

Virginia Pollutant Discharge Elimination System

General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) Serving the Urbanized Areas of Virginia

MS4 Program Plan for the Dulles Toll Road



Permit Number VAR040120

Permit coverage from July 1, 2013 to June 30, 2018

Prepared by:

**Metropolitan Washington Airports Authority
Washington Dulles International Airport
Engineering and Maintenance Division
PO Box 17045
Washington, D.C. 20041**

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The purpose of the Dulles Toll Road (DTR) MS4 Program Plan is to consolidate descriptions of various components of the previous Virginia Department of Transportation (VDOT) General Permits, and the existing Metropolitan Washington Airports Authority (Airports Authority) Permit Number VAR040120 created for urbanized areas of Virginia, into a single unified document for Virginia Department of Environmental Quality (DEQ) and Airports Authority management purposes. The Airports Authority MS4 Permit Management program is provided in the context of the six Minimum Control Measures (MCMs) outlined in the revised Virginia General Permit, effective July 1, 2013. The six MCMs are:

1. Public Education and Outreach on Stormwater Impacts,
2. Public Involvement and Participation,
3. Illicit Discharge Detection and Elimination,
4. Construction Site Stormwater Runoff Control,
5. Post Construction Stormwater Management, and
6. Pollution Prevention/Good Housekeeping for Municipal Operations.

1. Extent of the Regulated Small MS4 area of the Dulles Toll Road

The regulated property includes the combined rights-of-ways for the Dulles Airport Access Highway (DAAH), the DTR, and Phase 1 of the Washington Metropolitan Area Transit Authority (WMATA) rail service from the West Falls Church Metro Station to Dulles. Phase 1 runs 11.5 miles from East Falls Church to Wiehle Avenue on the eastern edge of Reston. It will include four stations in Tysons Corner-Tysons east, Tysons Central 123, Tysons Central 7 and Tysons West. Construction began in March 2009 and it was completed in late 2013.

Phase 2 extend 11.4 miles farther northwest, from Wiehle Avenue through Dulles International Airport and terminating near Route 772 in eastern Loudoun County. Phase 2 will include six new stations at Reston Parkway, Herndon (Monroe Street), and Route 28 in Fairfax County, and Dulles Airport, Route 606, and Route 772 in Loudoun County. Currently, the Airports Authority anticipates Phase 2 would be ready for revenue service in 2018. However, the three stations in Loudoun County (i.e., the Dulles Airport, Route 606, and Route 772 stations) are not connected to the DTR, and therefore are not regulated under this MS4 permit.

The entire Dulles Corridor is located in Fairfax and Loudoun Counties, and the City of Falls Church, Virginia. The property is a highway and transportation right-of-way that is adjacent to residential and commercial properties. The right-of-way for these highways and selected on- and off-ramps extends in an east-west direction from just west of the Magarity Road overpass on the east side of the corridor (inside the Beltway [I-495] but before merging with I-66) to Route 28 on the west side of the corridor. The total length of the right-of-way is approximately 14 miles. The average width of the right-of-way is approximately 700 feet.

2. Identification of the Dulles Toll Road MS4 Operator and Responsibilities

The operator is the Metropolitan Washington Airports Authority (Airports Authority). There have been no modifications to any Airports Authority department roles and responsibilities since July 2010, the start date of our current MS4 permit. Christopher U. Browne is the Airport Manager. Brian A. Leuck is the Manager of the Engineering & Maintenance Department, which oversees and ensures compliance of the MS4 permit. Jon D. Byroade, Government Programs Engineer, is responsible for maintaining compliance.

3. Dulles Toll Road MS4 Hydrologic Unit Codes

There are four Hydrologic Unit Codes (HUC) identified in the Virginia 6th Order National Watershed Boundary Dataset (NWBD) that transect the DTR drainage area, as listed and shown below. Since the entire width of the transportation corridor encompassing the DAAH, the DTR, and future WMATA rail only is 450 feet on average, very little drainage area exists in each HUC. In fact, Difficult Run (PL22) contains the majority of the DTR drainage area and has the most stream crossings under the DTR. The total estimated drainage area in acres, served by the regulated small MS4 discharging to any receiving surface waters are listed below:

COUNTY	VAHU6	WATERSHED	STREAM CROSSINGS	Drainage Area (in acres)
Loudoun	PL18	Horsepen Run	2	97
Fairfax	PL21	Sugarland Run	3	103
Fairfax	PL22	Difficult Run	4	368
Arlington	PL23	Potomac River	2	108

4. Total Maximum Daily Load (TMDL) Limits for MS4 area

The DTR may be affected in the future by a total maximum daily load (TMDL) limits if allocated for Difficult Run and Sugarland Run since both have been identified as impaired receiving surface waters listed in the most recent Virginia 305(b)/303(d) Water Quality Assessment. The DTR intersects Difficult Run watershed (PL22) and the Sugarland Run watershed (PL21). DTR operations and maintenance will not cause an increase in fecal coliform, sediment loading, or any other pollutant to either watershed since sources for pollutants does not exist in the DTR drainage area. The causes and locations of impairment are given below:

