



Municipal Separate Storm Sewer System (MS4) Awareness Presentation

March 8th, 2012

10:00AM – 12:00PM

Video Conference

AGENDA

- 1. Stormwater Introduction**
- 2. Overview of VDOT's MS4 Program**
- 3. Total Maximum Daily Loads (TMDLs)**
- 4. Pollutant Control Strategies**
- 5. MS4 Permit Impacts to VDOT**
- 6. Consequences of Non-Compliance**
- 7. What to do for an Audit by EPA/DCR**

1. STORMWATER INTRODUCTION 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)

1. STORMWATER INTRODUCTION IMPERVIOUS SURFACE

- **Impervious surfaces** are man-made changes to the ground that make it “hard” and prevent rainwater from being absorbed into the ground

1. STORMWATER INTRODUCTION IMPERVIOUS SURFACES

- **Examples:**
 - Roadways
 - Gravel or paved shoulders
 - Bike paths
 - Roof tops
 - Parking lots
 - Maintenance yards
 - Other compacted gravel and dirt areas



1. STORMWATER INTRODUCTION STORM SEWER SYSTEM

- A conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains:
- If designed or used for collecting or conveying stormwater

1. STORMWATER INTRODUCTION STORMWATER DISCHARGE

- When stormwater flows into a waterbody, it is called a **stormwater discharge**
- Stormwater discharges are either **point source** (from a channel, pipe, or ditch) or **non-point source** (where they spread out as they travel over the ground)

1. STORMWATER INTRODUCTION 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.)

1. STORMWATER INTRODUCTION

POTENTIAL POLLUTANTS IN STORMWATER



- **From Roadways:**
 - **Vehicle Related**
 - Antifreeze
 - Oil & grease
 - Heavy metals
 - **Roadway Operations and Construction**
 - Road salt & deicing chemicals
 - Sand and “fines” from stone
 - Pesticides and fertilizer
 - Animal carcasses
 - Pollutants carried from nearby properties onto road or into ditch

1. STORMWATER INTRODUCTION POTENTIAL POLLUTANTS IN STORMWATER

- **From VDOT facilities:**
 - **Storage**
 - Stockpiles
 - Road salt
 - Oil, gasoline, asphalt
 - Portable toilets
 - **Trash and debris**
 - VacHaul residuals
 - Street sweepings
 - **Equipment oil and grease**
 - **Roosting birds and fowl**



1. STORMWATER INTRODUCTION POTENTIAL POLLUTANTS IN STORMWATER



- **From VDOT construction sites:**
 - **Dirt (soil) erosion**
 - **Fuel storage**
 - **Machinery & equipment**
 - Metals
 - Oil & grease
 - Solvents
 - Antifreeze
 - **Trash & other debris**
 - **Portable toilets**

1. STORMWATER INTRODUCTION POTENTIAL POLLUTANTS IN STORMWATER



- **From adjacent properties:**
 - **Agricultural properties - sediment, fertilizer & pesticides**
 - **Commercial, industrial, and residential properties - bacteria, sediment, nutrients, chemicals**
 - **Wild animals - bacteria**
 - **Livestock - sediment, bacteria & nutrients**

1. STORMWATER INTRODUCTION BEST MANAGEMENT PRACTICES

- **Best Management Practices “BMP”** means to reduce the pollution of surface waters from the impacts of human activity:
 - **Structural devices**
 - **Non-structural practices**
 - **Prohibitions of practices**
 - **Schedules of activities**
 - **Maintenance procedures**



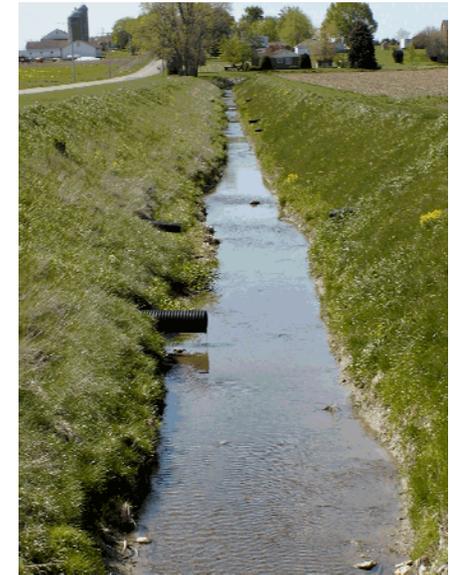
1. STORMWATER INTRODUCTION BMPs

- **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



2. OVERVIEW OF VDOT'S MS4 PROGRAM

Municipal Separate Storm Sewer System (MS4)



www.virginiadot.org/programs/stormwater_management.asp

2. OVERVIEW OF VDOT'S MS4 PROGRAM

- **Authorities involved with MS4**
 - **US Environmental Protection Agency (EPA)**
 - Given federal authority through the Clean Water Act
 - Compliance and enforcement authority
 - **Virginia Department of Conservation and Recreation (DCR)**
 - Given statewide authority by EPA
 - Compliance and enforcement authority
 - Issue permits
 - Individual Permits
 - General Permits (5-year cycle)



