Municipal Separate Storm Sewer System (MS4) Audit
Arlington County, Virginia
September 13 – 15, 2005

Prepared for:
EPA Region 3
EPA Office of Water
Virginia Department of Conservation & Recreation

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EXECUTIVE SUMMARY

Detailed findings from the Municipal Separate Storm Sewer System (MS4) audit conducted in Arlington, Virginia, on September 13-15, 2005 are presented in this report. The major general findings from the MS4 audit are as follows:

Required Actions

- The County must update its written Storm Water Management Program.

- The County must inspect and maintain municipally owned storm water detention and water quality BMP facilities once per permit cycle, require maintenance certifications for all privately maintained water quality BMPs, and perform random inspections of privately owned BMPs to ensure compliance.

- The County must revise its enforcement protocol to address illicit discharge events and revise its recordkeeping system for illicit discharge incidents.

- The County must develop a method for identifying existing industrial facilities as well as new industrial facilities. The County must also develop and maintain a list of VPDES-permitted facilities to be included in the County's annual report.

Recommended Actions

- The County should expand its program to identify transient illicit discharges such as spills and dumping, since these types of events were identified as the most likely to be contributing pollutants to the storm drain system (rather than illegal sanitary connections).

- The County should develop and implement a standard operating procedure (SOP) for storm drain cleaning that includes material capture when clearing a clog in the storm drain system. If the County intends to continue to discharge jetted materials downstream as part of their maintenance program, they are required to notify and obtain written documentation from Virginia DEQ regarding whether a VPDES permit is needed for the discharge of wastewater.

Positive Attributes

- The County has worked with neighboring communities and regional organizations in anticipation of implementation of a plan to address the bacteria TMDL in the Four Mile Run watershed.

- The County is encouraging the adoption of Low Impact Development techniques in new developments.

- The County has implemented a volunteer biomonitoring program that for the past several years has provided baseline and trend data to determine the overall health of Arlington's stream ecosystems.

- The County has undertaken an extensive program using closed circuit TV to determine the condition of the storm drain system and identify areas where maintenance and upgrades are needed.

- The County, as part of its retrofit program, has implemented several stream corridor restoration projects to restore heavily incised streams and reduce streambank erosion.

INTRODUCTION

At the request of U.S. Environmental Protection Agency (EPA) Region 3, EPA Office of Water, and the Virginia Department of Conservation and Recreation (DCR), a Municipal Separate Storm Sewer System (MS4) Audit was conducted on September 13-15, 2005 in Arlington County, Virginia. The audit consisted of both a programmatic, in-office review and an in-field verification of program implementation.

The audit team included John Kosco and Martina Keefe, Tetra Tech, Inc.; Paula Estornell, Andy Dinsmore, Ann Carkhuff, EPA Region 3; Peter Bahor, EPA Office of Enforcement and Compliance; Jennifer Molloy, EPA Office of Water; Reginald Parrish, EPA Chesapeake Bay Program; Doug Fritz and Gary Switzer; Virginia Department of Conservation and Recreation (DCR).

Arlington County, Virginia, was issued Permit No. VA0088587, effective from August 28, 2002 to August 27, 2007. Arlington County is the only permittee under this permit. Under the permit, the County is required to implement its storm water management program, including "pollution prevention measures, management or removal techniques, storm water monitoring, use of legal authority, and other appropriate means to control the quality and quantity of storm water…"

This report summarizes the findings of the MS4 audit organized by the individual components described in the County's FY2004 Annual Report which is largely the same order and format as the County's VPDES permit. Each program component section contains a summary of the findings associated with each program component along with any identified required and recommended actions.

In addition to the findings listed below, the audit team identified several activities the County is implementing that have a positive impact on its stormwater management program:

- The County has worked with neighboring communities and regional organizations in anticipation of implementation of a plan to address the bacteria TMDL in the Four Mile Run watershed. The County targets many of its efforts, such as monitoring and trash cleanup, in this watershed in large part to address the waterbody's specific water quality concerns.

- The County is encouraging the adoption of Low Impact Development techniques in new developments through the use of its Site Design Standards Worksheet. This worksheet also describes when certain site design features, such as rooftop disconnection to vegetated areas, qualifies for potential credit towards meeting the County's stormwater requirements.

- The County has implemented a volunteer biomonitoring program that for the past several years has provided baseline and trend data to determine the overall health of Arlington's stream ecosystems. This volunteer monitoring program was recently highlighted in a Washington Post Magazine feature article on November 27, 2005.

- The County has undertaken an extensive program using closed circuit TV to determine the condition of the storm drain system and identify areas where maintenance and upgrades are needed. This careful documentation of storm drain system conditions also can help in identifying illicit connections.

- The County, as part of its retrofit program, has implemented several stream corridor restoration projects to restore heavily incised streams and reduce streambank erosion. Completed projects include the Benjamin Banneker Project and the Glencarlyn Dog Exercise Area, and the Donaldson Run Project is currently underway.

