STAFFORD COUNTY PUBLIC SCHOOLS – CHESAPEAKE BAY TMDL ACTION PLAN

Revised August 2025

As a permittee under the Commonwealth of Virginia 2023-2028 General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), Stafford County Public Schools (SCPS) is required to develop a Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan for Phase III as an update to its existing MS4 Program Plan for submittal to the Virginia Department of Environmental Quality (VDEQ) By Nov 1, 2024.

This Action Plan contains the required and suggested elements that should be included to ensure the Third Phase Chesapeake Bay TMDL Action Plan ("Action Plan") is approvable. This Action Plan should allow VDEQ to verify that SCPS will be able to meet the additional reduction requirements for the Special Condition for the Third Phase Chesapeake Bay TMDL Action Plan.

This Action Plan includes the following material per Part II.A.12 of the MS4 General Permit ('Permit'):

A. Existing, new, and modified legal authorities implemented or to be implemented to meet the reduction requirements'
B. Load and cumulative reduction calculations for each river basin;
C. Total reductions achieved as of November 1, 2023 for each pollutant of concern (POC);
D. List of Best Management Practices (BMPs) implemented prior to November 1, 2023 to achieve reductions associated with the Chesapeake Bay TMDL, including
    a. The date of implementation; and
    b. The reductions achieved.
E. BMPs to be implemented by the permittee prior to the expiration of the MS4 General Permit to meet the cumulative reductions calculation in Part II A3, A4, and A5, including the type of BMP, Project name, location, percent removal efficiency of each POC, and calculation of the reduction expected to be achieved by the BMP; and
F. A summary of any public comments received on additional BMPs proposed through this document.

1. Previous Permit Cycles – BMPs and Associated Reductions

A. Total Annual Reductions Achieved 2013-2018

SCPS met or exceeded POC reduction requirements during the first permit cycle. Reductions and required reductions achieved per river basin by year 5 are presented below in **Table 1.1**. Reduction calculations for each year are detailed in **Appendix A**.

Table 1.1: Annual Reductions Achieved During the First Permit Cycle in the Potomac and Rappahannock River Basins

Watershed		Total Annual POC Reduction (lbs)		
		Total N	Total P	TSS
2013-2018	Potomac River	483.85	71.94	13,412.87
	Rappahannock River	99.95	2.52	756.00
Required 5% Reduction:		24.77	2.76	1,939.33
Reductions Met During Year 5 (%):		414%	563%	150%

B. Total Annual Reductions Achieved 2018-2023

SCPS did not meet POC reduction requirements during the second permit cycle. Reductions required and reductions achieved per river basin during this permit cycle are presented below in **Table 2.1**. Reduction calculations are detailed in **Appendix B**. SCPS plans to purchase the credits needed as soon as possible in order to meet the required reduction of 40% for the second permit cycle. The credits to be purchased can be found in **Table 2.1.**

Table 2.1: Annual Reductions Achieved During the Second Permit Cycle in the Potomac River Basin

Watershed		Total Annual POC Reduction (lbs)		
		Total N	Total P	TSS
2018-2023	Potomac	145.09	11.21	7,756.77
	Rappahannock	0	0	0
Required 40% Reduction (Potomac):		137.86	15.72	12,981.94
Required 40% Reduction (Rappahannock):		20.75	3.80	1,267.97
Reductions Met During Year 5 (Potomac) %:		105.24%	71.31%	59.75%
Reductions Met During Year 5 (Rappahannock) %:		0.00%	0.00%	0.00%
Credits Needed (Potomac):		0.00	4.51	5224.77
Credits Needed (Rappahannock)		20.75	3.80	1267.97

2. Legal Authority

A. Existing Legal Authorities

(*General Permit Part II A. Chesapeake Bay TMDL special condition 12.b.(1)) 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 Part II A 3, A 4, and A 5.

Stafford County Public Schools (SCPS) will operate under the Virginia MS4 General Permit (#VAR040071 November 1, 2023 – October 31, 2028) to address stormwater discharges from its regulated properties. The components of this MS4 Program, including the methods used for the six minimum control measures (MCM) detailed in the SCPS Program Plan.

