DISTRICT OF COLUMBIA
CHESAPEAKE BAY PROGRAM
BEST MANAGEMENT PRACTICES
DATA SUBMITTAL

QUALITY ASSURANCE PROJECT PLAN

Urban Best Management Practices Database

December 14, 2010

District of Columbia Chesapeake Bay Program Best Management Practices (BMP) Data Submittal

Quality Assurance Project Plan (QAPP)

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Program and/or Project Description

As a part of its Chesapeake Bay Program commitments, the District of Columbia reports its nutrient and sediment load reduction activities to the Environmental Protection Agency, Chesapeake Bay Program (CBP) Office. The District Department of the Environment (DDOE) is the District Government agency tasked with collecting this information and verifying that it is correct.

Stormwater best management practices (BMPs) data for the Bay Program are tracked annually. The data are cumulatively reported and incorporated into the CBP's Watershed Model to estimate progressive nutrient load reductions from implementation of these BMPs over time. Data are divided by into HUC 11 watersheds tracked in acres for erosion and sediment controls as well as for stormwater management practices and separated

The stormwater management data provided by DDOE consists of point source reductions from DC Water, urban BMPs that treat stormwater from new development or redevelopment, retrofits of existing areas, and non-structural BMPs such as street sweeping, urban stream restoration work, and changes in land use through activities such as tree planting. The District's primary reductions come from upgrades to the Blue Plains waste water treatment plant, the Long Term Control Plan to reduce combined sewer overflows, and from permitted stormwater treatment facilities installed as a part of new development or redevelopment of areas larger than 5,000 square feet.

DC Water is tasked with overseeing and implementing upgrades to it Blue Plains waste water treatment plant and to it combined sewer system. These upgrades are closely tracked by DC Water and are regulated by the EPA as a part of its discharge permit and its Long Term Control Plan. The permitting of stormwater treatment facilities is regulated and permitted by DDOE's Watershed Protection Division (WPD), Technical Services Branch and their installation and maintenance is overseen by WPD Inspection and Enforcement Branch. The DDOE WPD keeps a database of all permitted stormwater facilities and of all inspection and enforcement efforts.

The WPD Planning and Restoration Branch is charged with compiling, geo-coding, and processing the stormwater BMPs installed and non-structural stormwater BMP activities. DDOE WPD collects stormwater BMP data from several sources and determines the number of acres treated in the four 11 digit Hydrologic Unit Code watersheds. DDOE WPD then organizes this information and reports it to the CBP.

The purpose of this Quality Assurance Project Plan is to document:

- How the District of Columbia collects information on the BMPs installed throughout the city for CBP reporting purposes;
- How the District maintains it database of BMPs installed;
- How the city performs quality assurance/quality control (QA/QC) to identify and replace inaccurate and missing data; and
- How the District reports BMP data to the CBP.

Federal Grants Associated with the Program

a. EPA Section 319(h) Grant
b. EPA Chesapeake Bay Program Implementation Grant
c. EPA Chesapeake Bay Program Regulatory Assistance Program Grant

Program and/or Project Organization and Responsibilities

Task Organization

District Department of Transportation (DDOT) Trees QA/QC Responsibilities –
DDOT Trees is responsible for tracking the number and location of trees planted in the public right of way. DDOT Trees QA/QC's this data and then provides it to DDOE Planning and Restoration Branch for reporting to the CBP.

DC Water QA/QC Responsibilities –
DC Water is responsible for tracking the implementation of the District's Long Term Control Plan and upgrades to the Blue Plains Wastewater Treatment facility. DC Water also monitors discharges from the Combined Sewer System and Blue Plains, QA/QC's these point source loads, and reports the load data to DDOE Planning and Restoration Branch and to the Metropolitan Washington Council of Governments for reporting to the CBP.

District Department of Public Works (DPW) QA/QC Responsibilities –
DPW is responsible for tracking the lane miles swept, how often they are swept, the type of sweeper used, and the location of street sweeping activities as a part of the District's street sweeping efforts. DPW will also be responsible for tracking the actual amount of material collected through their street sweeping efforts. DPW QA/QC's this data and provides it DDOE's Stormwater Division who provides it to the DDOE Planning and Restoration Branch for reporting to the CBP.

