



# TOWN OF VINTON

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VINTON, VIRGINIA 24179

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**ANITA MCMILLAN**  
PLANNING AND ZONING DIRECTOR

March 4, 2011

Mr. J. Mason Harper, MS4 Permit Writer  
VA Dept. of Conservation  
203 Governor Street  
Richmond, VA 23219-2010

RE: Town of Vinton VSMP MS4 Registration #VAR040026  
Addendum to 2010 MS4 Annual Report

Dear Mr. Harper:

In response to your correspondence dated January 28, 2011, received on February 2, 2011, please find attached an addendum to the 2010 MS4 Annual Report. The addendum is to address the deficiencies as listed in your correspondence.

If you have any questions or need additional information, please give me a call at (540) 983-0601 or email me at [amcmillan@vintonva.gov](mailto:amcmillan@vintonva.gov). Thank you for your cooperation and continued support in our efforts to implement the Town of Vinton MS4 Program.

Sincerely,

Anita J. McMillan  
Planning and Zoning Director

Attachment

pc: Christopher S. Lawrence, Town Manager  
Michael Kennedy, Public Works Director

**Town of Vinton VSMP – General Permit Registration Number VAR040026  
Addendum to 2010 MS4 Annual Report: July 1, 2009 – June 30, 2010**

**Strategies to Ensure Program Consistency with TMDL Assumptions**

The Town of Vinton has several local creeks that have a TMDL completed at the time when the MS4 permit was issued. The creeks, associated pollutants, and waste load allocations are listed below. This addendum will discuss the evaluation of the current ordinances, policies, and BMPs of the Town of Vinton MS4 Program Plan to determine the effectiveness of addressing the specific pollutants and determine procedures to ensure consistency with the TMDL.

<b>TMDL Waterways and Tributaries</b>	<b>WLA</b>
<i>Tinker Creek Watershed, 2004 – E-Coli (EC)</i>	
Glade Creek	8.78E+10 cfu/year
Tinker Creek	3.42E+11 cfu/yr
<i>Roanoke River Watershed, 2006 – E-Coli (EC)</i>	
Roanoke River	3.32E+10 cfu/year
<i>Roanoke River Watershed, 2006 – Sediment (SED)</i>	
Roanoke River	119 Tons/Year

**Table 1: Wasteload Allocations for the Town of Vinton Watershed with Completed TMDLs**

The efforts which the Town of Vinton has and/or will continue to develop to reduce these pollutants are listed below:

- Measurable goals, schedules, and strategies to ensure Program Plan consistency with TMDL assumptions – Minimum Control Measures (MCM) 1 through 6.
- TMDL specific awareness campaign implementation
- Summary of assumptions of the Town of Vinton TMDLs
- List of ordinances and legal authorities, BMPs, policies, plans, and procedures applicable in reducing pollutants identified in WLA
- Summary of existing program evaluation (ordinances, legal authorities, policies, plans, and procedures)
- Implementation schedule
- Annual characterization of volume of stormwater and quantities of pollutants of concern
- Outfall reconnaissance for identification of potential sources of pollutant of concern
- Evaluation of all properties for potential sources of pollutant of concern

**Summary of Assumptions: Tinker Creek Watershed TMDL**

The Tinker Creek Watershed TMDL study, completed in March 2004, prepared for and approved by the Virginia Department of Environmental Quality (VDEQ), encompasses the waters of Glade Creek, Tinker Creek, Carvin Creek, Laymantown Creek, and Lick Run. The water quality impairment was to the fecal coliform standard and DEQ has translated fecal coliform values to *E.coli* values. As required, the Town will address the Waste Load Allocation (WLA) for Tinker and Glade Creeks, which are within the Town watershed.

