campaign on reducing trash loads to the Anacostia River.

Every year, thousands of pounds of trash are removed from the District's shorelines and stream banks by volunteers. DOEE has supported the AFF Potomac Watershed Clean-up and the Anacostia Watershed Society, Anacostia Earth Day Clean-up since their inception. AFF has developed an online GIS database to track cleanups that occur throughout the Potomac River watershed on an annual basis. Using this database, DOEE was able to determine the amount of trash removed from the District's watersheds by cleanup events 2015. DOEE estimates that 79,500 pounds of trash were removed District-wide: 29,000 pounds were removed from the Rock Creek watershed; 16,000 pounds was removed from the Potomac River watershed; and 34,000 pounds were removed from the Anacostia River watershed.

Finally, as part of the Sustainable DC Omnibus Act of 2014, the District passed a ban on expanded polystyrene, more commonly referred to as Styrofoam. The ban will be effective January 1, 2016. The ban affects all food service businesses that sell prepared foods in expanded polystyrene containers. The ban does not apply to prepackaged Styrofoam.

Table 5 - Tracking activities that aim to prevent nonpoint source pollution from individual actions, by carrying out effective information and education campaigns

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 1d: To reach 1000 school students annually with hands-on environmental education activities (DOEE, DCPS)		**Number of students participating in hands on environmental education**			
	Milestone 1: Reach 1,000 school students in the first year	1,297	1,241	7,000	36.3%
Objective 2d: To reach support 5000 school students annually having an overnight meaningful watershed experience		**Number of students participating in overnight meaningful watershed experience**			
	Milestone 1: Reach 5,000 school students in the first year	696	821	35,000	4.0%
Objective 3d: To install BMPs on 3 schoolyards per year	Milestone 1: Install BMPs at three schoolyards annually	**Number of BMPs installed**			
		3	5	21	23.8%
		Square feet treated			
		183,607	127,278	N/A	N/A
		Volume captured (cubic feet)			
		12,713	8,839	N/A	N/A
		Estimated load reductions			
				N/A	N/A
Objective 4d: To train 10 teachers annually thru training that integrate hands-on watershed education with system-wide standards of learning	Milestone 1: Train 10 teachers annually	**Number of teachers trained**			
		107	27	70	191%
	Milestone 2: Have watershed education fully immersed in standards of learning that outside trainings are no longer necessary by 2025	**Incorporation of watershed education into curriculum**			
		1 Learning Standards Complete	1 Learning Standards Complete	N/A	N/A

Goal Five – Implement Programs that Aim to Increase Nonpoint Source Pollution Runoff Prevention Practices on Private Property

Private property, including commercial, residential, and non-profit lands (religious and academic institutions), is the single largest land use in the District. These lands are one of the primary sources of pollution to District waterways, contributing pollutants through combined sewer overflow events and urban stormwater runoff.

One of the greatest needs and challenges for the District is to reduce water pollution by incentivizing retrofits at the individual property level. The District has recognized that without convincing property owners to adopt NPS pollution prevention techniques on their lands, it will be difficult to achieve its water pollution reduction goals. As such, the District has developed a variety of programs, including incentives to encourage property owners to adopt NPS pollution reduction techniques. These efforts include an LID retrofit grant program and the following list of RiverSmart programs:

- RiverSmart Rooftops (Green Roof Rebate/Retrofit Program)
- RiverSmart Communities
- RiverSmart Homes
- RiverSmart Rebates for cisterns, impervious surface reduction, rain gardens and trees

RiverSmart Rooftops (Green Roof Rebate/Retrofit Program)

Historically, the District has offered a rebate for installation of a green roof on a new building or the retrofit of an existing roof. Programs offered through DOEE provided varying rebate amounts with varying constraints. In 2012, DOEE restructured this rebate program to offer a single application process and set dollar rebate of $5 per square foot regardless of the roof size. In early 2013, the rebate program continued to offer a single application process with a rebate of $5 per square foot. Participation in the program was less than predicted, so DOEE has increased the rebate amount to $7 per square foot. DOEE has also identified priority watersheds throughout the District, in which it is implementing a concentrated suite of stormwater practices through programs such as RiverSmart Schools, RiverSmart Homes, RiverSmart Communities, and RiverSmart Rooftops.

DOEE awarded a new grant for administration of the RiverSmart Rooftops program in October 2014. The current program offers a $10 per square foot rebate throughout the District, and $15 per square foot in priority watersheds. The program is expected to continue through fiscal year 2016, pending the availability of funds.

In FY 2015, the District added 144,858 square feet of green roof to its portfolio. These projects were funded both publicly and privately, and DOEE's rebate program funded 30,000 square feet, or approximately 21 percent of all green roofs installed District-wide over the reporting time period.

Figure 16 – Green Zone Environmental Program youth in front of the Holy Redeemer RiverSmart Communities project they helped install

RiverSmart Communities Program

The RiverSmart Communities program is an extension of the RiverSmart Homes program to multi-family residences, such as condominiums and co-ops, businesses, houses of worship, and universities.

RiverSmart Homes, targets private, single-family homeowners to encourage the use of five specific stormwater BMPs (rain gardens, BayScaping, pervious pavement, rain barrels, and shade trees) to control NPS pollution on their property. The RiverSmart Communities Program aims to implement similar practices on a larger scale that is more appropriate for the increased runoff area often seen on larger developments.

In FY 2015, the RiverSmart Communities program completed 34 site audits at cooperatives, condominiums, apartments, businesses, and churches and completed eight projects. The 34 audits is well short of the goal of 150 audits annually for this program (see Table 6, Objective 2e). Audits are requested by property owners so the number performed is highly dependent on interest. As funds for this program are limited, there are not enough funds to install projects at such a high number of properties. In the future the District will change the objective to 30 properties per year.

Figure 17 – A home retrofitted with pervious paving and a cistern

RiverSmart Homes Program

In 2008 DOEE developed an LID retrofit program aimed at District single-family homes. The program started with eight demonstration sites, one in each of the District's wards. It then expanded to a pilot program in the Pope Branch watershed and has been open to all District residents since summer of 2009.

Through this program, DOEE performs audits of homeowner's properties and provides feedback to the homeowners on what LID technologies can be safely installed on the property. DOEE also offers up to $1,600 to the homeowner to help cover the cost of installation of any LID the homeowner chooses. Currently the program offers five different landscaping items: shade trees, native landscaping to replace grass, rain gardens, rain barrels, and permeable pavement.

The District has recognized the importance of targeting homeowners for pollution reduction measures because residential property is the largest single land use in the city and is the least likely to be required to install stormwater management practices because of the relatively small lot sizes. The program has continued in popularity with an average of 100 homeowners signing up per month.

