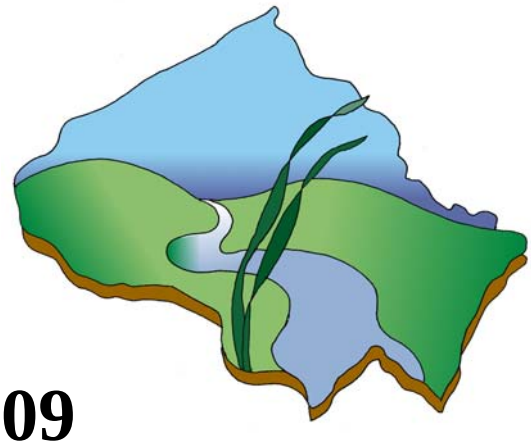

Annual Report for 2007-2009 NPDES Municipal Separate Storm Sewer System Permit

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for the Maryland Department of the Environment

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LIST OF ACRONYMS

BMP Best Management Practice

CIP Capital Improvement Program

USACE U.S. Army Corps of Engineers

DEP Department of Environmental Protection

DPS Department of Permitting Services

DPWT Department of Public Works and Transportation

EPA U.S. Environmental Protection Agency

GIS Geographic Information System

IBI Index of Biological Integrity

MDE Maryland Department of the Environment

MDP Maryland Department of Planning

MNCPPC Maryland National Capital Park and Planning Commission

MS4 Municipal Separate Storm Sewer System

NPDES National Pollutant Discharge Elimination System

USGS U.S. Geological Survey

WSSC Washington Suburban Sanitary Commission

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ATTACHMENT A. COMPACT DISK WITH THE FOLLOWING ELECTRONIC APPENDIXES

SDI2008.zip GIS Storm drain file for 1998 through April 2008

APPENDIX A.doc Annual Report Databases

MDENPDES07-08.mdb Required information in ACCESS 2000 database.

Urban Best Management Practices
NPDES Construction General Permits
Erosion and Sediment Control Responsible Personnel Training Certification
Illicit Discharge Program (and type codes)
Chemical Monitoring Site
Continuous Flow Monitoring
Chemical Monitoring Storm Event Data
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Stormwater Implementation Information

Reports Included:
Appendix B White Oak Source Control Pilot 2009_12 Final.pdf
Appendix C RESOLVE Report on funding initiatives 2007.pdf
Appendix D 2007 SPA Annual Report
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MONTGOMERY COUNTY MARYLAND
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT

I. BACKGROUND

This submission fulfills the requirement for an annual progress report to the Maryland Department of the Environment (MDE) as specified in Part V of Permit Number 00-DP-3320 MD0068349 (the Permit). The five-year Permit term began July 5, 2001, covering stormwater discharges from the municipal separate storm sewer system (MS4) in Montgomery County, Maryland. Significant accomplishments in the County's stormwater management program during the 2007 and 2008 calendar years are highlighted in the Overview. The report itself has been organized based on the headings in the Permit's Section III to document how specific required elements of the County's stormwater management program are being implemented. The database format for electronic submission is included on compact disc (CD) in Attachment A. This includes the field names, formats, and explanatory information provided by MDE.

The Montgomery County Department of Environmental Protection (DEP) has primary responsibility for the majority of the requirements of the Permit, including interagency coordination, annual reporting, source identification, discharge characterization, monitoring, stormwater facility inspection and maintenance enforcement, illicit discharge detection and elimination, watershed public outreach, and watershed restoration plans, and solid waste services. The Department of Permitting Services (DPS) is responsible for the County's Stormwater and Sediment and Erosion Control Program. The Department of Transportation (DOT) is responsible for storm drains, road and roadside maintenance. The Department of Environmental Protection, Division of Solid Waste Services (DEP-DSWS) is responsible for solid waste disposal. Three agencies are responsible for their facilities' General Permits for Storm Water Discharges Associated with Industrial Facilities at the County-owned vehicle and road maintenance facilities; DOT, DEP-DSWS, and the Department of General Services, Division of Fleet Management Services (DGS-DFMS).

The MDE modified the County's Permit effective January 26, 2004 to add six small localities as co-permittees for coverage under the Phase 2 of the National Pollutant Discharge Elimination System (NPDES) MS4 Permit Program. There were five municipalities: the Towns of Chevy Chase, Kensington, Poolesville, and Somerset, and Chevy Chase Village; and one special tax district, the Village of Friendship Heights.

This is the seventh report in this current permit cycle and covers years 2007 to 2009. The County's Permit was re-issued in February 2010.

II. OVERVIEW

Permit Administration

In July 2008, there was a significant reorganization of County Departments which affected in some cases relative roles and responsibilities for MS4 permit implementation. The Department of Public Works and Transportation became Department of Transportation (DOT), with responsibilities for capital transportation projects, traffic engineering and parking management, transit services, and highway maintenance and operations.

Other reorganization changes included creation of a new Department of General Services (DGS) with Fleet Management Services, Facilities and Services, and Capital Planning, Design and Construction from DPWT, as well as the Office of Procurement and the Small Business Reserve Program from the Department of Economic Development. The Division of Solid Waste moved from DPWT to the Department of Environmental Protection. The reorganization was completed to improve accountability; provide a sharper focus on customer service, transportation, transit needs and environmental protection.

Details and contact information for 2010 are provided in the report for Permit 06-DP-3320 MD0068349.

Legal Authority

During 2006, the County obtained legal authority to enforce its water quality ordinance within the City of Takoma Park boundaries. In 2004, the Office of the County Attorney had determined that the State of Maryland Code prohibited the County from exercising its authority over the stormwater management system within the City of Takoma Park "unless the City and the County otherwise agree." This prohibition had included investigations and enforcement activities for water quality complaints within the City of Takoma Park.

Source Identification

C1.Electronic Mapping

The Permit requires Montgomery County to inventory and map using a geographic information system (GIS) the potential pollutant sources and means of conveyance into receiving streams and other water bodies. The DPS continues work on drainage area delineation for the storm drain system added since October 1997. In 2008, the DPS digitized storm drain features for approximately 45 public and 90 private storm drain permits. The effort added about 1,650 points (headwall, manhole, inlet, and outfall) and lines (channel, culvert, and pipe), respectively, to the existing storm drain inventory. The DPS also added additional drainage areas to the inventory. The inventory is up-to-date or ahead of storm drain point and line features that are either constructed or under construction.

C2a. Urban BMP Database 2007

In 2007 DEP added over 400 new structures to their inventory. This large addition was due in part to a backlog of data entry and a delay in data entries due to bringing on line a new data system (asset maintenance management system). DEP began the effort to move to the asset maintenance management system in January 2007 and went live with the system in January 2008. The DEP also worked on improving the geospatial DA and point location geodatabase. In 2008, DEP added over 700 new structures to their inventory, continued to improve its data collection and management efforts, and worked on improving the geospatial drainage areas and point location geodatabase.

Discharge Characterization

The Permit requires that "Montgomery County shall contribute to Maryland's understanding of stormwater runoff and its effect on water resources by conducting a monitoring program." In 2007 and 2008 the county collected data to characterize discharge in the lower Paint Branch watershed. The results of that effort are presented in section III-D1 below. Control and test subwatersheds were studied in the Clarksburg area for stormwater design manual monitoring presented in section III-D2.

Long-term Discharge Characterization:
During 2007-08, the County completed the source control and pollution prevention pilot in the Stewart-April Lane tributary watershed. This approach included installation of storm drain inlet inserts and routine storm drain inlet cleaning and twice-monthly street sweeping. Water chemistry monitoring and solids characterization were conducted to document water quality conditions before and after structural and operational controls to reduce pollutants and trash being carried downstream. Data analysis and final report are included with this submission.

During 2002-2008, the baseflow mean concentrations (MCs) of total nitrogen in both the Tributary and Paint Branch were higher (significantly in the Tributary) than storm event mean concentrations (EMCs), at levels suggesting a substantial groundwater contribution of nitrogen to both systems. Calculated total phosphorus and Total Suspended Solids (TSS) storm EMCs were significantly higher than baseflow MCs in both waterways during 2002-2008. Storm EMCs for copper and zinc were significantly higher than corresponding baseflow MCs at both stations.

Impacts to biology and habitat at the Stewart April Lane tributary seem to indicate an issue of point source pollution from stormwater runoff. The benthic communities in the tributary have been consistently *poor* since monitoring began in 1995. In 2007, the community was dominated (99%) by generalist and more tolerant benthic groups, such as collectors and filterers, which are characteristic of disturbed streams that have been altered by urbanization processes. Habitat is *good/fair* overall, but the parameters that are consistently lacking are sediment deposition, bank vegetative protection, and bank stability. Poor scores in these parameters indicate impacts from uncontrolled runoff. Conductivity measurements have also been consistently high in the tributary and are likely caused by high levels of inorganic

dissolved solids from industrial pollution or urban runoff. Finally, documented changes in the tributary's channel morphology from 2005 to 2007 also indicate runoff responses in the form of deposition in 2006 and scouring in 2007. In 2007, the tributary was dominated by small particle sizes (less than 10 cm), which reflects unfavorable benthic habitat. Sinuosity has also decreased by 17% from 2005 to 2007, demonstrating that the stream has straightened over time in response to high flow volumes.

Design Manual Monitoring:

The County continued to monitor the Little Seneca (Newcut Road) LSLS104 "test" and Soper's branch, Little Bennett Watershed LBSB101 "control" subwatersheds selected to evaluate the effectiveness of the Maryland 2000 Design Manual criteria at protecting the stream channel. The analysis of this data pertains to sediment and erosion devices, as relatively few of the stormwater management BMPs have been fully converted in 2008. Full conversion to SWM is still several years away, so conclusions are limited to the effectiveness of the sediment and erosion devices in monitoring changes in stream morphology and biology. Both the Control and the test area have shown changes in morphological features over the years and a degradation in the benthic macroinvertebrate communities.

Management Programs

Stormwater Facility Maintenance:
In 2007, the DEP performed 1,591 initial inspections to assess the repair and maintenance needs of a stormwater management facility. Of the 1,591 inspections, 1,276 were at privately owned facilities and 315 were at publicly owned facilities. These initial inspections identified the need for repair at approximately 37 percent of all structures--about 96 percent of the aboveground structures and 6 percent of the underground structures. In contrast, during 2006, initial inspections identified that a repair was needed at 97 percent of the aboveground structures and 10 percent of the underground structures.

In 2008, DEP implemented a new database tracking system. The system is an asset maintenance management database that issues work orders for all inspections and maintenance activities performed on stormwater management facilities in the County. The move to a work order based system has changed how the Inspection and Maintenance program tracks its data. The data reported for 2008 more accurately represents DEP's inspection and maintenance program.

DEP is responsible for inspecting over 4,000 stormwater management facilities. Each facility is on a 3 year inspection cycle (triennial inspections) and to accomplish the inspection requirements, DEP has separated the County in three Inspection Regions. (i.e., Region 1 is eastern region, Region 2 central region, Region 3 western region. DEP uses contracted Inspectors to complete the triennial inspections.

In 2008, DEP performed or enforced structural maintenance on 1746 privately and publicly owned aboveground and below ground stormwater management facilities and sand filters.

Stormwater Facility Permitting:
The requirements for the second round permit included details on BMP types approved during the stormwater management planning and permitting process. This requirement was removed in the third-round permit, originally scheduled for re-issuance in July 2006 and final determination issued in February 2009. The DPS no longer tracks that information and it would consider a significant level of effort to retrieve the data from prior years and in some cases could be out-of-date based on subsequent changes to projects

Outfall Screening:
For the year 2007 the DEP screened a total of 119 outfalls with 45 having dry weather flows. The outfalls that were targeted for screening during 2007 were located within the drainage areas of biological monitoring sites that showed impairment the previous year due to factors presumably not due to degraded habitat. Of the 45 outfalls found to have flow, 13 actually had dry weather flow. Of the 13 outfalls having dry weather flow, one was found to have elevated pH and detergent levels, and two others were found to have detergent levels slightly above the detection limit. Source tracking was unsuccessful at determining specific point-sources contributing to water quality issues detected in the affected outfalls.

For the 2008-2009 monitoring season DEP began outfall screening in March 2009 because of issues related to snow melt and de-icing agents during the previous late fall/winter screening cycles, neither of which are related to illegal connections or illicit discharges. DEP screened a total of 113 outfalls with 28 having dry weather flows. DEP focused on outfalls contained within the Lower Rock Creek Watershed. Of the 28 outfalls found to have flow, 18 actually had dry weather flow. Of the 18 outfalls having dry weather flow, one was found to have elevated chlorine, detergent and conductivity levels, and two others were found to have detergent levels at the detection limit of 0.25 mg/l. Source tracking was unsuccessful at determining specific point-sources contributing to water quality issues detected in the affected outfalls.

County's Industrial Facilities: In general, the annual assessments found that compliance with the Stormwater Pollution Prevention Plans continues to be good. However, no progress was made on updating the Stormwater Pollution Prevention Plans to reflect current operations at these facilities.

Public Education and Outreach: The DEP continued to provide outreach support for water quality enforcement issues, to the stakeholders on the Water Quality Advisory Group, and for regional efforts under the Anacostia Watershed Restoration Agreement and the Patuxent Reservoirs Watershed Protection Agreement. The Watershed Management Division (WMD) continued to conduct watershed restoration project outreach, including public meetings, field walks, and telephone and e-mail responses. In addition, the WMD-Biological Monitoring staff provided technical assistance to a variety of community and environmental groups for workshops on volunteer biological monitoring.

Rainscapes: During 2007-8, the DEP initiated the county-funded Rainscapes Program. In June of 2006, the County Council added $500,000 to the DEP budget to provide financial incentives to private property-owners to implement these techniques on their properties. The goal for this expanded program was to move beyond outreach and education to demonstrate that sufficient interest and level of participation would bring about measurable improvements in runoff water quality. A full-time staff position for this Program was created and filled in January 2007.

Road Maintenance and Pollution Prevention:

In 2008, the County cleaned 20,892 linear feet of storm drain which is 76.4% more than the annual average for the years 1996-2006 (11,842). Material with a weight of 156.69 tons was removed. Storm drains were also cleaned in 2007, but records were lost.

Integrated Pest Management (IPM):

The County's roadside weed spraying program was conducted by Montgomery Weed Control Inc. Montgomery Weed Control Inc. is a cooperative weed control program between Montgomery County Department of Economic Development, Agricultural Services Division and the Maryland Department of Agriculture, Plant Protection and Weed Management Section. Montgomery Weed Control Inc. is licensed with a Public Agency Permit (PAP) by Maryland Department of Agriculture Pesticide Regulation Section (MDA PRS). All personnel employed by MCWC are pesticide applicators registered under Maryland Law and are trained in compliance with the State Pesticide Applicator's Law. All quantities of pesticides employed by Montgomery Weed Control will be reported annually as required by the Permit

Watershed Restoration

During 2004, the County began the watershed restoration inventory in the Great Seneca Creek and Muddy Branch watersheds as cooperative efforts with the USACE and the City of Gaithersburg. These areas represent roughly one-third of the total County land area and include drainage from the densely developed areas of Gaithersburg and Germantown. This study is continuing and will be completed in 2011. In 2008, the County in partnership with the USACE, Princes Georges County and the District of Columbia began a reassessment of the Anacostia River watershed. That study was completed in February 2010. Updated information is presented in Section III-F for the third-round Permit, 06-DP-3320 MD0068349.

Watershed Screening:

In 2007, the County monitored stations in the following watersheds: Broad Run, Hawlings River, Little Falls Branch, Muddy Branch, the Potomac direct and Watts Branch. The Broad Run watershed appears to be minimally impacted by the surrounding land uses and had Good stream conditions. The stream conditions of Hawlings River were as variable as are the land uses within the watershed. Stream condition ranged from Excellent to Fair. The stream condition at Little Falls Branch was Poor throughout all stations. Muddy Branch stations ranged from poor to Fair in the tributaries located nearer to developed Gaithersburg, but

some were Excellent in the relatively rural, low density residential areas. In the Potomac Direct watershed, due to the variety of land-uses present, there was also a variety of stream conditions ranging from Poor to Excellent. The overall stream condition of Watts Branch, exclusive of the Piney Branch tributary, a Special Protection Area, was rated as Fair with associated marginal habitat.

In 2008, The Cabin John, Lower Rock Creek and Upper Rock Creek watersheds were monitored. The entire Cabin John watershed is located within an urban to high density residential suburban setting with minimal storm water controls and overall, the stream conditions for the watershed were poor to fair. The Lower Rock Creek watershed overall stream condition was generally Poor with a few Fair stations. The Upper Rock Creek watershed ranged from Good conditions above Muncaster Mill to Fair or Poor below Mill Creek, a major tributary on the west that drains parts of the more urbanized areas of Gaithersburg, and the Southlawn Lane area.

Selected Restoration Watershed:

The total acres developed under County responsibility for stormwater management (81,603) is about 33.6% of total acres minus excluded areas. Of those acres, about 52% (42,480) has some sort of stormwater management. The 10% watershed restoration goal based on these calculations is 2,580 acres. The combination of 2,434 acres in the selected restoration watershed of Turkey Branch and the 2,872 acres to completed restoration projects in 2009 exceeds this calculated 10% goal.

The Hollywood Branch Stream Restoration Project was not completed during the second round Permit. Status of this project is provided in Section III. for the third-round Permit. #06-DP-3320.

The Turkey Branch project includes approximately 3 miles of stream restoration and three stormwater management ponds. The three ponds provide improved stormwater management controls for 403 acres. Despite design constraints stemming from limited space, the ponds are very effective at reducing flows for one and two year recurrence interval storms, and one provides good detention for the ten year storm as well. When added to the 162 acres controlled by the regional pond behind the Home Depot (which was a County participation project with Home Depot), over 63% of the upstream watershed has stormwater management. Having a significant amount of stormwater management in the watershed significantly improves the potential that the stream restoration work will be successful in improving aquatic habitat in Turkey Branch.

Program Funding

The Permit requires the County to submit a fiscal analysis of its expenditures and maintain adequate program funding to comply with all conditions of this permit. During the six-year period from FY03 through FY08, the County expended approximately $77 million to comply with second-round Permit requirements, an average of $12.8 million per year. The CIP funding for watershed assessments and restoration project implementation represented the largest budget category in every year.

In addition to the FY07 funding to meet Permit requirements, the County Council approved $1.25 million through the Water Quality Protection Charge to identify and increase implementation of low impact design (LID) and environmentally sensitive designs (ESD) in both the public and private sectors. These projects go beyond the second-round Permit-required programs, focusing on source control for watershed restoration. An additional $100,000 was allocated to initiate a flow and water chemistry monitoring network.

During the FY09 budget development, the DEP was required to provide detailed information on projected costs associated with the third-round Permit that was under negotiation. For that year, the Water Quality Protection Charge was slightly increased to cover first round increases as the County's MS4 permit implementation program geared up to meet these new requirements.

Assessment of Controls

The Permit requires the County to estimate TN and total Phosphorous (TP) annual loads from developed lands and the reductions associated with existing stormwater controls in the County from 2007-2009. Out of the total of 324,552 acres in the County, 81,603 developed acres are under the County's control for stormwater. This excludes the rural zoning, parklands, forests in parklands, the Cities of Rockville, Gaithersburg, and Takoma Park, state and federal properties, and state maintained roads. Existing stormwater management provides an estimated 15.1 % reduction in TN and a 19.2% reduction in TP loadings in runoff compared to uncontrolled conditions based on loadings by land use categories and loading reductions by acres controlled by BMP.

Special Protection Area Program

The SPA Program was established in 1994 to protect high quality waters from construction and development-related impacts. Part of the Clarksburg SPA is targeted for monitoring to meet the NPDES permit requirements for discharge characterization as summarized in Section III-D2.

Preliminary results indicate that BMPs are performing well; in some cases they are performing better than expected. The use of redundant BMPs placed in series appears to be effective in reducing runoff and decreasing pollutant loadings. However, biological monitoring indicates varying degrees of degradation in the streams. Areas with large amounts of intense development tend to show greater impacts to water quality. The efficiencies of the BMPs are not correlating to the health of the stream based on its biological integrity.

In February 2009, the County Council established an Ad Hoc Water Quality Working Group to more closely evaluate the findings of the SPA 2008 report related to decreases in stream resource conditions in sensitive streams in the Clarksburg SPA. Since these decreases were occurring simultaneous with upstream land disturbance and construction, environmental groups and some Council members expressed concerns about implications for protecting

stream resources during and after development in the nearby Ten-Mile Creek drainage. The Working Group included representatives from environmental groups, development community, County Council staff, and County agency staff.

The Ad Hoc Water Quality Working Group collected information on new and pending State and Federal regulations regarding water quality, stormwater management and sediment control the current state of Ten Mile Creek, Stage 4 of the 1994 Clarksburg Master Plan and related planning issues. The Working Group report was published in July 2010 and is available at
http://www.montgomerycountymd.gov/content/council/mem/knapp_m/pdf/wqworkinggroupreport.pdf

Special Programmatic Conditions

Interjurisdictional Cooperation

Throughout this Permit, the County maintained activities in ongoing multi-jurisdictional efforts to protect the Anacostia and the Patuxent Reservoirs Watershed, as well as the Chesapeake Bay restoration effort and the Potomac Trash Free Treaty Initiative. This has led to cooperative funding for monitoring, modeling, and restoration and retrofit project inventories, design, and construction. As part of these efforts, the County monitoring results are being used for regional screening and priority setting in these watersheds. The programs and projects being implemented through these watershed groups contribute toward the County's Permit-required watershed restoration goal and also the pollutant reductions that will be needed to meet the Tributary Strategies nutrient caps.

Potomac Trash Free Treaty Initiative
This initiative began in Montgomery County in June 2006, when County Executive Douglas Duncan signed the Potomac Trash Free Treaty, with its goal to achieve a trash free Potomac by the year 2013. The Alice Ferguson Foundation (www.fergusonfoundation.org) is leading this effort to address the trash problem from a watershed-wide approach to benefit the entire region. In Maryland and the District of Columbia, the Anacostia River was identified as impaired by trash and subsequently an inter-jurisdictional agency and external stakeholder group convened as the TMDL was developed. The EPA approved the Anacostia Trash TMDL in September 2011, just before the convening of the sixth Potomac River Watershed Trash Summit. Details on the County's trash and litter reduction strategy are presented in the Annual Report for FY10 for Permit No.06-DP-3200-MD0068349.

III. STANDARD PERMIT CONDITIONS

A. Permit Administration

In July 2008, there was a significant reorganization of County Departments which affected in some cases relative roles and responsibilities for MS4 permit implementation. The Department of Public Works and Transportation became Department of Transportation (DOT), with responsibilities for capital transportation projects, traffic engineering and parking management, transit services, and highway maintenance and operations.

Other reorganization changes included creation of a new Department of General Services (DGS) with Fleet Management Services, Facilities and Services, and Capital Planning, Design and Construction from DPWT, as well as the Office of Procurement and the Small Business Reserve Program from the Department of Economic Development. The Division of Solid Waste moved from DPWT to the Department of Environmental Protection. The reorganization was completed to improve accountability; provide a sharper focus on customer service, transportation, transit needs and environmental protection.

Details and contact information for 2010 are provided in the report for Permit 06-DP-3320 MD0068349.

B. Legal Authority

The MDE modified the County's permit effective January 26, 2004 to add six small localities as co-permittees for coverage under the Phase II of the NPDES MS4 Permit Program. The County is continuing its oversight, inspection, and enforcement authority over these five municipalities: the Towns of Chevy Chase, Kensington, Poolesville, and Somerset, and Chevy Chase Village; and one special tax district, the Village of Friendship Heights.

Updated information for 2010 is provided in the report for Permit 06-DP-3320 MD0068349.

C. Source Identification

C1. Electronic Mapping

The DPS continues work on drainage area delineation for the storm drain system added since October 1997. In 2008, the DPS digitized storm drain features for approximately 45 public and 90 private storm drain permits. The effort added about 1,650 points (headwall, manhole, inlet, and outfall) and lines (channel, culvert, and pipe), respectively, to the existing storm drain inventory. The DPS also added additional drainage areas to the inventory.
The inventory is up-to-date or ahead of storm drain point and line features that are either constructed or under construction.

Attachment A includes a CD with a zip file (SDI2008.zip) containing the DPS Storm Drain Inventory in the ESRI Personal GeoDatabase format, i.e., Microsoft Access 2000 Database. Each storm drain feature type is a feature class. Each feature class is a table in the database including both spatial and attribute information. This storm drain inventory contains data completed by DPS as of the end of April, 2008.

C2a. Urban BMP Database 2007

The database included in electronic format on the CD in Attachment A uses the format required for the MDE's Urban BMP Database. There are 3,946 records in this database, shown by structure type in Table III-C1. The three structure types with the greatest number are Oil Grit Separator (707), Dry Pond Quantity Control Only (470), and Flow Splitter (332). There are 2,835 geospatial data points designating the control structure or other feature for the stormwater facilities in Montgomery County. There are 2,491 geospatial polygons for the drainage area of the stormwater facilities. There are more geospatial points than DA because some pretreatment and diversion devices have the same DA as the terminal facility and are not delineated.

This year DEP has added over 400 new structures to their inventory. This large addition is due in part to a backlog of data entry and a delay in data entries due to bringing on line a new data system (asset maintenance management system). DEP began the effort to move to the asset maintenance management system in January 2007 and went live with the system in January 2008. With the addition of the asset maintenance and management system, as well as the backlog of data entry, there remains a large amount of data that has yet to be entered. DEP will work through out 2008 to improve its data in preparation for the next annual report. However, as with previous years, some of the data does not exist in the paper files for all facilities constructed prior to the County's first Permit (1996) and therefore remains unavailable. At the same time, the DEP is working on improving the geospatial DA and point location geodatabase. Due to the concurrent effort to bring on line the asset and maintenance management system and enter the backlog of data entry, the data between the two databases may not be identical at the time of the generation of the Urban BMP Database NPDES report.

With the move to a new data management system, DEP chose to change structure numbers in order to better assimilate the data in the new system. Included in this year Urban BMP Database are the new structure numbers, as well as the old number. DEP has named the old number field as STRU_NO-OLD. DEP will continue to include the old structure number field for several years to allow for data comparison.

There are a few data fields with consistent missing data or data irregularities, including four required for the Urban BMP database.

Drainage Area (DA) – There are structures shown in the database that are still missing DA. This is because the DA has not yet been calculated. The addition of the asset maintenance management system and the backlog of data entries have resulted in facilities that have not

yet had their DA delineated. Furthermore, pretreatment and diversion devices will not have a separate DA as these facilities have identical DA's and are not delineated.

Built Date – For many of the pre-1996 structures, the date was not recorded and cannot be determined from existing paper files. DEP is making an effort to add built date data for the facilities entered into the database after 1996. Those facilities where a date can not be determined has a date of 01/01/1111

Land Use – The MDoP land use classification included with the Urban BMP Database are based on the 2001 data layer provided by MDoP. Due to the date of this data, some land uses in the database do not accurately reflect the updated land use conditions known by the County at the time of the submission.

