Alger Park post-restoration

DISTRICT OF COLUMBIA

2017 NONPOINT SOURCE MANAGEMENT PROGRAM

ANNUAL REPORT

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District of Columbia
Department of Energy and Environment
Watershed Protection Division

Table of Contents

EXECUTIVE SUMMARY **5**

MISSION AND GOALS OF THE DISTRICT OF COLUMBIA'S NPS MANAGEMENT PROGRAM **5**

GOAL ONE: SUPPORT ACTIVITIES THAT REDUCE POLLUTANT LOADS FROM URBAN RUNOFF, CONSTRUCTION ACTIVITIES, COMBINED SEWER OVERFLOWS, AND TRASH DISPOSAL **6**

TECHNICAL SERVICES BRANCH 7
INSPECTION AND ENFORCEMENT BRANCH 8
WQD, MONITORING AND ASSESSMENT BRANCH 9

GOAL TWO: SUPPORT AND IMPLEMENT ACTIVITIES THAT RESTORE AND MAINTAIN HEALTHY HABITAT, SPECIES DIVERSITY, AND WATER FLOWS TO ALL DISTRICT TRIBUTARIES **12**

STREAM AND WETLAND RESTORATION 12
Springhouse Run Stream Restoration *12*
Nash Run Stream Restoration *13*
Watts Branch Stream Restoration *13*
Pope Branch Stream Restoration and Sewer Line Replacement *13*
Alger Park Stream Restoration *14*
Fort Dupont Watershed Restoration *14*
Stickfoot Branch *14*
Linnean Park and Linnean Gully Stream Restorations *15*
Spring Valley Stream Restoration *16*
Pinehurst Branch Environmental Assessment *16*
WETLAND PROTECTION 16

GOAL THREE: COORDINATE NPS MANAGEMENT PROGRAM EFFORTS WITH OTHER DISTRICT, FEDERAL, AND PRIVATE SECTOR PROGRAMS AND ADJOINING JURISDICTIONS **19**

DISTRICT AGENCIES 19
District Department of Transportation (DDOT) *19*
Department of Public Works (DPW) *20*
Department of General Services (DGS) *20*
Department of Parks and Recreation (DPR) *20*
Office of Planning (OP) *20*
District of Columbia Public Schools (DCPS) *21*
FEDERAL AGENCIES 21
Department of the Interior (DOI) *21*
U.S. Department of Agriculture (USDA) *21*
U.S. Environmental Protection Agency (EPA) *22*
U.S. Geological Survey (USGS) *22*
NON-GOVERNMENTAL ORGANIZATIONS (NGOS) 22
Regional NGOs *22*
Universities *22*
Nonprofit Partners *22*

GOAL FOUR: SUPPORT PROGRAMS THAT AIM TO PREVENT NPS POLLUTION FROM INDIVIDUAL ACTIONS BY CARRYING OUT EFFECTIVE INFORMATION AND EDUCATION CAMPAIGNS **25**

Conservation Education (Project Learning Tree) *25*
Teacher Training Workshops *25*
DC Environmental Literacy Plan *25*

District of Columbia Environmental Education Consortium (DCEEC) *26*
The Anacostia Environmental Youth Summit *26*
Meaningful Watershed Educational Experiences (MWEEs) *26*
RiverSmart Schools *27*
Storm Drain Marker Program *28*
River Corps *28*
Outreach on Pet Waste and Enforcement of Pet Waste Regulations *28*
Integrated Pest Management (IPM) and Nutrient Management *28*
Anacostia River Explorers *29*
Community Stormwater Solutions Grants *29*
Trash Removal *29*
Coal Tar Ban *30*
Anacostia Clean Up and Protection Act Enforcement *30*
Snow and Ice Removal *30*

GOAL FIVE – IMPLEMENT PROGRAMS THAT AIM TO INCREASE NPS POLLUTION RUNOFF PREVENTION PRACTICES ON PRIVATE PROPERTY **33**

RiverSmart Rooftops (Green Roof Rebate/Retrofit Program) *33*
RiverSmart Communities Program *34*
RiverSmart Homes Program *34*
Rain Barrel Rebate Program *35*
Rain Garden, Pervious Paver, and Impervious Surface Reduction Rebate *35*
Tree Planting *36*

TARGETED WATERSHED WORK **38**

Texas Avenue Targeted Watershed *38*
Hickey Run Targeted Watershed *42*
Nash Run Targeted Watershed *47*

SUMMARY **53**

APPENDIX A: FINANCIAL INFORMATION **54**

APPENDIX B: AGENCY PARTNERS **55**

Lead Agency *55*
District Government *55*
Federal Government *55*
Local Groups *55*

Figures

Figure 1- A RiverSmart Homes auditor tabling at a community event 6
Figure 2 – Erosion from a construction site during a rain event 8
Figure 3- A bioretention cell clogged with sediment 9
Figure 4- Erosion in Oxon Run 9
Figure 5– Springhouse Run – post restoration 12
Figure 6- Alger Park post-restoration 13
Figure 7- Linnean (RSC) groundwater fluctuations compared to Spring Valley, the control site. 15
Figure 8 – Mapping erosion in Pinehurst Branch 16
Figure 9 – A permeable paver alley installed near the National Arboretum 19
Figure 10– Impervious Surface Removal at the Takoma Recreation Center 20
Figure 11– A bioretention project at the National Arboretum 21
Figure 12- Students boarding a boat at the Anacostia Environmental Youth Summit 26
Figure 13- A bioretention project treating stormwater at Seaton Elementary 27
Figure 14- RiverCorps conducting photo monitoring for Nash Run 28

Figure 15– A RiverSmart Rooftops install 33
Figure 16– BayScaping and a rain barrel....34
Figure 17- A Monarch butterfly caterpillar on a milkweed leaf, photographed by a RiverSmart Homeowner in her BayScaping.....35
Figure 18- A newly installed permeable paver project....35
Figure 19- Ribbon cutting for the restored Alger Park stream 38
Figure 20- Percent of Goal Achieved for Tracked BMPs in Texas Avenue Tributary....39
Figure 21– The completed Springhouse Run restoration project....42
Figure 22- Percent of Goal Achieved for Tracked BMPs in Hickey Run....43
Figure 23– The restored Nash Run in full bloom (July 2017)....47
Figure 24- Percent of Goal Achieved for Tracked BMPs in Nash Run....47
Figure 25 - Change in Dissolved Oxygen in Nash run 48

Tables

Table 1 – Tracking activities that reduce pollutant loads from urban runoff, construction activity, combined sewer overflows, and trash disposal....10
Table 2 - Nash Run Post-Restoration Instantaneous Water Quality Data....13
Table 3 - Pre- and post-restoration data for Linnean Park and Spring Valley (control) 15
Table 4 - Tracking activities that strive to restore and maintain healthy habitat, species diversity, and water flows to all District tributaries....18
Table 5 - Tracking activities that coordinate NPS efforts with other District, federal and private sector programs, and adjoining jurisdictions 24
Table 6 - Tracking activities that aim to prevent NPS pollution from individual actions, by carrying out effective information and education campaigns 32
Table 7 - Tracking activities that aim to increase NPS pollution runoff prevention practices on private property 37
Table 8 - Tracking activities that reduce stream bank erosion, upland runoff, and pollutant loads to the Texas Avenue Tributary....40
Table 9 - Tracking activities that reduce stream bank erosion, upland runoff, and pollutant loads to Hickey Run.....44
Table 10 - Tracking Activities that reduce stream bank erosion, upland runoff, and pollutant loads to the Nash Run Tributary....49
Table 11 - Annual runoff volume and load reductions associated with the FY 2017 BMP inventory for the District of Columbia 51

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 (District) 319 Nonpoint Source (NPS) Management 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 (BMP) implementation and tracking, stream restoration efforts, education and outreach, and other measures to reduce NPS pollution loads.

In fiscal year (FY) 2017, the District received $1,004,000 through the Environmental Protection Agency (EPA) 319(h) grant and matched it with $676,000 to support the District's NPS pollution reduction activities. Over the course of its fiscal year 2017, which runs from October 1, 2016 through September 30, 2017, the District completed the installation of five RiverSmart Schools projects and audited 939 homes, installed 360 rain barrels, 974 trees, and 118 rain gardens through the RiverSmart Homes program. Additionally, DOEE completed a major stream restoration project at Springhouse Run, a tributary of Hickey Run. DOEE has targeted three subwatersheds for more intensive restoration efforts: Hickey Run, Texas Avenue Tributary, and Nash Run. Restoration activities in these subwatersheds funded by the 319(h) grant and other funding sources have resulted in 21 stormwater retrofits treating 2.58 acres.

Mission and Goals of the District of Columbia's NPS Management Program

The mission of the District's NPS Management Program is to prevent and control NPS pollution in its watersheds. Employing both regulatory and non-regulatory approaches, the NPS Management Program works to safeguard the District'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 *Nonpoint Source Management Plan for the District of Columbia, 2014: Reducing Polluted Runoff and Restoring the District's Waterways*. The plan is aimed at reducing NPS 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 implementing activities that 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 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 NPS pollution in the District with the resources available;
- Supporting programs that prevent NPS 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 and its watersheds; and
- Implementing programs that increase participation in practices that prevent NPS pollution runoff on private property, by reaching at least 1,000 properties per year.

The District's NPS Management Program has also created four detailed watershed implementation plans (WIPs) for three major watersheds in the District and for the District as a whole. All of these plans, including the *Oxon Run WIP* (2010), *Rock Creek WIP* (2010), the *Anacostia River WIP* (2011), and the *Consolidated TMDL Implementation Plan* (2016) have been approved by EPA. Additionally, the District participated in the development of the Anacostia Watershed Restoration Plan, which was facilitated by the U.S. Army Corps of Engineers and released to the public in April 2010. These plans lay out waterbody impairments, technically appropriate implementation projects, and timelines that guide DOEE in its work.

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 that are included in the District'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 waterbodies. Primary NPS pollutants of concern include nutrients, sediment, toxicants, pathogens and hydrocarbons. The few waterbodies that partially or fully support a designated use are also threatened by NPS pollutants. Processes to prioritize subwatersheds for NPS implementation in the District can be found in the WIPs referred to above. To properly address the water quality problems associated with the District's urban environment, DOEE has created a new NPS management plan. The new document outlines a comprehensive strategy for managing NPS pollution in an urban environment in an effort to restore beneficial uses, and sets new goals and objectives, including specific milestones for when the goals and objectives will be achieved.

Figure 1- A RiverSmart Homes auditor tabling at a community event

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 FY 2017 by the District in implementing its *Nonpoint Source Management Plan for the District of Columbia, 2014*.

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

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

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

Additionally, DOEE's Water Quality Division (WQD), 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 (PROW) projects, and stream restoration 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 (ESC) measures, hotspot concerns, post-construction land cover designations, stormwater 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, and 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 stormwater 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 stormwater management (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 ESC regulations, enacted in 1987, the District regulates all land disturbance over 50 square feet and requires onsite 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 onsite and offsite retention, or paying a fee-in-lieu for not meeting the stormwater retention standard.

FY 2017 was the third full year that projects had to comply with all aspects of the 2013 stormwater regulations. Although now widely understood by the development community, TSB continues to hold regular biweekly half-day meetings 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, and DOEE hired additional plan reviewers to help with the workload in FY 2017. 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 PROW compliance.

FY 2017 also marked the third year of DOEE reviews of the green area ratio (GAR), the zoning requirements for environmental high-performance landscape elements. DOEE has stand-alone guidance for the GAR compliance process and a guidance manual to support GAR plan submission, review and inspection. In 2017 DOEE held four GAR training sessions to support applicants, DOEE staff, Department of Consumer and Regulatory Affairs, and Zoning reviewers and inspectors.