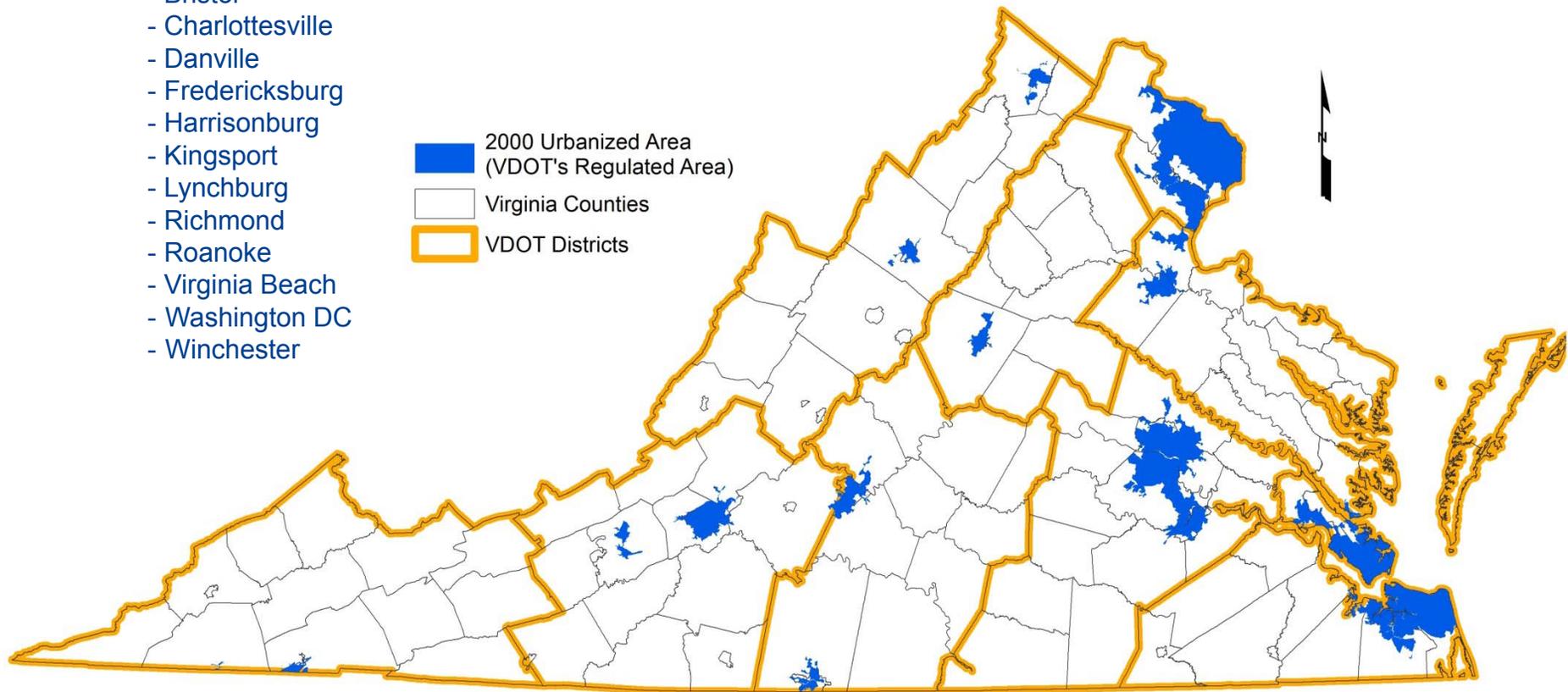
2. OVERVIEW OF VDOT'S MS4 PROGRAM

- **Types of MS4s**
 - **Large MS4** – applies to large cities and counties
 - Located in an incorporated place with a population $\geq 100,000$
 - Issued **Individual Permits**
 - Were the first MS4s to receive permit coverage
 - **Small MS4** – applies to other public body in highly developed areas
 - Only regulated in **Census “urbanized areas”**
 - Issued coverage under **General Permit**
 - Received coverage after Large MS4s

2. OVERVIEW OF VDOT'S MS4 PROGRAM

URBANIZED AREAS:

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



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

2. 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

2. OVERVIEW OF VDOT'S MS4 PROGRAM

- **MS4 Permit Requirements**
 - **Address TMDLs/WLAs**
 - **6 Minimum Control Measures (MCMs):**
 1. **Public education & outreach**
 2. **Public involvement/participation**
 3. **Illicit discharge detection & elimination**
 4. **Construction site runoff controls**
 5. **Post-construction site runoff controls**
 6. **Pollution prevention/good housekeeping**
 - **Annual Progress Reports to DCR**

2. OVERVIEW OF VDOT'S MS4 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**

2. OVERVIEW OF VDOT'S MS4 PROGRAM

VDOT's Stormwater Policy Committee

- **Mohammad Mirshahi - L&D Division - Chairman**
- **Other Members:**
 - **C. O. Division Administrators**
 - Environmental
 - Scheduling and Contracts
 - Maintenance
 - Learning Center
 - **District Administrator**

2. OVERVIEW OF VDOT'S MS4 PROGRAM

VDOT's MS4 Steering Committee

- **Roy Mills - L&D Division - Chairman**
- **Other Members:**
 - **Location & Design (L&D)**
 - **Environmental**
 - **Maintenance**
 - **Scheduling & Contracts**
 - **Public Affairs**
 - **Traffic Engineering**
 - **Transportation & Mobility Planning**
 - **Learning Center**