FINDINGS

1. Stormwater Management Program (Permit Sections A.2 and B.4)

Permit Section A.2 requires the County to "implement and, where appropriate, refine the Storm Water Management Program" and "update the program as necessary." The County's current storm water management program is as described in its Part 2 application, submitted to Virginia DEQ and EPA over 10 years ago. The County has not formally updated the storm water management program since the Part 2 submittal.

Required actions: *In accordance with Section A.2 and B.4 of Permit No. VA0088587, the County must update its written Storm Water Management Program.*

Recommended actions: *None.*

2. Structural and Source Controls (Permit Section B.1.a) and Retrofitting (Permit Section B.1.d)

Structural and Source Controls

The County has several municipally owned storm water controls that it is responsible for maintaining. These include Beaver Pond and Sparrow's Pond, which are storm water treatment wetlands, as well as hydrodynamic devices. The County is still in the process of completing an inventory of municipally owned BMPs and has not developed or implemented a comprehensive maintenance program for these facilities.

The County currently requires maintenance certifications from private stormwater detention facilities (e.g., ponds), but not water quality BMP facilities (e.g., commercial stormwater treatment units). Also, the County has not yet begun to conduct random inspections to ensure that privately owned facilities are properly functioning and maintained.

Retrofitting

Restoration of the Sparrow's Pond facility was identified as an opportunity for retrofit, and this restoration was completed in 2002. The County is in the process of investigating the feasibility of

retrofitting Beaver Pond. The County is also considering installation of hydrodynamic devices in the storm drain system; one hydrodynamic device has been installed at the Arlington County Trades Center, which was under redevelopment at the time of the evaluation. Specific locations for hydrodynamic device installation have not yet been identified.

Required actions: *In accordance with Section B.1.a of Permit No. VA0088587, the County must:*

(1) Inspect and maintain municipally owned storm water detention and water quality BMP facilities once per permit cycle.
(2) Require maintenance certifications for all privately maintained water quality BMPs.
(3) Perform random inspections of privately owned BMPs to ensure compliance.

Recommended actions: *The County should do the following:*

(1) Complete its inventory of municipally owned storm water detention and water quality BMP facilities.
(2) Develop an inspection and maintenance schedule for the facilities that is consistent with manufacturer recommendations, pollutant accumulation rates, or results of past facility inspections.
(3) Track and report information such as the inspection frequency and type of maintenance performed for each facility in the County's annual report.

3. Areas of New Development and Redevelopment (Permit Section B.1.b)

The new development and redevelopment program is primarily implemented through the Chesapeake Bay Preservation Ordinance (CBPO). The County has developed a CBPO Guidance Manual (Version 2.1, dated January 2005) that provides guidance on complying with the CBPO. In general, new development or redevelopment with more than 2,500 square feet of land disturbance are required to comply by developing a Landscape Conservation Plan, a Stormwater Management Plan, and an Erosion and Sediment Control Plan. Project applicants developing a Stormwater Management Plan are required to include a stormwater requirements worksheet and a site design standards worksheet. Projects must calculate the overall pollutant removal requirements for the site and then calculate onsite treatment required. Projects may have the option of contributing to a Watershed Management Fund for regional watershed management programs instead of providing on-site treatment for all required runoff.

The County does not apply specific source control standards to project. For example, although the CBPO includes requirements to preserve vegetation, source controls for common projects such as commercial retail are not included. The County does use a "site design standards worksheet" to encourage permit applicants to incorporate better site design techniques into their projects.

Required actions: *None*.

Recommended actions: *The County should do the following:*

Develop specific source control standards for common new development projects.

4. Roadways (Permit Section B.1.c)

Street sweeping: The County has implemented a street sweeping program using regenerative air sweepers to reduce dust generation. Residential roads are swept 6 times per year on average, and commercial corridors are swept an average of 13 times per year. The commercial Rosslyn/Ballston corridor is swept weekly. All roads in the county are swept in the spring to capture sand and salt accumulation from winter road maintenance (roads are swept less frequently in the winter). The County tracks the volume of material collected and has the capability to track the number of road miles swept.

Winter road maintenance: The County applies both abrasives and salt to roads based on public safety considerations. The Parks Department does not apply salt at nature centers. Sand and salt are collected via street sweeping in the spring unless a complaint of excessive buildup is received. Salt and sand are stored in covered domes at two locations. Collected snow is dumped in the Quincy parking lot without BMPs to contain or treat potentially contaminated runoff.

Required actions: *None*.

Recommended actions: *The County should do the following:*

> *Consider implementing BMPs to treat runoff from melting snow stockpiles that could result in the transport of salts and sand to receiving waters. These BMPs could include establishing filter berms that can capture particulates and chemicals from meltwater or sweeping storage areas after each pile has melted to recover abrasives.*

5. Pesticide, Herbicide, and Fertilizer Application (Permit Section B.1.e)

The County Parks, Recreation, and Cultural Resources Department uses pesticides, herbicides, and fertilizers during ground maintenance activities. Staff using these chemicals are certified and receive ongoing training on safe handling and proper application. Chemicals are stored in sheds with trays used to contain leaks and spills. The County employs integrated pest management techniques such as monitoring, mechanical maintenance, selective spraying, tolerance of pests, and plant selection. When applying chemicals, County employees follow labeling instructions. The County has developed and documented an informal plan for using pesticides, herbicides, and fertilizers. The County tracks the amount of chemicals used but does not evaluate these data.

