Municipal Separate Storm Sewer System (MS4) Audit
Montgomery County, Maryland
September 20 - 22, 2004

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EXECUTIVE SUMMARY

Purpose

The 1972 Amendments to the Clean Water Act (CWA) established a National Pollutant Discharge Elimination System (NPDES) for the control of point source discharges into waters of the United States. In response to the need for comprehensive NPDES requirements for discharges of stormwater, Congress amended the CWA in 1987 to require the United States Environmental Protection Agency (EPA) to establish phased NPDES requirements for stormwater discharges. To implement these requirements, EPA published the initial permit application requirements for certain categories of stormwater discharges associated with industrial activity and for discharges from Municipal Separate Storm Sewer Systems (MS4s) located in municipalities with a population of 100,000 or more (Phase I sources) on November 16, 1990. Stormwater discharge permits provide a mechanism for monitoring the discharge of pollutants from Phase I sources to waters of the United States and for establishing appropriate controls. Montgomery County applied for and holds an NPDES MS4 stormwater permit. The purpose of the audit was to determine, to the best practical extent, if Montgomery County is in compliance with its NPDES MS4 permit, the CWA, and appropriate federal regulations and guidance.

Audit Team

Jerry Whittum, Science Applications International Corporation
Carol Winston, Science Applications International Corporation
Chad Harsh, EPA Region 3
Chuck Schadel, EPA Region 3

Methodology

On September 20 - 22, 2004, an MS4 audit was conducted at Montgomery County, Maryland. The evaluation was led by an EPA Region 3 contractor Science Applications International Corporation (SAIC). EPA also participated in the audit.

The audit included a review of Montgomery County's MS4 permit requirements and annual reports. The on-site portion of the audit included interviews with various staff and management personnel involved in the MS4 program, file reviews, and oversight inspections of the construction and County facility programs.

General Findings

Montgomery County is well along with the implementation of its MS4 program and has achieved positives in the program; however, some concerns have been identified. The following list represents the most significant strengths and concerns with Montgomery County's MS4 program. The main report contains additional findings and supporting information. In the main report,

required and recommended actions are provided after the findings for each program component.

There are several areas where Montgomery County (County) has gone beyond the requirements specified in its permit to create programs that enhance implementation and achievement of the goals of the stormwater program. Two examples include the (1) Storm Drain Committee established by the Highway Maintenance Division to address drainage issues for which responsibility was not easily determined and (2) inspecting belowground stormwater management facilities on an annual rather than a triennial schedule. In addition, the County has fully achieved the requirements for the watershed restoration and assessment. The County uses stream monitoring to assess 20% of the watersheds annually, and thereby assesses 100% of the watersheds during the five-year permit cycle.

FINDINGS

Source Identification

- Part II.C.2 of the County's permit states that by January 3, 2005, the County must delineate the drainage area for all major outfalls. The County has approximately 10,000 outfalls. The County has delineated drainage areas for 3,600 outfalls that have Best Management Practice (BMP) controls, but has not delineated drainage areas for the 6,500 remaining outfalls. The County stated that they will not be able to meet the January 3, 2005 deadline, but anticipate delineating all major outfalls during 2005.

Stormwater Management Program

- Stormwater Management Plan reviews are comprehensive and well-documented. The County uses checklists that ensure consistent review of plans.

- Contract inspections were comprehensive, and the inspection program is almost exclusively proactive.

Illicit Connection Detection and Elimination

- Under Part II.E.2.d of the County's permit, the County must identify and include information on all County-owned facilities requiring NPDES permits. Currently the County does not include information on two County facilities with NPDES permits - the Resource Recovery facility and the Composting facility.

- When conducting site visits to the County facilities, staff at the County facilities were diligent and conscientious. The County currently does not have a checklist for conducting the daily walk-through of their facilities to ensure that they observe all relevant areas.

- The County has developed a voluntary program where all County agencies/departments must identify their environmental issues and develop environmental action plans. This activity goes beyond the County's permit requirements.

Illegal Dumping and Spills

- The County has a good program for identifying and targeting specific problem areas/issues for illicit discharges. For example, the County has specifically identified and developed programs to address vehicle maintenance and repair shops, stores that sell pesticides, and restaurants (i.e., to address food and grease problems).

Erosion and Sediment Control

- Erosion and Sediment Control Plan reviews are comprehensive and well-documented.

During the site visits to the construction sites by the MS4 audit team, some items of concern were identified:

- It was uncertain that controls (i.e., sediment ponds) were being properly maintained (i.e., through dredging). The inspector stated that the ponds are to be dredged by the permittee when a specified sediment level is reached; however, there appeared to be no accurate means to ascertain the sediment level.

- Portable toilets are allowed to be placed next to site street storm drain inlets. Placement of the portable toilets at those locations increases the potential for a chemical spill to the storm drain inlet if a vehicle were to strike the portable toilet.

- A stockpile was observed that had no controls (e.g., stabilization, silt fence).

- The County inspector stated that prior to beginning construction, silt fence must be placed at the perimeter of the construction area. Soil had been moved, forms installed, and concrete walls were being poured at one site that did not have a perimeter silt fence.

Other items of concern that were also observed during the site visits which would typically be addressed in the Erosion and Sediment Control plan review process were identified:

- It appeared that the use of source controls such as additional silt fence and inlet protection might be appropriate. Internal site areas belonging to the developer did not require controls, and runoff to the site streets during a storm event could be excessive.

- It appeared that non-stormwater discharges (e.g., concrete washout, significant materials) may not be appropriately addressed, even if not currently required under the County's erosion and sediment control program.

- The site sedimentation pond was discharging a very turbid effluent. It was uncertain if the County has criteria for situations when BMPs such as flocculation are to be used to aid in settling in sedimentation ponds.

Road Maintenance Activities

- Road maintenance program staff interviewed were very knowledgeable of their programs and stormwater issues. The road maintenance program is almost exclusively reactive (i.e., maintenance is done in response to complaints).

