CHAPTER 6
IMPLEMENTATION STRATEGY

Introduction

The purpose of the implementation strategy is to lay out a plan that when implemented will make significant and measurable progress in achieving a trash free Anacostia River within five years. The results should be measureable in terms of less trash. The strategy set forth in this chapter will not only meet those objectives but exceed them.

Legislative Solutions

The executive branch of DC government should work with the legislative branch to produce three pieces of legislation which will reduce trash not only in the Anacostia Basin, but also in Rock Creek and the Potomac River. If legislation is not enacted, then the entire burden of the trash reduction will fall upon the shoulders of the rate payers. Rates for stormwater control contained in the water bill will escalate. The legislative agenda should deal with 1) plastic bags, 2) foam cups, clamshells and plates, and 3) beverage bottles and cans. A shown in the following figures, this will result in a 57 % reduction of trash in the Anacostia River and a 66% reduction in the tributaries (Figure 6.1-2).

Figure 6.1
Anacostia River Trash Composition

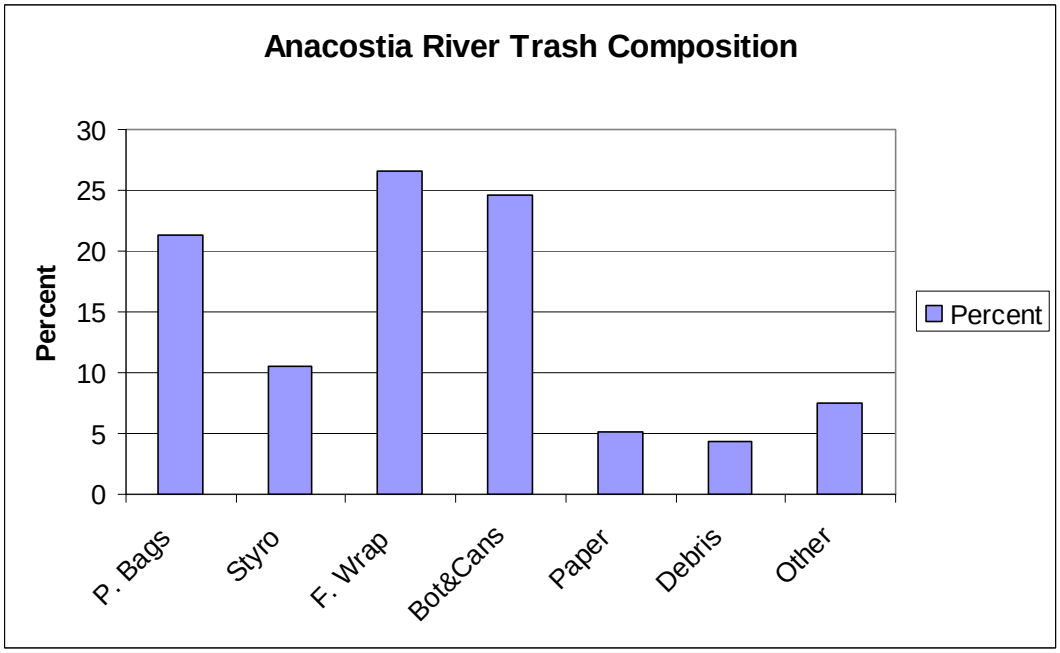
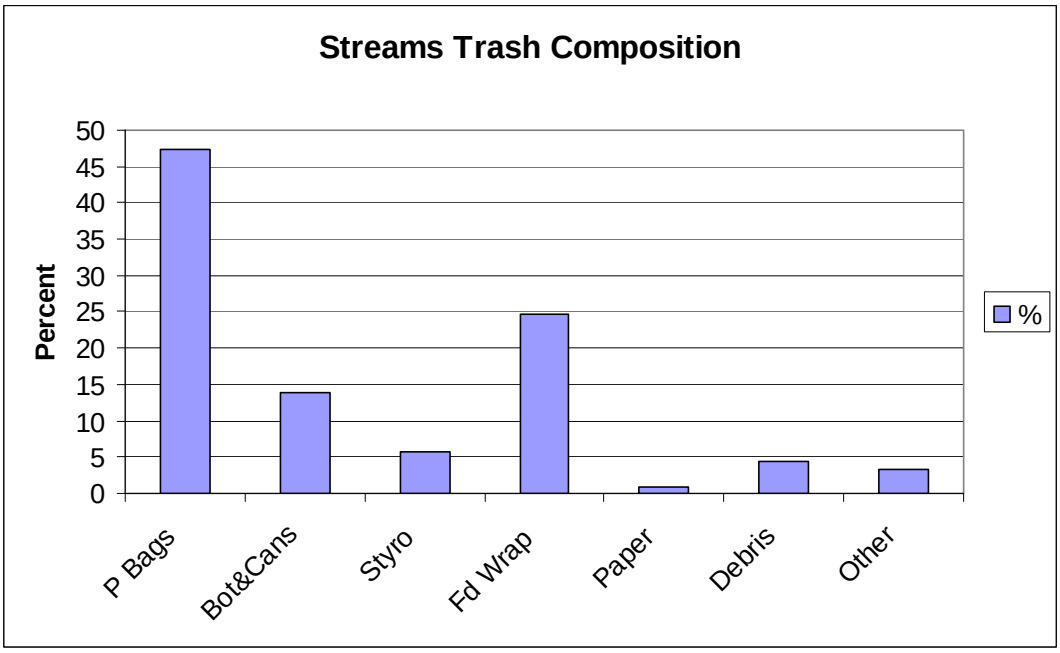


Figure 6.2
Streams Trash Composition



Plastic Bags

The most significant reductions can occur from political action. The single largest component of the trash in the streams, and most likely in the river, is plastic bags. Legislation requiring convenience store, grocery and food items bags to be biodegradable or to eliminate the use of any kind of "free" bag will effectively remove 47% of the trash from the tributaries and 21 % from the main stem. It is believed that the main stem number may be much greater than the data shows due to the selection of the monitoring stations which bias the data to be low. A larger number of mudflat stations would most likely have produced a higher percentage of plastic bags.