3. TOTAL MAXIMUM DAILY LOADS (TMDL) & WASTE LOAD ALLOCATIONS (WLAs)

- EPA and DEQ develop TMDLs & assign WLAs for waterbodies that do not meet water quality standards
 - **POC** – specific pollutant or pollutants that are causing the waterbody to be impaired (pollutant of concern).
 - **TMDL** – plan that establishes maximum amount of a pollutant that can be discharged without “overloading” a waterbody
 - **WLA** - quantity of a specific pollutant that may be discharged under a permit (MS4 and construction permit)

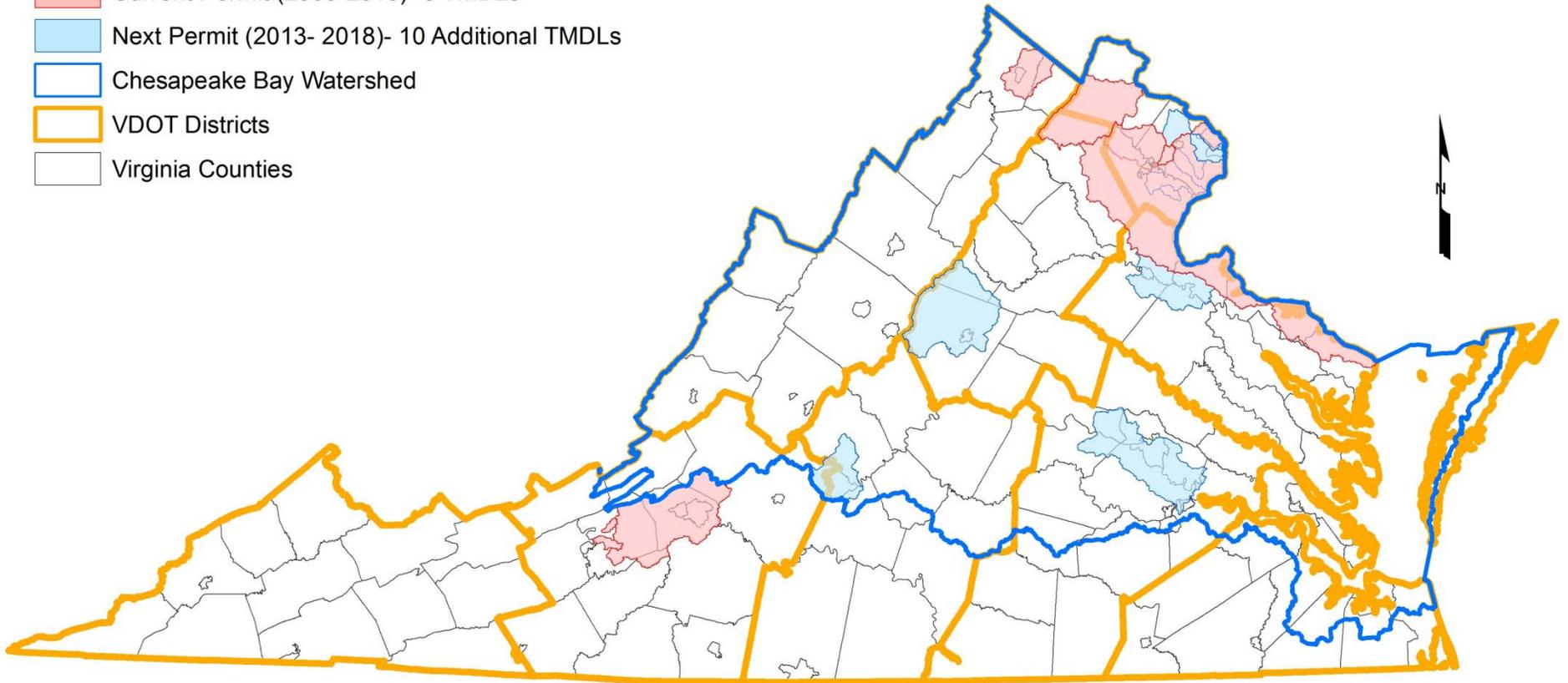
3. TOTAL MAXIMUM DAILY LOADS (TMDL) & WASTE LOAD ALLOCATIONS (WLAs)

- **Specific actions required:**
 - **Conduct assessment of all properties (ROW and facilities) for sources of POC**
 - **Monitor outfalls if have POC source in their drainage area**
 - **Implement BMPs to reduce POC discharge – typically by 20-100% within urbanized area**
 - **Annual reporting of stormwater discharge and pollutant load from VDOT properties**