Municipal Separate Storm Sewer System (MS4) Audit
Montgomery County, Maryland
September 20 - 22, 2004

BACKGROUND

At the request of the U.S. Environmental Protection Agency (EPA) Region 3, a Municipal Separate Storm Sewer System (MS4) Audit was conducted on September 20 - 22, 2004, at Montgomery County, Maryland. The audit team included Carol Winston and Jerry Whittum of Science Applications International Corporation and Chad Harsh and Chuck Schadel of EPA Region 3.

Montgomery County, Maryland (County) was issued Permit No. 00-DP-3320 MD0068349 for its MS4. The permit is effective from July 5, 2001 to July 5, 2006 and was modified January 26, 2004. Under the permit, the County is required to implement the components of the Stormwater Management Program described in the permit.

Attendees at the opening conference included the following County staff:

- James Caldwell, Director, Montgomery County Department of Environmental Protection
- Boyd Church, Chief, Stormwater Facility Maintenance Program, Montgomery County Department of Environmental Protection
- Meosotis Curtis, Senior Planning Specialist, Montgomery County Department of Environmental Protection
- Daniel Harper, Manager, Montgomery County Department of Environmental Protection
- Michael Reahl, Manager, Sediment Control/Stormwater Inspection, Montgomery County Department of Environmental Protection
- Cameron Wiegand, Chief, Watershed Management Division, Montgomery County Department of Environmental Protection
- Stan Wong, Division Chief, Division of Land Development Services, Montgomery County Department of Environmental Protection.

The County's permit was modified on January 26, 2004, to include six Phase II localities as co-permittees (i.e., Towns of Chevy Chase, Chevy Chase Village, Kensington, Somerset, and Poolesville, and the Village of Friendship Heights). The County attorney reviewed the County's legal authority to determine that the jurisdictions of the six Phase II municipalities were within the County's current legal authority. Montgomery County accepted responsibility for the storm sewer system, which included these localities, in 1968. Chapter 19 of the County Code, which covers all aspects of the stormwater program, also covers all the co-permittees.

The remainder of this report is divided into the program components as specified in Permit No. 00-DP-3320 MD0068349. Each program component section contains a brief summary of the permit requirement; findings associated with that program component; and required actions and/or recommended actions.

STORMWATER MANAGEMENT PROGRAM COMPONENTS

SOURCE IDENTIFICATION

GIS Capabilities

Requirements: Under Part III.C.1 of Permit 00-DP-3320 MD0068349, by 01/09/2002, Montgomery County must submit an example of its geographic information system (GIS) capabilities that includes the identification of all data layers available and the stage of development and a description of how data are stored, accessed, and used.

Findings: In the County's 1998 Annual Report, the County submitted a GIS example that included resource attributes within the Cabin John Creek watershed. The Maryland Department of the Environment (MDE) considered the example to be complete.

Required Actions: None.

Recommended Actions: None.

Storm Drain System

Requirements: Under Part III.C.2 of Permit 00-DP-3320 MD0068349, by 01/03/2005, Montgomery County must submit data identifying the extent of its storm drain system. Data must be submitted on CD-ROM and include all major outfalls, associated inlets, and all appurtenant conveyances. In addition, the County must delineate the drainage area for all major outfalls.

Findings: The County considers the MS4 to be both an old system (constructed before 1997) and a new system (piping constructed since 1997). Approximately 90% of the old system has been placed in the GIS and the remaining 10% is to be added as identified. (No paperwork exists for the 10% portion of the system.) Approximately 95% of the private system that has been deeded to the public, and approximately 5% of the County and the private systems have been placed in the GIS. The County has field mapped (collected the latitude and longitude) for the known outfalls, inlets, and manholes. The County has gathered data and incorporated some data into the GIS for some swales, ponds, permitted industrial facilities (including address and footprint), and monitoring points.

The County has approximately 10,000 outfalls total. The County has delineated the drainage area for the 3,600 outfalls that have Best Management Practice (BMP) controls. Approximately 6,500 remaining outfalls do not have their drainage areas delineated. Ms. Curtis stated that the County will not be able to meet the January 3, 2005 deadline for delineating all major outfalls in the GIS, but

expects the delineation to be completed in 2005. She stated that a lack of sufficient funding resulted in a lack of sufficient staff. The County did hire an additional staff for source identification in 2003, but additional staff are needed.

Required Actions: Under Part III.C.2 of the permit, the County is required to delineate the drainage area for all major outfalls by January 3, 2005. Due to insufficient funding, the County has lagged in delineating the drainage area for all major outfalls. The County does not expect to have all major outfall drainage areas included in the GIS by the required date. The County must delineate the drainage areas for all major outfalls by January 3, 2005, or request the State to modify the date by which this activity must be completed.

Recommended Actions: None.

New Source Identification

Requirements: Under Part III.C.3 of Permit 00-DP-3320 MD0068349, Montgomery County must compile any new source identification information on a continual basis and summarize the data collection process in its annual reports.

Findings: The County located and included 19.6 miles of unknown piping and has continued to include newly-deeded piping and stormwater management facilities. The County has summarized the data collection process in its annual reports.

Required Actions: None.

Recommended Actions: None.

Stormwater Management Facility Construction Completion Data

Requirements: Under Part III.C.4 of Permit 00-DP-3320 MD0068349, Montgomery County must submit stormwater management facility construction completion data for MDE's Urban Best Management Practice Database in its annual reports.

Findings: The County has submitted stormwater management facility construction completion data in its annual reports.

Required Actions: None.

Recommended Actions: None.

DISCHARGE CHARACTERIZATION

Long-Term Discharge Characterization

Requirements: Under Part III.D.1 of Permit 00-DP-3320 MD0068349, Montgomery County must perform long-term discharge characterization monitoring of an outfall and an

associated in-stream monitoring station using the minimum requirements for chemical, biological, and physical monitoring.

For Chemical Monitoring:

- monitoring must be performed at the Stewart-April Lane outfall and an associated downstream location in a tributary to Paint Branch for the characterization of runoff from high density residential land use.

- continuous flow measurements must be recorded at the in-stream monitoring station. These data or a calibrated watershed model must be used to facilitate annual and seasonal pollutant load estimates.

