Engaging in TMDL Development and Implementation

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MS4 WORKSHOP – VIMS
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Outline

• TMDL Overview
• Getting Involved in TMDL Development
• Implementation Plan Overview
• Developing an Implementation Plan
• Lessons Learned in Hampton Roads
WHAT is a TMDL?

- **Total Maximum Daily Load**

- **Definition:** Maximum amount of a pollutant that a waterbody can receive and still maintain its designated use.

- **In effect:** Planning tool to develop pollution reduction goals in order to improve water quality in impaired waterbodies.
TMDL PROCESS: 3 Steps

1. **303d List:** Identify Impaired Waters
2. **TMDL:** Develop allowable load
3. **Implementation Plan:** Identify measures to achieve load
Data Used to Develop TMDLs

- Population estimates (human, pets, livestock)
- Affected waters volume
- Bacterial Source Tracking Data
- Land use, Climate, and Tide data
- DEQ permit data
- DEQ spill response and remediation data
MS4 Involvement

- Get Informed
- Ask Questions
- Get Involved
- Contribute Data
- Lead Implementation Plan Process
Who is Involved in IP Development

- Stormwater Staff
- Planning Staff
- Utilities Staff
- Local Watershed Groups
- Virginia Department of Environmental Quality
- Virginia Department of Health
- Virginia Department of Conservation and Recreation
- Soil and Water Conservation Districts
IP Development

- Involve Local Stakeholders
  - Public meetings
  - Working groups
  - Steering committee

- Review and update data from TMDL Study

- Integrate watershed plans or other planning activities within the watershed

- Evaluate existing programs

- Identify existing and planned remediation activities (BMPs)
Hampton Roads IP Approach

- Evaluate TMDL Gaps
- Identify changes since TMDL
- Watershed Approach
- Identify related existing programs
- Focus on programmatic BMPs
- Create plan to fill information gaps
- Adaptive management approach
Best Management Practices to Reduce Bacteria

Wildlife

Residential

Commercial

DO NOT FEED THE WATERFOWL

Violators will be subject to $25.00 fine.

Per: Town of Yarmouth Department of Natural Resources.
Best Management Practices to Address Bacteria

Urban Stormwater

Boating

NOTICE
THIS WATERWAY IS A NO DISCHARGE ZONE
THE DISCHARGE OF SEWAGE FROM ANY BOAT IS STRICTLY PROHIBITED
9VAC25-71
Lessons Learned in Hampton Roads
Elizabeth River – Recreation Impairment
- Corrected livestock estimates
- Corrected septic system numbers and failures
- Influenced SSO contribution calculations

- Draft TMDL
  - Assume overflows are 25% raw sewage and 75% non raw sewage
  - Assume raw sewage has 500,000,000 fecal coliform colonies / 100 ml
  - Assume 1:1 ration of fecal coliform to enterococci

- Final TMDL
  - HRSD and localities collected enterococci data from pump stations
  - Data collected at 16 data points between 2004 and 2010 suggested that the geometric mean enterococci concentration at pump stations is 146,000 colonies/100ml.
<table>
<thead>
<tr>
<th>TMDL Watershed</th>
<th>Livestock</th>
<th>Wildlife</th>
<th>Failed Septic System</th>
<th>Pets</th>
<th>SSOs</th>
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<tbody>
<tr>
<td><strong>TMDL #1</strong> Lower Eastern Branch, Lower Southern Branch, Indian River, Broad Creek, Upper Mainstem</td>
<td>20%</td>
<td>10%</td>
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<tr>
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<td><strong>TMDL #4</strong> Paradise Creek</td>
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2: Need to Collect Additional Data

- Mill and Powhatan Creek Watersheds
  - Mill Creek – 6 sq miles : 1 monitoring station
  - Powhatan Creek – 22 sq miles : 2 monitoring stations
  - TMDL indicated septic systems as potential source
  - County and Health Department Partnered to eliminate septic systems as a primary source
  - County initiated fecal coliform sampling to identify hot spots.
Coliscan Easygel

Monthly sampling

7 Sites on Powhatan Creek

5 Sites on Mill Creek

Generally higher in Mill Creek

Targeted eastern branch Mill Creek for further investigation.
3. Need better methods for source identification

- Antibiotic Resistance Analysis Approach
  - Used for TMDL development through 2009
  - Library Dependent
  - Results can be misleading

- Toolbox Approach
  - Use variety of molecular methods
Hampton Roads Microbial Source Tracking Study

- Step 1: Tracer Screen and Sanitary Survey
- Step 2: Quantification of indicator bacteria to identify “hot spots”
- Step 3: Application of Molecular Methods: multiple methods will be utilized to minimize error.
- Step 4: Further Molecular Analysis
Proposed Study Areas

- Moore’s Creek
- Milldam Creek
- Shingle Creek
4. Hard work pays off

- Lynnhaven River- Shellfish condemnation
  - Partner with local watershed group
  - Raise Awareness
  - Sewer Improvements
  - No Discharge Zone
  - Oyster Restoration
Questions?