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

Permit Number – DEP has included a "place-holder permit number" for the facilities that were built prior to 1986 and do not have a permit number. Because many of these facilities were built prior to Montgomery County's authority to permit such facilities DEP will not be able to recover a permit number from the paper files for it is not known if one existed. This place holder number is "0000000000" and is DEP's final attempt to recover the data from the paper files. All original permit numbers known for the facilities built prior to 1986 were entered into the database (typically a 6 digit number). In addition, A 10 digit place holder number beginning with 900118XXXX was also entered for those facilities built prior to 1986. This number was created by the DPS in order for those facilities to be entered into their database system. DEP has kept this permit number in order to allow interfacing with the DPS database. There are data missing in the permit number field for facilities built after 1986. DEP will focus over the coming year to pull the permit number from the paper files and as-built plans to populate this field.

ADC Map – Over the past two years, DEP has made a concerted effort to populate the ADC Map field with the 2001 to 2006 ADC Map Book locations. DEP's effort specifically focused on those facilities that lack the MD grid coordinate data as it is understood that ADC map book location can be used in place of the Maryland grid coordinates. DEP continues to default to populating this field when MD grid coordinates are not available. Beginning with the release of the new ADC Map Book (2007), DEP will endeavor to update the ADC map field with the new map book location. DEP anticipates this update will take approximately three years, as the data will be updated as inspections occur.

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

Table III-C1. Total Number of Stormwater Facilities by Structure Type Designation (2007)			
DEP Structure Type	**DEP Structure Type Description**	**MDE Structure Type**	**Total Number**
AQFIL	Aquafilter	O	5
AQSW	Aquaswirl	O	6
BAYSAV	Baysaver	BS	57
BR	Bioretention, quality control	BR	76
BRQN	Bioretention, quantity control	BR	1
DS	Dry Swale	AS	2
FS	Flow Splitter, Aboveground	FLSP	332
FSU	Flow Splitter, Underground	FLSP	166
INF	Infiltration trench, quality control only	IT	323
INFIL	Infiltrator	IT	3
INFQN	Infiltration trench, quality and quantity control	IT	56
INFU	Infiltration trench, quality control underground	IT	130
INFUQN	Infiltration trench, quality and quantity buried, non-surface fed	IT	14
PDIB	Pond-infiltration basin, quality control only	IB	23
PDIBQN	Pond-infiltration basin, quantity control only	IB	36
PDQN	Pond-dry, quantity control only	DP	470
PDQNED	Pond-dry, quantity control and extended detention	EDSD	46
PDQNSF	Pond-dry, quantity control and sand filter base	DP	112
PDWD	Pond-wetland only	SM	13
PDWDED	Pond-wetland, extended detention	SM	103
PDWT	Pond-wet, quality control only	WP	44
PDWTED	Pond-wet, extended detention	EDSW	162
PSF	Peat sand filter	SF	1
SEP	Oil/grit separator	OGS	707
SEPSF	Oil/grit separator and sand filter	SF	115
SF	Sand filter	SF	317
SFQN	Sand filter, quantity control only	SF	26
SFU	Sand filter, underground	SF	44
STC	Stormceptor	SC	214
STFIL	Stormfilter	O	66
UG	Underground detention	UGS	261
UGINF	Underground with a stone bottom	UGS	13
VORTEC	Vortechnics	O	2
		Grand Total	**3,946**

C2b. Urban BMP Database 2008

The database included in electronic format on the CD in Attachment A uses the format required for the MDE's Urban BMP Database. There are 4,178 records in this database, shown by structure type in Table III-C2. The structure types with the greatest number are Oil Grit Separator (714), Flow Splitter (578), Dry Pond Quantity Control Only (472), and sand filters (343). There are 3,826 geospatial data points designating the control structure or other feature for the stormwater facilities in Montgomery County. There are 2,972 geospatial polygons for the drainage area of the stormwater facilities. There are more geospatial points than drainage areas because some pretreatment and diversion devices have the same drainage areas as the terminal facility and are not delineated.

In 2008, DEP has added over 700 new structures to their inventory. This large addition is due in part to a backlog of data entry and a delay in data entries due to bringing on line a new data system (asset maintenance management system). DEP began the effort to move to the asset maintenance management system in January 2007 and went live with the system in January 2008. DEP continues to improve its data collection and management efforts and as with previous years, some of the data does not exist in the paper files for all facilities constructed prior to the County's first Permit (1996) and therefore remains unavailable. At the same time, the DEP is working on improving the geospatial drainage areas and point location geodatabase. Due to the concurrent effort to bring on line the asset and maintenance management system and enter the backlog of data entry, the data between the two databases may not be identical at the time of the generation of the Urban BMP Database NPDES report. DEP receives data from the DPS once a stormwater management facility is constructed and the permit is released from bond. In many cases, the data required in the Urban BMP Database is not included in the paper files DEP receives from DPS. If this data is missing at the time of data entry, the fields in the database are left blank and will be populated as DEP does periodic quality assurance and quality checks on the data.

There are a few data fields with consistent missing data or data irregularities, including four required for the Urban BMP database.

Drainage Area (DA) – There are structures shown in the database that are still missing DA. This is because the DA has not yet been calculated. The addition of the asset maintenance management system and the backlog of data entries have resulted in facilities that have not yet had their DA delineated. Furthermore, pretreatment and diversion devices will not have a separate DA as these facilities have identical DA's and are not delineated.

Built Date – For many of the pre-1996 structures, the date was not recorded and cannot be determined from existing paper files. DEP is making an effort to add built date data for the facilities entered into the database after 1996. Those facilities where a date can not be determined has a date of 01/01/1111

Land Use – The MDoP land use classification included with the Urban BMP Database are based on the 2001 data layer provided by MDoP. Due to the date of this data, some land uses in the database do not accurately reflect the updated land use conditions known by the County at the time of the submission.

Structure Type – The MDE structure type of other is frequently used by the DEP. An explanation of how DEP classifies structures with an MDE ”other” structure type is included in general comments.

Permit Number – DEP has included a “place-holder permit number” for the facilities that were built prior to 1986 and do not have a permit number. Because many of these facilities were built prior to Montgomery County’s authority to permit such facilities DEP will not be able to recover a permit number from the paper files for it is not known if one existed. This place holder number is “0000000000” and is DEP’s final attempt to recover the data from the paper files. All original permit numbers known for the facilities built prior to 1986 were entered into the database (typically a 6 digit number). In addition, a 10 digit place holder number beginning with 900118XXXX was also entered for those facilities built prior to 1986. This number was created by the DPS in order for those facilities to be entered into their database system. DEP has kept this permit number in order to allow interfacing with the DPS database. There are data missing in the permit number field for facilities built after 1986. DEP will focus over the coming year to pull the permit number from the paper files and as-built plans to populate this field.

ADC Map – Over the past two years, DEP has made a concerted effort to populate the ADC Map field with the 2001 to 2006 ADC Map Book locations. DEP’s effort specifically focused on those facilities that lack the MD grid coordinate data as it is understood that ADC map book location can be used in place of the Maryland grid coordinates. DEP continues to default to populating this field when MD grid coordinates are not available. Beginning with the release of the new ADC Map Book (2007), DEP will endeavor to update the ADC map field with the new map book location. DEP anticipates this update will take approximately three years, as the data will be updated as inspections occur.

RCN – Our new asset and maintenance management system requires a number for all number fields. Those records with an RCN of “0” are records where the RCN was not provided in the paper files.

Table III-C2. Total Number of Stormwater Facilities by Structure Type Designation (2008)			
DEP Structure Type	**DEP Structure Type Description**	**MDE Structure Type**	**Total Number**
AQFIL	Aquafilter	O	6
AQSW	Aquaswirl	O	8
BAYSAV	Baysaver	BS	84
BR	Bioretention, quality control	BR	91
BRQN	Bioretention, quantity control	BR	1
BS	Bioswale	AS	1
DS	Dry Swale	AS	5
FS	Flow Splitter, Aboveground	FLSP	333
FSU	Flow Splitter, Underground	FLSP	245
INF	Infiltration trench, quality control only	IT	324
INFIL	Infiltrator	IT	3
INFQN	Infiltration trench, quality and quantity control	IT	55
INFU	Infiltration trench, quality control underground	IT	149
INFUQN	Infiltration trench, quality and quantity buried, non-surface fed	IT	12
NS	Nonstructural	O	1
PDIB	Pond-infiltration basin, quality control only	IB	24
PDIBQN	Pond-infiltration basin, quantity control only	IB	36
PDQN	Pond-dry, quantity control only	DP	472
PDQNED	Pond-dry, quantity control and extended detention	EDSD	49
PDQNSF	Pond-dry, quantity control and sand filter base	DP	112
PDWD	Pond-wetland only	SM	14
PDWDED	Pond-wetland, extended detention	SM	101
PDWT	Pond-wet, quality control only	WP	44
PDWTED	Pond-wet, extended detention	EDSW	160
PP	Porous Pavement	PP	4
PSF	Peat sand filter	SF	1
RG	Rain Garden	O	1
SEP	Oil/grit separator	OGS	714
SEPSF	Oil/grit separator and sand filter	SF	120
SF	Sand filter	SF	321
SFQN	Sand filter, quantity control only	SF	28
SFU	Sand filter, underground	SF	53
STC	Stormceptor	SC	220
STFIL	Stormfilter	O	84
UG	Underground detention	UGS	285
UGINF	Underground with a stone bottom	UGS	13
V2B1	Environmental 21 V2B1 Stormwater Treatment System	O	2
VORTEC	Vortechnics	O	2
		Grand Total	4,178

D. Discharge Characterization for 2007-2008

The second-round permit required that "Montgomery County shall contribute to Maryland's understanding of stormwater runoff and its effect on water resources by conducting a monitoring program." In 2007 and 2008, the County collected data to characterize discharge in the lower Paint Branch watershed. The results of that effort are presented in section III-D1 below. Control and test subwatersheds were studied in the Clarksburg area for stormwater design manual monitoring presented in section III-D2.

D1. Outfall and Instream Monitoring

From 2002 through 2008 the County conducted permit-required monitoring at one outfall and one mainstem station in the Lower Paint Branch Watershed. Stations were located on the Stewart-April Lane Tributary (Tributary) and Paint Branch, below the confluence with the Tributary (Figure III-D1). Drainage area characteristics are shown in Table III-D1. Field teams collected continuous flow data and baseflow water chemistry samples monthly and automated storm samples at a target rate of three events per quarter. Availability of candidate storms, success rate in capturing storms, and other factors influenced the number of storms captured in a given year. Precipitation data was collected in the same watershed at the WSSC laboratory on Tech Road approximately two miles from the stream stations.

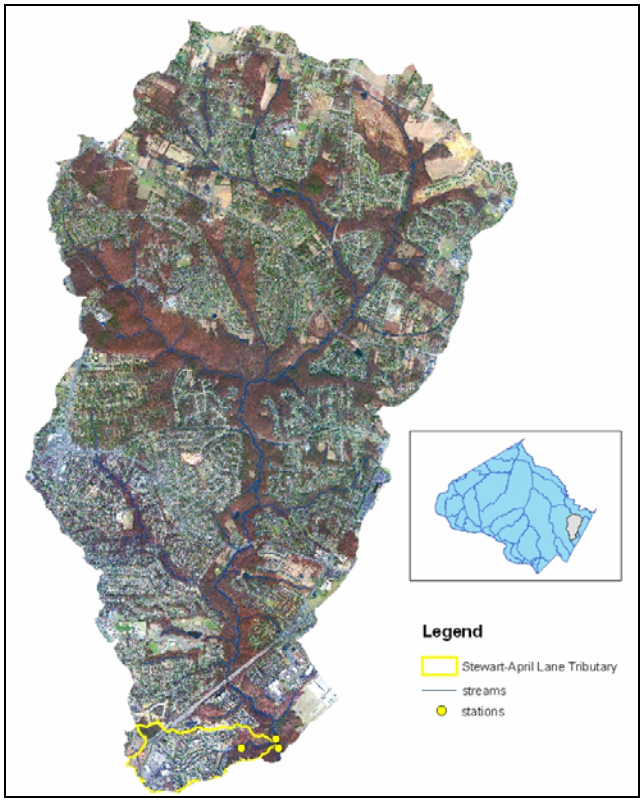


Figure III-D1. Location of the Monitoring Stations on the Stewart-April Lane Tributary and the Paint Branch Mainstem

Table III-D1. Drainage Area Characteristics for Water Chemistry Stations in the Lower Paint Branch Watershed

Drainage Area Characteristics	Percent				Total Acres	Stream Miles
	Impervious	Woods	Cropland	Lawn/ Open Land		
Outfall (PBPB104): Stewart-April Lane Tributary	38.7	21.3	0	40.0	223.4	0.6
Instream (PBPB310A): Paint Branch Mainstem	13.0	26.6	3.4	57.0	7,734.0	31.5

Rainfall

Precipitation patterns in Maryland during 2001 through 2008 varied widely from year to year and from season to season (Figure III-D2). Average annual precipitation over this eight-year period was about 5% above normal. This period began with two below-normal rainfall years in 2001 and 2002, including an extended drought from spring 2001 to October 2002, resulting in record low discharges in the Potomac River and other area waterways. In contrast, the record high precipitation during 2003 produced record high discharges in these same water bodies. Rainfall during October 2005 was over four inches higher than normal due to the contribution by remnants of Tropical Storm Tammy. Rainfall during 2006 was generally below normal until June, when the monthly total was augmented by a persistent wet weather pattern during the final week caused by a stationary front. High flows during this time caused substantial, visually apparent changes (e.g., bank and bottom scour) in the stream channels at both monitoring sites. Fall 2006 was also marked by above-average rainfall. Drought conditions generally prevailed from May 2007 until the end of 2007, leading to a total annual rainfall of approximately 5.5 inches less than the normal 42 inches of precipitation. During 2008, rainfall was generally above normal, especially during the spring months, when rainfall was a total of 46% higher than normal.

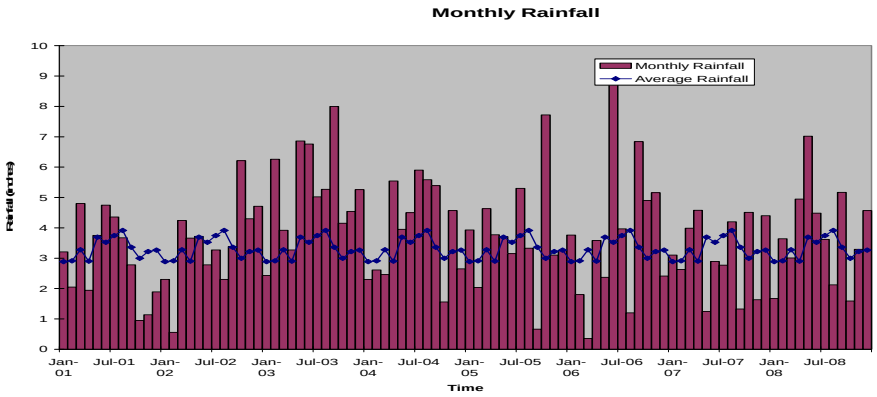


Figure III-D2. Average (1961-1990) and observed monthly precipitation (inches) in Maryland 2001-2008 (Northeast Regional Climate Center, 2008). Observed data reflect statewide average monthly rainfall; average monthly data reflect Baltimore, MD and Washington, DC (Reagan National Airport) average values.

Hydrology Modeling

The Permit requires that a model be conducted to evaluate rainfall to runoff characteristics of the contributing watershed. The U.S. Army Corps of Engineers (USACE) completed the hydrology model for existing and proposed retrofit construction runoff characteristics at the Stewart-April Lane Tributary and submitted these results as part of the Water Quality Certification Process.

Change to Source Control Approach

During 2006, the DEP recommended that the USACE discontinue the pond retrofit at this site given tree save concerns coupled with the low water quality volume and channel protection volume that would be provided. The DEP instead focused on a source control approach to controlling pollutants from this drainage area. The DEP received a $500,000 EPA award, through Prince George's County Department of Environmental Resources, to focus on reducing pollutants and trash entering the Anacostia. One element of this pilot project is the design, implementation, and monitoring of structural and operational best management practices to control trash and associated pollutants in the White Oak subwatershed in Lower Paint Branch. The report is included electronically in the CD submitted with this report as Appendix B. A summary of the results from the pilot project and monitoring are included in the following sections.

Water Chemistry

The mean storm event mean concentrations (EMCs) and baseflow mean concentrations (MCs) for nutrients, suspended solids and indicator metals for both the outfall and instream stations are shown in Table III-D2. During 2002-2008, the baseflow mean concentrations (MCs) of total nitrogen in both the Tributary and Paint Branch were higher (significantly in the Tributary) than storm event mean concentrations (EMCs), at levels suggesting a substantial groundwater contribution of nitrogen to both systems. The average Paint Branch storm EMC was higher than the corresponding average storm concentration in the Tributary, while the Tributary nitrogen baseflow MC was significantly higher than at Paint Branch. In the Tributary, the storm event total nitrogen concentrations were, on average, highest during the rising limb. These higher, intra-storm concentrations may indicate contributions of nitrogen during the early stages of a storm from first-flush runoff of nitrogen compounds from impervious surfaces in the upstream catchment.

Table III-D2. Mean Storm EMCs and Baseflow MCs (mg/L; ± 1-sigma standard deviation) in Stewart-April Lane Tributary and Paint Branch, 2002-2008.

Analyte	Storm EMC		Baseflow MC	
	Stewart-April Lane Tributary	Paint Branch	Stewart-April Lane Tributary	Paint Branch
Total Nitrogen	1.801 ± 1.803	1.918 ± 1.056	2.483 ± 0.505	2.335 ± 5.373
Total Phosphorus	0.109 ± 0.085	0.200 ± 0.199	0.006 ± 0.029	0.008 ± 0.056
TSS	56.1 ± 59.3	181.3 ± 199.7	4.4 ± 10.1	4.9 ± 13.1
Zinc	0.052 ± 0.032	0.044 ± 0.026	0.013 ± 0.007	0.005 ± 0.007
Copper	0.031 ± 0.029	0.023 ± 0.017	0.011 ± 0.006	0.008 ± 0.006

Calculated total phosphorus storm EMCs were significantly higher than baseflow MCs in both waterways during 2002-2008. Baseflow concentrations of total phosphorus at both stations were nearly always below reportable detection limits during 2002-2008 due to the low levels of suspended solids in this low-flow system. The storm EMC for total phosphorus in Paint Branch was significantly higher than the corresponding EMC in the Tributary, probably due to higher suspended solids loading resulting from bank erosion. Phosphorus tends to bind to sediment particles, so typically concentrations are higher during runoff events with high sediment loads.

During 2002-2008, the mean baseflow MCs of total suspended solids (TSS) were 4.4 mg/L and 4.9 mg/L, respectively, in the Tributary and in Paint Branch, and significantly lower than storm event means. The average storm EMC of TSS was significantly higher in Paint Branch than in the Tributary during 2002-2008. Concentrations of TSS in composite storm runoff samples representing rising and peak limbs showed a positive, statistically significant relationship with individual limb discharge in Paint Branch. Overall, storm flow TSS concentrations versus limb discharge have decreased over time. New home construction (which occurred beginning in 2006) in the Tributary catchment did not appear to contribute significantly to TSS loading.

Storm flow zinc and copper EMCs were higher (copper significantly) in the Tributary than in Paint Branch. Baseflow zinc and copper were significantly higher in the Tributary than in Paint Branch. The large residential and commercial parking areas in the contributing drainage of the Tributary were implicated as potential sources of these pollutants carried by storm water runoff. Storm EMCs for both pollutants were significantly higher than corresponding baseflow MCs at both stations. A trend analysis of zinc and copper results over the period 2002-2008 showed a significant decreasing trend in copper concentrations during the rising limb portion of the storm hydrograph for both waterways, which may indicate less availability of the metal due to reduced deposition.

Biological and Habitat Monitoring

DEP has three monitoring stations associated with the Stewart-April Lane tributary (Fig. III-D3).

1. PBPB104 – on the tributary;
2. PBPB309B – upstream of tributary on the Paint Branch mainstem; and
3. PBPB310A – downstream of tributary on the Paint Branch mainstem.

Figure III-D3. Location of DEP Monitoring Locations for Stewart-April Lane Tributary.

Biological data from 1995 to 2008 has been collected at the three monitoring sites and shown in Table III-D3. The tributary station (PBPB104) includes benthic macroinvertebrate (benthic) data only from 1995, and 2001-2008. This first order stream is too small to effectively monitor for fish. The fish communities in most small, headwater streams tend to be able to survive in the available habitat and are called pioneer species. Pioneer fish species are generally more tolerant to disturbance and are able to survive a wider range of stressors than the benthic macroinvertebrate community and respond differently overall. The larger mainstem monitoring sites (PBPB309B and PBPB310A) were monitored each year for both benthics and fish from 2002 to 2008..

Physical habitat was assessed at all three sites at the time the biological data was collected. Rapid habitat assessments involve rating the stream habitat on a series of ten individual parameters for a total score out of 200. Parameters include: 1) instream habitat, 2) epifaunal substrate, 3) embeddedness, 4) channel alteration, 5) sediment deposition, 6) frequency of riffles, 7) channel flow status, 8) bank vegetative protection, 9) bank stability, and 10) riparian vegetative zone. Numeric scores are converted to narrative scores (*excellent*, *good*, *fair*, *poor*). Table III-D4 shows the rapid habitat assessment parameters that scored less than *good* at each station for 2007 and 2008.

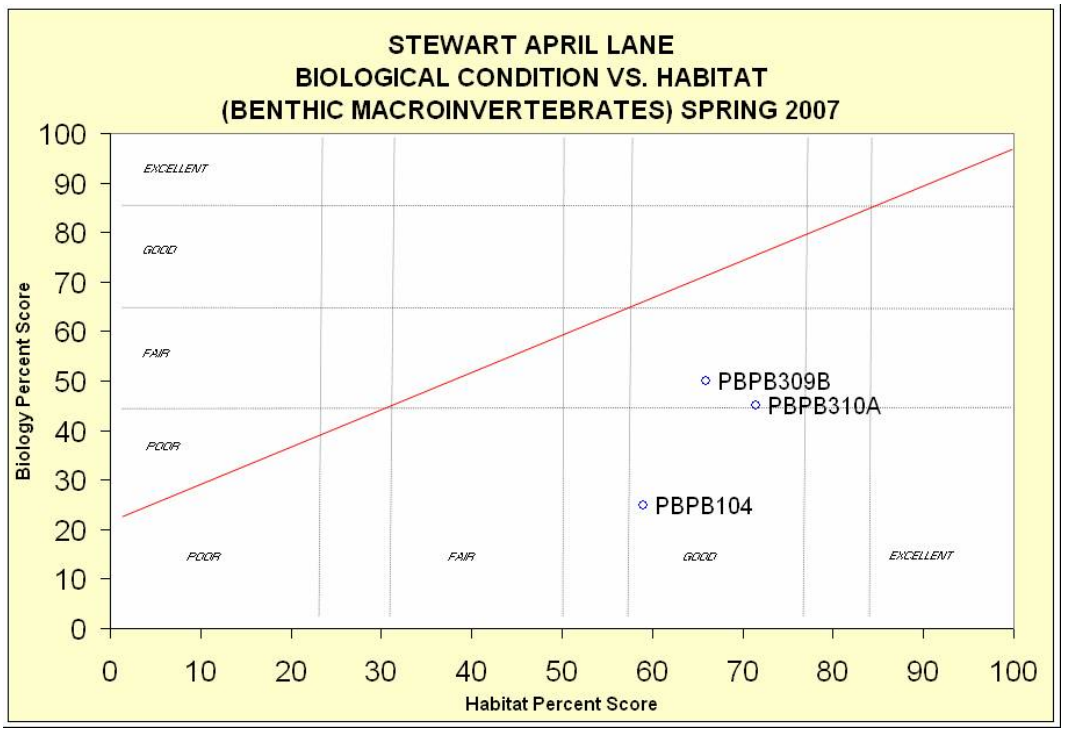
Table III-D3. Biological Data for Pre-Implementation (1995-2007) Long-Term Discharge Characterization

YEAR (Pre-Implementation)	PBPB104 Tributary		PBPB309B Upstream		PBPB310A Downstream	
	Fish[1]	Benthic	Fish	Benthic	Fish	Benthic
1995	*Not Sampled*	X				
1996	*Not Sampled*					
2001	*No fish found*	X				
2002	*No fish found*	X	X	X	X	X
2003	*No fish found*	X	X	X	X	X
2004	*No fish found*	X	X	X	X	X
2005	*No fish found*	X	X	X	X	X
2006	*Not Sampled*	X	X	X	X	X
2007	*Not Sampled*	X	X	X	X	X
2008	*Not Sampled*	X	X	X[2]	X	X[2]

[1]PBPB104 determined to be too small to monitor for fish since no fish were found 2001-2005. The fish community is likely not representative of the water quality in this small headwater stream, since the fish population would likely be more impacted by physical lack of habitat and unreliable water flow.
[2]PBPB309B and PBPB310A benthic IBI results are consistent with previous years reports, however, the results should be used with caution due to low numbers of individuals in the sub-samples

Table III-D4. Rapid Habitat Assessment Parameters with Low Scores in 2007 & 2008 for Long-Term Discharge Characterization	
2007	
PBPB104	**Stewart April Lane Tributary:** Sediment Deposition (10 out of 20) Bank Vegetative Protection (4 out of 10) Bank Stability (0 out of 10) Riparian Vegetative Zone (5 out of 10)
PBPB309B	**Paint Branch mainstem, upstream of PBPB104 confluence:** Epifaunal Substrate (9 out of 20)
PBPB310A	**Paint Branch mainstem, downstream of PBPB104 confluence:** Instream cover (9 out of 20) Sediment Deposition (9 out of 20) Channel Flow Status (9 out of 20)
2008	
PBPB104	**Stewart April Lane Tributary:** Instream cover (4 out of 20) Epifaunal Substrate (8 out of 20) Sediment Deposition (7 out of 20) Channel Flow Status (10 out of 20) Bank Vegetative Protection (4 out of 10) Bank Stability (2 out of 10)
PBPB309B	**Paint Branch mainstem, upstream of PBPB104 confluence:** Epifaunal Substrate (10 out of 20)
PBPB310A	**Paint Branch mainstem, downstream of PBPB104 confluence:** Channel Flow Status (10 out of 20)

Figures III-D4 and III-D5 graphically compare the 2007 and 2008 (respectively) habitat percent scores with the associated biological percent scores for both benthics and fish. Biological communities (benthics and fish) can be degraded by impaired habitat and sometimes by impaired water quality from possible point source pollution. If the station is plotted on the graph under the red line, it means that the biological community is impaired from other than habitat reasons. This graphical screening allows for further investigation into the water chemistry data collected at the site(s) to determine if there is impairment in any particular chemical parameter. According to the graphs, benthics at all sites for both years are impaired despite the habitat being *good*, indicating possible point source impacts to water quality. The mainstem sites sustained high quality (*good* or *excellent*) fish communities in 2007 and 2008. It is possible that fish, being more transient, can escape from point source impacts more easily than benthics.