TSB staff, with staff support from CWP, continues the development of training sessions. DOEE held three BMP training sessions focused on unique practices, nine trainings on the process for stormwater retention credit trading, five trainings on general stormwater compliance, and 12 trainings on the stormwater retention credit trading database in 2017. TSB continued to work with the District Department of Transportation (DDOT) on updates to its green street standards and specifications to ensure these 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.

TSB staff worked with DOEE's Stormwater Management Division to add details and plan sets for voluntary retrofits into the stormwater database. Specifically DOEE focused on adding RiverSmart Homes participants and green roof rebate participants to the database. This allows for better tracking of voluntary retrofits and faster applications for stormwater retention credit and stormwater fee discounts.

In FY 2017 TSB accomplished the following:

Figure 2 – Erosion from a construction site during a rain event

- Reviewed 1,830 building permit applications and plans for regulatory compliance;
- Approved 1,559 building permit applications and plans for regulatory compliance;
- Reviewed 234 building permit applications and plans for SWM compliance;
- Approved 207 building permit applications and plans for SWM compliance;
- Processed 76 Environmental Impact Screening Forms after they were reviewed for regulatory compliance;
- Completed updates to the District's ESC Guidebook;
- Reviewed 30/65/90 percent maximum extent practicable submissions for 25 DDOT projects;
- Reviewed 218 GAR submissions; and
- Provided training to 229 people through 37 trainings on new regulations and guidance materials through a combination of internal and public workshops.

In addition to these regulatory actions, engineers from TSB 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 the following:

- Committee Participant
  - Chesapeake Bay Program (CBP) Urban Stormwater Work Group
  - CBP BMP Verification Review Panel
  - DC Flood Risk Management (Silver Jackets) Team Meetings
  - District ESC Guidebook Revision (DOEE)
  - DC Community Rating System Program Overview Meeting
  - Mitigation Working Group Quarterly Meeting/Conference Call
  - DC Construction Codes Coordinating Board – Flood Hazard Special Committee
  - DC Construction Codes Coordinating Board – Mechanical Technical Advisory Group
  - Flood Inundation Map Task Group
  - Flood Emergency Planning Task Group
  - Interior Flooding Task Group

Inspection and Enforcement Branch

IEB inspects construction sites throughout the District to ensure they are in compliance with District regulations. IEB also regularly inspects existing SWM facilities to ensure 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. IEB 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, IEB has established and published guidelines for their proper maintenance.

In FY 2017 IEB accomplished the following:

- Conducted 3,328 inspections at construction sites for enforcement of ESC and 1,118 inspections for SWM BMP construction;
- Issued 93 Final Approval Notices for completion of implementation of SWM BMPs for land disturbance or land cover;
- Conducted 67 GAR inspections and 29 GAR final inspections;
- Completed a final draft of the ESC handbook;
- Took 83 enforcement actions, including stop-work orders and notices of infractions, notices of violation, and maintenance notices to strengthen enforcement activities;
- Inspected 1,197 SWM facilities to ensure proper function for operation and maintenance;
- Performed 190 maintenance service completion inspections for compliance with District regulations for SWM BMP operation and maintenance;
- Issued 144 maintenance notices to BMP owners to perform maintenance to SWM BMPs as listed on the SWM plan; and
- Continued to develop self-reporting/self-certification protocol and operating procedure of SWM BMP maintenance inspection reporting for SWM BMP owners or their agents.

Figure 3- A bioretention cell clogged with sediment

Figure 4- Erosion in Oxon Run

IEB continues to scan older approved plan sets and inspection forms for upload into the QuickBase database. Making this information available digitally has enabled inspectors to more efficiently perform inspections and develop inspection reports and enforcement notices, records of inspection, and other documents – all while in the field. Additionally all inspection forms and notices are now signed electronically by inspectors and the regulated community and issued in an electronic format.

WQD, Monitoring and Assessment Branch

Every year DOEE monitors 36 waterbody segments to determine their health 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 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	2016	2017	2020 Goal	% of 2020 Goal achieved
Objective 1a: To reduce pollutant loads in targeted watersheds	Milestone 1: Install LIDs in targeted watersheds	Number of BMPs Installed					
		3	117	42	21	N/A	N/A
		Area Treated					
		19.1	38.0	11.8	2.58	N/A	N/A
	Milestone 2: Monitor water quality of all District streams	Number of streams monitored					
		3	4	4	4	N/A	N/A
		Number of pollutants monitored					
		30	30	30	30	N/A	N/A
	Milestone 3: Produce annual report of state of the District's waterways	Number of reports					
		1	2	1	2	N/A	N/A
Objective 1b: To review, permit, and inspect all BMPs installed in the District	Milestone 1: Review all erosion and sediment and stormwater permit applications	Number of permits reviewed					
		3,264	3,597	4,796	5,158	N/A	N/A
		Number of permits approved					
		2,882	1,684	1,475	1,559	N/A	N/A
	Milestone 2: Inspect all permitted BMPs	Number of site inspected					
		5,326	2,237	4,364	4,446	N/A	N/A
		Number of sites in compliance					
		724	436	913	666	N/A	N/A
	Milestone 3: Keep a tracking database of permitted BMPs	Total Number of BMPs Installed					
		3,893	4,065	3,757	1,984	N/A	N/A
		Number of new sites with BMPs					
		211	172	228	205	N/A	N/A

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2020 Goal	% of 2020 Goal achieved
Objective 1c: To increase the number of waterbodies meeting water quality standards	Milestone 1: Install LIDs in watersheds with approved WIPs	Number of BMPs Installed					
		229	418	1378	1284	N/A	N/A
		Area Treated (acres)					
		290	173	152	153	N/A	N/A
	Milestone 2: Monitor District streams for water quality improvements	Number of streams monitored					
		25	25	25	25	N/A	N/A
		Number of pollutants monitored					
		30	30	30	30	N/A	N/A
	Milestone 3: One water quality improvement	Measured or calculated water quality improvement					
		0	0	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 Planning and Restoration Branch (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 WQD'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 2017, DOEE continued to work towards construction of several ongoing projects, performed pre- and post-restoration monitoring at completed and future restoration sites, and constructed two stream restoration projects. WPD currently has 23,000 linear feet of restored stream under post-restoration monitoring and has over 35,000 linear feet of stream reaches in the design phase process to be restored in coming years.

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 was stable, although 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.

DOEE coordinated the design of a stream and habitat restoration for Springhouse Run, which was delivered in late 2014. A construction contract was awarded in July 2016 and construction was completed in summer 2017. This project reach measures approximately 1,800 feet in length and lies entirely within the U.S. National Arboretum. A total of 44,120 square feet of nontidal wetlands were created in three sections of the stream.

Figure 5– Springhouse Run – post restoration

An additional component of this project was to construct bioretention facilities in the parking areas near the Arboretum Visitor Center. This project was funded in part with EPA 319 funds and was completed in 2017, and native plants were added by the Arboretum. As this project was only recently completed, we do not yet have post-restoration monitoring data for the site. We will add this information in the FY 18 Annual report.

Nash Run Stream Restoration

The Nash Run Stream Restoration and Trash Trap project was successfully completed in FY 2016. The 1,408 linear foot restoration project turned a degraded urban stream with high bank erosion rates into a stable stream with a hydrologically connected floodplain bench along both stream banks. Additionally, DOEE installed a floatable trash trap at the upstream-most part of the project area to capture floatable trash exiting the stormwater outfall at the top of the project area.

Table 2 - Nash Run Post-Restoration Instantaneous Water Quality Data

Parameters	Units	5/16/2017	6/15/2017	8/31/2017	Mean
Dissolved Oxygen	mg/L	13.7	20.46	12.14	15.43
pH	-	8.03	9.02	6.84	7.96
TDS	mg/L	507	429	435.5	457.2
Conductivity	mS/cm	0.77	0.67	0.64	0.69
Turbidity	NTU	16	-	10	13
Water Temperature	C	24.3	25.7	22.8	24.3
Nitrate	mg/L	1.2	-	2.77	1.99
Orthophosphate	mg/L	0.52	-	0.12	0.32
Flouride	mg/L	0.2	-	0.2	0.2
Ammonia	mg/L	0.02	-	0.04	0.03

The completed project is a tremendous improvement to the surrounding neighborhood and the Anacostia River. DOEE needed over 20 adjacent property owners to sign temporary easement forms to allow the District execute the project on private property. The restoration project will reduce 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 to the Anacostia River. DOEE is monitoring the health of the stream to demonstrate water quality improvement. As the project was only recently completed, post-restoration data is not yet available. Pre-restoration data can be found in Table 2.

Watts Branch Stream Restoration

The Watts Branch Stream Restoration Project was completed in early FY 2012. 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.

Figure 6- Alger Park post-restoration

Pope Branch Stream Restoration and Sewer Line Replacement

In 2016, DOEE and its partner, DC Water, completed the 4,780-foot-long stream restoration project at Pope Branch using regenerative stream design techniques. The construction access road that ran along the stream is now a walking path for residents, providing better access to the

restored stream valley. An annual cleanup is hosted on Martin Luther King Jr. Day at the site, helping to maintain the integrity of the project. As this project was only recently completed, we do not yet have post-restoration monitoring data for the site. We will add this information in the FY 18 Annual report.

Alger Park Stream Restoration

The 1,540-foot Alger Park Stream Restoration was completed in 2017. The stream restoration project used regenerative stream restoration techniques and added over one-half an acre of wetlands to the stream corridor. The project planted over 3,000 wetland plants, 300 shrubs, and 300 trees. Prior to restoration conservative estimates showed that Alger Park was transporting over 100 tons of sediment per year due to stream bank erosion and was one of the most highly incised streams in the District. DOEE has also done estenstive outreach in the watershed related to our RiverSmart Homes program to ensure we maximized the installation of private home LID practices in the area that drains to Alger Park. As this project was only recently completed, we do not yet have post-restoration monitoring data for the site. We will add this information in the FY 18 Annual report.

In addtion to DOEE's work in the watershed, in 2017 DDOT completed designs for upland LID projects in the subwatershed area that drains into Alger Park. In 2018, DDOT will install approximately 30 LID projects in the public space areas that drain to Alger Park which will capture and filter stormwater before it enters the stream valley.

DOEE continued to meet with community members and community groups throughout the year to update them on the project's progess.

Fort Dupont Watershed Restoration

The Fort Dupont watershed is included in the District's Anacostia River WIP approved in 2012 by the EPA. DOEE commenced a comprehensive project in 2017 to restore the Fort Dupont watershed with five main components: 1) community outreach and education activities focused on watershed restoration; 2) upland LID work on private property within the watershed through voluntary implementation efforts; 3) installation of LID on National Park Service (Park Service) or PROW areas; 4) stream restoration work; and 5) wetland restoration work. In 2017, DOEE contracted an environmental assessment (EA) to explore the impacts of stream and wetland restoration work in the park, which would allow for the restoration of over 10,000 linear feet of stream and five acres of wetlands. The scope of work in this EA will explore the options to implement the proposed actions of the Fort Dupont watershed restoration project that would take place on Park Service property in the watershed. DOEE also partnered with the Park Service and the Federal Highways Administration to add LID projects along the roadways that intersect the park.

DOEE expects to complete the EA in early 2018 and will then move forward with design and construction work for stream and wetland restoration, and DOEE expects the LID projects to be installed along the roadways in late 2018 or early 2019. DOEE will also move forward with a comprehensive plan to engage communities that surround the park to include them in the restoration efforts.

Stickfoot Branch

In 2017, DOEE enterted into an agreement with DC Water to restore a headwater tributary of Stickfoot Branch in the southeast part of the District that drains into the Anacostia River. The work will include the restoratin of 800 feet of highly incised stream channel, protection of a sanitary sewer line, and the improvement of three storm sewer outfalls in the restoration area. DOEE will begin the EA and design work for Stickfoot Branch in 2018.