As stated in MCM #3 of the SCPS MS4 Program Plan (Apex, TBD), SCPS is not a governing body and lacks the regulatory authority held by traditional General Permit MS4 operators. As a school system, SCPS must rely on Stafford County to develop and enforce legal authorities such as ordinances, permits or orders.

SCPS construction site stormwater runoff control is regulated by the Stafford County Code of Ordinances, Chapter 11 (Erosion and Sediment Control) and Chapter 21.5 (Stormwater Management). SCPS post-construction stormwater management is regulated by the Stafford County Code of Ordinances, Chapter 21.5 (Stormwater Management).

Existing legal measures within SCPS's range of authority are detailed below.

- Construction Contracts
    - SCPS construction contracts require erosion and sediment control plan approval by a Virginia Erosion and Sediment Control Program (VESCP) authority prior to commencement of land disturbing activities to ensure compliance with the Erosion and Sediment Control Law and any applicable local ordinances.
- Service Contracts
    - Contracted stormwater BMP inspection services help to fulfill MCM #3 (Illicit Discharge Detection & Elimination) and MCM #5 (Post-Construction Stormwater Management).
- Interjurisdictional Agreements
    - Interconnection letters were mailed to the following bordering MS4s.
        - Stafford County (Permit #VAR040056)
        - Virginia Department of Transportation (Permit #VAR0400061)

B. New or Modified Legal Authorities

SCPS has not identified any new or modified legal authorities. As new legal authorities are identified, or if existing legal authorities are modified, this document will be updated accordingly.

3. Load and Cumulative Reduction Calculations – Existing Sources

(*General Permit Part II A. Chesapeake Bay TMDL special condition 12.b.(2))*

A. Pervious/Impervious Acreage Calculation- Existing Development

As of November 1, 2023, the SCPS MS4 System is comprised of approximately 889.23 regulated and forested acres of land across twenty-five properties, located throughout Stafford County, Virginia. An additional four SCPS properties (approximately 220 acres) do not fall within the 2000, 2010 or 2020 census urbanized areas and therefore

are not currently considered part of the SCPS MS4 System. As part of contracted annual basin inspections, SCPS MS4 and non-MS4 outfall locations have been confirmed and geo-located via field investigations.

SCPS properties are located throughout the county and therefore fall into several Hydraulic Unit Codes (HUCs). Eighteen MS4-regulated SCPS properties discharge to the Potomac River Basin. The remaining seven MS4-regulated SCPS properties discharge to the Rappahannock River Basin. All load and reduction calculations for the purposes of this document have been performed utilizing the corresponding Potomac River and Rappahannock River Basin tables from the Permit.

Base aerial imagery dated 2024 provided through the Virginia Geographic Information Network (VGIN) and the Virginia GIS Clearinghouse (http://vgin.maps.arcgis.com/home/), was utilized for the identification of ground features. The aerial imagery was provided at the Department-recommended 1'x1' resolution.

Following a review of the May 2005 EPA publication "Estimating and Projecting Impervious Cover in the Southeastern United States", the proportion of pervious to impervious surface area in the SCPS MS4 was estimated from digital imagery using visual feature identification methods – features were manually classified by a human analyst. In the EPA document, visual feature identification was found to be generally accurate when controlled for subjectivity, but to be unacceptable in terms of efficiency and accuracy for the large acreage covered by the EPA study – spectral analysis software was utilized instead for more efficient identification. At the small scale of the SCPS MS4 regulated area, developing spectral analysis software capable of automatically classifying features to an acceptable level of accuracy was determined to be cost prohibitive.

The EPA study showed that visual feature identification accuracy is limited by the subjectivity and variability from analyst to analyst. Uncertainty can exist based on both the clarity of available aerial photography and the nature of the ground cover - actual surface material and nature is often hard to determine from aerial photography. To maximize consistency between analysts, visual analysis of the SCPS MS4 regulated area was conducted using the following designations (**Table 3.1**) for impervious and pervious feature categorization.

Table 3.1: Impervious vs. Pervious Surface Classification

Impervious	Pervious
Structures – Schools, Support Buildings, Portable Buildings	Grassed Areas – Lawns, Athletic Fields, Medians
Paved Areas – Driveways, Roads, Access Roads, Parking Lots	Mulched Areas – Playgrounds, Planting Beds
Paved Athletic Areas – Tracks, Tennis Courts, Basketball Courts	Vegetated Areas – Forests*, Medians, Planting Beds
Gravel Areas	Water Features
Sidewalks	Bare Soil Areas

* In accordance with the Bay Program Model, forested lands are permitted to be excluded from initial reduction calculations.