- twelve (12) storm events must be monitored per year at the outfall and in-stream monitoring locations with at least three (3) occurring per quarter. Quarters must be based on a calendar year. If extended dry weather periods occur, baseflow samples must be taken at least once per month at the in-stream monitoring station and, if flow is observed, at the outfall.

- discrete samples of stormwater flow must be collected at the outfall and in-stream monitoring stations using automated or manual sampling methods. Measurements of pH and water temperature must be taken.

- at least three (3) samples determined to be representative of each storm event must be submitted to a laboratory for analysis according to the methods listed under 40 CFR Part 136 and event mean concentrations (EMCs) must be developed for the following parameters: Biochemical Oxygen Demand (BOD_5), Total Cadmium, Total Kjeldahl Nitrogen (TKN), Nitrate plus Nitrite, Total Petroleum Hydrocarbons (TPH), Total Phosphorus, Total Copper, Total Phenols, Total Zinc, Fecal Coliform, Total Lead, Oil and Grease*, Total Suspended Solids (TSS)*. (* is optional).

For Biological Monitoring:

- monitoring must commence with chemical monitoring and the stream reach between the outfall and the in-stream station must be monitored each Spring and Fall using EPA's Rapid Bioassessment Protocols or other method approved by MDE.

For Physical Stream Assessment:

- a geomorphologic stream assessment must be conducted between the

outfall and in-stream monitoring station. This assessment must include, at a minimum, an annual comparison of permanently monumented stream channel cross-sections, an annual comparison of the stream profile, and a stream habitat assessment using techniques as defined by EPA's "Rapid Bioassessment Protocols for use in Wadeable Streams and Rivers," or other similar method approved by MDE.

- annually, a hydrologic and/or hydraulic model must be used (e.g., TR-20, HEC-2, HEC-RAS, HSPF, SWMM, etc.) to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.

Findings: The County has conducted long-term discharge characterization monitoring for chemical, biological, and physical parameters. The characterization monitoring was conducted in the Lower Paint Branch of the Anacostia Watershed. The monitoring points, as required by the permit, are located at the outfall at Stewart-April Lane (on a tributary to the Lower Paint Branch) and downstream (on Lower Paint Branch). The tributary to the Lower Paint Branch passes through an area of single family and high-density residential and commercial properties. In addition to the permit-required monitoring points, the County has also conducted background monitoring on the Lower Paint Branch above the confluence with the tributary.

The County operates and records automatic flow measurement of the stream. The flow measurement reading is collected every 15 minutes and digitally recorded as a time series. The flow gauge is linked to the automatic samplers and triggers sampling to begin when the flow rises a selected percentage above the dry weather flow.

The County monitored 12 storm events during 2003. The County did not collect dry-weather samples during September or October 2003 because an extended dry weather period did not occur during those months.

The County uses a discrete automatic sampler for the outfall and in-stream monitoring. Versar Inc. (Versar), a County contractor, visits the sample points following the storm event and selects three discrete samples (i.e., rising flow, peak flow, and falling flow). Measurements of pH and water temperature are also collected.

The County contracts Versar to conduct sample collection and handling. The County periodically observes Versar during sample collection and handling. As described above, Versar collects three discrete samples from each storm event. Versar transports the samples to the Washington Suburban Sanitary Commission

(WSSC) in Silver Spring, MD for analysis. The analytical methods used by WSSC comply with 40 CFR Part 136.

The County conducts both chemical (e.g., nutrients, metals) and biological (i.e., fish, benthic macroinvertebrate) monitoring and habitat assessments. Monitoring was conducted in March and September 2003.

The physical stream assessment for the tributary at Stewart-April Lane has been completed. The US Army Corps of Engineers or their contractor has run the TR-20 model as a part of the Stewart-April Lane retrofit process.

Required Actions: None.

Recommended Actions: None.

Evaluate Effectiveness of Stormwater Management System

Requirements: Under Part III.D.2 of Permit 00-DP-3320 MD0068349, Montgomery County must evaluate the effectiveness of a stormwater management system constructed in accordance with the *2000 Maryland Stormwater Design Manual* for stream channel protection effectiveness.

Findings: In 2002, the County selected the Little Seneca Creek watershed to evaluate the effects of stormwater BMPs in the *2000 Maryland Stormwater Design Manual*. The watershed area has experienced rapid residential development during 2003 and 2004. The County is using the Fish and Wildlife Service to quantify the geomorphologic change.

As required under Part III.D.2.b of the permit, the County has surveyed the Little Seneca Creek, conducted geomorphologic monitoring, and assessed stream channelization (i.e., channel parameters, slope, straight line distance, sinuosity) and stream habitat. Sopers Branch, in the Little Bennett watershed, is being used as a control (see Document Log No. 70). The County established a baseline stream profile as of 1994.

As required under Part III.D.2.c of the permit, the County provides the baseline cross-section and stream profiles in electronic spreadsheets in Attachment A of its Annual Report.

To comply with Part III.D.2.d of the permit, the County required developers within the Little Seneca Creek area to run a TR-20 model to compare pre-development and post-development runoff. The model runs have been temporarily deferred until the development projects design and approval process has progressed such that accurate modeling can occur. Modeling has been

conducted for portions of the area for which Stormwater Management plans have been developed.

Required Actions: None.

Recommended Actions: None.

MANAGEMENT PROGRAMS

Stormwater Management Program - Inspections

Requirements: Under Part III.E.1.a of Permit 00-DP-3320 MD0068349, and in accordance with Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland, Montgomery County must conduct preventative maintenance inspections 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 enforcement action(s) used to facilitate inspection order compliance, maintenance inspection schedules, and any other relevant information must be submitted in the County's annual reports.

Findings: The County conducts preventative maintenance inspections of all aboveground stormwater management facilities triennially and belowground stormwater management facilities annually (which exceeds the permit requirement). The County has contractors who conduct the inspections of the stormwater management facilities; however, the County conducts all enforcement.