Required actions: *None*

Recommended actions: *The County should do the following:*

> *(1) Formalize existing plans for pesticide, herbicide, and fertilizer use and integrated pest management goals and document this information in the SWMP.*

6. Illicit Discharges and Improper Disposal (Permit Section B.1.f)

The County has an ordinance prohibiting illicit discharges to the storm drain system, which is discussed further in Section 14 of this report. Because of the transient nature of illicit discharge events, in most cases it is difficult for the County to identify the source of the discharge. Also,

when sources are identified, enforcement of the ordinance is limited due to staffing limitations and because illicit discharge incidents must be heard in court. Most of the time, incidents are not escalated to this level. The County does not have the authority to issue tickets to parties responsible for illicit discharges.

Through the County's program to inspect storm sewer lines using closed-circuit television, the County is able to identify pipes in need of maintenance, thereby helping to reduce the incidence of infiltration of seepage from sanitary sewers. Maintenance such as new pipe linings is tracked in the storm drain infrastructure GIS system. Additionally, dry weather screening is conducted that would allow the County to pinpoint areas where seepage is occurring.

The County addresses floatable pollutants through their infrastructure maintenance programs, namely street sweeping and catch basin cleaning. The County also has solid waste and recycling programs that provide receptacles in trash-generating areas. Finally, the County addresses floatable pollutants as part of their education and outreach activities. Data on trash generation and amounts collected during infrastructure maintenance activities are not analyzed to identify areas or neighborhoods with high rates of floatable pollutant loading. Future plans call for the installation of hydrodynamic devices to treat stormwater for floatable pollutants.

The County offers used oil recycling services at the Water Pollution Control Plant to augment collection at service stations. Other household wastes and chemicals can be dropped off at the plant weekly or at biannual collection events. These services are advertised in utility bills, on the County's Web site, through citizen phone inquiries, and via presentations made to associations and at county events. The household hazardous waste program focuses on residents – businesses are informed of proper disposal procedures and their materials are not accepted at the Water Pollution Control Plant.

Green waste generated by homeowners is collected by County crews. During the fall, the County collects leaves that residents bag or rake into the street, and citizens can call the County to have branches and other green waste picked up throughout the year. This material is composted at the County Trades Center. Grass clippings are not accepted – the County uses education to encourage homeowners to leave clippings on the lawn.

Pet waste is addressed through several programs. Dog parks include signage and bags encouraging proper disposal of pet wastes. Additionally, the County has an ordinance requiring pet owners to clean up after their pets. Parks are inspected and maintained regularly to ensure that pet wastes are not accumulating on the ground or in receptacles.

The County has conducted dry weather screening for the past 5 years at frequencies greater than those specified in the Permit. Each outfall is visually inspected annually and outfalls greater than 36 inches in diameter are colorimeter-tested. Outfalls with problems identified in the past were tested for optical brighteners in 2004. As stated previously, the County conducts television inspections of the storm sewer system, which allow the County to identify and investigate suspected illicit connections.

The County uses reports from citizens and County employees to identify spills and illicit discharge incidents. County staff investigate these discharges and attempt to identify a source. When a source is identified, County staff work with the responsible party to stop the discharge. Enforcement mechanisms are used infrequently.

Required actions: *In accordance with Section B.1.f of Permit No. VA0088587, the County must:*

*(1) Revise its enforcement protocol to address illicit discharge event*s. *This issue is further discussed in Section 14 of this report.*

(2) Revise its recordkeeping system for illicit discharge incidents. The County inconsistently maintained files on incidents and did not have a tracking system to determine the status of each case with respect to the investigation, follow-up, and enforcement actions taken and still pending. The County needs to develop a protocol for storing information about illicit discharge cases to ensure that actions required by the County are taken in a timely manner and that all necessary follow-up is occurring.

Recommended actions: *The County should do the following:*

(1) Expand its program to identify transient illicit discharges such as spills and dumping, since these types of events were identified as the most likely to be contributing pollutants to the storm drain system (rather than illegal sanitary connections). This might include periodically screening high priority areas that are likely to have a high frequency of discharges, such as commercial districts, for evidence of dumping or spills. Additionally, the County can provide education to other County employees and citizens to expand reporting of incidents. Additional staff time should be allocated to investigate reports and conduct follow-up and enforcement where needed.

(2) Evaluate data on trash generation to identify areas in need of additional source controls, such as additional trash receptacles, more intensive education, or increased frequency of cleanup events, or treatment controls, such as retrofitting the storm drain system with trash racks or hydrodynamic devices.

7. Spill Prevention and Response (Permit Section B.1.g)

The Fire Department responds to spills and Environmental Services and Public Works assist in assessment and cleanup as needed. Spill incidents are tracked with respect to whether the incident involved a stream.