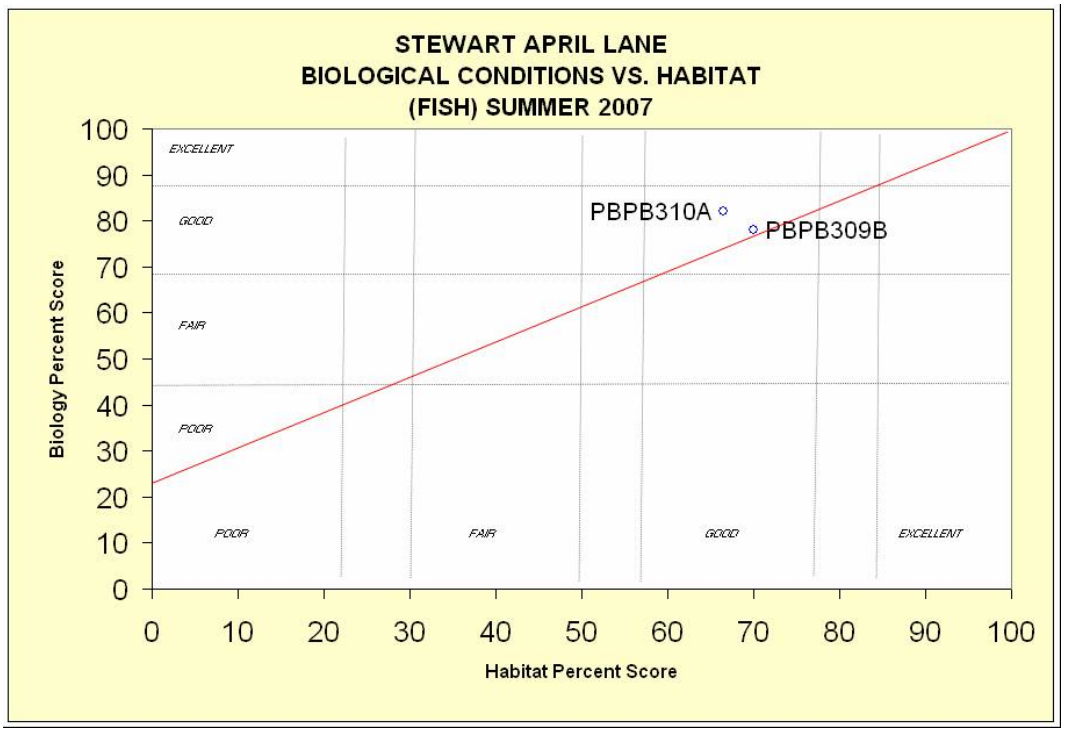
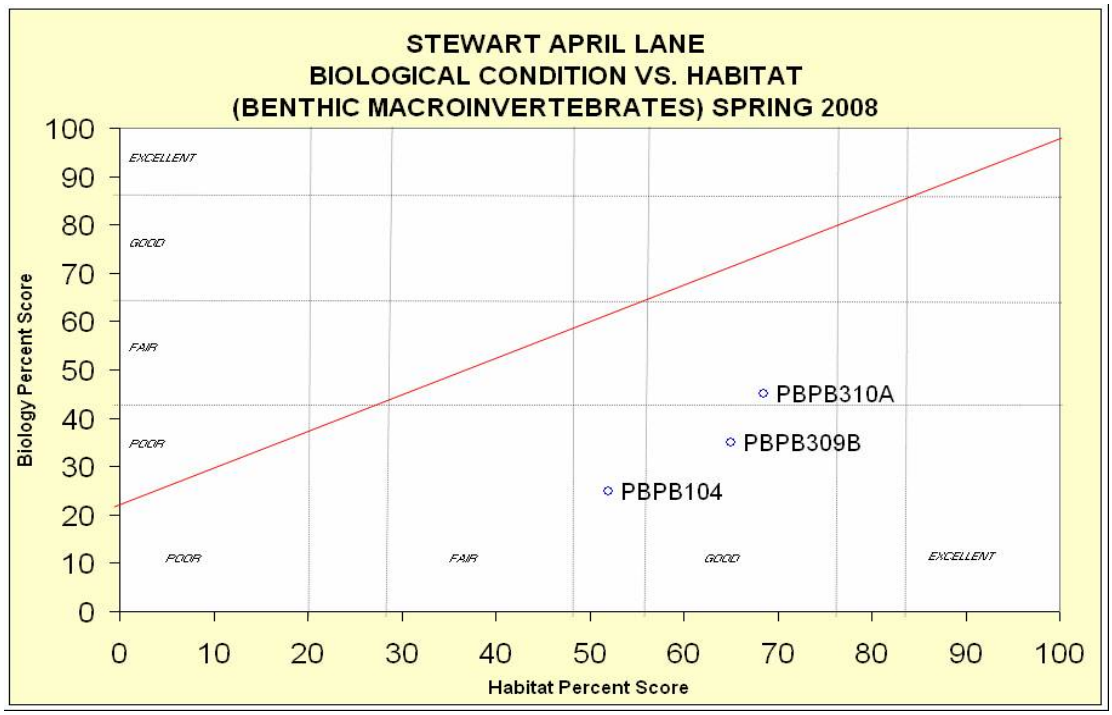


Figure III-D4 Term Discharge Characterization Biology and Habitat Conditions in 2007. Line shows expected direct correspondence between biological and habitat conditions.



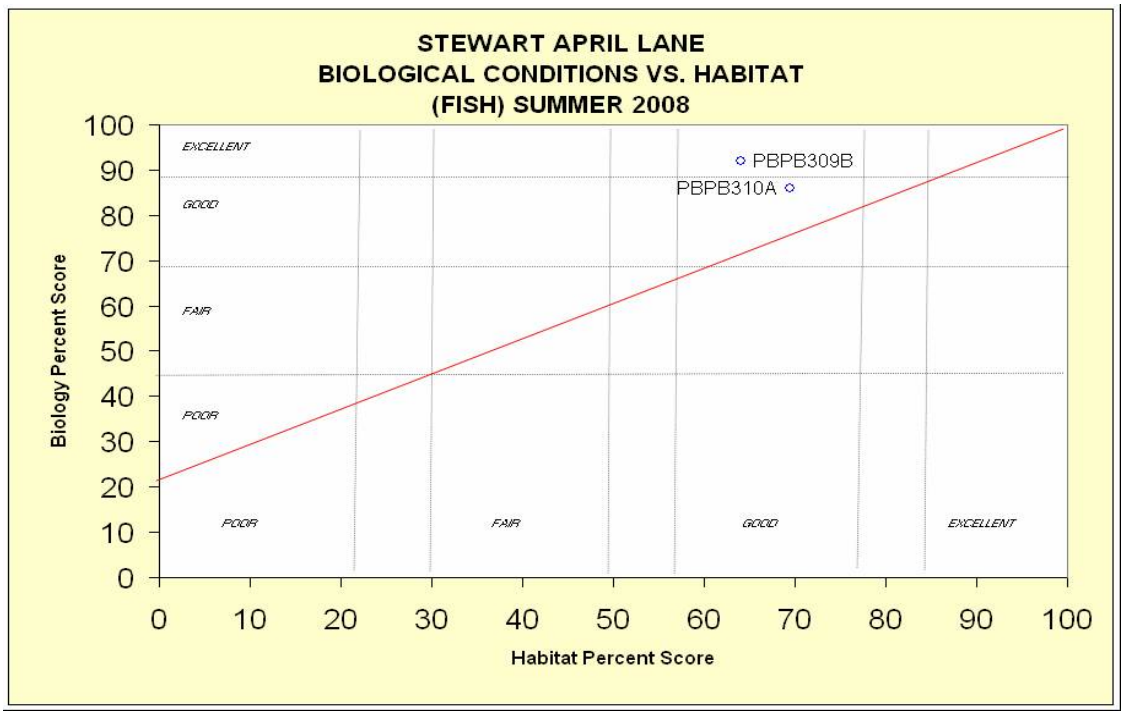


Figure III-D5. Long-Term Discharge Characterization Biology and Habitat Conditions in 2008. Line shows expected direct correspondence between biological and habitat conditions.

Table III-D5 shows results from the water chemistry and physical parameters collected at the same time biological communities were monitored. All parameters are within normal ranges, with the exception of conductivity at the Stewart April Lane tributary (PBPB104) site. Both 2007 and 2008 conductivity measurements are higher than the mainstem stations. The high conductivity readings are likely caused by high levels of inorganic dissolved solids from industrial pollution or urban runoff.

Table III-D5. Water Quality Measurements at Biological Stations 2007 & 2008.
Long-Term Discharge Characterization

STATION	PBPB104 (tributary)				PBPB309B (upstream)				PBPB310A (downstream)			
TYPE	Benthic (Spring)		Fish (Summer)		Benthic (Spring)		Fish (Summer)		Benthic (Spring)		Fish (Summer)	
YEAR	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
Dissolved Oxygen (> 5 mg/l)	9.82	11.24	*	*	10.49	12.75	8.45	8.87	11.03	13.15	8.19	8.61
% Dissolved Oxygen Saturation	121	101	*	*	133	116	95	96	137	118	89	93
PH (6.5-8.5)	7.27	7.15	*	*	7.7	7.63	6.9	7.41	7.74	7.58	7.31	7.34
Conductivity (<= 300 umhos)	**494**	**618**	*	*	204	239	189	128	212	249	204	129
Air Temperature (deg C)	nd	11	*	*	nd	11	nd	23	nd	11	27	18
Water Temperature (deg C)	16.4	10.4	*	*	17.9	11.4	21.8	20.2	17.9	10.7	19.6	19.9

*PBPB104 was not monitored for fish in 2007 or 2008
nd = no data

The biological community scores over time are shown in Figure III-D6. Benthic scores at all three sites have been impaired each monitored year. The PBPB104 tributary has had slightly lower benthic scores than the two mainstem sites (PBPB309B and PBPB310A) for 2006, 2007, and 2008. Fish scores differ drastically from the Stewart April Lane tributary and the Paint Branch mainstem sites. The PBPB104 tributary was monitored for fish from 2001 to 2005 and no fish were found, resulting in *poor* scores. The two mainstem sites have maintained *good* or *excellent* scores, with the exception of 2003 when PBPB310A dropped to *fair*.

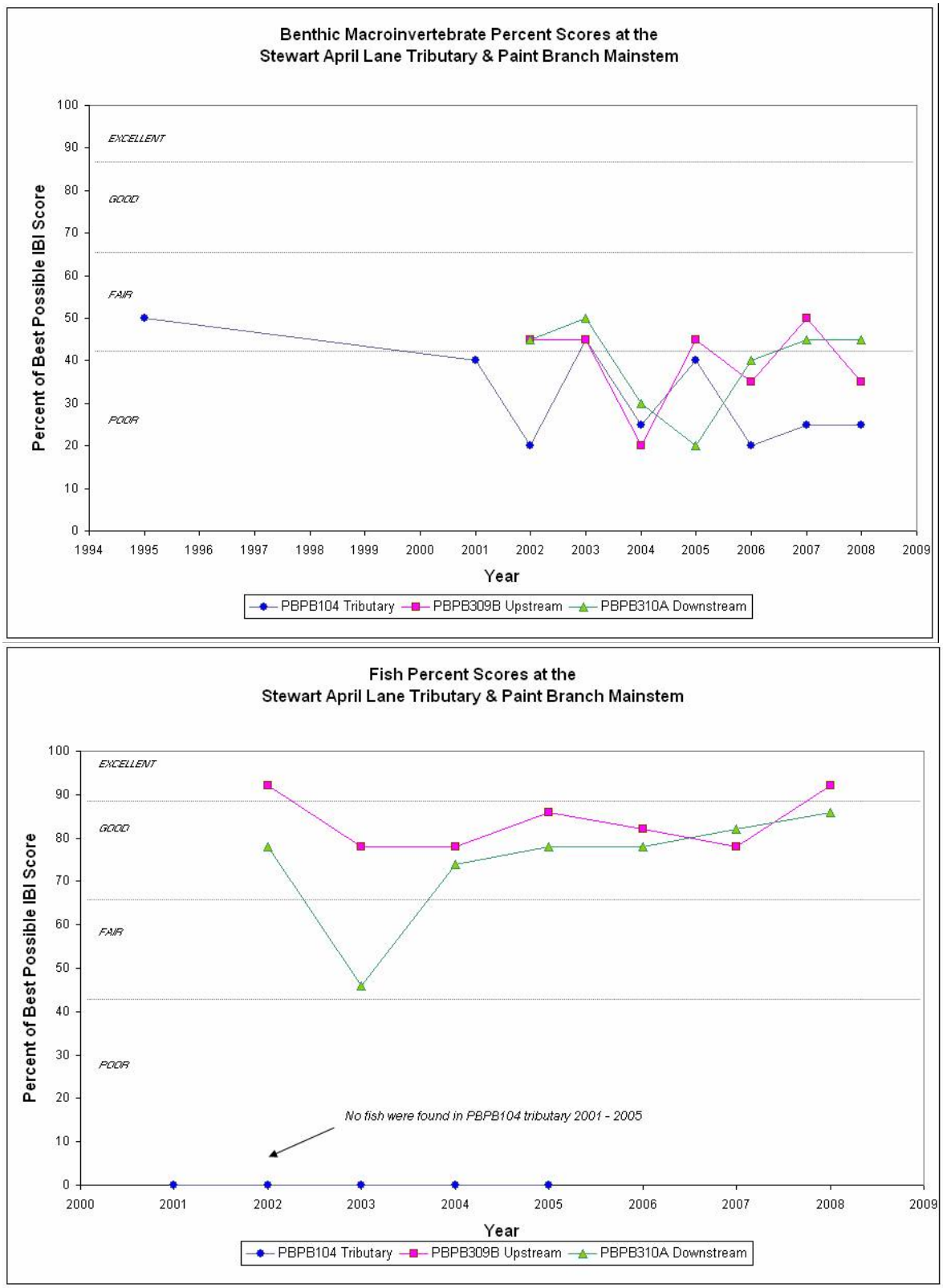


Figure III-D6. Long-Term Discharge Characterization Comparison of Biological Community Over Time.

Benthic Community Structure and Function Differences

Eight measurements of community structure and function make up the DEP's Benthic Index of Biological Integrity (BIBI). These include functional feeding groups (FFGs), taxa richness, diversity, composition, and pollution tolerance. Each measurement responds in a predictable way to increasing levels of stressors. Examining the details of the benthic communities provides more information on possible impairing factors than available just from the overall BIBI score.

Functional Feeding Groups

The FFG classifications are ecological classifications that distinguish benthic macroinvertebrates based on how they process food (Camann, 2003 and Cummins in Loeb and Spacie, 1994). The five FFGs usually examined in a bioassessment are collector gatherers, filtering collectors, shredders, scrapers, and predators. Collectors are the most generalized and usually most abundant FFG because their food source of fine particulate organic matter is abundant. Shredders reduce coarse material (like leaves) into fine material which can then be transported downstream for use by collectors. Shredders actually use the fungi and bacteria present on leaf surfaces for food, breaking the leaf into smaller fragments in this process. Other FFGs include scrapers and predators. Scrapers scrape and graze on the diatoms and on other algae that grow attached on exposed surfaces. Predators attack and consume other insects and macroinvertebrates.

Figures III-D7 through III-D8 examine changes over time using metrics of community structure (dominant taxa) and community function (FFGs) for the benthic macroinvertebrate community. Dominant taxa are those organisms that make up the majority of the sampled community.

The FFGs in the Stewart-April Lane tributary (PBPB104) are compared to those in Gum Springs (PBGS111) for 2007 and 2008 in Figure III-D7. The Gum Springs station is on a first order stream in the Upper Paint Branch, and with significantly less contributing impervious area than in the Stewart April Lane tributary (less than 15% versus about 39%). The BIBI scores in the Gum Springs have been consistently in the *good* range since it was first monitored in 1995.

In 2007, the benthic macroinvertebrate community at PBPB104 was comprised of 95% collectors, 4% filterers, 1% predators, and no shredders or scapers. In contrast, the PBGS111 station represented 42% collectors, 29% filterers, 3% predators, 18% shredders, and 8% scrapers. The dominant FFGs in small headwater streams are typically shredders and collectors. The shift from sensitive and specialized feeders, such as shredders, to generalist and more tolerant groups, such as collectors and filterers, are characteristic of disturbed streams that have been altered by urbanization processes. PBPB104 and PBGS111 show difference in the dominant taxa and percentages in 2007 and 2008.

The FFGs diversity at the Paint Branch mainstem stations (PBPB309A and PBPB310B) is shown in Figure III-D8 for both 2007 and 2008. Both sites shifted to having more collectors from 2007 to 2008. The overall FFG composition was as expected for these larger size streams with collectors as the dominant group. Collectors and scrapers tend to be dominant FFGs in higher order streams where food sources are more broken down.

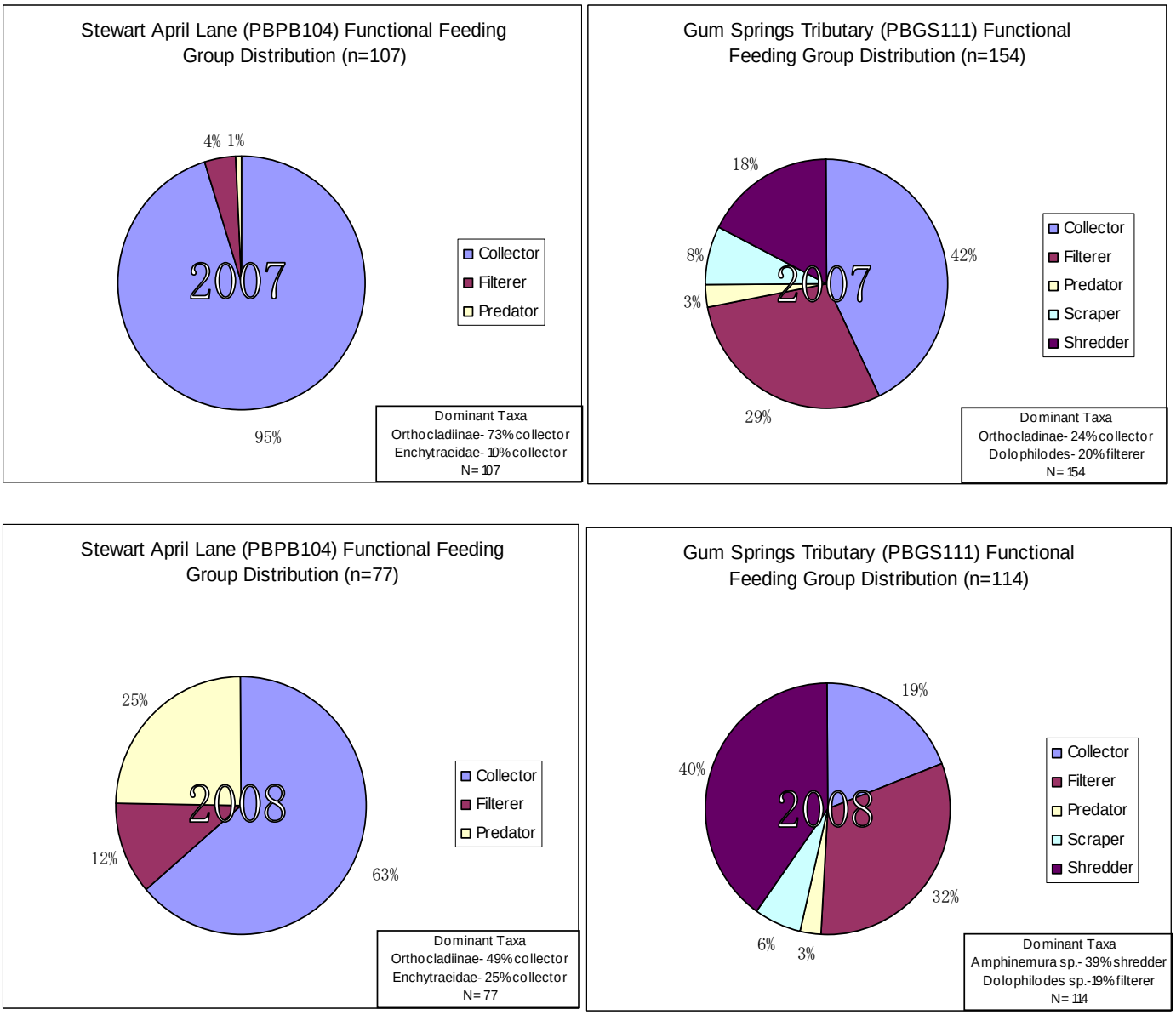


Figure III-D7. Comparison for 2007 and 2008 by percent functional feeding groups in two first order Paint Branch streams.
Stewart April Lane Tributary: 39% impervious, Benthic Index of Biological Integrity = poor.
Gum Springs Tributary: less than 15% impervious, Benthic Index of Biological Integrity = good.

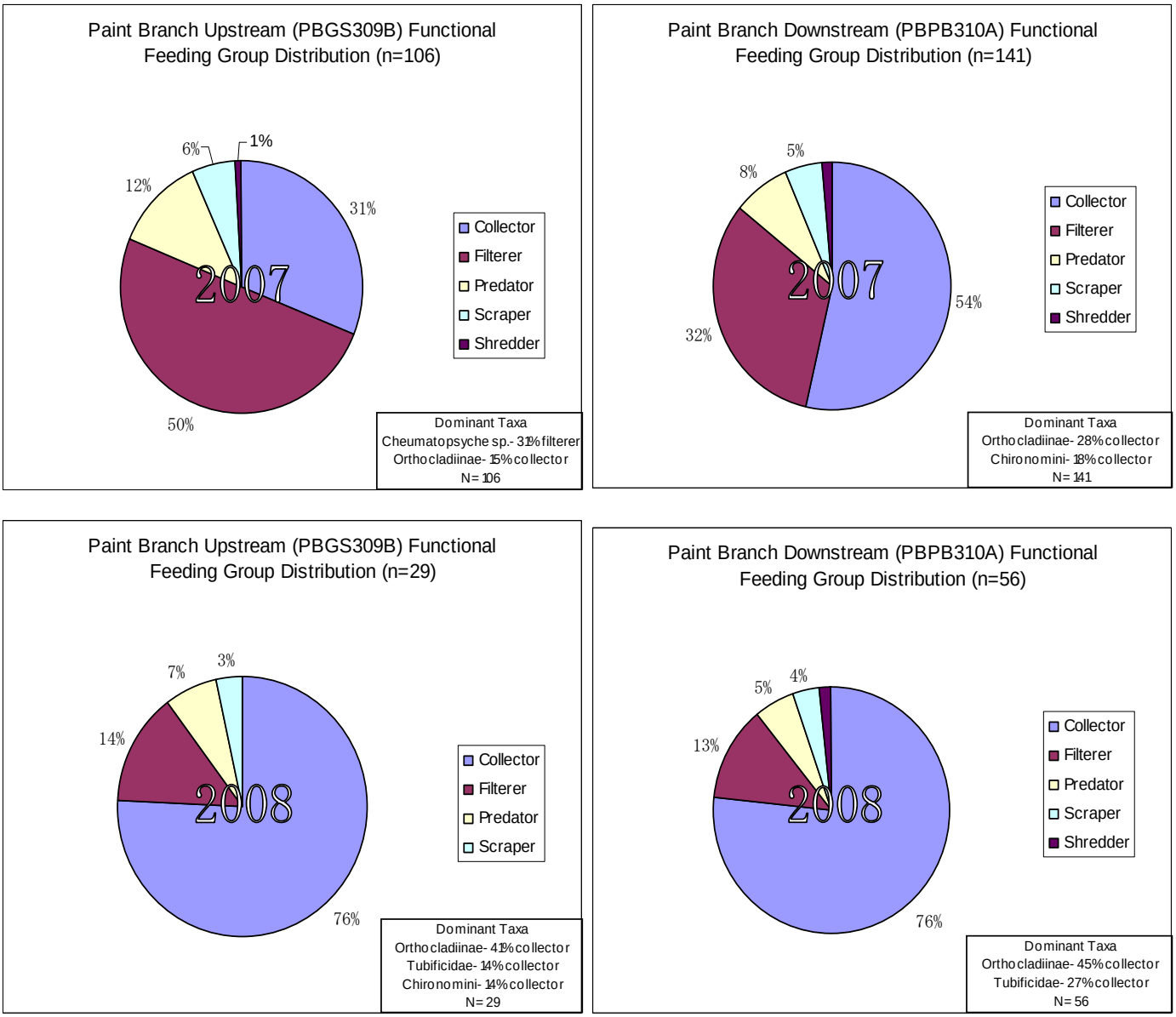


Figure III-D8. Comparison for 2007 and 2008 by percent functional feeding groups in mainstem Paint Branch upstream and downstream of the Stewart-April Lane Tributary. Percent impervious in contributing watershed about 13%. Benthic Index of Biological integrity dropped from fair in 2007 to poor in 2008 at PBPB310A.

Taxa Richness

Taxa richness reflects the number of different taxa found at a station, with more taxa showing a more diverse community. The average number of taxa found in the Stewart April Lane tributary and in Gum Springs has decreased from 2007 to 2008. The Stewart April Lane

tributary has decreased from 12 taxa to 5 taxa and PBGS111 has decreased from 18 taxa to 15 taxa. The number of taxa in the PBPB104 tributary has been consistently lower than that in Gum Springs and is also less than the mainstem stations, which had an average of 18 taxa between 2007 and 2008.

Physical Stream Assessment

The County has completed a longitudinal profile, two cross sections, pebble counts, sinuosity measurements, and slope calculations to examine stream morphology in the Stewart-April tributary. Methods for this stream morphology study are the same as those found in the Stormwater Design Manual criteria section. These results are based on three years of monitoring.

Cross section 1 (Fig. III-D9) shows annual changes to the stream channel both above and below the one and a half year storm mark. The graph indicates that deposition occurred in 2006 and scouring occurred in 2007. A boulder was present in the stream channel in 2007 that had not been recorded in 2006. This is likely a result of the 100 year storm that occurred here in the summer of 2006. This demonstrates that this system is capable of moving large bed particles during significant storm events.

Cross section 2 (Fig. III-D10) also shows that deposition took place in 2006 and scouring took place in 2007 both above and below the one and a half year storm mark. There are indications that a high flow event resulted in approximately 1.5 feet of material being lost from the left bank. Table III-D6 has cross sectional areas for both cross section 1 and 2. The areas show deposition in 2006 (with a decrease in cross-sectional area), and scouring in 2007 (with an increase in cross-sectional area).

