

**MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION**

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT
MD0068349**

REVIEW OF MONTGOMERY COUNTY'S 2010 ANNUAL REPORT

Montgomery County was reissued a National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system discharge permit (MD0068349) on February 16, 2010. NPDES regulations require permit conditions that effectively prohibit non-stormwater discharges and reduce the discharge of pollutants to the "maximum extent practicable." The permit applies to discharges to and from the storm drain systems owned and operated by Montgomery County, including Montgomery County Public Schools (MCPS), and the following localities: the Towns of Chevy Chase, Chevy Chase Village, Kensington, Somerset, and Poolesville; and the Village of Friendship Heights (co-permittees).

For each year of the County's permit, an annual report is required to help assess the County's stormwater program. In order to provide continuity of reporting between permit terms, the County is to submit its annual reports by the anniversary date of permit issuance with information specific to the preceding fiscal year. The following is a review of Montgomery County's annual report that was submitted to the Maryland Department of the Environment (MDE) on February 17, 2011. The annual report is specific to activities performed from January 1, 2010 through July 1, 2010.

Permit Administration

Montgomery County is required to identify key administrative and technical personnel responsible for permit compliance. The County submitted an updated contact list and organizational charts with its annual report. Significant organizational changes have occurred as a result of a reorganization of County Departments in July 2008. For example, functions of the Division of Solid Waste were moved from the Department of Public Works and Transportation (DPWT) to the Department of Environmental Protection (DEP). Additionally, the DPWT was renamed the Department of Transportation (DOT) and some previous DPWT responsibilities such as Fleet Management Services, Facilities and Services, and Design and Construction moved to a newly created Department of General Services (DGS). None of these changes should adversely impact NPDES permit compliance. Any additional or future changes should be reported to MDE in a timely manner.

Legal Authority

Montgomery County is required to maintain legal authority to perform the activities described in 40 Code of Federal Regulations (CFR) 122.26(d)(2)(i) and permit MD0068349. The County Attorney submitted certification of legal authority on January 7, 2002. In 2006, a memorandum of understanding was established between the County and the City of Takoma Park allowing the County to enforce its water quality ordinance within the City. Additionally, in May 2006, the County established the Clean Water Task Force (CWTF) to evaluate existing interagency

coordination for stormwater management and water resources protection. As a result of the CWTF findings and a State mandate regarding implementation of the Stormwater Management Act of 2007 and associated regulations, a report has been developed regarding how the County's codes, regulations, programs, and policies need to be updated to allow the use of environmental site design (ESD) and low impact development techniques to the maximum extent practicable (MEP). The County reported that the DEP will begin coordination with the appropriate County agencies to draft legislation changes in 2011. Further discussion regarding this report is included in the Stormwater Management section below.

Anticipating permit reissuance, the County and MCPS entered into a Memorandum of Understanding (MOU) in January 2010. The MOU defined relative roles and responsibilities regarding permit conditions. Through the MOU, the County agreed to continue facility inspections and structural maintenance of stormwater best management practices (BMPs) at MCPS sites and to coordinate annual reporting requirements. The MCPS agreed to provide annual updates regarding its efforts to reduce runoff impacts from its facilities, coordinate BMP inspections and maintenance with the County, reduce pesticide and fertilizer applications through the use of Integrated Pest Management (IPM), report on pollution plan development and implementation, provide staff training and general outreach, and to reduce trash and litter from its facilities. MDE believes that the MOU clearly defines MCPS responsibilities for permit compliance.

Montgomery County has done well to maintain adequate legal authority to comply with State and federal NPDES stormwater requirements. An exemplary job was done to identify impediments and opportunities in local codes for implementing ESD. Further discussion on the County's efforts in this regard is found below in the Stormwater Management section. Continued legal authority compliance will require completing the changes to local codes and the development approval process identified in the County's report "*Implementing Environmental Site Design in Montgomery County.*"

Source Identification

Montgomery County is required to identify sources of pollutants in stormwater runoff and link these sources to specific water quality impacts on a watershed basis. The source identification process is to be used to develop watershed restoration plans that effectively improve water quality. To demonstrate this capability, the County is required to submit information regarding its storm drain system, urban BMPs, impervious surfaces, monitoring locations, and watershed restoration locations in geographic information system (GIS) format with associated tables as required in Part IV of the permit. This information is to be updated annually and submitted on databases in a format consistent with Attachment A of the permit.