Linnean Park and Linnean Gully Stream Restorations

In FY 2014, DOEE completed the installation of a regenerative stormwater conveyance (RSC) system in Linnean Park that restored 1,000 linear feet of in-stream habitat. The Linnean Park tributary is a perennial stream that was degraded by stormwater runoff from a 24.5-acre watershed dominated by single family homes and wide suburban streets. Table 3 provides baseflow and stormflow data for the restoration project.

Table 3 - Pre- and post-restoration data for Linnean Park and Spring Valley (control)

	RSC – Pre construction			***RSC – Post construction***		
	Kg $ha^{-1}yr^{-1}$			*Kg $ha^{-1}yr^{-1}$*		
Parameter	**Baseflow**	**Stormflow**	**Total**	**Baseflow**	**Stormflow**	**Total**
Area (ha)	13.44	13.44	13.44	14.73	14.73	14.73
Runoff (m^3)	27,511	55,890	83,402	28,855	46,186	75,041
TSS	21.2	599.8	620.9	19.4	127.9	147.3
TN	3.08	8.87	11.96	1.52	3.39	4.91
TP	0.19	1.39	1.58	0.18	0.54	0.73

This project, partially funded by a National Fish and Wildlife Foundation grant, was monitored to better understand the efficacy of the RSC restoration approach. The University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory performed pre-installation monitoring for concentrations of nutrients, sediment, metals, bacteria, flow volume and velocity, water temperature, and habitat health. In FY 2016 the researchers continued post-restoration monitoring of the project area and a final report was submitted to DOEE 2017. The project used 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.

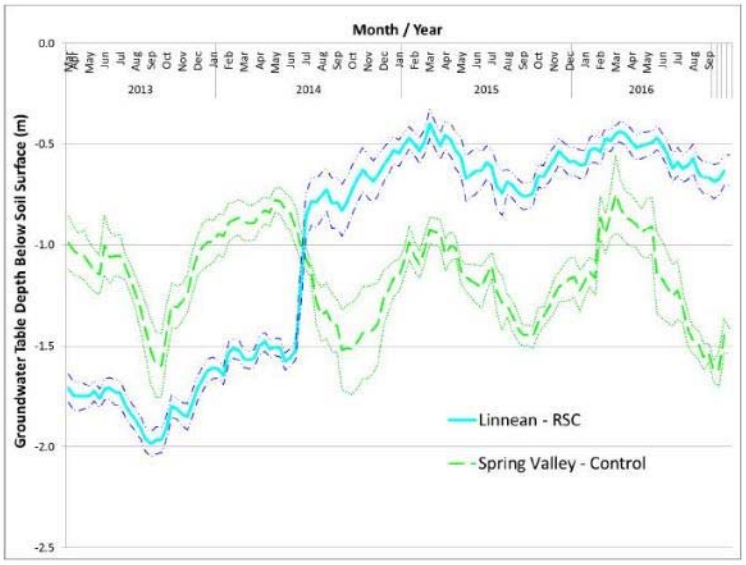

Figure 7- Linnean (RSC) groundwater fluctuations compared to Spring Valley, the control site.

The data show that the RSC restoration project reduced phosphorous, nitrogen, and sediment loading in both baseflow and especially stormflow levels of the Linnean Park stream. The construction, which took place in early summer of 2014, raised the average groundwater table depth substantially, especially as compared with the control site, Spring Valley, which fluctuated more but remained lower on average. A higher groundwater table indicates a closer connection between a stream and its floodplain.

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 stream, a tributary of the Potomac River. The basis of design for the stream channel is to replace the existing incised stream channel with a stable stream channel located just below the top of bank elevation for the majority of the approximately 1,100 linear feet of channel. The proposed channel cross section has been sized to convey stormflows within a proposed channel with increased flow width and shallower flow depth to reduce channel shear stress and minimize potential bank erosion.

In FY 2017 DOEE awarded a design-build contract for the restoration of the Spring Valley stream. Design advanced in 2017 to the conceptual phase and DOEE hopes to have final designs in 2018 with construction commencing soon thereafter. DOEE also met with community members to inform them about this project and encourage them to adopt practices on their properties to reduce stormwater runoff to the stream.

Pinehurst Branch Environmental Assessment

Pinehurst Branch originates at the District/Maryland border and flows approximately 1.3 miles east-southeast on Park Service property to its confluence with Rock Creek. The 619-acre Pinehurst Branch watershed land use is approximately 70% residential and commercial development and 30% parkland. Approximately 70% of the watershed lies within the District, with the remaining in Montgomery County, Maryland. The large amount of imperviousness in the watershed has caused significant erosion in Pinehurst Branch, resulting in sediment transport to Rock Creek and exposed sanitary sewer lines in the stream. DC Water is planning to abandon or remove existing sanitary sewer lines in Pinehurst Branch in early 2018 and DOEE will coordinate with DC Water to restore the stream following completion of the sanitary sewer line work.

Figure 8 – Mapping erosion in Pinehurst Branch

The Pinehurst Branch stream restoration project will be a comprehensive restoration project that addresses current degraded conditions in the stream, including eroding banks, exposed sewer lines, and invasive vegetation. The first step in restoration is to conduct an EA as required by the National Environmental Policy Act. The scope of work in this EA will explore the options to implement the proposed actions of the Pinehurst Branch restoration project that would take place on Park Service property. The EA will consider the potential to implement restoration activities that could meet the following objectives: to restore approximately 7,900 feet of degraded stream reaches; to create conditions suitable for wildlife habitat; and to improve the condition of existing wetlands.

The EA contract was awarded to a local contractor in April 2017 and will be completed in April 2018. With input from the Park Service and surrounding community, decisions about the design and construction of the stream restoration project will be made based upon the preferred alternative selected from the EA. If an alternative proves viable, a design contract with be awarded in early to mid-2019. Pending the availability of funding, another solicitation will be advertised and a contract awarded for construction, possibly before the end of 2021.

Wetland Protection

WQD'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 had not been done since 1997. The new information will be mapped using geographic information system (GIS) technology to accurately create digital maps that will be publically available. Making the map electronically available will aid developers in identifying wetlands that may be impacted, and aid the District in identifying areas with potential for wetland restoration. In FY 2016 DOEE completed a draft version of the report and the maps associated with the project. A final version of the plan is expected to be released in FY 2018.

Table 4 - Tracking activities that strive to restore and maintain healthy habitat, species diversity, and water flows to all District tributaries

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2020 Goal	% of 2020 Goal Achieved
Objective 2a: To restore five miles of stream by 2025	Milestone 1: Restore two miles of stream by 2020	Miles of stream restored					
		0.55	0	1.17	1.27	2	149.5%
	Milestone 2: Restore additional three miles of stream by 2025	Miles of stream restored					
		N/A	N/A	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	4.38	2.01	70	10.1%
	Milestone 2: Increase wetlands by an additional 50 acres by 2035	Acres of wetland created					
		N/A	N/A	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	48	48	N/A	N/A
		Total wetland acres					
		280	280	280	280	N/A	N/A
	Milestone 2: Update wetland regulations	Number of updated regulations					
		0	0	0	0	N/A	N/A
	Milestone 3: Protect District wetlands from degradation, encroachment, or destruction	Acres of wetlands protected					
		280	280	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 U.S. 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 are designed and implemented effectively.

District 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)

DOEE regularly partners with DDOT's Storm Water Management Branch to green District transportation infrastructure by ensuring that DDOT projects minimize stormwater runoff. In FY 2017, DDOT worked on engineering designs for the following projects using a combination of DOEE and EPA funds:

- Klingle Valley Watershed Green Streets
- Alger Park Upland LID
- Constructing permitted LID retrofits in the PROW

Figure 9 – A permeable paver alley installed near the National Arboretum

Each of these projects will install bioretention, permeable pavement, and other appropriate volume-reduction techniques to retain stormwater runoff from streets and alleys that drain into District waterways. Additionally, DDOT completed construction on LID retrofits in the Oxon Run watershed that included 11 bioretention cells treating a 387,000 square-foot area. DDOT also worked around Fort Davis installing stormwater retrofits including permeable pavement, biorentention cells, and tree planting that treat a 40,000 square-foot area. Both of these completed projects were funded utilizing Clean Water State Revolving Fund (CWSRF) monies. Finally, DDOT is in the process of constructing roadway and bike trail retrofits in the Rock Creek watershed, and several LID retrofits in the PROW. The Klingle and Alger sites were chosen specifically because they outfall to existing or planned stream restoration sites.

Furthermore, DOEE has worked with the Urban Forestry Division (UFD) within DDOT on three major efforts. First, DOEE completed new ESC guidelines and is working with UFD to develop measures that reduce construction's impact on existing trees. Second, DOEE and UFD continued to partner on a project to develop and implement tree planting plans on District school property and parklands. Lastly, DOEE

and UFD worked together to select a grantee for an initiative aimed at developing and implementing planting plans on large parcels. This effort will begin in earnest in FY 2018.

Department of Public Works (DPW)

DOEE entered into an annual memorandum of understanding (MOU) with DPW to fund activities required by the District's municipal separate storm sewer system (MS4) permit. In FY 2017, DOEE provided DPW with funding to maintain regenerative air street sweepers; print and disseminate brochures on the District's lead collection program; and conduct a drop-off and disposal program for household hazardous waste. Additionally, in 2017 DPW aided in the maintenance of permeable pavement installed on public projects throughout the District.

DOEE, in partnership with DPW, will design and install water quality practices and stormwater retention practices at two solid waste transfer stations—Fort Totten and Benning Road. The trash transfer stations are located in the MS4 in the Anacostia River watershed. The project will therefore benefit the waters and ecosystems of the Anacostia River by lessening the volume of trash, organic matter, and bacterially- and/or chemically-polluted stormwater leaving these sites and entering the Anacostia River through storm drains. EPA Clean Water State Revolving Fund is contributing $1,174,250 and the Department of Public Works is contributing $960,750 for this work.

Department of General Services (DGS)

DOEE has partnered with two groups within DGS. Over the past year, the Sustainability and 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 2017, DGS completed the installation of 100,000 square feet of green roofs on five schools, one police station, and one fire station. Additionally, DOEE works 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 the FY 2017 reporting period, OCP managed several contracts for the design and installation of LID practices and stream restoration.

Figure 10– Impervious Surface Removal at the Takoma Recreation Center

Department of Parks and Recreation (DPR)

DPR provides quality urban recreation and leisure services for residents of and visitors to the District. DPR supervises and maintains area parks, community facilities, swimming pools and spray parks, and neighborhood recreation centers. In FY 2017 DOEE and DPR continued to work together on tree planting efforts on DPR lands, urban vegetable gardens, and an MOU for the installation of LID on several other DPR parcels. DOEE completed the construction of one LID retrofit in FY 2017 and began contracting for three others. Additional contracting and construction of LID retrofits will occur in FY 2018.

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 2017 DOEE worked with OP on targeted planning efforts for small District parks (less than one acre in size) and on the development of the Anacostia Waterfront—especially the waterfront trail and Buzzard Point development.

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 RiverSmart Schools and DGS renovations.

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 (DOI)

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.

Figure 11– A bioretention project at the National Arboretum

In FY 2017, DOEE worked with the Park Service on contracting efforts to install LID retrofits in the parking area of the Carter Barron Tennis Center and Amphitheater, roadway retrofits in Fort Dupont, and EAs for the Fort Dupont and Pinehurst Branch tributaries. Additionally, DOEE discussed with the Park Service expedited permitting and partnering on future restoration efforts. FWS is 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)

In 2017 DOEE completed the construction of an LID retrofit and stream restoration project on the National Arboretum's grounds which is managed by the USDA. The LID captures and filters stormwater from the parking areas near the visitor's center, which drains to Hickey Run. The stream restoration project restored Springhouse Run, a tributary of Hickey Run and the Anacostia River. DOEE and the Arboretum hope to replicate similar projects in future years.