DDOE QA/QC Responsibilities –
DDOE has multiple roles and responsibilities for assuring QA/QC of CBP data. These roles are broken out by DDOE branches below.

DDOE Stormwater Division – Collects the street sweeping data from DPW and provides it to the DDOE WPD Planning and Restoration Branch for reporting to the Bay Program.

DDOE WPD Plan Review Branch – Tracks, reviews, and records all plans for new development or redevelopment in the District. The Plan Review Branch ensures that all permitted construction over 50 square feet has a plan to have appropriate erosion and sediment control devices in place and that all permitted construction over 5,000 square feet has plans to install stormwater suitable BMPs. The Plan Review Branch records all submitted construction plans in a database, manages the database, and QA/QCs the recorded data.

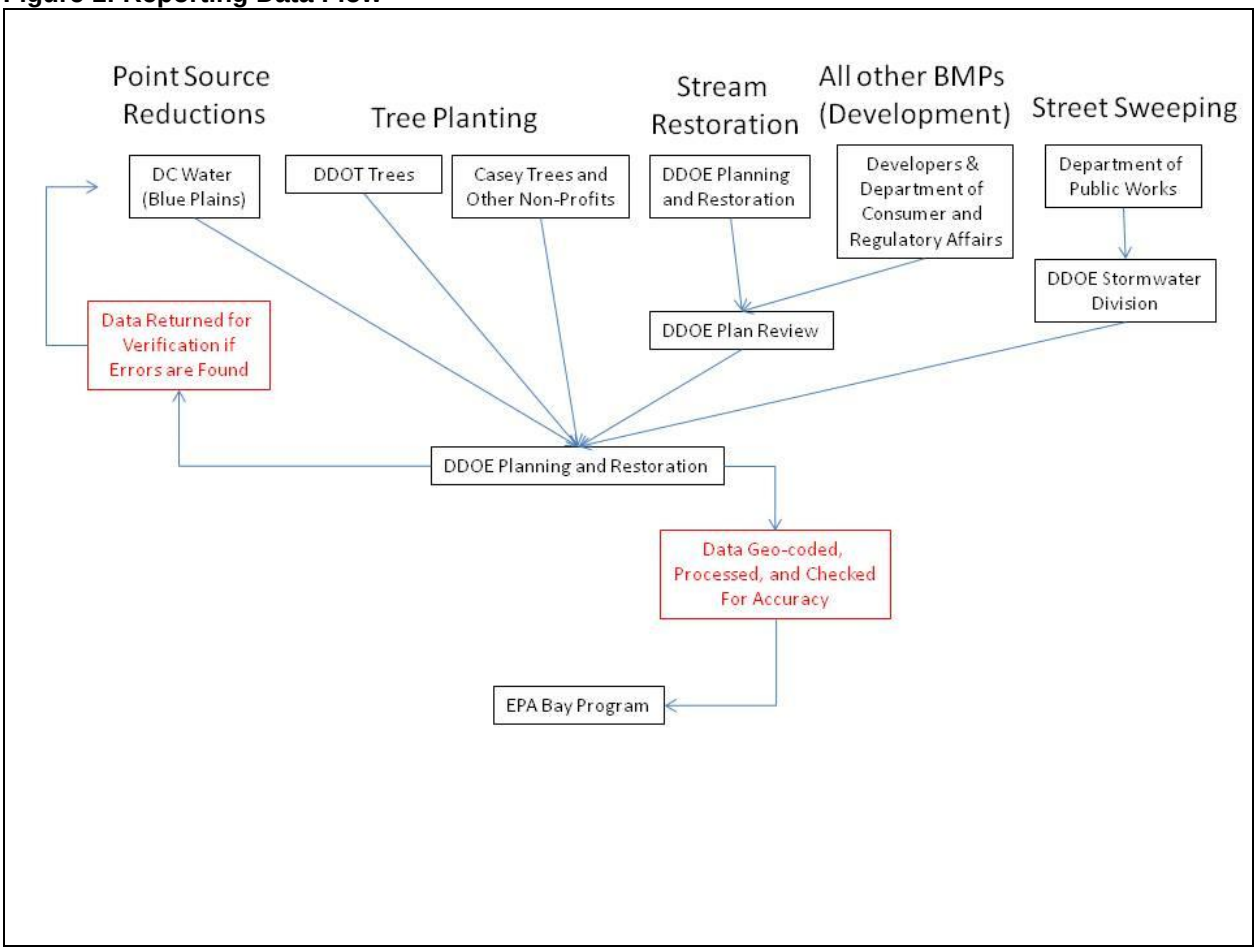
DDOE WPD Inspection and Enforcement Branch – Inspects sites under construction to make sure that they are in compliance with erosion and sediment control regulations, performs inspections during the installation of BMPs, the final inspection on constructed BMPs, and maintenance inspections of installed BMPs. The Inspection and Enforcement Branch maintains records of inspections and QA/QCs recorded data.