The County reported that it maintains a storm drain inventory in GIS format and that location features (e.g., outfalls, inlets) are routinely updated. Applicable attributes were digitized for 48 public and 105 private storm drain system permits issued during the reporting period. These data were submitted on the required database. In addition to the database, the County should summarize results regarding the number of new outfalls, inlets, and pipe length for each reporting period.

The County submitted stormwater management facility construction completion data on MDE's

Urban BMP Database and in GIS format. A review of the data submitted found a discrepancy in the number of facilities reported. The database includes information specific to 4,316 facilities while the GIS data supports only 3,907. Additionally, drainage area had been delineated for 57 percent and 76 percent of the facilities, respectively. Many of the facilities without an associated drainage area had an as-built date during the present millennia. The reasons for these discrepancies are unclear. Additionally, the data are further constrained due to many of the data fields not conforming to designations found in Attachment A of the permit (e.g., BMP type). It is imperative that drainage areas be delineated and data sets correspond to each other to ensure that pollutant load reductions can be accurately accounted for and credited. MDE staff is more than willing to collaborate with Montgomery County to resolve these issues and make modifications that will render the data usable.

The County is also required to delineate impervious areas. This information was submitted in GIS format to MDE in July, 2010. The County's analysis indicates that there are 35,965 acres of impervious surfaces (e.g., transportation and building footprint) in Montgomery County. After excluding areas such as State and federal facilities and roads and municipalities not covered by this permit, 25,119 impervious acres remain. The County reported that approximately 3,661 impervious acres have been treated to the maximum extent practicable (MEP). As a result, 21,458 acres remain to be addressed by restoration efforts.

Information regarding the locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the *2000 Maryland Stormwater Design Manual* was not submitted. Lastly, information regarding watershed restoration projects was submitted. However, the database included only eight projects and most data fields had not been populated. It is imperative that data for all projects planned to meet the impervious surface treatment goal and waste load allocations (WLA) for approved total maximum daily loads (TMDL) be included. This particular dataset will be used to gauge the County's compliance with restoration requirements.

Management Program

Stormwater Management

Montgomery County is required to maintain an acceptable stormwater management program in accordance with Maryland's law and regulations. In part, this includes the preventative maintenance inspection of all stormwater management facilities at least on a triennial basis. Documentation identifying the facilities inspected, the number of maintenance inspections, follow-up inspections, and the enforcement action(s) used to ensure compliance are to be submitted in the County's annual report. As described above, there are more than 4,300 stormwater management facilities in Montgomery County. The County reported that contracted inspectors completed 557 maintenance inspections during the reporting period. Additionally, maintenance occurred at 739 facilities. Although this initial annual reporting period is truncated for a six-month period, it appears that stormwater management facility maintenance occurs on a routine basis in Montgomery County.

In order to assure that MDE-approved programs reflect the policies established for implementing ESD to the MEP, the County was required to revise its local stormwater ordinance. The County revised and adopted an MDE approved stormwater ordinance on July 27, 2010. In addition to

this effort, the County was to review all local ordinances and identify impediments to and opportunities for promoting ESD. Montgomery County contracted Biohabitats and the Horsley Whitten Group to review its Development Review Process, selected Chapters of the County Code, and the Commercial-Residential Zoning Text Amendments to identify potential impediments to ESD and to develop recommendations for Code changes.

Most notably, Montgomery County's Zoning Code, Chapter 59, and the County's Development Approval Process were identified as having significant barriers, gaps, or opportunities for implementing ESD. For example, possible changes under Chapter 59 include allowing for wider street rights-of-way to accommodate ESD practices, allowing for greater building heights when using green roofs or smaller footprints to increase green space, and allowing for permanent cisterns and rain barrels for rainwater harvesting. Regarding the latter, the Washing Suburban Sanitary Commission (WSSC) is the agency responsible for plumbing regulations in Montgomery County. The County reported that WSSC is considering code revisions to address water reuse systems including rainwater harvesting. MDE supports these efforts to create better opportunities for implementing ESD.