FY 2015 accomplishments include the following:

- Installed 595 rain barrels
- Planted 943 shade trees
- Installed 133 rain gardens
- Implemented BayScaping at 145 properties
- Replaced impervious surfaces with green space or pervious pavers at 31 properties.
- Conducted 1,071 audits

The District notes that the number of rain barrels it installed is short of its goal (see Table 6, Objective 5e). The District's grantee for the rain barrel installation grant went out of business this year and DOEE

had to scramble to start a new grant. The District anticipates that the number of rain barrels installed in FY 2016 will also fall short of the goal for this reason.

In addition the RiverSmart Homes program, DOEE holds annual contractor trainings for any local landscape contractor to become a RiverSmart Homes contractor. Four trainings were conducted in FY 2015 with 75 contractors completing the indoor classroom and outdoor hands on rain garden construction.

Rain Barrel Rebate Program

Property owners who purchase and install a rain barrel from an approved rain barrel list are able to apply for a rebate. Rebate amounts depend on the capacity of the rain barrel, $1 per gallon stored, up to $500. For example, a 75-gallon rain barrel will merit a $75 rebate and a 500-gallon cistern will merit a $500 rebate. The rebate program includes conducting outreach to advertise the program through traditional channels and through innovative approaches, (e.g., partnerships with local hardware stores). Through much of 2015 the rain barrel rebate program was administered by a partnering nonprofit organization, DC Greenworks. DC Greenworks verified that the requested rebates are in the District and that the rain barrels were actually installed. Homeowners are eligible to receive up to two rebates per property. Ninety-nine rain barrels were installed and rebated in FY 2015.

Figure 18 - A newly installed rain garden inspected for the rebate program

Rain Garden, Pervious Paver, and Impervious Surface Reduction Rebate

Any single-family homeowner in the District is eligible for the rain garden, pervious paver, and impervious surface reduction rebate, including homeowners who have already received funding through the RiverSmart Homes program. The rebate is based on how many square feet of impervious area is treated with the rain garden or pervious pavers/impervious surface removal. Impervious areas can either be rooftops or areas that are covered in concrete, asphalt, and other impervious materials. The rebate will reimburse homeowners $1.25 per impervious square foot treated. The minimum square footage is 400 square feet, which would total a $500 rebate. The maximum rebate is $1,000 for treating 800 square feet or more of impervious surface. In FY 2015, 57 rebates were issued treating 48,781 square feet of impervious surface.

RiverSmart Efforts in Bloomingdale

Bloomingdale is an area of the District with historic flooding issues. After the neighborhood was impacted by a series of flood events in the summer of 2012, the Mayor created a multi-agency taskforce to develop a plan to address flooding through short- and long-term projects. DOEE's WPD has played an integral role in this effort.

Short-Term Measures – With funding from DC Water, DOEE spearheaded the fast-track action of deployment of cisterns in the sewershed draining to the Bloomingdale neighborhood. In order to guarantee that the appropriate size and type of barrel is installed and also to ensure proper usage by residents, DOEE began conducting stormwater audits of properties in September of 2012 and continued through 2013. Over 200 audits were completed and 125 cisterns installed in this target area. Under ideal maintenance scenarios, approximately 30,000 gallons can be captured during every large rain event through this implementation project.

As part of the audit, DOEE educated homeowners on the need to empty the barrels prior to each rainstorm. During the installation process, additional education was delivered by DOEE's nonprofit partner at the time, DC Greenworks, who spoke to homeowners about proper usage of cisterns.

Medium-Term Measures – The cistern installations were a rapid response effort in the project area. As a second step in installing targeted LID, DOEE has offered higher rebate amounts for green roofs, permeable pavers, and impervious surface removal in the sewershed. Residents who live in this sewershed are able to receive a $15 per square foot rebate for green roofs and permeable pavers. A $5 per square foot rebate is also available for homeowners who wish to remove driveways and patios and replace them with vegetation. Twenty-six rebates were issued and 17,890 square feet were treated under the targeted program in FYs 2014 and 2015.

Figure 19 - A paver install in the Bloomingdale neighborhood

Tree Planting

The District of Columbia has been called "The City of Trees." It has a tree canopy cover of 35 percent, which is high for a dense urban environment, but lower than the canopy cover has been historically even when the city had a higher population density. In an effort to improve air and water quality, reduce the urban heat island effect, and offset greenhouse gas emissions, the District has adopted a 40-percent tree canopy goal. Mayor Bowser has adopted a Sustainability Plan that calls for achieving the canopy goal by 2032. To achieve that goal the District will need to plant an average of 10,800 trees annually (an increase of 25 percent over current efforts). Currently the Urban Forestry Administration, the agency that maintains the District's street trees, plants an average of 6,225 trees annually.

DOEE, with help from non-profit partners such as Casey Trees and Washington Parks and People, plants trees on private, federal, and other District lands. FY 2015 accomplishments include the following:

- Planted 943 trees as part of the RiverSmart Homes and Tree Rebate Program
- 766 trees were planted on parks and school lands and 160 planting plans for these parcels were created as a part of a special effort to increase tree canopy in these areas
- District-wide 14,700 trees were planted

Low Impact Development Retrofit Program

LID retrofits are focused on four main practices: cistern installation, establishment of bioretention cells, retrofit of vegetated (green) roofs, and installation of pervious pavers. In FY2015 no additional LID projects were completed due to the delays in contracting.

Table 6 - Tracking activities that aim to increase nonpoint source pollution runoff prevention practices on private property

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 1e: To audit 1,000 residential properties per year	Milestone 1: 1,000 audits annually	**Number of residential homes audited**			
		1,117	1,071	7,000	31.3%
Objective 2e: To audit 150 multi-family and commercial properties per year	Milestone 1: 150 audits annually	**Number of multi-family and commercial properties audited**			
		31	34	1,050	6.0%
Objective 3e: To plant 750 trees per year on private property	Milestone 1: 750 trees planted in first year	**Number of trees planted on residential properties**			
		972	943	5,250	36.5%
		Estimated canopy expansion/acreage of canopy			
		9.72	9.43	N/A	N/A
Objective 4e: To plant 8,600 tree per year in public space	Milestone 1: 8,600 trees planted annually	**Number of trees planted in public space**			
		9,560	14,700	29,050	83.5%
		Estimated canopy expansion/acreage of canopy			
		95.6	147.0	N/A	N/A
Objective 5e: To install 900 rain barrels per year on residential homes	Milestone 1: 900 rain barrels installed annually	**Number of rain barrels installed**			
		475	595	7,000	15.3%
		Estimated volume of rainwater captured (gallons)			
		1,934,695	2,423,435	N/A	N/A
Objective 6e: To install 100 rain gardens per year at residential homes	Milestone 1: Install 100 rain gardens per year (DOEE, Nonprofits)	**Number of rain gardens installed**			
		138	133	700	38.7%
		Area treated (square feet)			
		61,392	59,850	N/A	N/A
		Volume captured (gallons)			
		531,605	1,160,691	N/A	N/A

Targeted Watershed Work

DOEE has targeted watersheds in the District for focused LID and stream restoration work. In an effort to delist downstream water bodies and/or resolve local issues such as flooding and erosion, DOEE has three such targeted efforts: the Texas Avenue watershed, the Hickey Run watershed, and the Nash Run watershed. These watersheds were selected using several criteria including the following:

- The targeted watersheds are within areas that have EPA-approved Watershed Implementation Plans;
- The work planned in the watershed address the watershed impairments;
- The planned projects protect and improve both ecosystem and human health;
- The efforts planned aid in connecting District residents with the environment; and
- The projects are coordinated with other infrastructure projects such as roadway or sewer enhancements.