Cause Group Code A11R-03-BEN Difficult Run
Benthic-Macroinvertebrate Bioassessments - Total Impaired Size by Water Type: Difficult Run
City / County: Fairfax Co.
Two biological monitoring events in 2006 at station 1aDIF005.06 (Route 675) both resulted in a VSCI score which indicates an impaired macroinvertebrate community, two biological monitoring events in 2006 at station 1aDIF010.48 (Route 681) both resulted in a VSCI score which indicates an impaired macroinvertebrate community, and two biological monitoring events in 2002 at station 1aDIF010.57 both resulted in a VSCI score which indicates an impaired macroinvertebrate community.
Location: Begins at confluence with Rocky Branch, approximately 0.25-river mile upstream of Route 672,

and continues downstream until the confluence with Wolftrap Creek.
Cause Group Code A10R-01-BAC Sugarland Run
Escherichia coli - Total Impaired Size by Water Type: Sugarland Run.
City / County: Fairfax Co and. Loudoun Co.
E. coli bacteria criterion excursions (4 of 18 samples - 22.2%) from station 1aSUG004.42, at Route 7.
Location: Begins at the confluence with Folly Lick Branch, at approximately rivermile 5.75, and continues downstream until the confluence with the Potomac River.

5. MS4 Program Elements

1. Public Education and Outreach on Stormwater Impacts (MCM 1)

As part of the Airports Authority’s Virginia Pollutant Discharge Elimination System (VPDES) individual permit number VA0089541 with Virginia Department of Environmental Quality (DEQ), the Airports Authority implemented a public education program to distribute educational materials and annual training to the community and conduct equivalent outreach activities about the impacts of stormwater discharges on water bodies and the steps that the public and airport employees can take to reduce pollutants in stormwater runoff. This activity was implemented in 2006, under Stormwater Phase II guidelines, and continues into the current year. All public education, outreach, and involvement programs under this permit have been developed and implemented in coordination with the Airports Authority Public Affairs Office and the Airport Manager’s Office. Past and ongoing efforts to satisfy this MCM are given in *Table 1*.

2. Public Involvement and Participation (MCM 2)

Public involvement and participation is difficult to implement for the DTR since the public is not allowed to stop on the DTR, except in emergencies. Any such efforts would have to be performed with the public education BMPs and may treat the DTR and Airport as a single entity, in coordination with the ongoing Rail-to-Dulles project. Activities which have been completed involve the public are included in *Table 2*.

3. Illicit Discharge Detection and Elimination (MCM 3)

The Airports Authority has developed a program to detect and eliminate illicit discharges, as defined at 9 VAC 25-750-10, into the stormwater collection system on Airport property. This project is complete for the Airport, and has been expanded to include DTR property. Efforts enacted to detect and eliminate illicit discharges into the DTR stormwater collection system can be found in *Table 3*.

4. Construction Site Stormwater Runoff Control (MCM 4)

The required regulatory mechanism to control construction runoff has been in place on the Airport for many years. In accordance with DCR regulations, a construction-related stormwater discharge permit application must be submitted for any land-disturbing activity that affects one acre or more of land. The Airports Authority has adopted a more stringent policy of 2,500 square feet or more of land disturbed. The Airports Authority requires each construction contractor to prepare a site-specific Stormwater Pollution Prevention Plan (SPPP) and to submit a copy of the DCR discharge permit with their SPPP prior to commencing land-disturbing activities.

Regardless of the size of land disturbance, all construction activities shall have erosion and sediment control plans for review and approval by the Airports Authority's Building Codes and Environmental Department, Office of Engineering, prior to the issuance of the Construction/Building Code Permit. Contractors are to exercise every reasonable precaution, including temporary and permanent measures, throughout the duration of the project to control erosion and prevent or minimize pollution of receiving waters. The contract specification also states that siltation control measures shall be applied to erodible material exposed by any activity associated with construction including, but not limited to, local material sources, stockpiles, disposal areas, and haul roads. Erosion and sediment control devices and products used are to be in accordance with the *Virginia Erosion and Sediment Control Handbook*, Third Edition, 1992 (and any subsequent revisions). Responsibility for identifying and designing site temporary and permanent BMPs for construction activities lies with the architect/engineer.

The Airports Authority will comply with the Virginia Erosion and Sediment Control Law, the Virginia Stormwater Management Act, and attendant regulations regarding land disturbance activities. All regulated land disturbance activities will be performed in accordance with the most recently DCR-approved version of the Airports Authority Erosion and Sediment Control and Stormwater Management standards and specifications. In addition, the Airports Authority will provide the controls on construction found in *Table 4*.

5. Post-Construction Stormwater Management for New Development and Redeveloped Lands (MCM 5)

The Airports Authority has developed, implemented, and enforced a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to 2,500 square feet, and projects less than 2,500 square feet that are part of a larger common plan of development. The program has been expanded to cover the DTR. Past and ongoing efforts to satisfy this MCM are given in *Table 5*.

All current stormwater ponds on the DTR are designed and constructed to function as extended detention basins, or dry ponds. Dry ponds retain water for a specified period of time (usually 24 hours) after a storm. Water is impounded temporarily to allow many of the pollutants time to settle to the bottom. The impounded water is discharged through an outlet that provides for prolonged release. This DTR MS4 inspection and maintenance program has been developed using the following guidance for the Northern Virginia area:

Northern Virginia BMP Handbook: A Guide to Planning and Designing Best Management Practices in Northern Virginia (1992); Northern Virginia Planning District Commission (NVPDC) & Engineers and Surveyors Institute (ESI)

Maintaining Stormwater Systems: A Guidebook for Private Owners and Operators in Northern Virginia (2007); the Northern Virginia Regional Commission (NVRC).