Ground features were identified and categorized by human analysts with the help of Geographic Information System (GIS) software. The amount of area covered by impervious surfaces within each SCPS property boundary was measured by drawing polygons to delineate impervious features. Total impervious surface area was calculated as the sum of these polygon areas. Total pervious surface area was calculated as the total property acreage less impervious area. Delineating each feature allows the generation of the most accurate measure of both the acreage and location of impervious surfaces on each property. These pervious and impervious areas were field verified using Apex's professional judgement and determined to be accurately delineated.

Impervious and pervious surface area calculations for each MS4-regulated property classified as "Existing" (Developed Pre-6/30/2009) are provided in **Table 3.2**. Calculations for properties are classified as "New" (Developed or Re-Developed Post-6/30/2009) are provided in **Section 4**.

Table 3.2: Estimated Impervious vs. Pervious Surface Acreage of SCPS Existing Properties Third Permit Cycle – (Developed Pre-6/30/2009)

Property	Year Built	HUC/Discharge Water Body	Discharge Basin	Total Minus Forested Acreage	Impervious Acreage	Pervious
Alvin Bandy Administrative Complex	1900	PL57/Lower Aquia Creek	Potomac River	9.55	4.30	5.25
Anthony Burns Elementary School	2006	PL57/Lower Aquia Creek	Potomac River	21.47	6.08	15.39
Colonial Forge High School	1999	PL58/Accokeek Creek	Potomac River	61.73	15.63	46.10
Conway Elementary School	2005	RA46/Rappahannock River - Hazel Run	Rappahannock River	17.47	6.14	11.33
Edward E Drew Middle School	1951	RA46/Rappahannock River - Hazel Run	Rappahannock River	13.99	4.44	9.55
Falmouth Elementary School	1967	RA46/Rappahannock River - Hazel Run	Rappahannock River	9.72	3.70	6.02
Ferry Farm Elementary School	1967	RA46/Rappahannock River - Hazel Run	Rappahannock River	15.76	3.89	11.87
Gari Melchers Complex	1931	RA46/Rappahannock River - Hazel Run	Rappahannock River	20.76	5.13	15.63
Garrisonville Elementary School & AG Wright Middle School	1981	PL56/Upper Aquia Creek	Potomac River	40.25	15.22	25.03
Grafton Village Elementary School and Dixon-Smith Middle School	1967 2006	PL60/Upper Aquia Creek	Potomac River	45.83	12.04	33.79
Hampton Oaks Elementary School	1992	PL57/Lower Aquia Creek	Potomac River	12.44	4.92	7.52
H.H. Poole Middle School	1995	PL57/Lower Aquia Creek	Potomac River	27.35	6.48	20.87
Kate Waller Barrett Elementary School	2002	PL56/Upper Aquia Creek	Potomac River	15.69	5.92	9.77
Margaret Brent Elementary School & Mountain View High School	2004 2005	PL57/Lower Aquia Creek	Potomac River	105.34	27.54	77.80

Table 3.2: Estimated Impervious vs. Pervious Surface Acreage of SCPS Existing Properties – (Developed Pre-6/30/2009) (Continued)

Property	Year Built	HUC/Discharge Water Body	Discharge Basin	Total Regulated Acreage	Impervious Acreage	Pervious
North Stafford High School	1981	PL57/Lower Aquia Creek	Potomac River	65.42	22.59	42.83
Park Ridge Elementary School	1990	PL57/Lower Aquia Creek	Potomac River	16.16	4.75	11.41
Rockhill Elementary School	1989	PL56/Upper Aquia Creek	Potomac River	16.14	4.86	11.28
Rocky Run Elementary School	2000	RA45/Rappahannock River - Motts Run	Rappahannock River	14.02	6.05	7.97
Rodney E. Thompson Middle School	2000	PL58/Accokeek Creek	Potomac River	33.59	8.62	24.97
Shirley Heim Middle School	2008	PL57/Lower Aquia Creek	Potomac River	22.01	6.82	15.19
Stafford Elementary School	1968	PL57/Lower Aquia Creek	Potomac River	12.76	4.16	8.60
T. Benton Gayle Middle School	2002	RA46/Rappahannock River - Hazel Run	Rappahannock River	30.14	8.15	21.99
Widewater Elementary School	1988	PL54/Potomac River - Tank Creek	Potomac River	16.66	5.26	11.40
Winding Creek Elementary School	1997	PL58/Accokeek Creek	Potomac River	15.60	3.75	11.85
			Potomac River Basin Total:	537.99	158.94	379.05
			Rappahannock River Basin Total:	121.86	37.50	84.36
			TOTAL:	659.85	196.44	463.41