The Tinker Creek watershed TMDL study summarized the potential point and non-point sources of fecal coliform. The study indicates that eight point sources are permitted to discharge in the Tinker Creek watershed through VPDES. Additionally, both urban and rural non-point sources were cited, such as residential sewage treatment systems, land application of waste (livestock and biosolid), livestock, wildlife, and pets. The Town does not allow livestock or the land application of waste, and majority of the residences are served by Town public sewer.

### Summary of Assumptions: Roanoke River TMDLs

The Bacteria and Benthic TMDLs Development for Roanoke River completed in February and March 2006, prepared for and approved by the VDEQ, encompasses Wilson Creek, Ore Branch, and the Roanoke River Watershed. Two water quality impairments were cited; E. coli and sediment, and the Town will address the WLA for Roanoke River, which is within the Town watershed. The Roanoke River Bacterial TMDL summarized the potential point and non-point sources of E. coli; and these sources include wildlife, human waste, livestock waste, and pets. The Roanoke River Benthic TMDL summarized the potential point and non-point sources for sediment; non-point sources include forested lands, agricultural lands, developed lands, wetlands, or barren lands, and point sources include facilities that have discharge permits and in-stream bank erosion.

### List of Ordinances, Legal Authorities, MCMs/BMPs, Policies, Plans, and Procedures Applicable to Reduce Pollutants Identified in the TMDL and WLA Development

Minimum Control Measures/Best Management Practices	EC/FC	SED.	Evaluated
<b><i>MCM 1: PUBLIC EDUCATION AND OUTREACH</i></b>			
BMP 1-1: Stormwater Educational Programs Review	✓	✓	✓
BMP 1-2: Stormwater Educational/Informational Materials	✓	✓	✓
BMP 1-3: Stormwater Educational School Program	✓	✓	✓
BMP 1-4: Stormwater Public Awareness Program	✓	✓	✓
BMP 1-5: Town of Vinton Stormwater Webpage	✓	✓	✓
<b><i>MCM 2: PUBLIC PARTICIPATION AND INVOLVEMENT</i></b>			
BMP 2-1: Storm Drain Stenciling Program	✓		✓
BMP 2-2: Clean-up and Environmental Events	✓		✓
BMP 2-3: Stormwater Citizens Advisory Committee	✓	✓	✓
BMP 2-4: Staff & Town Representatives on Environmental Related Regional Organizations	✓		✓
BMP 2-5: Posting of the VSMP Report on Town's Website	✓	✓	✓
<b><i>MCM 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION</i></b>			
BMP 3-1: Storm Sewer System Mapping	✓	✓	✓
BMP 3-2: Illicit Discharge Ordinance	✓		✓
BMP 3-3: Illicit Discharge Program	✓		✓
<b><i>MCM 4: CONSTRUCTION SITE STORMWATER RUNOFF CONTROL</i></b> (Note on the Applicability of Roanoke County BMPs Per Agreement with Roanoke County, February 14, 1984, as the Town's ESC Agent)			

Minimum Control Measures/Best Management Practices	EC/FC	SED.	Evaluated
BMP 4-1: Erosion and Sediment Control (ESC) Ordinance		✓	✓
BMP 4-2: Erosion and Sediment Control (ESC) Certification		✓	✓
BMP 4-3: Land Development Procedures Review, Inspection, Enforcement, and Evaluation		✓	✓
<b><i>MCM 5: POST-CONSTRUCTION STORMWATER MANAGEMENT FOR NEW DEVELOPMENT AND REDEVELOPMENT</i></b>			
BMP 5-1: Stormwater Management Ordinance and Manual		✓	✓
BMP 5-2: Stormwater Management Facility Inspection Program		✓	✓
BMP 5-3: Low Impact Development (LID) Utilization		✓	✓
<b><i>MCM 6: POLLUTION PREVENTION AND GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS</i></b>			
BMP 6-1: Spill Prevention and Control Plan for Town Facilities	✓	✓	✓
BMP 6-2: Storm Sewer Systems Maintenance Program	✓	✓	✓
BMP 6-3: Street Sweeping and Leaf Collection Program		✓	✓
BMP 6-4: Pollution Prevention and Hazardous Waste Training	✓	✓	✓
Ordinances	EC/FC	SED.	Evaluated
Vinton Code Chapter 15: Stormwater Management Ordinance/ Roanoke County Code Chapter 23, Stormwater Management Ordinance	✓	✓	✓
Vinton Code Chapter 15.1: Erosion and Sediment Control and Steep Slope Development Ordinance/Roanoke County Code Chapter 8.1 and Section 8.1-2		✓	✓
Chapter 23, Section 5.7: Illicit Discharge Ordinance	✓		✓
Policies and Procedures	EC/FC	SED.	Evaluated
Land Development Review and Evaluation Procedures		✓	✓
Stormwater Management Facility Inspection Protocol		✓	✓
Illicit Discharge Inspection Procedures	✓		✓