REGULAR INSPECTIONS

The Airports Authority requires a specific schedule of inspections for all ponds. In most instances, a quarterly inspection will be performed by DEQ certified inspectors, as defined in the Airports Authority's Erosion and Sediment Control Program, 2014 Revision. It will also be necessary to conduct an inspection after a large storm event during which the ponds' capacity were surpassed. The minimum frequency for inspections is annually, and after any storm that causes the capacity of the spillway to be exceeded, per 9VAC25-870-200. In addition, any problems noted during regular mowing operations will be reported to the Airports Authority.

Generally, Extended Detention (ED) Dry Ponds are prone to a high clogging risk at the low-flow outlet. Ideally, the outlet should be inspected at least four times a year after initial construction. The constantly changing water levels in ED Ponds make it difficult to mow or manage vegetative growth. The bottom of ED Ponds often become soggy, and water-loving trees such as willows may invade and will need to be managed. Periodic mowing of the stormwater buffer is only required along maintenance rights-of-way and the embankment. The remaining buffer may be managed as a meadow (mowing every other year) or forest. Frequent removal of sediment from the forebay (every 5-7 years, or when 50% of the forebay capacity is filled) is essential to maintain the function and performance of the ED Pond. Sediments excavated from ED Ponds are usually not considered toxic or hazardous, so they can be safely disposed of either by land application or land filling.

All inspections will be performed in accordance with Virginia Stormwater Management Minimum Standards 3.01, 3.02, 3.03, 3.04, 3.05, and 3.07 as specified in the Virginia Stormwater Management Handbook, Vol. I, 1999 (pages 3.01-17, 3.02-32, 3.03-7, 3.04-3, 3.05-6, and 3.07-26). These are the minimal standards for proper operation of extended detention ponds and are summarized in Attachment A, and a revised checklist from DEQ Stormwater Management Instructors Manual (Attachment B).

The goal of inspections is to identify and fix problems by asking the following questions:

STRUCTURAL INTEGRITY

- ✓ Does the pond show signs of settling, cracking, bulging, misalignment, or other structural deterioration?

- ✓ Do embankments, emergency spillways, side slopes, or inlet/outlet structures show signs of excessive erosion or slumping?
- ✓ Is the outlet pipe or structure damaged or otherwise not functioning properly?
- ✓ Do impoundment and inlet areas show erosion, low spots, or lack of stabilization?
- ✓ Are trees or saplings present on the embankment or in the pond?
- ✓ Are animal burrows present?
- ✓ Are contributing areas unstabilized with evidence of erosion?
- ✓ Do grassed areas require mowing and/or are clippings building up?

WORKING CONDITIONS

- ✓ Does the depth of sediment or other factors suggest a loss of storage volume?
- ✓ Is there standing water in inappropriate areas after a dry period?
- ✓ Is there an accumulation of floating debris and/or trash?

OTHER INSPECTION ITEMS

- ✓ Is there evidence of encroachments or improper use of basin areas?
- ✓ Are there signs of vandalism?
- ✓ Do fences, gates, or locks need repair?
- ✓ Is there excessive algae growth, or has one type of vegetation taken over the pond?
- ✓ Is there evidence of oil, grease, or other automotive fluids entering the pond?

ROUTINE AND PREVENTATIVE MAINTENANCE

VEGETATION MANAGEMENT

These ponds rely on sediment forebays to filter sediment from stormwater before it reaches the main basin. Vegetation also serves to prevent erosion of the banks and stabilize the bottom of the ponds. While turf grass and natural plants is the most common groundcover, these ponds have been retrofitted or designed to not contain woody vegetation to increase pollutant removal.

- ✓ **Mowing** - Most plants are hardiest if maintained as a natural upland meadow, therefore no mowing should occur within the pond. Grass on embankment tops and roads surrounding the ponds (if present) should be cut at least once a month during the growing season.
- ✓ **Pest and Weed Control** - To reduce the amount of pollutants reaching the pond, avoid using fertilization and pesticides. If pond remain wet, mosquitoes control should be performed if a problem. Several ponds are located very close to private homes.

- ✓ **Removing Sediment Build-Up** - Since the vegetation surrounding the pond is designed to trap sediment, it may become laden with sediment and require removal.
- ✓ **Stabilize Eroded Areas or Bare Spots** - Bare spots should be vigorously raked, backfilled if needed, covered with top soil, and seeded.
- ✓ **Unwanted Vegetation** - Some vegetation is destructive to a pond. Keeping embankments and bottom areas free of deep-rooted vegetation (i.e., woody plants) is critical as roots may destabilize the structure. Consistent monitoring and removal will control any unwanted vegetation.

EMBANKMENT AND OUTLET STABILIZATION

A stable embankment is important to ensure that erosion does not contribute to water quality problems and that embankments are not breached resulting in downstream flooding. Maintaining a healthy vegetative cover and preventing the growth of deep-rooted (woody) vegetation on embankment areas is an important component to stabilization. Animal burrows will also deteriorate the structural integrity of an embankment. Groundhogs in particular will burrow tunnels up to six inches in diameter. Efforts should be made to control excessive animal burrowing and existing burrows should be filled as soon as possible

DEBRIS AND LITTER CONTROL

Regular removal of debris and litter can be expected to help in the following areas:

- ✓ reduce the chance of clogging outlet structures and trash racks;
- ✓ prevent damage to vegetated structures;
- ✓ reduce mosquito breeding habitats;
- ✓ maintain facility appearance; and,
- ✓ reduce conditions for excessive algal growth.