The County maintains databases of the public and private facilities which alert County staff as to when facility inspections should be scheduled. The private database also alerts County staff to send a letter annually to the owners of private belowground facilities directing that the belowground structure be pumped out. County Department of Environmental Protection (DEP) inspectors visit the site during the pump-out process and inspect for repair needs. If repair needs are identified, the owner is required to either make urgent repairs typically within 30 days or make non-urgent repairs the following year when the tank is again pumped down.

The County's Annual Report contains documentation of the number of public and private facilities inspected, number of follow-up inspections, and the percentage of facilities in need of repair. The County does not document in the Annual Report the identification of the facilities inspected and the enforcement actions conducted; this information is documented in internal records and is summarized in the Annual Report.

The MS4 audit team visited private and County-owned stormwater management facility sites (see Appendix 3) and observed the County contractor conducting inspections. The contract inspectors were very comprehensive and effective, and the inspection program is almost exclusively proactive.

Required Actions: None.

Recommended Actions: None.

Stormwater Management Program - Modify Existing County Ordinances, Regulations, and Administrative Procedures

Requirements: Under Part III.E.1.b of Permit 00-DP-3320 MD0068349, Montgomery County must modify its existing ordinances, regulations, and administrative procedures to accommodate the implementation of the *2000 Maryland Stormwater Design Manual*.

Findings: Chapter 19, Article II. Stormwater Management of the Montgomery County Code (County Code) provides the authority for the County's stormwater management program (see Document log No. 5). Specifically, a person that receives a building permit or an erosion and sediment control permit must provide on-site stormwater management unless the Director waives the requirement. Section 19-26, which contains the stormwater management design criteria, references the Maryland Stormwater Design manual as the official guide for stormwater management principles, methods, and practices.

Required Actions: None.

Recommended Actions: None.

Stormwater Management Program - Implement *2000 Maryland Stormwater Design Manual*

Requirements: Under Section Part III.E.1.c and .d of Permit 00-DP-3320 MD0068349, Montgomery County must implement the stormwater management design policies, principles, methods, and practices found in the *2000 Maryland Stormwater Design Manual*. Montgomery County must track the progress toward satisfying the implementation.

Findings: The County staff use the *2000 Maryland Stormwater Design Manual* for guidance during the review process for the Stormwater Management Plan. The local standard specifications developed by Montgomery County use the *2000 Maryland Stormwater Design Manual* standards, but also include additional detail. The County has implemented comprehensive and well-documented processes for Stormwater Management Plan reviews. County staff use checklists which ensure a consistent review of plans. The County provided the MS4 audit team with examples of the review checklists for stormwater management filtration system plans, underground stormwater management facility plans, stormwater management pond plans, as-built/record drawing plans, and water quality storm drain plans (see Document Log Nos. 11, 12, 13, 14, 15).

The County has used a "Hansen" database since 1999 to track all aspects of the stormwater management administrative procedures including permit application; fee computation; project number; project name; identification of staff who enter

the data; the plan review; the bonding process; site inspection reports; and permit termination.

Montgomery County has a committee that reviews the changes and interprets the *2000 Maryland Stormwater Design Manual*.

Required Actions: None.

Recommended Actions: None.

Illicit Connection Detection and Elimination Program

Requirements: Under Part III.E.2.a of Permit 00-DP-3320 MD0068349, Montgomery County must ensure that all discharges to the municipal separate storm sewer that are not composed entirely of stormwater are either permitted by MDE or eliminated.

Findings: Emergency Bill No. 25-94 concerning Water Quality Discharges (see Document Log No. 45) and Article IV., 19-47 through 19-54 provides the County with the ability to prohibit discharges to its MS4 that are not composed entirely of stormwater (see Document Log No. 5).

Previously, sections of the County were randomly evaluated on an annual basis to determine if illicit connections existed and to require elimination and/or correction of the connections. Currently, problem areas in the County, which are mainly industrial or areas where they have complaints, are targeted. The decision of which areas to target is based on field screening (i.e., outfall monitoring). During 2003, the County also focused on the outfalls of Phase II municipalities.

Required Actions: None.

Recommended Actions: None.

Illicit Connection Detection and Elimination Program - Field Screening

Requirements: Under Part III.E.2.b of Permit 00-DP-3320 MD0068349, Montgomery County must annually field screen at least 100 outfalls. Outfalls with a discharge must be sampled using a chemical test kit.

Findings: The County conducts 100 outfall field screening events annually. The outfall monitoring is conducted by five staff. The County has an Instruction Sheet (see Document Log No. 48) and a Storm Drain Outfall Screening and Monitoring Field Sheet for staff conducting the field screening (see Document Log No. 46). The Watershed Management Division staff monitor 40 outfalls annually, and the Division of Environmental Policy and Compliance (DEPC) staff monitor 60 outfalls annually. To date in 2004, the County had screened 101 outfalls and identified 18 dry weather flows. When a dry weather flow is observed, the

County staff try to identify the source by map and by tracking the source upstream in the piping. Fourteen dry-weather flows were identified as piped streams, and four as actual dry-weather flows. The County also conducted follow-up outfall screening.

Required Actions: None.

Recommended Actions: None.

Illicit Connection Detection and Elimination Program - Field Screening Reporting

Requirements: Under Part III.E.2.c of Permit 00-DP-3320 MD0068349, Montgomery County must report annually the results of field screening activities on MDE's illicit connection detection database to include: the number of illegal storm drain connections, the results of investigations, any enforcement used, the disposition of all illegal storm drain system connections found as a result of this portion of Montgomery County's stormwater management program, an updated list of targeted outfalls, and an inspection schedule.

Findings: The County's Annual Report contains the results of the field screening activities. The County designates the areas to be targeted during the upcoming year in each year's annual report. The 2003 Annual Report states that the 2004 target will be the older, urban areas and will include the seven reaches identified as impaired by other than physical habitat factors.

Required Actions: None.

Recommended Actions: None.

Illicit Connection Detection and Elimination Program - County-Owned Facilities with NPDES Permits

Requirements: Under Part III.E.2.d of Permit 00-DP-3320 MD0068349, Montgomery County must identify all County-owned facilities requiring an NPDES discharge permit and submit documentation that a permit has been obtained for each facility. The implementation status of pollution prevention plans for these County-owned facilities must also be submitted with the County's annual reports.