**Table 2: List of MCMs, BMPs, Legal Authorities, Ordinances, Policies, and Procedures Applicable to Reduce Pollutants Identified**

**Summary of Program Evaluation**

As shown in Table 2, multiple best management practices listed in the Program Plan and many of the Town’s ordinances, policies, and procedures are designed to address the reduction of the pollutants that are identified in the TMDL Waste Load Allocations (WLAs) to the maximum extent practicable. The Town of Vinton is aware that some of the practices are yet to be implemented due to the lack of resources. On the other hand, the Town feels that these methods sufficiently address the pollutants of concern and if implementation of the current and future stormwater management program continues, the reduction of the identified pollutants will result. Currently, no weaknesses or limitations have been identified that would limit the Town’s programs consistency with the assumptions of the TMDLs.

## Implementation Schedule

Overall, the Town feels that there is no lack of clear weakness in the Town's overall Program Plan on the ordinances, policies, and procedures. Due to limited resources, the implementation of the following best management practices has either been minimal and/or has not been fully implemented: BMP 3-1: Storm Sewer System Mapping, BMP 5-2: Stormwater Management Facility Inspection Program, and BMP 6-1: Spill Prevention and Control Plan for Town Facilities. Therefore, an implementation schedule will be developed to implement the mentioned BMPs by next reporting period, due by October 1, 2011.

## Annual Characterization of Volume of Stormwater and Quantities of Pollutants of Concern

The Town of Vinton will be working closely with the Virginia Department of Conservation and Recreation (DCR) and Roanoke County in the development of a standard method with which to estimate the volume of stormwater discharged from the regulated MS4 and the quantity of pollutants identified in the WLAs.

## Outfall Reconnaissance for Identification of Potential Sources of Pollutant of Concern

The Town of Vinton has fewer than 250 total outfalls discharging to any of the TMDL WLAs identified surface waters; Roanoke River, Tinker Creek, and Glade Creek. Therefore, the Town will perform reconnaissance of all outfalls during the five-year permit period and will annually conduct reconnaissance on a minimum of 15% of the Town known MS4 outfalls discharging to the surface water for which a TMDL has been completed and a WLA has been assigned, see Table 3.

Surface Water	Total Outfalls	Year 3 2010-2011	Year 4 2011-2012	Year 5 2012-2013
Glade Creek	6	2	2	2
Tinker Creek	6	2	2	2
	12	25%	50%	100%

**Table 3: Town of Vinton Outfall Reconnaissance Schedule**

## Evaluation of All Town Properties for Potential Sources of Pollutant of Concern

Town Facility Illicit Discharge Inspection Schedule	Schedule	Inspected	Pollutant?
Vinton Municipal Building, 311 S. Pollard Street	2010-11		
Vinton Storage Building, W. Jackson Avenue	2010-11		
Vinton EMS Building, 120 W. Jackson Avenue	2010-11		
Vinton/County Health Dept., 227 S. Pollard Street	2010-11		
Town Facility Illicit Discharge Inspection	Schedule	Inspected	Pollutant?