3. TOTAL MAXIMUM DAILY LOADS (TMDL)

Map of TMDLs with VDOT WLAs

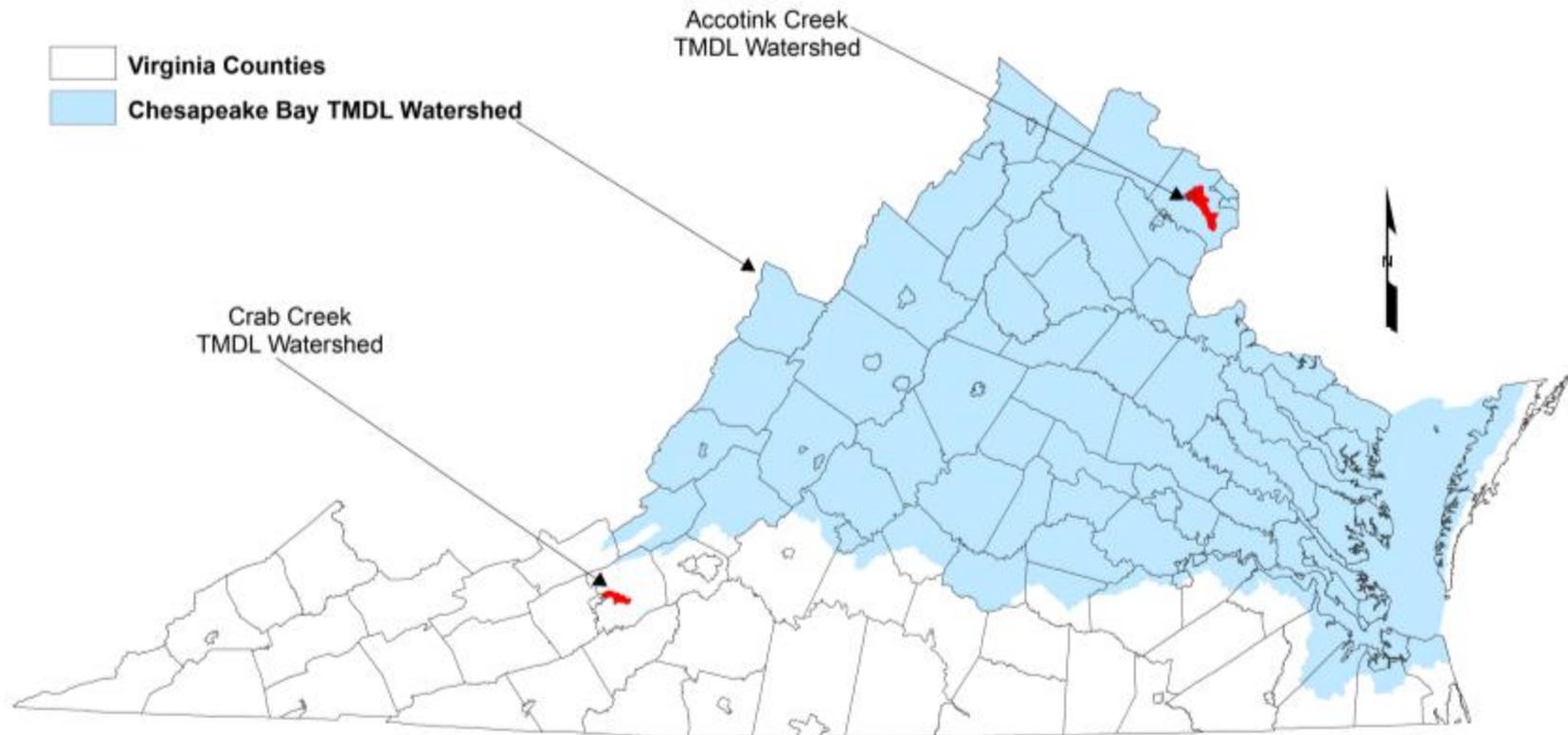
-  Current Permit (2008-2013)- 8 TMDLs
-  Next Permit (2013- 2018)- 10 Additional TMDLs
-  Chesapeake Bay Watershed
-  VDOT Districts
-  Virginia Counties



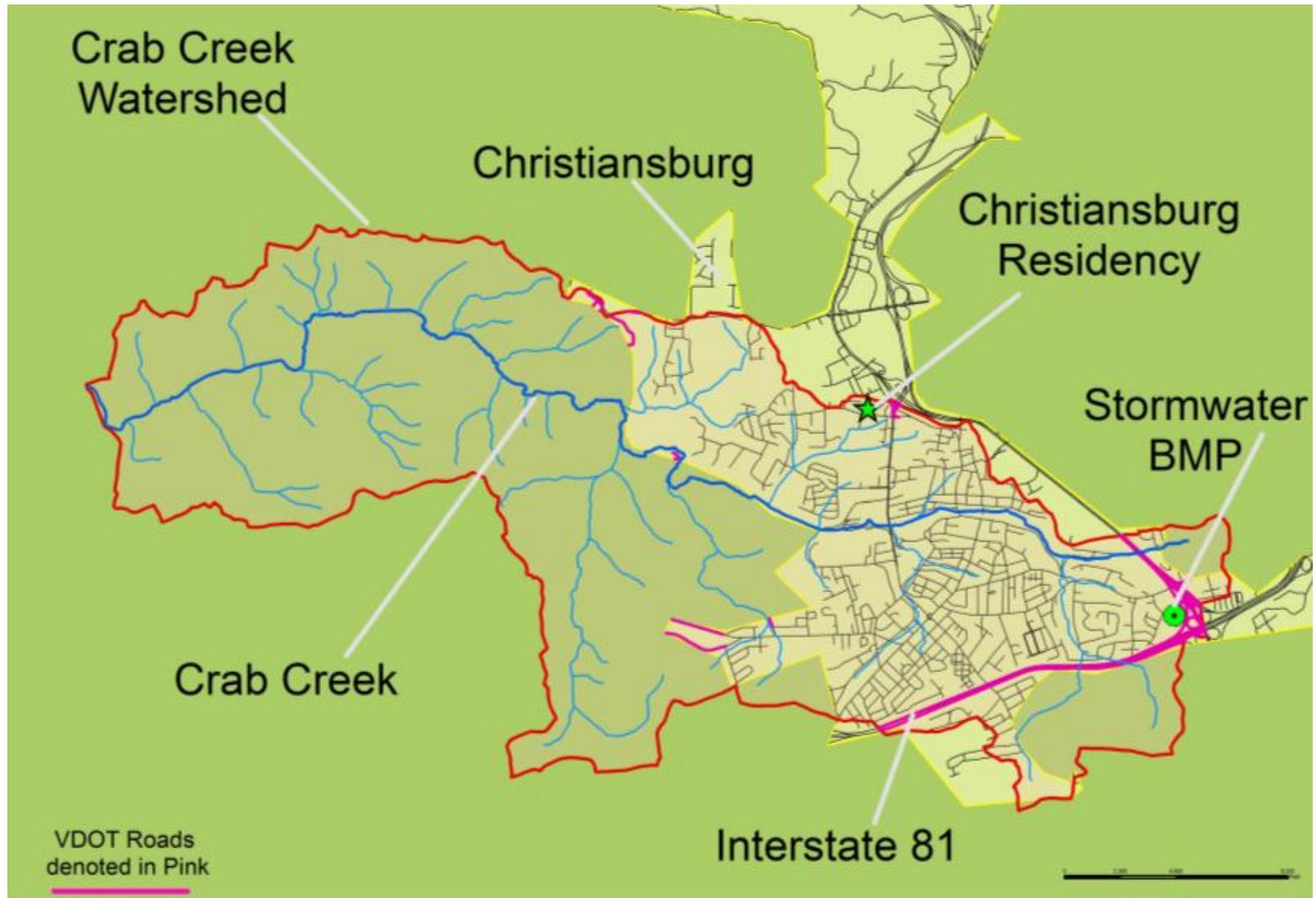
3. TOTAL MAXIMUM DAILY LOADS (TMDL)