Major issues identified with the County's Development Approval Process include stormwater management not being formally introduced into the process until many site elements (e.g., roads, lot lines, etc.) have been laid out; site plans and details not always showing proposed stormwater BMP locations resulting in competing priorities such as road layout and fire safety; the need for detailed concept plans for rezoning applications that precede the review of stormwater management; and the County's existing Natural Resources Inventory that does not identify areas that may be appropriate for stormwater management (e.g., soils with high infiltration rates). One overarching concern is that the County used an expanded list of ESD practices during its code review. Five practices: soil compost amendments, stormwater planter, expanded tree pits, stormwater curb extensions, and foundation planters are not recognized by MDE for new development. In some cases, these might actually be approved practices using an alias (e.g., foundation planter for micro-bioretenion). However, the County should use practices and nomenclature consistent with the *2000 Maryland Stormwater Design Manual* and make a clear distinction between new and redevelopment, and retrofitting. As discussed in the Legal Authority section above, the County has completed its assessment of local codes and will begin addressing necessary legislative changes in 2011.

Erosion and Sediment Control

Montgomery County continues to maintain an acceptable erosion and sediment control program. Delegation of erosion and sediment control enforcement authority to Montgomery County has historically been granted for the maximum two-year period and the need for immediate program improvement was not identified during the last review in 2009. As part of its erosion and sediment control efforts, the County also conducts responsible personnel certification classes to educate construction site personnel regarding erosion and sediment control compliance. Program activity is to be recorded on MDE's "green card" database and submitted with annual reports. A review of the data submitted finds that the County conducted three classes during the reporting period with 39 individuals attending. Lastly, information regarding earth disturbances exceeding

one acre or more is to be reported quarterly and is to be specific to the permitting activity for the three months preceding submittal. Grading permit information has been routinely submitted

during the reporting period.

Illicit Discharge Detection and Elimination

The County is required to implement an illicit discharge detection and elimination program. At a minimum, the County is to field screen at least 150 outfalls annually, survey commercial and industrial areas for discovering and eliminating pollutant sources, and maintain a program to address illegal dumping and spills. Inspection and enforcement efforts are to ensure that all discharges to and from the municipal storm drain system that are not composed entirely of stormwater are either permitted by MDE or eliminated. Significant discharges are to be reported to MDE for enforcement and/or permitting.

Previously, Montgomery County's field screening efforts have not detected much in the way of illicit discharges. Screening efforts have primarily occurred in areas where biological impairments had been found. However, the identification of illicit discharges did not pair up well under this approach. As a result, Montgomery County and the Center for Watershed Protection (CWP) have partnered with various local watershed groups to implement the CWP's procedures for illicit discharge detection and elimination (IDDE) investigation. Under this process, outfall screening areas will be based on their potential for having illicit connections or producing water quality problems. The County believes implementing these new procedures and targeting specific areas will yield improved results.

While there is no record of outfall screening during the reporting period, the County did however, report that a total of 225 outfalls were screened in the Sligo Creek watershed during January 2011. Fifty-eight (26 percent) of the outfalls exhibited dry-weather flow with 13 suspected of sewage discharges based on high concentrations of both ammonia and detergents. Field verification of the County's GIS outfall layer found that 75 percent of the outfalls having dry-weather flow had not been mapped. Due to this discrepancy and an absence of staff dedicated to illicit discharge detection identification and elimination, the isolation and elimination of these sources was hindered. Information regarding the routine survey of commercial and industrial areas for discovering and eliminating pollutant sources was not reported. Clearly, the County needs to improve its mapping and staff resources to ensure that pollutant sources are identified, isolated, and eliminated.

The investigation and enforcement of non-stormwater discharges also occurs as a result of complaints. The DEP maintains an Illegal Dumping Hotline 240.777.DUMP and the County also allows citizens to call one number (311) for all concerns, including illicit discharges and spills. During the reporting period, the DEP's Division of Environmental Policy and Compliance (DEPC) responded to 59 water quality complaints and 13 hazardous material incidents. These investigations resulted in the issuance of 10 formal enforcement actions and numerous warnings. The formal enforcement actions included four civil citations totaling \$2,000 and six notices of violation. Additionally, there were 244 complaints regarding dumping. Investigation of these resulted in 24 formal enforcement actions and numerous warnings. These formal enforcement actions included five civil citations totaling \$2,500 and 19 notices of violation. The County

reported that only a small percentage of the dumping incidents resulted in the potential for discharges to the storm drain system and that discarded materials were removed and disposed of

properly.

Overall, Montgomery County's management program efforts continue to be strong. The changes to the illicit connection detection and elimination program should yield considerable progress toward pollutant reductions. The County is commended for its efforts to address the management program requirements.