Required actions: *None.*

Recommended actions: *None.*

8. Industrial and High Risk Stormwater Runoff (Permit Section B.1.h)

The County has not developed a program to comprehensively identify or evaluate the pollution potential of industrial facilities. Also, the County does not conduct specific stormwater inspections at commercial businesses. Other inspections are being performed at businesses by

the Fire Department, the Health Department, and by the Water Pollution Control Plant's Pretreatment staff, but inspections specifically addressing stormwater concerns have not been added to these departments' inspection protocols. An informal referral system between the Fire Department and Environmental Services is used to inform stormwater staff of possible issues at businesses.

The County does not maintain a list of VPDES-permitted facilities in its jurisdiction.

Required actions: *In accordance with Section B.1.h of Permit No. VA0088587, the County must:*

(1) Develop a method for identifying existing industrial facilities as well as new industrial facilities. The County is required in Permit Section B.1.h to determine whether such facilities are contributing a substantial pollutant loading to the storm drain system. An inventory of facilities is necessary to ensure that the County is meeting its requirement to address potential discharges from these sources.

(2) Develop and maintain a list of VPDES-permitted facilities to be included in the County's annual report.

Recommended actions: *The County should do the following:*

(1) Work with the Fire Department, Health Department, and Pretreatment staff to coordinate inspections and ensure that stormwater issues are being addressed at commercial facilities.

(2) Develop a set of questions or inspection items to be considered as well as a protocol for referring stormwater violators to the Environmental Services Department for investigation and follow-up.

9. Construction Site Runoff (Permit Section B.1.i)

The County's Department of Public Works Engineering Division manages the Erosion and Sediment Control Program. The County currently has two plan review staff and four inspectors, with two inspectors primarily inspecting commercial and multi-family projects and the other two inspectors (one under contract to the County) inspecting single family construction projects.

The County's Erosion and Sediment Control Ordinance requires all projects disturbing at least 2,500 square feet to develop an erosion and sediment control plan. The County has developed a 6-page plan review checklist that includes the required elements for each major section of a plan. The County also delivers a memo to all project applicants notifying them of the requirement to comply with DCRs construction general permit, but does not verify that the project has actually applied for the permit.

During plan review, the County requires erosion and sediment control plans to be approved prior to filing for a building permit (except for single family homes where the reviews occur simultaneously). The County reviews erosion and sediment control plans, but does not review or require the submittal of SWPPPs. In general, the erosion and sediment control plans generally do not address other sources of stormwater pollution such as material storage areas, concrete washouts, and waste management.

The County's four primary stormwater construction inspectors receive state-certified training each year. In addition, County Building Inspectors have also received erosion and sediment control training. The County stormwater inspectors, however, do not inspect for non-erosion and sediment control BMPs at construction sites such as good housekeeping practices, concrete washouts, or other pollution prevention measures.

The County's inspectors inspect sites at varying frequencies depending on the size and complexity of the project, but generally inspect each site about once a week or more frequently. However, because of the large number of single family homes under construction, the County stated that it was not able to inspect all of these projects within 48 hours following a rain event.

Required actions: *In accordance with Section B.1.i of Permit No. VA0088587, the County must remain consistent with DCR's requirements for a fully approved Erosion and Sediment Control Program. This includes the inspection of construction projects within 48 hours following any runoff producing storm event (or an alternate inspection schedule approved by DCR).*

Recommended actions: *The County should do the following:*

(1) Train inspectors to identify good housekeeping and other non-sediment potential pollutant sources such as concrete waste at construction sites.
(2) Review paperwork on-site to verify the existence of a VPDES stormwater permit and a stormwater pollution prevention plan (SWPPP).
(3) Develop outreach material that is specifically targeted to single family home construction, the most common type of construction in the County.

10. Storm Sewer Infrastructure Management (Permit Section B.1.j)

The County has developed an inventory of the storm sewer system, most of which has been entered into a GIS. Field verification is underway to identify parts of the system that are not yet documented. These data are augmented by television inspection of the system, which identifies pipes and connections that are not consistent with existing system maps.

The County uses a contractor to inspect and clean its catch basins; the schedule is based on a grid system. County crews respond to citizen complaints and perform additional maintenance (other than debris removal) that is identified by contractors during regular inspections. County crews also perform maintenance of creeks and open channels, but only on a complaint basis. When storm drain lines are cleared of clogs, materials are not recovered (i.e., they are flushed through the storm drain system to receiving waters).

The County tracks maintenance performed in terms of the number of catch basins inspected and cleaned and the weight of materials removed from the system. The County also tracks the number of feet of the storm sewer system television-inspected each year.

Required actions: *None.*

Recommended actions: *The County should do the following:*

Develop and implement a standard operating procedure (SOP) for storm drain cleaning that includes material capture when clearing a clog in the storm drain system. For

example, County crews can use a vacuum truck in a downstream catch basin to suction jetted materials out of the storm drain system. These materials can then be disposed of in a landfill or other designated area. If the County intends to continue to discharge jetted materials downstream as part of their maintenance program, they are required to notify and obtain written documentation from Virginia DEQ regarding whether a VPDES permit is needed for the discharge of wastewater.