- **VDOT WLAs in Current Permit (2008 – 2013)**
 - 8 TMDLs
 - POC: Sediment, Bacteria, PCBs
- **VDOT WLAs in Next Permit (2013 – 2018)**
 - 10 TMDLs already approved
 - POC: Sediment, Bacteria, PCBs, Nutrients (Nitrogen and Phosphorus), Flow
 - At least 15 more TMDLs being developed with likely VDOT WLA

3. TOTAL MAXIMUM DAILY LOADS (TMDL)



3. CRAB CREEK TMDL - WATERSHED



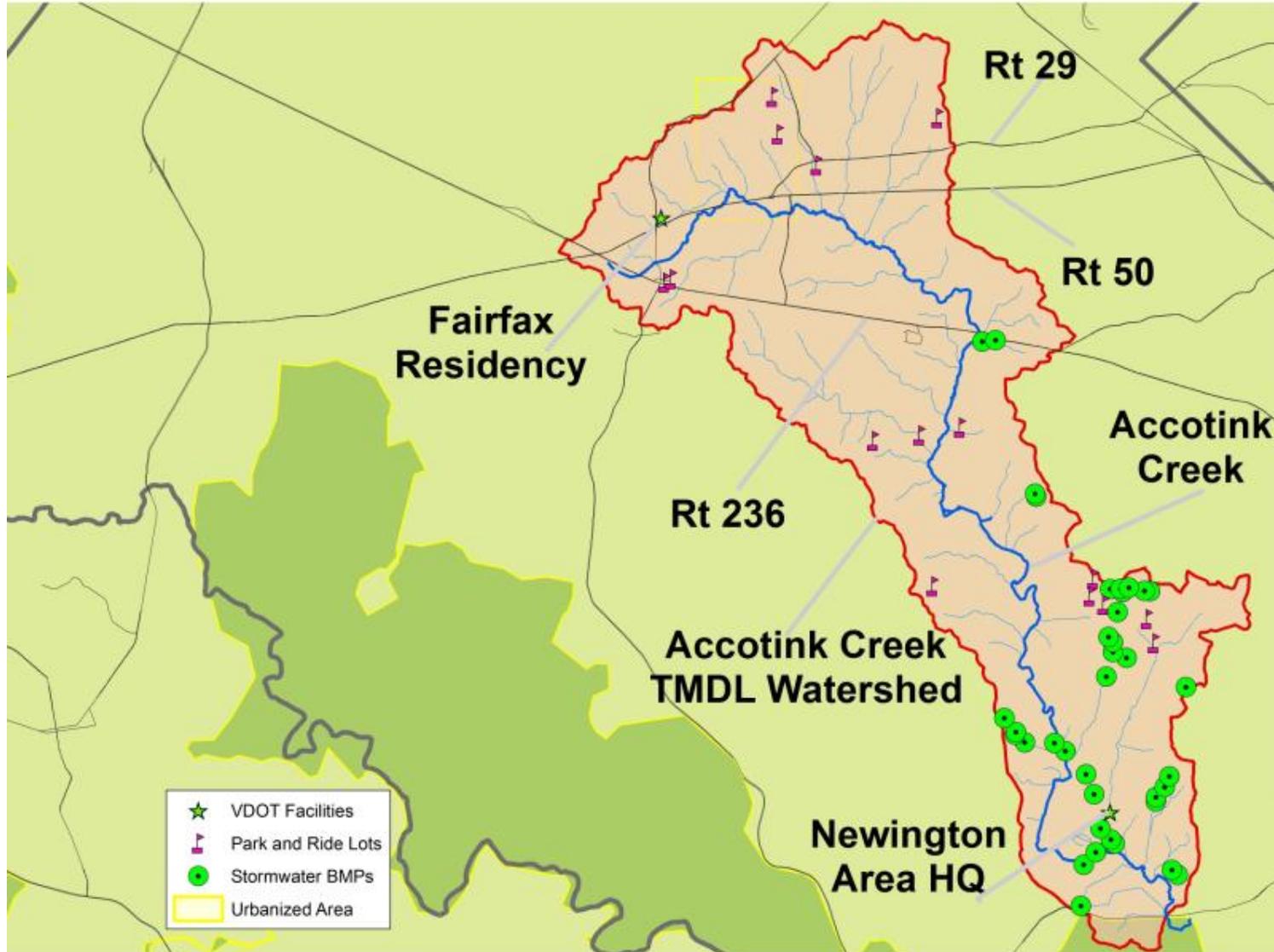
3. CRAB CREEK TMDL - BACKGROUND

- **POC: bacteria & sediment**
- **VDOT WLA requires:**
 - **65 % reduction in sediment discharge**
 - **100 % reduction in bacteria discharge**

3. CRAB CREEK TMDL- VDOT ACTIONS

- **Relatively small and simple TMDL for VDOT**
 - 5.5 miles of road in regulated area
 - Christiansburg Residency in regulated area
 - 7 regulated outfalls and 1 BMP owned by VDOT
- **VDOT's cost:**
 - **Required TMDL studies \$116,000:**
 - Stormwater and pollutant modeling
 - Property/facility assessments
 - BMP implementation plan
 - Outfall monitoring
 - **BMP implementation: unknown**

3. ACCOTINK CREEK TMDL – WATERSHED AREA



3. ACCOTINK CREEK TMDL - BACKGROUND

- **Flow-based TMDL due to benthic impairment**
- **VDOT WLA requires:**
 - **50.5 % reduction in 1-yr 24-hour storm flow**

3. ACCOTINK CREEK TMDL- VDOT ACTIONS

- **Moderate size and complexity for VDOT**
 - 425 miles of road in regulated area
 - 19 VDOT facilities (Fairfax Residency, Newington AHQ, and Park & Rides)
 - 37 SWM Basins
 - > 400 regulated outfalls
- **VDOT's cost:**
 - TMDL studies: ~\$150,000-250,000
 - BMP implementation:
 - New structural BMPs & retrofits to existing structural BMPs
 - \$69 million conceptual estimate (not including ROW costs)

3. CHESAPEAKE BAY TMDL - BACKGROUND

- **POC: Nutrients and Sediment**
 - Requires 24% reduction in phosphorus, 25% in nitrogen, and 20% in sediment
 - Covers more than 50% of Virginia and impacts every district except Bristol

3. CHESAPEAKE BAY TMDL- VDOT ACTIONS

- **Huge Size and Complexity**
 - Thousands of road miles in regulated area
 - Covers 8 urban areas
- **VDOT's Cost**