Findings: The County's Annual Report includes a list and summary of the County-owned facilities requiring an NPDES permit. The list and summary are provided in Table III-E5 of the 2003 Annual Report.

The County does not currently include information on two County facilities (i.e., the Resource Recovery facility and the Composting facility) with NPDES permits.

When conducting site visits at County facilities during the MS4 audit, the MS4 audit team found the staff at the County facilities to be diligent and conscientious (see inspection reports in Appendix 2). The County facilities did not have a checklist for conducting the daily site inspections.

Pollution Prevention: The County has developed a voluntary program where all County agencies/departments must identify their environmental issues and develop environmental action plans. According to Resolution 15-597 (see Document Log No. 4), the environmental action plans developed by County agencies and departments must be submitted to the County Council by July 29, 2004. In the environmental action plans, each agency and department will identify the environmental issues that it wishes to address and the appropriate environmental actions it will implement to address the identified issues. The County-wide environmental action plan covers everything from environmentally-preferred purchasing to reducing impacts associated with field work. This voluntary program goes beyond the permit requirements.

Required Actions: Under Part III.E.2.d of its permit, the County must submit information in its Annual Report on County-owned facilities with NPDES permits. The County is currently not including information on its Resource Recovery facility and Composting facility, both of which have NPDES permits according to County staff. In accordance with its permit requirements, the County must submit information on its Resource Recovery facility and Composting facility in its Annual Report.

Recommended Actions: The County should consider developing a checklist to use when conducting daily inspections of their facilities to ensure all relevant areas are inspected.

Illegal Dumping and Spills

Requirements: Under Part III.E.3 of Permit 00-DP-3320 MD0068349, Montgomery County must maintain the implementation of its existing program to respond to illegal dumping and spills including procedures for public reporting and citizen complaints.

Findings: Illegal Dumping: The County maintains an illegal dumping hotline. The complaints are logged into the County's case database (i.e., CaseBase) by an information specialist, who assigns the case to an investigator. The investigators also receive complaints via email and the County web site. Complaints are logged into a County database where all actions related to the complaint are tracked. County staff provided the MS4 audit team with an example case summary report from the CaseBase for a complaint regarding a whitish substance flowing in and coating a County stream (see Document Log No. 51a). DEPC has about 1,500 environmental cases per year (for all environmental media). In 2003, 246 and 14 cases were related to water and stormwater, respectively. DEPC staff have

citation authority. An example civil citation for an illicit discharge was provided to the MS4 audit team (see Document Log No. 50).

Targeting for Illicit Discharges: The County has developed a good program for identifying and targeting specific problem areas and issues for potential illicit discharges. For example, the County has specifically identified and targeted vehicle maintenance and repair shops, stores that sell pesticides, and restaurants with food and grease problems, and has developed activities and materials to address these areas (see Document Log No. 37). The County has implemented a program called Environmental Partners Program. As an example, under this program, an automotive repair shop would allow the County to come in and conduct a compliance and pollution prevention inspection. If the automotive repair shop then attempts to remedy the problems and implement pollution prevention recommendations, the shop can become an environmental partner. Example compliance and pollution prevention inspection reports were provided to the MS4 audit team (see Document Log Nos. 44a, 44b, 44c).

Spill Response: The County Fire Department provides first response to spills. The DEPC provides support to the Fire Department. During normal business hours, the Fire Department will contact the County DEP to report spills. The Fire Department will contain the spill and DEP will oversee the clean-up and remediation as necessary. The responsible party, if identified, is provided with a list of clean-up contractors. If the responsible party cannot be identified, the State Emergency Response Division is contacted. The State Emergency Response Division will respond to the site and provide contractor clean-up. After-hours spills are reported to the State Emergency Response Division. The County DEP has produced an Emergency Response Guide (see Document Log No. 52) for its staff. The County fleet vehicles carry minor spill clean-up materials, and the staff are trained in the 40-hour OSHA HAZWOPER training.

WSSC is responsible for and will respond to sanitary sewer overflows (SSOs). Generally, WSSC notifies the County and provides specific details of SSOs that enter the MS4. The WSSC Sewer Overflow Policy, which details reporting procedures, was provided to the MS4 audit team (see Document Log No. 51b).

Required Actions: None.

Recommended Actions: None.

Erosion and Sediment Control

Requirements: Under Part III.E.4.and 4.b of Permit 00-DP-3320 MD0068349 and in accordance with the Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland, Montgomery County must maintain an acceptable erosion and sediment control

program and must conduct responsible personnel certification classes at least three times per year to educate construction site operators regarding erosion and sediment control compliance. Program activity must be recorded on MDE's green card database and submitted with the Montgomery County annual report.

Findings: Chapter 19, Article I. Erosion and Sediment Control of the County Code provides the authority for the County's erosion and sediment control program (see Document log No. 5). Specifically, Section 19-2 requires an erosion and sediment control permit for any land-disturbing activity which disturbs 5,000 square feet or more of surface area; results in 100 cubic yards or more of earth movement; or is for construction of a new residential or commercial building. A program evaluation of Montgomery County's Erosion and Sediment Control Program was conducted by MDE during September, October, and November of 2003. Based on this evaluation, MDE continued delegation of the erosion and sediment control enforcement authority to Montgomery County to June 30, 2006.

Plan Review: An erosion and sediment control (ESC) plan must be prepared in accordance with Chapter 19, Article I, County regulations, standards and specifications (specifications being defined as the *1983 Maryland Standards and Specifications for Soil Erosion and Sediment Control* or any subsequent revisions, and requirements of the Montgomery County Soil Conservation District). The County has developed two documents containing information on its ESC program: *Erosion and Sediment Control Design Guidelines, March 2003* (see Document Log No. 7) and *Sediment Control Handbook, Winter 2003* (see Document Log No. 8). It was unclear whether Montgomery County requires ESC plans to address potential non-stormwater discharges (e.g., stormwater containing concrete) from the construction site. For example, although the Sediment Control Handbook does not address BMPs for significant materials such as concrete that might be used on a construction site, an "Official Notice" provided by the County to the MS4 audit team noted that discharges of any pollutant are prohibited, and all potential pollutants must be covered and stored properly (see Document Log No. 23).