MECHANICAL COMPONENTS MAINTENANCE

These ponds do not have mechanical components that need periodic attention, such as valves, sluice gates, pumps, and anti-vortex devices. They do have locked access hatches on the outlet structures which should be functional at all times. All padlocks are keyed the same.

ACCESS MAINTENANCE

Pond sites are designed so that heavy equipment can safely and easily reach the basin for non-routine maintenance. Routine maintenance of access areas is particularly important since one never knows when emergency access will be needed. Maintenance includes removal of woody vegetation, upkeep of gravel areas, fences, chains, and locks. Each pond is secured with an Airports Authority chain and lock set to prevent accidental or intentional vehicle access.

6. Pollution Prevention and Good Housekeeping for Municipal Operations (MCM 6)

The Airports Authority is expanding our existing operation and maintenance program to include a stronger training component and has the ultimate goal of preventing or reducing pollutant runoff from DTR operations. By using training materials that are available from EPA, State, and other organizations, the program includes employee training to prevent and reduce stormwater pollution from activities such as open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance. The intent of this control measure is to ensure that existing operations are performed in ways that will minimize contamination of stormwater discharges. The Airports Authority has addressed the following components when developing the program for this measure as shown in ***Table 6***.

<i>Minimum Control Measure</i>	<i>BMP</i>	<i>Measurable Goal</i>	<i>Status/Year 3 Actions</i>	<i>Future Actions</i>
<p align="center">Table 1</p> <p align="center">Public Education and Outreach</p>	BMP 1A Public Education	Develop and maintain a DTR Stormwater Management web page on www.metwashairports.com	Ongoing - The site has had 1,961 views from July 1, 2013 through June 31, 2014 by 1,783 unique visitors. The current MS4 Program Plan has been downloaded 473 times and the annual report was downloaded 492 times. This is about a 15% usage increase over the prior year.	The Airports Authority will continue to update web site posting as needed.
		Evaluate the effectiveness of the stormwater management educational videos and Public Service Announcements (PSAs) on www.metwashairports.com	Declined - The Airports Authority has determined that there is no need for the stormwater management educational videos or PSAs.	No Future Actions - Removed from MS4 Program Plan.
		Develop a Stormwater Management fact sheet. An electronic version of the fact sheet will be posted on the www.metwashairports.com	Ongoing - A DTR Stormwater Management fact sheet will be available on the website.	Upon completion of Phase II the Airports Authority will create a combined Stormwater Management Fact Sheet to include the entire transportation corridor.
		Partner with other MS4 operators to broadcast Stormwater Management PSAs once in each permit 5-year cycle.	Ongoing - The Airports Authority continues to review options and collaborating opportunities with other MS4 operators.	The Airports Authority will collaborating in the future with adjacent MS4 jurisdictions if necessary or effective for management of stormwater runoff from the DTR.
	BMP 1B Public Outreach	Evaluate and promote storm drain stenciling and programs similar to the Adopt-a-Highway program. This goal was to evaluate programs similar to the VDOT Adopt-a-Highway program for applicability to the DTR.	Declined - The Airports Authority has determined that this VDOT program is not for primary highways such as the DTR with very limited access.	No Future Actions - Removed from MS4 Program Plan.
		Evaluate watershed sign installation (i.e., “Drains Directly to Chesapeake Bay”).	Declined - Given the limited major stream crossings this option has been eliminated from further	No Future Actions - Removed from MS4 Program Plan.

<i>Minimum Control Measure</i>	<i>BMP</i>	<i>Measurable Goal</i>	<i>Status/Year 3 Actions</i>	<i>Future Actions</i>
			consideration.	
Table 2 Public Participation & Involvement	BMP 2A Public Involvement	Make available for public review the DTR MS4 Program Plan, General Permit, and subsequent annual reports on the Airports Authority Stormwater Management web page.	Completed - All documents are available on the website www.metwashairports.com	The Airports Authority will provide updates to MS4 Program Plan as needed and post future years' Annual Reports.
	BMP 2B Public Participation	Participate in local activities aimed at increasing public awareness of water quality and stormwater issues.	Ongoing - The Airports Authority continues to evaluate participating and local activities to address joint water quality issues in the Potomac Basin.	The Airports Authority will attend, as appropriate, any meetings with Federal, Virginia, and local agencies concerning water quality and the DTR.
Table 3 Illicit Discharge Detection and Elimination	BMP 3A Evaluate guidance and training programs to prohibit non-stormwater discharge into MS4	Review training guidance and current practices and update and revise as necessary to adequately train DTR employees.	Completed - The Airports Authority has developed a factsheet for distribution to DTR employees that perform maintenance functions and oversight.	The Airports Authority will update training to DTR employees as needed.
		Provide Illicit Discharge Detection and Elimination (IDDE) training programs to appropriate audiences.	Ongoing - Airport Authority employees receive annual Environmental Awareness training that covers illicit discharges. The factsheet for DTR employees includes this BMP.	The Airports Authority will update training to DTR employees as needed.
	BMP 3B Guidance to identify and report illicit discharges connections	Develop or revise illicit discharge identification and reporting protocols.	Completed - The Airports Authority has expanded spill reporting to include releases on DTR.	The Airports Authority will maintain identification training and reporting protocols.
		Establish a means for the public to report illicit discharges.	Declined - The Airports Authority has determined that methods for	No Future Actions - Removed from MS4 Program Plan.