 - **TMDL studies: no estimate yet (but may cost several million)**
 - **BMP implementation:**
 - **BMP retrofits & new BMPs** using infiltration & bio-retention
 - No estimate yet but **may cost > \$100 million** for construction plus additional costs for maintenance and right-of-way acquisition

4. POLLUTANT CONTROL STRATEGIES TO ADDRESS MCMs AND TMDLs

- **Knowledge and Awareness**
 - Training, Public Service Announcements, Stormwater Website
- **Manuals and Procedures**
 - Maintenance Best Practices Manual
 - Annual ESC and SWM Standards & Specifications
 - Illicit Discharge Detection and Elimination Manual
 - SSAR Guidance Manual
- **Good Housekeeping and Pollution Prevention**
 - Materials Storage and Handling
 - Pollution Prevention Assessments

5. MS4 PERMIT IMPACTS ON VDOT

- **Maintenance Activities**
 - BMP maintenance
 - Outfall mapping & screening
 - Material storage & pollution prevention
 - Animal carcasses
 - IDDE investigations
- **Construction Activities**
 - Contract documents (TAMS, PPTA, DBB, DB)
 - Enhanced BMP standards
 - Enhanced E&S controls

5. MS4 PERMIT IMPACTS ON VDOT

- **ROW and Utilities**
 - **IDDE Awareness**
 - **Additional ROW acquisition for new BMPs**
- **Location and Design**
 - **Information for BMP & outfall databases**
 - **Enhanced E&S and SWM Programs**

5. MS4 PERMIT IMPACTS ON VDOT

- **Local Assistance**
 - Information for BMP & outfall databases
 - Guidance for localities & private developers
- **Public Affairs**
 - Enhanced outreach to the public
 - VDOT website
www.virginiadot.org/programs/stormwater_management.asp

5. MS4 PERMIT IMPACTS ON VDOT

- **Environmental**
 - **Training**
 - **Facility Environmental Compliance Assessments**
 - **IDDE Assistance**
 - **TMDLs/WLAs**
 - Annual Characterization
 - BMP Implementation Plans

- **VDOT Facilities**
 - **Facility pollution prevention**
 - **POC containment/source reduction**
 - **IDDE Reporting**

6. CONSEQUENCES OF NON-COMPLIANCE

- **MS4 Violations may lead to:**
 - Fines of \$25,000/day
 - EPA Consent Order
 - Criminal penalties
 - Supplemental Environmental Projects