Figure 20 - A degraded outfall in the Texas Avenue watershed

Texas Avenue Targeted Watershed

The Alger Park upland LID and stream restoration project lies within the Texas Avenue tributary of the Anacostia River. DOEE is using local dollars to leverage a National Fish and Wildlife Foundation grant and Clean Water State Revolving Funds to implement large- scale upland LID work in the Texas Avenue watershed, specifically in the area that drains into Alger Park.

Having completed 30-percent designs for both upland LID and stream restoration work in the Alger Park area within the Texas Avenue watershed, DOEE issued a contract and completed the 100-percent designs of the degraded stream in Alger Park in FY 2015. It is expected that the project will be put out to bid and construction commence in FY 2016. DOEE is also partnering with DDOT to ensure that upland areas in public space are retrofitted with LID projects to reduce the volume and velocity of stormwater that enters the Texas Avenue storm sewer system. In FY 2015, DOEE transferred funds to DDOT to contract the public space design component of this project. The final component of work in Texas Avenue watershed is a community outreach, education, and engagement campaign led by DOEE's RiverSmart Homes program, focused on retrofitting private homes in the Hillcrest neighborhood in Ward 7. The goals of the program are to contact 100 percent of the watershed residents, perform audits on 50 percent of the homeowner properties, and install at least two RiverSmart practices on 25 percent of the properties audited.

In FY 2015, DOEE reached out to all residents of the neighborhood encouraging them to sign up for the RiverSmart program. DOEE has begun auditing the properties of those who expressed interest. DOEE also held a stream cleanup event with local residents and a Boy Scout troop. In 2016, DOEE will work to meet its RiverSmart Homes audit and installation goals. To date two percent of the watershed's load reductions have been achieved through stormwater retrofits (see Figure 21).

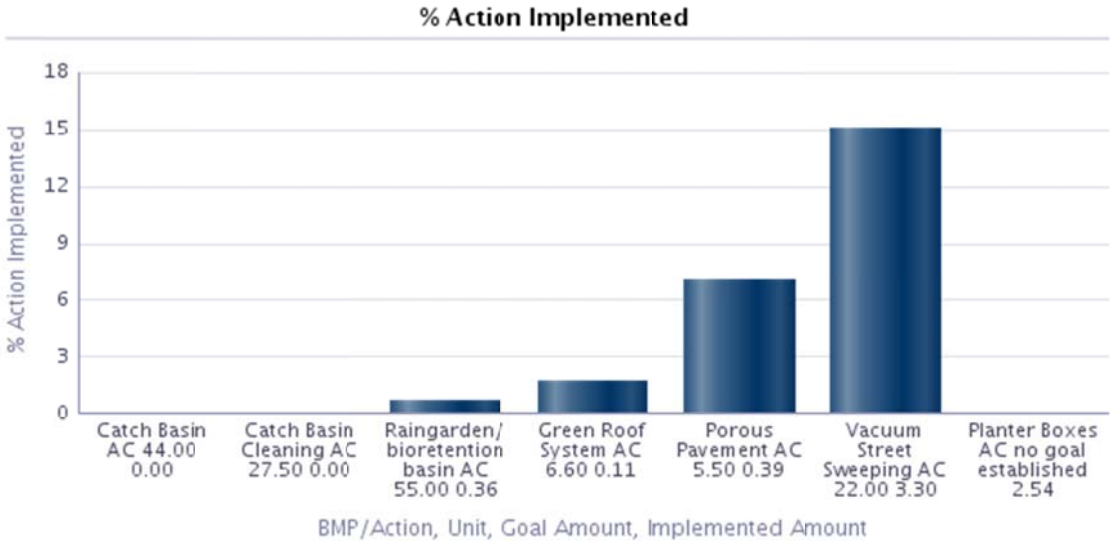

Figure 21 - Percent of Goal Achieved for Tracked BMPs in Texas Avenue Tributary

Table 7 - Tracking activities that reduce in-stream bank erosion, upland runoff, and pollutant loads to the Texas Avenue Tributary

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 1: To stabilize and enhance the habitat conditions in a 1,530-foot stretch of stream in the Texas Avenue watershed.	Milestone 1: Survey and assess the watershed and stream valley to establish baseline conditions	**Number reports developed**			
		1	N/A	1	100%
	Milestone 2: Develop a design report with recommendations for optimal restoration work	**Number of design reports developed**			
		1	N/A	1	100%
	Milestone 3: Develop 100% plans for stream enhancement work	**Number of stream restoration plan sets developed**			
		0	1	1	100%
Objective 2: To maximize treatment and storage of impervious run-off in the public space in the 35-acre watershed that drains into Alger Park	Milestone 1: Survey and assess the upland areas of the watershed for potential LID installations in public space	**Number survey reports developed**			
		1	N/A	1	100%
	Milestone 2: Develop design plan sets for LID work in the public space	**Number of LID plan sets developed**			
		1	N/A	1	100%
	Milestone 3: Install LID projects in public space in areas throughout the watershed	**Number of LIDs installed**			
		1	0	N/A	N/A
		Acres treated			
		0.2	0	N/A	N/A