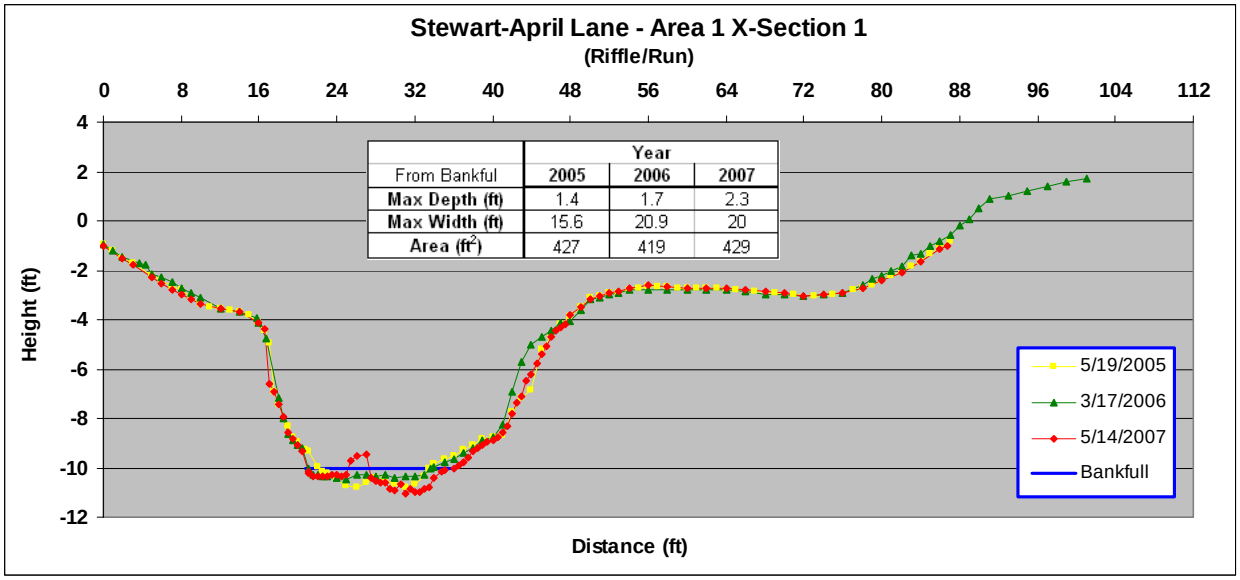


Figure III-D9. Cross section 1 for Stewart-April Lane tributary, Area 1. Cross sections measured in riffle/run features. Drainage Area = 0.33 mi^2.

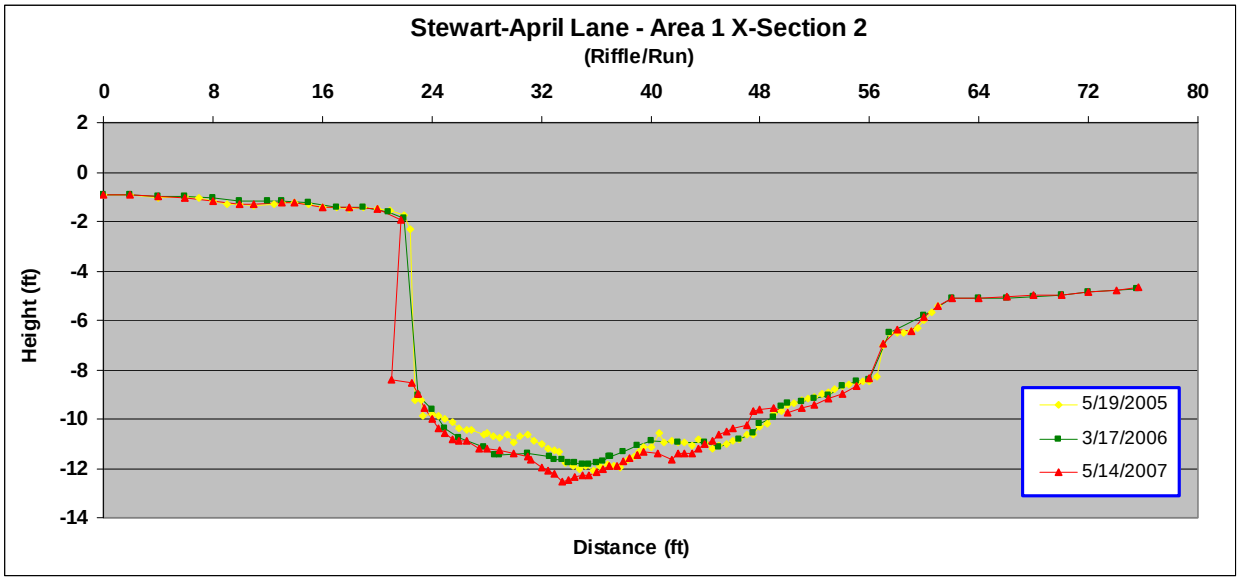


Figure III-D10. Cross section 2 for Stewart-April Lane tributary, Area 1. Cross sections measured in Riffle/run features. Drainage Area = 0.33 mi^2.

Table III-D6. Total cross sectional areas for the Stewart April Lane tributary.

	Cross Section 1 Area (ft^2)			Cross Section 2 Area (ft^2)		
Year	'05	'06	'07	'05	'06	'07
PBPB104	427	418	429	412	419	428

The longitudinal profile (Fig. III-D11) shows that in 2007, deposition had taken place at many of the pools and total pool length has increased, compared to previous years. The total longitudinal slope remained fairly constant (Table III-D7). A comparison of slopes of individual features shows an increase in riffle slope, from 2.39% to 7.82% (Table III-D8). Riffles are grade controls; an increase in riffle slope is an indication that the channel is adjusting to the overall increase in channel slope. Sinuosity has also decreased by 17% from 2005 to 2007, demonstrating that the stream has straightened over time in response to high flow volumes (Table III-D7). A pebble count was performed throughout the entire longitudinal reach and proportioned among riffle, run, and pool lengths. The particle sizes are listed in Table III-D9 and the graphed results are shown in Figure III-D12. The tributary is dominated by small particle sizes, with the majority of particles found measuring less than 10 cm in length.

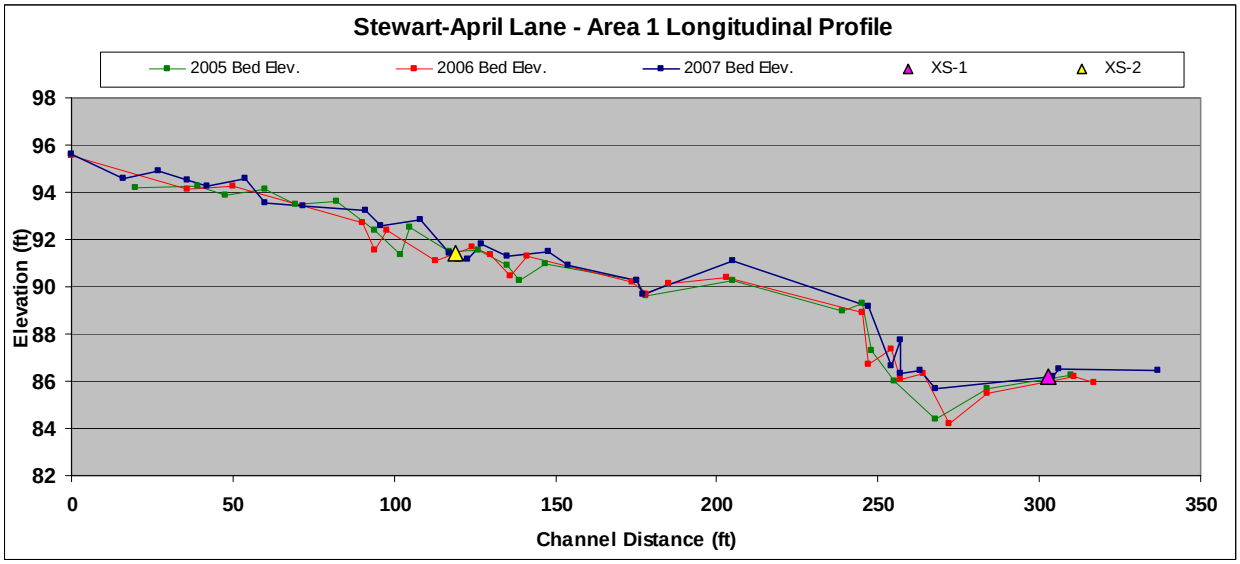


Figure III-D11. Longitudinal profile for Area 1 in the Stewart-April Lane tributary.

Table III-D7. Total longitudinal reach slope and sinuosity for 2005 through 2007 at the Stewart April Lane tributary.

	Total Longitudinal Slope (%)			Sinuosity		
Year	'05	'06	'07	'05	'06	'07
PBPB104	2.7	3.0	2.7	1.8	1.6	1.5

Table III-D8. Comparison of the fluvial feature's mean lengths and slopes for the years 2005 through 2007 at the Stewart April Lane tributary.

PBPB104	Mean Length			Mean Slope		
Year	'05	'06	'07	'05	'06	'07
Pool	20.5	12.5	23.6	0.07	2.54	0.9
Riffle	16.1	25.7	17.3	2.39	5.23	7.82
Run	15.8	15.4	12.6	4.11	2.7	0.38

Table III-D9. D50 and particle sizes for 2005 through 2007 at the Stewart April Lane tributary.

	D50 (mm)			Particle		
	'05	'06	'07	'05	'06	'07
PBPB104	42	38	74	Very Coarse Gravel	Very Coarse Gravel	Small Cobble

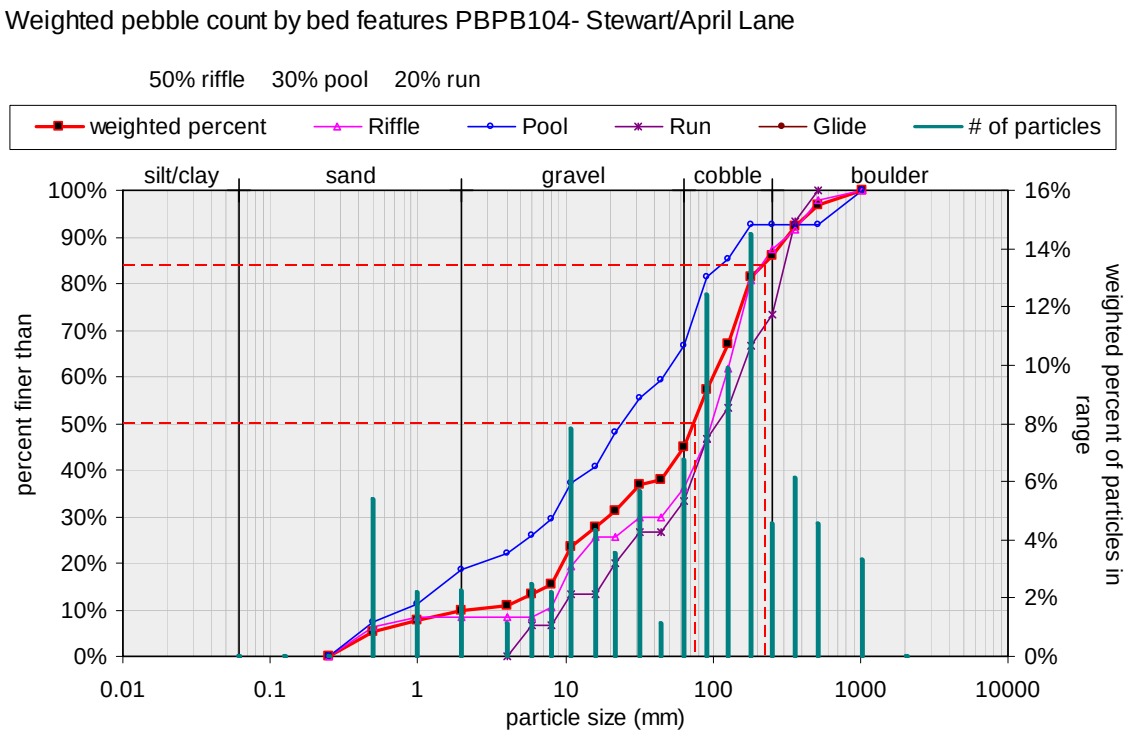


Figure III-D12. Pebble count distributions by bed features for Stewart April Lane tributary.

Summary of Biological and Habitat Conditions

Impacts to biology and habitat at the Stewart April Lane tributary seem to indicate an issue of point source pollution from stormwater runoff. The benthic communities in the tributary have been consistently *poor* since monitoring began in 1995. In 2007, the community was dominated (99%) by generalist and more tolerant benthic groups, such as collectors and filterers, which are characteristic of disturbed streams that have been altered by urbanization processes. Habitat is *good/fair* overall, but the parameters that are consistently lacking are sediment deposition, bank vegetative protection, and bank stability. Poor scores in these parameters indicate impacts from uncontrolled runoff. Conductivity measurements have also

been consistently high in the tributary and are likely caused by high levels of inorganic dissolved solids from industrial pollution or urban runoff. Finally, documented changes in the tributary's channel morphology from 2005 to 2007 also indicate runoff responses in the form of deposition in 2006 and scouring in 2007. In 2007, the tributary was dominated by small particle sizes (less than 10 cm), which reflects unfavorable benthic habitat. Sinuosity has also decreased by 17% from 2005 to 2007, demonstrating that the stream has straightened over time in response to high flow volumes.

D2. Stormwater Design Manual Monitoring

Summary

The purpose of this monitoring is to document the effectiveness of storm water controls designed from the 2000 Maryland Stormwater Management Design Manual in minimizing impacts to stream morphology and biology. The analysis of this data pertains to sediment and erosion devices, as relatively few of the stormwater management BMPs have been fully converted in 2008. Full conversion to SWM is still several years away, so conclusions are limited to the effectiveness of the sediment and erosion devices in monitoring changes in stream morphology and biology. Observations on stormwater management effectiveness will begin after the developments in the drainage area of the test tributary are completed and the stream is monitored for about five years.

The County monitored the "positive control" area, Soper's Branch, and a test area, Little Seneca (Newcut Road Neighborhood) tributary using the methods as described in the 2003 NPDES Report. During 2007 and 2008, the eastern portion of the test tributary (Greenway Village) continued with construction and development related activities. Greater portions of the development are now owner occupied, while elsewhere forests were cleared, land grading continued, and more houses began to take shape. Many of the sediment and erosion devices on the eastern side of the test tributary have not been fully converted to stormwater controls. To the west of the test tributary (Clarksburg Village), the first roads were installed and land grading continued. The land composition in the control tributary's (Soper's Branch) drainage area remained unchanged.

Landscape Changes and LiDAR

Overall, the topography, natural drainage patterns, and naturally diffuse infiltration have been altered due to the cut and fill levels necessary to meet the requirements of the developments located within the test area watershed. Final grades can be seen throughout the site as the rolling topography has been cut, graded, smoothed, and leveled. Most of the stormwater runoff is now diverted into stormwater inlets and drains rather then infiltrating into a pervious surface over a wide area.

Hydrology

The greater the impervious surfaces that cover a watershed, the smaller the amount of precipitation that infiltrates into the groundwater system and the more precipitation directly runs off into streams. This is through the grading and compaction activities that currently occur as a result of development. Naturally pervious soils and a diffuse infiltration system are altered and/or lost through the cut and fill requirements currently being followed to develop a property.

The natural hydrology of the Newcut Road Neighborhood in Clarksburg has been altered dramatically by the development process. The ability of BMPs to mimic pre-construction hydrologic conditions will be evaluated once the construction process has been completed and the SWM BMPs are online and functioning as designed.

Surface hydrology analysis has shown that, on average, the overall amount of precipitation infiltrating into the ground or lost via evapotransporation has steadily declined in the Newcut Road Neighborhood Tributary while remaining fairly constant in the Sopers Branch control. The overall amount of precipitation that directly entered the Newcut Road Neighborhood Tributary test area also increased over this same time period as compared to the Sopers Branch. During the construction period, the Newcut Road drainage was, on average, flashier than the Sopers Branch drainage. These changes to surface hydrology would cause the stream to move more sands and gravels in the channel and aggrade (Paul and Meyer 2001).

Geomorphology

The County has conducted physical surveys of the stream channel at the test and the control site each year since 2003. There has been a change in the longitudinal profiles for the test and the positive control sites. Until all of the sediment and erosion devices have been converted, changes in the test and control tributaries will be attributed to natural variability and, in addition, for the test areas, the impact of development and the effects of sediment and erosion control devices. The test tributary shows evidence of down-cutting and increases in cross-sectional area. Though there are noticeable changes in the fluvial features, the overall longitudinal slope of each area is still fairly constant from one year to the next. Sinuosity indices for the LSLS104 test tributary reveal the stream has straightened over time (ratios went from 1.4 to 1.0 in just four years. The sinuosity of the Sopers Branch positive control channel has remained fairly consistent. This would be consistent with the increased annual runoff observed at the LSLS104 test tributary.

Cross Sections

Cross sections are used to look at change that takes place to the stream channel over time. It appears that most, if not all of the channel changes occur at elevations at or below the frequent storm level for both the control and test tributaries. On average, cross sections from the test area experienced channel aggradation corresponding to the most active years of

construction (2004, 2005 and 2006), and then channel degradation and some widening in 2007 as this area neared final elevations and stabilization. On the other hand, cross sections at the control in Little Bennett Regional Park show little yearly change. The S&EC BMPs on the development sites were functioning as designed and maintained. However, even the best maintained and functioning S&EC BMP are not 100% effective in removing fine clays and silts.

The total cross sectional area shows that the test area has generally had an overall increase in channel area and has experienced more annual change than at the control. In contrast, the control tributary had little or no change in area since 2006, and total cross sectional area has increased only slightly since 2003. The debris dam that was responsible for the changes observed in 2004 at Area 2 of the control was still present in 2007.

Biology

The biological communities in the test tributary continue to show signs of stress from the impacts of the development. The benthic community appears to have suffered the greatest impact, shifting from an excellent community structure in 2004 to a poor community structure in 2008. Data indicates that the benthic community was impacted by construction activities on the eastern side of the test tributary (Greenway Village) in 2004. This was followed by a marked decrease in biotic integrity since 2006, which corresponds to the more recent construction operations now underway on the western side of the tributary (Clarksburg Village).

The most observable impact to the benthic community is a change in the dominant functional feeding group and the sensitivity of dominant taxa found there. The shredder community that feeds on leaf material has been greatly reduced, while the filterer and collector communities that feed off of particulates have increased dramatically. Currently, water temperature does not seem to be a factor in any biological stream impairments in either the control or test tributaries. Most likely, the forest buffer and spring seeps are the predominate contributors to regulating the summer water temperatures in the control tributary. With the rapidly developing test tributary, water temperature may play a larger role in the aquatic biota's survival due to land disturbances that may alter tree canopy and/or spring seeps.

E. Management Programs

E1. Stormwater Management Program

Facility Inspections and Maintenance 2007

In 2007, the DEP performed 1,591 initial inspections to assess the repair and maintenance needs of a stormwater management facility. Of the 1,591 inspections, 1,276 were at privately owned facilities and 315 were at publicly owned facilities. Table III-E1 shows the total number of initial inspections by facility type and ownership. The majority of the inspections occurred at three structure types--oil-grit separators (468), flow splitters (176), and Stormceptor (149). A majority of the inspections were completed by DEP's contractor under

the Stormwater Facility and Inspection Support contract, while a few inspections were completed by DEP's Stormwater Inspectors or Senior Engineer. These initial inspections identified the need for repair at approximately 37 percent of all structures--about 96 percent of the aboveground structures and 6 percent of the underground structures. In contrast, during 2006, initial inspections identified that a repair was needed at 97 percent of the aboveground structures and 10 percent of the underground structures.

Aboveground facilities include ponds, infiltration trenches, infiltration basins, filtration basins, and filtration devices (bioretention and surface sand filter). Underground structures include all structures located physically underground such as oil-grit separators, underground sand filters, underground infiltration, and underground storage facilities. In 2007, there were 273 inspections at aboveground facilities and 48 inspections at belowground facilities related to public complaints, follow-up inspections, and inspections at facilities being considered for transfer into the DEP's Stormwater Facility Maintenance Program (SWFMP). After the initial inspection, DEP's Stormwater Inspectors on average complete two follow-up inspections per aboveground facility and one follow-up inspection per underground facility to ensure the facility is properly repaired and maintained. In addition, DEP's inspectors perform a final inspection for each facility once repairs and maintenance are completed. This inspection is completed to ensure the facility is in compliance and is available for transfer in the SWFMP. Maintenance (other than grass cutting and trash removal) is funded through the Water Quality Protection Charge for facilities in the SWFMP.

Aboveground Facility Inspections

The number of initial inspections of aboveground facilities in 2007 was 542. Of these, 467 were at privately owned and 75 were at publicly owned facilities. Maintenance and/or repairs were required at 518 facilities; 24 required immediate repairs. Twenty-four percent of the repairs required for the inspected aboveground facilities were completed in 2007. One of the privately owned facilities inspected in 2007 was accepted into the DEP maintenance program.

Belowground Facility Inspections

The number of initial inspections of belowground facilities in 2007 was 1049–809 at privately owned and 240 at publicly owned facilities. Repairs were made at 63 facilities; with four of the facilities requiring immediate repairs. Seventy-five percent of the maintenance and/or repairs required for belowground facilities were completed in 2007. Twelve of the privately owned facilities have been accepted for transfer into the DEP maintenance program.

Table III-E1. Total Number of Initial Inspections by Facility Type and Ownership (2007)			
Structure Type	**Publicly Owned**	**Privately Owned**	**Total**
Aquafilter	0	4	4
Aquaswirl	0	5	5
Baysaver	12	16	28
Bioretention	0	24	24
Constructed Wetland	2	31	33
Dry Pond (Detention)	30	102	132
Flow Splitter	13	163	176
Infiltration Basin	0	18	18
Infiltration Trench	6	47	53
Oil/Grit Separator	138	330	468
Oil/Grit Separator and sand filter	12	49	61
Pond/Sand Filter	5	26	31
Sand Filter	10	90	100
Stormceptor	32	117	149
StormFilter	0	16	16
Underground Infiltration Trench	23	28	51
Underground Sand Filter	1	27	28
Underground Storage	12	132	144
Underground Storage with infiltration	0	10	10
Vortechnics	0	1	1
Wet Pond (Retention)	19	40	59
Grand Total	**315**	**1276**	**1591**
Total Inspections Indicating Repairs	*73*	*512*	*585, 37%*
Total Aboveground with Repairs	*70*	*448*	*518, 96%*
Total Underground with Repairs	*3*	*64*	*63,6%*

Facility Inspections and Maintenance 2008

In 2008, DEP implemented a new database tracking system. The system is an asset maintenance management database that issues work orders for all inspections and maintenance activities performed on stormwater management facilities in the County. The move to a work order based system has changed how the Inspection and Maintenance program tracks its data. The data reported for 2008 more accurately represents DEP's inspection and maintenance program.

Triennial Inspections

DEP is responsible for inspecting over 4,000 stormwater management facilities. Each facility is on a 3 year inspection cycle (triennial inspections) and to accomplish the inspection requirements, DEP has separated the County in three Inspection Regions. (i.e., Region 1 is eastern region, Region 2 central region, Region 3 western region. DEP uses contracted Inspectors to complete the triennial inspections. In 2008, DEP performed 957 inspections to assess the repair and maintenance needs of each stormwater management facility located in Inspection Region 1. Table III-E2 shows the total number of inspections by facility type and ownership. The majority of the inspections occurred at four structure types—ponds (269), infiltration facilities (153), filters (149), and oil/grit separators (149). The Water Quality Protection Charge funds the triennial inspections and the DEP inspection program.

Table III-E2. Total Number of Initial Inspections by Facility Type and Ownership 2008

Structure Type	Publicly Owned	Privately Owned	Total
Baysaver	8	2	10
Bioretention	2	16	18
Filters[1]	43	106	149
Infiltration	71	82	153
Oil/Grit Separators	68	81	149
Stormwater Ponds[2]	56	213	269
Stormceptors	17	26	43
Underground Storage	10	39	49
Wetland	0	2	2
Other[3]	34	81	115
Total	309	648	957

[1] This includes all aboveground and underground sand filters, and proprietary filters such as Stormfilters
[2] This includes all dry and wet ponds, and ponds with extended detention
[3.] This includes all other type of devices not captured, including flow splitters

In addition to scheduled triennial inspections, DEP will perform unscheduled inspections as a result of public complaints or for transfer of the facility to DEP's maintenance program. In 2008, there were 33inspections at aboveground facilities and 7 inspections at belowground facilities related to public complaints and inspections at facilities being considered for transfer into the DEP's Stormwater Facility Maintenance Program (SWFMP).

Maintenance

DEP maintenance program is responsible for ensuring maintenance is completed on all stormwater facilities in the County. Unless specified in the maintenance agreements, all maintenance is the responsibility of the property owner. The Water Quality Protection Charge funds DEP's maintenance program. In 2003, the County enacted legislation giving DEP the authority to perform structural maintenance, including cleaning of underground

facilities, on residential and associated non-residential stormwater management facilities. In order for DEP to have the legal ability to perform the maintenance, the private owner of the facility must have an executed maintenance agreement that specifies the County is responsible for structural maintenance. Once executed, DEP is the sole entity responsible for structural maintenance; the property owner remains responsible for nonstructural maintenance. Of the 4,178 facilities in the maintenance program, there are over 1,800 facilities maintained by DEP; 830 are privately owned (e.g., facilities that serve residential properties) and 970 are publicly owned (i.e., facilities that serve public schools).

DEP performed structural maintenance on 222 privately owned and DEP maintained, and publicly owned aboveground stormwater management facilities. DEP's maintenance program also performs routine sand filter maintenance on all facilities in the maintenance program. One-hundred and twenty-three facilities had routine sand filter maintenance (i.e., scarification) performed by DEP in 2008.

In 2008, DEP enforced maintenance on 247 privately owned and maintained aboveground stormwater facilities. Property owners are given 120 days to complete the maintenance and/or repairs as specified in the repair reported generated from the triennial inspection. DEP's Stormwater Inspectors on average complete two follow-up inspections per aboveground facility while the facility is under repair. These inspections are typically done with the property owner or property manager and the contractor hired to complete the inspection. Each owner and the owner's repair contractor are required to hold a pre-construction meeting with DEP inspectors to ensure the facility will be maintained properly. DEP inspectors complete a final inspection to ensure the work was completed and the facility was maintained or repaired properly. DEP notifies the property owner once the work is completed to satisfaction. DEP is also responsible for enforcing nonstructural maintenance on aboveground facilities where DEP performs the structural maintenance. In 2008, DEP enforced the routine nonstructural maintenance on 112 facilities.

DEP requires owners of underground stormwater management facilities to perform an annual maintenance cleaning each year. DEP will complete this cleaning for those facilities in the DEP maintenance program. DEP performs the cleaning and repairs on 524 privately owned and DEP maintained, and publicly owned underground facilities. Facilities located at depots are cleaned twice a year.