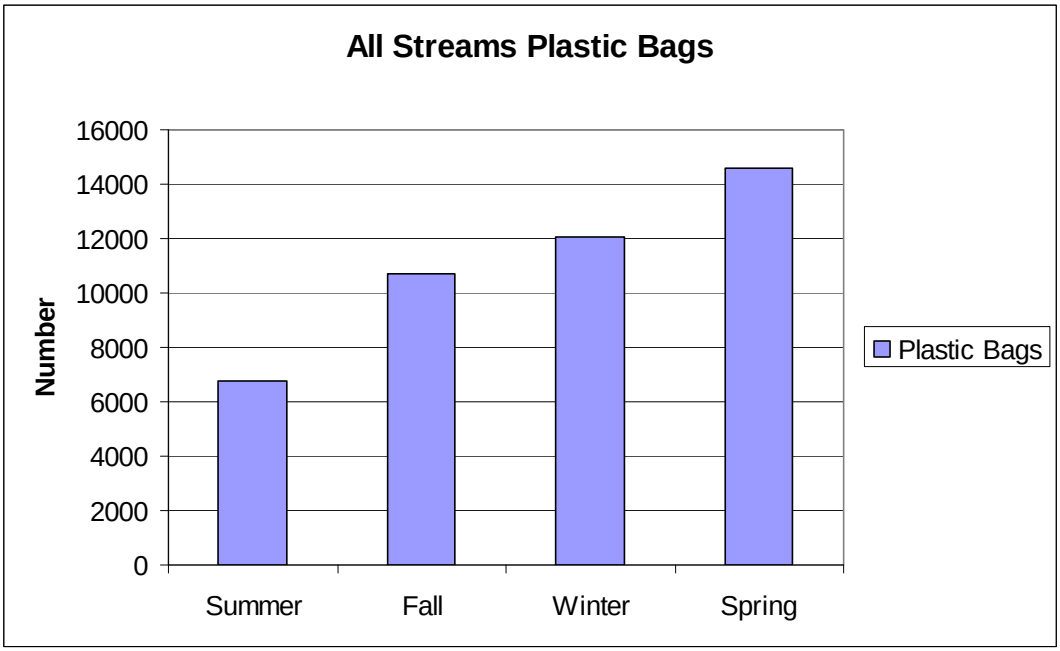
Alternatives to plastic bags are readily available and the data collected during this survey demonstrates that the alternatives are not a major source of trash. Paper bags such as those currently used by McDonalds and Wendy's do not persist in the hydraulic transport from the street and through the storms sewers to the streams. Two of the streams survey transects, Watts and Ft. Stanton, are in very close proximity to these types of establishments. The McDonald's on Watts Branch is literally on the shoreline and the only instances of their paper bags being in the stream was in the vicinity of the footbridge where it appeared that pedestrians discarded the bags right into the stream. There was a notable absence of the bags downstream from the restaurant, indicating that they disintegrate before being transported any appreciable distance. Tests were conducted on paper bags which showed that disintegration begins immediately upon getting wet. Within a short time, the paper simply ceases to exist as anything other than small pieces. The survey initially was designed to count the different types of plastic bags but it was

simply not feasible due to the abraded nature of the bags. While no quantitative data was compiled it is a safe estimate that less than five percent of the bags were yard and leaf bags.

The major grocery stores allow customers to bring their own reusable bags and sell reusable bags. Giant will deduct $0.05 from the bill for each reusable bag the customer supplies.

It should be remembered that trying to remove plastic bags with treatment devices such as grates and screens is gong to be very high maintenance due to the fact that just a few bags can quickly clog the openings, thereby reducing the effectiveness of the device and causing bypasses. This will be a long term financial burden on the rate payers. Each "free" plastic bag that becomes litter costs somebody else money to clean it up (Figure 6.3).

Figure 6.3
All streams – Plastic bags



Legislation to reduce the number of plastic bags could be in several different forms. One option would be to require an added cost to the consumer for each plastic bag. The other extreme is a prohibition of using plastic bags for carryout food items. Consideration could be given to legislation that establishes a sliding increased cost to the consumer and then a total prohibition. A structure such as a five cent cost for each plastic bag for the first two years then ten cents for each bag for two years and then twenty-five cents for each bag for one year and at the end of the five years a total ban on plastic bags for carryout food could be used. The recommended monitoring plan in Chapter 8 can be used to assess the effectiveness of the legislation over the five years.

Styrofoam – Expanded Polystyrene Foam

The category of 'Styrofoam' is defined as items made from expanded polystyrene foam (EPF), and it contains cups, plates, takeout food packaging such as clamshells, and various broken pieces of foam. This category is about 11% of the trash found in the river and 5% of the trash found in the streams. About three fourths of the foam items are cups. It should be noted that the survey did not differentiate between plastic clamshells and foam clamshells. There is a portion of the take out food containers that are not EPF but it is probably only a quarter of the category.

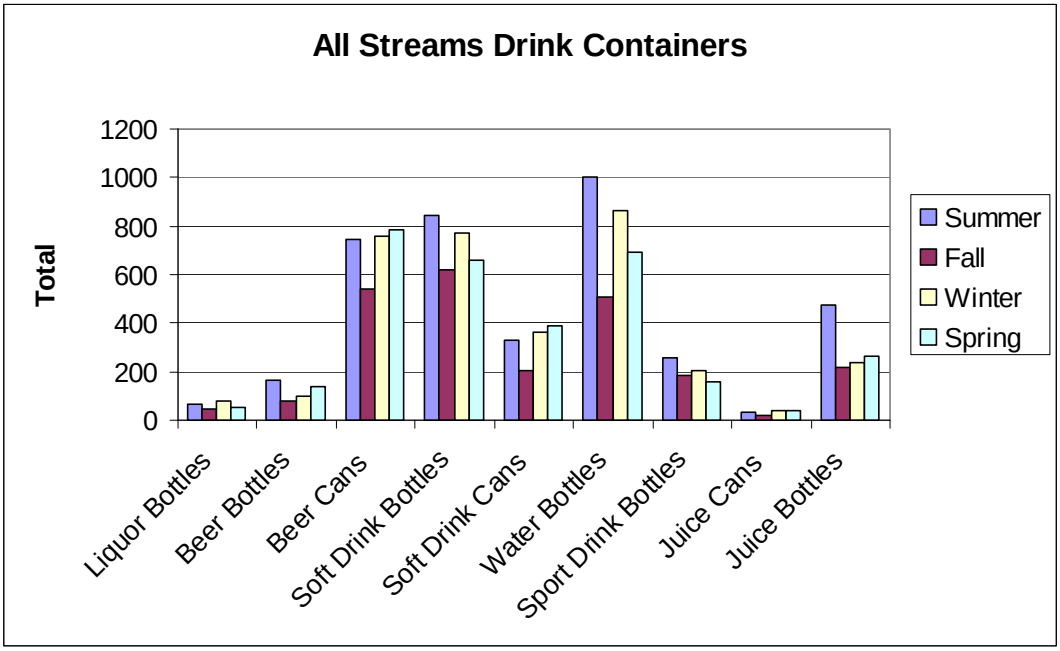
There are effective alternatives to EPF containers available and in use. Starbucks Coffee now uses paper cups and insulators. McDonald's and Wendy's use corrugated paper clamshells. One note is that their French Fries container is a semi-durable plastic coated paper, and it persists longer than uncoated paper but does degrade, from the forces acting on it in a stream environment. Paper cups were very seldom found in the stream. Switching to plastic cups will not remove much trash from the streams. The switch must be to a biodegradable cup.

In California, there has been legislation enacted in various forms to reduce the amount of expanded polystyrene foam containers. The cities of Malibu, Laguna Hills, Berkeley, San Juan Capistrano, Laguna Woods, Huntington Beach, San Clemente, Laguna Beach, Santa Margarita Water District and the county of Ventura all have some type of legislation or ordinance restricting the use of foam containers. Oakland enacted a special litter tax on fast food and convenience stores near schools to fund litter cleanup.

Beverage Bottles and Cans

Beverage bottles and cans comprise a quarter of the trash in the Anacostia River and 14 percent in the tributaries (Figure 6.4). This does not include the hundreds of thousands of pieces of broken glass in the streams.

Figure 6.4
All streams – Drink Containers



The survey counted pieces of broken glass in the streams. It is clear that discarded glass bottles wind up broken. Therefore, the count of liquor bottles and beer bottles is low while the amount of broken glass in the streams is high. Removal of the source of glass bottles will assist in achieving streams that are safe for recreational activities such as wading, as well as in reducing the trash.

When bottles were worth money, people scavenged them from the roadways so that they could redeem the cash value (Figure 6.5). Sometimes it is the old and tried and proven ideas that work the best. There are currently eleven states with some form of Bottle Bill enacted.