<i>Minimum Control Measure</i>	<i>BMP</i>	<i>Measurable Goal</i>	<i>Status/Year 3 Actions</i>	<i>Future Actions</i>
			public to report accidents and releases in DTR drainage areas are not necessary.	
	BMP 3C Inventory of DTR stormwater system	Develop and maintain an updated inventory of roadway outfalls in the MS4 urbanized areas of the DTR.	Ongoing - The Airports Authority is compiling complete stormwater management maps for Phase I for identification of future outfalls and collection structures.	The Airports Authority will complete this BMP in October 2014 since Phase 1 of the Dulles Metrorail Project is complete.
	BMP 3D Track and eliminate illicit discharges	Notify in writing any downstream-regulated MS4 to which the DTR small-regulated MS4 is physically interconnected to their system.	Completed - The Airports Authority sent a letter on June 28, 2011 to four adjacent MS4 permit holders.	No Future Actions - Removed from MS4 Program Plan.
		Develop and maintain a process for contacting and reporting illicit discharges to appropriate authorities.	Completed - The Airports Authority will report to DEQ in the same manner (e-mail and telephone call, with follow-up report, if required). Any discharges will also be reported adjacent MS4 permit holders, as needed.	The Airports Authority will continue to update the database to generate spill logs and illicit discharges, as needed for DEQ annual reports.

<i>Minimum Control Measure</i>	<i>BMP</i>	<i>Measurable Goal</i>	<i>Status/Year 3 Actions</i>	<i>Future Actions</i>
Table 4 Construction Site Runoff Control	BMP 4 Procedures for receipt and consideration of information submitted by the public	Develop and implement procedures for the receipt and consideration of information submitted by the public concerning the Airports Authority's stormwater program.	Ongoing - The Airports Authority is determining the applicability of this BMP to future DTR construction projects. All current construction activities and response to public inquiries is now handled by the Dulles Corridor Metrorail Project (DCMP), either through their website www.dullesmetro.com , public meetings, and direct communications.	It is currently unknown if this BMP will be used after construction of the Dulles Corridor is complete. At that time, the Airport Authority may have similar contacts for DTR stormwater and other environmental information for the operation of stormwater structures on www.metwashairports.com
Table 5 Post-Construction Runoff Control	BMP 5 Provide long-term operation and maintenance of BMPs and controls	Evaluate inspection and maintenance guidance and procedures and revise or update as appropriate.	Ongoing - The Airports Authority uses the current inspection and maintenance protocols found in 9VAC25-870-200.	The Airports Authority will update the MS4 Program Plan to include stormwater structures located within the DTR right-of-way.
		Update/develop/maintain a database of all known structural stormwater management facilities owned and operated by the Authority.	Ongoing - The Airports Authority is completing final stormwater management maps and BMP details for Phase I of the DCMP for identification of future outfalls and collection structures	By October, the Airports Authority will compile a complete inventory of permanent stormwater structures on DTR property that will require long-term operation and maintenance.
		Perform yearly inspection and required maintenance on stormwater management facilities.	Ongoing - Inspection and Maintenance to be performed per Virginia Stormwater Management Minimum Standards 3.01, 3.02, 3.03, 3.04, 3.05, and 3.07 as specified in the Virginia Stormwater Management Handbook, Vol. I (pages 3.01-17, 3.02-32, 3.03-7, 3.04-3, 3.05-6, and 3.07-26). These requirements will be added to the	The Airports Authority will update the MS4 Program Plan to include stormwater structures located within the DTR right-of-way. Once turned over, these will be added to the Airports Authority preventive maintenance and inspection programs for stormwater management. See Table 1 below for preliminary ponds information.

<i>Minimum Control Measure</i>	<i>BMP</i>	<i>Measurable Goal</i>	<i>Status/Year 3 Actions</i>	<i>Future Actions</i>
			DTR MS4 Program Plan.	
Table 6 Pollution Prevention and Good Housekeeping	BMP 6A Implement operation procedures, maintenance schedules, and long-term inspection procedures to reduce pollutant discharges	Review and revise as necessary the compliance procedures for maintenance activities.	Completed - The Airports Authority has expanded our DEQ-approved Good Housekeeping BMPs to areas and operations on the DTR.	The Airports Authority will monitor conditions and activities on the DTR and will ensure that protocols are adhered to within the DTR right-of-way.
		Perform maintenance activities such as animal carcass removal and disposal, road cleaning, vehicle removal, etc. to minimize/eliminate potential sources of stormwater pollution.	Ongoing - Since 2010, maintenance on the DTR has been performed under various contracts with private companies.	Maintain contracts and ensure companies have all required licenses and certification to provide their services on the DTR.
		Continue to implement procedures and training that will encourage employees and contractors to employ pollution and prevention practices in day-to-day operations.	Ongoing - The Airports Authority will continue training programs that includes factsheets for good housekeeping and pollution prevention.	The Airports Authority will update training DTR employees as needed.
	BMP 6B Implement a program to eliminate discharges of pollutants and promote the proper disposal and recycling of	Annually evaluate the Authority's waste management and recycling programs and revise waste disposal processes and procedures as necessary.	Ongoing - The Airports Authority has a contract to pick-up trash and recyclables. Hazardous, non-hazardous, and universal wastes are handled under the Airports Authority contract.	The trash and recyclable contract will be maintained. All hazardous, non-hazardous, and universal wastes generated by remediation activities or toll road operations in the DTR right-of-way will be disposed under our EPA generator permit (VA 6690500909)
		Ensure proper disposal of wastes from construction and maintenance activities in accordance with the DCR-	Ongoing - The Airports Authority has incorporated the procedures used successfully on large-scale construction projects on Airport	The Airports Authority will maintain the program standards above for future construction projects on the DTR under Airports Authority