Trash and Litter

Montgomery County is required to support regional strategies to reduce trash and increase recycling consistent with obligations established under the *Potomac River Watershed Trash Treaty*. Additionally, baseline loadings were established by MDE in 2010 for trash and litter as part of a TMDL for the Anacostia River Watershed. The TMDL WLA requires Montgomery County to remove 621.6 pounds of trash per day or 226,884 pounds per year from the Anacostia River. In addition to existing activities (e.g., adopt-a-road, storm drain marking, street sweeping, etc.), the County has proposed to increase funding for trash reduction programs, improve outreach, promote effective reduction technologies such as a plastic bag ban, and improve enforcement of laws to reduce trash in all County watersheds. The County's analysis regarding implementation of its reduction strategies indicates that trash and litter into the Montgomery County portion of the Anacostia River will be reduced by 68 percent during this permit term. Future annual reports will need to describe the actions taken and pollutant load reductions for the reporting period.

Property Management

The County is to ensure that a Notice of Intent (NOI) has been submitted to MDE and a pollution prevention plan developed for each County-owned and municipally owned facility that requires NPDES stormwater general permit coverage. Additionally, the status of pollution prevention plan development and implementation is to be reported annually. The County has identified fifteen facilities that it owns and operates as requiring discharge permits. These fifteen facilities have been permitted under MDE's *General Discharge Permit for Storm Water Associated with Industrial Activities*. Coverage under MDE's general permit is predicated upon developing and implementing a pollution prevention plan. The County submitted updated plans for the Colesville Highway Maintenance Depot and the Kensington Small Transit Service Maintenance Facility. While documentation regarding site inspection was submitted for six additional facilities, the status for updating plans for these and the remaining facilities was not reported. The County needs to report on the status for updating the pollution prevention plans for these facilities.

Information was also submitted for five MCPS facilities requiring NPDES stormwater general permit coverage. Pollution prevention plans were reported to be developed for four of the five facilities. The plan for the fifth facility (West Farm Depot) will be completed in 2011. During its first year as a co-permittee, the MCPS provided maintenance, repaired and upgraded its stormwater facilities, conducted staff training, and incorporated ESD into its construction projects. Additionally, potential low impact development (LID) retrofit opportunities were inventoried, assessed, and prioritized at more than 70 MCPS sites. A storm drain inventory was also performed during site assessments and this information will be integrated with the County's existing storm drain GIS database.

Montgomery County's permit requires continued implementation of a program to reduce pollutants associated with road maintenance activities. The program is to include street sweeping, inlet cleaning, increased use of IPM, and controlling the overuse of deicing materials. The County reported that 1,246 miles of priority residential routes were swept in March-June 2010 resulting in 777 tons of material collected. Additionally, 2,100 inlets were cleaned during the reporting period resulting in the removal of 181 tons of debris from the storm drain system.

The amount of herbicide used on County road rights-of-way to control noxious weeds was reported for 2007 through 2009. The primary herbicides used are Clopyralid and Glyphosate and application is by State-certified applicators. There has been an annual increase in the use of Clopyralid and a large spike in Glyphosate use during 2008. While three years does not provide adequate data to assess trends, the County needs to continue to track this information and explore ways to reduce herbicide, pesticide, and fertilizer use. Information regarding pesticide and fertilizer use was not submitted. Similarly, the County reported that 169,633 tons of salt and sand were applied for deicing County roads in fiscal year 2010. Information regarding the investigation of alternative materials and techniques, equipment calibration, and staff training was not reported. Montgomery County needs to report annually its efforts to reduce pesticide and fertilizer use, as well as efforts to controlling the overuse of deicing materials.

Public Education

As discussed above, the DEP maintains an Illegal Dumping Hotline (240.777.DUMP) and a call center number (311) for water quality issues, illicit discharges, and spills. Additionally, the County has developed outreach materials for specific problems such as pet waste pickup, lawn stewardship, littering, etc. These materials will be disseminated to targeted audiences as part of an implementation strategy for programmatic practices identified in the County's Coordinated Implementation Strategy (CIS) and TMDL implementation plans described below. The County also continues to implement a diverse public outreach program that focuses on its RainScapes Program, stream resource monitoring, and stormwater maintenance and capital improvement projects. Recent activities include participating in numerous public and community events focused on minorities such as the Asian American Community Resource Fair. While the County continues to do an excellent job with the development and dissemination of outreach material, the true success of these efforts will be gauged by measurable changes in behavior and improved water quality for the targeted pollutants of concern. An assessment regarding changes in public awareness and behavior should be made.