Schedule			
Vinton Farmers' Market, 204 W. Lee Avenue	2010-11		
Vinton Stage, 209 W. Lee Avenue	2010-11		
Vinton Storage Buildings, 135 W. Jackson Avenue	2010-11		
Vinton Museum Historical Society, 210 E. Jackson Avenue	2010-11		
Vinton War Memorial Building, 814 Washington Avenue	2011-12		
Charles R. Hill Senior Center, 820 Washington Avenue	2011-12		
Municipal Swimming Pool, 330 Meadow St.	2011-12		
Vinton Public Works Building/Garage, 804 3 <sup>rd</sup> Street	2011-12		
Vinton Storage Lot, 3 <sup>rd</sup> Street	2011-12		
Niagara Road Pump Station, 1300 Niagara Road	2012-13		
Hardy Road Pump Station, 1359 Hardy Road	2012-13		
Third Street Pump Station, 804 Third Street	2012-13		
Wolf Creek Greenway, Hardy Road	2012-13		
Gearhart Park/Storage Building, 350 Highland Road	2012-13		
M.A. Banks Park/Shelter, 131 Craig Avenue	2012-13		

**Table 4: Town Properties Evaluation and Inspection Schedule**

**Stormwater Volume and Pollutant Load Estimation with Waste Load Allocation (WLA) Identified**

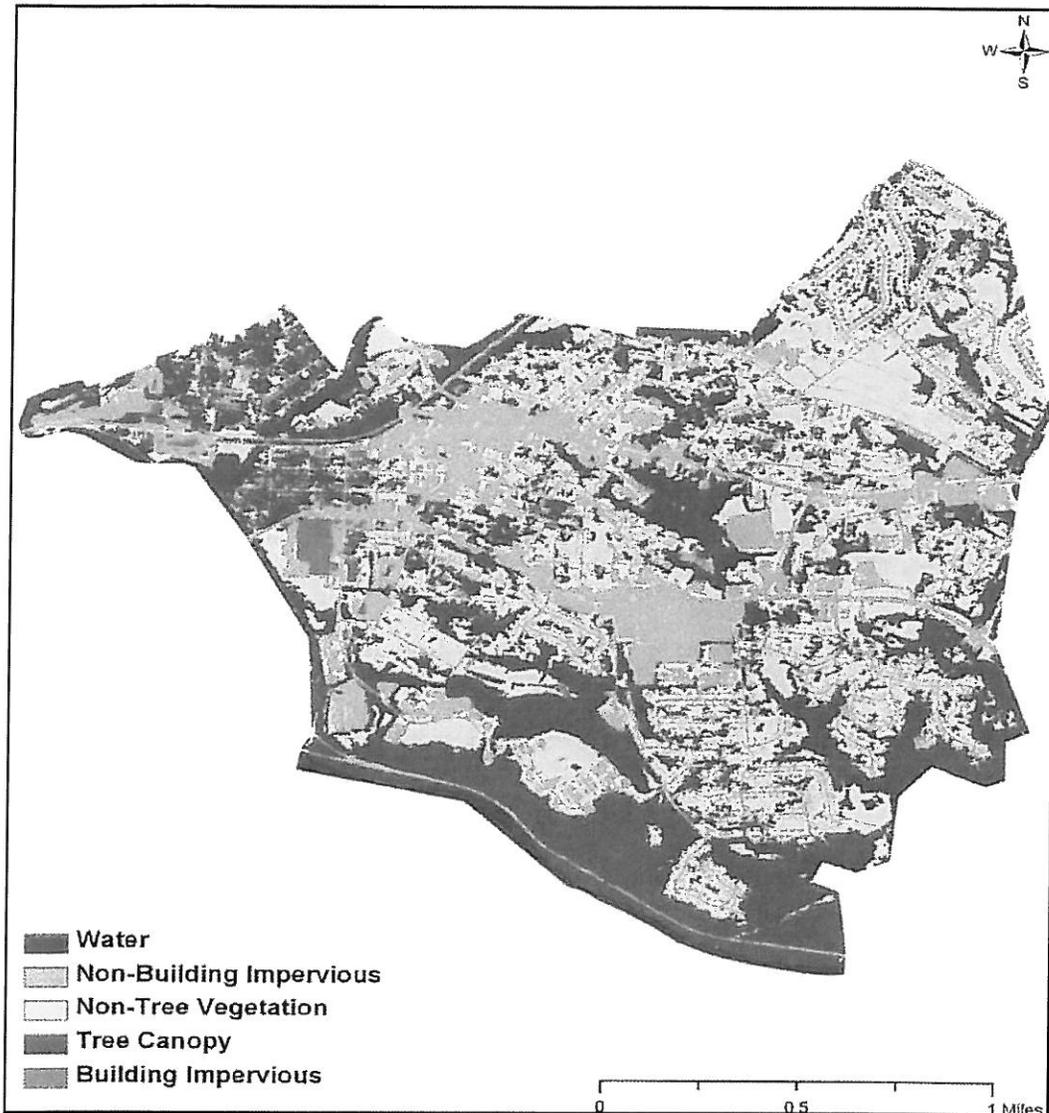
As part of the Town of Vinton Annual Report – July 1, 2009 through June 30, 2010, this information is being submitted to report the estimate volume of stormwater discharged and the quantity of pollutants identified in the Town’s Waste Load Allocations (WLAs) that is discharged by the regulated small MS4 for each pollutant identified in the local creeks that have a TMDL completed in 2004 and 2006. In this section, the methods and results of the calculations for the following items will be described:

1. Estimated Percent Impervious for the Town of Vinton MS4
2. Annual Precipitation for the Reporting Period
3. Estimation of Volume of Stormwater Discharged
4. Estimation of Colony Forming Units of E. Coli
5. Estimation of Total Suspended Solids Discharged Annually

**Percent Impervious for Town of Vinton MS4**

The Percent Impervious for the Town of Vinton was derived from the Town of Vinton Urban Tree Canopy (UTC) Report carried out by the Virginia Department of Forestry in collaboration

with the Town and Roanoke Valley Alleghany Regional Commission. The data analysis utilized high resolution (1 meter) aerial imagery acquired in the summer of 2008 and incorporated parcel specific zoning and land use data provided by the Town of Vinton. The UTC report provided the Town with an estimate of total impervious cover of **29.4%**.



**Figure 1: Land Cover for the Town of Vinton, Urban Tree Canopy (UTC) Report**

### **Annual Precipitation for the Reporting Period**

The Town of Vinton gathers its annual precipitation from the Local Climatological Data from NOAA's National Climatic Data Center (NCDC). The Town of Vinton used the data from the Roanoke Regional/Woodrum Field Airport (KROA) due to its close proximity to the Town. This data was collected on a monthly basis from July 1, 2009 through June 30, 2010, and compiled for

this report. The total precipitation for the July 1, 2009 through June 30, 2010 period was **50.38 inches**.

### Estimation of Volume of Stormwater Discharged

Using the Town of Vinton’s impervious percentage estimate and annual precipitation, the Town of Vinton has used the formula below to derive the volume, in cubic feet, of runoff from the regulated MS4 for each of the watersheds with an identified wasteload allocation. The results are shown below:

$$R_{cubi} = 36.3021 * X * Y * Z$$

$$36.3021 = \left( \frac{1}{100\%} \right) \left( \frac{1ft}{12in} \right) \left( \frac{0.0015625mi^2}{1acre} \right) \left( \frac{27,880,000ft^2}{1mi^2} \right)$$

- Where:
- R = Runoff Volume Estimate, cubic feet
  - X = Estimated percentage of impervious for Town of Vinton MS4 (%)
  - Y = Annual precipitation in inches of reporting period Jul 1, 2009 – June 30, 2010: Data from NOAA, Roanoke Regional Airport Station (KROA)
  - Z = Area of MS4 (in acres)