DDOE WPD Planning and Restoration Branch – Compiles, geo-codes, and processes the information on stormwater BMPs installed and non-structural stormwater BMP activities from the various reporting agencies, divisions and branches. The Planning and Restoration Branch also maintains and manages a database of stormwater BMPs that it or its grantees install that are not tracked in any other database. DDOE WPD then classifies the information by the type of BMP installed, determines the number of acres treated for each of the city's four 11 digit Hydrologic Unit Code watersheds, organizes this information, and reports it to the CBP.

General Reporting Data Flow

The reporting data flow for this QAPP is shown in Figure 1 below. For each reporting flow path shown in Figure 1 we will document how the data is collected, recorded, reported to the Bay Program.

Figure 1: Reporting Data Flow



Point Source Reductions (Blue Plains)

The majority of the District's load reductions reported to the Chesapeake Bay Program come from point source pollution reductions either from upgrades to the Combined Sewer System as a part of the Long Term Control Plan, or from modifications to the Blue Plains Waste Water Treatment Plant that reduce loads discharged from the facility. Reductions associated with upgrades to the sewer system and wastewater treatment are generally episodic in nature with long periods of no change followed by a dramatic drop in loads when a project has been completed.

As stated earlier, DC Water is legally responsible for the upgrades to both its combined sewer system and to the Blue Plains Wastewater Treatment facility through EPA permits. DC Water monitors discharges from the Combined Sewer System and Blue Plains, QA/QC's its point source loads, and reports them to the EPA as a part of their permit compliance activities. They also annually report this information to both the DDOE Planning and Restoration Branch and to the Metropolitan Washington Council of Governments (MWCOG). Reporting of this data to the Bay Program is performed either by DDOE's Planning and Restoration Branch or by MWCOG.

Tree Planting

The District currently tracks tree planting in the city from three sources: DDOT Trees tree planting activity, DDOE grant funded tree planting activities, and tree planting efforts reported by other non-funded groups such as the National Park Service and Casey Trees. The acres reported for these tree planting activities are estimated based on tree diameters of 20 feet.

The reporting for each of these activities is on a "pull" basis where DDOE makes an information request to the major tree planters requesting the tree planting information. DDOT Trees provides DDOE with a map of tree planting locations, a list of planted trees, and a total number of trees planted annually. DDOE grantees are required to report on their deliverables and DDOE WPD confirms that the grantee has indeed completed the reported work. Finally, DDOE asks other tree planting organizations to provide information on the number and location of trees they planted over the past fiscal year. These plantings are non-regulatory and the numbers are not confirmed. DDOE's Planning and Restoration Branch collects this information from each of these sources who then determines the acres planted in each of the city's four 11 digit Hydrologic Unit Code watersheds, organizes this information, and reports it to the CBP.

Stream Restoration

The majority of stream restoration work is initiated by DDOE's Planning and Restoration Branch, however, regardless of the source of this work, any stream restoration plans must be reviewed and approved by the Plan Review Branch of the Watershed Protection Division. Submitted plans and their treatment areas are entered into a database and are double-checked by the engineer performing the plan review. On an annual basis, the Planning and Restoration Branch queries the database for stream restoration projects installed, geocodes the locations of each project, determines which 11 digit Hydrologic Unit Code watershed the project is located in, determines the linear feet of stream restored, and reports it to the CBP.