11. Public Education (Permit Section B.1.k)

The County has not yet developed an overall storm water education strategy, although many activities and initiatives are taking place. The County partners with Arlingtonians for a Cleaner Environment (ACE) and other community organizations to conduct outreach and education. Each year, the County develops a campaign using one or more types of media, such as posters in Metro stations (2002), movie theater ads (2003), radio public service announcements (2005). Messages target pollutants of concern (bacteria/pet waste due to the Four Mile Run bacteria TMDL and nutrients/fertilizer due to Chesapeake Bay eutrophication) rather than specific audiences. Messages are delivered in both English and Spanish, the two most prevalent languages in the County according to Census Bureau data.

The County adapts materials and messages from other municipalities and tracks the number of impressions made for each campaign in a spreadsheet to facilitate annual reporting. Other activities include developing articles for County and homeowners' association newsletters, brochures detailing volunteer opportunities and best management practices for homeowners, and Web site content (brochures, information on environmental services offered by the County, household hazardous waste collection and other events, etc.).

Education at schools has been performed in partnership with ACE and Americorps. Signs have been posted in parks and along waterbodies with environmental education and watershed awareness messages.

Public participation activities include stream cleanups, Adopt-A-Storm Drain and Adopt-An-Outfall programs, invasive species plant removal, stream monitoring, storm drain marking, and public reporting of spills and illicit discharges. The County developed a water stewardship program that encourages neighbors to work together to bring about behavior changes through education and pledges from individuals.

The County has not developed a comprehensive program for educating municipal staff.

Required actions: *None.*

Recommended actions: *The County should do the following:*

(1) Develop a strategy for education and outreach that identifies target audiences and pollutants of concern and includes a description and schedule of activities each year that address each of these audiences and pollutants. This will allow the County to ensure that all target audiences are receiving stormwater messages and that all pollutants of concern are being addressed. The strategy should include education for municipal employees,

both general stormwater education and targeted education on BMP use for specific activities.

(2) Expand its education messages beyond residential audiences to address commercial businesses. Information can include the businesses' responsibilities under the County's ordinances, proper disposal of wastes, etc. Materials and messages can be tailored to specific businesses and activities, such as automotive maintenance facilities, restaurants, car washes/car dealers, and other business types that the County considers high priority with respect to water pollution potential.

(3) Evaluate and develop tailored messages and activities for disadvantaged communities, as these populations might not have the same activities as more affluent constituents. For example, messages addressing residents of multifamily buildings would not address lawn and garden care but might address trash and recycling issues. Also, these residents might be more likely to perform their own auto maintenance, providing a need for spill control, used oil recycling, and fluid disposal information.

12. Watershed Management (Permit Section B.1.l)

The County has developed a Watershed Management Plan that outlines a long-term strategy for monitoring, source controls, treatment controls, and stream corridor restoration, among other activities. The County has incorporated many stormwater program requirements into this Plan, although it is not a substitute for a SWMP.

Required actions: *None*.

Recommended actions: *None.*

13. Monitoring Programs (Permit Sections B.1.m and C.1, C.2, and C.3)

As described earlier, the County performs dry weather screening at a greater frequency than that required by the Permit. For the past 4 years the County has performed wet weather monitoring at 4 outfalls that drain different land uses. Additionally, instream automatic samplers are being established in Four Mile Run and Donaldson Run. This instream sampling includes both grab and flow-weighted sampling with two samples collected every 6 months.

The County conducts biomonitoring at 9 locations every 3 months using volunteers. Results are compared to a reference stream located in a relatively undeveloped stream in Northern Virginia. Floatables monitoring has also been performed for the past few years at 3 locations along Four Mile Run, although these data have not been analyzed for trends that could guide management decisions. *E. coli* monitoring is planned for various locations in the Four Mile Run watershed.

The County has not comprehensively modeled pollutant loads apart from SWMM modeling of the Four Mile Run watershed, which focused on hydraulics and hydrology. The County has also not developed a program to conduct or obtain existing monitoring data from industrial high risk facilities.

Required actions: *In accordance with Section B.1.m of Permit No. VA0088587, the County must develop a program to conduct or obtain existing monitoring data from industrial high risk facilities as specified in Permit Section B.1.m.3.*

Recommended actions: *The County should do the following:*

Analyze floatable data to identify trends in floatable pollutant loading and determine if management activities have affected loading rates.

14. Legal Authority (Permit Section B.2)

The County relies primarily on three ordinances to implement its storm water program: an Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code), Stormwater Detention Ordinance (Chapter 60) and Chesapeake Bay Preservation Ordinance (Chapter 61). The Erosion and Sediment Control Ordinance requires land-disturbing activity greater than 2,500 square feet to develop and erosion and sediment control plan. The Ordinance also adopts the Virginia Erosion and Sediment Control Handbook and Regulations as the County's program.