Figure 6.5
Return for deposit Coca Cola

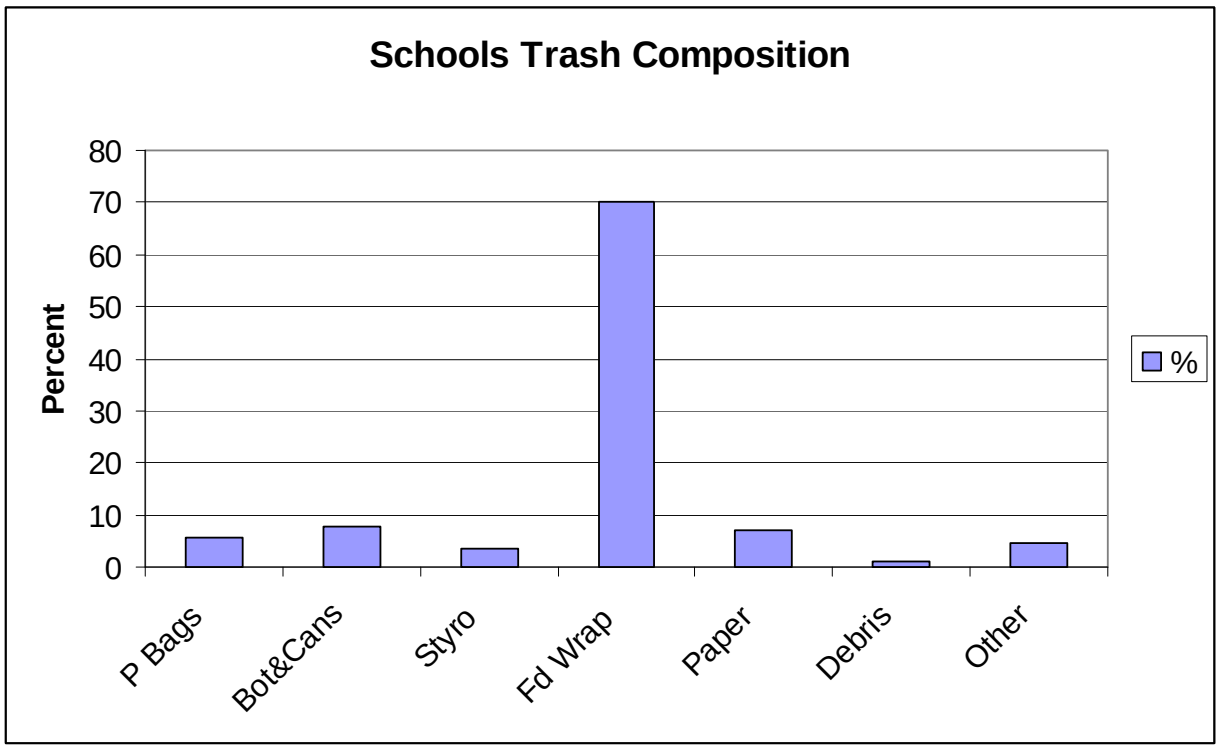
A "bottle bill" will remove about 25 percent of the total trash from the streams and rivers. People who need a few dollars, or groups like the Boy Scouts who wish to raise funds, will comb the road sides and bushes to collect these redeemable bottles for a monetary refund, just like people used to do 50 years ago.

Snack Wrappers

The estimates are that nearly 20% of the population is at risk from type 2 diabetes. Linked to this are high blood pressure, heart disease, obesity, high cholesterol, and gum disease. Controlling type 2 diabetes involves proper nutrition. The types of trash that are found on the land and in the streams indicate that the local health departments have lost the battle with the TV advertising of candy and chips and soda and beer. High sugar, high salt, high carbohydrate food packaging are the predominate source of trash and they are detrimental to long term health when consumed in disproportionate quantities. The data show that the 70% of the trash at schools is

snack wrappers. This is where the hearts and minds and bodies are lost. The District of Columbia Public Schools system (DCPS) needs to remove these materials from the schools. Schools should be a place to learn important skills for life such as how dietary choices affects one's health. The Department of Health and DCPS need to deal with the children's health, and in so doing, will improve the quality of the environment. The schools need to ensure that the children have food and snacks that are beneficial. The price to the taxpayer of later life health issues for people who suffer from these ailments is not estimated here, but clearly the number is enormous.

Figure 6.6
Schools Trash Composition



Consideration should be given to a special tax on individual snack items that have non biodegradable wrappers. The tax should be allocated to the MS4 revenue account for use in removing trash.

Total Legislative Package

A total legislative package that deals with plastic bags, EPF and drink bottles and cans has the ability to remove collectively 21%, 11%, and 25% of the items from the River. This is 57 % of the total Anacostia River trash. In the tributaries, the removal would be 47 %, 5 %, and 14% for a total removal of 66%. This is at no cost to the rate payers. Removing this material through other means will require capital expenditures and ongoing operation and maintenance costs to be

paid for by the rate payers. Preliminary estimates are that **it will cost DC rate payers an ADDITIONAL $32,400,000 to clean up other people's poor disposal habits in the Anacostia basin alone.** If the citizens in the other parts of the District wish to have cleaner streets, neighborhoods and streams, then additional costs will be incurred. These costs will be on top of the millions already being spent. Because a TMDL for trash is being created, which will be accompanied by a regulatory requirement in the EPA-issued stormwater permit that contains severe monetary penalties for non-compliance, there is no way to avoid the additional costs. Penalties under the Federal Clean Water Act can be up to $32,500 per day per violation. A violation would occur with each rainfall event and it rains about 100 days per year in DC. A year of non-compliance would cost $32,500,000, which will cost the same as compliance. The benefits of having clean neighborhoods are not weighed in this report which details how to achieve clean streams; but, it is believed that people would like to live in clean neighborhoods.

New Programs

There is only one new program recommended; a stream maintenance program.

Stream Maintenance Program

- At one time there was a stream a maintenance program whose function was to remove log jams and blockages. Many of the existing steam structures are in very poor shape, and the entrances to pipes are clogged because there is no agency responsible for maintaining them. This effort involves removing debris from streams, cutting up fallen trees and removing debris dams from inlet structures. The program was housed in the Department of Public Works when it existed.

Enhancements to Existing Programs

There are a lot of very good programs that are already working well to remove trash and some of them could remove even more trash with enhancements.

MS4 Permit Enhancements

The District submitted a permit enhancement to the Environmental Protection Agency, and EPA has administratively amended the permit to include the new activities. Many of these will reduce stormwater runoff peak flow, which will subsequently reduce the washing of trash into the storm sewers. These enhancements are listed in the Tables 6.1 and 6.2.

Table 6.1
MS4 Permit Enhancements

ACTIVITY	MEASURABLE AND QUANTIFIABLE MILESTONES WITH SPECIFIC DEADLINES
	Administrative
Memorandum of Understanding (MOU) between the District Agencies	• Update the existing MOU dated December 2000 to formally define roles and responsibilities of each District agency, including the District Department of the Environment (DDOE), D.C. Water and Sewer Authority (WASA), District Department of Transportation (DDOT), and Department of Public Works (DPW), by August 19, 2008.
Enterprise Fund	• Convene a Stormwater Management Task Force to make recommendations on the organization of the District's Stormwater Administration, and the District's stormwater funding mechanisms and fee structure, by March 28, 2008. • Implement recommendations for funding mechanisms and fee structure by December 31, 2008.
	Management Plan for Commercial, Residential, and Government Areas
Tree Canopy	• Draft strategy for the District to achieve optimal tree canopy, with input from the Casey Trees foundation, Friends of the Earth (FOE), and other stakeholders. The strategy will utilize GIS technology to determine and to prioritize planting locations. • Provide final detailed plan for achieving the optimal District tree canopy goal in the 2009 Implementation Plan, dated August 19, 2009. • The District shall make best efforts to achieve optimal tree canopy by planting at least 4,150 trees per year with a goal of planting and maintaining at least 13,500 additional trees by 2014. Trees shall be planted in the manner recommended by *The Green Build-out Model: Quantifying the Stormwater Management Benefits of Trees and Green Roofs in Washington, DC* (Casey Trees May 15, 2007) and/or other pertinent studies to achieve optimal survival tree rate determined in the strategy. The District shall annually document the survival rate of total trees planted along with an annual estimate of storm capture rates to determine the volume of storm water that is being removed from the MS4 system in a typical year of rainfall as a result of the maturing tree canopy over the life of the permit.