In 2008, 626 facilities were maintained and cleaned to DEP's satisfaction. Any repairs identified were also completed at that time. Property owners of underground stormwater facilities are give 45 days to complete the cleaning. DEP Stormwater Inspectors performs a final inspection on each facility to ensure it was maintained properly. DEP notifies the property owner once the work is completed to satisfaction. Table III-E3 shows the facilities repaired and /or maintained in 2008.

Table III-E3. Repairs and Maintenance for 2008	
Type Of Facility	**Number of Facilities**
Aboveground Privately Owned and Maintained	247
Aboveground DEP Maintained	222
Aboveground DEP Routine Sand Filter Maintenance	123
Underground Privately Owned and Maintained	626
Underground DEP Maintained	524
Total Number of Facilities Maintained	**1,742**

Stormwater Management Ordinance and Implementation

During 2007-2009, the DPS coordinated with MDE in order to implement requirements under the Maryland Stormwater Management Act of 2007. The primary goal of this Act was to mandate the use of environmental site design (ESD) to the maximum extent practicable for new development and redevelopment. The MDE published draft regulations in October, 2008 to meet requirements for the formal process of adopting modified stormwater management regulations and changes to the 2000 Maryland Stormwater Design Manual. The State adopted these regulations in January, 2009.

The regulation requires the submission of local ordinances to MDE for review by July 1, 2009 with implementation by December 31, 2009. The County proceeded with drafting changes to its local ordinances to meet the State requirements but these were not implemented during 2009. Each local ordinance must include the following:

(a) Considers all aspects of project planning, design, and construction from initial conception through final approval;

(b) Requires the submission, review, and approval of interim plans at an increasing level of detail for specific stages of project development; and

(c) Provides for coordinated input for all plans from all appropriate agencies including, but not limited to soil conservation districts and departments of planning, zoning, public works, and environmental protection.

Reporting of BMP types

This Permit included requirements to report details on BMP types approved during the stormwater management planning and permitting process. This requirement was removed in the Permit No. 06-DP-3320 MD0068349, originally scheduled for re-issuance in July 2006 and final determination issued in February 2009. The DPS discontinued tracking that information and it would consider a significant level of effort to retrieve the data from prior years. In some cases, the information reported for prior years would be out of date for this reporting cycle due to subsequent changes to projects.

E2. Water Quality Program Enforcement

Outfall Screening- Years 2007-2008

For the year 2007 the DEP screened a total of 119 outfalls with 45 having dry weather flows. The outfalls that were targeted for screening during 2007 were located within the drainage areas of biological monitoring sites that showed impairment the previous year due to factors presumably not due to degraded habitat. Errors in outfall location or type as shown on the existing maps were reported and will be corrected in the GIS inventory. In addition, 3 new outfalls were identified and will be added to our existing maps.

Of the 45 outfalls found to have flow, 32 were identified as piped streams with varying degrees of flow, and 13 actually had dry weather flow. Of the 13 outfalls having dry weather flow, one was found to have elevated pH and detergent levels, and two others were found to have detergent levels slightly above the detection limit. Other parameters (Phenol, Copper and Chlorine) for these outfalls were below detection limits, and conductivity was <750 µS. In addition, elevated water quality parameters were detected at 10 of the 32 piped streams surveyed. Source tracking was unsuccessful at determining specific point-sources contributing to water quality issues detected in the affected outfalls.

For the 2008-2009 monitoring season, the DEP began outfall screening in March 2009 because of issues related to snow melt and de-icing agents during the previous late fall/winter screening cycles, neither of which are related to illegal connections or illicit discharges. The DEP screened a total of 113 outfalls with 28 having dry weather flows with a focus on outfalls contained within the Lower Rock Creek Watershed. Errors in outfall location or type as shown on the existing maps were reported and will be corrected in the GIS inventory. In addition, 11 new outfalls were identified and were added to the GIS maps.

Of the 28 outfalls found to have flow, 10 were identified as piped streams with varying degrees of flow, and 18 actually had dry weather flow. Of the 18 outfalls having dry weather flow, one was found to have elevated chlorine, detergent and conductivity levels, and two others were found to have detergent levels at the detection limit of 0.25 mg/l. The remainder of the outfalls having dry weather flow tested below the detection limits for water chemistry parameters (Phenol, Chlorine, Detergent and Copper), and conductivity measurements were below 750 µS. In addition, slightly elevated water quality parameters were detected at 2 of the 10 piped streams surveyed. Source tracking was unsuccessful at determining specific point-sources contributing to water quality issues detected in the affected outfalls.

The DEP is continuing to work with the WSSC by performing follow-up site visits for reported sanitary sewer overflows (SSOs) in Montgomery County, and performed 67 of these site visits in 2007 and 92 visits in 2008. The purpose to these follow-up site visits is to verify the SSO has been corrected, ensure adequate cleanup and treatment of all affected areas, and ensure adequate public notice signage has been posted in affected areas. The DEP is continuing to work with the WSSC's FOG (Fats, Oils and Grease) Program regarding restaurant grease, improper disposal of which can have direct effects on storm water quality in the County.

Proposed Outfall Screening Changes for 2009 forward

During 2009, the DEP considered possible revisions in the County's outfall screening program to accommodate changes required for the next Permit cycle. The DEP review of results from prior years indicated that increasing the number of outfalls screened and continuing the existing screening program would not be effective in identifying or eliminating illegal connections. For example, in 2007-2009, out of 232 outfalls screened, only six were found with dry weather flow and values greater than detection limit for the sampled parameters. Linking the outfalls screened to stream reaches identified as impaired by other than physical habitat had not increased success in identifying what 'other' factor might be causing that impairment.

Beginning with the screening for 2009-2010, the preference would be to focus on areas within the County where there are documented or potential illegal connections which 'routinely' produce water quality problems. These areas would be small enough or contain a simple enough drainage network that water quality investigations could methodically proceed with a 'good' probability of locating the sources of continuing problems. The DEP would then implement dye studies, targeted outreach, or other measures to assure that these sources are eliminated or at least significantly reduced.

The DEP would determine how many of these areas or the amount of area to be covered that would be reasonable within one year and 'survey' and 'screen' within these areas to meet the Permit requirements. There would be no fixed number of outfalls per year, but rather the effort would be on surveying all outfalls within these identified problem areas and screening any outfall with dry weather flow. This would provide a more efficient use of staff time to focus on problem identification rather than traveling to widely spaced areas in order to meet criteria for screening a certain number of outfalls. The DEP feels that multi-family residential, especially dense multi-family residential, should be included with commercial and industrial for survey purposes. Institutional facilities (places of worship, hospitals, schools, and colleges) should also be included.

Water Quality Investigations during 2007

For the calendar year 2007, the DEP Division of Environmental Policy and Compliance (DEPC) investigated 231 water quality complaints and 53 hazardous materials incidents, which resulted in the issuance of 30 Enforcement Actions (8 Civil Citations with fines totaling $4,000 and 22 Notices of Violation (NOVs)). These are summarized in the Table III-E4.

Table III-E4 2007 Water Quality Investigations

No.	Case Number	Date Issued	Citation/NOV	Violation	Defendant	Defendant's Address
1	18876	4/12/07	NOV	Vehicle Fluids Discharge	Jessica Mejia	14115 Chesterfield Road, Rockville, MD 20853
2	18911	4/26/07	NOV	Fuel Oil Discharge	Mr. & Mrs. Hector Villegas	25901 Frederick Road, Clarksburg, MD
3	19031	5/9/07	NOV	Pool Chlorine Discharge	Greg Tucker	3901 Ferrara Drive, Silver Spring, MD
4	18890	5/16/07	NOV	Cooking Grease Discharge	Peter Legum/Nellis	6001 Montrose Rd Rockville, MD
5	19093	5/29/07	NOV	Brick Cutting Discharge	Jeremey Musselman	8553 Ashwood Dr., Capitol Heights,MD
6	19207	6/19/07	NOV	Cooking Grease Discharge	Siddhartha	16240 Frederick Road, Gaithersburg, MD 20877
7	18618	7/2/07	NOV	Cooking Grease Discharge	Peterson Properties	916 Ellsworth Drive, Silver Spring, MD 20910
8	19279	7/12/07	NOV	Vehicle Fluids Discharge	Tok Son Park	906 Brick Manor Circle, Silver Spring, MD 20905
9	19119	7/16/07	NOV	Waste Water Discharge	Seong Kwon/Han Ah Reum Asian Market	12015 Georgia Ave Silver Spring 20906
10	19321	7/27/07	NOV	Waste Water Discharge	All-State Appliance Center	8111 Piney Branch Road, Silver Spring, MD
11	19370	8/7/07	NOV	Concrete Discharge	Mr. Alex Galoustian	Chase Construction, Inc.
12	19363	8/20/07	NOV	Cooking Grease Discharge	Federal Realty	1626 E Jefferson St. Rockville
13	19368	8/27/07	$500	Concrete Discharge	Insulators of Maryland	15430-D Old Columbia Pike Burtonsville
14	19451	9/5/07	$500	Waste Water and Cooking Grease Discharge	McDonalds/Naeem Mahmood	8637 16th Street, Silver Spring, MD
15	19451	9/5/07	$500	Improper Handling of Cooking Grease	McDonalds/Naeem Mahmood	8637 16th Street, Silver Spring, MD
16	19451	9/5/07	$500	Waste Water and Cooking Grease Discharge	Popeyes/Mcchickens LTD/ Inga Fofana	8641 16th St., Silver Spring, MD
17	19369	9/6/07	$500	Concrete Discharge	John F. Casey/ Clydeco Development	5000 Sunnyside Ave., Beltsville, MD
18	19464	9/11/07	NOV	Paint Discharge	Thomas Ragusa	10110 Dallas Avenue, Silver Spring, MD 20901
19	19498	9/14/07	NOV	Paint Discharge	Mr. Steven Lin	12122 Hunters Lane, Rockville, MD
20	19437	9/17/07	NOV	Pool Water Discharge	YMCA BCC/Jonathan Davis	9401 Old Georgetown Rd Bethesda
21	19497	9/18/07	NOV	Concrete Discharge	Southard Brothers Concrete	4090 St. Paul Road, Hampstead, MD 21074
22	19476	9/21/07	$500	Concrete Discharge	Ervin Lee	22 Ladybug Lane, Kearneysville, W.VA. 25430
23	19504	10/4/07	$500	Improper Clean Up of Oil Spill	Willie Joyner	2200 Georgian Woods Place, Wheaton, MD
24	19512	10/4/07	NOV	Oil Discharge	Burkhardt Excavating	P.O. Box 97, Braddock Heights, MD 21714
25	19360	10/5/07	NOV	Concrete Discharge	Lafarge North America/ Jeremy Dhremer	300 E Joppa Rd Towson, MD
26	19451	10/25/07	NOV	Improper Handling of Cooking Grease	McDonald's Manager	8637 16th Street Silver Spring, MD
27	19363	11/8/07	$500	Waste Water Discharge	Centro Restaurant/Francis Namin	4838 Bethesda Avenue
28	19738	11/21/07	NOV	Waste Water Discharge	Great Eggspectation	923 Ellsworth Drive, Silver Spring, MD 20910
29	19813	12/14/07	NOV	Cooking Grease Discharge	Lotte Plaza Market	13069 Wisteria Drive Germantown
30	19806	12/14/07	NOV	Cooking Grease Discharge	Mr. Jose R. Neto	13655 Georgia Avenue, Rockville, MD

Water Quality Investigations during 2008

For the calendar year 2008, the DEP Division of Environmental Policy and Compliance (DEPC) investigated 156 water quality complaints and 53 hazardous materials incidents, which resulted in the issuance of 24 formal Enforcement Actions (9 Civil Citations with fines totaling $4,500 and 15 Notices of Violation (NOVs)) and numerous Warning Letters. The formal Enforcement Actions are summarized in the Table III-E5.

Table III-E5 Water Quality Investigations in 2008

	Case Number	Date Issued	Citation/NOV	Violation	Defendant	Defendant's Address
1	19943	1/31/2008	NOV	Cooking Grease Discharge	Mr. Cho	13541 Clopper Rd., Germantown, MD
2	19931	2/27/2008	NOV	Vehicle Fluids Discharge	James Robert Martin	12633 Tobeytown Dr., Potomac, MD
3	20087	3/24/2008	NOV	Vehicle Fluids Discharge	Mr. Chester Allen	11200 Empire Lane, Rockville, MD
4	20164	4/4/2008	NOV	Pool Water Discharge	Baily's Total Fitness Center	11010 Viers Mill Rd., Wheaton, MD
5	20269	5/6/08	$500	Sediment Discharge	Ross Contracting	1007 Rising Ridge Rd., Mt. Airy, MD
6	20269	5/6/08	$500	Sediment Discharge	Ross Contracting	1007 Rising Ridge Rd., Mt. Airy, MD
7	20316	5/8/08	$500	Vehicle Fluids Discharge	Potomac Disposal, Inc.	14815 Old Dover Rd., Rockville, MD
8	20375	5/27/2008	NOV	Waste Water Discharge	Ms. Michelle Kollar	19801 Frederick Rd., Germantown, MD
9	20417	6/11/2008	NOV	Improper Handling of Road Salt	Mr. Douglas Boyland	7513 Hawkins Creamery Rd., Laytonsville, MD
10	20509	6/24/2008	NOV	Concrete Discharge	Liberty Concrete	6214 Old Keene Mill Ct., Springfield, VA
11	20539	7/14/2008	NOV	Waste Water Discharge	Ms. Diane Jones	2096 Gaither Rd., Suite 202, Rockville, MD
12	20556	7/15/2008	NOV	Pool Water Discharge	Mr. Miguel A. Grande	12502 Timber Hollow Pl., Germantown, MD
13	20591	7/22/08	$500	Waste Water Discharge	Vanover's Hardwood Floors/ Dwight Vanover	1010 E Cannons Ct., Woodbridge, VA
14	20632	7/25/2008	NOV	Waste Water Discharge	Shoppers Food Warehouse	18066 Mateney Rd., Germantown, MD
15	20747	8/26/2008	NOV	Vehicle Fluids Discharge	Shin, Yong Woo/Aspen Hill Korean Church	4400 Renn St., Rockville, MD
16	20780	9/5/2008	NOV	Paint Discharge	Huang Yousong	6658 Chestnut Ave., Falls Church, VA
17	20938	10/14/2008	NOV	Vehicle Fluids Discharge	Michael Debleecker	15401 Good Hope Rd., Silver Spring, MD
18	20883	10/15/08	$500	Vehicle Fluids Discharge	Atman Corp./ Frank Oyenuga	14616 Old Gunpowder Rd., Laurel, MD
19	20883	10/15/08	$500	Vehicle Fluids Discharge	Atman Corp./ Frank Oyenuga	14616 Old Gunpowder Rd., Laurel, MD
20	20883	10/15/08	$500	Vehicle Fluids Discharge	Atman Corp./ Frank Oyenuga	14616 Old Gunpowder Rd., Laurel, MD
21	20961	10/22/08	$500	Vehicle Fluids Discharge	Littlejohn JD/ James Littlejohn	1332 Horner Rd., Woodbridge, VA
22	20933	10/31/2008	NOV	Sediment Discharge	Mr. Matthew Taff	1100 Kathryn Rd., Silver Spring, MD
23	20375	12/5/08	$500	Waste Water Discharge	Enterprise Leasing Co.	2 Research Pl., Rockville, MD
24	21070	12/17/2008	NOV	Cooking Grease/Waste Water Discharge	The Chicken Place	2418 University Blvd., Silver Spring, MD

Water Quality Investigations during 2009

For the calendar year 2009, the DEP Division of Environmental Policy and Compliance (DEPC) investigated 167 water quality complaints and 37 hazardous materials incidents, which resulted in the issuance of 18 formal Enforcement Actions (7 Civil Citations with fines totaling $3,500 and 11 Notices of Violation (NOVs)) and numerous Warning Letters. The formal Enforcement Actions are summarized in Table III-E6.

Table III-E6. Water Quality Investigations in 2009

No.	Case Number	Date Issued	Citation/NOV	Violation	Defendant	Defendant's Address
1	22360	9/16/2009	$500	Concrete Discharge	Allied Environmental Services Inc.	PO Box 1242, Millersville, MD
2	21543	5/4/09	$500	Cooking Grease Discharge	Realty Management - Ned Tendo	7910 Woodmont Ave, suite 350, Bethesda, MD
3	21543	10/5/09	$500	Cooking Grease Discharge	Realty Management - Ned Tendo	7910 Woodmont Ave, suite 350, Bethesda, MD
4	21870	6/16/2009	$500	Vehicle Fluids Discharge	Reece Trucking	17756 Colonial Port Road, Dumfrees, VA
5	20375	4/6/2009	$500	Waste Water Discharge	Mr. Mark Zavacky	2273 Research Blvd., Rockville, MD
6	21431	3/19/2009	$500	Swimming Pool Discharge	Mr. Steven A. Michael, Esq.	7600 Maple Avenue, Takoma Park, MD
7	21431	3/19/2009	$500	Swimming Pool Discharge	Mr. Steven A. Michael, Esq.	7600 Maple Avenue, Takoma Park, MD
8	20375	4/6/2009	NOV	Waste Water Discharge	Mr. Mark Zavacky	2273 Research Blvd., Rockville, MD
9	22178	8/19/2009	NOV	Cooking Grease Discharge	Earl P. Chinn	965 Thayer Avenue, Silver Spring, MD
10	21155	1/5/2009	NOV	Waste Water Discharge	Exxon Gas Station	8384 Colesville Road, Silver Spring, MD
11	21801	8/11/2009	NOV	Leaking Fuel Oil Tank	Dr. Barry Ross	501 Stonington Road, Silver Spring, MD
12	22280	8/31/2009	NOV	Waste Water Discharge	Debra Thompson(ServPro)	7901 Queenair Drive, Gaithersburg, MD
13	21590	4/13/2009	NOV	Cooking Grease Discharge	Mr. Eli Jackson	2526 University Blvd W., Wheaton, MD
14	22178	8/19/2009	NOV	Cooking Grease Discharge	Earl P. Chinn	965 Thayer Avenue, Silver Spring, MD
15	19421	1/27/2009	NOV	Animal Manure Runoff	Woodland Horse Center	16301 New Hampshire Ave., Silver Spring, MD
16	21541	4/7/2009	NOV	Waste Water Discharge	J & G Carpet Cleaning	11006 Viers Mill Road, Wheaton, MD
17	22354	9/18/2009	NOV	Concrete Discharge	J & M Concrete	PO Box 962, Laurel, MD
18	22597	11/9/2009	NOV	Vehicle Fluids Discharge	Krishanand Singh	8216 Brink Road, Gaithersburg, MD

Implementation Status of Stormwater Pollution Prevention Plans

Table III-E7 lists the County facilities covered under the State General Discharge Permit for Storm Water Associated with Industrial Activities (the General Permit). The State accepted the Notice-Of-Intents (NOI's) for these facilities in March of 2003 for coverage until November 30, 2007.

Staffing changes, site changes, and site activities not included on the existing Stormwater Pollution Prevention Plans (Plans) were also identified during this year's Site Assessments and updated accordingly. With the reorganization in 2008, the implementation of stormwater management plans was distributed among three different departments. The changes are as follows:

The Department of General Services (DGS) – Facilities Management Division has the overall responsibility for the property. Specifically, DGS is responsible for Facility Management Certification and overall responsibility of the SWP3. Operating agencies at these facilities include: Department of Transportation (Division of Highway Services), the Department of Transportation (Division of Transit Services), and DGS/Fleet Management, and Department of Environmental Protection (Division of Solid Waste). Each of these agencies is responsible for implementing portions of the SWP3 that relates to their operations.

In 2007 and 2008, the County delivered yearly training on the NPDES requirements and implementation to all the agencies operation at the facilities. Training is specific to each operation, is based on yearly assessments, and is delivered at each facility location. Training was delivered during both 2007 and 2008 and close to 200 staff attended the training. Assessments needs and improvements are covered in this training as well as ways reduce hazardous substances, pollutants, or contaminants.

A comparison of last 2006's Site Assessments, the 2007 and 2008 shows improvement regarding sweeping; however, these facilities need to have more routine inspections; more routine sweeping/house keeping to ensure that pavement is kept clean from debris, oils, and vehicle fluids; more structural storage for proper product storage; pavement re-surfaced; domars replaced; and, more facility oversight to ensure compliance across the various operations within facilities.

In 2008, a new Capital Improvement Program (CIP) funding was initiated that dedicates funds for environmental compliance, specifically the development and implementation of P2 Plans at each of the County maintenance facilities. The goal of this program is to focus on a facility at a time by developing P2 Plans for each facility, and then follow up with the design and construction of mitigating measures at each facility. These P2 Plans will also highlight SWP3 responsibilities per agency so that each agency can dedicate funding to maintain and operate in such manner to prevent the potential of product runoff.

As such, the County hired a Consultant to develop and update the 2000 Pollution Prevention Plans (SWP3). The County started focusing on Colesville Depot as it is located in a "Special Protection Area." Spill Emergency Plans specific to each facility is not included in this contract and will need to be developed for each facility and incorporated into each facility Pollution Prevention Plan.

DEP (Division of Solid Waste) has a new position, Compliance Officer, to ensure environmental compliance at Solid Waste Operations; DGS (Division of Fleet Management) has a Program Manager responsible for environmental compliance for Fleet operations; and, DOT (Division of Highways) has a Program Manager responsible for environmental compliance for Highway operations at Depots.

The lack of indoor vehicle wash facilities at several of the sites prevents the complete elimination of wash water to the storm drain system. The Seven Locks facility which previously did not have a vehicle wash facility has a wash facility included in the new design layout. Gaithersburg/Equipment Maintenance Operations Center and the Silver

Spring/Brookeville facilities have been upgraded and currently have functioning indoor vehicle wash facilities on each site; however, these facilities would benefit if these vehicle wash stations were expanded to increase efficiency. There are two remaining facilities without indoor vehicle wash facilities and each facility continues to manage outdoor vehicle washing in order to eliminate the potential for contamination and the direct runoff of wash water to the storm drain system. The clogged storm water best management practice at the Poolesville Facility was modified, is being maintained, and is functioning per design intent.

TABLE III-E7. Results of Annual Site Assessments at Montgomery County Facilities Under the General Permit for Stormwater Discharges (Permit No. 02--SW).

SUMMARY 2006	ASSESSMENT 2007 and 2008
Colesville Highway Maintenance Depot, Anacostia-Paint Branch; 12 acres	
1. P2 plans need to be updated. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; however more frequent sweeping is recommended. 4. There needs to be more frequent routine site inspections. 3. Additional housekeeping attention needed to avoid outside storage of “small equipment items”. 4. Additional storage sheds or areas needed for small equipment items, tire chains, manhole covers, etc. 5. Additional secondary containment needed for storing batteries and waste products. 6. Additional storage is needed for heavy equipment. 7. Vehicle wash station needs to be upgraded. 8. Delivered sand and salt is mixed outside and stored undercover ASAP, storage domars have containment devices in-place to contain sand/salt mixture inside and prevent excessive runoff. 9. Refuse material storage areas have minimal stored items on-site i.e. cut trees, woody debris; recovered asphalt, etc.-storage areas are emptied ASAP upon collection. 10. Material storage bin retaining wall needs to be partially replaced due to erosion. Wood shoring walls to be replaced with concrete retaining wall. 11. Domars need to be replaced – and/or roof repaired/replaced. !2, Additional storage building needed for new materials (propane tanks and pavement and repair materials). 13. Pollution Prevention Team has been updated and all necessary personnel have been identified on annual assessments. 14. The BMP’ were cleaned in 12/26/06-the next cleaning and maintenance was June ’07 per schedule. 15. Vehicle maintenance bays are well ordered and stocked to include spill kits and secondary containment trays; additional attention needed for floor care 16. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit	1. P2 plans are currently being updated. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year and the County has a small sweeper for more frequent sweeping. 4. There needs to be more frequent routine site inspections. 5. Outside storage areas well maintained. 6. Additional storage sheds or areas needed for small equipment items, tire chains, manhole covers, etc. 7. Additional secondary containment + structural storage needed for storing batteries and waste products. 8. Vehicle wash station is being maintained and used regularly. 9. Delivered sand and salt is mixed outside and stored undercover ASAP. 10. Storage domars are in need of replacement. 11. Retaining walls for the Refuse material storage areas need to be redone (retaining walls have deteriorated). !2, Additional storage building needed for new materials (propane tanks and pavement and repair materials). 13. Pollution Prevention Team has been updated and all necessary personnel have been identified on annual assessments. 14. The BMP’ were several times during 2007 and 2008. 15. Vehicle maintenance bays are well ordered and stocked to include spill kits and secondary containment trays; additional attention needed for floor care- 16. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit available. 17. Pavements/resurfacing is needed. 18. Pollution Prevention training delivered in 2007 and 2008. 19. SWM facility needs more frequent maintenance.

TABLE III-E7. Results of Annual Site Assessments at Montgomery County Facilities Under the General Permit for Stormwater Discharges (Permit No. 02--SW).	
SUMMARY 2006	**ASSESSMENT 2007 and 2008**
available. 17. A large un-used liquid magnesium tank is on-site and needs to be removed. *18. Dilapidated small storage shed has been removed and additional shed demolitions are pending* 19. Pollution Prevention training occurred in January 11, 2006 for depot personnel.	
Damascus Highway Maintenance Depot, Potomac-Great Seneca Creek; 1.4 acres	
1. P2 plans need to be updated. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; however more frequent sweeping is recommended. 4. There needs to be more frequent routine site inspections. 5. Containment barriers are in-place in front of domars to prevent run-off from the site. 6. Stored misc. metals need to be removed ASAP. 7. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit next to the pumps. 8. Additional secondary containment needed for storing batteries and waste products. 9. Public refuse collection area is clean and swept after removal of debris. The site has reduced the types of items to be accepted for drop-off by the public. 10. Vehicle and equipment storage areas are well maintained and neat. 11. Additional small storage sheds needed for small equipment to include mowing/grass cutting equipment, small tools, etc. 12. Pollution Prevention Team has been updated and all necessary personnel have been identified. 13. Maintenance bays are well ordered and stocked to include spill kits and secondary containment trays. 14. Pavements/resurfacing is needed. 15. Storage domars for salt/sand materials have containment barriers placed to prevent run-off. 16. Pollution Prevention training occurred on January 17, 2006**.**	1. P2 plans need to be updated. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; and the County has a small sweeper for more frequent sweeping. 4. There needs to be more frequent routine site inspections. 5. Containment barriers are in-place in front of domars to prevent run-off from the site. 6. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit next to the pumps. 7. Additional secondary containment needed for storing batteries and waste products. 8. Public refuse collection area is clean and swept after removal of debris. The site has reduced the types of items to be accepted for drop-off by the public. 9. Vehicle and equipment storage areas are well maintained and neat. 10. Additional small storage buildings needed for small equipment to include mowing/grass cutting equipment, small tools, etc. 11. Pollution Prevention Team has been updated and all necessary personnel have been identified. 12. Maintenance bays are well ordered and stocked to include spill kits and secondary containment trays. 13. Pavements/resurfacing is needed. 14. Storage domars for salt/sand materials have containment barriers placed to prevent run-off. 15. Pollution Prevention training delivered in 2007 and 2008. 16. SWM facility needs more frequent maintenance.
Gaithersburg Highway Maintenance Depots, Equipment Maintenance Operations Center and Gaithersburg/Rockville Transit Services, Potomac-Rock Creek; 26 acres	
1. P2 plans need to be updated. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; however more frequent sweeping is recommended. 4. There needs to be more frequent routine site inspections.	1. P2 plans need to be updated. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; and the County has a small sweeper for more frequent sweeping. 4. There needs to be more frequent routine site inspections.