Table 6 - Continued

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 3: To maximize treatment and storage of impervious runoff on private property in the 35-acre watershed that drains into Alger Park	Milestone 1: Contact homeowners in the watershed and provide information about the RiverSmart Homes program	**Number of homes reached with information**			
		132	N/A	132	100%
	Milestone 2: Audit homes in the watershed	**Number of homes audited**			
		59	20	66	120%
	Milestone 3: Plant trees on private property	**Number of trees planted**			
		19	2	N/A	N/A
		Estimated reduction volume (gallons)			
		20,368	2,144	N/A	N/A
	Milestone 4: Install rain barrels on private property	**Number of rain barrels installed**			
		22	3	N/A	N/A
		Area treated (square feet)			
		4,092	558	N/A	N/A
		Estimated volume reduction (gallons)			
		39,727	5,417	N/A	N/A
	Milestone 5: Install permeable pavers on private property	**Number of projects installed**			
		0	0	N/A	N/A
		Area treated (square feet)			
		0	0	N/A	N/A
		Estimated volume reduction			
		0	0	N/A	N/A
	Milestone 6: Install rain gardens on private property	**Number of projects installed**			
		1	1	N/A	N/A
		Area treated (square feet)			
		408	325	N/A	N/A
		Estimated volume reduction			
		3,967	3,152	N/A	N/A

Hickey Run Targeted Watershed

The Hickey Run watershed has been targeted for restoration based on historic commercial and residential pollution impacting stream water quality. Impervious surfaces, one of the main pollutant contributors to Hickey Run, comprise approximately 41 percent of the watershed making Hickey Run one of the most impervious of the Anacostia River's subwatersheds.

Figure 22 – The Hickey Run stormwater BMP and trash trap

Over the past several years, DOEE has worked with local schools, libraries, parks, artists, students, and residents to clean up Hickey Run by hosting events to engage a wide range of people within the watershed to maximize the installation of LID.

In order to make a significant difference in the Hickey Run watershed, the District's goal was to install RiverSmart features in at least 25 percent of the watershed or 385 homes. By the end of FY 2015 DOEE recruited 230 participants or 60 percent of its goal. In order to achieve its goal, DOEE doubled the incentive available to homeowners through RiverSmart Homes by offering $2,400 toward rain gardens and BayScaping on each property in the watershed.

An additional incentive offered to homeowners to adopt RiverSmart practices was to design and construct a "green street" on the block in Hickey Run with the highest RiverSmart Homes adoption rate. In 2015 DOEE selected the winning green street which had a 100 percent participation rate. DOEE hosted a community meeting with the winning block and began developing the scope of work for the project. In 2016 DOEE will contract the design and construction of this project.

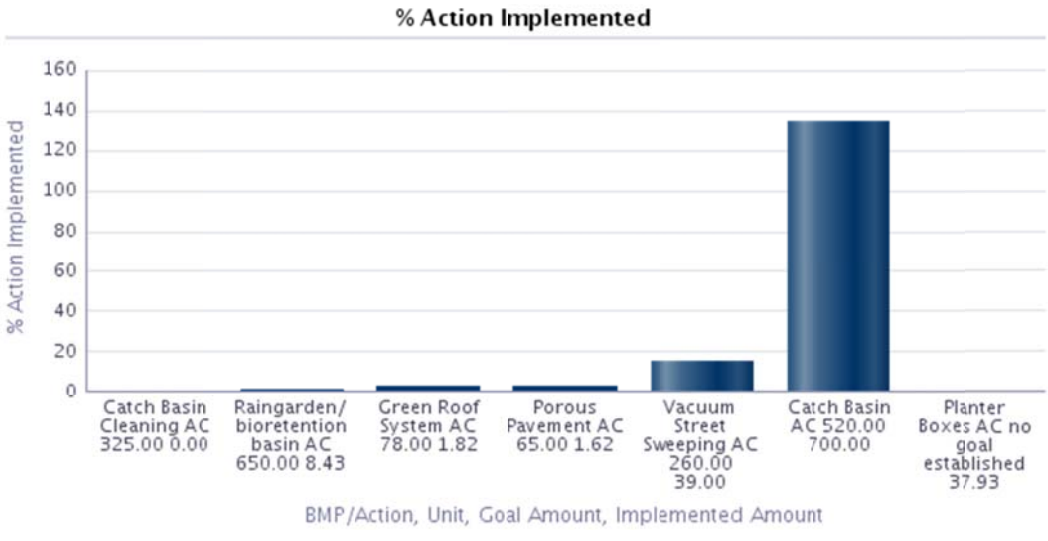

Figure 23 - Percent of Goal Achieved for Tracked BMPs in Hickey Run

In addition to the upland LID work, DOEE is working to restore the mainstem of Hickey Run and a side tributary called Springhouse Run. In FY 2015, DOEE worked on contracting the construction of the stream restoration for Springhouse Run. DOEE also worked to secure funds to study the extent of contaminated soils in the mainstem of Hickey Run. In FY 2016 DOEE will contract the construction of Springhouse Run and will work on contracting a contamination study. To date 41 percent of the watershed's load reductions have been achieved through stormwater retrofits (see Figure 23).

Table 8 - Tracking activities that reduce in-stream bank erosion, upland runoff, and pollutant loads to Hickey Run

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 1: To maximize treatment and storage of impervious runoff on private property in the 600-acre watershed that drains to Hickey Run	Milestone 1: Reach all homes in the watershed with information about the RiverSmart Homes program	**Number of homes reached with information**			
		1,543	Complete	N/A	N/A
	Milestone 2: Audit homes in the watershed	**Number of homes audited**			
		200	30	N/A	N/A
	Milestone 3: Plant 300 trees on private property	**Number of trees planted**			
		78	24	300	26%
		Estimated reduction volume (gallons)			
		83,616	25,728	N/A	N/A
	Milestone 4: Install 100 rain barrels on private property	**Number of rain barrels installed**			
		143	45	100	143%
		Estimated volume reduction (gallons)			
		258,224	81,259	N/A	N/A
	Milestone 5: Install 10 permeable paver projects on private property	**Number of projects installed**			
		10	0	N/A	N/A
		Area treated (square feet)			
		2,090	0	N/A	N/A
	Milestone 6: Install rain gardens on private property	**Number of projects installed**			
		17	21	N/A	N/A
		Area treated (square feet)			
		6,936	1,050	N/A	N/A
		Estimated volume reduction (gallons)			
		67,279	10,185	N/A	N/A

Table 7 - Continued

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 2: To maximize treatment and storage of impervious runoff in the public space of the 600 acre Hickey Run watershed	Milestone 1: Survey and assess the upland areas of the watershed for potential LID installations in public space	**Number survey reports developed**			
		1	N/A	1	100%
	Milestone 2: Develop design plan sets for LID work in the public space	**Number of LID plan sets developed**			
		1	N/A	1	100%
	Milestone 3: Install LID projects in public space in areas throughout the watershed	**Number of LIDs installed**			
		2	10	N/A	N/A
		Acres treated			
		6.2	12.48	N/A	N/A
Objective 3: To stabilize and enhance the habitat conditions in an 1,800-foot stretch of stream (Springhouse Run) that is a tributary to Hickey Run.	Milestone 1: Survey and assess the watershed and stream valley to establish baseline conditions	**Number reports developed**			
		1	N/A	1	100%
	Milestone 2: Develop a design report with recommendations for optimal restoration work	**Design Reports Developed**			
		1	N/A	1	100%
	Milestone 3: Develop 100% plans for stream enhancement work	**Stream Restoration Plan Sets Developed**			
		1	N/A	1	100%
	Milestone 4: Issue a contract for stream restoration work	**Restoration Contracts Issued**			
		0	0	1	0%
	Milestone 5: Implement stream restoration work	**Feet of Stream Length Restored**			
		0	0	1,800	0%
	Milestone 6: Riparian plantings along stream banks	**Acres of Riparian Plantings**			
		0	0	N/A	N/A
		Number of Trees Planted			
		0	0	N/A	N/A