Review of ESC plans is performed in the County Department of Permitting Services. The County encourages ESC permit applicants to meet with County staff before submitting their applications. The County has implemented comprehensive and well-documented processes for Stormwater Management Plan reviews. County staff reviewers use the Erosion and Sediment Control Plan Review Checklist (see Document Log No. 10). Once the ESC plan is approved, the permit is effective for two years after the date of issuance. As a condition of the permit, the permittee must notify the County 48 hours before beginning construction. The majority of permittees request pre-construction meetings to go over the requirements.

Inspections and Enforcement: The County currently has 14 inspectors (and an additional inspector on leave) who are each assigned to geographic areas. The 15 geographic areas are shown on the Stormwater/Sediment Control Inspection Areas map (see Document Log No. 34). County inspectors conduct both ESC and Stormwater Management inspections at the construction site. Each site is typically scheduled for inspection every two weeks unless there are problems at the site or the site requires more frequent inspection because of the construction activities occurring. Inspectors have laptop computers in their vehicles into which they enter the inspection information as soon as the inspection is completed. An example sediment control/stormwater management inspection report was provided to the MS4 audit team (see Document Log No. 26).

The MS4 audit team site visited private and County-owned construction sites (see Appendix 1). Findings associated with the County inspection of the private construction site were as follows:

- It was uncertain that controls (i.e., sediment ponds) are being properly maintained (i.e., dredged). The inspector stated that the ponds are to be dredged by the permittee when a specified sediment level is reached; however, there appeared to be no accurate means to ascertain the sediment level.

- Portable toilets are allowed to be placed next to site street storm drain inlets. Placement of the portable toilets at those locations increases the potential for a chemical spill to the storm drain inlet if a vehicle were to strike the portable toilet.

- A stockpile was observed that had no controls (e.g., stabilization, silt fence).

- The County inspector stated that prior to beginning construction, silt fence must be placed at the perimeter of the construction area. Soil had been moved, forms installed, and concrete walls were being poured at one site that did not have a perimeter silt fence.

- The County inspector did not check any paperwork such as self-inspection reports at the construction sites. (In the State of Maryland, this may not be required as part of the County's program.)

Other items of concern that were also observed during the site visits which would typically be addressed in the Erosion and Sediment Control plan review process were identified:

- It appeared that the use of source controls such as additional silt fence and inlet protection might be appropriate. Internal site areas belonging to the developer did not require controls, and runoff to the site streets during a storm event could be excessive.

- It appeared that non-stormwater discharges (e.g., concrete washout, significant materials) may not be appropriately addressed even if not currently required under the County's erosion and sediment control program.

- The site sedimentation pond was discharging a very turbid effluent. It was uncertain if the County has criteria for situations when BMPs such as flocculation is to be used to aid in settling in sedimentation ponds. Flocculation was being used at another construction site visited during the MS4 audit.

The County uses several types of enforcement actions including stop work (see Document Log No. 24), notices of violation (see Document Log No. 27), and citation/fines. The citation/fine is $500 for the first offense and $750 for the second offense. The County is allowed by State law to issue a certain maximum fine amount. All inspectors are code enforcement officers and get training from the Office of the County Authority. The County provided the MS4 audit team with the training document entitled *Code Enforcement in Montgomery County: Process and Procedure, From Citation to Trial and Beyond, August 2002* (see Document Log No. 9), which covers the citation and the process, the trial, trial results and problem solving, settlements, roles and relationships, and special issues in code enforcement.

The County also has a reference document for inspectors entitled *Inspector's Manual, Sediment Control & Stormwater Management Inspections*.

Personnel Certification: The County maintains a mailing list of contractors and distributes a newsletter entitled Constructive Comments (see Document Log No. 33). The County also provides a training course monthly on Erosion and Sediment Control. The training course, which costs $30.00 per person, covers proper construction, implementation, and maintenance of sediment control measures. It is intended for personnel from land development, engineering, and excavation firms. Participants receive the *Sediment Control Handbook*, and after completion of the course and an exam, receive a certification from the County (i.e., Green Card). All contractors must have at least one certified personnel who holds a Green Card on the construction site.

Required Actions: None.

Recommended Actions: The following recommendations were based on the construction site visit conducted during the audit by the MS4 team: (1) There appeared to be no accurate means to ensure that the sediment ponds are dredged by the permittee when the specified sediment level is reached. The County should ensure that permittees implement methods for accurately determining the sediment level so that sedimentation basins can be dredged as required.

(2) Internal site areas that were not experiencing building construction were not required to have source controls to limit or reduce the loss of sediment to site streets, sedimentation ponds, and potentially the receiving waters. During the ESC plan review, the County should ensure that the ESC includes storm water controls such as silt fence and/or other controls for internal areas belonging to developers when there is a potential for loss of sediment to the site streets and sedimentation ponds.

(3) It appeared that non-storm water discharges such as concrete washout are not addressed. During the ESC plan review, the County should address non-storm water discharges and require site operators to implement appropriate BMPs.
(4) Placement of portable toilets at construction sites did not appear to be located to protect storm water from potential pollutants. The County should develop criteria for the placement of portable toilets, such as prohibiting placement on a street or requiring placement at a reasonable distance from a storm drain inlet.

(5) A soil stockpile was observed that had no storm water controls. A building site was observed that had construction occurring (i.e., pouring concrete walls), but did not have storm water controls. The County inspectors should ensure that all required storm water controls are implemented and maintained to minimize pollutant discharges in storm water.

(6) One site visited during the MS4 audit had a sedimentation pond that was discharging a turbid effluent but was not using flocculation, while another construction site visited was using flocculation. It is uncertain if the County has criteria for situations when flocculation aids should be used in sedimentation ponds. The County should develop and implement criteria that uniformly require BMP controls such as settling aids to minimize sediment in discharges from construction sites.