Street Sweeping/Catch Basin Inserts

The District Department of Public Works (DPW) is the lead agency for sweeping District of Columbia roadways and maintaining data on the mileage of road swept, the frequency of sweeping, and the type of sweeper used. DPW maintains GIS data on street sweeping routes, their frequency, and the type of machinery used and provides this information to the Stormwater Division of DDOE. This information is then passed on to the Planning and Restoration Branch who reports it to the CBP.

Development/Redevelopment All other BMPs

The second largest proportion of load reduction acreage reported to the Bay Program after point source load reductions comes from the redevelopment of the city. The vast majority of the District was developed before the advent of stormwater BMPs so new development in the District invariably reduces stormwater and pollutant loads to our local waterways.

New development and redevelopment projects must apply for permits through the District Department of Consumer and Regulatory Affairs. Construction projects that disturb 50 square feet are automatically directed to the District Department of the Environment Plan Review Branch for erosion and sediment control plan review. Likewise, construction that disturbs over 5,000 square feet must meet District stormwater regulations and their plans are sent to the Plan Review Branch for stormwater plan review. All of these projects are logged into a tracking database that tracks the watershed where the project is located, the type of BMPs installed, and their area treated. The data in the database is maintained and verified by the engineers of the Plan Review Branch. The Planning and Restoration Branch queries this database on an annual basis and reports to the CBP the acres treated by various BMPs for each of the Districts four HUC-11 watersheds.

Below is the list of District agencies and partners that collect data utilized by the Planning and Restoration Branch for reporting to the CBP, and information on the type of database maintained by the agency.

Table 2: Reporting Agencies and the Type of Databases they Utilize

Agency/Organization	Type of BMP	Completion Form	Database	NPDES Permittee
DC Water	Point Source		X	X
DDOT Trees	Urban Tree Planting		X	
Casey Trees	Urban Tree Planting		X	
DDOE Planning & Restoration Branch	Urban Tree Planting	X		
DPW	Street Sweeping		X	
DDOE Plan Review Branch	New Development & Redevelopment		X	
DDOE Plan Review Branch	Stream Restoration		X	

Quality Assurance Objectives

The stormwater management data collected by the Planning Restoration Branch from other agencies is not provided on a mandatory basis, but instead are provided through inter-agency cooperation. DDOE's Planning and Restoration Branch objectives for reporting to the Bay Program are:

- To receive data on all BMPs listed under NPDES Permits (ongoing)
- To receive data on all BMPs being installed and inspected (ongoing)
- To receive data on all federal BMPs (ongoing)
- To accurately record location data for all BMPs in the Database (ongoing)
- To receive data on all BMPs installed on a voluntary basis (non-permitted activities such as tree planting) (ongoing)
- To verify BMPs installed on a voluntary basis (May 2012)
- To provide the BMP data in the format necessary for the CBP Model (ongoing)
- To provide the data through an EPA Data Node (January 2011)
- To post the BMP data and their associated load reduction estimates on the internet for the public (May 2012)

Data Processing Procedures, System Audits and Quality Assurance Corrective Action Plans

Upon receiving BMP data, the Planning and Restoration Branch staff edit the data. This includes the following steps:

- Site descriptions and addresses are standardized so that they can be properly geo-coded. This facilitates sorting and helps in the recognition of replicates.
- Site locations without addresses are geo-referenced manually to ensure that as many projects are geo-references as is possible.
- Using Arc View, the data is plotted along with an overlay of USGS HUC-11 data for the Washington, D.C. area and layers showing the combined sewer system (CSS) and the MS4 areas.
- Data is then clipped for each for each HUC-11 watershed and within each HUC-11 watershed it is further delineated by CSS and MS4 within each HUC-11 watershed.
- Once the data is organized by each HUC-11 watershed and its sewersheds, the data is sorted by BMP type and the acres treated by each BMP type is recorded.
- This data is then submitted electronically to the CBP for inclusion in the Bay Program model.
- The data submitted to the CBP and all supporting data is compiled and stored in Access and Excel databases as well as in Outlook email archives. This data is backed up weekly by DDOE Information Technology staff.