Table 7 - Continued

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 4: To stabilize and enhance the habitat conditions of the main stem of Hickey Run, a 5,000-foot tributary of the Anacostia River.	Milestone 1: Survey and assess the watershed and stream valley to establish baseline conditions	**Number reports developed**			
		0	0	1	0%
	Milestone 2: Develop a design report with recommendations for optimal restoration work	**Design Reports Developed**			
		0	0	1	0%
	Milestone 3: Develop 100% plans for stream enhancement work	**Stream Restoration Plan Sets Developed**			
		0	0	1	0%
	Milestone 4: Issue a contract for stream restoration work	**Restoration Contracts Issued**			
		0	0	1	0%
	Milestone 5: Implement stream restoration work	**Feet of Stream Length Restored**			
		0	0	5,000	0%
	Milestone 6: Riparian Plantings along stream banks	**Acres of Riparian Plantings**			
		0	0	N/A	N/A
		Number of Trees Planted			
		0	0	N/A	N/A

Nash Run Targeted Watershed

Nash Run is a tributary of the Anacostia River whose mouth is a series of interlocking marsh ponds inside the grounds of the Kenilworth Aquatic Gardens. The upper portion of this tributary originates from storm drain discharges in Prince George's County, Maryland. Nash Run's watershed measures approximately 0.7 square miles (460 acres).

Figure 24 - Nash Run prior to construction in planned for 2015

In FY 2015 DOEE completed contracting the stream restoration work for a 1,400 linear foot stretch of stream on Nash Run, a tributary of the Anacostia River. Construction of the contracted work will begin in early 2016. The project, which includes the installation of an upstream trash trap, will help improve habitat and water quality in this tributary that drains to the Kenilworth Aquatic Gardens, a scenic National Park Service property on the banks of the Anacostia River.

In addition to the stream restoration effort, DOEE continued its outreach to private property owners along the stream to inform them of the project timeline and what to expect during the construction period. As the stream project moves forward in FY 2016, DOEE will use the project to help galvanize support from private property owners to install LID practices throughout the watershed. The agency is also scouting

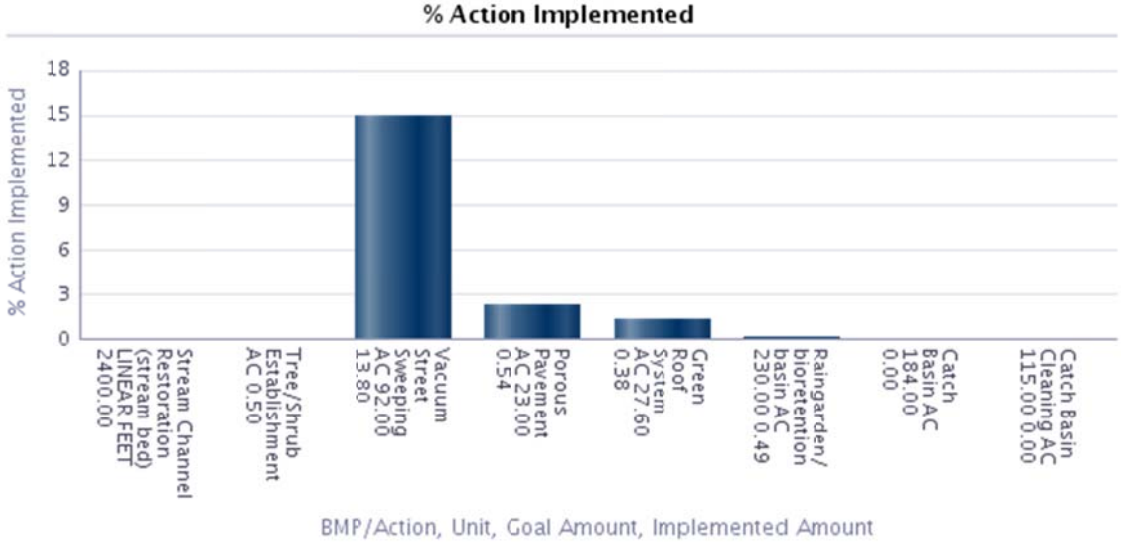

Figure 25 - Percent of Goal Achieved for Tracked BMPs in Nash Run

locations for larger upland LID projects on District parkland and school grounds, as well as on large private parcels, through the RiverSmart Communities program. DOEE already has a grant in place for post-restoration monitoring of the Nash Run project which will help determine if the project will achieve its restoration goals. To date three percent of the watershed's load reductions have been achieved through stormwater retrofits (see Figure 25).

Table 9 - Tracking Activities that reduce stream bank erosion, upland runoff, and pollutant loads to the Nash Run Tributary

OBJECTIVES	MILESTONES	2014	2015	2020 Goal	% 2020 Goal Achieved
Objective 1: To stabilize and enhance the habitat conditions of the main stem of Nash Run, a 1,400-foot tributary of the Anacostia River.	Milestone 1: Survey and assess the watershed and stream valley to establish baseline conditions	**Number reports developed**			
		1	N/A	1	100%
	Milestone 2: Develop a design report with recommendations for optimal restoration work	**Design Reports Developed**			
		1	N/A	1	100%
	Milestone 3: Develop 100% plans for stream enhancement work	**Stream Restoration Plan Sets Developed**			
		1	N/A	1	100%
	Milestone 4: Issue a contract for stream restoration work	**Restoration Contracts Issued**			
		0	1	1	100%
	Milestone 5: Implement stream restoration work	**Feet of Stream Length Restored**			
		0	0	1,400	0%
	Milestone 6: Riparian Plantings along stream banks	**Acres of Riparian Plantings**			
		0	0	1	0%
		Number of Trees Planted			
		0	0	N/A	N/A
Objective 2: To maximize treatment and storage of impervious run-off in the public space of the 460 acre watershed that drains into Nash Run	Milestone 1: Survey and assess the upland areas of the watershed for potential LID installations in public space	**Number of survey reports developed**			
		0	0	1	0%
	Milestone 2: Develop design plan sets for LID work in the public space	**Number of LID plan sets developed**			
		0	0	1	0%
	Milestone 3: Install LID projects in public space in areas throughout the watershed	**Number of LIDs installed**			
		0	6	N/A	N/A
		Number of acres treated			
		0	3.86	N/A	N/A