	• No later than August 19, 2008, develop and implement a schedule to achieve an optimal tree canopy goal. The District shall make best efforts to implement said schedule no later than December 31, 2014, and will employ a stakeholder process that includes at a minimum Friends of the Earth and Casey Trees. The plan and schedule will be incorporated into the next revision of the MS4 permit. • Continue current tree planting at the rate of at least 4,150 annually
Low Impact Development (LID) Practices	• Complete a master LID implementation list by August 19, 2008. The master list will be a revision of Appendix C included in the 2005 Anacostia TMDL Implementation Plan. • Construct 17 LID projects by August 19, 2009. • Complete the "Low Impact Development (LID) Stormwater Control Structures Maintenance Manual" by April 30, 2009. • To the extent feasible, DDOT will comply with all LID options in the Anacostia Waterfront Initiative Transportation Architecture Design Standards for all DDOT transportation infrastructure projects. • Appendix C to the 2005 Anacostia TMDL Implementation Plan shall be included in the next revision of the DC MS4 permit. • The City shall make best efforts to devise a LID plan and schedule to be completed no later than December 31, 2014, which shall include measures such as: conversion of paved or hardened areas throughout the District, such as traffic street medians, and large sidewalk areas, into green space in the form of "pocket parks" or "green streets." The plan will identify all locations throughout the District where such projects are technically feasible and commit to specific schedules for implementing these projects at specific locations throughout the seven-year period, with highest priority given to projects that offer the greatest storm water capture potential. • Such plan and schedule extend LID incentives to strategies, including rain barrels and downspout disconnections, to other areas than just pocket parks.
Rain Gardens	• Install approximately 50 rain gardens and 125 rain barrels city-wide, and perform 200 downspout disconnections, by December 31, 2009.

Green Roofs	• No later than 18 months from the date of this package, DDOE shall work with the Mayor's office to determine the best way to develop legislation to establish tax credits or other incentives programs for installation of green roofs on non-governmental buildings. An update will be submitted by August 19, 2010. • Complete a structural assessment on all District properties maintained by Office of Property Management (OPM) to determine current roof conditions and the feasibility for green roof installation by April 30, 2009. • For the next four years, every new building constructed by OPM will include green roofs where feasible as determined by OPM and all major renovations/rehabilitation projects of District-owned properties within OPM's inventory will include green roofs where feasible as determined by OPM. • Submit an implementation schedule including square footage, for the green roofs to be installed in selected District properties, based upon the results of the structural assessment, in the 2009 Implementation Plan. • Continue to review new and retrofit construction (federal, residential, commercial, and District-controlled properties) for green roof installation throughout the District, making available $500,000 in incentives for these roofs beginning October 1, 2008. • After one year, assess the effectiveness of the green roof incentives program and modify as needed, including dedicating up to $1,000,000 per year if deemed effective in order to make progress toward the Mayor's goal of achieving 20% green roof coverage in the District in 20 years. The Plan and schedule shall provide for steady progress toward the goal throughout the period and be incorporated into the next MS4 permit revision. • Annually document and report the square footage of green roof coverage for all buildings in the District.
Street Sweeping	• Complete the street sweeping study and begin implementing the long-term enhanced street sweeping and fine particle removal schedule and program by December 31, 2007. Provide notice and opportunity for comment on plan by Friends of the Earth (FOE). • Submit the details of the implementation of the enhanced program for street sweeping and

	fine particle removal in the upgraded Storm Water Management Plan of February 19, 2009. • Continue with implementation of current large and enhanced fine particle removal program for street sweeping based on recently completed study recommendations and document annual pollutant removal rates in pounds from the analysis of different materials collected that have been captured to show the amount of pollution from the street sweeping operation that is being diverted from entering the MS4 system. • The plan and schedule for the street sweeping program will be incorporated into the next MS4 permit revision and shall represent the District's best efforts at achieving a program designed to achieve optimum removal of fine particulate matter and other pollutants from the MS4 waste stream.
Coordinated Catch Basin Cleaning	• Install environmental catch basins or equivalent BMPs in new road reconstruction projects, starting April 2008. Submit implementation schedule in the upgraded Storm Water Management Plan.
Estimation of Pollutant Reductions from Structural and Non-structural Best Management Practices (BMPs)	• Develop a statistical model for estimating pollutant reductions in Microsoft Excel or other database program that will be a combination of Portland's non-structural BMP spreadsheet model and the Watershed Treatment Model (WTM) developed by EPA. A draft of the model will be included in the 2008 MS4 Annual Report and final version will be included in the upgraded Stormwater Management Plan.
Implementation of a Program to Control Discharges from District and Federally Owned Facilities	• Develop a pollution prevention program that will include training to District government workers who are in charge of maintenance facilities and who handle hazardous materials, by September 30, 2008.

Management Plan for Construction Sites	
Update Stormwater Regulations and Guidelines, to Incorporate Enhanced Management Methods	• Promulgate new stormwater regulations that will require LID construction as a first option, and will incorporate enhanced stormwater management requirements for the District where feasible as proposed in the Anacostia Waterfront Corporation (AWC) standards, by June 30, 2008. • Promulgate new regulations that will require construction site managers to have erosion control training by June 30, 2008. • Revise and update the District of Columbia Storm Water Management Guidebook, by December 31, 2008.
Review Construction Projects	• Continue to review construction projects in the District for soil erosion, sedimentation control, and stormwater management. Once promulgated, the District will require compliance with the AWC standards where feasible. • Provide the number of LID projects installed in private properties annually.
Illicit Discharge Program	
Trash Removal Plan	• Continue with current and new trash removal programs to document that trash removal efforts from all sources are increased from the previous year, with annual incremental increases over the life of the permit and that such trash is diverted from the waste stream that contributes to the MS4 system. • Require water quality catch basins for trash/sediment removal devices for new roadway reconstruction projects. • By the end of FY 2009, complete a trash survey and trash removal strategy / trash reduction plan for the Anacostia River and include in the 2010 Implementation Plan • Determine the type of trash control devices that would be the most effective in retaining large debris and sediments in the hot spot areas identified by the trash survey to be included in the 2010 Implementation Plan • Identify a suitable location for one end-of-pipe litter trap in the 2009 Implementation Plan, to be installed by a contractor in the following year. If effective, describe efforts to increase installations of end-of-pipe litter traps in the 2010 Implementation Plan.

