



Stafford County, Virginia Phase II Chesapeake Bay TMDL Action Plan

October 31, 2019

Prepared in Compliance with Municipal Separate Storm Sewer System (MS4)
Permit No. VAR040056

Phase II Chesapeake Bay TMDL Action Plan

Stafford County, Virginia

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1 INTRODUCTION

1.1 PURPOSE

This Phase II Chesapeake Bay TMDL Action Plan builds on Stafford County's initial Chesapeake Bay TMDL Action Plan approved by the Virginia Department of Environmental Quality (DEQ) on February 10, 2016. The plan documents how the County intends to meet the "Chesapeake Bay TMDL Special Condition" in Part II A of the General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) that became effective November 1, 2018 (2018 MS4 permit). In accordance with the 2013 MS4 permit, the County submitted a draft Phase II plan with its Registration Statement. The 2018 MS4 permit requires the County to submit a final Phase II plan to DEQ no later than 12 months after the effective date of the permit.

A TMDL for the Chesapeake Bay was established by the U.S. Environmental Protection Agency in 2010. Pollutants of concern (POCs) identified for the Chesapeake Bay include total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS). Virginia subsequently developed and adopted a Watershed Implementation Plan (WIP) that establishes the framework for meeting the Chesapeake Bay TMDL. The 2018 MS4 permit states that MS4 permit holders will implement a phased approach for meeting required reductions over three five-year permit cycles in accordance with the following: 5% by the end of the first permit cycle (June 30, 2018); 40% by June 30, 2023; and, 100% by June 30, 2028.

The County met the 5% reduction requirement for the first permit cycle for both the Potomac River and Rappahannock River watersheds. This Phase II Chesapeake Bay TMDL Action Plan establishes the County's 40% reduction target and identifies the Best Management Practices (BMPs) for achieving the target in accordance with the 2018 MS4 permit and the Chesapeake Bay TMDL Special Condition Guidance developed by DEQ (Guidance Memo No 15-2005) dated May 18, 2015.

1.2 SUMMARY OF REQUIRED REDUCTIONS AND BMPs TO ACHIEVE REDUCTIONS

The County calculated the 5% reduction requirement in its initial Chesapeake Bay TMDL Action Plan. The 40% reduction calculation is presented in Section 3. This includes reductions from existing sources as of June 30, 2009, offsets to account for increases in pollutant loads due to new sources initiating construction between July 1, 2009 and June 30, 2014, and offsets to account for grandfathered projects commencing construction after July 1, 2014.

Reductions and offsets are calculated based on the extent of the MS4 service area within the 2010 Census Urbanized Area. Based on its MS4 area, the County calculates that the following reductions must be achieved from existing sources as of June 30, 2009 to meet the 40% target in the Potomac watershed: 87.37 pounds for TN; 7.49 pounds for TP; and, 5,603.29 pounds for



TSS. The calculated reductions to meet the 40% target in the Rappahannock watershed are: 135.33 pounds for TN; 25.26 pounds for TP; and, 8,469.76 pounds for TSS.

The MS4 permit requires the County to offset any increases from new sources initiating construction between July 1, 2009 and June 30, 2014 that disturbed 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. In addition, the County must offset any grandfathered projects that disturb one acre or greater than begin construction after July 1, 2014 and where the project utilizes an average land cover condition greater than 16%. The County's 2003 Stormwater Management Ordinance used technology-based requirements and mandated stormwater treatment for any increase in impervious surface (i.e., a more stringent 0% threshold for triggering stormwater controls rather than the state default of 16%). Therefore, no offsets are necessary.

The next step is to identify the BMPs to achieve the required POC reductions. The County's strategy for achieving the reductions includes a combination of BMPs as detailed in Sections 4 and 5. These include:

- stormwater facilities installed between January 1, 2006 and June 30, 2009;
- County-initiated stormwater management and stream restoration projects;
- nutrient management plans (NMPs) outside of the MS4 area;
- septic conversions; and,
- additional BMPs that may be implemented in accordance with DEQ's Chesapeake Bay TMDL Special Conditions Guidance.