(7) Although this may not be required by the State of Maryland, the County should consider including in its inspection procedures a review of self-inspection reports at construction sites to ensure that site developers/operators are adequately identifying and correcting problems.

Public Education and Outreach

Requirements: Under Part III.E.5.a and .b of Permit 00-DP-3320 MD0068349, Montgomery County must provide information regarding the water quality issues to the general public and to the regulated community when requested.

Findings: The County provides public outreach through various means including but not limited to fact sheets (e.g., Rainscapes), web site materials, the GreenMan televison broadcasts and articles, workshops, and community activities. The County provides educational tools and training for teachers and presents school programs. The County has promoted water conservation through various means.

The County web site article entitled Stormwater Control (see Document Log No. 84) addresses stormwater facility maintenance. The County offers erosion and sediment control training monthly to the general public with a target audience of land-developers, engineers, and excavation firms (as previously discussed in Erosion and Sediment Control section).

As part of its public outreach program, the County:

- Provides information on lawn care; alternatives to fertilizers, pesticides, and herbicides; and landscape management through television broadcasts and outreach materials (see Document Log Nos. 39, 78).
- Provides information on grass recycling and composting (see Document Log Nos. 76, 78).
- Produced a television broadcast on business recycling.
- Produced an Illegal Dumping pamphlet (see Document Log No. 41) with a hazardous waste telephone number and an Illegal Dumping fact sheet with a hotline number to report observed illegal dumping (see Document Log No. 82).
- Produced a television broadcast addressing illegal dumping and household hazardous waste (see Document Log No. 77).
- Developed a Vehicle Maintenance and Repair manual that promotes recycling and the proper environmental handling of chemicals (see Document Log No. 37).
- Provided other vehicle stormwater-related materials (see Document Log No. 72).
- Produced English and Spanish pamphlets entitled Oil & Water Don't Mix (see Document Log Nos. 73, 74).
- Provided information on hybrid electric vehicles and is preparing information on alternative means of transportation.

Required Actions: None.

Recommended Actions: None.

Road Maintenance Activities

Requirements: Under Part III.E.6 of Permit 00-DP-3320 MD0068349, Montgomery County must develop and implement a plan to reduce pollutants associated with road maintenance activities. At a minimum, the County must document and submit progress on inlet cleaning; reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with roadside vegetative practices; and controlling the overuse of winter weather deicing materials.

Findings: The County performs the described maintenance activities below.

Cleaning inlets and drains - For storm drain cleaning, the County typically conducts flushing, rather than using the vactor truck because the majority of the structures are jammed with logs, limbs, and debris which are impossible to vactor out. According to the County's 2003 Annual Report, the Department of Public Works and Transportation (DPWT), Division of Highway Services removed accumulated material from a total of 9,750 linear feet of storm drains during 2003.

The County's maintenance program is complaint-driven. Complaints come into the County via the publicized telephone numbers, a web site, etc. The complaint is transmitted to the appropriate DPWT depot, which is responsible for addressing the complaint. Typical response time to address maintenance needs is within one or two days. An example service request printout was provided to the MS4 audit team (see Document Log No. 62). The field crews determine the maintenance priorities and then schedule as appropriate. When DPWT becomes aware that severe weather is coming, the staff try to catch up with the outstanding maintenance needs.

Several years ago, the County had a backlog of approximately 75 storm drain complaints for which it was unclear who was responsible for addressing these complaints. DPWT, Division of Highway Services started the Storm Drain Committee comprising every division/department within the County to resolve who had responsibility for addressing and implementing a solution for storm drain complaints. The Storm Drain Committee meets bimonthly and prepares a status report on outstanding issues that indicates who has responsibility to address each storm drain issue. An example memorandum from a Storm Drain Committee meeting held in May 2003 was provided to the MS4 audit team (see Document Log No. 61).

Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with roadside vegetative practices - Mr. Guy Turenne, Tree Maintenance Program Manager in DPWT, Division of Operations/Highway

Maintenance Section discussed the DPWT's program. DPWT uses three non-restricted use pesticides - Round-Up, Rodeo, and Pendulum. The DPWT has in-house staff at each depot who have gone through pesticide training. Mr. Turenne is the certified applicator, and other staff are registered to apply pesticides. At any given time, DPWT has 30 staff who apply pesticides. Mr. Turenne conducts the staff training each year. The training comprises video modules followed by a test. A copy of the test for Module 1: Pesticides Laws and Regulations was provided to the MS4 audit team (see Document Log No. 55). DPWT does not have Standard Operation Procedures for pesticides handling, use, and disposal.

Pesticides are all stored at the warehouse in Gaithersburg and are distributed as needed. Therefore, each depot would only have a limited amount of pesticides stored on the site.

Street sweeping - Annual street sweeping occurs in the spring in numbered routes which have a regular schedule (see Document Log No. 57). All other County roads are swept on an as-needed basis (generated by service requests similar to storm drain cleaning). Priority areas (i.e., the Northwest Branch, Paint Branch, Little Paint Branch, Sligo Creek, and Watts Branch watersheds) were identified by the County DEP for street sweeping (see Document log No. 58).

The County tracks the amount of debris collected daily on each route to translate into pounds collected per curb mile. According to the County's 2003 Annual Report, from April to August 2003, DPWT Division of Highway Services swept 3,895 miles of arterial roads and 182 miles of residential roads, collecting 4,451 tons of material. The County tested the collected street sweeping debris a few years ago to see if it could be recycled, and it could not. Thus, the collected debris is taken directly to the County waste transfer station.

Snow removal/control of winter weather deicing materials - The County uses a salt/sand mixture (4 parts salt/1 part sand) for deicing. Salt storage domes are located at each DPWT depot. During a winter storm event, the County generally salts about 34% of the roads, while 66% of the roads are to be plowed and only have salt applied if needed. Every County truck used for salt/sand application is rebuilt and recalibrated in-house.

The County experimented with using liquid magnesium chloride, but it was not successful. However, DPWT staff noted that they will continue to try to apply liquid magnesium chloride when appropriate. DPWT staff noted that currently some localities are pre-applying anti-icing materials. This probably does not work in Montgomery County because the process only works within a very small temperature range. Pre-applying anti-icing materials is better for colder, dry events, rather than wet freezing rain.