Table 8 - Continued

OBJECTIVES	MILESTONES	2014		2020 Goal	% 2020 Goal Achieved
Objective 3: To maximize treatment and storage of impervious runoff on private property in the 460 acre watershed that drains into Nash Run	Milestone 1: Reach homes in the watershed with information about the RiverSmart Homes program	**Number of homes reached with information**			
		46		N/A	N/A
	Milestone 2: Audit homes in the watershed	**Number of homes audited**			
		46	7	N/A	N/A
	Milestone 3: Plant trees on private property	**Number of trees planted**			
		19	12	N/A	N/A
		Estimated reduction volume (gallons)			
		20,368	12,864	N/A	N/A
	Milestone 4: Install rain barrels on private property	**Number of rain barrels installed**			
		15	13	N/A	N/A
		Estimated volume reduction (gallons)			
		27,086	23,475	N/A	N/A
	Milestone 5: Install permeable pavers on private property	**Number of projects installed**			
		0	0	N/A	N/A
		Area treated (square feet)			
		0	0	N/A	N/A
		Estimated volume reduction (gallons)			
		0	0	N/A	N/A
	Milestone 6: Install rain gardens on private property	**Number of projects installed**			
		5	1	N/A	N/A
		Area treated (square feet)			
		2040	400	N/A	N/A
		Estimated volume reduction (gallons)			
		19,836	3,880	N/A	N/A

Table 10 - Annual runoff volume and load reductions associated with the FY15 BMP inventory for the District of Columbia

Watershed	Annual Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	TPCB (lbs)	E. *coli* (Billion MPN)
Anacostia	12,916,165	380.63	43.95	8,773.7	7,262	3,967	404.3	1.8E-01	6.1E+00	1.9E+00	2.1E+00	2.2E-02	1.4E+01	1.1E-03	3.5E-04	1.6E-03	4.0E-03	3.1E-05	1.0E-04	7.1E-02	4.7E-01	9.3E-03	2,914.6
Anacostia Lower	1,757,508	52.10	6.08	1,206.1	997	543	55.7	2.4E-02	8.4E-01	2.6E-01	2.8E-01	3.0E-03	1.9E+00	1.5E-04	4.8E-05	2.1E-04	5.5E-04	4.3E-06	1.4E-05	9.7E-03	6.4E-02	1.3E-03	400.1
Anacostia Upper	11,160,242	328.58	37.88	7,568.6	6,266	3,424	348.6	1.5E-01	5.3E+00	1.6E+00	1.8E+00	1.9E-02	1.2E+01	9.4E-04	3.0E-04	1.3E-03	3.4E-03	2.7E-05	8.9E-05	6.2E-02	4.0E-01	8.0E-03	2,514.9
ANATF_DC	10,472,369	315.52	36.61	7,221.5	6,053	3,207	339.0	1.5E-01	5.1E+00	1.6E+00	1.7E+00	1.8E-02	1.2E+01	8.9E-04	2.9E-04	1.3E-03	3.3E-03	2.5E-05	8.4E-05	5.8E-02	3.8E-01	7.7E-03	2,429.2
ANATF_MD	900,728	25.29	2.90	562.2	474	270	27.4	1.2E-02	4.0E-01	1.2E-01	1.3E-01	1.4E-03	9.2E-01	7.4E-05	2.3E-05	1.0E-04	2.6E-04	2.2E-06	7.2E-06	5.0E-03	3.1E-02	6.1E-04	190.1
Battery Kemble Creek	563,464	15.62	1.79	197.8	292	132	15.8	7.2E-03	2.5E-01	7.5E-02	8.2E-02	8.9E-04	4.7E-01	4.6E-05	1.4E-05	6.3E-05	1.6E-04	1.4E-06	4.5E-06	3.1E-03	2.0E-02	3.8E-04	117.1
Broad Branch	1,529,258	42.38	4.85	759.6	792	302	53.0	2.0E-02	6.8E-01	2.0E-01	2.2E-01	2.4E-03	1.3E+00	1.3E-04	3.8E-05	1.7E-04	4.4E-04	3.7E-06	1.2E-05	8.4E-03	5.3E-02	1.0E-03	317.8
C&O Canal	836,140	23.65	2.72	301.3	441	196	23.4	1.1E-02	3.7E-01	1.1E-01	1.2E-01	1.3E-03	7.2E-01	6.9E-05	2.1E-05	9.5E-05	2.4E-04	2.0E-06	6.7E-06	4.6E-03	2.9E-02	5.7E-04	176.9
Dalecarlia Tributary	820,478	23.14	2.65	295.4	432	192	22.9	1.1E-02	3.7E-01	1.1E-01	1.2E-01	1.3E-03	7.0E-01	6.8E-05	2.1E-05	9.3E-05	2.4E-04	2.0E-06	6.6E-06	4.5E-03	2.9E-02	5.6E-04	173.4
Dumbarton Oaks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fenwick Branch	436,572	12.26	1.40	221.1	229	86	15.1	5.7E-03	2.0E-01	5.9E-02	6.5E-02	7.0E-04	3.8E-01	3.6E-05	1.1E-05	4.9E-05	1.3E-04	1.1E-06	3.5E-06	2.4E-03	1.5E-02	3.0E-04	92.1
Fort Chaplin Tributary	7,266	0.20	0.02	4.4	4	2	0.2	9.3E-05	3.2E-03	9.7E-04	1.1E-03	1.2E-05	7.3E-03	6.0E-07	1.8E-07	8.1E-07	2.1E-06	1.8E-08	5.8E-08	4.0E-05	2.5E-04	4.9E-06	1.5
Fort Davis Tributary	7,383	0.20	0.02	4.5	4	2	0.2	9.5E-05	3.3E-03	9.8E-04	1.1E-03	1.2E-05	7.5E-03	6.1E-07	1.8E-07	8.2E-07	2.1E-06	1.8E-08	5.9E-08	4.1E-05	2.6E-04	5.0E-06	1.5
Fort Dupont Tributary	128,200	20.43	2.52	732.3	498	116	3.9	9.9E-03	3.8E-01	1.4E-01	1.6E-01	1.2E-03	9.7E-01	2.9E-05	2.2E-05	1.1E-04	2.7E-04	3.1E-07	1.0E-06	8.7E-04	1.8E-02	5.4E-04	200.0
Fort Stanton Tributary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Foundry Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hickey Run	564,720	16.12	1.85	361.7	303	169	18.0	7.5E-03	2.6E-01	7.8E-02	8.6E-02	9.2E-04	5.9E-01	4.7E-05	1.5E-05	6.5E-05	1.7E-04	1.4E-06	4.5E-06	3.1E-03	2.0E-02	3.9E-04	121.6
Kingman Lake	554,897	16.32	1.94	377.2	313	166	24.6	7.6E-03	2.6E-01	8.1E-02	8.9E-02	9.4E-04	6.1E-01	4.7E-05	1.5E-05	6.7E-05	1.7E-04	1.3E-06	4.4E-06	3.1E-03	2.0E-02	4.0E-04	125.4
Klingle Valley Run	2,692	0.07	0.01	1.3	1	1	0.1	3.5E-05	1.2E-03	3.6E-04	3.9E-04	4.3E-06	2.3E-03	2.2E-07	6.7E-08	3.0E-07	7.7E-07	6.5E-09	2.2E-08	1.5E-05	9.3E-05	1.8E-06	0.6
Lower Beaverdam Creek	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luzon Branch	581,085	16.14	1.85	289.6	302	115	20.1	7.5E-03	2.6E-01	7.8E-02	8.5E-02	9.2E-04	4.9E-01	4.8E-05	1.5E-05	6.5E-05	1.7E-04	1.4E-06	4.6E-06	3.2E-03	2.0E-02	3.9E-04	121.1
Melvin Hazen Valley Branch	16,754	0.46	0.05	8.3	9	3	0.6	2.2E-04	7.4E-03	2.2E-03	2.4E-03	2.7E-05	1.4E-02	1.4E-06	4.2E-07	1.9E-06	4.8E-06	4.1E-08	1.3E-07	9.2E-05	5.8E-04	1.1E-05	3.5
Nash Run	8,213	0.23	0.03	5.0	4	2	0.3	1.1E-04	3.6E-03	1.1E-03	1.2E-03	1.3E-05	8.3E-03	6.7E-07	2.1E-07	9.1E-07	2.3E-06	2.0E-08	6.6E-08	4.5E-05	2.9E-04	5.5E-06	1.7
Normanstone Creek	606,909	16.82	1.93	301.5	314	120	21.0	7.8E-03	2.7E-01	8.1E-02	8.8E-02	9.6E-04	5.2E-01	5.0E-05	1.5E-05	6.7E-05	1.7E-04	1.5E-06	4.8E-06	3.3E-03	2.1E-02	4.1E-04	126.1
Northwest Branch	1,130,691	31.76	3.64	703.0	593	339	34.5	1.5E-02	5.0E-01	1.5E-01	1.7E-01	1.8E-03	1.2E+00	9.3E-05	2.9E-05	1.3E-04	3.3E-04	2.7E-06	9.0E-06	6.2E-03	3.9E-02	7.7E-04	237.9
Oxon Run	5,368,247	151.87	17.39	1,933.1	2,829	1,258	151.0	7.0E-02	2.4E+00	7.3E-01	8.0E-01	8.6E-03	4.6E+00	4.4E-04	1.4E-04	6.1E-04	1.6E-03	1.3E-05	4.3E-05	3.0E-02	1.9E-01	3.7E-03	1,135.2
Pinehurst Branch	26,268	0.73	0.08	13.0	14	5	0.9	3.4E-04	1.2E-02	3.5E-03	3.8E-03	4.2E-05	2.2E-02	2.2E-06	6.6E-07	2.9E-06	7.5E-06	6.4E-08	2.1E-07	1.4E-04	9.1E-04	1.8E-05	5.5
Piney Branch	8,969	0.25	0.03	4.5	5	2	0.3	1.2E-04	4.0E-03	1.2E-03	1.3E-03	1.4E-05	7.6E-03	7.4E-07	2.2E-07	1.0E-06	2.6E-06	2.2E-08	7.2E-08	4.9E-05	3.1E-04	6.0E-06	1.9
Pope Branch	9,437	0.54	0.06	14.8	11	3	0.3	2.4E-04	8.6E-03	3.0E-03	3.3E-03	2.9E-05	2.1E-02	1.0E-06	5.0E-07	2.4E-06	5.9E-06	2.3E-08	7.5E-08	5.4E-05	5.1E-04	1.3E-05	4.4
Portal Branch	7,189	0.36	0.04	8.0	7	1	0.2	1.5E-04	5.7E-03	2.0E-03	2.2E-03	1.9E-05	1.2E-02	7.1E-07	3.3E-07	1.6E-06	3.9E-06	1.7E-08	5.7E-08	4.0E-05	3.4E-04	8.2E-06	2.9