Montgomery County has successfully implemented many of the stormwater management program elements required by its NPDES permit. While certain program components are considered to be strong (e.g., erosion and sediment control, response to water quality complaints, and public outreach) a quantitative assessment of other programmatic activities cannot be made due to inadequate documentation or reporting. Montgomery County needs to address reporting problems so that the implementation of the fundamental components of its stormwater management program can be properly assessed. The future omission of required reporting elements cannot continue and will be deemed a failure to comply with permit requirements.

Watershed Assessment

Montgomery County is required to conduct a systematic assessment of water quality within its watersheds, identify water quality improvement opportunities, and develop and implement watershed restoration plans. Specific requirements include providing a schedule for completing

these assessments and to complete an assessment for the Great Seneca Creek and Muddy Branch watersheds during the first year of the permit term. The County reported that assessment work for the Great Seneca Creek and Muddy Branch watersheds should be finalized in 2011.

Montgomery County has two major drainage basins: The Patuxent River and Potomac River watersheds. These basins contain eight Maryland eight-digit watersheds with a total of 22 twelve-digit subwatersheds. Restoration plans have been developed to address WLAs for specific pollutants established in approved TMDLs for seven of the eight watersheds. Work remains to finalize the restoration plan for bacteria in the Lower Monocacy watershed.

As NPDES stormwater program implementation has evolved, there has been a move toward conducting assessments and planning based upon Maryland's hierarchical twelve-digit sub-basins. For more than ten years, stream conditions have been assessed in these smaller sub-basins through activities conducted under Montgomery County's Countywide Stream Protection Strategy. The County reported that pre-assessments have been completed and restoration plan development is underway for the Dry Seneca Creek and Little Seneca Creek watersheds; Lower Potomac Direct watershed (including Rock Run and Little Falls); and the Upper Potomac Direct watershed (including Little Monocacy and Broad Run).

The County's Coordinated Implementation Strategy, Implementation Plan Guidance Document, and Watershed Implementation Plans were included with the annual report. MDE has reviewed these documents and specific comments have been transmitted to the County under a separate cover. The County used the CWP's Watershed Treatment Model (WTM), version 2.0 (CWP, 2001) to compute existing pollutant loads and projected reductions based on implementation of proposed BMPs to address TMDL WLAs. Most of MDE's concerns revolve around the nomenclature, loading rates, and pollutant reduction rates used. These issues will need to be addressed to avoid potential conflicts with future modeling and implementation efforts.

The County continues to make a concerted effort to document watershed conditions. Similarly, significant progress has been made regarding the development of restoration plans. Ultimately, the success of the County's assessment and planning efforts will be gauged by project implementation and improved water quality.

Watershed Restoration

Montgomery County is required to implement the practices identified in its watershed restoration plans. The goal is to maximize the water quality in a single watershed, or combination of watersheds; using efforts that are definable and the effects of which are measurable; and show progress toward meeting WLAs developed under the United States Environmental Protection Agency's (EPA) approved TMDLs. In addition to showing progress toward meeting WLAs, the County is to complete the implementation of those restoration efforts that were identified and initiated during the previous permit term to restore ten percent of the County's impervious surface area. The watershed or combinations of watersheds where the restoration efforts are implemented are to be monitored to determine their effectiveness toward improving water quality. As noted above, a total of 21,458 impervious acres remain to be treated in Montgomery County and ten percent of this total is 2,146 acres. Approximately 1,005 impervious acres were reported to have been treated during the previous permit term. This leaves a balance of 1,141 acres requiring treatment to meet the prior permit goal.

Additionally, the County is required to implement restoration for an additional twenty percent

(4,392 acres) of the County's impervious surface area. Therefore, the total impervious surface treatment goal to be completed during this permit term is 5,433 acres. The planned restoration work for this permit term, as identified in the County's CIS and TMDL implementation plans, falls short of the impervious surface treatment goal by 1,131 acres. Montgomery County will need to revisit its rate of retrofitting to ensure that the impervious surface treatment goals are met for this permit term.