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. Additionally, DOEE has completed the activities required under its 2012 MS4 permit and coordinated with Region III on a new draft permit which was issued for public comment in FY 2017. Finally, the District receives funds from the EPA Chesapeake Bay Program for Bay Program goal implementation activities that aid in restoring 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 (NGOs)

The District works with many local 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 FY 2017 MWCOG continued to perform macroinvertebrate sampling and fish surveys to document the District's progress towards restoration of its waterways. 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 2017 DOEE has worked with American University to support tree planting on their campus. Additionally the University of Maryland completed work for DOEE in which they monitored several District streams to examine the effectiveness of stream restoration practices through a grant provided by DOEE. Some of the final monitoring results can be found in Table 3.

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 its NPS management obligations.

Nonprofit partners that DOEE worked with in FY 2017 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;
- Groundwork Anacostia, which maintains trash traps on the Anacostia and its tributaries;
- The nonprofit grantees that oversee aspects of the RiverSmart Homes program including Casey Trees and the Alliance for the Chesapeake Bay;
- The American Society of Landscape Architects (ASLA) was awarded a grant from DOEE to design and construct voluntary stormwater retrofits on three blocks of Eye Street NW in the densely developed downtown area of the District. Because of the visibility of the Chinatown location, this project will serve as a tool for education an outreach in addition to providing a stormwater treatment and retention benefit. The total funding approved is $1,295,000 from EPA Clean Water State Revolving Fund and $1,060,800 from ASLA; however, the project is in design phase, so only a small portion of this amount has been awarded to date.
- The Golden Triangle Business Improvement District (GT BID) was awarded a grant from DOEE to design and construct voluntary stormwater retrofits on three blocks of the 19th Street corridor in NW DC. This voluntary project will reduce impervious surface by adding green infrastructure, and will decrease the volume of water entering the combined sewer system (CSS). The total funding approved is $884,352from EPA Clean Water State Revolving Fund and $723,560from GT BID; however, the project is in design phase, so only a small portion of this amount has been awarded to date.
- Casey Trees and Washington Parks and People manage grants planting trees at District parks and schools; and
- The nonprofits that oversee environmental education grants include Project Learning Tree, the District of Columbia Environmental Education Consortium, the Earth Conservation Corps, Living Classrooms, the Alice Ferguson Foundation (AFF), and Nature Bridge

Table 5 - Tracking activities that coordinate NPS efforts with other District, federal and private sector programs, and adjoining jurisdictions

OBJECTIVES	MILESTONES	2014	2015	2016	2017	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	8	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	55	80	N/A	N/A
		Number of joint committees annually					
		25	25	25	43	N/A	N/A
	Milestone 2: Demonstrate two programmatic partnership successes annually	Number of successful partnerships					
		4	2	4	2	14	85%
Objective 3c: To participate on Region 3 and Bay Program Technical Advisory Committees	Milestone 1: Join technical committees	Number of committees participating on annually					
		16	25	17	25	N/A	N/A

Goal Four: Support Programs That Aim to Prevent NPS 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 for the following reason, among others:

- 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 teaches critical thinking skills that lead to environmental stewardship (grades K-12). DOEE offers PLT training workshops free to those that request them. In FY 2017, DOEE staff conducted three educator workshops for 119 staff.

Teacher Training Workshops

Workshops in environmental education provide teachers and informal educators with environmental curricula that support the District's teaching and learning standards, and provide students with meaningful environmental education experiences via outdoor activities and events. Teachers in the RiverSmart Schools program receive 16 seat hours of training on SWM designs and classroom lessons on sustainability. In FY 2017, 101 teachers participated in the training workshop and received education resource kits for their classrooms.

DC Environmental Literacy Plan

In July 2014, Mayor Vincent Gray (2011-2014) 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 (ELP) first developed under the Healthy Schools Act. In FY 2017, DOEE continued to collaborate with stakeholders to implement the District ELP. In partnership with nonprofit organizations, DOEE began implementation of the 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. Four of the eight model schools were DOEE RiverSmart Schools participants. 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. DOEE continues to work with OSSE to implement the ELP, which will bring environmental education, including meaningful outdoor experiences, to District youth.

District of Columbia Environmental Education Consortium (DCEEC)

DOEE helps organize a network of environmental educators throughout the District so that ideas and resources can be shared among them. 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 2017 DOEE and DCEEC hosted their 10th annual DC Teacher's Night at the U.S. Botanic Garden. Over 200 teachers registered and those in attendance 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 12- Students boarding a boat at the Anacostia Environmental Youth Summit

The District held its inaugural Growing Healthy Schools Month, which is the fusion of DC School Garden Week and DC Farm to School Week. Growing Healthy Schools Month 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.

In FY 2017 DOEE assisted the consortium with an initiative on Nature Near School mapping. The goal is to identify public parks within 0.25 miles (5-minute walk) of all District schools. This effort will continue in FY 2018 to ensure all schools know walkable mini-field trips that would enrich the environmental literacy efforts.

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 2017, the event hosted nine schools, 447 students and 30 teachers, 21 exhibitors, 13 volunteers, and seven judges. The event was a success, with teachers giving positive feedback on the experience of youth gathering and presenting knowledge with the various environmental exhibitors.

Meaningful Watershed Educational Experiences (MWEEs)

As part of DOEE's sub-grant program, several initiatives were funded for nonprofit partners to create MWEEs for hundreds of District youth. In FY 2014 the grant program focused on students in Wards 7 and 8. AFF 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 2017, 1,603 fifth-grade students who were enrolled in District Public Schools and Public Charter Schools participated in the overnight MWEE program. AFF continues to administer this program in partnership with NatureBridge and Living Classrooms.

In addition to the overnight MWEE program, DOEE funds a trash-focused MWEE awarded a nonprofit partner, Live It Learn It, to offer day programming to students in Wards 7 and 8. This program reached 340 students in FY 2017.

While the program has greatly expanded since 2014, the District has fallen short of the goal set in Table 6 Objective 4d. The shortfall can be explained for several reasons, including the following:

- There are only approximately 4,200 fifth graders in the District, so the goal was never attainable;
- 2017 is the third year the program was offered District-wide. Attaining 100% participation in three years is unrealistic; and
- Even if running at full capacity, the program could not be expected to reach 100% of the students because of absences and parents not signing permission slips.

DOEE proposes 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 participate 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 13- A bioretention project treating stormwater at Seaton Elementary

In FY 2017 WPD accomplished the following:

- Provided 40 teachers with an eight-day workshop on RiverSmart schools site usage and programming;
- Conducted 17 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 design and construction of the following five RiverSmart Schools projects:

- The Hart Middle School project included the installation of two rain gardens treating a drainage area of 3,220 square feet with 8,004 gallons of onsite retention achieved;
- Seaton Elementary installed bioretention cells, native plant gardens, and an outdoor classroom. The improvements treat 24,873 square feet and retain 5,556 gallons of stormwater;
- Payne Elementary School schoolyard project involved the construction of a large conservation landscape area and an outdoor classroom. The total project area is 1,675 square feet;
- The Mundo Verde Public Charter School received a native garden and outdoor classroom in a 700 square foot area; and

- DOEE will install a 500 square foot native pollinator garden at Bruce Monroe Elementary School in 2018. The project was delayed due to other work being performed at the school.

Storm Drain Marker Program

In FY 2017, DOEE installed 708 storm drain markers throughout the District. DOEE has maintained its geolocated database of marked storm drains. WPD worked with nine different volunteer groups to achieve this goal, including: the Green Zone Environmental Program (GZEP); an elementary school; an afterschool program; a summer camp; a Girl Scout troop; and two universities.

River Corps

In 2017, DOEE commenced a green infrastructure and job training program, the River Corps, run by the Latin American Youth Center. Each year two cohorts of 10 youth each will participate in a five-month long green infrastructure job training program where young people learn how to maintain LID sites, inspect RiverSmart Homes installations, perform trash cleanups, remove invasive plant species, and photo-monitor upcoming and existing stream restoration projects. In FY 2017, the River Corps monitored the following streams: Bingham Run, Milkhouse Ford, Nash Run, Alger Park, and Pope Branch.

Figure 14- RiverCorps conducting photo monitoring for Nash Run

Outreach on Pet Waste and Enforcement of Pet Waste Regulations

In FY 2017 DOEE provided a community partner with 9,600 dog waste bags for three dispensers in Edgewood, which is within the CSS. If all these bags were used, it is estimated that they helped to remove 3,600 pounds of pet waste from the environment in the fiscal year alone, the weight equivalent of a four-door sedan.

Additionally DOEE coordinated with DDOT to post 183 signs throughout the District advertise the fines associated with not picking up after dogs and the environmental impacts of abandoned feces. Finally, DOEE implemented a new system for tracking pet waste complaints and calls it received about pet waste. During FY 2017 DOEE received 388 pet waste complaints: an estimated 160 complaints taken over the phone and 228 from DOEE's online form. DOEE also received 264 calls (estimated 22.25 hours' worth). These calls typically were requesting enforcement, requesting signs, or requesting updates on "Scoop Your Poop" sign posting activities.

Integrated Pest Management (IPM) and Nutrient Management

Two years ago the District passed legislation restricting the application of fertilizer during certain times of the year unless soil tests show fertilizer is needed. DOEE has developed a robust outreach and education program to educate commercial applicators, vendors of fertilizer products, and the general public about the new law. In addition to letters to commercial applicators and signs for businesses, DOEE educates homeowners through outreach on the web and in person. Homeowners participating in the RiverSmart Homes program learn about proper fertilizer use, environmentally sensitive mowing, and IPM.

DOEE published a set of webpages on the Fertilizer Law, along with an educational sign for residents on the District's Fertilizer Law that encourages the adoption of BMPs when applying fertilizer. The sign was sent to 30 fertilizer retailers so that it could be displayed for District residents and was made available

online on DOEE's website. Three public-facing webpages were created on the Fertilizer Law: one on the law itself, one on the impacts of fertilizer on the environment, and one on best practices for fertilizer use.

- Fertilizer law webpage: https://doee.dc.gov/fertilizer
- Environmental Impacts webpage: https://doee.dc.gov/node/1178311
- Fertilizer use webpage: https://doee.dc.gov/node/1178325
- Sign: https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/Fertilizer%20Sign.pdf

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. Furthermore, the DOEE IPM and nutrient 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.

Anacostia River Explorers

Anacostia River Explorers are boat tours that educate the public about the Anacostia River through one- and two-hour motorized and canoe tours. Participants learn about the Anacostia River's human and natural history, the threats it faces, and what solutions are being undertaken to help the River realize its full potential as an invaluable asset for the District and its residents. There are two grantees undertaking this work for the District and in FY 2017 they held 197 tours that reached 3,127 District residents and participants.

Community Stormwater Solutions Grants

In FY 2017, DOEE launched the Community Stormwater Solutions Grant program, which provides start-up funding for community-oriented projects that raise awareness about urban watershed issues, in particular those associated with stormwater runoff. In 2017, the program awarded 11 grants totaling $208,812. Projects must fall into one or more of the following project areas:

- Remove impervious surfaces, install green infrastructure, or plant trees
- Create/promote jobs focused on stormwater solutions
- Restore native habitat
- Prevent litter
- Clean up an area affected by high volumes of litter
- Educate or raise awareness of a stormwater issue

Trash Removal

In 2010, the District and the State of Maryland established a total maximum daily load (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. NPS loads were attributed to illegal dumping. For the District's portion of watershed, an annual load allocation totaling 20,048 pounds of trash was assigned.

Some of the tools the District is applying to meet the goals of the trash TMDL include education and outreach, stream and shoreline cleanups, new regulations, and enhanced enforcement. From 2014 through 2016, the AFF worked on a DOEE grant-funded project which included 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. AFF reported a 31% reduction in littering as a result of implementing the campaign.