Section 4 summarizes total reductions achieved during the first permit cycle to-date as reported in the County's FY18 MS4 annual report. Section 5 describes the BMPs that will be used to meet the 40% reduction target as required in the 2018 MS4 permit. Note that the 40% reduction target for all three POCs was achieved in the Potomac watershed during the first permit cycle. As a result, the focus of the County's efforts during the second permit cycle is on the Rappahannock watershed. Reductions in excess of 40% for all three POCs that are documented in this plan and in future annual reports to DEQ will be applied to the third permit cycle.

Tables 1A and 1B provide a summary of the required reductions (40% reduction from existing sources as of June 30, 2009 plus new source and grandfathered offsets) and the BMPs implemented or planned from Sections 4 and 5 to achieve the required reductions for each watershed.

Table 1A – Summary of Required Reductions and Planned BMPs to Achieve Required Reductions in the Potomac River Watershed

	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Required Reductions from Existing Sources to Meet 40%	87.37	7.49	5,603.29



	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Target			
+ Required New Source Offsets	-	-	-
+ Required Grandfathered Offsets	-	-	-
= Total Required Reductions and Offsets	87.37	7.49	5,603.29
- BMPs Implemented During the First Permit Cycle from Section 4	535.91	62.64	54,691.98
- BMPs Planned for the Second Permit Cycle from Section 5	-	-	-
= Remainder/(Excess)	(448.54)	(55.15)	(49,088.69)
Percent Planned Toward 40% Reduction	613.38%	836.32%	976.07%

Table 1B – Summary of Required Reductions and Planned BMPs to Achieve Required Reductions in the Rappahannock River Watershed

	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Required Reductions from Existing Sources to Meet 40% Target	135.33	25.26	8,469.76
+ Required New Source Offsets	-	-	-
+ Required Grandfathered Offsets	-	-	-
= Total Required Reductions and Offsets	135.33	25.26	8,469.76
- BMPs Implemented During the First Permit Cycle from Section 4	49.61	10.97	3,613.07
- BMPs Planned for the Second Permit Cycle from Section 5	294.13	140.49	14,262.18
<i>County Projects</i>	268.30	139.95	14,262.18



	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
<i>NMPs</i>	15.03	0.54	
<i>Septic Conversion</i>	10.80		
= Remainder/(Excess)	(208.41)	(126.20)	(9,405.49)
Percent Planned Toward 40% Reduction	254.00%	599.60%	211.05%

1.3 PERMIT COMPLIANCE CROSSWALK

Table 1C provides each of the requirements for this action plan from Part II A 11 of the 2018 MS4 permit and the specific sections where the requirements are addressed.

Table 1C – Action Plan and Permit Compliance Crosswalk

Action Plan Section	MS4 Permit	MS4 Permit Requirement
Section 2	Part II A 11 a	Any new or modified legal authorities, such as ordinances, permits, policy, specific contract language, orders, and interjurisdictional agreements, implemented or needing to be implemented to meet the requirements of Part II A 3, 4, and 5.
Section 3	Part II A 11 b	The load and cumulative reduction calculations for each river basin calculated in accordance with Part II A 3, 4, and 5.
Section 4	Part II A 11 c	The total reductions achieved as of July 1, 2018 for each pollutant of concern in each river basin.
Section 4 and Appendix A	Part II A 11 d	A list of BMPs implemented prior to July 1, 2018 to achieve reductions associated with the Chesapeake Bay TMDL including: (1) The date of implementation; and, (2) The reduction achieved.
Section 5 and Appendix B	Part II A 11 e	The BMPs to be implemented by the permittee prior to the expiration of this permit to meet the cumulative reductions calculated in Part II A 3, 4, and 5, including as applicable: (1) Type of BMP; (2) Project name;



Action Plan Section	MS4 Permit	MS4 Permit Requirement
		(3) Location; (4) Percent removal efficiency for each pollutant of concern; and, (5) Calculation of the reduction expected to be achieved by the BMP calculated and reported in accordance with the methodologies established in Part II A 8 for each pollutant of concern.
Section 6 and Appendix C	Part II A 11 f	A summary of any comments received as a result of public participation required in Part II A 12 below, the permittee’s response, identification of any public meetings to address public concerns, and any revisions made to the Chesapeake Bay TMDL Action Plan as a result of public participation.

1.4 ADAPTIVE MANAGEMENT

As part of this iterative process for reducing pollutant loadings, the County reserves the discretion to carry out pollutant reduction activities that may vary from the details of this action plan while still meeting or exceeding the minimum pollutant reduction requirements of the MS4 permit. This adaptive management may include but is not limited to (a) selection or substitution of alternative projects or other means or methods based on cost effectiveness, site constraints, permitting or other factors, (b) documentation of credit from projects not represented in this action plan, (c) implementation of new or alternative BMPs, and (d) pollutant credit trading. In all cases, changes will be reported in the annual report to DEQ and credit calculation will be in accordance with good engineering practice and applicable policy and guidance.

2 CURRENT PROGRAM AND LEGAL AUTHORITY

2.1 CURRENT PROGRAM AND EXISTING LEGAL AUTHORITY

The County has adopted an MS4 Program Plan that documents implementation of all MS4 permit requirements, including the programmatic and legal authorities required to meet the “Special Condition for the Chesapeake Bay TMDL.” The full MS4 Program Plan can be found online at <https://staffordcountyva.gov/1248/MS4-Stormwater-Permit-Program>. Table 2A provides a summary of elements of the six minimum control measures (MCMs) implemented by the County under the MS4 permit that relate to controlling total nitrogen, total phosphorus, and total suspended solids.



Table 2A – MS4 Program Plan Components Related to Meeting the Chesapeake Bay TMDL

Minimum Control Measure	MS4 Program Plan Elements Related to Controlling Total Nitrogen, Total Phosphorus, and Total Suspended Solids
Public Education and Outreach on Stormwater Impacts.	The County's implements a Public Education & Outreach Program Plan that addresses nutrients and sediment through education and outreach activities with high priority on residential lawn care and illicit discharges. The County participates in the Northern Virginia Regional Commission's Clean Water Partners regional stormwater education media campaign, which targets nutrients and sediment.
Public Involvement and Participation	The County has designed a program to involve the public in the decision-making process by: <ul style="list-style-type: none"> • Meeting all public notice requirements • Maintaining an Environmental website • Promoting river clean-up events, volunteer storm drain marking program, the regional household hazardous waste collection program, and the Stafford County Cooperative Extension Office Smart Green Lawns program
Illicit Discharge Detection and Elimination	The County has integrated into its MS4 Program Plan an Illicit Discharge Detection and Elimination Program. This program includes preventing, identifying, and eliminating sources of pollutants, including nutrients and sediment.
Construction Site Stormwater Runoff Control	The County's construction site stormwater runoff control program is designed to be fully consistent with the water quality control requirements of the Virginia Erosion and Sediment Control Act and the Virginia Stormwater Management Act, and their attendant regulations. See the Stafford County Code of Ordinances Chapter 11, Erosion and Sediment Control and Chapter 21.5, Stormwater Management. The latest update of the Stafford County Stormwater Management Design Manual was completed in March 2014 (4 th Edition) and includes procedures for the County's Erosion & Sediment Control Program's inspection process.
Post-Construction Stormwater Management	The County's post-construction stormwater management program is designed to be fully consistent with the water quality control requirements of the Virginia Stormwater Management Act and its attendant regulations. See the Stafford County Code of Ordinances Chapter 21.5, Stormwater Management. The stormwater facility inspection program is outlined in the County's VSMP Compliance & Enforcement Policy and Procedures document as well as the County's Stormwater Management Design Manual (4 th Edition), March 2014.
Pollution Prevention and Good Housekeeping for Municipal Operations	The County has included in its MS4 Program Plan actions to meet the pollution prevention and good housekeeping requirements for municipal operations. This includes general good housekeeping, as well as specific requirements to develop nutrient management plans



Minimum Control Measure	MS4 Program Plan Elements Related to Controlling Total Nitrogen, Total Phosphorus, and Total Suspended Solids
	for all properties where nutrients are applied to more than one contiguous acre.

2.2 NEW OR MODIFIED LEGAL AUTHORITY

After review of the County’s existing MS4 Program Plan and legal authorities, the County finds that no additional legal authorities are required for compliance with the “Special Condition for the Chesapeake Bay TMDL.”

3 LOAD AND CUMULATIVE REDUCTION CALCULATIONS

The following sections describe the methodology used by the County to determine the load and cumulative reduction calculations in accordance with Part II A 3, 4, and 5 of the 2018 MS4 permit.

3.1 MS4 SERVICE AREA DELINEATION METHODOLOGY

Stormwater outfalls owned or operated by Stafford County were identified using desktop-based geographic information systems (GIS). Aerial imagery, topography, and storm sewer systems data was reviewed within the 2010 Census Urbanized Area boundaries. County parcel data was used to distinguish among County MS4 outfalls, VDOT MS4 outfalls, and private outfalls. Outfall locations were confirmed via field investigations.

Drainage areas to County MS4 outfalls were delineated using a combination of automated and manual GIS processes. A hydrologically-enforced digital elevation model (DEM) was developed from 2-foot contours to enable automatic delineation of MS4 outfall drainage areas. Where available, construction plans were digitized and georeferenced in order to capture MS4 outfall drainage areas as accurately as possible.

The County’s regulated MS4 area is comprised of lands draining to County-owned or operated MS4 outfalls. This includes the outfalls of four major regional stormwater management ponds as well as County-owned property. The regional facilities are:

1. Stafford Lakes Regional Pond 2A
2. Stafford Lakes Regional Pond 4A
3. Manheim Auto Auction Regional Pond
4. Embrey Mill Regional Pond 5

Drainage in the road right-of-way is maintained by VDOT. Other drainage is maintained by the property owner or the property owner’s association, including outfalls in drainage easements on private property not maintained by the County.



Stafford County previously presented this methodology to DEQ in a memorandum dated November 21, 2014. The County further discussed the methodology and specific MS4 service area delineation examples during a meeting with DEQ staff on February 9, 2015. The MS4 service area was revised in August 2016 to remove areas identified as being regulated under other Phase II permits. Specifically, this includes areas identified by VDOT and the University of Mary Washington in their respective Chesapeake Bay TMDL action plans.

3.2 PERVIOUS AND IMPERVIOUS SURFACE DELINEATION METHODOLOGY

The County worked with the Virginia Geographic Information Network to develop a County-wide impervious cover polygon GIS layer based on aerial imagery captured in 2013. This layer was subsequently used to develop a 2009 impervious cover layer corresponding to the Census Urbanized Area, based on aerial imagery captured in 2009. Roads and buildings constructed since 2009 were removed from the 2013 impervious cover dataset, and other adjustments were made to the layer in order to accurately reflect 2009 conditions.

3.3 REDUCTION REQUIREMENTS

The County straddles the Potomac River and Rappahannock River watersheds. Therefore, reduction requirements are calculated in accordance with both Table 3b and Table 3c in Part II A 3 of the 2018 MS4 permit.

Tables 3A and 3B present the estimated existing source loads in accordance with the MS4 permit and the Chesapeake Bay TMDL Special Conditions Guidance.



Table 3A – Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for the Potomac River Basin

Pollutant	Subsource	A. Loading Rate (lbs/ac/yr)	B. Existing Developed Land 2009 (acres)	C. Loading (lbs/yr)	D. MS4 Required Bay Total L2 Loading Rate Reduction	E. Percentage of L2 Required Reduction by 2023	F. 40% Cumulative Reduction Required by 2023	G. Sum of 40% Cumulative Reduction (lbs/yr)
TN	Imp.	16.86	43.18	728.01	0.09	0.4	26.21	87.37
	Perv.	10.07	253.06	2,548.31	0.06	0.4	61.16	
TP	Imp.	1.62	43.18	69.95	0.16	0.4	4.48	7.49
	Perv.	0.41	253.06	103.75	0.0725	0.4	3.01	
TSS	Imp.	1,171.32	43.18	50,577.60	0.2	0.4	4,046.21	5,603.29
	Perv.	175.8	253.06	44,487.95	0.0875	0.4	1,557.08	

Table 3B – Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for the Rappahannock River Basin

Pollutant	Subsource	A. Loading Rate (lbs/ac/yr)	B. Existing Developed Land 2009 (acres)	C. Loading (lbs/yr)	D. MS4 Required Bay Total L2 Loading Rate Reduction	E. Percentage of L2 Required Reduction by 2023	F. 40% Cumulative Reduction Required by 2023	G. Sum of 40% Cumulative Reduction (lbs/yr)
TN	Imp.	9.38	222.58	2,087.80	0.09	0.4	75.16	135.33
	Perv.	5.34	469.50	2,507.13	0.06	0.4	60.17	
TP	Imp.	1.41	222.58	313.84	0.16	0.4	20.09	25.26
	Perv.	0.38	469.50	178.41	0.0725	0.4	5.17	
TSS	Imp.	423.97	222.58	94,367.24	0.2	0.4	7,549.38	8,469.76
	Perv.	56.01	469.50	26,296.70	0.0875	0.4	920.38	

3.4 NEW SOURCE OFFSET

Part II A 4 of the 2018 MS4 permit requires the County to offset 40% of increases 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. Stafford County has implemented an effective and more stringent stormwater management program for land development activities since 2003 with a focus on the implementation of low impact development technology for stormwater management. The County's 2003 Stormwater Management Ordinance used technology-based requirements and mandated stormwater treatment for any increase in impervious surface exceeding 0%. This exceeds the state minimum default amount of 16%. As a result, no offset is required to be addressed by this plan.

3.5 GRANDFATHERED PROJECTS OFFSET

Part II A 5 of the 2018 MS4 permit requires the County to offset any grandfathered projects that disturb one acre or greater than begin construction after July 1, 2014 and where the project utilizes an average land cover condition greater than 16%. As noted in Section 3.4, the County adopted post-construction stormwater management requirements in 2003 that exceeded the average land cover condition of 16%. Therefore, no offset is required for grandfathered projects.

3.6 TOTAL REDUCTION AND OFFSET REQUIREMENTS

Table 3C presents the total reduction and offset requirements by watershed that the County must achieve during the second MS4 permit cycle.

Table 3C – Total Reduction and Offset Requirements

Reductions and Offsets	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Potomac River Watershed			
Required Reductions from Existing Sources to Meet 40% Target	87.37	7.49	5,603.29
Required New Source Offsets	-	-	-
Required Grandfathered Offsets	-	-	-
Total Reductions and Offsets	87.37	7.49	5,603.29
Rappahannock River Watershed			
Required Reductions from Existing Sources to Meet 40% Target	135.33	25.26	8,469.76
Required New Source Offsets	-	-	-
Required Grandfathered Offsets	-	-	-
Total Reductions and Offsets	135.33	25.26	8,469.76



4 BMPs Implemented During the First Permit Cycle

The County’s strategy for achieving POC reductions during the first permit cycle included a combination of BMPs as described below:

- stormwater facilities installed between January 1, 2006 and June 30, 2009; and,
- County-initiated stormwater management and stream restoration projects.

The County exceeded the 5% POC reduction requirement for the first permit cycle. Part II A 4 of the 2018 MS4 permit requires the County to provide a list of the BMPs implemented prior to July 1, 2018 to achieve these reductions. This section presents progress documented in the first permit cycle as reported in the County’s FY18 MS4 annual report.

4.1 POTOMAC RIVER WATERSHED

Table 4A summarizes the reductions achieved by the County during the first permit cycle. A list of BMPs, including the date of implementation and the reductions achieved, is included in Appendix A as required in Part II A 4 of the 2018 MS4 permit. All BMPs proposed in the initial action plan have been completed.

Table 4A – Summary of BMPs Implemented in the Potomac River Watershed During the First Permit Cycle

BMPs	Time Period	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
2006-2009 Facilities	Calculated once with the initial action plan.	218.13	33.50	30,621.21
County Projects	Two completed through FY18.	317.78	29.14	24,070.77
Total BMPs		535.91	62.64	54,691.98

4.2 RAPPAHANNOCK RIVER WATERSHED

Table 4B summarizes the reductions achieved by the County during the first permit cycle. A list of BMPs, including the date of implementation and the reductions achieved, is included in Appendix A as required in Part II A 4 of the 2018 MS4 permit. All BMPs proposed in the initial action plan, as amended in the annual reports, have been completed.

Table 4B – Summary of BMPs Implemented in the Rappahannock River Watershed During the First Permit Cycle

BMPs	Time Period	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
2006-2009 Facilities	Corrected calculation from FY17 MS4 annual report.	38.99	9.74	3,300.28



BMPs	Time Period	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
County Projects	One completed in FY17.	10.62	1.23	312.79
Total BMPs		49.61	10.97	3,613.07

5 BMPs Planned for the Second Permit Cycle

This section describes the BMPs that will be implemented during the second permit cycle to achieve the cumulative 40% POC reduction target as required in Part II A 11 e of the 2018 MS4 permit.

5.1 POTOMAC RIVER WATERSHED

Stafford County has exceeded the 40% requirement in the Potomac River watershed with the projects completed in the first permit cycle; therefore, no additional BMPs are proposed in the second permit cycle.

Table 5A summarizes the County's compliance with the required reductions from Section 3 for each POC.

Table 5A – Potomac River Compliance Summary

	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Required Reductions from Existing Sources to Meet 40% Target	87.37	7.49	5,603.29
+ Required New Source Offsets	-	-	-
+ Required Grandfathered Offsets	-	-	-
= Total Required Reductions and Offsets	87.37	7.49	5,603.29
- BMPs Implemented During the First Permit Cycle from Section 4	535.91	62.64	54,691.98
- BMPs Planned for FY2018 and the Second Permit Cycle from Section 5	-	-	-
= Remainder/(Excess)	(448.54)	(55.15)	(49,088.69)
Percent Planned Toward 40%	613.38%	836.32%	976.07%



	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Reduction			

5.2 RAPPAHANNOCK RIVER WATERSHED

5.2.1 County-Initiated Projects

The County will take credit for voluntary County-initiated retrofit projects. The County plans to complete a stream restoration project in St. Clair Brooks Park during the second permit cycle. The design for this project is nearing completion and construction will commence in the second permit cycle. Additional projects may be considered during the second permit cycle and will be reported in MS4 annual report.

This stream restoration project consists of the restoration of approximately 1,400 linear feet of perennial stream within St. Clair Brooks Park. The stream restoration was designed using Natural Channel Design (NCD) techniques and includes the implementation of rock sills, boulder riffles, a reinforced substrate, toe wood, and buffer restoration using vegetation indigenous to Stafford County. Detailed information about the Brooks Park Stream Restoration project is provided in Appendix B, including photos of the degraded stream and calculation of the pollutant reduction associated with the project in a format consistent with the Chesapeake Bay TMDL Special Conditions Guidance.

Table 5B – Summary of Reductions from County-Initiated Projects in the Rappahannock River Watershed During the Second Permit Cycle

Project	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Brooks Park Stream Restoration	268.30	139.95	14,262.18
Total	268.30	139.95	14,262.18

5.2.2 Nutrient Management Plans

The County will take credit for nutrient management plans (NMPs) that have been developed for land outside of the regulated MS4 provided it is not a regulated golf course. In accordance with the Chesapeake Bay TMDL Special Condition Guidance (Appendix V.K), blended urban nutrient removal rates of 9% and 4.5% are used for TN and TP respectively. In addition, for NMPs outside of the regulated MS4, the County may only take credit for the pounds of TN and TP addressed in the plan minus the 48% required by the Virginia WIP to meet baseline conditions. The NMPs for Stafford County are summarized in Table 5C and detailed in Appendix B.

Table 5C – Summary of Reductions from Nutrient Management Plans in the Rappahannock River Watershed During the Second Permit Cycle

	Acres	TN Load (lbs/year)	TP Load (lbs/year)	TN Reduction (lbs/year)	TP Reduction (lbs/year)
NMPs Acreage	60.13	321.09	22.85	15.03	0.54



	Acres	TN Load (lbs/year)	TP Load (lbs/year)	TN Reduction (lbs/year)	TP Reduction (lbs/year)
Outside MS4					

5.2.3 Septic Conversion

The County may take credit for the connection of septic systems to the sanitary sewer. Septic systems must be located within the regulated MS4 service area and credit is only available for TN. In order to calculate TN credit, the 2010 Census is used to determine the County’s average number of people per household. The average is then multiplied by the TN edge of stream loading value of 3.6 lbs TN/year/person. The average household size for Stafford County based on the 2010 Census is 3.00. The County has identified one property within the MS4 that it plans to convert from septic to sanitary during this permit cycle. The property is located at 12 Railroad Lane, Fredericksburg, VA.

Table 5D – Summary of Reductions from Septic Conversions in the Rappahannock River Watershed During the Second Permit Cycle

	TN Load (lb/yr/person)	Average Household Size	TN Reduction (lbs/year)
12 Railroad Lane	3.6	3.00	10.8

5.2.4 Additional BMPs

The County reserves the right to implement and take credit for additional creditable facilities or practices as provided for in the Chesapeake Bay TMDL Special Condition Guidance. The guidance document specifically references the work of the Chesapeake Bay Urban Stormwater Workgroup, which includes credits for urban nutrient management and homeowner best management practices such as rainwater harvesting, downspout disconnection, permeable hard-scapes, tree planting, and impervious cover removal. Reductions achieved will be documented to DEQ in the County’s annual reports.

The County also has the option of purchasing off-site nutrient credits under the provisions of §62.1-44.15:35 of the Code of Virginia

5.2.5 Compliance Summary

Table 5E demonstrates how the County will meet the required reductions from Section 3 for each POC with the BMPs implemented in Section 4 and the BMPs described in Sections 5.2.1 through 5.2.3.

Table 5E – Rappahannock River Compliance Summary

	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Required Reductions from Existing Sources to Meet 40%	135.33	25.26	8,469.76



	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Target			
+ Required New Source Offsets	-	-	-
+ Required Grandfathered Offsets	-	-	-
= Total Required Reductions and Offsets	135.33	25.26	8,469.76
- BMPs Implemented During the First Permit Cycle from Section 4	49.61	10.97	3,613.07
- BMPs Planned for the Second Permit Cycle from Section 5	294.13	140.49	14,262.18
<i>County Projects</i>	268.30	139.95	14,262.18
<i>NMPs</i>	15.03	0.54	
<i>Septic Conversion</i>	10.80		
= Remainder/(Excess)	(208.41)	(126.20)	(9,405.49)
Percent Planned Toward 40% Reduction	254.00%	599.60%	211.05%

6 PUBLIC COMMENTS

In accordance with Part II A 11 f of the 2018 MS4 permit, this section will be updated in the final Phase II Chesapeake Bay TMDL Action Plan to reflect the requirement that the public have an opportunity to provide comment on proposed BMPs not previously included in the initial plan. At a minimum, a 15 day comment period must be provided. This section will include a summary of any comments received through the public participation process, the County's response, identification of any public meetings to address public concerns, and any revisions made to the plan as a result of public participation. Appendix C is reserved for any detailed information related to public comments received by the County.



Appendix A

Summary of BMPs Implemented in First Permit Cycle



BMP	Date Installed	Load Reduction Achieved (lb/yr)		
		TN	TP	TSS
Potomac River Watershed				
DP257 Pond Retrofit	August 2018	221.88	19.29	16,088.70
DP337 Pond Retrofit	April 2017	95.90	9.85	7,982.07
Historical BMPs	2006-2009	218.13	33.50	30,621.21
	Total	535.91	62.64	54,691.98
Rappahannock River Watershed				
Brooks Park Bioretention	April 2017	10.62	1.23	312.79
Historical BMPs	2006-2009	38.99	9.74	3,300.28
	Total	49.61	10.97	3,613.07



Appendix B

Information for BMPs Planned for Second Permit Cycle



Stream Restoration Project in St. Clair Brooks Park – Pollutant Reduction Calculation

Brooks Park Stream Restoration					
Anticipated Installation Date: 2018/2019					
Latitude: 38.320768		HUC: 02080104			
Longitude: -77.462921		Calculation Method: Protocol 1			
BANCS Assessment Sediment Erosion Rate:		285 ton/yr			
TN Conversion (Erosion Rate * 2.28):		649.8 lb/yr			
TP Conversion (Erosion Rate * 1.05):		299.25 lb/yr			
STEP 1: Initial Stream Restoration Project POC Reductions					
TN (Apply 50% factor)		324.9 lb/yr			
TP (Apply 50% factor)		149.63 lb/yr			
TSS (Convert to lbs, apply 50% factor and 0.061 SDR)		17385 lb/yr			
	TN	TP	TSS		
Impervious 5% Rate Reduction - Rappahannock (lbs/ac/yr)	0.04221	0.01128	4.2397		
Pervious 5% Rate Reduction - Rappahannock (lbs/ac/yr)	0.01602	0.0013775	0.24504375		
STEP 2: Acreage to Project	Total	Forested	Impervious	Pervious	Total Urban
Regulated Acres	1.05	0.32	0.15	0.58	0.73
Unregulated Acres	173.48	48.16	31.40	93.92	125.32
	174.53	48.48	31.55	94.50	126.05
STEP 3: Acreage Ratios & Reduction Credits	Portion of Reductions (lbs/yr)				
	Land Ratio	TN	TP	TSS	
Regulated Urban	0.004	1.36	0.63	72.72	
Unregulated Urban	0.718	233.29	107.44	12,483.17	
Forested	0.278	90.25	41.56	4,829.11	
	Total	324.90	149.63	17,385.00	
STEP 4: Total Baseline Reductions	TN	TP	TSS		
Required Baseline Reduction on Unregulated Impervious (lbs/yr)	26.51	7.08	2,662.53		
Required Baseline Reduction on Unregulated Pervious (lbs/yr)	30.09	2.59	460.29		
Total Required Baseline Reduction on Unregulated (lbs/yr)	56.60	9.67	3,122.82		
STEP 5: Total Adjusted Reduction Credits	TN	TP	TSS		
Regulated POC Reduction Credits (lb/yr)	1.36	0.63	72.72		
Unregulated POC Reduction Credits - Baseline Reduction (lb/yr)	176.69	97.77	9,360.35		
Forested POC Reduction Credits	90.25	41.56	4,829.11		
Total POC Reduction Credits	268.30	139.95	14,262.18		



Stream Restoration Project in St. Clair Brooks Park – Photos of Condition Prior to Restoration





Nutrient Management Plan Credit Calculation (NMPs Outside MS4 Service Area)

Location	Owner	NMP Status	NMP Acreage	Longitude	Latitude	TN Load (lb/yr)	TP Load (lb/yr)	TN Credit (lb/yr)*	TP Credit (lb/yr)**
Berea Fire and Rescue (Stafford County Fire & Rescue Station 12)	Fire & Rescue Department	Will be updated during permit cycle	0.94	-77.507394	38.356098	5.02	0.36	0.23	0.01
Englund Run Library (Central Rappahannock Regional Library)	Stafford County	Will be updated during permit cycle	0.82	-77.497629	38.363617	4.38	0.31	0.20	0.01
John Lee Pratt Memorial Park	Parks and Recreation	Will be updated during permit cycle	28.02	-77.458864	38.312749	149.63	10.65	7.00	0.25
Duff McDuff Green Memorial Park - MS4 acreage of 3.69 ac subtracted from NMP acreage of 17.25 ac	Parks and Recreation	Will be updated during permit cycle	13.56	-77.431561	38.273338	72.41	5.15	3.39	0.12
St Clair Brooks Park - MS4 acreage of 1.05 ac subtracted from NMP acreage of 17.84 ac	Parks and Recreation	Will be updated during permit cycle	16.79	-77.462910	38.320768	89.66	6.38	4.20	0.15
			60.13					15.03	0.54

* Load x 0.09 x 0.52

** Load x 0.045 x 0.52



Appendix C

Reserved for Public Comments and Response

The Chesapeake Bay TMDL Action Plan was posted on Stafford County web pages from October 01 – October 31, 2019 with no comments provided from the public. [Scott Rae, 191031]