<i>Minimum Control Measure</i>	<i>BMP</i>	<i>Measurable Goal</i>	<i>Status/Year 3 Actions</i>	<i>Future Actions</i>
	waste	approved erosion and sediment control and stormwater management standards and specifications through environmental compliance reviews.	property under the Dulles Development program, to include DTR operations and construction directly under control of the Airports Authority within the DTR right-of way.	contracts, or by Airports Authority Grounds Maintenance employees.
		Develop or revise protocols and tracking procedure for performing environmental compliance assessments of DTR Facilities. Perform annual reviews.	Completed - The Airports Authority uses existing inspection protocols to track compliance with an Environmental Management System (by Comm-Trac ver. 3.1 by EDM, Inc.) database.	The Airports Authority will continue to track progress in our EMS for each permit year for the DTR MS4 permit requirements.
	BMP 6C Employee pollution prevention education	Implement training courses for employees that promote a general awareness of stormwater management and pollution prevention.	Completed - The Airports Authority continues to provide training programs and factsheets that include topics such as good housekeeping and pollution prevention procedures, waste disposal and marking, and emergency response awareness to be used on all Airports Authority property.	The Airports Authority will update training to all employees as needed.
		Provide waste management, hazardous waste management, in-stream maintenance activities, US DOT hazardous shipping, SPCC, and VDACS pesticide applicator certification training to appropriate employees.	Completed - The Airports Authority has included DTR in various contracts.	Maintain contracts and ensure companies have all required licenses and certification to provide their services on the DTR.

ATTACHMENT A

Virginia Stormwater Management Handbook, *First Edition, 1999*

VOLUME I

VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION

MINIMUM STANDARD 3.01 - EARTHEN EMBANKMENT

A thick, healthy grass cover, free of trees and brush, should be maintained on the embankment.

Such a cover will help stabilize the surfaces of the embankment and will simplify inspections.

The maintenance and inspection guidelines presented below are not all-inclusive. Specific facilities may require other measures not discussed here. It is the designer's responsibility to decide if additional measures are necessary.

- ✓ The embankment should be mowed periodically during the growing season, ensuring that the last cutting occurs at the end of the season. The grass should not be cut less than 6 to 8 inches in height.
- ✓ If necessary, the embankment should be limed, fertilized and seeded in the fall, after the growing season. Lime and fertilizer application rates should be based on soil test results.
- ✓ The type of seed should be consistent with that originally specified on the construction plans.
- ✓ All erosion gullies noted during the growing season should be backfilled with topsoil, reseeded and protected (mulched) until vegetation is established.
- ✓ All bare areas and pathways on the embankment should be properly seeded and protected (mulched) or otherwise stabilized to eliminate the potential for erosion.
- ✓ All animal burrows should be backfilled and compacted and burrowing animals should be removed from the area.
- ✓ All trees, woody vegetation and other deep-rooted growth, including stumps and associated root systems, should be removed from the embankment and adjacent areas extending to at least 25 feet beyond the embankment toe and abutment contacts. The root systems should be extracted and the excavated volume replaced and compacted with material similar to the surrounding area. All seedlings should be removed at the first opportunity. Similarly, any vine cover and brush should be removed from the embankment to allow for inspections.
- ✓ Any repairs made to the principal spillway (riser or barrel) should be reviewed by a professional engineer. Vertical trenching to expose the barrel should not be allowed under any circumstances. The trench side slopes should be stepped back at a 2:1 slope, minimum.

MINIMUM STANDARD 3.02 - PRINCIPAL SPILLWAY

This section presents general operation, maintenance and inspection guidelines for principal spillways and components. However, these guidelines are not intended to be all-inclusive. Specific structures may require special measures not discussed here. The engineer is responsible for determining what, if any, additional items are necessary.

- ✓ Spillway structures should be cleared of debris periodically and after any significant rainfall event where inspection reveals a significant blockage.
- ✓ During low water conditions, concrete spillway structures should be inspected to decide if water is passing through any joints or other structure contacts and to identify any cracks, spalling, broken or loose sections. Any cracked, spalled, broken or loose sections should be cleaned and refilled with an appropriate concrete patching material. A professional engineer should be consulted to repair extensive leakage, spalls or fractures.

- ✓ Outlet protection (stilling basins) and discharge channels should be cleared of brush at least once per year.
- ✓ Trash racks and locking mechanisms should be inspected and tested periodically to make sure they are intact and operative.
- ✓ Any repairs made to the principal spillway (riser or barrel) should be reviewed by a professional engineer. Vertical trenching to expose the barrel should not be allowed under any circumstances. The trench side slopes should be stepped back at a 2:1 slope, minimum.

MINIMUM STANDARD 3.03 - VEGETATED EMERGENCY SPILLWAY

The following maintenance and inspection guidelines are recommendations. The engineer must decide if additional criteria are needed based upon the size and scope of the facility.

