



WORKSHOP ON GREEN STREETS

Metropolitan
Washington Council of
Governments
April 8, 2013



STORMWATER RUNOFF*



- **Rain and snowmelt create stormwater runoff because not all stormwater “percolates” into the ground**
- **Stormwater runs over the ground and eventually enters waterbodies (i.e. streams, rivers, or lakes)**

TRANSPORT OF POLLUTANTS*



- A **pollutant** is a material or chemical that affects water quality of a receiving waterbody
- Pollutants are **transported** during a storm event, and the pollutants are washed off with the stormwater
- Pollutants that are in the stormwater are then **discharged** into waterbodies (lake, river, stream, creek, etc.)

* From VDOT-CO MS4 Presentation



BEST MANAGEMENT PRACTICES (BMPs)*

Best Management Practices “BMP” means to reduce the pollution of surface waters from the impacts of human activity

- **Structural or Non-Structural**
 - **Structural**
 - Stormwater basin or pond
 - Silt fence
 - **Non-Structural**
 - Maintenance practices
 - Prohibition of activities
- **Permanent or Temporary**
 - **Temporary BMPs**
 - Erosion control blanket
 - Silt fence
 - **Permanent BMPs**
 - Stormwater basin or pond
 - Level spreaders



* From VDOT-CO MS4 Presentation

Virginia Stormwater Management Law is codified in Title 10.1, Chapter 6 of the Code of Virginia and the Virginia Stormwater Management Regulations are found at Chapter 60 and Chapter 30 of the Virginia Administrative Code (4VAC50-60-50, 4VAC50-30-40, 4VAC50-60-60, 4VAC50-60-70 & 4VAC50-60-80). The Law and Regulations together provide the authority and the technical criteria for the Virginia Stormwater Management Program (SWM Program).

VDOT is a MS4 General Permit Holder and executes Annual Agreement for its Standards and Specifications with **Virginia Department of Conservation & Recreation (DCR)** which includes SWM Program and Erosion and Sediment Control Program.

VDOT Roles and Responsibilities

- **Central office staff** will develop MS4 program wide policies and procedures, handle annual reporting, training, and assessment of VDOT's operations
- **District staff** will be responsible for implementation of various components of the program within the regulated area

The Virginia Stormwater Management Regulations are applicable to all Regulated Land Disturbance Activities (RLDA) undertaken by or for VDOT including, but not limited to projects and activities developed under the following plan processes:

- RAAP
 - SAPP
 - Minimum
 - No Plan
 - PPTA
 - Design Build
 - Capital Outlay
 - Rural Rustic
 - Non Routine/Routine Maintenance Activities *
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- **All routine maintenance activities exempted by 2011 G.A. changes to the VSMP Law (Section 10.1-603.8)**

SWM Requirements

SWM Requirements are applicable for those regulated land disturbance activities that disturb **one acre or greater** except in those areas designated as a Chesapeake Bay Preservation Area in which case the land disturbance threshold is **2500 square feet** or greater.

The following land disturbance activities are exempt for the VSMP Regulations for linear development projects (i.e., highway construction projects) where **all** the following conditions are met:

- *Less than one acre will be disturbed per outfall or watershed.*
- *There will be insignificant increases in peak flow rates downstream of the discharge point.*
- *There is no existing or anticipated erosion problems downstream of the discharge point.*
- *There is no existing or anticipated flooding problems downstream of the discharge point.*

Typically applied on an outfall by outfall basis

SWM Requirements

As part of current VDOT Annual Agreement with DCR, following are design criteria addressing water quality under VDOT SWM Requirements:

Using Technology Approach:

1. Base the percent impervious cover on the entire post construction impervious area within the right of way plus permanent easement area per outfall.
2. Determine the required BMP based on the percent impervious calculated from No. 1 above.

Using Performance Approach:

Design the BMP for a water quality volume based on the net increase in impervious area plus 10% of the pre-construction impervious area. The goal is to determine BMP that would remove pounds of phosphorus to 10% less than existing loading.

Water quantity control shall be governed by the Virginia Erosion and Sediment Control Regulation Minimum Standard - 19 (MS-19) that requires an adequate receiving channel for stormwater outfalls

Current BMP Selection

Table 11-1 VDOT Drainage Manual as well as IIM-195.7

Water Quality BMP	Treatment Volume	Target Phosphorus Removal Efficiency	Percent Impervious Cover**
Vegetated filter strip Grassed swale		10% 15%	16-21%
Constructed wetlands Extended detention Retention basin I	2xWQV 2xWQV 3xWQV	20% 35% 40%	22-37%
Bioretention basin Bioretention filter Extended detention-enhanced Retention basin II Infiltration	4xWQV 1xWQV	50% 50% 50% 50% 50%	38-66%
Sand filter Infiltration Retention basin III with aquatic bench	2xWQV 4xWQV	65% 65% 65%	67-100%

*Innovative or alternate BMPs not included in this table may be allowed at the discretion of DCR and VDOT.