Watershed with WLA	Drainage Area of MS4 (ac)	Volume (cubic feet)
Roanoke River	148	7.95E+06
Tinker Creek	489	2.62E+07
Glade Creek	711	3.28E+07

**Table 5: Stormwater Runoff Volume Estimation**

### Estimation of Colony Forming Units of E. Coli

Town of Vinton has utilized the Simple Method (Schueler, 1987) to calculate urban stormwater loading for bacteria. This method is originally derived to calculate bacteria in the form of Fecal Coliform using the National Median Concentration for Chemical Constituents in stormwater factor for fecal coliform. To convert to the E. Coli standard for bacteria to make this calculation consistent with the WLA, Town of Vinton has converted Fecal Coliform to E. Coli using the regression model developed by the Virginia Department of Environmental Quality (DEQ). These methods and results are detailed below.

*The Simple Method:*

$$L (cfu/year) = 103 * R * C_b * A (Fecal Coliform)$$

- Where:
- L = Annual load (cfu/yr)
  - R<sub>in</sub> = Annual Runoff Estimate, inches

$$= X * Y$$

$C_b$  = Bacteria Concentration (1000/mL)  
 = 15,000/mL (factor for fecal coliform)  
 $A$  = Area (acres)

Note: 103 is the conversion Factor for Bacteria

The Virginia Department of Environmental Quality Conversion from Fecal Coliform to E. Coli

$$E\ coli = 2^{[-0.0172+0.91905*\log_2(\text{fecal coliform})]}$$

Watershed with WLA	Drainage Area of MS4 (acres)	Fecal Coliform (L) (cfu/year)	E. Coli (cfu/year)
Roanoke River	148	3.39E+09	5.66E+8
Tinker Creek	489	1.12E+10	1.70E+9
Glade Creek	711	1.63E+10	2.40E+9

**Table 6: Colony Forming Units of E. Coli Estimation**

**Estimation of Total Suspended Solids (TSS) Discharged Annually**

Town of Vinton has utilized the simple method (Schueler, 1987) to calculate urban stormwater loading for total suspended solids. This method identified to the method used for Fecal Coliform with different values for potential concentration and conversion factors. The method and results are detailed below.

*The Simple Method:*

$$L = 0.226 * R_{in} * C_p * A$$

Where:

- $L$  = Annual Load (lbs/year)
- $R_{in}$  = Annual Runoff Estimate, inches  
=  $X * Y$
- $C_p$  = Pollutant Concentration (mg/L)  
= 54.51 mg/L (factor for TSS)
- $A$  = Area (acres)

Note: 0.226 is the Conversion Factor for TSS

$$L\ annual\ load\ (tons) = \frac{L\ lbs\ (annual\ load)}{2000\ lbs}$$

Watershed with WLA	Drainage Area of MS4 (ac)	Total Suspended Solids (tons/yr)
Roanoke River	148	13.5 tons/year

**Table 7: Total Suspended Solids (TSS) Discharged Annually Estimation**

**Regulated Land-Disturbing Activities Data**

Per Agreement with Roanoke County, February 14, 1984, Roanoke County is the Town's ESC Agent; See *Vinton Code Chapter 15.1: Erosion and Sediment Control and Steep Slope Development Ordinance/Roanoke County Code Chapter 8.1 and Section 8.1-2*

Permit Number	Date Issued	Project Name	Address of Property	Disturbed Acreage
09-0034	8/6/2009	Advance Auto Parts – ESC Plan	401 Washington Avenue	.88 Ac.
09-0070	12/17/2009	Residential Drive-way Repair – In-Lieu	1019 Lauderdale Avenue	< 0.05 Ac.

**Table 8: Town of Vinton Regulated Land-Disturbing Activities for 2010 Report  
July 1, 2009 – June 30, 2010**