The Stormwater Detention Ordinance applies to all projects in the County except for single family residential development. The ordinance primarily addresses flooding caused by development and requires a certification of annual inspection of private detention systems.

The Chesapeake Bay Preservation Ordinance (CBPO) was recently revised in 2003 and is the County's primary water quality ordinance. The CBPO applies to all projects that propose to disturb more than 2,500 square feet of land. More specific standards are applied within Resource Protection Areas (RPAs), which are generally the buffer area within 100 feet of waterbodies.

When violations are identified, the County has enforcement authority, although it has not been effective due to the burden on staff to bring violators to court. Enforcement of cases is not being escalated due to the burdensome process of taking perpetrators to court. The County does not have the authority to issue tickets or fines without a hearing.

The County needs to revise its enforcement protocol to ensure that illicit discharges are addressed in a timely manner.

Required actions: *In accordance with Section B.2 of Permit No. VA0088587, the County must revise its enforcement protocol to address illicit discharges as expeditiously as reasonably possible.*

Recommended actions: *The County should do the following:*

Work with DCR to identify other legal mechanisms that can be used to hold dischargers accountable, recover cleanup costs, and help prevent future incidents.

15. Stormwater Management Program Resources (Permit Section B.3)

The County's estimates stormwater program resources, as described in the FY2004 Annual Report, include 22.25 FTE and over $3.3 million. The majority of this funding (approximately $2.5 million) is for operations and maintenance and capital improvements. The County has conducted a stormwater feasibility study and is currently in the second phase of the study developing a preliminary stormwater utility rate analysis.

Required actions: *None.*

Recommended actions: *None.*

16. Annual Report (Permit Section C.4)

The County's annual report does not include information on inspections and maintenance activities of municipally owned BMPs as well as maintenance agreements and inspections performed on private BMPs. The annual report also does not include a list of VPDES-permitted facilities. Illicit discharge incidents and follow-up activities are not reported in detail in the annual report, stemming from a communication gap between departments of which the County is aware. Construction inspection information also lacked detail.

The County's assessment of the stormwater program in the annual report also lacked detail and was generally qualitative. The County stated in the annual report that the watershed monitoring program that began in FY 2004 will provide the baseline data with which to evaluate future water quality trends and the overall effectiveness of the program.

Required actions: *In accordance with Section C.4 of Permit No. VA0088587, the County must include the following information in all future annual reports:*

(1) Inspections and maintenance activities performed on municipally owned stormwater detention facilities and water quality BMPs (C.4.a.1.a);
(2) Maintenance agreements and certifications received for privately owned stormwater detention facilities and water quality BMPs and any random inspections performed (C.4.a.1.b);
(3) Report all identified illicit dischargers, including site inspections and a description of any follow-up activities (C.4.a.6.a);
(4) Updated list of VPDES permitted facilities to the MS4 as well as other industrial stormwater discharges to the MS4 (C.4.a.8.b); and
(5) Summary of construction site inspection and enforced control measures (C.4.a.9.a)

The County also must develop a written plan for how the County will assess the effectiveness of the storm water management program (Permit Section C.4.c). This plan should build on the current watershed monitoring program and include other information such as implementation data, public survey results, and loading reduction estimates to develop a comprehensive assessment of the County's program.

APPENDIX A

Inspection of the Arlington County Trades Center
Arlington County, VA
September 14, 2005

Overview

The audit team consisted of Martina Keefe, Tetra Tech, Doug Fritz, Virginia DNR, Jenny Malloy, EPA, Rachel Hebert, EPA, and Ann Carkhuff, EPA Region 3. The site was inspected just after a light rainstorm in the afternoon of September 14, 2005.

The Arlington County Trades Center (hereafter Trades Center) consists of several buildings and material and equipment storage areas. Parts of the site were under active construction during the time of the inspection (see an aerial view of the Trades Center with key features highlighted in Photo 1).

Findings

The paved areas of the Trades Center require regular sweeping.
The parking lots and other paved areas need to be swept periodically to prevent vehicle tracking and reduce sediment loads to storm drain inlets. Some examples:

- The upper parking area west of the Water, Sewer and Streets Building showed excessive sediment buildup, indicating that the parking lot is not swept regularly (Photo 2).

- The mulch storage area north of the Traffic Engineering Building did not have secondary containment and was poorly maintained with regard to sweeping and tracking of mulch and dirt (Photo 3). Runoff from this area is unlikely to reach catch basins, so this is more of a housekeeping issue than a threat to water quality.

- The gravel and rock storage area had sediment accumulation indicating that it has not been swept (Photo 4), although a drain along the width of the road at the entrance to this area should collect runoff and sediment during small storms.

- The sand and salt storage area is covered, but the doorway is open and there is no secondary containment or evidence of sweeping to control materials tracked outside the shelter (Photo 5). Regular sweeping of the paved area outside the doorway would help to ensure that potential pollutants are not carried in runoff to catch basins.

Catch basins at the Trades Center should be cleaned regularly.
The County should add the Trades Center storm drain inlets to the inventory of catch basins that are cleaned regularly. Several of the catch basins that were observed were not well maintained, with evidence of sediment and debris buildup (Photo 6).