TABLE III-E7. Results of Annual Site Assessments at Montgomery County Facilities Under the General Permit for Stormwater Discharges (Permit No. 02--SW).	
SUMMARY 2006	**ASSESSMENT 2007 and 2008**
5. Additional attention needed to store small metal equipment items off the ground and into available storage sheds or under-cover i.e. manhole covers, small metal equipment and parts, etc. 6. Additional small storage sheds needed to store new and waste products. 7. Additional secondary containment needed for storing batteries and waste products. 8. Truck wash facility is operational. 9. Asphalt recovery area has been discontinued. 10. The large tar pot is still on-site and needs to be removed. 11. Maintenance bays need attention towards neatness and floor cleaning. Spill kits and secondary containment trays are in-place. 12. Storage domars for salt/sand materials have containment barriers placed to prevent run-off. 13. Sand/salt stored on-site is placed in domars ASAP. 14. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit available. 15.Transit Maintenance and fueling areas are well maintained, orderly and clean 16. The BMP's were cleaned12/27/06. 17. Covered storage area roof needs to be replaced. 18. Yard needs to be resurfaced. 19. Pollution Prevention Team has been updated and all necessary personnel have been identified. 20. Pollution Prevention training delivered in December 7, 2005 and January 10, 2006.	5. Additional small storage sheds needed to store new and waste products. 6. Additional secondary containment needed for storing batteries and waste products. 7. Truck wash facility is operational. 8. Asphalt recovery area has been discontinued. 9. The large tar pot is still on-site and needs to be removed. 10. Maintenance bays need attention towards neatness and floor cleaning. Spill kits and secondary containment trays are in-place. 11. Storage domars for salt/sand materials have containment barriers placed to prevent run-off. 12 . Sand/salt stored on-site is placed in domars ASAP. 13. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit available. 14.Transit Maintenance and fueling areas are well maintained, orderly and clean 15. The BMP's were cleaned12/27/06. 16. Covered storage area roof needs to be replaced. 17. Pavements/resurfacing is needed. 18. Pollution Prevention Team has been updated and all necessary personnel have been identified. 19. Pollution Prevention training delivered in 2007 and 2008.
Poolesville Highway Maintenance Depot, Potomac-Dry Seneca Creek; 4 acres	
1. P2 plans need to be updated. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; however more frequent sweeping is recommended. 4. There needs to be more frequent routine site inspections. 5. The BMP's were cleaned in 12/28/06-the next scheduled cleaning was scheduled for June'07. 6. The waste-oil recycling area still needs a three-sided containment shed w/ a roof to prevent rain water infiltration. 7. Maintenance bays are well ordered and stocked to include spill kits and secondary containment trays. 8. The salt/ash domars have containment barriers in-place to prevent run-off. 9. Stored road materials outside have containment barriers to prevent run-off. 10. The large tar pot is still on-site and needs to be removed. 11. Domars need to be replaced – and/or roof repaired/replaced.	1. P2 plans need to be updated. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; and the County has a small sweeper for more frequent sweeping. 4. There needs to be more frequent routine site inspections. 5. The waste-oil recycling area still needs a three-sided containment shed w/ a roof to prevent rain water infiltration. 6. Maintenance bays are well ordered and stocked to include spill kits and secondary containment trays. 7. The salt domars have containment barriers in-place to prevent run-off. 8. Storage domars are in need of replacement. 9. Stored road materials outside have containment barriers to prevent run-off. 10. The large tar pot is still on-site and needs to be removed. 11. Additional small storage buildings needed to store new and waste products. 12. Additional secondary containment needed for

TABLE III-E7. Results of Annual Site Assessments at Montgomery County Facilities Under the General Permit for Stormwater Discharges (Permit No. 02--SW).	
SUMMARY 2006	**ASSESSMENT 2007 and 2008**
12. Additional small storage sheds needed to store new and waste products. 13. Additional secondary containment needed for materials and waste products. 14. Building structures need repair/replacement. 15. Pollution Prevention Team has been updated and all necessary personnel have been identified. 16. Pollution Prevention training occurred on January 18, 2006.	materials and waste products. 13. Building structures need repair/replacement. 14. Pavements/resurfacing is needed. 15. Pollution Prevention Team has been updated and all necessary personnel have been identified. 16. Pollution Prevention training delivered in 2007 and 2008.
Seven Locks Maintenance Center, Potomac-Cabin John Creek; 19 acres	
1. P2 plans need to be updated; there were two plans developed for this facility in 2000 that omitted other operations within this site. There needs to be only one plan that covers all operations within this facility. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; however more frequent sweeping is recommended. 4. There needs to be more frequent routine site inspections. <u>Highway Maintenance Depot</u> 1. Renovations continue on the site- to be completed in 2008/2009. The new Admin/Office/Personnel building, and truck wash facility is under construction. 2. A large un-used liquid magnesium tank is on-site and needs to be removed. 3. Maintenance bays are well ordered and stocked to include spill kits and secondary containment trays. 4. Additional secondary containment needed for storing new and waste products. 5. Refuse material storage areas are minimal and are emptied ASAP. 6. Pollution Prevention Team has been updated and all necessary personnel have been identified. 7. Pollution Prevention training occurred on January 9, 2006. <u>Fleet Fuel/Maintenance Facility</u> 1. The BMP's were cleaned 12/21/06-next scheduled cleaning was June '07. 2. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit available. 3. Vehicle maintenance areas are well maintained, orderly and clean. 4. Car wash facility is well maintained and clean. 5. Vehicle storage area is clean and well maintained. <u>Materials Testing Lab</u> 1. Lab area is very cleaned and organized. 2. As requested the staff has placed containment	1. P2 plans need to be updated; there were two plans developed for this facility in 2000 that omitted other operations within this site. There needs to be only one plan that covers all operations within this facility. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; however more frequent sweeping is recommended. 4. There needs to be more frequent routine site inspections. 5. Pavements/resurfacing is needed on older area. <u>Highway Maintenance Depot</u> 1. Renovations were completed. 3. Maintenance bays are well ordered and stocked to include spill kits and secondary containment trays. 5. Refuse material storage areas are minimal and are emptied ASAP. 6. New truck wash is being used. 7. Pollution Prevention Team has been updated and all necessary personnel have been identified. 8. Additional secondary containment needed for storing vehicle maintenance products. New salt barn needs doors. 9. Additional storage area needed for storing products (currently in sheds) 10 Pollution Prevention training delivered in 2007 and 2008. <u>Fleet Fuel/Maintenance Facility</u> 1. The BMP's need more routine maintenance. 2. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit available. 3. Vehicle maintenance areas are well maintained, orderly and clean. 4. Car wash facility is well maintained and clean. 5. Vehicle storage area is clean and well maintained. Above ground waste oil storage tank needs new secondary storage.

TABLE III-E7. Results of Annual Site Assessments at Montgomery County Facilities Under the General Permit for Stormwater Discharges (Permit No. 02--SW).	
SUMMARY 2006	**ASSESSMENT 2007 and 2008**
devices around discarded waste material area to prevent run-off. <u>Tech Center</u> 1. Interior work areas and outside storage areas are well organized and well maintained. 2. The warehouse area is very well maintained and neat. <u>Sign and Marking Shop</u> 1. The yard area is clean and all materials neatly stacked. 2. Interior work areas and lounge areas are clean and well maintained. 3. Covered outdoor storage areas are clean and well maintained.	<u>Materials Testing Lab</u> 1. Lab area is very cleaned and organized. 2. As requested the staff has placed containment devices around discarded waste material area to prevent run-off. 3. Additional secondary containment needed for products. <u>Tech Center</u> 1. Interior work areas and outside storage areas are well organized and well maintained. 2. The warehouse area is very well maintained and neat. <u>Sign and Marking Shop</u> 1. The yard area is clean and all materials neatly stacked. 2. Interior work areas and lounge areas are clean and well maintained. 3. Covered outdoor storage areas are clean and well maintained.
Silver Spring/Brookville Road Service Park, Potomac-Rock Creek; 18 acres	
1. P2 plans need to be updated; there were two plans developed for this facility in 2000. There needs to be only one plan that covers all operations within this facility. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; however more frequent sweeping is recommended. 4. There needs to be more frequent routine site inspections. <u>Highway Maintenance Depot</u> 1. Renovation has started on-site and is scheduled for completion in '08 - Demolition of-Building A began in May '07. Phase 1 will include Installing a new access road and expand the bus parking area. The Admin Building will be constructed '08 2. Maintenance bays are well ordered and stocked to include spill kits and secondary containment trays. 4. Additional secondary containment needed for storing new and waste products 5. The BMP's were cleaned 12/28/07 – next scheduled cleaning was scheduled for June '07. 6. Delivered sand and salt is mixed outside and stored undercover ASAP, storage domars have containment devices in-place for containment. 7. Material storage bins are neat and clean and well	1. P2 plans need to be updated; there were two plans developed for this facility in 2000. There needs to be only one plan that covers all operations within this facility. 2. Spill and Emergency Plans need to be developed and incorporated into the P2 Plans. 3. Depot is in fairly good condition and maintained. The County contract is in-place to provide sweeping **four** times per year; however more frequent sweeping is recommended. 4. There needs to be more frequent routine site inspections. 5. Pavements/resurfacing is needed on older areas. 6. The BMP's need more frequent cleaning <u>Highway Maintenance Depot</u> 1. Renovation has started on-site and is on-going. The lower part of the site which includes the Transit bus maintenance & storage and Fleet maintenance facilities have been completed. 2. Maintenance bays are well ordered and stocked to include spill kits and secondary containment trays. 3. Additional secondary containment needed for storing new and waste products 4. Delivered sand and salt is mixed outside and stored undercover ASAP, storage domars have containment devices in-place for containment. 5. Storage domars are in need of replacement. 6. Need additional material storage bins – preferably

TABLE III-E7. Results of Annual Site Assessments at Montgomery County Facilities Under the General Permit for Stormwater Discharges (Permit No. 02--SW).	
SUMMARY 2006	**ASSESSMENT 2007 and 2008**
maintained. 8. Vehicle parking area is clean. 9. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit available. 10. A large un-used liquid magnesium tank is on-site and needs to be removed. 11. Pollution Prevention Team has been updated and all necessary personnel have been identified. 12. Pollution Prevention training occurred on January 20, 2006. <u>Fleet Maintenance Area</u> 1. Maintenance bays are neat, clean, and well organized. 2. The bus parking area was relatively clean but several wet spots were noted from what appears to be leaks from buses. 3. Fleet Maintenance needs more frequent inspections of storm water facilities on the bus parking area. The containment sock(s) at the oil/grit separator at this location needs to be inspected and changed more frequently. 4. Additional secondary containment needed for storing new and waste products. 11. Pollution Prevention Team has been updated and all necessary personnel have been identified. 12. Pollution Prevention training occurred on December 7, 2005.	covered. 7. Vehicle parking area is generally clean. 8. Gasoline/Diesel Fuel pumping area is clean and no spills reported; Area has a well stocked spill kit available. 9. Pollution Prevention Team has been updated and all necessary personnel have been identified. 10. Pollution Prevention training delivered in 2007 and 2008. <u>Transit Bus parking Area</u> 1. Bus parking lot needs regular cleaning. The bus parking area was relatively clean but several wet spots were noted from what appears to be leaks from buses. 2. Need more frequent inspections of storm water facilities on the bus parking area. The containment sock(s) at the oil/grit separator at this location needs to be inspected and changed more frequently. <u>Fleet Maintenance Area</u> 1. Maintenance bays need improved housekeeping. 2. Additional secondary containment needed for storing new and waste products. 3. Pollution Prevention Team has been updated and all necessary personnel have been identified. 4. Outside storage areas need to be kept covered and clean. 5. Pollution Prevention training delivered in 2007 and 2008.
Solid Waste Transfer Station/Materials Recycling Facility, Potomac-Rock Creek; 43 out of 52.5 acres	
1. Quarterly inspections continue for all outfalls and BMP's on site, which occurred in March 2007. In addition, there is a daily walk-around as part of other on-site inspections and SW issues are also noted during the walk-around. 2. Site is generally well kept; litter pick-up to address trash blown from the 1,000 plus vehicles a day that pass through the site is performed daily. 3. Inlet screens have some partial blockage from blowing leaf and grinding debris. Storm drains contain minor amounts of sediment that will be removed. 4. A project was initiated in January 2007 to construct two new scales, new interior site access road, new bay at the public unloading facility, and a transfer building addition. Portions of the on-site stormwater collection system that are in the project area are protected in accordance with local and/or state requirements. 5. The annual update of the Stormwater Pollution Prevention Plan was completed in April 2007.	1. Quarterly inspections continue for all outfalls and BMP's on site, which occurred in June 2009. In addition, there is a daily walk-around as part of other on-site inspections and SW issues are also noted during the walk-around. 2. Site is generally well kept; litter pick-up to address trash blown from the 1,000 plus vehicles a day that pass through the site is performed daily. 3. Inlet screens have some partial blockage from blowing leaf and grinding debris. Storm drains contain minor amounts of sediment that will be removed. 4. The annual update of the Stormwater Pollution Prevention Plan was completed in April 2009.

TABLE III-E7. Results of Annual Site Assessments at Montgomery County Facilities Under the General Permit for Stormwater Discharges (Permit No. 02--SW).	
SUMMARY 2006	**ASSESSMENT 2007 and 2008**
Gude Landfill (closed 1982) , Potomac-Rock Creek; 120 acres	
1. Quarterly inspections continue for all outfalls and BMP's on the site, which occurred in April 2007. 2. Site remains in vegetative and stable condition. 3. Several persistent leachate seeps remain at or adjacent to the site in areas that cannot be readily repaired. Given that this is a pre-regulatory era landfill, the number of seeps and liquid volume associated with the seeps is minimal. 4. Litter pickup along the fence near the Homeless Shelter on Gude Drive occurs twice per month. Other debris from where homeless individuals camped on site will be removed. 5. The annual update of the Stormwater Pollution Prevention Plan was completed in April 2007.	1. Quarterly inspections continue for all outfalls and BMP's on the site, which occurred in March 2009. 2. Site remains in vegetative and stable condition. 3. Several persistent stormwater depressions and leachate seeps have been repaired. Other areas of the site will be addressed during the Nature and Extent Study. Given that this is a pre-regulatory era landfill, the number of seeps and liquid volume associated with the seeps is minimal. 4. Litter pickup along the fence near the Homeless Shelter on Gude Drive occurs twice per month. 5. The annual update of the Stormwater Pollution Prevention Plan was completed in November 2008.
Oaks Landfill, Patuxent-Hawlings River and Potomac-Rock Creek;190 out of 545 total	
1. Quarterly inspections continue for all outfalls and BMP's on the site, which occurred in April 2007. 2. Stormwater pond berms and emergency spillways are mowed. Additional pond maintenance including removal of beaver dams and placement of riprap (Pond No. 2) occurred in April 2007. 3. Several areas at the top of the landfill have settled causing depressions which hold water. Required repairs (soil placement, regrading, stabilization) have been made to direct ponded water to the stormwater downchutes in April 2007. 4. Site continues to be well vegetated and all storm water conveyance systems are intact. Several downchutes on the landfill have experienced substantial settling and were repaired in August 2006. 5. The annual update of the Stormwater Pollution Prevention Plan was completed in April 2007.	1. Quarterly inspections continue for all outfalls and BMP's on the site, which occurred in March 2009. 2. Stormwater pond berms and emergency spillways are mowed. 3. Site continues to be well vegetated and all storm water conveyance systems are intact. 4. The annual update of the Stormwater Pollution Prevention Plan was completed in December 2009.

E3. Illegal Dumping and Spills

The DEP continues to support its Illegal Dumping Hotline 240-777-3867 ("DUMP"). During the year 2007, there were 444 complaints of illegal dumping, which resulted in the issuance of 33 Enforcement Actions (9 Civil Citations with fines totaling $4,500 and 24 Notices of Violation (NOVs)). During the year 2008, there were 390 complaints of illegal dumping, which resulted in the issuance of 26 formal Enforcement Actions (6 Civil Citations with fines totaling $3,000 and 20 Notices of Violation (NOVs)) and 48 Warning Letters. The vast majority of complaints concerned bags of trash, vegetation (leaves and brush), or other unwanted materials either dumped or being stored on private or public property. Only a small percentage of these cases represented a potential for direct runoff of contaminated material into a storm drain or receiving system. Complaint resolution invariably involved removal and proper disposal of trash and debris and proper storage (i.e. under cover) of other materials.

During the year 2009, there were 358 complaints of illegal dumping, which resulted in the issuance of 23 formal Enforcement Actions (5 Civil Citations with fines totaling $2,500 and 18 Notices of Violation (NOVs)) and numerous Warning Letters. The vast majority of complaints concerned bags of trash, vegetation (leaves and brush), or other unwanted materials either dumped or being stored on private or public property. Only a small percentage of these cases represented a potential for direct runoff of contaminated material into a storm drain or receiving system. Complaint resolution invariably involved removal and proper disposal of trash and debris and proper storage (i.e. under cover) of other materials.

The DEP also provides on-line forms, applications, and other resources related to water quality enforcement. These include an '**Incident Report Form**' which can be used to file a complaint with DEP regarding the following general issues: indoor air quality and ambient (or outdoor), air quality, water quality, noise, and illegal dumping.

E4. Sediment and Erosion Control

The Permit requires that the County report on program status, responsible personnel certification classes, and grading permits for projects greater than one acre. There were no significant changes made to the program in 2007 or 2008. During 2007, the DPS conducted eight classes with 93 attendees for responsible personnel certification. There were a total of 123 projects with 819.24 acres of disturbance. During 2008, the DPS conducted nine classes with 132 attendees for responsible personnel certification. There were a total of 103 projects with 605.00 acres of disturbance. The CD in Attachment A includes workshop and grading permit information.

E5. Public Education and Outreach

General Environmental Outreach

During 2007 and 2008, the County continued its multimedia approach for environmental outreach and education. The County routinely provides information on its web page and in response to direct requests on water conservation, stormwater facility maintenance, lawn care and landscape management, pet waste management, illegal dumping, and reporting of water quality incidents. During 2007, the DEP began a significant update of the web pages associated with Watershed Management and Environmental Policy and Compliance. The enhanced web pages would provide information to the general public in an easier to access format and provide for direct calls for action and clear steps that residents and businesses can take to meet the goals of the DEP programs. A key feature would be maps that could be queried using street address to provide watershed-based information.

The Division of Solid Waste Services provides outreach on household hazardous waste and litter control, recycling, and composting at a variety of outreach events throughout the County and on its web page. The DPS's Well and Septic Section provides information on well and septic system management.

Watershed Outreach

The responsibility for all general watershed outreach remained within the DEPC during 2007 and 2008. The DEPC continued to provide outreach support for water quality enforcement issues, to the stakeholders on the Water Quality Advisory Group, and for regional efforts under the Anacostia Watershed Restoration Agreement and the Patuxent Reservoirs Watershed Protection Agreement. The WMD continued to conduct CIP project outreach, including public meetings, field walks, and telephone and e-mail responses. In addition, the WMD-Biological Monitoring staff provided technical assistance to a variety of community and environmental groups for workshops on volunteer biological monitoring.

Rainscapes

During fiscal year 2007, initial funding of $500,000 per year was used to hire the first RainScapes Planner and begin program development to use incentives for voluntary implementation of runoff management on private property. The first year included hiring a consultant to complete a literature survey and public 'charrette' to provide input on how to frame the program for effective outreach and stewardship. The consultant report on the literature survey and public workshop was published in June 2007. The report is included electronically as Appendix C on the CD submitted with this report.

During fiscal year 2008, the DEP established the RainScapes Rewards rebates and Targeted Neighborhoods programs based on recommendations from the consultant report. Key findings in that report included:

- Most programs use a targeted sub-watershed approach to tailor and deliver effective public outreach campaigns, and to allow monitoring of program success.
- All of the approaches depend on voluntary action by property owners interested in controlling stormwater at their residences or commercial sites – targeted education INSPIRES voluntary action and RESULTS in public funding of projects on private property.
- Achieving “critical mass” in terms of level of participation through voluntary action, is the central challenge of all of these programs. Establishing a participation rate of approximately 50% of the residences in a target neighborhood or subwatershed is a common theme. This level of participation often corresponds to achieving measurable reductions in key indicators such as runoff rates and pollutant reductions.
- Provide a variety of options and mechanisms for participation that meet the needs of do-it-yourselfers as well as those who do not enjoy working in their yards, or hire others to do it.

- Several of the approaches require residents to agree to maintain the projects, and so far have not had major problems. Other programs provide a limited amount of maintenance support when residents experience serious issues (i.e. drainage problems).
- Using standard rain garden sizes and types facilitates design consultation with homeowners, and makes the use of contractors more cost-effective and efficient. This approach must be weighed against the need to tailor projects to unique site conditions.
- An essential lesson learned from several rain barrel programs, is the importance of offering technical and troubleshooting assistance after projects are installed. A 2-month and 2-year check-in might be sufficient.
- The existence of a stormwater utility program may provide an effective way to engage residents while simplifying the funding approach. The utility provides a mechanism for discounts or credits as a reward for project implementation.
- Public perception and resistance to new stormwater management practices was one of the most difficult challenges encountered across all programs, as many citizens have serious concerns about standing water in gardens and swales. Effective education to dispel misconceptions about mosquito breeding, and good technical design assistance to ensure adequate drainage, is essential.
- Potential participants' age, attitudes toward gardens (and maintenance), and experience with water problems are significant influences over whether or not residents opt for rain gardens.
- Program success in most of the case studies is measured in terms of public participation rates.
- Although there is not a long-term history yet on these programs, combining public education, technical assistance, and a small amount of money (often through grants) appears to be a highly effective strategy to obtain public buy-in and get projects implemented on the ground.
- There is also a growing movement toward offering project implementation services instead of funding or incentives alone.

E6. Road Maintenance and Pollution Prevention

Storm Drain Cleaning

In 2008 the county cleaned 20,892 linear feet of storm drain which is 76.4% more than the annual average for the years 1996-2006 (11,842). (Fig. III-E1). Material with a weight of 156.69 tons was removed. Storm drains were also cleaned in 2007, but records were lost. There is an estimated 5.72 million total feet of County storm drains. There is no annual schedule for storm drain maintenance, with the countywide program being complaint driven to remove clogged inlets or drainage problems on public or private property. At the current maintenance rate of less than 0.5% of the system per year, it will take 200 years for a first pass of the entire system.

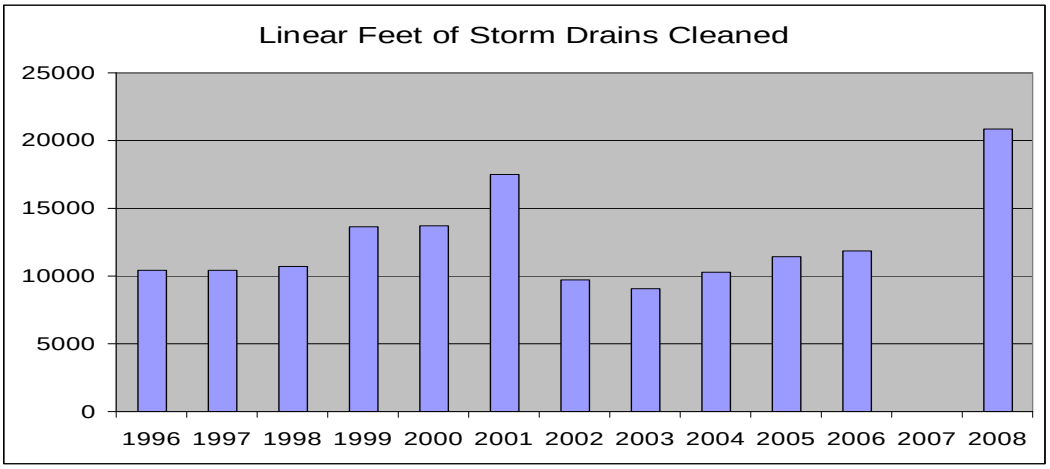


Fig. III-E1 Linear Feet of Storm Drain Cleaned per Year

Streetsweeping

A number of significant events have taken place in the County's streetsweeping operations since the last report covering calendar year 2006.

- The DEP has funded more frequent sweeping on a route composed of arterial roads. This route was swept seven times in 2007 and ten times in 2008. These roads produce more material per curb mile and are easier to sweep because of parking patterns.
- The frequency of sweeping those residential routes designated as priorities was increased from once annually to three times annually in 2007 and 2008.
- A pilot study of intensive streetsweeping and other BMP's has been completed.
- In July of 2007 the county created a Department of Transportation (DOT). Streetsweeping was one of the functions transferred from DPWT to the newly created DOT.

The results by sweeping route in terms of tons of materials collected per curb mile are shown for one round of county-wide sweeping in Figures III-E2-4 (MAPS) for the years 2003-2005, 2007 and 2008. The year 2006 is not shown because there was no county-wide sweeping done that year. Sweeping in 2006 was limited to routes identified as priorities using the results from 2003 through 2005.