Table 2: BMP Structures Currently Reported to the Bay Program

Structure Name	Structure Function	Reporting Units
Bio-retention	Landscape designed such that stormwater runoff collects in shallow depressions before filtering through fabricated planting soil media	Acres treated
Cisterns/Rain Barrels		Acres treated
Detention Structure (Dry Pond)	Designed to store runoff without creating a permanent pool	Acres treated
Dry swale	Open drainage channel designed to detain and promote the filtration of stormwater runoff through underlying fabricated soil media	Acres treated
Dry Well	An infiltration trench variant designed to exclusively accommodate rooftop runoff	Acres treated
Extended Detention Structure (Two types): 1) Extended Detention Structure, Dry 2) Extended Detention Structure, Wet	Designed to temporarily detain a portion of runoff for 24 hrs after a storm using a fixed orifice to regulate outflow at a specific rate, allowing solids & associated time to settle out Designed for the temporary storage of runoff associated with at least a 24 hr 1-year storm without creating a permanent pool of water Designed for the storage of runoff associated with at least a 24 hr 1-year storm. The detained water drains partially & the remaining portion creates a permanent pool	Acres treated
Grass Swale	Open vegetated channel used to convey runoff and provide treatment by filtering pollutants and sediment	Acres treated
Green Roof		Acres treated
Hydrodynamic Structure aka: 1) Oil grit separator 2) Bay Saver© 3) Stormceptor©	An engineered structure used to separate sediments and oils from stormwater runoff using gravitational separation and/or hydraulic flow	Acres treated
Infiltration Basin	Designed to allow stormwater to infiltrate into permeable soils. It differs from a retention structure in that it may include a back-up underdrain pipe to ensure eventual removal of standing water	Acres treated
Infiltration Trench (Three types): 1) Complete Exfiltration 2) Partial Exfiltration 3) Water Quality Exfiltration	An excavated trench that has been backfilled with exposed or unexposed stones to form an underground reservoir (Also see Dry Well) Runoff can only exit the trench by exfiltrating through the stone reservoir into the underlying infiltration system. Runoff exits the trench by exfiltrating a) through the stone reservoir into the underlying soil, and b via a perforated underdrain at the bottom of the trench that diverts runoff to a central outlet Storage volume is set to receive only the first ½" of runoff (first flush) from an impervious area of the watershed	Acres treated
Landscape	Impervious area reduction	Acres
Porous Pavement	A porous asphalt surface designed to have bearing strength similar to conventional asphalt but provides a rapid conduit for runoff to reach a subsurface stone reservoir	Acres
Sand Filter	A bed of sand to which the first flush of runoff is diverted. Water leaving the filter is collected in underground pipes & returned to a waterway. A layer of peat, limestone, and/topsoil may be added to improve removal efficiency	Acres treated
Stream Restoration		Linear Feet
Underground Storage	Vault like structure designed for the temporary storage of storm flow	Acres treated
Water Quality Inlet	See Oil/Grit Separator	Acres treated
Wetlands	A structure with a permanent shallow pool planted with wetland vegetation often designed to provide extended detention	Acres treated
Vegetated Buffer	A vegetated protective zone of variable width located along both sides of a waterway	Acres treated

Identification of Customers and Stakeholders

- Customers: U.S. Environmental Protection Agency
- Stakeholders: District of Columbia Government Agencies, DC Water, and the general public.

Procedures for Emergency Situations

The data submitted to the CBP and all supporting data is compiled and stored in Access and Excel databases as well as in Outlook email archives. This data is backed up weekly by DDOE Information Technology staff. The District Department of the Environment has contingency plans in case of an information technology (IT) disaster. DDOE IT Branch maintains this plan.

Reporting Requirements

The DDOE Planning and Restoration Branch reports on its CBP funded grant activities on a semi-annual basis and annually reports load reduction data for inclusion in the Bay Program model.