Housekeeping was poor in many less-visible areas of the Trades Center property.
There were several areas of the site where items were discarded improperly. Some examples:

- A car battery and pieces of lumber were scattered near one edge of the parking lot west of the Water, Sewer and Streets Building (Photo 2).

- An empty container of sealer (Photo 7) was discarded on the other side of a Jersey barrier at the end of the parking area east of the sand/salt storage dome.

- Vehicles parked east of the sand/salt storage dome showed evidence of leaks (oil spots on the ground (Photo 8). [Note that this parking area was separated from the road with a low asphalt berm (Photo 9), which would prevent runoff from smaller storms from transporting the mulch, debris, and oil down the hill.]

- Barrels were unlabeled and stored outside without cover or secondary containment (Photo 10).

- The front, more visible side of the automotive maintenance building was very tidy (Photo 11), whereas the back, less visible part had piles of scrap metal and other debris (Photo 12).

- Plastic sheets littered the area along the unpaved hillside road south of the rock and gravel storage area (Photo 13).

The County should perform periodic inspections of the entire site to identify areas where housekeeping is lacking and initiate cleanup. These inspections should be part of an overall stormwater pollution prevention plan for the site that includes standard operating procedures governing other source control practices such as parking lot and road sweeping, catch basin cleaning, and facility retrofits (covering stockpiles, installing secondary containment, etc). Also, staff training would be helpful to educate employees regarding spill prevention and control, proper disposal of materials, good housekeeping, vehicle maintenance and washing, and general stormwater management.

More spill controls are needed at the fuel island area.
The fuel islands used by County employees each had bins of kitty litter (Photo 14), and there was evidence that this material was used (Photo 15), but there were no tools for sweeping or shoveling used absorbent for proper disposal. The islands would benefit from signs directing users in spill containment and cleanup as well as tools available for proper disposal of absorbents. Also, all of the fuel pumps showed signs of leakage (Photo 16), indicating the need for maintenance.

System for containment of spills for two liquid storage tanks needs to be evaluated and revised.
Two storage tanks located east of S. Taylor St. had secondary containment via a concrete wall, but the wall system has an overflow to the pavement outside the barrier (Photo 17). The overflow pipe was approximately one foot about the ground and it did not appear to have a shut-off valve. The County should evaluate this containment system to determine whether it is adequate to prevent spills from the liquid storage tanks from migrating to storm drain inlets.

The County treats the first flush of runoff from the area where compost and other materials are stored.
The material stockpile area drains to a low point that connects to the sanitary sewer and has a small-capacity intake. Larger flows are bypassed to a storm drain inlet (Photo 18).

Photo 1: Site map of the Arlington County Trades Center.

Photo 2: A car battery and lumber improperly disposed of in parking lot.

Photo 3: The mulch pickup area does not have secondary containment and is poorly maintained.

Photo 4: The gravel and rock storage area is not swept.

Photo 5: The sand and salt storage area lacks secondary containment and sweeping of tracked materials.

Photo 6: The condition of this storm drain inlet indicates that it is not cleaned regularly.

Photo 7: This empty sealer container is improperly disposed of.

Photo 8: Vehicle shows evidence of fluid leak.

Photo 9: A berm traps runoff from a vehicle parking area.

Photo 10: Barrels are stored without a roof or secondary containment, and they are not labeled to indicate their contents.

Photo 11: The more-visible front side of the Automotive Repair Facility building is well-kept.

Photo 12: The less-visible rear of the Automotive Repair Facility building has piles of scrap metal and other debris.

Photo 13: Plastic sheeting litters a hillside at the far end of the site.

Photo 14: Each fuel island has a bin of kitty litter to be used to absorb spills.

Photo 15: Evidence of kitty litter use at the fuel island.

Photo 16: Evidence of leakage from fuel pumps indicating maintenance is needed.

Photo 17: The concrete wall providing secondary containment for two liquid storage tanks has an overflow drain to the pavement outside the enclosure.