6. CONSEQUENCES OF NON-COMPLIANCE

EXAMPLES OF MS4 VIOLATIONS

- **Newport News**
 - Failed to monitor and control stormwater discharges from facilities and maintenance yards
 - Failed to reduce pollutant discharges from MS4 system
 - \$115,000 penalty and Consent Order
- **Chesterfield County**
 - Failed to implement and maintain BMPs
 - Failed to operate in accordance with the County's Erosion and Sediment Control Ordinance
 - \$131,000 penalty and Consent Order
- **Henrico County**
 - Failed to manage illicit discharges (one of the 6 MCMs)
 - Failed to manage stormwater discharges from all MS4 properties
 - \$164,300 penalty and Consent Order

6. CONSEQUENCES OF NON-COMPLIANCE

CALTRANS MS4 VIOLATIONS

- **Maintenance Personnel**
 - Not following recordkeeping protocol
 - Unaware of maintenance guides/manuals
 - Not documenting inspections of BMPs
- **Construction Sites**
 - Identified problems were not corrected or enforced
 - Contractors not adequately installing/using BMPs
- **Facilities**
 - Needed site-specific BMPs for maintenance activities
 - Needed to track illicit discharge incidents more fully

7. WHAT TO DO FOR AN AUDIT BY EPA/DCR

VDOT Steering Committee will lead the audit process. Other VDOT staff statewide should be aware of the following:

- **Audit of your facility may be on short notice**
- **Know the BMPs/SOPs that most affect you**
- **Know if your facility is in an urbanized area**
- **Know if your facility is in a TMDL/WLA and the associated POC**
- **Answer all questions honestly, but don't volunteer information**
- **If you do not know the answer to a question, say so and offer to get back to them with the information/answer**

SUMMARY

- VDOT's MS4 program is a federally mandated stormwater permit administered by DCR
- Most VDOT operations within urbanized areas are affected by the MS4 program
- VDOT has been issued WLAs for sediment, PCBs, & bacteria through 8 TMDLs (current permit ending 2013)
- Many more TMDLs/WLAs will be assigned to VDOT's next permit
- VDOT has many existing programs to control regulated pollutants but these tools will be revised & enhanced so that VDOT meets its MS4 & TMDL/WLA obligations
- VDOT will be audited by EPA/DCR this year; **let's be prepared!**



DIRECT QUESTIONS TO:

The MS4 Steering Committee:

MS4@vdot.virginia.gov

Roy Mills

**State Stormwater Program Administrator
& Chairman, MS4 Steering Committee**

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VDOT TMDLs

For VDOT's Municipal Separate Storm Sewer System (MS4) Phase II Permit, the map below displays watersheds with a Total Maximum Daily Load (TMDL) where VDOT has been assigned a Waste Load Allocation (WLA).

Current Permit (2008 - 2013)

Map Number	Watershed	Pollutant of Concern
1	Crab Creek	Sediment & Bacteria
2	Stroubles Creek	Sediment
3	Roanoke River	Sediment & Bacteria
4	Abrams and Opequon Creeks	Sediment & Bacteria
5	Goose Creek and Little River	Sediment
6	Bull Run	Sediment
7	Popes Head Creek	Sediment
8	Potomac River	PCBs