Every year, thousands of pounds of trash are removed from the District's shorelines and stream banks by volunteers. DOEE has supported the Annual AFF Potomac Watershed Clean-up and the Anacostia Watershed Society Earth Day Cleanup 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 in 2017. DOEE estimates that 90,608 pounds of trash were removed District-wide; 18,150 pounds were removed from the Rock Creek watershed; 13,542 pounds were removed from the Potomac River watershed; and 58,916 pounds were removed from the Anacostia River watershed. In addition, 2,312 volunteers were engaged through these cleanups.

In addition, beginning in the summer of 2016, DOEE implemented a new illegal dumping enforcement pilot program called DumpBusters with the DC Metropolitan Police Department, the DC Department of Public Works, DDOT, CSX, Inc., and the Park Service. The program entails identifying 10 illegal dumping hotspots in the Anacostia River watershed and installing enforcement signage and cameras. Over the past year over 30 arrests have been made and thousands of dollars in civil fines have been issued. DOEE is currently working with its partners to expand the program District-wide in 2018.

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 Anacostia Watershed Society determined through their monitoring study conducted in 2008 that expanded polystyrene is one of the top-four-most common types of trash found in the Anacostia River. The ban became effective January 1, 2016 and affects all food service businesses that sell prepared foods in expanded polystyrene containers. The ban does not apply to prepackaged Styrofoam. In FY 2017, DOEE inspectors determined that 88% of District businesses were in compliance with the ban.

Coal Tar Ban

The Comprehensive Stormwater Management Enhancement Amendment Act of 2008, effective July 1 2009, prohibits the sale, use, and permitting of coal tar based pavement products in the District (Coal Tar Ban). The Coal Tar Ban helps to protect human health and the environment by reducing the amount of toxic polycyclic aromatic hydrocarbons (PAHs) in our communities and environment. Rainwater washes PAH-containing sealant particles and dust down storm drains and into local streams and rivers, threatening aquatic life in the Anacostia and Potomac Rivers and the Chesapeake Bay. No coal tar violations were found in District FY 2017.

Anacostia Clean Up and Protection Act Enforcement

The District continues to implement the Anacostia Clean Up and Protection Act of 2009 (Bag Law), which requires any business selling food or beverages to charge five cents for every disposable bag distributed, with limited exemptions. The Bag Law is working to keep trash out of District waterbodies by incentivizing residents to use reusable bags and reduce consumption of disposable bags. Also, funds from the disposable bag fee are funding important projects, including maintenance of trash traps, stream restoration, reusable bag distribution, and environmental education. In District FY 2017, inspectors determined that 76% of businesses were compliant with the Bag Law.

Snow and Ice Removal

DOEE works with the District snow team to address vehicle washing, snow disposal operations, and salt storage. These efforts include developing the first District plan to identify and prepare site maps for snow disposal sites and conducting salt dome and vehicle wash facility walk-throughs. In FY 2017 DOEE developed its first DOEE Snow Plan to clearly articulate DOEE's role in snow and ice removal operations

and emergency response management during winter weather events. DOEE also helped a District salt dome devise a temporary vehicle wash station to divert wash water away from a sand filter into the sanitary sewer. In total, DOEE conducted five onsite visits to provide compliance assistance to snow operations (three salt domes and two vehicle washing operations).

DOEE also revised its website content in FY 2017 for how to be environmentally friendly during the winter with pollution prevention tips for residents, and created a webpage that describes DOEE efforts, in order to make the agency's role during winter weather events more transparent (https://doee.dc.gov/service/protecting-environment-winter-weather-what-you-can-do).

Finally, DOEE developed and led snow trainings for District employees, contractors and downtown Business Improvement Districts. These 10-20 minute presentations taught District light- and heavy-plow operators and manual street and bridge teams about stormwater permitting, how to minimize stormwater pollution from snow and ice removal operations, good housekeeping practices, and how to respond to spills, leaks, and drips.

Table 6 - Tracking activities that aim to prevent NPS pollution from individual actions, by carrying out effective information and education campaigns

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2020 Goal	% 2020 Goal Achieved
Objective 4a: To reach 1,000 school students annually with hands-on environmental education activities (DOEE, DCPS)	Milestone 1: Reach 1,000 school students in the first year	**Number of students participating in hands on environmental education**					
		1,297	1,241	2,100	1,943	7,000	94%
Objective 4b: To support 2,100 school students annually through an overnight meaningful watershed education experience	Milestone 1: Reach 2,100 school students in the first year	**Number of students participating in overnight meaningful watershed experience**					
		696	821	1,776	1,603	14,700	33%
Objective 4c: To install BMPs on three schoolyards per year	Milestone 1: Install BMPs at three schoolyards annually	**Number of BMPs installed**					
		3	5	5	5	21	86%
		Square feet treated					
		183,607	127,278	28,371	25,348	N/A	N/A
		Volume captured (cubic feet)					
		12,713	8,839	2,310	1,813	N/A	N/A
		Estimated load reductions					
						N/A	N/A
Objective 4d: To train 10 teachers annually through training that integrates hands-on watershed education with system-wide standards of learning	Milestone 1: Train 10 teachers annually	**Number of teachers trained**					
		107	27	44	40	70	311%
	Milestone 2: Have watershed education fully immersed in standards of learning so that sponsor trainings are no longer necessary by 2025	**Incorporation of watershed education into curriculum**					
		1 Learning Standards Complete	1 Learning Standards Complete	1 Learning Standards Complete	1 Learning Standards Complete	N/A	N/A

Goal Five – Implement Programs That Aim to Increase NPS Pollution Runoff Prevention Practices on Private Property

Private property, including commercial, residential, and nonprofit 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. Therefore, the District has developed a variety of programs, including incentives to encourage property owners to such 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 with a set 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.

Figure 15– A RiverSmart Rooftops install

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.

To date, the RiverSmart Rooftops Rebates program has contributed $8,939,571.25 towards the installation of 990,791 square feet of green roofing in the District. In FY 2017, the District added 363,800 square feet of green roofing to its portfolio. This includes 22,137 square feet through the RiverSmart Rooftops program and an additoinal 341,663 square feet of green installed outside of the DOEE incentive

programs. The RiverSmart Rooftops program installations amounts to 9% of the total green roofing installed in FY 2017.

RiverSmart Communities Program

In previous years the RiverSmart Communities program focused on implementing SWM practices at multi-family complexes (e.g., condominiums, apartments, co-ops), businesses, religious and nonprofit institutions, and other private properties. Typical practices include permeable paving systems, bioretention, rain gardens, BayScaping, and tree planting. The program provided rebates to partially offset project costs to property owners.

In FY 2017 RiverSmart Communities retooled and began a new focus aimed solely at installing retrofits on nonprofit and religious institutional properties. In exchange the nonprofit partner will perform outreach and education to the audience they serve about relevant District environmental programs. DOEE selected four nonprofits in a competitive grant process: Peace Lutheran Church, SB Works, St. Theresa of Avila Catholic Church, and Luther Place Memorial Church. These sites will have LID retrofits installed in FY 2018. Additionally two RiverSmart Communities sites were installed under the old grant. These sites were at Veazy Street Cooperative and DCity Smokehouse.

RiverSmart Homes Program

The District has recognized the importance of targeting homeowners for pollution reduction measures because residential property is among the largest single land uses in the city and, because of the relatively small lot sizes, is the least likely to be required to install SWM practices. In 2008 DOEE developed RiverSmart Homes, 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 the summer of 2009.

Figure 16– BayScaping and a rain barrel.

Through this program, DOEE performs audits of homeowners' properties and provides feedback to the homeowners on what LID technologies can be safely installed on the property. DOEE also offers homeowners subsidized installations of any LID recommended at the audit, which can include shade trees, native landscaping to replace grass, rain gardens, rain barrels, and permeable pavement.

FY 2017 accomplishments include the following:

- Conducted 939 audits
- Installed 360 rain barrels
- Planted 583 shade trees
- Installed 118 rain gardens
- Implemented BayScaping at 192 properties
- Replaced impervious surfaces with green space or pervious pavers at 58 properties

The District notes that the number of audits conducted was below its goal of 1,000 audits. This was due to changes in staff: however, with a new staff member on board, the RiverSmart Homes team anticipates reaching this goal for FY 2018.

Figure 17- A Monarch butterfly caterpillar on a milkweed leaf, photographed by a RiverSmart Homeowner in her BayScaping.

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. In response to losing its grantee for rain barrel installations in FY 2015, DOEE increased the rebate for rain barrels from $1 per gallon stored to$2 per gallon stored, for up to $1,000. This change ensured DOEE was able to continue offering an incentive for its most popular LID option. The rebate program includes conducting outreach to advertise the program through traditional channels and through innovative approaches, (e.g., partnerships with local hardware stores). 132 rain barrels were installed and rebated in FY 2017, with an average capacity of 68 gallons each.

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. DOEE also made changes to this program in FY 2016. For permeable pavement and impervious surface reduction projects, DOEE changed the rebate to be based on the square footage of impervious area removed and replaced, rather than the square footage of impervious area treated with the retrofit. DOEE's rebate for rain gardens is still based on the square foot age of impervious area treated by the garden. Impervious areas are defined as rooftops or areas that are covered in concrete, asphalt, or other impervious materials.

Figure 18- A newly installed permeable paver project

The rebate reimburses homeowners $10 per square foot of impervious surface removed and replaced with permeable pavement. The rebate is $5 per square foot of impervious surface removed and replaced with vegetation. There is no maximum square footage or rebate for permeable pavement and vegetation retrofits. The rebate for rain gardens is $3 per square foot of treatment area with a maximum rebate of $2,200 per property. In FY 2017, three rain gardens, 18 re-vegetation projects, and 32 permeable paver projects were completed through this rebate program, treating a total of 40,360 square feet of impervious area.

The model for estimating volume captured for residential rain gardens was recently updated, and all previous fiscal years included in this report have been updated accordingly.

Tree Planting

The District has been called "The City of Trees." It has a tree canopy cover of 35%, which is high for a dense urban environment, but lower than what 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% over current efforts). Currently the Urban Forestry Division, the agency that maintains the District's street trees, plants an average of 6,225 trees annually.

DOEE, with help from nonprofit partners such as Casey Trees and Washington Parks and People, plants trees on private, federal, and other District lands. FY 2017 accomplishments include the following:

- Planted 2,676 trees as part of the RiverSmart Homes and Tree Rebate Program, with the majority of the trees coming from the increasingly popular rebate program.
- 8,204 trees were planted District-wide

In May of 2017, DOEE released a request for applications for a large parcel tree planting program. Duties for the selected grantee will include: performing outreach to large parcel landowners; developing and implement planting plans; maintaining newly planted trees; and engaging community members through the planting process. DOEE anticipates the contract will be awarded for this program in FY 2018.

Table 7 - Tracking activities that aim to increase NPS pollution runoff prevention practices on private property

OBJECTIVES	MILESTONES	2014	2015	2016	2017	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	1,032	939	7,000	59.4%
Objective 2e: To audit 150 multi-family and commercial properties per year	Milestone 1: 30 audits annually	**Number of multi-family and commercial properties audited**					
		31	34	30	10	150	70%
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	962	974	5,250	73%
		Estimated canopy expansion/acreage of canopy					
		9.72	9.43	9.62	9.74	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	9,893	8,204	51,600	82%
		Estimated canopy expansion/acreage of canopy					
		95.6	147.0	989	820.4	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	354	360	6,300	28.3%
		Estimated volume of rainwater captured (gallons)					
		1,934,695	2,423,435	1,441,842	1,466,280	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	76	118	700	66%
		Area treated (square feet)					
		61,392	59,850	29,700	82,470	N/A	N/A
		Volume captured (gallons)					
		760,033	740,943	367,686	1,020,979	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 waterbodies 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 WIPs;
- The work planned in the watershed addresses 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.