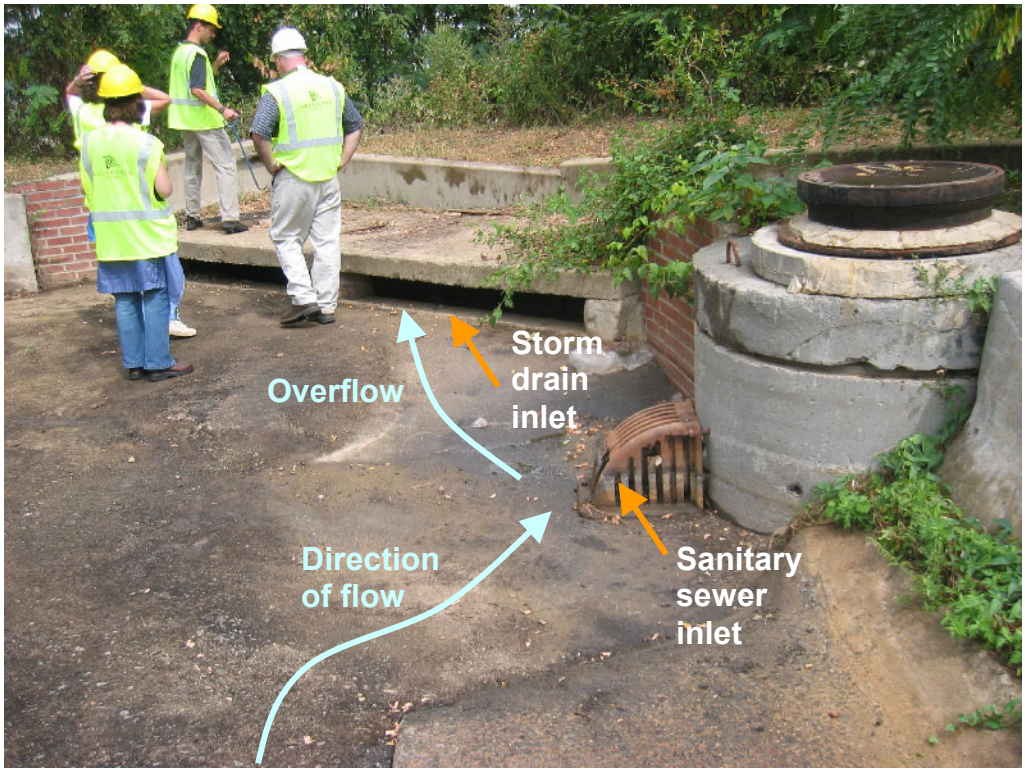

Photo 18: Runoff from a material stockpile area drains to a sanitary sewer inlet, with bypass flows entering the storm drain inlet.

APPENDIX B

Summary of MS4 Audit Construction Inspection Observations
Arlington County, VA
September 14 – 15, 2005

Overview

The audit team consisted of John Kosco, Tetra Tech, Andy Dinsmore, EPA and Gary Switzer, Virginia DCR along with construction inspectors Bill Boyce, Rodney Stanley and Joe Nichols, Department of Environmental Services (DES), Arlington County and George Hardy, consultant under contract to DES. The audit team was also joined by additional staff from the County and EPA.

The audit team observed the four County inspectors during inspections of seven construction sites across the County. Mr. Stanley and Mr. Nichols conducted inspections of commercial and multi-family construction projects, while Mr. Boyce and Mr. Hardy conducted inspections of single family home construction projects. The inspected sites included:

- Alcova Row, a townhouse project
- Cleveland Heights, a small development of about 6 single family homes
- The Regent, a large office/residential building under construction in Ballston
- Maywood Crest, construction of four single family homes
- 306 Irving, single family home construction
- 1319 N. Jackson, single family home construction
- 2034 N. Taylor St., single family home construction

Findings

All inspectors appeared knowledgeable about erosion and sediment control principles and practices. Inspectors also verified the installation and maintenance of erosion and sediment control BMPs.

However, inspectors did not identify potential stormwater problems caused by non-sediment sources, such as concrete washouts or fuel storage (see photos 7, 9, 10, 12 below). The inspectors were generally unaware of the potential stormwater problems that could be caused by these sources. The inspectors also were not trained or knowledgeable about the requirements in DCRs construction general permit and did not review SWPPPs on-site. One site, The Regent, had not applied for coverage under DCRs construction stormwater permit.

The inspectors did not complete a checklist in the field and instead stated that they summarize their notes on inspections back in the office. Observed violations were typically given a verbal warning.

Photo 1: Alcova Row Construction Site – SWPPP Notice with copy of NOI

Photo 2: Alcova Row Construction Site – Copy of SWPPP kept on-site.

Photo 3: Alcova Row Construction Site – Above grade storm drain inlet protected with silt fence.

Photo 4: Alcova Row Construction Site – Small sediment trap constructed at down-gradient corner of project (circled on photo).

Photo 5: Alcova Row Construction Site – Storm drain inlet protection.

Photo 6: Alcova Row Construction Site – Stabilized construction exit with ruble pad.

Photo 7: Cleveland Heights Construction Site – Cement partially exposed.

Photo 8: Cleveland Heights Construction Site – Construction exit with minor tracking.

Photo 9: The Regent Construction Site – Battery, used oil and gasoline containers stored without cover or secondary containment.

Photo 10: The Regent Construction Site – Diesel fuel dispenser with evidence of spills (circled on photo). No spill kit present.

Photo 11: The Regent Construction Site – Stabilized construction exit with rumble pad.

Photo 12: The Regent Construction Site – Concrete washout with

Photo 13: The Regent Construction Site – Concrete washout.

Photo 14: Maywood Crest Construction Site – Partially stabilized hillside that discharges into a sediment trap (photo 15).

Photo 15: Maywood Crest Construction Site – Sediment trap in need of maintenance.

Photo 16: 306 Irving Construction Site – Single family house under construction.

Photo 16: 306 Irving Construction Site – Silt fence that had not been toed in (this location was used to remove the dumpster to the left of the photo).