- ✓ Vegetated emergency spillway channels should be mowed concurrently with the embankment and should not be cut to less than 6 to 8 inches in height.
- ✓ The emergency spillway approach and discharge channels should be cleared of brush and other woody growth periodically.
- ✓ After any flow has passed through the emergency spillway, the spillway crest (control section) and exit channel should be inspected for erosion. All eroded areas should be repaired and stabilized.

MINIMUM STANDARD 3.04 - SEDIMENT FOREBAY

Direct access to the forebay should be provided to simplify maintenance. Provision of a hardened access or staging pad adjacent to the forebay is also beneficial. Such an area helps protect the forebay and basin from excessive erosion resulting from operation of the heavy equipment used for maintenance. The pad area can be hardened by installing block pavers or similar material. Also, a hardened bottom to the forebay will help avoid over excavation during clean out operations.

In addition, a fixed, vertical, sediment depth marker should be installed in each sediment forebay to measure the sediment deposition. The sediment depth marker will allow the owner to monitor the accumulation and anticipate maintenance needs. Clean out frequency will vary depending on the conditions of the upstream watershed and the given site. In general, sediment should be removed from the forebay every 3 to 5 years, or when 6 to 12 inches have accumulated, whichever comes first. To clean the forebay, draining or pumping and a possible temporary partial drawdown of the pool area may be required. Refer to the VESCH, 1992 edition for proper dewatering methods.

To reduce costs associated with hauling and disposing of dredged material, a designated spoil area should be approved and identified on the site during initial design and development of the project.

MINIMUM STANDARD 3.05 – LANDSCAPING

A maintenance schedule should be provided in the project plans and/or specifications. This is particularly important for BMPs that have a vegetative component that is integral to the pollutant removal efficiency. The schedule should include guidance regarding methods, frequency, and time of year for landscape maintenance and fertilization

Specific plant communities may require different levels of maintenance. Upland and floodplain terrace areas, grown as meadows or forests require very little maintenance, while aquatic or emergent vegetation may need periodic thinning or reinforcement plantings. Note that after the first growing season it should be obvious if

reinforcement plantings are needed. If they are, they should be installed at the onset of the second growing season after construction.

MINIMUM STANDARD 3.07 - EXTENDED-DETENTION BASIN

The following maintenance and inspection guidelines are not intended to be all-inclusive. Specific facilities may require other measures not discussed here. The engineer is responsible for determining if any additional items are necessary.

Inspecting and maintaining the structures and the impoundment area should be the responsibility of the local government, a designated group such as a homeowner association, or an individual. A specific maintenance plan should be formulated outlining the schedule and scope of maintenance operations.

General Maintenance

Maintenance and inspection guidelines found in the following minimum standards also apply: **3.01, Earthen Embankment; 3.02, Principal Spillway; 3.03, Vegetated Emergency Spillway; 3.04, Sediment Forebay, and 3.05, Landscaping.**

Vegetation

The basin's side slopes, embankment and emergency spillway should be mowed at least twice a year to discourage woody growth. More frequent mowing may be necessary in residential areas for aesthetic purposes.

Dry extended-detention basins may have soggy bottoms, making mowing costly and difficult. The use of water-tolerant, hardy, and slow growing grass is recommended for the bottom of these basins.

Vegetation is preferred to an impervious low-flow channel since the channel may interfere with the pollution removal capabilities of the basin. The designer should be aware of local program requirements, as some localities require low-flow channels.

Specific plant communities may require different levels of maintenance. Upland and floodplain terrace areas, grown as meadows or forests require very little maintenance, while aquatic or emergent vegetation may need periodic thinning or reinforcement plantings. Note that after the first growing season it should be obvious if reinforcement plantings are needed. If they are, they should be installed at the onset of the second growing season after construction.

Research indicates that for most aquatic plants the uptake of pollutants is stored in the roots, not the stems and leaves. Therefore, aquatic plants should not require harvesting before winter plant die-back. There are still many unanswered questions about the long term pollutant storage capacity of plants. Possible aquatic and emergent plant maintenance recommendations may be presented in the future.

Debris and Litter Removal

Debris and litter will accumulate near the inflow points and around the outlet control structure. Such material should be removed periodically. Significant accumulation can clog the low-flow outlet and the upper control openings.

Sediment Removal

Sediment deposition should be continually monitored in the basin. Removal of accumulated sediment is extremely important. A significant accumulation of sediment impairs the pollutant removal capabilities of the

basin by reducing the available storage for the water quality volume and/or reducing the available volume for the shallow marsh. In addition, accumulated sediment in the bottom of a basin creates unsightly conditions and chokes out established vegetation.

Unless unusual conditions exist, it is anticipated that accumulated sediment will need to be removed from the basin every 5 to 10 years. More frequent cleaning of the area around the low flow or extended-detention orifice may be required. The use of a sediment forebay with access for heavy equipment will greatly simplify the removal process. During maintenance procedures, ensure that any pumping of standing water or dewatering of dredged sediments complies with the VESCH, 1992 edition, and any local requirements.

Owners, operators, and maintenance authorities should be aware that significant concentrations of heavy metals (e.g., lead, zinc and cadmium) and some organics, such as pesticides, may be expected to accumulate at the bottom of a basin. Testing of sediment, especially near points of inflow should be conducted regularly and before disposal to find the leaching potential and level of accumulation of hazardous materials. Disposal methods must comply with the health department requirements of the local government.