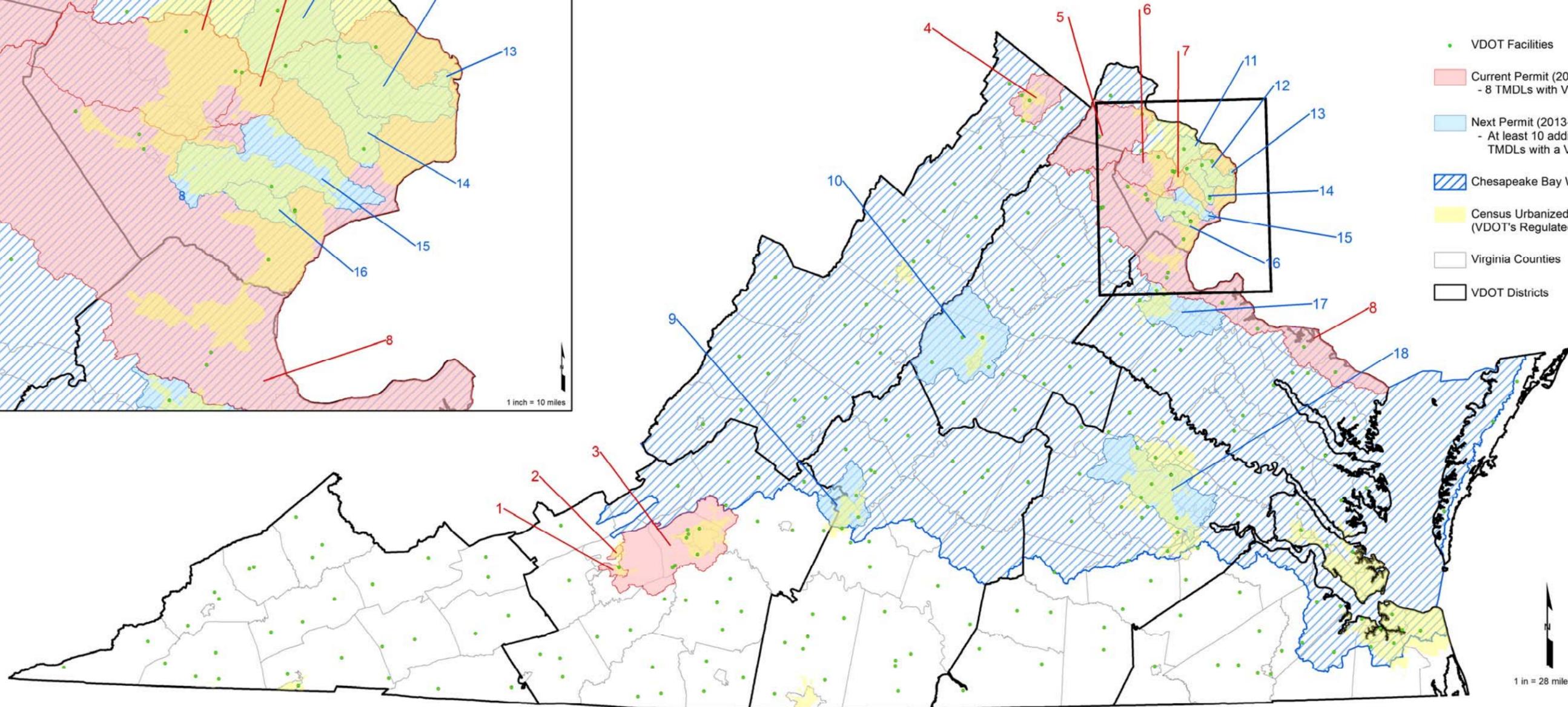
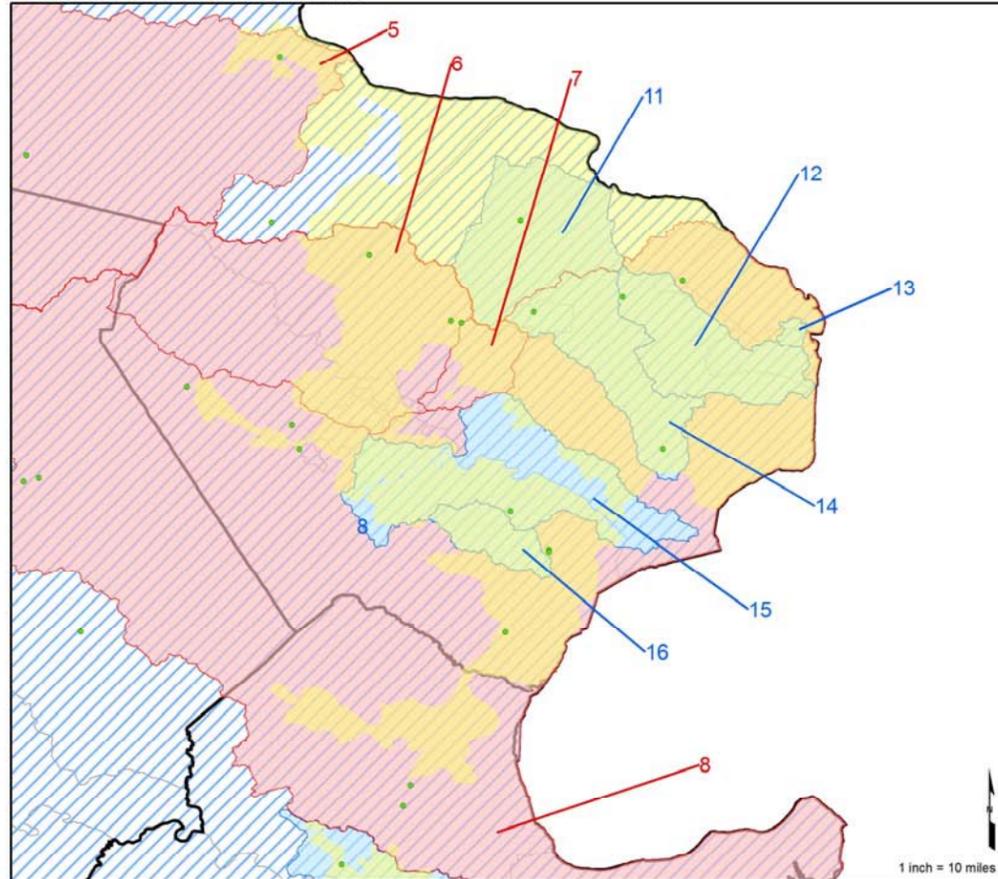
Next Permit (2013–2018)

Map Number	Watershed	Pollutant of Concern
9	James River (Lynchburg)	Bacteria
10	Rivanna River	Sediment
11	Difficult Run	Sediment & Bacteria
12	Hunting Creek, Holmes Run, Cameron Run	Bacteria
13	Tidal Four Mile Run	Bacteria
14	Accotink Creek	Bacteria & Stormwater Flow
15	Occoquan River	Bacteria
16	Neabsco Creek	Bacteria
17	Rappahannock River	Bacteria
18	James River and Tributaries (Richmond)	Bacteria
*	Chesapeake Bay	Sediment & Nutrients

*WLAs for the Chesapeake Bay TMDL have not yet been developed.

Note: More TMDLs with VDOT WLAs are expected to be developed by the 2013-2018 permit period

Fairfax and Prince William Area



- VDOT Facilities
- Current Permit (2008-2013):
- 8 TMDLs with VDOT WLAs
- Next Permit (2013-2018):
- At least 10 additional TMDLs with a VDOT WLA
- ▨ Chesapeake Bay Watershed
- Census Urbanized Area (VDOT's Regulated Area)
- Virginia Counties
- VDOT Districts

Note: No TMDLs with WLAs for VDOT exist in the Bristol District.