	• Retrofit 50 catch basins to address trash control, in conjunction with enhancements to the District's street sweeping efforts, by February 19, 2009. • Develop a total maximum daily load (TMDL) implementation plan for the Anacostia River towards the goal of a "Trash-Free Potomac River" to be provided by October 31, 2010. • Continue current trash removal program and document trash removal efforts including household hazardous waste, leaves, and litter cans from all sources showing that at least 50% is currently being removed from the trash stream that contributes to the MS4 system.
Retrofit Catch Basins	• Commit $1 million annually for retrofitting existing catch basins with vortex separator systems or other effective structural BMPs that the District determines to be the best practicable technology available to maximize storm water pollution reduction, beginning October 1, 2009. Retrofitting will be part of subwatershed implementation plans.
Pet Waste	• Provide an implementation plan and strategy to reduce pet waste from entering storm drains. Strategy may include the creation of dog parks, and providing pet waste bags/receptacles at dog parks, hiring a contractor to deal with pet waste, and conducting a public education campaign in the District, in the upgraded Storm Water Management Plan.
Illegal Dumping	• Submit the number of catch basins and structural components of the MS4 conveyance system to be retrofitted as part of the Watts Branch restoration project in the upgraded Storm Water Management Plan. • Begin the Watts Branch project which will include stream restoration, catch basin retrofits, and storm drain stenciling in the Watts Branch watershed. Storm drain stenciling will begin by April 30, 2008. Report progress in the 2008 Annual Report. • Establish an Enforcement Office to advance and standardize enforcement procedures in DDOE. • Continue to enhance the current DPW illegal dumping programs. • Work with members of the Metropolitan Police Department to enhance illegal dumping enforcement. • Work with DPW to install camera(s) to record illegal dumping activities and assist
	enforcement actions. The camera(s) will be installed in a rotating basis throughout the MS4 area. The installation will begin by August 19, 2009.
Illicit Discharge Program	• Continue to enhance the District's illicit discharge program by targeting potential discharge sources (e.g. Laundromats, dry cleaners, auto repair shops). • By January 31, 2008, the City shall complete a strategy for proactive inspection and enforcement of illicit discharges of pollutants to storm sewers and drains. The program will target each item listed in the chart on p. 5 of the District's Sept. 24, 2007 proposal. • Annually target 20 percent of the MS4 area to achieve 100 percent coverage in the permitting cycle.
Enforcement Plan (Public Education)	
Install Storm Drain Markers	• Install 1,000 storm drain markers per year starting in April 2008.
Promote Proper Pet Waste Disposal	• Distribute "scoop your pet's poop" educational materials to all veterinarian clinics and pet shops in the District by March 2008.
Publicize Illicit Discharge Program Elements	• Enhance program to prevent illicit discharges by increasing publicity of the need to prevent illicit discharges. Enhancements to be identified in the upgraded Storm Water Management Plan.

DC Department of Public Works

Street Sweeping and Cleaning

The collected data show there are clean streets and dirty streets. Street sweeping is very effective in removing the TMDL pollutants as well as trash. At this time it is not known what the exact quantitative impact of street sweeping and street cleaning is on the levels of trash in the streams. As can be seen in the photo (Figure 6.7), it is clear that the exact area of the street that these two activities target is the area where street trash gets transported to the storm sewer via stormwater.

Figure 6.7
Areas Targeted by Street Sweepers and Street Cleaning

The street sweeping and cleaning program should be expanded to include more streets, more often. Very little of the Anacostia Basin is swept on a weekly basis. High efficiency sweepers should be purchased as planned to achieve the maximum benefit of removing not just trash but also the other TMDL pollutants.

A team (perhaps from the Clean City Coordinators Office) should perform windshield surveys on a quarterly basis exactly as was done in this study, and problem streets should be cleaned. The teams should code the problems streets according to what type of cleaning is needed. Some streets can simply be swept, some need a combination of a street crew and a sweeper, and some will need just a manual trash pickup. This survey team should be trained and capable of enforcing solid waste laws. Private trash dumpsters with excessive spillage should be addressed.

DC Water And Sewer Authority (WASA)

There are two studies that need to be performed by WASA to determine if additional trash reductions can be achieved.

1. CSO

Trash from the combined sewer overflow (CSO) will be greatly reduced by the end of 2008 from the pump station upgrades. It is believed that the 40 % reduction in overflows that will be achieved will reduce the trash discharge at least that amount, and likely by a larger percentage.

The CSO area that serves the Historic Anacostia area, and which discharges through outfalls 005, 006 and 007, should be 'greened' with curb cuts and other LID BMPs that will exclude trash. This should be accompanied by enhanced street sweeping. Outfall 006 will have the combined sewer system separated, and the discharge of combined sewage into the Anacostia River will be eliminated by 2010. The stormwater from the 006 drainage area will have water quality inlets installed by WASA as shown in the Table 6.2.

Table 6.2
Location of Water Quality Catch Basins

Location	Water Quality Catch Basin
Between MLK and Good Hope Road	3
Between MLK and U Street	5
Between MLK and V Street	6
Total	**14**

The remaining inlets will need to be screened and swept regularly.

The remaining CSOs will be connected to the Long Term Control Plan (LTCP) tunnel system by 2018. The storage being provided by the current configuration of the tunnels system is expected to accomplish the overflow reduction scheduled for 2025 by 2018. In the interim, it is recommended that WASA investigate the quantity of trash being discharged. New York City uses floating skirted booms around the outfalls and skimmer boats to clean up the trash after rainfall events and WASA could adopt the same type of program. The booms might need to be removed during January and February when the river will sometimes freeze over.

2. Catch Basin Cleaning

The current schedule is to clean all catch basin once a year. WASA should commission a study to determine whether some catch basins fill up more quickly and clean those out more frequently.

Education

One of the largest components of the trash is the food wrappers such as potato chip and candy bar bags. They are constant at 25 percent of the total trash in both the streams and rivers. These are made out of plastic. They do not degrade. They are a very poor nutritional choice and have little value for the money. Given the prevalence of diabetes, high blood pressure and obesity, one begins to understand a connection between the bottles and cans, cups, and snack wrappers. Trash is a health related issue. Poor dietary habits and poor citizenship seem to be related. The Department of Health and the DC Public Schools need to develop a coordinated educational program.

The education of the fishing community needs to be made a priority. The fishing area surveyed was one of the worst of all of the areas, and it was right on the bank such that trash could easily get into the river.

Similarly, the athletic community needs to be educated by DC Parks and Recreation. The soccer field at Kenilworth has a lot of beer bottles in the buffer zone.

Clean City Coordinator

The city should build upon its existing Adopt-a-Block and Adopt-a-Storm Drain programs run through the Clean City Coordinator, and should encourage community groups and non-profits to undertake trash reduction activities by offering them both supplies and monetary grants. One of the Adopt-a-Block groups is the Ambassador Baptist Church at the intersection of Good Hope Road and Minnesota, and they were observed on several occasions cleaning up the sidewalk and street.

The Cleanliness Surveys should be modified to be more quantitative, as recommended earlier in the Street Sweeping section. Actual counts of trash per block should be made and recorded. This could be a very useful tool in targeting street cleaning, and preventing litter from reaching the streams.

Litter Enforcement

District law requires property owners to sweep or keep clean the area in front of their homes or businesses, from the curb line out 18 inches into the roadway. There were some beautiful neighborhoods surveyed, but it was observed that one unkempt house will degrade a whole block. There is enough work in the Anacostia drainage basin to keep all the enforcement staff busy full time. The citizens of the Skyline Terrace area complained bitterly to the survey team about the lack of enforcement by Metropolitan Police Department (MPD). The citizens would write down the tag numbers of Maryland license plates that dumped bags of garbage in their neighborhood and would get no response from MPD. The Clean City Coordinator should bring together the management of the Departments of Transportation (DDOT), Consumer and Regulatory Affairs (DCRA), Environment (DDOE), Health (DOH) and Public Works (DPW) to work together to develop common guidelines and standards for enforcing litter and trash. The principal agencies should meet and agree to a "standard" for their inspectors. Such a standard might be 10 pieces of trash per 1000 square feet or 100 lineal feet. Agreement should be reached on enforcement actions to be taken once the standard is violated. Uniformity is not the desired goal. Less trash is what is desired. There should be a discussion of any areas of any types of facilities where there is not sufficient enforcement. Gaps in enforcement should be eliminated.