Darker coloration on the map indicates greater amounts swept up per curb-mile. Results from 2007 matched prior years with the greatest amount of material removed in the southern part of the county, particularly the Anacostia and Lower Rock Creek watersheds, as well as a district in the western part of the County near Poolesville, one in the County center near Gaithersburg and one near Rockville. The Poolesville values are attributed to the use of grit in addition to sand and salt for de-icing activities in that part of the County. The grit being heavier is presumed to increase the weight of material being collected in the sweeping. The cause of the high removal rates (assumed to reflect application rates) in the routes near Gaithersburg and Rockville remains unknown. Results from 2008 show lower amounts of

material picked up per curb mile. This is probably related to a 31% decrease in the amount of sand/salt mixture applied to the roads that year with no decrease in sweeping activity from 2007 (Fig. III-E5). Of note is the fact that the Anacostia and Rock Creek watersheds did not show the greatest amounts of material collected per curb mile as in past years for 2008 and 2009. That plot also shows that even though the sweeping program only picks up a fraction of the material put on the roads in winter, it does keep many tons of material from entering county BMPs and waterways. Sweeping picked up approximately 3050 tons of material in 2007 and 1383 tons of material in 2008

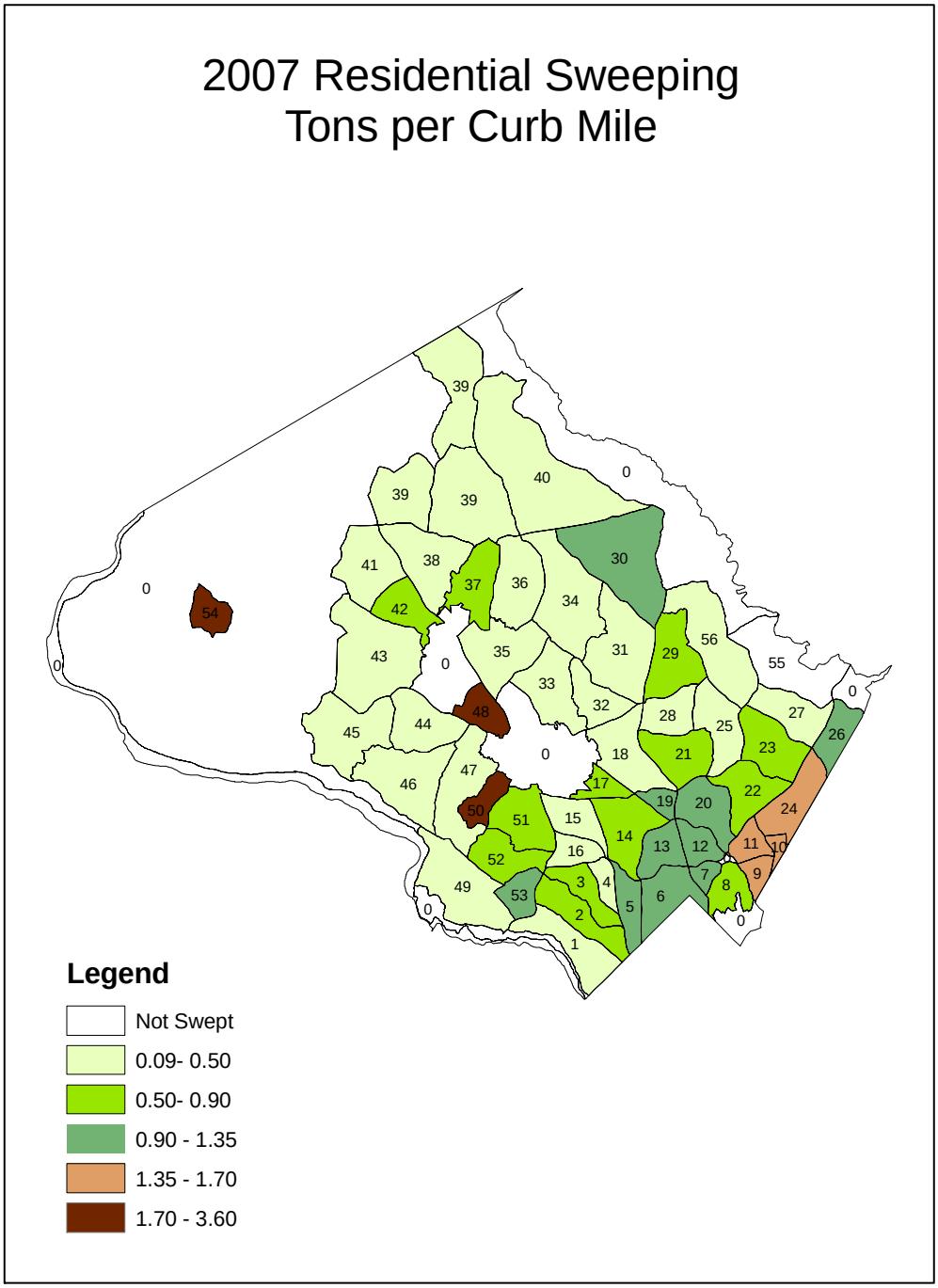


Figure III-E2. 2007 Residential Sweeping Tons Per Curb Mile

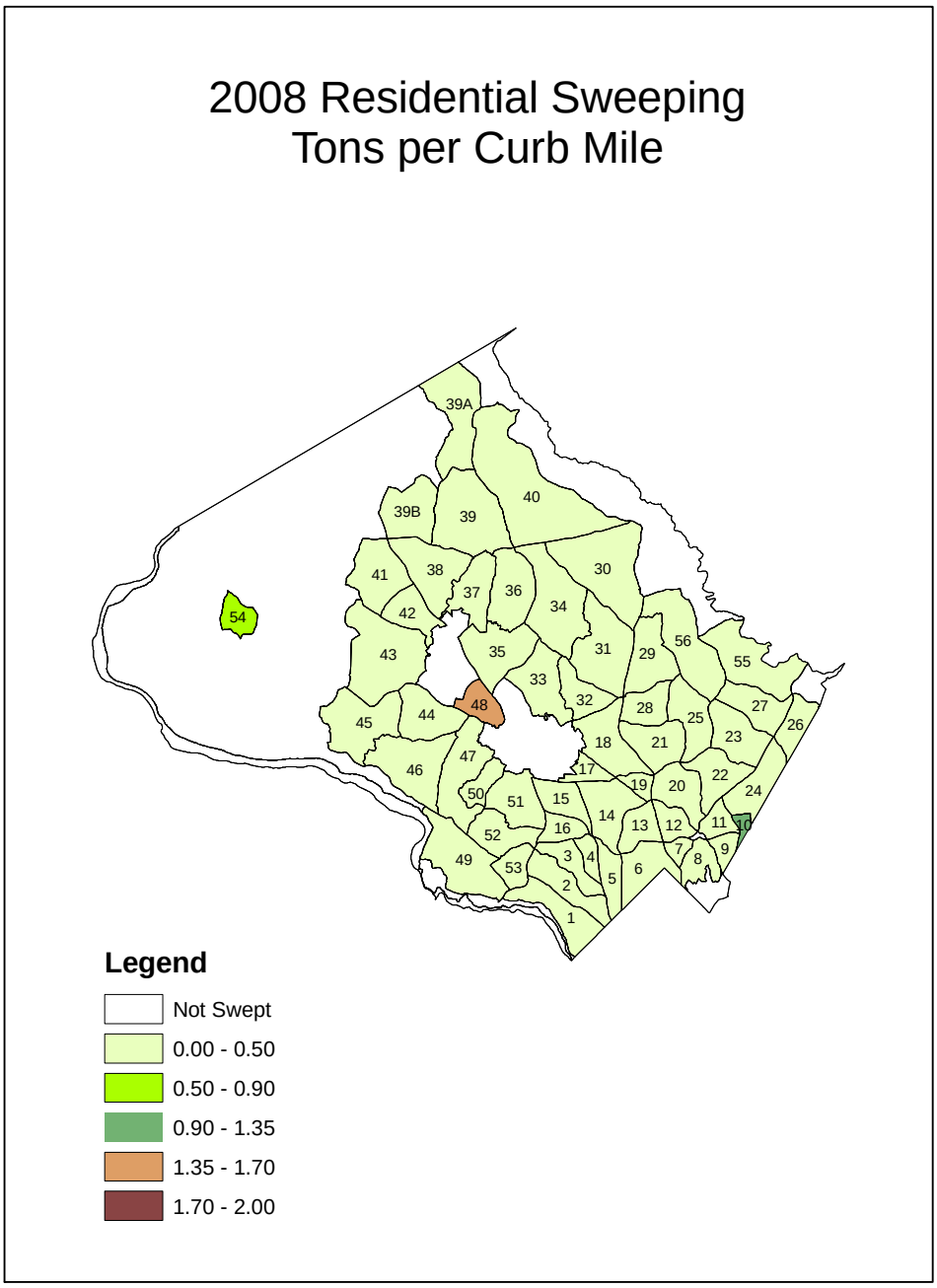


Figure III-E3. 2008 Residential Sweeping Tons Per Curb Mile

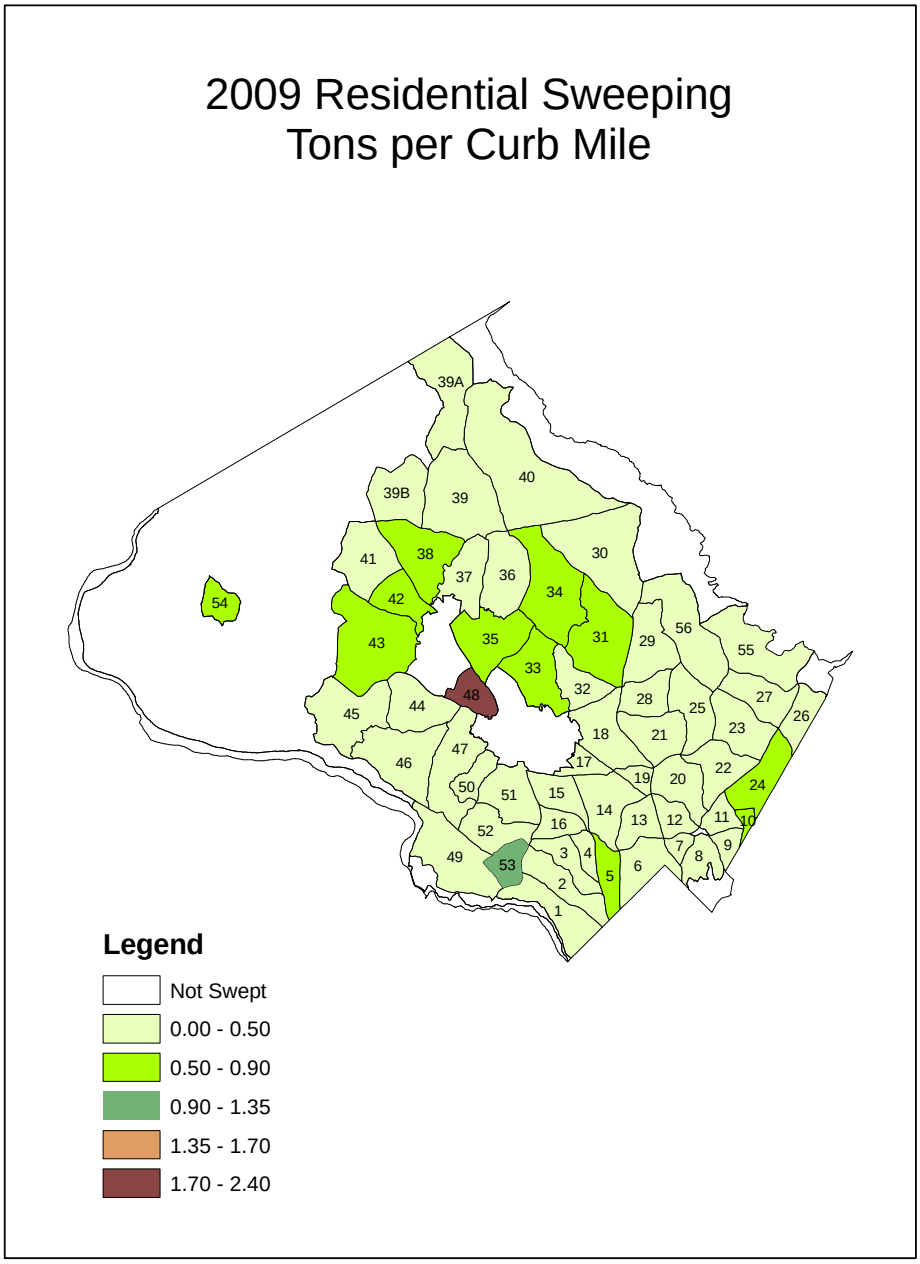


Figure III-E4 2009 Residential Sweeping Tons Per Curb Mile

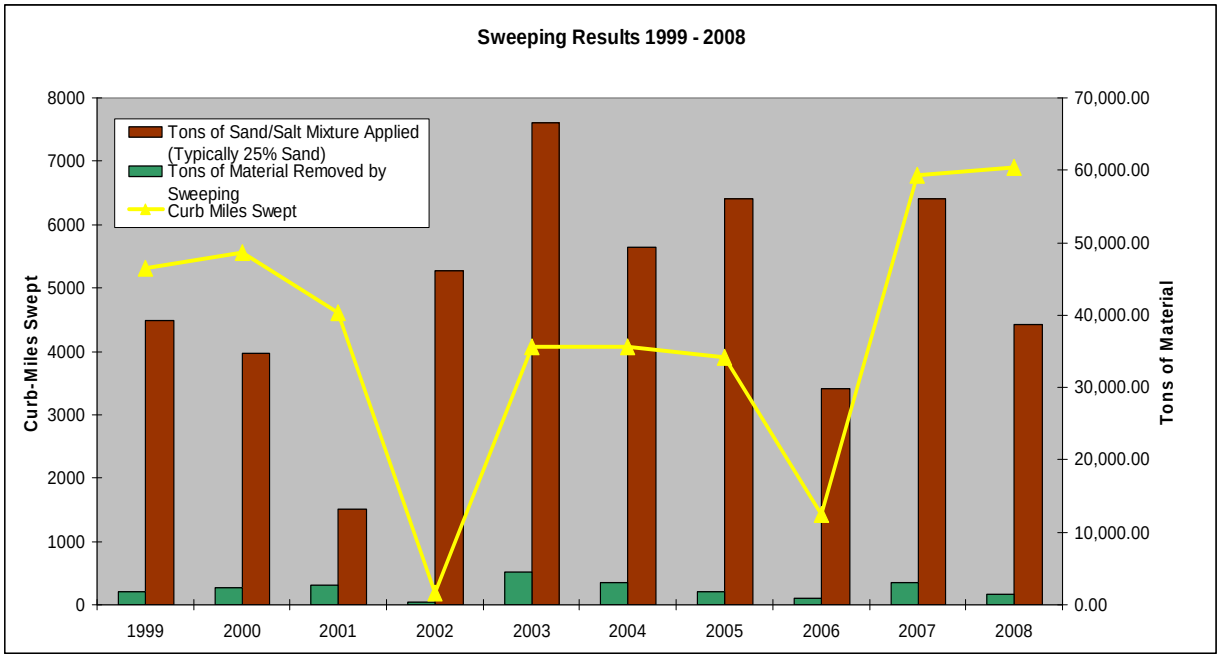


Figure III-E5 Sweeping Results 1999-2008

The residential routes where the most material was collected from 2003 through 2005 were designated as DEP priority routes. DEP provided additional funding so those routes were swept three times per year in 2007 and 2008 as opposed to once annually in prior years. Table III-E8 shows that although the amount of material collected per curb mile in 2007 and 2008 was lower than in prior years, the total amount of material collected was still significant. There were 1659 tons of materials picked up in 2007 which is above the average for 2003-2005. Only 657 tons of materials were picked up from these priority residential routes in 2008, but there was less material applied to the roads in 2008.

Table III-E8 Amount of Material Collected per Year

Priority Residential Routes				
	Avg. 2003-05	**2006**	**2007**	**2008**
Tons	1335	792	1659	657
Average tons/cu. mi. Per Sweeping Cycle	1.08	0.65	0.44	0.18
Cumulative Tons/cu.mi. (All Sweeping Cycles)	1.08	0.65	1.33	0.53
SweepingCycles	1	1	3	3

In 2007 a route composed of arterial roads was identified as an even more efficient approach to sweeping. The absence of parked cars and the heavy pollutant loads associated with heavy traffic volumes made frequent sweeping of this route a more efficient means of reducing pollutant loadings to county streams and BMP facilities. This route was swept seven times in 2007 and 10 times in 2008. Figure III-E6 shows that the amount of material picked up per curb mile on this route remained consistent on this route even though lesser amounts of material was picked up per curb mile on other county routes in 2008.

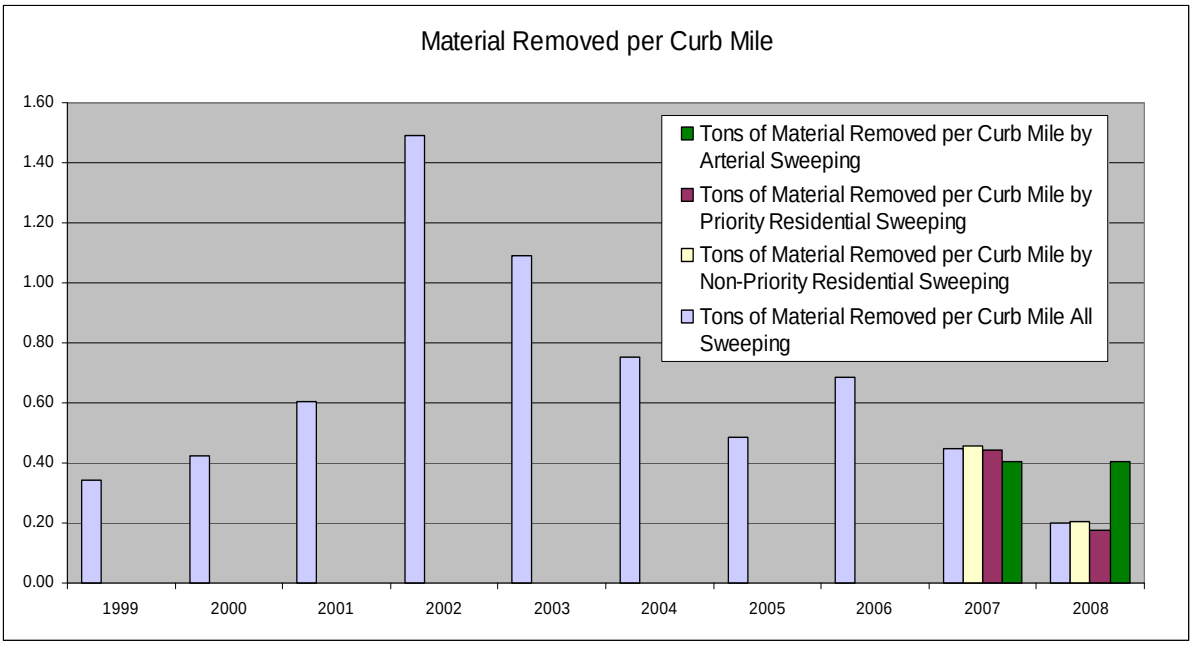


Figure III-E6

Pilot Project

Between April 2007 and April 2008 the County undertook an intensive street sweeping and inlet cleaning program to evaluate the potential of these types of source controls to reduce pollutant loadings and improve water quality in highly developed watersheds. The selected White Oak watershed comprises the drainage area of the Stewart April Lane tributary where Permit-required discharge characterization was being done. The 223 acre watershed is 38.7% impervious and lacks stormwater controls. The predominant land uses are high density residential and commercial.

Two miles of streets in the watershed were swept every two weeks. Tandem sweeping used a conventional brush sweeper followed by a second regenerative vacuum sweeper to enhance effectiveness Figure III-E7. Trays were also installed in 28 roadway inlets in the watershed to intercept solids before they entered the rest of the storm drain system. To evaluate effectiveness, material collected by the sweepers was weighed twice monthly. Trash items collected were categorized and counted. Material collected by the inlet trays was categorized and counted monthly. Grit collected by the sweepers was also analyzed for pollutants. One liter samples of first flush stormwater were collected at the storm drain inlets and analyzed for pollutants. Stormwater results were compared to rising limb values from the Stewart April Lane and Paint Branch sampling stations.

Figure III-E7 Dual Sweeper Formation

Although a large amount of solids was collected over the course of the study (15,907 lbs), the amounts of pollutants removed were small relative to loadings typically seen in the Stewart April Lane Tributary Table III-E9. Impacts of the source control efforts could not be identified in the downstream stormwater at the Stewart April Lane sampling station Table III-E10 The results at the Stewart April Lane sampling station before and after implementation of the sweeping program exhibited similar patterns to the Paint Branch station where sweeping did not occur. Comparisons of mean pollutant concentrations in first flush samples collected from White Oak inlets before and after the start of the street sweeping program also failed to show significant decreases. Rising limb values before and after implementation of the White Oak BMPs did not indicate any decrease in pollutant concentrations at the Stewart April Lane station that could be attributed to the White Oak BMPs.

Relative to other street sweeping efforts in Montgomery County, lower mean amounts of material were collected per curb mile in the White Oak watershed (Figure III-E8). This was partly attributed to small amounts of material being collected between May and November of 2007. The sweepers collected much more material between December 2007 and April 2008. On average more material was collected per curb mile from roads that were swept less often and were more heavily trafficked.

Using a regenerative sweeper in tandem with a brush sweeper was not found to greatly increase the amount of material removed by street sweeping. The marginal additional removal of the regenerative sweeper was low relative to the brush sweeper. Because the regenerative sweeper ran behind the brush sweeper during the project no comparison can be made about the relative effectiveness of the two types of sweepers operating independently. The two sweepers combined did pick up 15,907 pounds of particulates and trash. Sweepers could be an important part of efforts to prevent pollutants from entering county streams and contribute to reducing impacts on watersheds heavily affected by suspended solids and large trash loads. The inlet trays were effective in collecting trash items, but required such frequent maintenance that widespread use would be impractical (Figure III-E9).

Table III-E9 Pollutants Removed by Sweepers and Loadings at Stewart April Lane Outfall (pounds)				
	Total Pollutants Removed by Sweepers During Period of Sweeping Project 4/5/07 - 4/24/08 *			Mean Loading per Storm at Stewart April Lane 4/12/07 - 4/20/08**
	Brush	Regenerative	Total	
Copper	0.83	0.22	1.05	0.97
Zinc	0.82	0.30	1.11	1.53
NO3+NO2	0.03	0.01	0.04	13.42
TKN	6.42	1.50	7.92	31.34
Total P	1.67	0.62	2.29	2.99
* Amount removed is the mean concentration times the total weight of material collected during the project. Mean concentrations based on 13 samples of solids; results <DL were set to the DL.				
** Mean load based on 10 sampled storms; results <DL were set to 0. Loadings from NPDES Water Chemistry Monitoring in Lower Paint Branch Watershed 2008. Versar, Inc. Draft Report, 7/17/09. pp. 2-17 and 2-18				

III-E10. Water Chemistry Sampling at Stewart Aril Lane Pre and Post Street Sweeping

	Mean of First Flush Samples From White Oak Inlets (mg/L)		Maryland State Standard* (mg/L)		Rising Limb Mean Concentrations (mg/L) at Paint Branch and Stewart April Lane Stations, 1/06 - 4/08	
Data	Sweeping	Total	Acute	Chronic	PAINT BRANCH	STEWART APRIL
Biochemical Oxygen Demand	Pre-sweeping	45.44			5.08	5.31
	Sweeping	40.09			4.59	3.57
Total Phosphorus	Pre-sweeping	0.68			0.16	0.11
	Sweeping	0.52			0.20	0.21
Total Suspended Solids	Pre-sweeping	286.19			108.42	14.70
	Sweeping	369.25			143.67	68.33
Total Kjeldahl Nitrogen	Pre-sweeping	3.76			0.74	0.75
	Sweeping	7.19			1.40	1.19
Nitrate + Nitrite	Pre-sweeping	0.63			1.06	0.87
	Sweeping	1.26			0.72	1.16
Total Nitrogen**	Pre-sweeping	4.39			1.68	1.61
	Sweeping	8.45			2.12	2.34
Zinc	Pre-sweeping	0.35	0.12	0.12	0.028	0.036
	Sweeping	0.42			0.054	0.048
Copper	Pre-sweeping	0.07	0.013	0.009	0.017	0.023
	Sweeping	0.08			0.021	0.022

*Source: COMAR 26.08.02.03-2 Numerical Criteria for Toxic Substances in Surface Waters
**Total Nitrogen = Nitrate + Nitrite + Total Kjeldahl Nitrogen

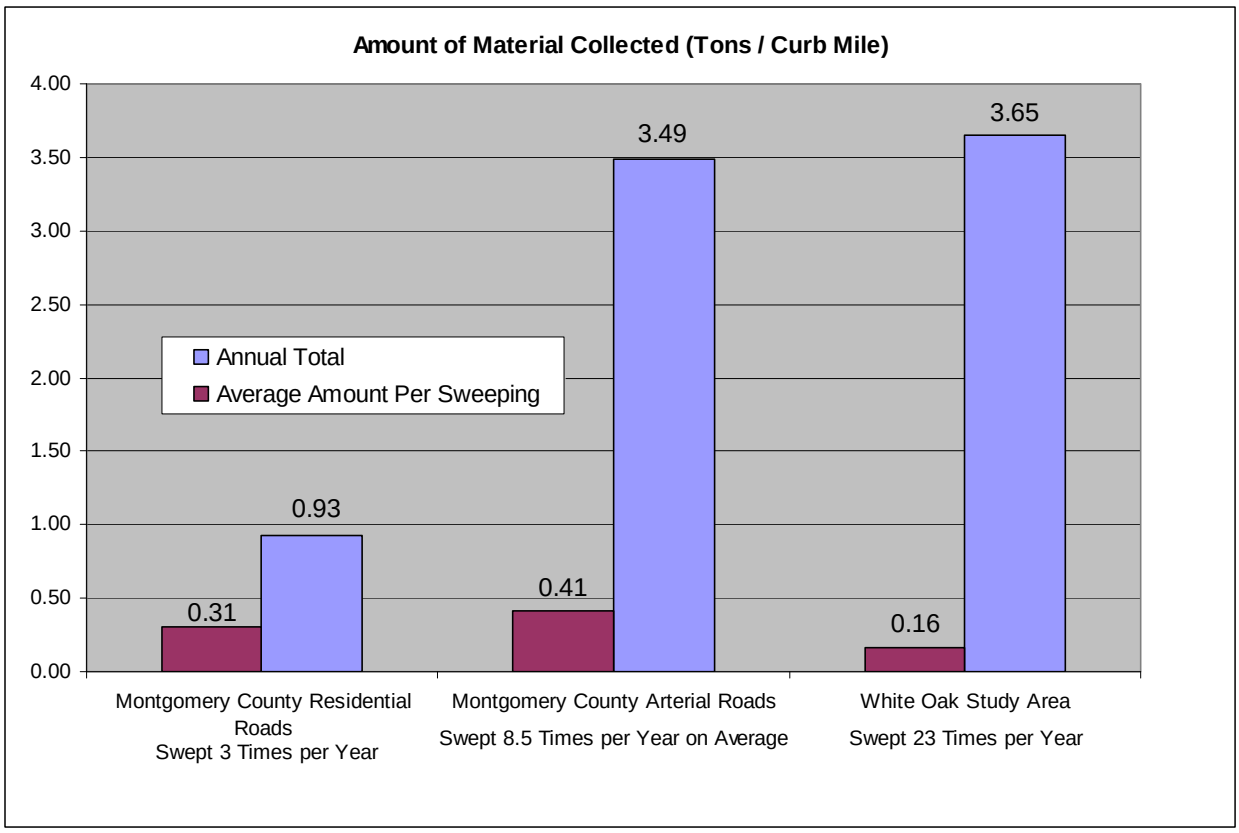


Figure III-E8 Amount of Material Collected

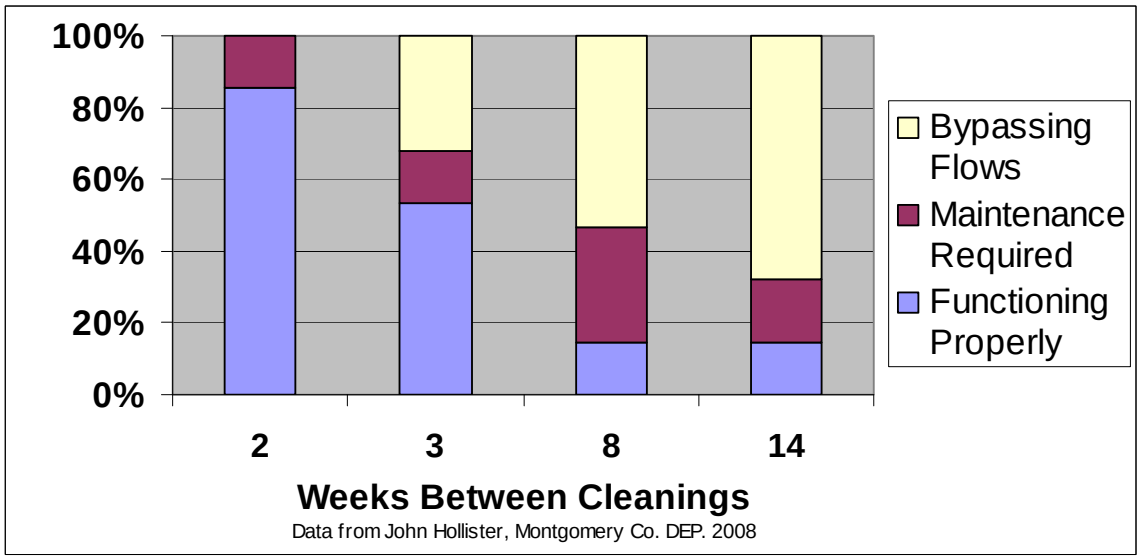


Figure III-E9 Weeks Between Cleaning

E.7 Integrated Pest Management

The County's roadside weed spraying program will now be conducted by Montgomery Weed Control Inc. Montgomery Weed Control Inc. is a cooperative weed control program between Montgomery County Department of Economic Development, Agricultural Services Division and the Maryland Department of Agriculture, Plant Protection and Weed Management Section. Montgomery Weed Control Inc. is licensed with a Public Agency Permit (PAP) by Maryland Department of Agriculture Pesticide Regulation Section (MDA PRS).