Inspections

An extended-detention basin and its components should be inspected annually to ensure that they operate in the manner originally intended. If possible, inspections should be conducted during wet weather to determine if the extended-detention time is being achieved. Inspections should be conducted by a DEQ qualified individual following the checklist provided in Attachment B.

APPENDIX B

Maintenance Inspection Checklist for Extended Detention Dry Ponds with Sediment Forebays

Inspection Date _____

Pond Location _____

Date of Last Inspection _____ Inspector _____

MWAA/Contractor Representative _____

Final As-Built Plans attached: Y / N

Element of Pond	Potential Problems and Observations	Problem?	Investigate?	Repaired?	How to Fix Problem	Comments or Actions Taken
Contributing Drainage Area	Adequate vegetation				Supplement as needed.	
	Excessive trash and debris				Remove immediately.	
	Evidence of erosion and/or bare or exposed soil				Stabilize immediately.	
	Excessive landscape waste and yard clippings				Remove immediately.	
Pre-Treatment (Sediment Forebay)	Adequate access to the forebay				Establish adequate access	
	Excessive trash and debris				Remove immediately.	
	Evidence of erosion and/or exposed soil.				Immediately identify and correct the cause of the erosion and stabilize the eroded or bare area.	
	Sediment deposits are 50% or more of forebay capacity.				Dredge the sediment to restore the design capacity; sediment should be dredged from forebays at least every 5-7 years, and earlier, as needed.	
	Evidence of clogging				Clear blockages of the riser or orifice(s) and make other adjustments needed to meet the approved design specifications	
	Dead vegetation				Revegetate, as needed	
Inlet	The inlet provides a stable conveyance into the pond				Stabilize immediately, as needed and clear blockages.	
	Excessive trash, debris, or sediment.				Remove immediately	
	Evidence of erosion/undercutting at or around the inlet				Repair erosion damage and restabilize	
	Cracking, bulging, erosion or sloughing of the forebay dam.				Repair and restabilize immediately.	
	Woody growth on the forebay dam.				Remove within 2 weeks of discovery.	

Element of Pond	Potential Problems and Observations	Problem?	Investigate?	Repaired?	How to Fix Problem	Comments or Actions Taken
	More than one (1) inch of settlement.				Add fill material and compact the soil to the design grade	
	Inlet alignment is incorrect.				Correct immediately.	
Vegetation	Plant composition is consistent with the approved plans				Determine if existing plant materials are consistent with the design criteria, and replace inconsistent species.	
	Invasive species are present.				Remove invasive species immediately and replace vegetation as needed.	
	Trees planted in the buffer and on wetland islands and peninsulas need watering during the first growing season				Consider watering every 3 days for first month, and then weekly during first year (April – October), depending on rainfall.	
	Grass around the facility is overgrown				Mow (at least twice a year) to a height of 4"-9" high and remove grass clippings.	
	Vegetation is dead or reinforcement planting is needed.				Remove and replace dead or dying vegetation.	
Embankment and Abutments	Sparse cover, settlement, cracking, bulging, misalignment, erosion rills deeper than 2 inches, or sloughing.				Repair and restabilize immediately, especially after major storms.	
	Soft spots, seepage, boggy areas or sinkholes.				Reinforce, fill and stabilize immediately.	
	Evidence of nuisance animals.				Animal burrows must be backfilled and compacted. Burrowing animals should be humanely removed from the area.	
	Woody vegetation on the embankment.				Removal of woody species near or on the embankment and maintenance access areas should be done when discovered, but at least every year.	
Overflow Emergency Spillway	Woody growth on the spillway.				Removal of woody species near or on the emergency spillway should be done when discovered, but at least every year.	
	Excessive trash, debris, or other obstructions.				Remove immediately.	
	evidence of erosion/back cutting				Repair erosion damage and reseed	
	Soft spots, seepage or sinkholes.				Reinforce, fill and stabilize immediately.	

Element of Pond	Potential Problems and Observations	Problem?	Investigate?	Repaired?	How to Fix Problem	Comments or Actions Taken
	Only one layer of stone armoring exists above the native soil.				Reinforce rip-rap or other armoring materials.	
Outlet	Outlet provides a stable conveyance from the pond.				Stabilize immediately, as needed and clear blockages.	
	Woody growth within 5 feet of the outlet pipe barrel.				Prune vegetation back to leave a clear discharge area.	
	Excessive trash, debris, or other obstructions.				Remove immediately.	
Outlet	Excessive sediment deposits at the outlet.				Remove sediment.	
	Discharge is causing undercutting, erosion or displaced rip-rap at or around the outlet.				Repair, reinforce or replace rip rap as needed, and restabilize.	
Overall	Access to the pond or its components is adequate.				Establish adequate access. Remove woody vegetation and debris that may block access. Ensure that hardware can be opened and operated.	
	Fences are inadequate				Collapsed fences must be restored to an upright position. Jagged edges and damaged fences must be repaired or replaced.	
	Water levels in one or more cells are abnormally high or low.				Clear blockages of the riser or orifice(s) and make other adjustments needed to meet the approved design specifications.	
	Mosquito proliferation				Eliminate stagnant pools. Treat for mosquitoes as needed.	
	Encroachment on the pond or easement				Inform involved property owners; clearly mark the boundaries, if needed.	
	Safety signage is not adequate.				Provide sufficient, legible safety signage, if needed.	

COMMENTS: