



City of Harrisonburg, Virginia

Chesapeake Bay TMDL Action Plan

Reporting Period: First TMDL Action Plan Report

Permit Number: VAR040075

In compliance with the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4)



Chesapeake Bay TMDL Action Plan

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Principal Executive Officer	
Title:	City Manager
Name:	Kurt Hodgen
Address:	317 South Main Street Harrisonburg, Virginia 22801
Phone:	(540) 432-7701
Email:	Kurt.Hodgen@harrisonburgva.gov

Duly Authorized Representatives	
Title:	MS4 Program Coordinator
Name:	Kelley Junco
Address:	320 East Mosby Road Harrisonburg, Virginia 22801
Phone:	(540) 434-5928
Email:	Kelley.Junco@harrisonburgva.gov
Title:	Director of Public Works
Name:	James Baker
Address:	320 East Mosby Road Harrisonburg, Virginia 22801
Phone:	(540) 434-5928
Email:	Jim.Baker@harrisonburgva.gov

2.a. (1) MS4 Program Review

Description: A review of the current MS4 program implemented as a requirement of this state permit including a review of the existing legal authorities and the operator's ability to ensure compliance with this special condition;

Response: A review has been completed and existing legal authorities are sufficient.

Existing Legal Authorities, <http://www.harrisonburgva.gov/code>

- Section 6-5 of the City Code establishes a Stormwater Utility Fee
- Section 7-6 of the City Code Illicit Discharges and Connections Ordinance
- Section 10-4 of the City Code describes the Erosion and Sediment Control Ordinance
- Design & Construction Standards Manual
- Section 10-7 of the City Code describes the Stormwater Management Ordinance
- References from above ordinances and documents to the “Virginia Erosion and Sediment Control Regulations” and the Virginia Erosion & Sediment Control Handbook
- Section 10-2 of the City Code describes the Subdivision Ordinance
- Section 10-3 of the City Code describes the Zoning Ordinance

2.a. (2) Legal Authority

Description: The identification of any new or modified legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition;

Response: This is the first Chesapeake Bay TMDL Action Plan submittal. All existing legal authorities are noted above. The City does not anticipate any new or modified legal authorities to be implemented in the future.

2.a. (3) Means and Methods for New Sources

Description: The means and methods that will be utilized to address discharges into the MS4 from new sources;

Response: The City of Harrisonburg addresses discharges into the MS4 from new discharges through its existing legal authorities and through its Illicit Discharge Detection & Elimination Program.

2.a. (4) Estimate of Annual POC Loads 2009

Description: An estimate of the annual POC loads discharged from the existing sources as of June 30, 2009, based on the 2009 progress run. The operator shall utilize the applicable versions of Tables 2 a-d in this section based on the river basin to which the MS4 discharges by multiplying the total existing acres served by the MS4 on June 30, 2009, and the 2009 Edge of Stream (EOS) loading rate.

Response: Using the best data available at the time, below is the City’s estimate of annual POC loads discharged. An explanation of how subsources were calculated is provided in Appendix A entitled *Explanation of Estimate Annual POC Loads 2009*. In future years, the City may update the estimate of annual POC loads when new aerial photography or improved data sources are available.

Table 2b: Calculation Sheet for Estimating Existing Source Loads for the Potomac River Basin

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre)	Estimated Total POC Load Base on 2009 Progress Run
Regulated Urban Impervious	Nitrogen	3010	16.86	50,749
Regulated Urban Pervious		3547	10.07	35,718
Regulated Urban Impervious	Phosphorus	3010	1.62	4,876
Regulated Urban Pervious		3547	.41	1,454
Regulated Urban Impervious	Total Suspended Solids	3010	1,171.32	3,525,613
Regulated Urban Pervious		3547	175.8	623,563

	Total MS4 (ac)
Impervious	3,010
Pervious	3,547
Forest	281
Total	6,839

2.a. (5) Total Required Pollutant Load Reductions

Description: A determination of the total pollutant load reductions necessary to reduce the annual POC loads from existing sources utilizing the applicable versions of Tables 3 a-d in this section based on the river basin to which the MS4 discharges. This shall be calculated by multiplying the total existing acres served by the MS4 by the first permit cycle required reduction in loading rate. For the purposes of this determination, the operator shall utilize those existing acres identified by the 2000 U.S. Census Bureau urbanized area and served by the MS4.

Response: Using the best data available at the time, below is the City’s estimate of Total POC Reductions required during 2013-2018 permit cycle. In future years, the City may update the estimate of annual POC loads when new aerial photography or improved data sources are available.

Table 3b: Calculation Sheet for Determining Total POC Reductions Required During the 2013-2018 Cycle for the Potomac River Basin

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre)	Total Reduction Required First Permit Cycle (lbs)
Regulated Urban Impervious	Nitrogen	3010	.08	241
Regulated Urban Pervious		3547	.03	106
Regulated Urban Impervious	Phosphorus	3010	.01	30
Regulated Urban Pervious		3547	.001	4
Regulated Urban Impervious	Total Suspended Solids	3010	11.71	35,247
Regulated Urban Pervious		3547	.77	2,731

2.a. (6) Means and Methods to Meet Required Reductions

Description: The means and methods, such as management practices and retrofit programs that will be utilized to meet the required reductions included in subdivision 2 a (5) of this subsection, and a schedule to achieve those reductions. The schedule should include annual benchmarks to demonstrate the ongoing progress in meeting those reductions;

Response: The following practices are planned by the City to meet required reductions by June 30, 2018. This TMDL Action plan will use the adaptive management approach so that if better practices are identified, the City may substitute alternative practices to meet requirements. Any substitutions will be reported to DEQ in future annual reports and this TMDL Action Plan will be updated as necessary.

Temporary Reduction Practices

No temporary water quality trading credits or offsets have been purchased or are planned to be purchased by the City of Harrisonburg to comply with these special conditions.

Permanent Reduction Practices: First Permit Cycle (2013-2018)

Street Sweeping	TP	TN	TSS
Street Sweeping Mass Reduced per pound of sediment swept	.001	.0025	.3
Annual pounds of swept material	1,163,860 lbs/ year		
City of Harrisonburg Street Sweeping Program	814.70 lbs TP/ year	2,036.76 lbs TN/ year	244,410.60 lbs TSS/ year

PROJECT INFORMATION

The City of Harrisonburg’s urban streets and infrastructure include a significant number of storm water pipes and drop-inlets that take road sediment and debris directly into local waterways. For this reason, an active street sweeping program plays an important role in minimizing the amount of pollutants going into local waterways. Presently, the City regularly operates two regenerative air street sweepers. The collected street sweepings are disposed of at the Rockingham County landfill.

Load reduction calculations for street sweeping in the City of Harrisonburg were performed according to the mass loading approach as outlined in Appendix V.G. in the Chesapeake Bay TMDL Special Condition Guidance. An explanation of how total BMP reductions were calculated is provided in Appendix B entitled *Calculation of Annual Street Sweeping Pollutant Removal*.

2.a. (7) Means and Methods to Offset Increased Loads from New Sources (July 1, 2009 – June 30, 2014)

Description: The means and methods to offset the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2014, that disturb one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities. The operator shall utilize Table 4 to develop the equivalent pollutant load for nitrogen and total suspended solids. The operator shall offset 5.0% of the calculated increased load from these new sources during the permit cycle.

Response: The City of Harrisonburg does not utilize an average land cover condition greater than 16% in the design of post-development stormwater management facilities and therefore section a.(7) is not applicable.

2.a. (8) Means and Methods to Offset Increase in POCs from Grandfathered Projects

Description: The means and methods to offset the increased loads from projects as grandfathered in accordance with [9VAC25-870-48](#), that disturb one acre or greater that begin construction after July 1, 2014, where the project utilizes an average land cover condition greater than 16% impervious cover in the design of post-development stormwater management facilities. The operator shall utilize Table 4 to develop the equivalent pollutant load for nitrogen and total suspended solids.

Response: The City of Harrisonburg does not utilize an average land cover condition greater than 16% in the design of post-development stormwater management facilities and therefore section a.(8) is not applicable.

2.a. (9) Address modifications to TMDL or watershed implementation plan that occurs during the term of this state permit as part of reapplication.

Description: The operator shall address any modification to the TMDL or watershed implementation plan that occurs during the term of this state permit as part of its permit reapplication and not during the term of this state permit.

Response: The City of Harrisonburg will address this at the time of permit reapplication.

2.a. (10) List of Future Projects that Qualify as Grandfathered

Description: A list of future projects and associated acreage that qualify as grandfathered in accordance with [9VAC25-870-48](#);

Response: The City of Harrisonburg does not utilize an average land cover condition greater than 16% in the design of post-development stormwater management facilities and therefore section a.(10) is not applicable.

2.a. (11) Estimate of the Expected Cost

Practice Name/ Description	Annual Estimated Cost
Street Sweeping Program	\$174,000

2.a. (12) Public Comment for TMDL Action Plan

Response: An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan was provided through the following mediums:

The Chesapeake Bay TMDL Action Plan draft was posted on the City of Harrisonburg website (<http://www.harrisonburgva.gov/MS4-permit-program>) on June 26, 2015 and advertised through the website, social media, and advertisement in local newspaper. Written public comments were accepted through July 22, 2015 through Be Heard Harrisonburg (website), e-mail, or letter to 320 East Mosby Road Harrisonburg, VA 22801. No public comments were received.

3. a. Nutrient Management Plans

Description: Implementation of nutrient management plans in accordance with the schedule identified in the minimum control measure in Section II related to pollution prevention/good housekeeping for municipal operations;

Response: See MS4 Program Plan and MS4 Annual Reports for regular updates on municipally-owned properties that require nutrient management plans.

3. b. Construction Site Stormwater Runoff Control

Description: Implementation of the minimum control measure in Section II related to construction site stormwater runoff control in accordance with this state permit shall address discharges from transitional sources;

Response: See MS4 Program Plan and MS4 Annual Reports.

3. c. Post-Construction Stormwater Management Facilities

Description: Implementation of the means and methods to address discharges from new sources in accordance with the minimum control measure in Section II related to post-construction stormwater management in new development and development of prior developed lands and in order to offset 5.0% of the total increase in POC loads between July 1, 2009, and June 30, 2014. Increases in the POC load from grandfathered projects initiating construction after July 1, 2014, must be offset prior to completion of the project.

Response: See MS4 Program Plan and MS4 Annual Reports.

3. d. Reduce POC Loads from Existing Sources

Description: Implementation of means and methods sufficient to meet the required reductions of POC loads from existing sources in accordance with the Chesapeake Bay TMDL Action Plan.

Response: See 2.a.(6) Means and Methods to Meet Required Reductions, above.

Appendix A. Explanation of Estimate of Annual POC Loads 2009

The Chesapeake Bay TMDL pollutant removal estimates provided with the Chesapeake Bay TMDL Action Plan dated June 30, 2015 is based on the:

- **Impervious area delineation of parcels and railroad right-of-way.** This was completed using 2011 aerial photography and ArcGIS.
- **An estimate of the public right-of-way impervious area.** The estimate of public right-of-way impervious area within the MS4 boundary was calculated by subtracting an inward buffer of 5-feet from the ROW polygon's area.
- **A delineation of forested areas within the City's MS4 area.** This was completed by scanning 2011 aerial photography to delineate 'forested' areas based on the March, 2015 Chesapeake Bay TMDL draft guidance. In the final revised guidance released by VA DEQ in May 2015, the size threshold for forested areas has been reduced. The City will update the forest area mapping with the next annual report.
- **Delineation of MS4 Service Area.** This delineation was completed by mapping city-owned outfalls and the drainage areas entering them.

The Chesapeake Bay TMDL pollutant removal estimates does not include VDOT or James Madison University which have MS4 permits. Properties that have VPDES Industrial Stormwater permits have not been removed at this time, and will be considered in the future.

In future years, the City may update the estimate of annual POC loads when new aerial photography or other improved data sources are available.

Refer to spreadsheet titled "Harrisonburg – TMDL Pollutant Removal Estimates 2015.xlsx" for calculations.

Calculation of Annual Street Sweeping Pollutant Removal

Annual Billing Statement:

312.55 tons from Sweeper 24 - 7/01/2013-6/30/2014

269.38 tons from Sweeper 25 - 7/01/2013-6/30/2014

Annual Total: 581.93 tons

Total Nitrogen

$581.93 \times 2,000 = 1,163,860$ lbs

$1,163,860$ lbs $\times .7$ (Dry Weight Factor) = $814,702$ lbs

$814,702 \times .0025$ (Pounds of dry weight sweeping solids) = **2,036.755 lbs TN/ year**

Total Phosphorus

$581.93 \times 2,000 = 1,163,860$ lbs

$1,163,860$ lbs $\times .7$ (Dry Weight Factor) = $814,702$ lbs

$814,702 \times .001$ (Pounds of dry weight sweeping solids) = **814.702 lbs TP/ year**

Total Suspended Solids

$581.93 \times 2,000 = 1,163,860$ lbs

$1,163,860$ lbs $\times .7$ (Dry Weight Factor) = $814,702$ lbs

$814,702 \times .3$ (250 Micron Correction) = **244,410.6 lbs TSS/ year**