MDE's recently released the document, "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated," that establishes a credit system for pollutant removal rates and impervious acre equivalents for a suite of traditional and alternative stormwater practices such as stream restoration, street sweeping, and reforestation. These credits are based on approved efficiencies documented by the EPA Chesapeake Bay Program (CBP) and local monitoring efforts. Because the pollutant removal rates and impervious area equivalency rates used in MDE's guidance are conservative compared to those used by the County for development of its CIS and TMDL implementation plans, a gap between the planned project implementation and impervious surface treatment goals could be realized. The County needs to examine this potential gap to ensure that pollutant load reduction goals are met.

Annual reports are to include the monitoring data and surrogate parameter analyses used to determine water quality improvements, the estimated cost and the actual expenditures for program implementation, and the progress toward meeting applicable WLAs. This information and the associated Watershed Restoration Project database were not submitted with the annual report. During this reporting period, approximately 54 acres of impervious surfaces were treated as a result of BMP implementation. Given the current pace of implementation, future compliance with NPDES watershed restoration goals is questionable. The County needs to accelerate its implementation of restoration projects. Additionally, as indicated above, the continued omission of required reporting elements will be deemed a failure to comply with permit requirements and may further affect restoration implementation.

Assessment of Controls

Montgomery County is required to use chemical, biological, and physical monitoring to document progress toward meeting the watershed restoration goals and applicable WLAs. In April 2009, the County requested to move its watershed restoration assessment monitoring activities from the Stewart April Lane Tributary in the Paint Branch subwatershed to the Breewood Tributary in the Sligo Creek subwatershed. Both of these subwatersheds are within the Anacostia River watershed. MDE's approval of this change is contingent upon restoration projects being implemented within the drainage area above the monitoring locations. A detailed restoration implementation schedule and cost estimates were submitted with the annual report. Additionally, information regarding the relationship between restoration efforts, impervious surface treatment, and water quality improvement was included.

All monitoring requirements remain unchanged (e.g., chemical, biological, and physical protocols). Continuous flow monitoring is required at the in-stream station to develop stage and discharge relationships and pollutant load estimates. For chemical monitoring, at least three discrete samples determined to be representative of each storm event sampled are to be collected and analyzed for 12 specified parameters. Twelve storm events are to be monitored each year and baseflow samples are to be taken once per month during periods of extended dry weather.

Breewood Tributary is a first-order stream with a total drainage area of approximately 45 acres. The land use consists of 51 medium-density one-quarter acre residential lots, two multi-family complexes, and institutional uses that include Northwood High School and Northwood Presbyterian Church. Current impervious cover is 33 percent with approximately ten percent of the total area having stormwater management control. The stations were set up and chemical monitoring started in May 2009. Eight storm event and seven baseflow samples were collected from May 2009 through December 2009. Storm event sampling is well represented for each quarter with at least two in each quarter. Sampled storm events ranged in rainfall depths from 0.38 to 1.31 inches. Event mean concentrations (EMCs) were calculated and reported on MDE's Chemical Monitoring Storm Event Database as required. An initial examination of the data finds copper levels often exceeding EPA acute and chronic criteria. Additionally, the water temperature values appear to be reported in Fahrenheit for some samples and Celsius for others. The County needs to reexamine the data for accuracy. The County reported that a narrative summary of sampling analyses will be submitted with the next annual report.

In addition to chemical monitoring, the County is required to conduct biological and physical assessments between the outfall and in-stream station. The County reported that benthic macroinvertebrate sampling and physical monitoring occurred on May 7, 2010 and July 12, 2010, respectively. As with the chemical monitoring, a narrative summary of sampling analyses for the biological and physical results were not submitted but are to be included in the next annual report. In addition to reporting an Index of Biological Integrity (IBI), the County will report on the changes in the biological community's structure and function metrics. This will allow for the tracking of smaller, cumulative changes to the biological community. Concurrent with the biological sample collection, a qualitative assessment of habitat quality is performed. For physical assessment, a stream profile and two monumented cross-sections are monitored for changes in longitudinal profile, cross-section, and bed composition changes. Measurements and a comparative analysis are to occur annually.

Finally, Montgomery County is required to continue its monitoring in the Clarksburg Special Protection Area for determining the effectiveness of stormwater management practices for stream channel protection. The County identified a 294-acre drainage area of the proposed Clarksburg Town Center for monitoring. This watershed was approved by MDE in March 2002. Land use was predominantly cropland with forested buffers of varying widths with rapid development and land cover changes commencing in 2002. Development will result eventually in approximately 30% imperviousness within this watershed. The County reported that there has been a decrease in development during 2008 and 2009 due to the current economic downturn. However, many of the developments in Clarksburg have been completed and former erosion and sediment control facilities converted to stormwater management. Additionally, the County is monitoring Sopers Branch as a "paired" watershed. Sopers Branch will remain static with stable land cover and be used as a control for analyses.