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.

Figure 19- Ribbon cutting for the restored Alger Park stream

The designs were completed for the Alger Park Stream Restoration project, advertised for bids, and a contractor was selected in FY 2016. DOEE's contractor started and completed construction of the restoration project in FY 2017. 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 2017, DDOT completed designs for the upland LID and construction work is planned to start in FY 2018. The final component of work in the 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% of the watershed residents, perform audits on 50% of the homeowner properties, and install at least two RiverSmart practices on 25% of the properties audited.

DOEE performed this work by participating in community meetings to update and educate residents about the stream restoration project, and by holding a ribbon cutting ceremony when the stream restoration work was completed. DOEE will continue to promote the RiverSmart Homes program and to recruit new participants in the Hillcrest neighborhood. To date, 3% of the watershed's load reductions have been achieved through stormwater retrofits (see Figure 21). As this project was only recently completed, we do not yet have post-restoration monitoring data for the site so we cannot show water quality trends. We will add this information in the FY 18 Annual report.

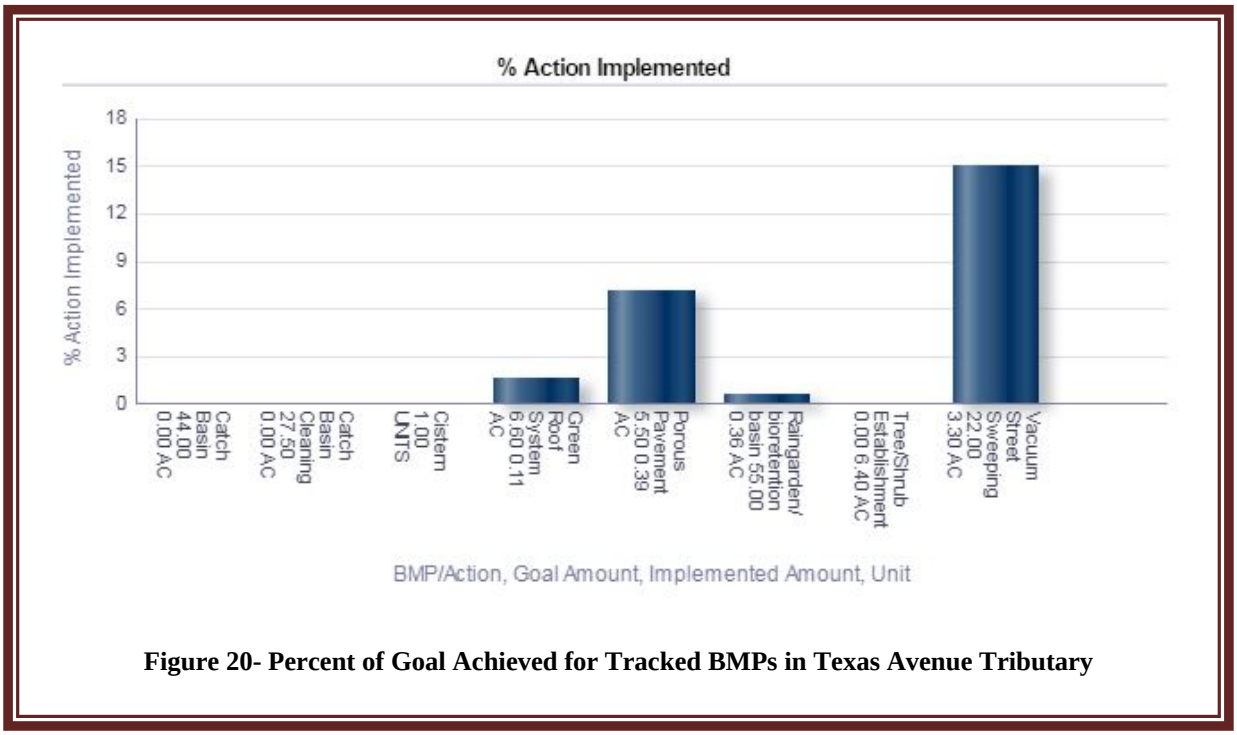

Figure 20- Percent of Goal Achieved for Tracked BMPs in Texas Avenue Tributary

Table 8 - Tracking activities that reduce stream bank erosion, upland runoff, and pollutant loads to the Texas Avenue Tributary

OBJECTIVES	MILESTONES	2014	2015	2016	2017	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	N/A	N/A	1	100%
	Milestone 2: Develop a design report with recommendations for optimal restoration work	**Number of design reports developed**					
		1	N/A	N/A	N/A	1	100%
	Milestone 3: Develop 100-percent plans for stream enhancement work	**Number of stream restoration plan sets developed**					
		0	1	N/A	N/A	1	100%
Objective 2: To maximize treatment and storage of impervious runoff 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	N/A	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	N/A	N/A	1	100%
	Milestone 3: Install LID projects in public space throughout the watershed	**Number of LIDs installed**					
		1	0	0	0	N/A	N/A
		Acres treated					
		0.2	0	0	0	N/A	N/A

Table 8 - Continued

OBJECTIVES	MILESTONES	2014	2015	2016	2017	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	N/A	N/A	132	100%
	Milestone 2: Audit homes in the watershed	**Number of homes audited**					
		59	20	1	6	66	130.3%
	Milestone 3: Plant trees on private property	**Number of trees planted**					
		19	2	65	4	N/A	N/A
		Estimated reduction volume (gallons)					
		20,368	2,144	69,680	4,288	N/A	N/A
	Milestone 4: Install rain barrels on private property	**Number of rain barrels installed**					
		22	3	2	1	N/A	N/A
		Area treated (square feet)					
		4,092	558	372	186	N/A	N/A
		Estimated volume reduction (gallons)					
		39,727	5,417	3,611	1,805	N/A	N/A
	Milestone 5: Install permeable pavers on private property	**Number of projects installed**					
		0	0	1	0	N/A	N/A
		Area treated (square feet)					
		0	0	1,117	0	N/A	N/A
		Estimated volume reduction					
		0	0	10,835	0	N/A	N/A
	Milestone 6: Install rain gardens on private property	**Number of projects installed**					
		1	1	0	0	N/A	N/A
		Area treated (square feet)					
		408	325	0	0	N/A	N/A
		Estimated volume reduction					
		3,967	3,152	0	0	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% of the watershed, making Hickey Run one of the most impervious of the Anacostia River's subwatersheds.

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% of the watershed (385 homes). By the end of FY 2015 DOEE recruited 230 participants (60% 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.

Figure 21– The completed Springhouse Run restoration project.

An additional incentive offered to homeowners to adopt RiverSmart practices was to design and construct a "green street" on the block in the Hickey Run watershed with the highest RiverSmart Homes adoption rate. In 2015 DOEE selected the winning green street, which had a 100% participation rate. DOEE hosted a community meeting with the winning block and began developing the scope of work for the project. In 2017 DOEE worked to contract the design and construction of this project. It is expected that designs will be completed and construction will begin in FY 2018.

DOEE is working to upgrade the Hickey Run trash trap located at the primary outfall to Hickey Run. DOEE contracted for an analysis of the trash trap in FY 2017 and a report on potential upgrades is expected in early FY 2018. It is expected that upgrades will improve the efficiency of the BMP and increase its capacity.

In FY 2017, DOEE completed construction of the Springhouse Run (a tributary to Hickey Run) stream restoration project, which includes retrofitting the U.S. National Arboretum visitor parking lot with five bioretention facilities. DOEE also worked to secure funds to study the extent of contaminated soils in the mainstem of Hickey Run. DOEE will work on contracting a contamination study for Hickey Run. To date, 42% of the watershed's load reductions have been achieved through stormwater retrofits (see Figure 23).

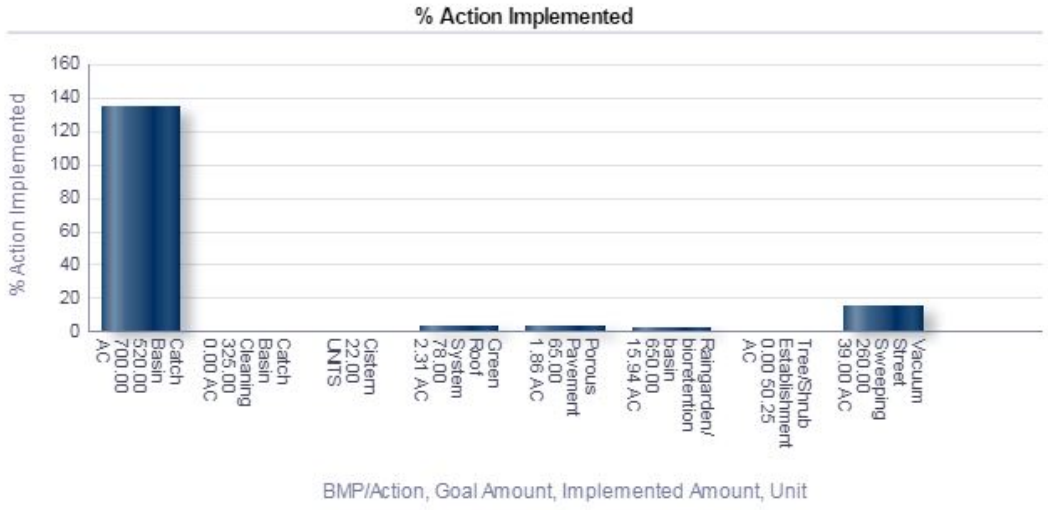

Figure 22- Percent of Goal Achieved for Tracked BMPs in Hickey Run

Table 9 - Tracking activities that reduce stream bank erosion, upland runoff, and pollutant loads to Hickey Run

OBJECTIVES	MILESTONES	2014	2015	2016	2017	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	Complete	Complete	N/A	N/A
	Milestone 2: Audit homes in the watershed	**Number of homes audited**					
		200	30	20	25	N/A	N/A
	Milestone 3: Plant 300 trees on private property	**Number of trees planted**					
		78	24	36	18	300	308%
		Estimated reduction volume (gallons)					
		83,616	25,728	38,592	19,296	N/A	N/A
	Milestone 4: Install 100 rain barrels on private property	**Number of rain barrels installed**					
		143	45	14	21	100	233%
		Estimated volume reduction (gallons)					
		258,224	81,259	25,281	37,905	N/A	N/A
	Milestone 5: Install 10 permeable paver projects on private property	**Number of projects installed**					
		10	0	0	0	N/A	N/A
		Area treated (square feet)					
		2,090	0	0	0	N/A	N/A
	Milestone 6: Install rain gardens on private property	**Number of projects installed**					
		17	21	5	6	N/A	N/A
		Area treated (square feet)					
		6,936	1,050	2,995	2,972	N/A	N/A
		Estimated volume reduction (gallons)					
		85,868	12,999	37,078	36,793	N/A	N/A

Table 9 - Continued

OBJECTIVES	MILESTONES	2014	2015	2016	2017	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	N/A	N/A	1	100%
	Milestone 2: Develop design plan sets for LID work in public space	**Number of LID plan sets developed**					
		1	N/A	N/A	N/A	1	100%
	Milestone 3: Install LID projects in public space in areas throughout the watershed	**Number of LIDs installed**					
		2	10	31	18	N/A	N/A
		Acres treated					
		6.2	12.48	7.2	0.77	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	N/A	N/A	1	100%
	Milestone 2: Develop a design report with recommendations for optimal restoration work	**Design Reports Developed**					
		1	N/A	N/A	N/A	1	100%
	Milestone 3: Develop 100% plans for stream enhancement work	**Stream Restoration Plan Sets Developed**					
		1	N/A	N/A	N/A	1	100%
	Milestone 4: Issue a contract for stream restoration work	**Restoration Contracts Issued**					
		0	0	1	0	1	100%
	Milestone 5: Implement stream restoration work	**Feet of Stream Length Restored**					
		0	0	0	1,800	1,800	100%
	Milestone 6: Riparian plantings along stream banks	**Acres of Riparian Plantings**					
		0	0	0	1.01	N/A	N/A
		Number of Trees Planted					
		0	0	0	12	N/A	N/A