**Percent Impervious Cover: The ratio of the new impervious area and the area within the right-of-way and easements per project outfall.

Current Directive on Low Impact Development (LID) Practices use within VDOT Maintained Right of Way

Currently, DCR has no published credits for LID practices in meeting water quality requirements. However, such practices are being requested as a means to improve water quality. If there is a proposal to use LID practices to meet water quality requirements, VDOT would need to get DCR concurrence on a project by project basis.

Language in the VDOT Subdivision Street Acceptance Policies is encouraging LID practices, even to the allowance of such inside VDOT right of way (with acceptable maintenance agreements with the locality). For those items inside the right of way, either VDOT maintenance personnel would have to agree to the future maintenance requirements or VDOT would have to execute agreements with the Locality for them to maintain such facilities (assuming the facilities are constructed in conjunction with a subdivision development or County project).

Use of Manufactured Best Management Practices (BMP)

VDOT prefer to only use manufactured BMPs (and the oil grit separators are just one of many types) as a last resort. Use of such facilities requires review and approval by VDOT Central Office - Location and Design - Hydraulic Section.

Other conventional (and not so conventional) surface facilities are preferred where VDOT will have maintenance responsibility.

Recent examples of Projects that are proposed or utilizing manufactured BMPs that VDOT has accepted or will accept are:

- ❖ Route 234 Widening in mid-1990s
- ❖ Springfield Interchange in sometime mid-2006
- ❖ Saratoga Park and Ride Lot off Route 234 & Balls Ford Road (PW County) – under construction
- ❖ Route 50/Courthouse Road – under construction
- ❖ Telegraph Road Widening in Fairfax County – advertised for construction
- ❖ Lorton Road Construction – Fairfax County Administered Construction, VDOT Maintained - advertised for construction

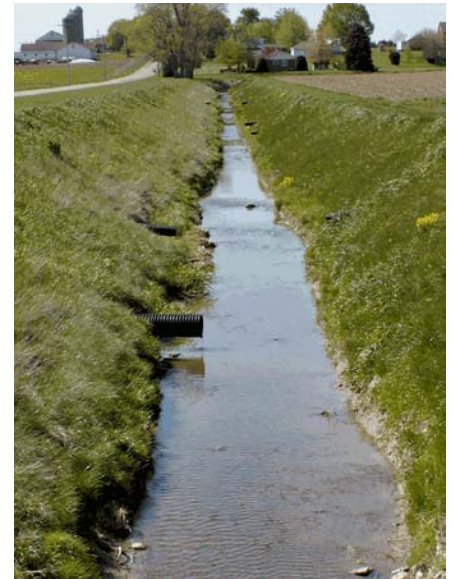
Use of Manufactured Best Management Practices (BMP)

BMPs ENVISIONED:

- Bioslope (Ecology Embankment)
- Compost Amended Soils
- Bioretention Filter
- Natural Dispersion
- Level Spreader
- Porous Asphalt
- Underground Sand Filter
- Proprietary Underground BMPs such as Filterra, StormCeptor, DC Sand Filter etc.

VDOT'S MS4 PROGRAM*

Municipal Separate Storm Sewer System (MS4)