Watershed	Annual Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	TPCB (lbs)	E. *coli* (Billion MPN)
Potomac Lower	6,688,261	188.45	21.58	2,400.3	3,512	1,569	187.9	8.7E-02	3.0E+00	9.0E-01	9.9E-01	1.1E-02	5.7E+00	5.5E-04	1.7E-04	7.5E-04	1.9E-03	1.6E-05	5.3E-05	3.7E-02	2.3E-01	4.5E-03	1,409.5
Potomac Middle	452,480	15.61	1.90	222.4	298	106	22.9	6.9E-03	2.5E-01	8.0E-02	8.7E-02	8.5E-04	4.8E-01	3.9E-05	1.4E-05	6.5E-05	1.6E-04	1.1E-06	3.6E-06	2.5E-03	1.7E-02	3.6E-04	119.6
Potomac Upper	3,488,292	100.01	11.49	1,294.9	1,876	828	97.8	4.6E-02	1.6E+00	4.9E-01	5.3E-01	5.7E-03	3.1E+00	2.9E-04	9.0E-05	4.0E-04	1.0E-03	8.4E-06	2.8E-05	1.9E-02	1.2E-01	2.4E-03	753.0
POTTF_DC	12,191,308	344.32	39.46	4,953.6	6,439	2,734	366.9	1.6E-01	5.5E+00	1.7E+00	1.8E+00	2.0E-02	1.1E+01	1.0E-03	3.1E-04	1.4E-03	3.5E-03	3.0E-05	9.7E-05	6.7E-02	4.3E-01	8.3E-03	2,584.2
POTTF_MD	798,380	22.53	2.58	287.6	421	187	22.3	1.0E-02	3.6E-01	1.1E-01	1.2E-01	1.3E-03	6.8E-01	6.6E-05	2.0E-05	9.0E-05	2.3E-04	1.9E-06	6.4E-06	4.4E-03	2.8E-02	5.4E-04	168.8
Rock Creek Lower	929,147	25.81	2.95	462.5	482	184	32.2	1.2E-02	4.1E-01	1.2E-01	1.4E-01	1.5E-03	7.9E-01	7.6E-05	2.3E-05	1.0E-04	2.7E-04	2.2E-06	7.4E-06	5.1E-03	3.2E-02	6.3E-04	193.4
Rock Creek Upper	3,664,917	102.12	11.70	1,839.5	1,912	727	127.0	4.7E-02	1.6E+00	4.9E-01	5.4E-01	5.8E-03	3.1E+00	3.0E-04	9.2E-05	4.1E-04	1.1E-03	8.9E-06	2.9E-05	2.0E-02	1.3E-01	2.5E-03	767.5
Soapstone Creek	420,000	11.82	1.36	217.8	225	86	14.6	5.5E-03	1.9E-01	5.8E-02	6.4E-02	6.8E-04	3.7E-01	3.5E-05	1.1E-05	4.8E-05	1.2E-04	1.0E-06	3.4E-06	2.3E-03	1.5E-02	2.9E-04	90.2
Texas Avenue Tributary	3,172	0.09	0.01	1.9	2	1	0.1	4.1E-05	1.4E-03	4.2E-04	4.6E-04	5.0E-06	3.2E-03	2.6E-07	7.9E-08	3.5E-07	9.1E-07	7.7E-09	2.5E-08	1.7E-05	1.1E-04	2.1E-06	0.7
Tidal Basin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Washington Ship Channel	452,480	15.61	1.90	222.4	298	106	22.9	6.9E-03	2.5E-01	8.0E-02	8.7E-02	8.5E-04	4.8E-01	3.9E-05	1.4E-05	6.5E-05	1.6E-04	1.1E-06	3.6E-06	2.5E-03	1.7E-02	3.6E-04	119.6
Watts Branch	5,330,503	147.74	16.91	3,263.1	2,760	1,599	162.4	6.9E-02	2.4E+00	7.1E-01	7.8E-01	8.5E-03	5.4E+00	4.4E-04	1.3E-04	5.9E-04	1.5E-03	1.3E-05	4.3E-05	2.9E-02	1.9E-01	3.6E-03	1,107.7
Watts Branch - Lower	1,560	0.04	0.00	1.0	1	0	0.0	2.0E-05	6.9E-04	2.1E-04	2.3E-04	2.5E-06	1.6E-03	1.3E-07	3.9E-08	1.7E-07	4.5E-07	3.8E-09	1.2E-08	8.6E-06	5.4E-05	1.0E-06	0.3
Watts Branch - Upper	5,328,943	147.69	16.90	3,262.1	2,759	1,598	162.4	6.9E-02	2.4E+00	7.1E-01	7.8E-01	8.5E-03	5.4E+00	4.4E-04	1.3E-04	5.9E-04	1.5E-03	1.3E-05	4.3E-05	2.9E-02	1.9E-01	3.6E-03	1,107.4
CSS - Anacostia	11,215,471	356.86	41.20	8,270.6	6,756	3,392	345.0	1.6E-01	5.7E+00	1.8E+00	1.9E+00	2.0E-02	1.3E+01	9.6E-04	3.2E-04	1.5E-03	3.7E-03	2.7E-05	9.0E-05	6.2E-02	4.2E-01	8.5E-03	2,711.5
CSS - Potomac	3,473,337	109.63	12.77	1,487.7	2,062	823	104.5	4.9E-02	1.7E+00	5.4E-01	6.0E-01	6.1E-03	3.4E+00	2.9E-04	9.8E-05	4.5E-04	1.1E-03	8.4E-06	2.8E-05	1.9E-02	1.3E-01	2.6E-03	827.5
CSS - Rock Creek	2,393,407	76.77	8.89	1,467.2	1,454	477	85.5	3.5E-02	1.2E+00	3.8E-01	4.2E-01	4.3E-03	2.4E+00	2.0E-04	6.9E-05	3.1E-04	8.0E-04	5.8E-06	1.9E-05	1.3E-02	8.9E-02	1.8E-03	583.5