Table 9 - Continued

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2020 Goal	% 2020 Goal Achieved
Objective 4: To stabilize and enhance the habitat conditions of the mainstem 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	0	0	1	0%
	Milestone 2: Develop a design report with recommendations for optimal restoration work	**Design Reports Developed**					
		0	0	0	0	1	0%
	Milestone 3: Develop 100% plans for stream enhancement work	**Stream Restoration Plan Sets Developed**					
		0	0	0	0	1	0%
	Milestone 4: Issue a contract for stream restoration work	**Restoration Contracts Issued**					
		0	0	0	0	1	0%
	Milestone 5: Implement stream restoration work	**Feet of Stream Length Restored**					
		0	0	0	0	5,000	0%
	Milestone 6: Riparian Plantings along stream banks	**Acres of Riparian Plantings**					
		0	0	0	0	N/A	N/A
		Number of Trees Planted					
		0	0	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 23– The restored Nash Run in full bloom (July 2017)

In FY 2016, DOEE completed the stream restoration project at Nash Run. The stream restoration project involved the removal of over 11,000 cubic yards of soil from the project area for the creation of a low floodplain bench along the stream. In total, the project restored 1,400 feet of stream, created 1.08 acres of a floodplain wetland along the stream, constructed two new culvert pipes midway through the project to help reduce flooding in the community, and installed a floatable trash trap to capture floatable trash at the beginning of the project reach. Additionally, over 1,000 herbaceous plants and grasses were planted along with 99 native trees.

Figure 24- Percent of Goal Achieved for Tracked BMPs in Nash Run

Throughout the project's construction DOEE staff worked with area residents to address concerns and answer questions about the project. The agency continues to seek locations for larger upland LID projects on District parkland, school grounds, and 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, 4% of the watershed's load reductions have been achieved through stormwater retrofits (see Figure 24). As the project is only recently completed, there is not yet good data on trends in water quality improvement. One early improvement that has been noted is a marked increase in dissolved oxygen in the stream since restoration. This early trend can be seen in Figure 25 below.

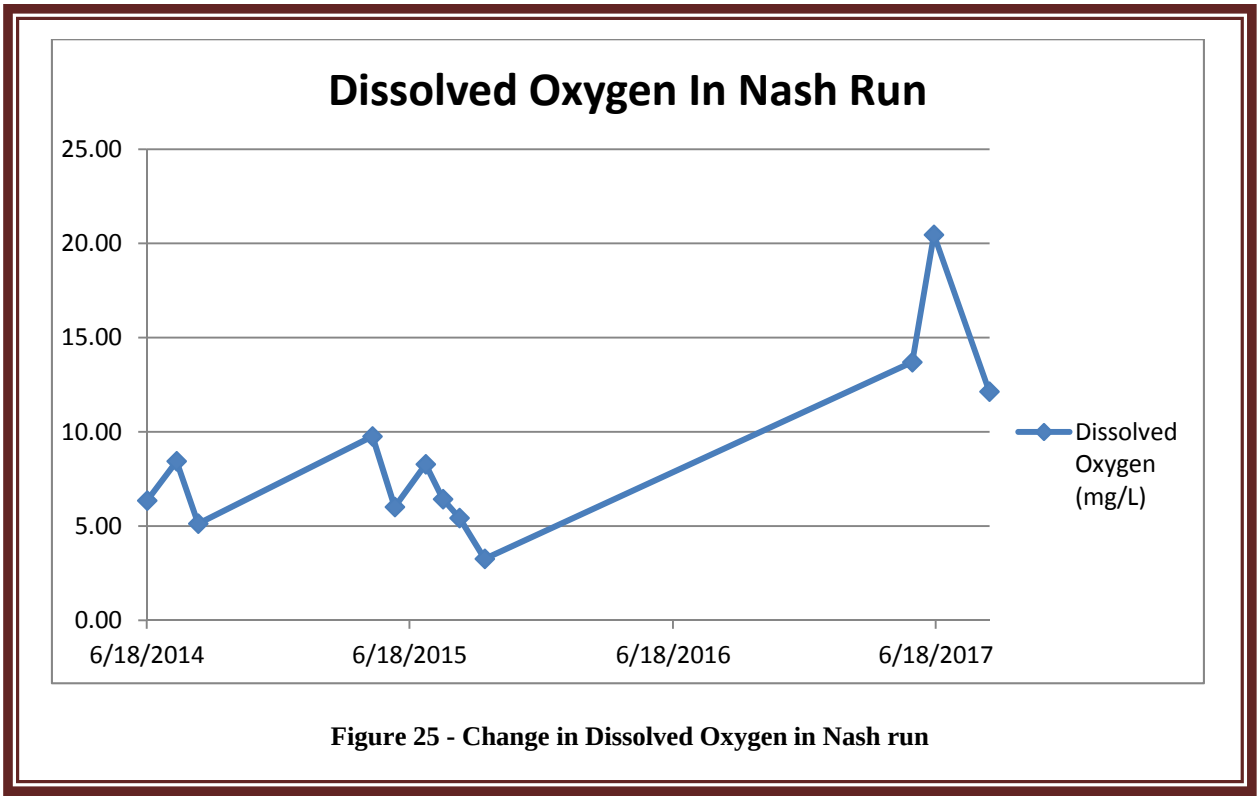

Figure 25 - Change in Dissolved Oxygen in Nash run

Table 10 - Tracking Activities that reduce stream bank erosion, upland runoff, and pollutant loads to the Nash Run Tributary

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2020 Goal	% 2020 Goal Achieved
Objective 1: To stabilize and enhance the habitat conditions of the mainstem 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	N/A	N/A	1	100%
	Milestone 2: Develop a design report with recommendations for optimal restoration work	**Design Reports Developed**					
		1	N/A	N/A	N/A	1	100%
	Milestone 3: Develop 100-percent plans for stream enhancement work	**Stream Restoration Plan Sets Developed**					
		1	N/A	N/A	N/A	1	100%
	Milestone 4: Issue a contract for stream restoration work	**Restoration Contracts Issued**					
		0	1	N/A	N/A	1	100%
	Milestone 5: Implement stream restoration work	**Feet of Stream Length Restored**					
		0	0	1,400	0	1,400	100%
	Milestone 6: Riparian Plantings along stream banks	**Acres of Riparian Plantings**					
		0	0	1	0	1	100%
		Number of Trees Planted					
		0	0	99	0	N/A	N/A
Objective 2: To maximize treatment and storage of impervious runoff in 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	0	0	1	0%
	Milestone 2: Develop design plan sets for LID work in public space	**Number of LID plan sets developed**					
		0	0	0	0	1	0%
	Milestone 3: Install LID projects in public space in areas throughout the watershed	**Number of LIDs installed**					
		0	6	11	3	N/A	N/A
		Number of acres treated					
		0	3.86	4.5	1.81	N/A	N/A

Table 10 - Continued

OBJECTIVES	MILESTONES	2014	2015	2016	2017	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	7	3	6	N/A	N/A
	Milestone 2: Audit homes in the watershed	**Number of homes audited**					
		46	7	3	6	N/A	N/A
	Milestone 3: Plant trees on private property	**Number of trees planted**					
		19	12	0	1	N/A	N/A
		Estimated reduction volume (gallons)					
		20,368	12,864	0	1,072	N/A	N/A
	Milestone 4: Install rain barrels on private property	**Number of rain barrels installed**					
		15	13	0	0	N/A	N/A
		Estimated volume reduction (gallons)					
		27,086	23,475	0	0	N/A	N/A
	Milestone 5: Install permeable pavers on private property	**Number of projects installed**					
		0	0	0	0	N/A	N/A
		Area treated (square feet)					
		0	0	0	0	N/A	N/A
		Estimated volume reduction (gallons)					
		0	0	0	0	N/A	N/A
	Milestone 6: Install rain gardens on private property	**Number of projects installed**					
		5	1	0	1	N/A	N/A
		Area treated (square feet)					
		2040	400	0	879	N/A	N/A
		Estimated volume reduction (gallons)					
		25,255	4,952	0	10,882	N/A	N/A

Table 11 - Annual runoff volume and load reductions associated with the FY 2017 BMP inventory for the District of Columbia