Beginning in 2007, the County expanded its efforts to include comprehensive ecological monitoring and assessment in order to link land use, stream hydrology and morphology, and habitat changes to biological stream conditions. Preliminary results indicate that stream channel aggradation corresponded to the most active years of construction followed by degradation and widening as development neared final elevations and stabilization. Hydrologic analysis indicates that infiltration has decreased and annual runoff has increased with a corresponding decrease in

stream channel sinuosity. The County has concluded that faster conversion of erosion and sediment control trapping devices to stormwater management, stricter construction phasing with emphasis on stabilization, establishing grading limitations, and limiting the amount of cut and fill would result in better stream protection. The County also noted a need for more frequent BMP maintenance. Presently, MDE has addressed many of these issues in the proposed revisions to the *1994 Maryland Standards and Specifications for Erosion and Sediment Control* and State Erosion and Sediment Control regulations.

Montgomery County conducts a noteworthy stormwater monitoring program. Background conditions have been characterized using chemical, biological, and physical monitoring over the past several years. The Breewood Tributary watershed is targeted for numerous stormwater management retrofit projects. These efforts can be monitored and compared to the well established characterization data. Analyses will improve the understanding of pollutant removal efficiencies associated with watershed restoration activities and the *2000 Maryland Stormwater Design Manual*.

Program Funding

Montgomery County is required to maintain adequate funding to comply with all conditions of its NPDES stormwater permit. In 2002, Montgomery County established the Water Quality Protection Charge with a proposed rate of \$12.75 per Equivalent Residential Unit (ERU). The charge appears as a line item on property tax bills and was initially used to pay for the structural maintenance of stormwater facilities. The ERU rate is determined by the costs of structural maintenance for stormwater facilities divided by the number of ERUs. Originally, the estimated yearly collection of charges netted approximately \$4 million for Montgomery County. The fee has been raised over the years to \$35.50 per ERU, which will provide approximately \$8.5 million annually for stormwater management program activities.

Montgomery County submitted fiscal year 2010 budget information for its capital, operation, and maintenance expenditures associated with NPDES implementation efforts. The reported costs were \$27.4 million not including costs associated with inlet cleaning or property management. It was reported that the agencies responsible for these efforts are unable to parse these costs from their operating costs. It is recommended that an estimate of these costs be explored and reported as specified in Attachment A, Database L., Fiscal Analyses.

Previous annual reports indicate that the average annual funding for NPDES stormwater program activities was \$12.8 million for fiscal years 2003 through 2008. The County's watershed restoration plans contain estimated costs associated with BMP implementation through 2015. The estimated costs are approximately \$303 million over the next five years. Roughly, the annual revenues needed would be \$60 million for restoration efforts alone. It is unclear how

program funding can support the efforts needed to attain restoration goals during this permit term. As program implementation accelerates, the County will need to augment existing NPDES funding and support needs.

Total Maximum Daily Loads

Montgomery County is required to develop TMDL implementation plans that include estimates of pollutant loading reductions to be achieved by specific deadlines and describe those actions necessary to meet the storm drain systems share of WLAs in EPA approved TMDLs.

Montgomery County submitted its draft Comprehensive County Implementation Strategy, Implementation Plan Guidance Document, and Watershed Implementation Plans as required by the permit. MDE believes that these documents present a solid foundation for addressing water quality impairments not only within the current permit term but beyond as well. As discussed above, MDE has expressed concerns regarding the nomenclature, loading rates, and pollutant reduction rates used in the restoration plans. These issues will need to be addressed to avoid potential conflicts with future modeling and implementation efforts. Additionally, as described above, the County needs to complete the TMDL implementation plan for bacteria in the Lower Monocacy watershed.

Summary

Montgomery County has implemented many of the program components required by its NPDES permit. Watershed assessment, restoration plan development, and assessment of control efforts are exemplary. Program improvement can be realized by improving source identification data reporting, implementing the routine surveying of commercial and industrial areas to detect water quality problems, and the aggressive implementation of restoration practices and strategies.