Each of the high trash streets in Chapter 6 should be checked, and a determination of appropriate action made. Once the Cleanliness Surveys become quantitative they can be used to target enforcement inspections.

District Department of the Environment (DDOE)

The erosion control and stormwater regulations should require that all Best Management Practices (BMPs) have trash and litter control included. The design manual is currently being revised to include more Low Impact Development techniques. The BMPs in the manuals need to be reviewed to determine if the BMPs can be enhanced to remove even more trash. In particular, the new water quality catch basins should be test with screen in place to catch entrained trash and determine the maintenance requirements with screens in place. The regulations could be amended to require large construction sites to proved trash receptacles for their employees.

Inspectors should begin checking for construction debris and litter that can escape the site and get to a storm drain or stream. District Department of Environment (DDOE) should review the water quality catch basin and modify it as needed to capture more trash. The modified design should be piloted in a few high trash locations.

DDOE needs to adopt a final regulatory definition of trash that can be used for design purposes for such things as mesh size of grates and screens.

Trash monitoring should be conducted quarterly on the Anacostia River and a few of the larger tributaries.

The DDOE is the water quality certification agency for all NPDES permits. They should "conditionally" certify all permits with a condition that the permittee develop and submit for approval a trash discharge elimination plan for the facility. Since trash is now listed as a pollutant, it is easy to legally require the reduction of the discharge of trash along with other pollutants.

Environmental Protection Agency (EPA)

In the first Trash Summit, the Environmental Protection Agency (EPA) agreed to look into the legality of requiring trash reduction measures in the general stormwater permits. That has not occurred, and EPA needs to require the same controls that DDOE will require.

EPA has been coordinating the Anacostia River Basin Trash TMDL to be performed by DDOE and Maryland Department of the Environment. This activity will lead to upstream controls. EPA has been very conscientious in approving the Maryland TMDLs to insure that the Maryland allocations are legally enforceable. At the 2008 Trash Summit, Montgomery County agreed to accept a numerical trash reduction goal in their MS4 permit.

Department of Transportation (DDOT)

The Department of Transportation (DDOT) needs to review their policies and design criteria concerning grate spacing and reduce it to the final dimensions that are determined in the TMDLs.

DDOT needs to retrofit their bridges to eliminate trash discharges to the river from bridge stormwater runoff.

DDOT needs to make installing water quality catch basins a component of a major street work, not just reconstruction projects. An ideal time to install LID BMPs is during construction and replacement of sidewalks and of curbs & gutters.

There are street endings and street "T"s where DDOT has allowed water to run off of roads in an uncontrolled manner, which causes severe gully erosion as well as trash to be transported overland.

Washington Metro Area Transit Authority (WMATA)

Most of the metro parking lots and stations were very clean, and that included the curbs. Their facility maintenance program appeared to be excellent. The Adopt-a-Bus Stop program is working well at the bus stop surveyed by the study. It seems to be an excellent program and should be expanded as much as possible. There are a few bus stops without trash receptacles, and Metro should survey those facilities to determine if trash cans are warranted.

DC Department of Parks and Recreation

Most of the undeveloped parks have a moderate amount of dumping that occurs. Very little of it is into the streams, but this dumping does still degrade the watershed. Better enforcement and better maintenance is needed. Most of the maintenance effort seems to be placed upon "improved" parkland which has been landscaped and mowed. Figure 6.8 is a photo taken from the MacDonald's parking lot on Nannie Helen Burroughs Avenue, and there is a six person team cleaning up the park adjacent at the Watts Branch foot bridge. They will not venture out of the mowed areas. Some of them are most likely volunteers.

Figure 6.8
Six person team cleaning up the park adjacent to the Watts Branch foot bridge

DC Housing Authority

Many of the public housing units had very clean grounds. Maintenance staff workers were observed with wheeled trash cans and brooms and shovels cleaning the gutters and sidewalks. They should be asked to increase the emphasis on trash and litter cleanup. Possibly they can be enlisted to install and maintain inlet screens.

National Park Service

The National Park Service (NPS) needs to develop a better trash can policy. There are many people of goodwill who simply do not know exactly how to dispose of their trash. Figures 6.9-6.11, while taken in Rock Creek drainage, depict conditions which are common to all areas. The public goes to a lot of trouble to bag their trash and then winds up leaving it on the ground for raccoons and crows to scatter. The NPS field staff then have to manually pick it up, which they do, and do very well. However, this creates additional work, and the possibility for scattered trash to be moved before it is picked up.

Figure 6.9
Bagged trash placed next to trash can

The public does not know how to deal with their trash bags and the small doors on the trash cans. It is not obvious that the lid is removable or hinged. As can be seen, the citizens go to a lot of trouble to neatly bag their trash and carry it to the trash cans. For the purposes of the photo the lid has been pivoted to prove that the trash cans are less than half full (Figure 6.10).

Figure 6.10
Trash can lids removed to show that the trash cans are less than half full

A well designed decal that showed how to open the top of the trash can might prevent a lot of trash from ending up on the ground and in the streams, as well as prevent unnecessary maintenance staff costs.

Figure 6.11
There is room for a well designed decal demonstrating how to open the lid of this trash can

Clearly there is room for a sticker on the trash can lid, and it can easily be printed in both English and Spanish.

The National Park Service needs to install trash cans at the fishing area in Kenilworth Park and along the buffer zone of the soccer field. This will be cheaper than manually picking up the trash item by item.

The National Park Service needs to review all of their facilities and modify their storm drains to exclude trash. This includes all NPS roads. Anacostia Drive between South Capitol Street to the Boat Ramp at the DDOE Aquatic Recreation Education Center should have curb cuts installed which will help collect trash.

Basin Specific Strategies

The desired outcome of this program is that at the end of five years, a measureable reduction in the amount of trash in the Anacostia River will have been made. There are several ways of doing that. WASA measures the amount of trash that they skim out of the river and certainly that is a "measureable reduction" which causes the river to have less trash. It is always good to be able to measure trash removed. It is also good to measure trash that is not present in the river in the first place, and it is this concept that is at the heart of the recommended plan. The goal is to remove the trash before it gets to the tributaries. By getting them clean first, they are eliminated as a source of trash to the Anacostia River. It should be noted that in 2018, WASA will prevent trash from reaching the river from CSOs when full implementation of the CSO Long Term Control Plan (LTCP) is achieved. Thus, the fundamental concept of this plan is to clean up the tributaries that flow to the river, as well as cleaning up the main stem of the river. Conversely, any plan that involves screening or bagging a tributary where it flows into the river should be rejected outright as being an unacceptable premise. The tributary itself must be clean. Where storm sewers flow directly into the river they obviously must be dealt with or else the river will still receive excessive trash.

To develop the strategies for the sub-basins a few criteria were established:

1. The tributaries to the main Anacostia River should be as clean as the river.
2. The strategy should build upon or compliment the *Anacostia TMDL Implementation Plan* for the twenty specified pollutants.
3. To be cost effective, storm water should not be treated twice to remove trash. There are a number of the tributaries which drain into very large storm sewers and are comingled with other stormwater flows before reaching the Anacostia River.
4. To the extent reasonable, the actions should be those that the government has demonstrated that it knows how to perform well.
5. The citizens should be satisfied with the results.
6. The costs should be something that can be afforded.