Watershed	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[1] (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	9,220,439	631	83	17,014	13,381	6,907	1,240	3.1E-01	1.1E+01	3.6E+00	3.9E+00	3.8E-02	2.6E+01	1.7E-03	6.3E-04	2.9E-03	7.3E-03	4.5E-05	1.5E-04	1.0E-01	7.6E-01	1.6E-02	5,370
Anacostia Lower	2,075,913	131	16	3,221	2,603	1,392	151	6.2E-02	2.2E+00	6.8E-01	7.5E-01	7.6E-03	5.1E+00	3.6E-04	1.2E-04	5.6E-04	1.4E-03	1.0E-05	3.3E-05	2.3E-02	1.6E-01	3.3E-03	522.4
Anacostia Upper	7,144,526	501	67	13,793	10,778	5,516	1,090	2.5E-01	8.8E+00	2.9E+00	3.2E+00	3.1E-02	2.1E+01	1.3E-03	5.0E-04	2.3E-03	5.9E-03	3.5E-05	1.1E-04	7.9E-02	6.0E-01	1.3E-02	2,162.0
ANATF_DC	11,469,658	622	84	15,883	13,255	6,524	1,380	3.0E-01	1.1E+01	3.5E+00	3.9E+00	3.8E-02	2.5E+01	1.6E-03	6.2E-04	2.9E-03	7.2E-03	4.3E-05	1.4E-04	9.9E-02	7.4E-01	1.6E-02	2,659.8
ANATF_MD	434,249	23	3	699	507	214	11	1.1E-02	4.0E-01	1.4E-01	1.5E-01	1.3E-03	9.9E-01	4.3E-05	2.3E-05	1.1E-04	2.7E-04	8.8E-07	2.9E-06	2.1E-03	2.2E-02	5.7E-04	203.4
Battery Kemble Creek	152,777	8	1	107	158	72	9	3.9E-03	1.3E-01	4.1E-02	4.5E-02	4.8E-04	2.6E-01	2.5E-05	7.7E-06	3.4E-05	8.7E-05	7.4E-07	2.4E-06	1.7E-03	1.1E-02	2.1E-04	31.7
Broad Branch	2,794,463	155	18	2,786	2,901	1,104	194	7.2E-02	2.5E+00	7.5E-01	8.2E-01	8.9E-03	4.8E+00	4.6E-04	1.4E-04	6.2E-04	1.6E-03	1.4E-05	4.5E-05	3.1E-02	1.9E-01	3.8E-03	582.2
C&O Canal	404,916	11	1	142	210	95	11	5.2E-03	1.8E-01	5.4E-02	5.9E-02	6.4E-04	3.4E-01	3.3E-05	1.0E-05	4.5E-05	1.2E-04	9.8E-07	3.2E-06	2.2E-03	1.4E-02	2.7E-04	84.1
Dalecarlia Tributary	1,005,512	56	6	706	1,041	471	56	2.6E-02	8.9E-01	2.7E-01	2.9E-01	3.2E-03	1.7E+00	1.7E-04	5.0E-05	2.2E-04	5.7E-04	4.9E-06	1.6E-05	1.1E-02	7.0E-02	1.4E-03	208.9
Dumbarton Oaks	-																						
Fenwick Branch	1,560	4E-02	5E-03	1	1	3E-01	5E-02	2.0E-05	6.9E-04	2.1E-04	2.3E-04	2.5E-06	1.3E-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
Fort Chaplin Tributary	1,560	4E-02	5E-03	1	1	5E-01	5E-02	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
Fort Davis Tributary	3,230	9E-02	1E-02	2	2	1	1E-01	4.2E-05	1.4E-03	4.3E-04	4.7E-04	5.1E-06	3.3E-03	2.7E-07	8.1E-08	3.6E-07	9.2E-07	7.8E-09	2.6E-08	1.8E-05	1.1E-04	2.2E-06	0.7
Fort Dupont Tributary	520	1E-02	2E-03	3E-01	3E-01	2E-01	2E-02	6.7E-06	2.3E-04	6.9E-05	7.6E-05	8.2E-07	5.2E-04	4.3E-08	1.3E-08	5.8E-08	1.5E-07	1.3E-09	4.2E-09	2.9E-06	1.8E-05	3.5E-07	1.7
Fort Stanton Tributary	-																						
Foundry Branch	-																						
Hickey Run	406,417	11	1	251	212	122	13	5.3E-03	1.8E-01	5.5E-02	6.0E-02	6.5E-04	4.1E-01	3.3E-05	1.0E-05	4.5E-05	1.2E-04	9.8E-07	3.2E-06	2.2E-03	1.4E-02	2.8E-04	85.2
Kingman Lake	325,563	11	1	284	226	98	36	5.3E-03	1.9E-01	6.0E-02	6.6E-02	6.5E-04	4.4E-01	2.9E-05	1.1E-05	4.8E-05	1.2E-04	7.9E-07	2.6E-06	1.8E-03	1.3E-02	2.7E-04	90.6
Klingle Valley Run	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lower Beaverdam Creek	-																						
Luzon Branch	24,754	1	8E-02	12	13	5	1	3.2E-04	1.1E-02	3.3E-03	3.6E-03	3.9E-05	2.1E-02	2.0E-06	6.2E-07	2.7E-06	7.1E-06	6.0E-08	2.0E-07	1.4E-04	8.6E-04	1.7E-05	5.0
Melvin Hazen Valley Branch	297,758	8	1	149	155	59	10	3.8E-03	1.3E-01	4.0E-02	4.4E-02	4.7E-04	2.5E-01	2.4E-05	7.5E-06	3.3E-05	8.6E-05	7.2E-07	2.4E-06	1.6E-03	1.0E-02	2.0E-04	62.3
Nash Run	1,457,668	40	5	892	755	437	44	1.9E-02	6.4E-01	1.9E-01	2.1E-01	2.3E-03	1.5E+00	1.2E-04	3.7E-05	1.6E-04	4.2E-04	3.5E-06	1.2E-05	8.0E-03	5.1E-02	9.8E-04	302.9
Normanstone Creek	505,417	14	2	251	262	100	18	6.5E-03	2.2E-01	6.7E-02	7.4E-02	8.0E-04	4.3E-01	4.1E-05	1.3E-05	5.6E-05	1.4E-04	1.2E-06	4.0E-06	2.8E-03	1.8E-02	3.4E-04	105.0
Northwest Branch	413,487	25	3	729	533	228	13	1.1E-02	4.2E-01	1.5E-01	1.6E-01	1.4E-03	1.0E+00	4.7E-05	2.4E-05	1.2E-04	2.9E-04	1.0E-06	3.3E-06	2.4E-03	2.4E-02	6.1E-04	213.4
Oxon Run	1,138,904	65	8	840	1,221	534	83	3.0E-02	1.0E+00	3.2E-01	3.5E-01	3.7E-03	2.0E+00	1.9E-04	5.9E-05	2.6E-04	6.7E-04	5.5E-06	1.8E-05	1.3E-02	8.0E-02	1.6E-03	244.8
Pinehurst Branch	5,133	3E-01	3E-02	5	5	2	4E-01	1.3E-04	4.5E-03	1.4E-03	1.5E-03	1.6E-05	8.7E-03	8.4E-07	2.6E-07	1.1E-06	2.9E-06	2.5E-08	8.2E-08	5.6E-05	3.6E-04	6.9E-06	1.1
Piney Branch	520	1E-02	2E-03	3E-01	3E-01	1E-01	2E-02	6.7E-06	2.3E-04	6.9E-05	7.6E-05	8.2E-07	4.4E-04	4.3E-08	1.3E-08	5.8E-08	1.5E-07	1.3E-09	4.2E-09	2.9E-06	1.8E-05	3.5E-07	0.1
Pope Branch	4,856	3E-01	3E-02	6	5	3	3E-01	1.2E-04	4.3E-03	1.3E-03	1.4E-03	1.5E-05	9.8E-03	8.0E-07	2.4E-07	1.1E-06	2.8E-06	2.4E-08	7.8E-08	5.3E-05	3.4E-04	6.5E-06	0.9

Portal Branch	1,560	4E-02	5E-03	1	1	3E-01	5E-02	2.0E-05	6.9E-04	2.1E-04	2.3E-04	2.5E-06	1.3E-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
Potomac Lower	1,143,776	65	8	843	1,226	536	84	3.0E-02	1.0E+00	3.2E-01	3.5E-01	3.7E-03	2.0E+00	1.9E-04	5.9E-05	2.6E-04	6.7E-04	5.5E-06	1.8E-05	1.3E-02	8.0E-02	1.6E-03	245.8
Potomac Middle	2,683,469	182	23	2,662	3,564	1,401	312	8.3E-02	2.9E+00	9.5E-01	1.0E+00	1.0E-02	5.8E+00	4.6E-04	1.7E-04	7.7E-04	1.9E-03	1.3E-05	4.3E-05	3.0E-02	2.0E-01	4.3E-03	715.2
Potomac Upper	2,807,993	186	23	2,803	3,745	1,582	237	8.6E-02	3.1E+00	1.0E+00	1.1E+00	1.1E-02	6.1E+00	4.9E-04	1.7E-04	8.1E-04	2.0E-03	1.4E-05	4.5E-05	3.1E-02	2.1E-01	4.6E-03	751.6
POTTF_DC	7,054,690	348	42	5,893	6,794	2,673	494	1.6E-01	5.7E+00	1.8E+00	2.0E+00	2.0E-02	1.1E+01	9.6E-04	3.2E-04	1.5E-03	3.7E-03	2.7E-05	9.0E-05	6.2E-02	4.1E-01	8.5E-03	1,363.4
POTTF_MD	1,035,077	57	6	719	1,061	480	57	2.6E-02	9.0E-01	2.7E-01	3.0E-01	3.2E-03	1.7E+00	1.7E-04	5.1E-05	2.3E-04	5.8E-04	5.0E-06	1.6E-05	1.1E-02	7.1E-02	1.4E-03	212.8
Rock Creek Lower	1,186,230	66	8	1,181	1,231	469	82	3.1E-02	1.0E+00	3.2E-01	3.5E-01	3.8E-03	2.0E+00	1.9E-04	6.0E-05	2.6E-04	6.8E-04	5.7E-06	1.9E-05	1.3E-02	8.2E-02	1.6E-03	247.0
Rock Creek Upper	2,951,767	166	19	3,017	3,119	1,166	237	7.7E-02	2.7E+00	8.1E-01	8.8E-01	9.5E-03	5.1E+00	4.9E-04	1.5E-04	6.7E-04	1.7E-03	1.4E-05	4.7E-05	3.2E-02	2.1E-01	4.0E-03	625.9
Soapstone Creek	110,160	8	1	185	169	44	40	3.8E-03	1.4E-01	4.8E-02	5.2E-02	4.7E-04	2.8E-01	2.1E-05	8.2E-06	3.8E-05	9.3E-05	5.3E-07	1.8E-06	1.2E-03	9.2E-03	2.1E-04	33.9
Texas Avenue Tributary	520	1E-02	2E-03	3E-01	3E-01	2E-01	2E-02	6.7E-06	2.3E-04	6.9E-05	7.6E-05	8.2E-07	5.2E-04	4.3E-08	1.3E-08	5.8E-08	1.5E-07	1.3E-09	4.2E-09	2.9E-06	1.8E-05	3.5E-07	0.1
Tidal Basin	1,425,396	45	6	635	877	334	107	2.1E-02	7.3E-01	2.3E-01	2.5E-01	2.6E-03	1.4E+00	1.2E-04	4.1E-05	1.9E-04	4.7E-04	3.5E-06	1.1E-05	7.8E-03	5.2E-02	1.1E-03	351.9
Washington Ship Channel	1,258,073	92	11	1,393	1,811	733	99	4.1E-02	1.5E+00	4.9E-01	5.4E-01	5.1E-03	2.9E+00	2.2E-04	8.4E-05	4.0E-04	9.8E-04	6.1E-06	2.0E-05	1.4E-02	9.9E-02	2.2E-03	363.3
Watts Branch	805,561	50	6	1,205	982	483	117	2.3E-02	8.2E-01	2.6E-01	2.8E-01	2.9E-03	1.9E+00	1.4E-04	4.7E-05	2.1E-04	5.4E-04	3.9E-06	1.3E-05	8.9E-03	6.1E-02	1.2E-03	197.0
Watts Branch - Lower	3,296	2	4E-01	85	58	1	26	1.1E-03	4.3E-02	1.7E-02	1.8E-02	1.3E-04	1.1E-01	2.5E-06	2.5E-06	1.2E-05	3.2E-05	8.0E-09	2.6E-08	1.8E-05	2.0E-03	5.7E-05	23.2
Watts Branch - Upper	802,265	46	5	1,035	866	481	65	2.1E-02	7.3E-01	2.2E-01	2.4E-01	2.6E-03	1.7E+00	1.3E-04	4.2E-05	1.9E-04	4.8E-04	3.9E-06	1.3E-05	8.8E-03	5.7E-02	1.1E-03	173.7
CSS - Anacostia	19,845,731	581	69	13,478	11,171	6,055	881	2.7E-01	9.4E+00	2.9E+00	3.2E+00	3.4E-02	2.2E+01	1.7E-03	5.4E-04	2.4E-03	6.2E-03	4.8E-05	1.6E-04	1.1E-01	7.2E-01	1.4E-02	174.7
CSS - Potomac	209,609	7	1	156	147	41	30	3.4E-03	1.2E-01	3.9E-02	4.3E-02	4.2E-04	2.4E-01	1.8E-05	6.8E-06	3.1E-05	7.8E-05	5.1E-07	1.7E-06	1.2E-03	8.0E-03	1.8E-04	175.7
CSS - Rock Creek	1,343,819	42	5	596	828	331	76	2.0E-02	6.9E-01	2.2E-01	2.4E-01	2.4E-03	1.3E+00	1.2E-04	4.0E-05	1.8E-04	4.6E-04	3.3E-06	1.1E-05	7.4E-03	5.0E-02	1.0E-03	176.7

Summary

The District's NPS Management Program meets the challenges of the highly urbanized setting within the District by seeking and employing innovative solutions for reducing NPS 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 2018 the District will work to strengthen its existing programs for regulation and enforcement, stream and wetland restoration, education and outreach, and pollution prevention. The NPS Management Program will continue to provide technical assistance and resources that will improve the quality of the District's waterways.

Appendix A: Financial Information

FY 2017 Grant	***Source***	***Federal***	***Match***
319 Grant (FY 2017)	EPA	$1,014,000	$676,000
Chesapeake Bay Implementation (Sec. 117)	EPA	$1,712,784	$1,712,784
Chesapeake Bay Regulatory Enhancement (Sec. 117)	EPA	$1,134,554	$1,134,554

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 (Park Service)
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)
American Society of Landscape Architects (ASLA)
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 (GT BID)
Groundwork Anacostia
Interstate Commission on the Potomac River Basin (ICPRB)
Latin American Youth Center (LAYC)
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