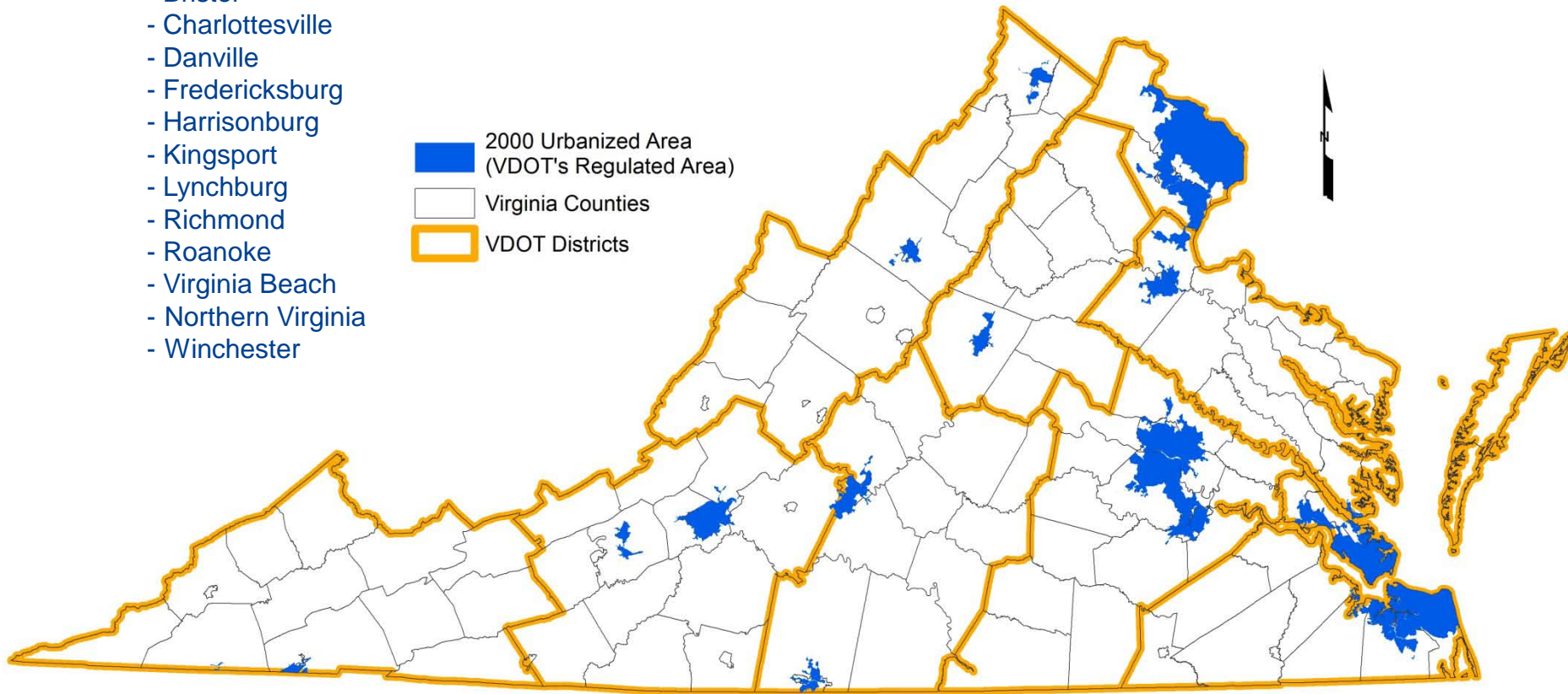
www.virginiadot.org/programs/stormwater_management.asp

*From VDOT-CO MS4 Presentation

VDOT'S MS4 PROGRAM*

URBANIZED AREAS:

- Blacksburg
- Bristol
- Charlottesville
- Danville
- Fredericksburg
- Harrisonburg
- Kingsport
- Lynchburg
- Richmond
- Roanoke
- Virginia Beach
- Northern Virginia
- Winchester



****VDOT's MS4 Permit applies only in the 13 urbanized areas (according to 2000 Census)****

OVERVIEW OF VDOT'S MS4 PROGRAM*

All right-of-way & property within urbanized areas

- > 9,000 miles of roads, bridges, and tunnels
- > 600 stormwater basins
- > 30,000 regulated outfalls

VDOT facilities within urbanized areas

- 34 Area Headquarters
- 9 Residency Complexes
- 5 District Complexes
- 3 Central Office Bldgs.
- 17 Rest Areas
- 7 Storage Areas
- 2 Weigh Stations
- 22 Residual Properties
- 40 Park & Ride lots
- Bridge & Tunnel Facilities

Reference Documents for VDOT relative to ESC, SWM & VSMP (Design, Construction & Maintenance)

- **2007 Road and Bridge (R&B) Specifications (also include any supplemental sections).**
- **2008 Road and Bridge (R&B) Standards and its latest updated version.**
- **April 2002 VDOT Drainage Manual (latest version in July 2012)**
- **Informational and Instructional Memorandums (IIM):**
 - ❖ IIM-LD-11.27 (for Erosion and Sediment Control)
 - ❖ IIM-LD-110.21 (General Notes)
 - ❖ IIM-LD-122.13 (for Roadside Development)
 - ❖ IIM-LD-191.2 (for Hazardous Material/Waste Sites)
 - ❖ IIM-LD-195.7 (for Storm water Management Requirements), SWPA 12-01, SWPA 12-02 & SWPA 12-03
 - ❖ IIM-LD-233 (for Natural Channel Design)
 - ❖ IIM-LD-242.3 (for VSMP Construction Permit)
 - ❖ IIM-LD-244.1 (for Pipe Rehabilitations)
 - ❖ IIM-LD-246.2 (for Stormwater Pollution Prevention Plan (SWPPP))
- **Construction Manual**
- **Inspection Manual**
- **Locally Administered Projects Manual**
- **Design Build Manual**
- **IDDE Manual**
- **Other manuals (for Design, Construction and Maintenance) which can be checked in at:**
<http://www.virginiadot.org/business/manuals-default.asp>

Thank You

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VDOT – Northern Virginia District Drainage Engineer