Summary

The District of Columbia's Nonpoint Source Program meets the challenges of the highly urbanized setting within the District by seeking and employing innovative solutions for reducing nonpoint source pollution. With the help of creative partnerships and cutting-edge technologies, the District will continue to make significant progress toward achieving its goals. In FY 2016 the District will work to strengthen its existing programs for regulation and enforcement, stream and wetland restoration, education and outreach, and pollution prevention. The Nonpoint Source Program will continue to provide technical assistance and resources that will improve the quality of the District's waterways.

Appendix A: Financial Information

FY 2015 Grant	*Source*	*Federal*	*Match*
319 Grant (FY15)	EPA	$1,040,873	$693,916
Chesapeake Bay Implementation (Sec. 117)	EPA	$805,784	$805,784
Chesapeake Bay Regulatory Enhancement (Sec. 117)	EPA	$623,036	$623,036

Appendix B: Agency Partners

Lead Agency
DC Department of Energy and Environment, Watershed Protection Division

District Government
Deputy Mayor's Office for Planning and Economic Development (DMPED)
DC Department of General Services (DGS)
DC Department of Parks and Recreation (DPR)
DC Department of Public Works (DPW)
DC Department of Transportation (DDOT)
DC Metropolitan Police Department (MPD)
DC Office of Planning (OP)
DC Office of the State Superintendent of Education (OSSE)
DC Public Charter School Board
DC Public Schools (DCPS)
DC State Board of Education
DC Water and Sewer Authority (DC Water)
University of the District of Columbia (UDC)
Urban Forestry Administration (UFA)

Federal Government
Architect of the Capitol
National Park Service (NPS)
US Army Corps of Engineers (USACE)
US Department of Agriculture Natural Resources Conservation Service (USDA-NRCS)
US Environmental Protection Agency (EPA)
US Environmental Protection Agency, Chesapeake Bay Program (CBP)
US Fish and Wildlife Service (USFWS)
US Geological Survey (USGS)

Local Groups
Alice Ferguson Foundation (AFF)
Anacostia Watershed Society (AWS)
Casey Trees
DC Environmental Education Consortium (DCEEC)
DC Greenworks
DC Habitat for Humanity
Earth Conservation Corps (ECC)
Friends of Takoma Recreation Center
Golden Triangle Business Improvement District
Groundwork Anacostia
Interstate Commission on the Potomac River Basin (ICPRB)
Living Classrooms of the National Capital Region
Marina Environmental Education Fund (MEEF)
Metropolitan Washington Council of Governments (MWCOG)
North of Massachusetts Avenue (NoMA) Business Improvement District
Potomac Conservancy
Project Learning Tree (PLT)
Rock Creek Conservancy
Student Conservation Association (SCA)

Sustainable Community Initiative (SCI)
Washington Parks and People (WPP)
William Penn House