7. Where risks are involved with unproven techniques, small basins are to be used as a prototype before moving to large basins.

The basic components of the EPA approved *Anacostia TMDL Implementation Plan* is to reduce the discharge of pollutants from the storm sewers by street sweeping and catch basin cleaning. Trash will become one more component of that plan. The costs of that type of solution are competitive with other types of solutions. The government agencies are familiar with the implementation and operation of those practices.

Because controlling the amount of trash that reaches a storm sewer and then discharges to a waterway is a relatively new concern, there is a significant amount of old and new technology that is available but has not been extensively tested for removing trash. The most promising and simplest technology is to place screens on the entrances to the storms sewers and use street sweepers to remove the trash and leaves that will collect there. End of the pipe structural devices have been tested in California, and some were found to be effective but are not recommended. Low Impact Development techniques, such as curb cuts, can be adapted to trash removal.
It is recommended that the primary method of controlling trash be to install permanent screens on the catch basin inlets and sweep the streets weekly all year long, including winter. Because this has not been proven on a large scale, and in a cold climate, it should be tested on the smaller basins first before proceeding to the larger drainage areas.

Kingman Lake Trash Reduction Plan

The area of M Street and Maryland Avenue can be dealt with by any of four methods:

1. An inline device such as a Baysaver or CDS can be installed in the vicinity of Maryland Ave. and M Street.

2. A LID water quality treatment system such as a wetland can be installed to remove all TMDL related pollutants, and the stream should be daylighted. A small study would need to be done to determine that the stream actually has flow enough of the time to sustain the plants.

3. A netting trash trap system can be installed in the golf course and maintained via the golf cart trail.

4. Catch basins can be screened and the streets swept.

It is recommended that a wetland be constructed

The storm sewer system that runs along Benning Road will have new catch basins installed as a part of the reconstruction, but they are the old design and will provide little water quality improvement. They should be modified to capture trash and pollutants. The catch basins should be screened to capture trash and swept weekly.

The MS4 system above RFK stadium parking lot area should be screened and the streets swept.

The Sports and Entertainment Authority should accept responsibility for the trash in the buffer zone along Kingman Lake and hire a crew to clean it up. This includes the inter-tidal area. They should ensure that the trash from tailgating parties is properly disposed. They should screen all of the inlets in their parking areas and maintain them.

The commercial car washing activities in the parking lot on the weekend are a violation of the MS4 permit and need to be eliminated.

Hickey Run

This basin is scheduled to have a trash removal component as part of an end of pipe treatment for the largest storm sewer. A two component treatment train consisting of a trash removal device and a Baysaver unit has been selected, and it is believed construction will begin in 2010. The smaller basins can be dealt with in the same manner, being as the maintenance requirements will be the same.

The small MS4 basin south of New York Avenue and east of Bladensburg Road is very clean. It is debatable whether it needs any controls. The outfall should be monitored to determine if there is any issue with trash.

The DC Department of Parks and Recreation should install trash cans at the Langdon ball fields. The inlet grates have a width opening of two inches, and one inch hardware cloth could be inserted under the grate.

Nash Run

The beginning of Nash Run is not easily accessible as it currently exists. In order to clean up the tributary, the solution will need to be up in the MS4 system. All catch basins will need to be screened. The streets will need to be swept regularly, and the catch basins maintained. On an interim basis, trash can be caught and collected at a downstream point with a structural device such as a fence or net to protect the Kenilworth Marsh.

Watts Branch – DC Portion

Watts Branch is an inter-jurisdictional stream with half its basin in Prince Georges County, Maryland. The Maryland basin is a significant source of debris and trash. Solutions should be coordinated with Maryland because both Maryland and DC have total suspended solids (TSS) TMDLS that affect Watts Branch. These two jurisdictions should consider a holistic solution that achieves significant flow reduction. Large debris items float down the stream during high flow events, and, therefore, any in-stream device would need to be armored to withstand heavy impacts. In-stream devices do not appear to be feasible at this time.

1. Catch basins should be modified with screens starting with the upstream MS4 basins. The areas should be swept weekly to clean the screens.

2. The Environmental Crimes Unit should be asked to investigate the dumping behind a residence on the 44-46th Block of Gault Place, NE (Figure 6.12). This material is reaching the stream. It is believed that the Metropolitan Police Department (MPD) would be the most appropriate first contact at this residence. DDOE could wade alongside in the stream and verify the house number to assist.

Figure 6.12
Motorcycle in Streambed Behind a Residence of the 44-46th Block of Gault Place

3. There are about 20-50 people who are usually present in Marvin Gaye Park in the vicinity of Division Avenue. There is a lot of trash and litter associated with some of the people. The trash ranges from needles and cooking lids to newspaper, beer cans & glass bottles, and a lot of plastic cups & water bottles and Styrofoam plates. The Umoja Treatment Center Methadone Maintenance at 5140 Nannie Helen Burroughs Avenue, NE should be contacted to see if the amount of trash can be reduced.

4. There is a minor amount of dumping at 46th and Grant Street, NE.

5. A broken sewer line at Eads St. and Watts Branch was reported to DDOE and was fixed immediately.

6. The Mayfair Parkside community would be a good place to do curb cuts. The streets are relatively clean and well maintained.

7. The NPS needs to install about 15 trash cans in Kenilworth Park. There should be one at each end of the fishing area, about four around each of the soccer fields, and one at the abandoned bridge over Watts Branch. This will be much cheaper than having the maintenance crew manually pick up trash from the ground each week.

8. For the single family residence area of Lee, Lane, Marne, 40th and 44th Streets, NE, the two storm sewers are relatively shallow and accessible, and there is enough room for LID to be used if the NPS is agreeable.

9. Progressive litter enforcement should occur with the businesses along the I-295 Service Road. A site visit to each, and an informational brochure about litter control could be presented during the first visit. A second visit could include a small civil infractions fine and followed by further follow up actions of increasing intensity.

Fort DuPont

Fort DuPont has only a few small storm sewers and is easily remedied. It should be one of the first streams targeted.

1. The area adjacent to Burns Street and Ridge Road, NE needs to have the dumped debris removed and then a decorative rail fence installed to discourage future dumping.

2. There are about 19 catch basins in the Burns Street area which need to be screened. One of them has had curb cuts installed, but the inlet should still be screened and swept (Figure 6.13)

Figure 6.13
Curb cuts and unscreened catch basin

3. The seven catch basins adjacent to the Ridge Road Recreation Center should be screened. One of them has had a curb cut installed, but the catch basin inlet is still unscreened.

4. The storm sewer outfall from the Ridge Road Recreation Center area needs to be repaired. The whole outfall structure has collapsed and there is severe erosion occurring (Figures 6.14 & 6.15)

Figure 6.14
Collapsed Storm Sewer Outfall from the Ridge Road Recreation Center

Figure 6.15
Storm Sewer Outfall

5. The NPS should reduce the opening size on the storm water inlets along Ft Davis Drive to one inch or install inserts under the grates.

6. The NPS should check for other inlets which are not mapped and remedy them also.

7. The inlets along F Street already have curb cuts. It would be good to replace the five inlets along E street with curb cuts although some places do not seem to have very much space available. The F Street curb cuts are shown in the pictures (Figures 6.16 & 6.17).