The program function is to assist farmers, landowners, businesses and government agencies in the control of noxious and invasive weeds and enable them to comply with the Maryland Noxious Weed Law. The purpose of the program is to assist in the control and eradication of noxious weeds in Montgomery County. The program is equipped and weed control personnel are trained to provide a spray service for control of noxious weeds on a fee basis. The program utilizes specialized spray equipment. Cost efficient control is achieved with minimal use of herbicides. Best Management Practices (BMPs) are always followed. All personnel employed by MCWC are pesticide applicators registered under Maryland Law and are trained in compliance with the State Pesticide Applicator's Law. All quantities of pesticides employed by Montgomery Weed Control will be reported annually as required by the Permit.

Treatments are done for noxious weeds on Montgomery County Highway Services Division ROW using the most effective labeled herbicides, following labeled recommendations. Treatments are done only where areas/spots of noxious weed infestations exist. No "lay by" treatments are done. No Aquatic Treatments are done. - Extra care is taken when working near water, storm drains or other sensitive area. All treatments are post emergent.
Two primary herbicides are used for the control of noxious weeds on the County ROW; Clopyralid and Glyphosate. Other herbicides may be used in specific situations

Table III-E11 *Pesticide Usage by Montgomery Weed Control Inc. on Montgomery County Highway Services Division ROW*

Purpose	2009	2008	2007
Treat for State mandated Noxious Weeds	9.06 Gal. Clopyralid 3.49Gal. Glyphosate	8.25 Gal. Clopyralid 9.5 Gal. Glyphosate	7.25Gal. Clopyralid 3.75Gal. Glyphosate
	Herbicide use is directly correlated to growing conditions for each season		

F. Watershed Restoration

The County is continuing its systematic assessment of water quality, stream resource conditions, and habitat modification within all of its watersheds. During 2004, the County began the watershed restoration inventory in the Great Seneca Creek and Muddy Branch watersheds as cooperative efforts with the USACE and the City of Gaithersburg. These areas represent roughly one-third of the total County land area and include drainage from the densely developed areas of Gaithersburg and Germantown. This study is continuing and will be completed in 2011. In 2008, the County in partnership with the USACE, Princes Georges County and the District of Columbia began a reassessment of the Anacostia River watershed. That study was completed in February 2010. Updated information is presented in Sections III-F-G in the report for Permit 06-DP-3320 MD0068349.

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F1. Watershed Screening
2007

Broad Run
The Broad Run watershed located in western Montgomery County is entirely within the agricultural preserve. Four stations were monitored in 2007. The stream conditions at all sites within this watershed were rated as Good. Other than localized agricultural impacts this watershed appears to be minimally impacted by the surrounding land uses.

Hawlings River
The Hawlings River is a major tributary of the Patuxent River. Ten stations were monitored in 2007. The stream conditions of Hawlings River were as variable as are the land uses within the watershed. Stream condition ranged from Excellent at sections of the Upper Hawlings River near Georgia Avenue and again near Sundown Road close to Laytonsville to Fair in different monitoring stations in the James Creek. James Creek drains the highly impervious areas of Olney containing a mixture of medium to high density residential and commercial land uses. The range of physicochemical parameters for this watershed does not indicate that they are likely to be a contributing factor leading to impairment of the streams with lower water quality.

Little Falls Branch
Five stations were monitored in 2007. The stream condition at Little Falls Branch was Poor throughout all stations. The land uses within this watershed are mostly high density residential and commercial that developed prior to the use of storm water controls. It appears that both habitat impairment and local sources of chemical contamination contributing to high conductivity are the major contributing factors leading to impairment. High conductivity values were measured during the summer at two mainstem stations in the bottom half of the watershed (LFLF301A just upstream of Massachusetts Avenue, and LFLF301C just upstream of Dalecarlia Reservoir) with 794 and 737 µmhos, respectively) indicating causes of impairment other than just degraded habitat.

Muddy Branch
Ten stations were monitored within the Muddy Branch watershed in 2007. The headwaters of the Muddy Branch originate in portions of Gaithersburg, within older neighborhoods developed without stormwater management and with high imperviousness levels. Muddy Branch improves in stream condition in the lower portions of the watershed which tend to also be rural or residential development with lower imperviousness levels. For instance, for two stations located in the lower part of the watershed within a relatively rural, low density residential (i.e., large lot suburban setting) stream condition is Excellent, compared with the Poor to Fair conditions of the headwater reaches located within the city of Gaithersburg where high density, highly urban land-uses predominate. High conductivity (779 µmhos) was recorded at a monitoring station near East Deer Park Drive The odor of sewage during a summer visit was evident, thus periodic leakage of sewage into this section of Muddy Branch may be a contributing source of the high conductivity measured there. A small tributary, Rich Branch located within the western part of the watershed in a mixed suburban and commercial land use area of medium density which in the recent past had intensive and concentrated agricultural practices has a Poor stream condition. Habitat impairment was also evident within the upper reaches of the watershed as far downstream as Great Seneca Highway and Muddy Branch Drive. Furthermore downstream where imperviousness is lower and land use changes from high density to low density the main stem and tributaries have markedly improved habitat quality and stream conditions.

Potomac Direct
Twelve stations within a variety of small streams draining into the Potomac River in mid-west to western Montgomery County were surveyed during 2007. Due to the variety of land-uses present, there was also a variety of stream conditions ranging from Poor to Excellent. Quarry Branch (above White's Ferry Road in the western County) draining a near totally forested watershed had Excellent stream conditions. One Potomac tributary draining the Dickerson yard trim compost facility exhibited an episode of high conductivity (1460µmohs) during the summer fish survey. This station is fed by a first order stream that drains the south side of the facility. However, the stream condition at this particular station was rated as Good.

Watts Branch
The Watts Branch headwaters are within the western portion of Rockville and one of its major tributaries Piney Branch is a designated Special Protection Area (SPA). Six stations were monitored within the Watts Branch watershed in 2007. The overall stream condition of Watts Branch, exclusive of the Piney Branch tributary was rated as Fair with associated marginal habitat. The better rated stream stations were in the Greenbriar Tributary and the Sandy Branch tributaries, with both having Good stream conditions with corresponding Sub-Optimal habitat. Both of these tributaries are on the western side of the watershed, in fairly rural, low imperviousness land uses. Conversely, the mainstem reaches of Watts Branch and Kilgour Branch along the eastern portion of the watershed have Poor to Fair stream conditions and marginal habitat. Land-use in these portions of the Watts Branch are primarily mixed density residential with few stormwater controls in place.

2008

Cabin John
Ten stations were monitored in the Cabin Branch watershed in 2008. The headwaters of Cabin John are within the southern limits of the city of Rockville and the entire watershed is located within an urban to high density residential suburban setting with minimal storm water controls. Booze Creek and Thomas Branch were the lowest rated streams in the watershed. All stations with the exception of the Snakeden Branch tributary had degraded benthic communities whereas the fish communities were more variable. Overall, the stream conditions for the watershed were poor to fair.

Lower Rock Creek
The lower portion of Rock Creek is defined as that portion of the Rock Creek watershed below route 28 near Rockville. This portion flows through heavily urbanized parts of the county that were developed prior to the routine implementation of storm water controls. Eleven stations were monitored in 2008. Nearly all stations surveyed indicated impaired stream condition based on poor benthic macroinvertebrate indices. The fish communities fared slightly better at a few stations. Overall stream condition was generally Poor with a few Fair stations.

Upper Rock Creek
Upper Rock Creek originates from several springs near Laytonsville, Maryland. The two main headwater tributaries join above Muncaster Road. Fifteen stations were monitored within the Upper Rock Creek in 2008.Stream conditions are mostly in Good condition. However, once below Muncaster Mill Road, stream conditions change rapidly. Mill Creek, a major tributary on the west drains parts of the more urbanized areas of Gaithersburg. Stream conditions are Fair to Poor. Below Lakes Needwood and Lake Frank, stream conditions in the main stem and tributaries remain in a Fair to Poor condition. Western tributaries of Southlawn Branch and Crabbs Branch drain older industrial or commercial areas and have Poor to Fair stream conditions.

F2. Selected Restoration Watershed

Restoration Goals

Table III-F1 shows the results of the impervious surface analysis to calculate the restoration goal for 'areas equaling ten percent of Montgomery County’s impervious area that has not been treated to the maximum extent practicable.' The total acres developed under County responsibility for stormwater management (81,603) is about 33.6% of total acres minus excluded areas. Of those acres, about 52% (42,480) has some sort of stormwater management. The 10% watershed restoration goal based on these calculations is 2,580 acres. The combination of 2,434 acres in the selected restoration watershed of Turkey Branch and the 2,872 acres to completed restoration projects in 2006 exceeds this calculated 10% goal.

The County identified the Hollywood Branch stream restoration project to meet Permit requirements to 'submit a detailed watershed assessment for an additional watershed equaling ten percent impervious area to MDE by the end of this permit term.' Project updates are shown in the following sections.

Table III-F1 Impervious Surface Analysis for Watershed Restoration Goal (2006-2009)		
Total County Acres		324,552.00
Total Acres of Impervious Surface		34,001.99
Total Acres of Impervious Surface minus excluded areas		25,798.08
10% Goal in Acres		2,579.8
Turkey Branch		2,434.00
Excluded Areas: (total area, not just impervious area; in acres, except as noted)		
Rural Zoning (RC, RDT, RZ)		100,308
Parklands (Local, State, National)		61,435
Forests in Parkland		40,916
Municipalities with own stormwater management programs	*Rockville*	8,644
	Gaithersburg	6,419
	Takoma Park	1,339
State and Federal Properties		22,045
State Maintained Roads	Miles	1,598
	Acres	2,344
Existing Controls (acres)		
Stormwater BMPs		42,480
Drainage to Stream Restoration Projects (completed in 2006)		2,872 (estimated)

Turkey Branch Watershed

The Turkey Branch project includes approximately 3 miles of stream restoration and three stormwater management ponds. These ponds include the retrofit of an existing stormwater pond at the Peppertree Apartments, and the construction of two ponds at Georgia Avenue. Matthew Henson Pond Number One is located on park property and was designed in an open field while Matthew Henson Pond Number Two (MH2) is located on County and State Highway Administration owned property and was the former location of a plant nursery. The three ponds provide improved stormwater management controls for 403 acres. Despite design constraints stemming from limited space, the ponds are very effective at reducing flows for one and two year recurrence interval storms, and MH2 provides good detention for the ten year storm as well. When added to the 162 acres controlled by the regional pond behind the Home Depot (which was a County participation project with Home Depot), over

63% of the upstream watershed has stormwater management. Having a significant amount of stormwater management in the watershed significantly improves the potential that the stream restoration work will be successful in improving aquatic habitat in Turkey Branch. Erosion damage to urban infrastructure, such as sanitary sewer pipes, by uncontrolled urban flows is reduced, further improving ecological health of the system.

Hollywood Branch Steam Restoration Project

This project will mitigate stream degradation caused by past suburban development made without adequate stormwater controls. Figure III-F1 shows an example of a severely impacted stream reach on Hollywood Branch.

Hollywood Branch is located in the suburbs of eastern Montgomery County, Maryland, and is a second order tributary to Paint Branch (a tributary of the Anacostia River). Figure III-xx shows the drainage areas to various points along the 2.25-mile stream reach that was evaluated for the restoration project. .

The Hollywood Branch Stream Restoration Project was not completed during this Permit cycle. An update on project status is provided in Section III. for Permit. 06-DP-3320 MD006849.

Figure III-F1 Example of Stream Conditions in Hollywood Branch

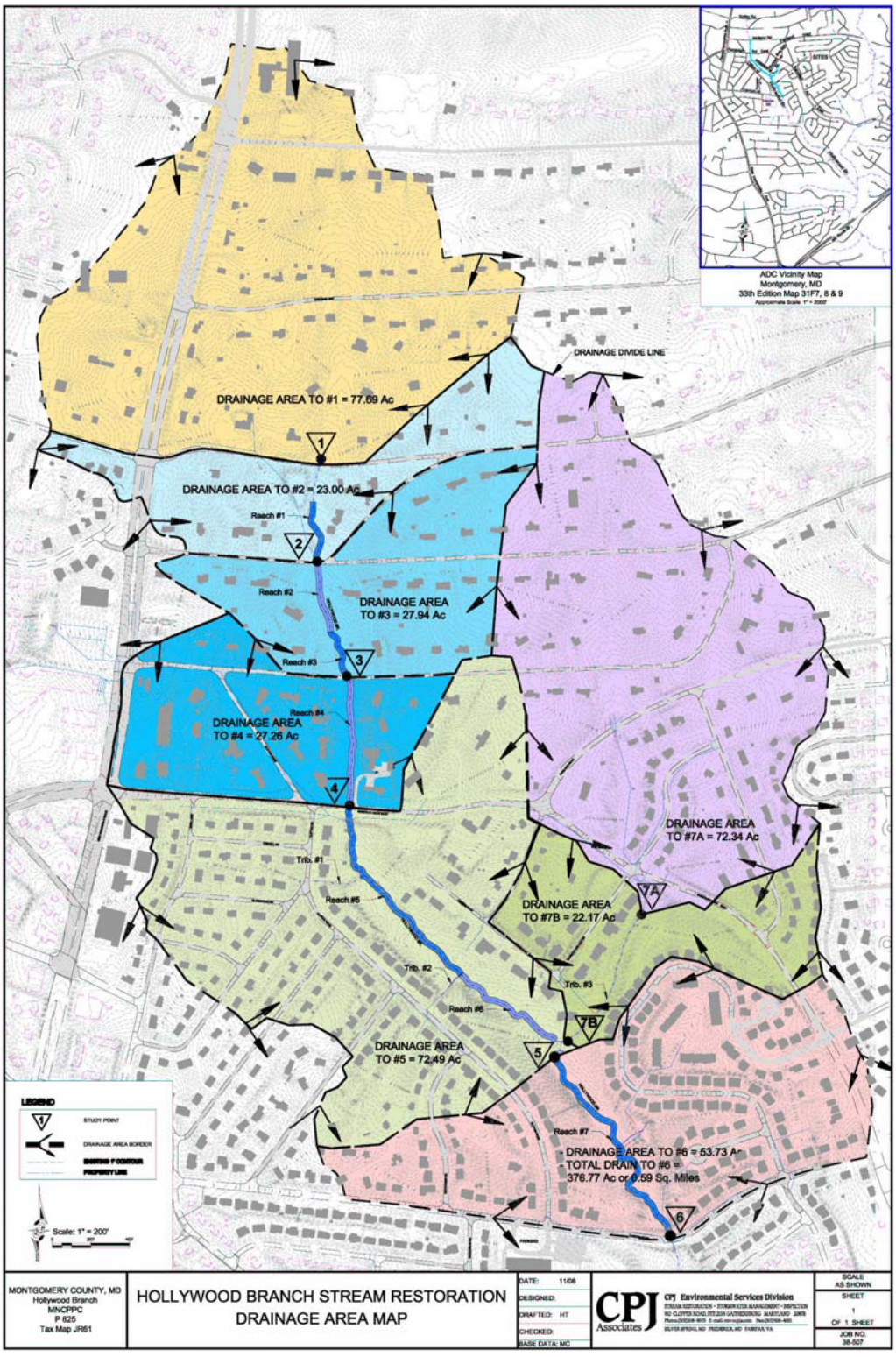

Figure III-F2 Hollywood Branch Stream Restoration Drainage Area

G. Program Funding

The Permit requires the County to submit a fiscal analysis of its expenditures and maintain adequate program funding to comply with all conditions of this permit. Table III-G1 compares expenditures in FY03 with those budgeted by fiscal year through FY08. The County's fiscal year runs from July 1 of one year to June 30 of the next. During this six-year period, the County expended approximately $77 million to comply with second-round Permit requirements, an average of $12.8 million per year. The CIP funding for watershed assessments and restoration project implementation represented the largest budget category in every year..

In addition to the FY07 funding to meet Permit requirements, the County Council approved $1.25 million through the Water Quality Protection Charge to identify and increase implementation of low impact design (LID) and environmental site designs (ESD) in both the public and private sectors. These projects go beyond the second-round Permit-required programs, focusing on source control for watershed restoration. An additional $100,000 was allocated to initiate a flow and water chemistry monitoring network.

Table III-G1

Montgomery County's Budgeted Funding for Fiscal Years (FY) 2003-2008
for Permit-required Programs in thousands of dollars. (CIP=Capital Improvement Program)

PERMIT CATEGORY	FY03	FY04	FY05	FY06	FY07	FY08	TOTAL	AVERAGE
Source Identification								
Storm Drain Inventory (DEP)	31	98	195	160	110	**	594	99
Discharge Characterization and Monitoring								
Outfall and Instream Water Chemistry Monitoring (DEP)	50	50	50	50	50	85	335	56
Countywide, Discharge Characterization, and Design Manual Monitoring *(DEP)*	574	572	612	751	773	854	4,136	689
Management Programs								
Stormwater Management and Erosion and Sediment Control Casework Management (DPS)	369	394	322	256	338	356	2,035	339
Stormwater Management and Erosion and Sediment Control-Plan Review (DPS)	864	924	1,220	1,306	1,412	1,497	7,223	1,204
Inspection-Stormwater Management and Sediment/Erosion Control (DPS)	945	956	1,178	1,319	1,424	1,422	14,467	2,411
Stormwater Facility Maintenance Inspections (DEP)	989	899	1,379	995	1,007	1,029	13,542	2,257
Stormwater Facility Repairs (DEP) WQPF	1,005	2,773	1,941	3,056	1,781	2,000	12,582	2,097
operating	26							
DEP Public Outreach andCoordination	333	339	265	265	265	265	1,732	289
Water Quality Discharge Law Enforcement (DEP)	246	268	147	161	168	191	1,181	197
Street Sweeping (DPWT)	12	208	208	208	100	100	836	139
(DEP)		112	112	112	200	327	863	144
Watershed Restoration								
Watershed Assessments and Action Plans *(inventories, project design, and construction)* CIP	5,395	4,267	8,220	3,779	6,021	4,260	31,942	5,324
TOTAL	10,839	11,860	15,849	12,418	13,649	12,386	77,001	12,834

During the development of the FY09 budget request, the DEP was required to provide detailed information on projected costs associated with the third-round Permit that was then under negotiation with MDE. Changes that will require significant additional staffing and project resources include:

- Increasing the watershed restoration requirement of the uncontrolled impervious area to 30% within the five year permit period, by 2013.
- A Trash and litter reduction strategy to meet the Potomac Trash Free Treaty goal of zero trash in the Potomac by 2013;
- Implementation plans for projects, programs, and policies to reduce pollutants to meet TMDL regulatory limits
- Public comment and input for the development of the trash and litter reduction strategy and for all TMDL implementation plans

Table III-G2 summarizes changes in the annual assessment rate and revenues collected based on that assessment. From FY08 to FY09, the rate increased by $10.27, the largest since the WQPC was initiated. The revenues generated increased from about $6.02M to $8.542M to support DEP's increased level of planning efforts to meet anticipated third round Permit requirements.

Table III-G2 Annual Assessment Rate and Revenues Collected

Fiscal year	Levy Year	Rate per Unit	Change in $	Collected
FY04	2003	$12.75	**n/a**	$ 2,964,414
FY05	2004	$12.75	$0.00	2,968,343
FY06	2005	$19.35	$6.60	4,551,124
FY07	2006	$25.23	$5.88	5,965,168
FY08	2007	$25.23	$0.00	6,021,745
FY09	2008	$35.50	$10.27	8,543,816

H. Assessment of Controls

Table III-H1 summarizes stormwater delivered loads from Montgomery County during this Permit cycle. An updated table based on significantly improved GIS coverages for drainage areas controlled by BMPs is provided in the first annual report for Permit 06-DP-3320 MD0068349.

TABLE III-H1. Stormwater Delivered Loads (lbs) from Developed Acres under Montgomery County Stormwater Management
(excludes rural zoning, parklands, forests, Cities of Rockville, Gaithersburg, and Takoma Park, state and federal properties, and state maintained roads)

Description	Runoff Type	TN (lbs/yr)	TP (lbs/yr)
Acres Developed (under County stormwater management) 81,603	Uncontrolled	701,788	67,731
Acres with BMPs (estimated; includes stream restoration drainage) 42,480	With BMPs	278,937	21,657
Average % removal of all BMPs		23.6	38.6
% developed acres with control 52.7		% reduced 15.1	% reduced 19.2
average Loading (lbs/acre) (based on County monitoring 1994-2001)		8.6	0.83

Special Protection Area (SPA) Program

The SPA Program was established in 1994 to protect high quality waters from construction and development-related impacts. Part of the Clarksburg SPA is targeted for monitoring to meet the NPDES permit requirements for discharge characterization as summarized in Section III-D2. The SPA annual reports for 2007 and 2008 are included in electronic form as Appendixes D and E on the CD submitted with this report and as hard copy in Attachment B. The reports summarize monitoring to date on the effectiveness of sediment and erosion control and stormwater BMPs and impacts on stream biota and physical characteristics.

Preliminary results indicate that BMPs are performing well; in some cases they are performing better than expected. The use of redundant BMPs placed in series appears to be effective in reducing runoff and decreasing pollutant loadings. However, biological monitoring indicates varying degrees of degradation in the streams. Areas with large amounts of intense development tend to show greater impacts to water quality. The efficiencies of the BMPs are not correlating to the health of the stream based on its biological integrity.

The reports also make a number of recommendations for future implementation.

- Stormwater management controls, environmental buffers, and other environmentally sensitive areas should be given a higher priority in land development projects in the SPAs.
- Sediment control structures should be converted to permanent SWM structures as soon as possible construction should be strictly phased to allow for greater focus on soil stabilization.
- A grading ordinance to limit the acreage of exposed soils prone to erosion should be considered.
- The time required for soil stabilization should be reduced.
- Utility work should have stricter sediment control requirements.
- Grading activities should retain more natural drainage patterns.
- ESD must be the preferred approach to new development in Clarksburg whenever possible, in accordance with the Maryland State Stormwater Management Act (2007).

In February 2009, the County Council established an Ad Hoc Water Quality Working Group to more closely evaluate the findings of the SPA 2008 report related to decreases in stream resource conditions in sensitive streams in the Clarksburg SPA. Since these decreases were occurring simultaneous with upstream land disturbance and construction, environmental groups and some Council members expressed concerns about implications for protecting stream resources during and after development in the nearby Ten-Mile Creek drainage. The Working Group included representatives from environmental groups, development community, County Council staff, and County agency staff.

The Ad Hoc Water Quality Working Group collected information on new and pending State and Federal regulations regarding water quality, stormwater management and sediment control the current state of Ten Mile Creek, Stage 4 of the 1994 Clarksburg Master Plan and related planning issues. The Working Group report was published in July 2010 and is available at
http://www.montgomerycountymd.gov/content/council/mem/knapp_m/pdf/wqworkinggroupreport.pdf
Follow up to the Working Group activities included the establishment of a USGS continuous flow gauge on Ten-Mile Creek to document baseline, during, and post-development flow conditions and initiation of Master Plan Amendment process to review planned densities and types of development.

PART IV. SPECIAL PROGRAMMATIC CONDITIONS

Interjurisdictional Commitments

Throughout this Permit, the County maintained activities in ongoing multi-jurisdictional efforts to protect the Anacostia and the Patuxent Reservoirs Watershed, as well as the Chesapeake Bay restoration effort and the Potomac Trash Free Treaty Initiative. This has led to cooperative funding for monitoring, modeling, and restoration and retrofit project inventories, design, and construction. As part of these efforts, the County monitoring results are being used for regional screening and priority setting in these watersheds. The programs and projects being implemented through these watershed groups contribute toward the County's Permit-required watershed restoration goal and also the pollutant reductions that will be needed to meet the Tributary Strategies nutrient caps.

Potomac Trash Free Treaty Initiative

This initiative began in Montgomery County in June 2006, when County Executive Douglas Duncan signed the Potomac Trash Free Treaty, with its goal to achieve a trash free Potomac by the year 2013. The Alice Ferguson Foundation (www.fergusonfoundation.org) is leading this effort to address the trash problem from a watershed-wide approach to benefit the entire region. In Maryland and the District of Columbia, the Anacostia River was identified as impaired by trash and subsequently an interjurisdictional agency and external stakeholder group convened as the TMDL was developed. The EPA approved the Anacostia Trash TMDL in September 2011, just before the convening of the sixth Potomac River Watershed Trash Summit. Details on the County's trash and litter reduction strategy are presented in the Annual Report for FY10 for Permit No.06-DP-3200-MD0068349.

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