The County developed a Snow Procedures manual, which is distributed to management. Copies of the Snow Procedures manual are kept at every depot, and names of the staff receiving the manual are maintained; 21 copies have been distributed. The County also developed Snow Removal Training (see Document Log No. 69). The training includes sections on preparing equipment (e.g., plows and sanders) and tips for sensible salting. County staff will attend the annual Snow Conference when the budget is sufficient.

Required Actions: None.

Recommended Actions: The County DPWT should develop and implement Standard Operating Procedures for pesticides handling, use, and disposal for DPWT staff.

Reduction of Herbicide, Pesticide, and Fertilizer Use

Requirements: Under Part III.E.7 of Permit 00-DP-3320 MD0068349, as a component of the County's Pollution Prevention Program, the use, control, and reduction of herbicides, pesticides, and fertilizers must be examined for all Montgomery County government departments. A report describing the present application activities and proposed reduction strategies must be submitted to MDE as part of the County's second annual report. Each subsequent annual report must include the status of implementing the reduction strategies.

Findings: In 1990, the County decided that all County agencies and departments would create an integrated pest management strategy. In 1996, the Pest Management Policy (Policy) for DPWT was signed (see Document Log No. 66a). The policy indicates that Integrated Pest Management Practices (IPM) will be used within County facilities and grounds and addresses pest control scheduling (i.e., pesticide applications); materials selection, handling, and storage; and ventilation of areas where pesticides are applied. The Division of Facilities and Services within DPWT is responsible for implementation of the policy.

Pesticide applications are done at County facilities by County contractors. DPWT, Division of Facilities and Services developed a list of approved Pesticide Products for use by the County's Pest Control Contractors (see Document Log No. 66b). Since most of the pesticides are restricted-use pesticides, the contractors must have certifications with the Maryland Department of Agriculture. Example pesticide business licenses and pest control applicator certificates for County pest control contractors were provided to the MS4 audit team (see Document Log Nos. 67 and 68). Before a contractor uses any pesticide, the contractor must have approval from Mr. Jeffrey Marks, Program Manager in the Facilities Maintenance and Operations Section, DPWT, for use of the proposed pesticides. An example contract for landscape services requires the contractor to use the principles of IPM

when addressing disease and insect control in trees, shrubs, groundcover, and grasses (see Document Log No. 65). An example contract for structural pest control was also provided to the MS4 audit team (see Document Log No. 64).

Mr. Marks provided the pesticide usage for calendar year 2003 for both landscape and structural pest control (see Document Log No. 63). According to County staff and as noted in the County's 2003 Annual Report, no fertilizers were applied in 2002 and 2003.

Required Actions: None.

Recommended Actions: None.

WATERSHED RESTORATION

Biological and Physical Monitoring

Requirements: Under Part III.F.1 of Permit 00-DP-3320 MD0068349, biological and physical habitat monitoring must continue to be conducted as a screening tool to identify and evaluate water quality problems by subwatershed.

Findings: The County uses stream monitoring for watershed assessment. Each year, the County assesses twenty percent of the watersheds and thereby will evaluate all County watersheds during the five-year permit term. The County plans to repeat the process at the same monitoring stations during the next permit cycle.

The five-year period has been changed to coincide with the Maryland Department of Natural Resources (MDNR) biological monitoring cycle. The County installs a monitoring station in the same watershed as the MDNR to increase the coverage. Monitoring is conducted for fish and benthics. Watershed screening was conducted in five subwatersheds in 2003.

Required Actions: None.

Recommended Actions: None.

Watershed Restoration

Requirements: Under Part III.F.2 of Permit 00-DP-3320 MD0068349, within 12 months of permit issuance Montgomery County must select a watershed, or combination of watersheds, to be restored.

Findings: The County previously selected the Upper Paint Branch, Northwest Branch, and Rock Creek for improvement and was beginning the process for Cabin John Creek, Hawlings River, and Lower Paint Branch. The County has selected the

Turkey Branch Watershed (part of Rock Creek) for current restoration. Since 1996, the County has assessed and identified restoration opportunities in approximately forty percent of the County's total watershed area. The County has exceeded the required activities for ten percent of the impervious area (per the permit requirement).

Required Actions: None.

Recommended Actions: None.

Watershed Assessment

Requirements: Under Part III.F.3 of Permit 00-DP-3320 MD0068349, within 18 months of issuance of this permit, Montgomery County must complete and submit for MDE approval a detailed assessment of the watershed described above that at a minimum must determine current water quality conditions; identify and rank water quality problems; identify all structural and nonstructural water quality improvement opportunities; include the results of a visual watershed inspection; specify how the restoration efforts will be monitored; and provide an estimated cost and schedule. After completing the assessment, Montgomery County must submit a watershed assessment for an additional watershed equaling ten percent impervious area by the end of the permit.

Findings: The County provided the information (listed above) in its Interim Report for Watershed Restoration (see Document Log No. 54). In addition, the County has produced related public fact sheets (see Document Log Nos. 6, 88 - 92).

An assessment and restoration schedule for the Turkey Branch subwatershed was submitted in January 2003. The County conducted Turkey Branch pre-construction monitoring during 2002 and 2003 and plans post-restoration monitoring at one, three, and five-years following construction (e.g., ponds).

Required Actions: None.

Recommended Actions: None.

Implement Watershed Restoration

Requirements: Under Part III.F.4 of Permit 00-DP-3320 MD0068349, within 18 months of permit issuance, Montgomery County must begin to implement restoration efforts according to the schedule outlined above. The annual report must document the progress toward meeting the schedule, the estimated cost and actual implementation expenditures, and surrogate parameter monitoring data for analysis used to determine water quality improvement.

Findings: The County has initiated evaluation of the Turkey Branch and anticipates implementation of restoration by 2005. The County will use contracted services for the restoration monitoring and as appropriate for specific restoration projects and goals.

Required Actions: None.

Recommended Actions: None.