Figure 6.16
F Street curb cut

Figure 6.17
F Street curb cut

8. Litter enforcement officials should visit the alley behind the 3200 block of E Street S.E.

9. The park area adjacent the alley of the 3200 block of E street should be targeted for a cleanup.

10. There are some inlets on 32nd Street near D and Ely Streets, and it is not known where they discharge.

11. While not an objective of this report, there were a few other things noticed:

    a. The NPS should daylight the stream adjacent to their maintenance yard. They should also remove the culvert below Ft Davis Drive before the stream removes it and severe erosion of the streambank occurs. The catch basins that are screened will need to be swept regularly.
    b. The park land below Minnesota Avenue needs to have all the trash picked up. It is exceptionally dirty.
    c. There is a lot of dumping under the elevated portion of the Anacostia Freeway, but it does not reach any waterway (Figure 6.18). The stormwater from the Anacostia Freeway drains down onto the ground and forms puddles. This should be resolved with the resolution of Ely MS4 by constructing a wetland.

Figure 6.18
Below the elevated portion of the Anacostia Freeway

Fort Chaplin

1. This stream should have the catch basins screened except right along the park where curb cuts will work.

2. The downstream inlet needs to have regular maintenance.

3. The streets should be swept regularly.

4. Litter enforcement needs to visit D Street and Ridge Road

5. There is a lot of dumped garbage, trash and household items in the park along Burbank Street. There are several trash cans along there but they do not seem to be used. The material is not reaching the stream, but it degrades the park.

Ft. Davis-1 and Ft. Davis -2

These two streams have very clean neighborhoods draining to them. Ft Davis-2 has serious erosion problems.

1. The two basins should have curb cuts installed where there is room, and screens where there is not so much room, combined with regular street sweeping. There are about 10 inlets for FD-1 and about 21 for FD-2.

2. To help with the erosion problem, the stormwater energy from the steep slopes of the storm sewer lines needs to be dissipated.

3. The downstream end of FD-1 needs to be maintained. The inlet to the pipe is clogged and sediment has been deposited in the old stream channel.

4. The MS4 System below Fort Davis can either be handled with an inline system because the outfall is easily accessible, or the system can be handled by screening the inlets and sweeping the streets. It would be better to screen and sweep, so the flow from the upper section would not have to be treated twice.

Texas Avenue Tributary and Pennsylvania Avenue MS4

1. For some areas of this stream basin, curb cuts could be used and would work well, however, other parts such as Hillcrest Drive and Park Drive are very steep and there is not much space.

2. The storm sewer serving 28th Place and Texas Avenue is a serious source of trash and is causing severe gully erosion. Consideration should be given to a more holistic BMP that would reduce volumes and energy of the water. One solution would be to pipe the storm

water down the hill to 28th Street, dissipate the velocity, and remove the trash before discharge.

3. There is a lot of dumping along Texas Avenue above 27th Street and a decorative rail fence would help as a deterrent, although in this area it is more garbage than debris that is dumped. There are trash cans along that side of the street, but the dumping of beer bottles and cans persists anyway.

4. On the main stem channel there is an inlet to the culvert just above the intersection of Park Drive and Hillcrest Drive. The grate is clogged and needs to be cleaned.

5. The Texas Avenue Tributary drains to the Pennsylvania Avenue MS4 and is about one third of the area. Consequently, to avoid treating that much water twice, the Pennsylvania Avenue MS4 should also be screened and swept.

6. There is a degraded wetland in the drainage basin. DDOE should conduct a feasibility study to determine the rehabilitation potential.

Fort Stanton

1. The design of the water quality catch basin serving the Anacostia Community Smithsonian Museum parking lot should be checked for trash removal. If they do not have it incorporated, then they should be screened and maintained by the staff.

2. The roadway inlets along Fort Place that drain to this tributary should be screened and perhaps the museum staff could be persuaded to maintain them. There are 8 inlets.

3. There are thousands of bottles and cups in the discharge area of the storm sewer at Fort Place. These are trapped in the porcelain berry vines. They represent an extreme fire hazard as well as a potential source of trash to the stream. They must be removed. A similar but not as extreme situation exists in a braided section of the tributary that may be caused by the storm sewer serving Ainger Place. The debris in the tributary, which is mostly some very old tires, should be removed. WASA has constructed a temporary access road for work on the drinking water system and the debris can be easily removed.

4. The main stem needs the construction debris removed.

5. The six Ainger Place storm sewer inlets should be screened. Alternatively, an inline treatment and removal device can be evaluated.

6. The storm sewer serving the Skyland -Wagner area should be screened and swept. The residents of this small community have organized themselves and take turns cleaning up the neighborhood on a weekly basis. They would greatly appreciate any help in achieving a clean neighborhood. They currently complain that Maryland residents come and dump trash bags in their neighborhood, and when they report it to MPD they get no satisfaction.

7. The lower Ft. Stanton MS4 system can be screened and swept.

Pope Branch

There is a restoration plan for Pope Branch and many of the non-trash problems will be taken care of with the restoration.

1. Upper Pope Branch storm sewers should have all of the inlets screened, or where there are opportunities, curb cuts can be used.

2. The streets need to be swept on a regular basis.

3. The restoration of Pope Branch will have to deal with some of the storm sewers that need energy dissipation such as at Texas and Nash. LID techniques that reduce peak flow will help reduce trash also.

4. Lower Pope Branch storm sewers along Fairlawn drain into the pipe that carries Pope Branch under the railroad and to the Anacostia. The inlets need to be screened and/or curb cut, and the streets swept regularly so the total out flow does not have to be treated at the Anacostia outfall.

MS4 Systems

Because most of the MS4 systems have no open stream channel to protect they can usually be handled with an end of pipe solution. The exception is the largest of the East Capitol Street MS4s. The solution should be to achieve a reduction for all of the TMDL parameters, not just trash. Screening the catch basin and sweeping the streets will work, the costs are comparable and the citizens get clean neighborhoods.

East Capitol MS4s

There are about four or five pipes in this system that discharge to the Anacostia. They are all accessible for end of pipe solutions. The Ft. Chaplin tributary drains to the largest of the MS4 systems, and it will cost about an extra $1M to retreat the Ft. Chaplin flow, so this system should be screened and swept.

Ely MS4

The end of the pipe is not readily accessible due to parkland which is also a wetland. However, it crosses under an elevated portion of the Anacostia Freeway. Ideally, it would be good to explore the possibility of constructing a wetland under the Freeway to treat both the storm water from the Freeway as well as from the MS4 (Figure 6.19). A wetland would enhance the Anacostia River habitat.

Figure 6.19
Possible location of wetland under an elevated portion of the Anacostia Freeway

Significant portions of this area are under control of the Potomac Division of the District of Columbia Housing Authority. More emphasis on outside trash and litter clean up would be helpful. The Housing Authority should help install and maintain the inlet screens if that solution was used.

Naylor MS4

This system is amenable to an end of the pipe system. The pipe goes across the open field in Anacostia Park near the Recreation Center. It can be daylighted and treated by constructing a wetland.

Stickfoot MS4

Stickfoot Sewer is actually an old stream, and it should be daylighted and the trash captured at the point of daylighting. It would seem that there might actually be an application for an electrically operated screening facility. A better option would be to construct a more environmentally compatible LID system so that all of the TMDL pollutants are removed.

Post Implementation Measures

Once the implementation of trash reduction measures for a tributary have been completed, then the tributary should be cleaned up. There are a number of organizations which are capable of

cleaning up trash and debris from tributaries. The DC Summer Jobs Program could be used, for example. After the trash has been cleaned up, then the stream should be periodically surveyed to ensure that there were no sources of trash left uncontrolled.