B. Annual POC Load Calculation – Existing Development

*Per the General Permit Part II 11. B. (2) t*he estimated annual POC loads discharged from existing sources and the reduction requirements for existing development have been calculated using the tools described in the VDEQ Guidance Memo No. 15-2005. SCPS utilized the applicable Potomac River Basin Table (Table 3b) and the applicable Rappahannock River Basin Table (Table 3c) from the MS4 General Permit (2023-2028) Part II TMDL Special Conditions A.3. Total existing acres in each river basin served by the MS4 on June 30, 2009 were multiplied by the applicable loading rate to estimate the load in lbs/yr. The cumulative reduction required by 6/30/2028 was then calculated by multiplying the load by the percentage of MS4 required Chesapeake Bay total L2 loading reduction. The completed calculation tables for the Potomac River and the Rappahannock River are provided below as **Table 3.3 and Table 3.4**. A summary of POC load reduction for existing property is provided in **Table 3.5**.

Table 3.3: Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for the Potomac River Basin (Based on Part II.A.3 Table 3b)

Pollutant	Sub source	Loading Rate (lbs/acre/yr)	Total Existing Acres Served by MS4 (06/30/09)	Load (lbs/yr)	Percentage of MS4 required Chesapeake Bay total L2 loading Reduction	100% cumulative reduction required by 10/31/2028	Sum of 100% cumulative reduction (lbs/yr)
Nitrogen	Regulated Urban Impervious	16.86	158.94	2,679.73	9	241.18	**470.20**
	Regulated Urban Pervious	10.07	379.05	3,817.03	6	229.02	
Phosphorus	Regulated Urban Impervious	1.62	158.94	257.48	16	41.20	**52.47**
	Regulated Urban Pervious	0.41	379.05	155.41	7.25	11.27	

Table 3.4: Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for the Rappahannock River Basin (Based on Part II.A.3 Table 3c)

Pollutant	Sub source	Loading Rate (lbs/acre/yr)	Total Existing Acres Served by MS4 (06/30/09)	Load (lbs/yr)	Percentage of MS4 required Chesapeake Bay total L2 loading Reduction	100% cumulative reduction required by 10/31/2028	Sum of 100% cumulative reduction (lbs/yr)
Nitrogen	Regulated Urban Impervious	9.38	37.50	351.75	9	31.66	**58.69**
	Regulated Urban Pervious	5.34	84.36	450.48	6	27.03	
Phosphorus	Regulated Urban Impervious	1.41	37.50	52.88	16	8.46	**10.78**
	Regulated Urban Pervious	0.38	84.36	32.06	7.25	2.32	

Table 3.5: POC Load Reductions Required for Existing Sources in Each River Basin During the Third Permit Cycle.

Watershed	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)
Potomac Basin	470.20	52.47
Rappahannock Basin	58.69	10.78
TOTAL	**528.89**	**63.25**

4. Annual Loadings from New Sources and Grandfathered Projects

In addition to computing baseline loadings from existing conditions as of June 30, 2009, the special conditions require the determination of offsets for increased loads from development occurring on or after July 1, 2009, including grandfathered projects. No offsets are necessary for new sources since:

- Loadings from new sources are addressed with the water quality criteria in the stormwater management regulations. Water quality criteria for new sources from regulated development between July 1, 2009 and June 30, 2014 was based on an average land cover condition of 16% and therefore appropriate offsets were incorporated within the development project's stormwater management plan.
- No grandfathered projects occurred on or after July 1, 2009.

5. Total Required Reductions

Based on the results of the Department-provided calculation tools, the annual required pollutant load reductions for existing and new development are as follows:

Table 5.1: Annual SCPS POC Reduction Requirements – Third Permit Cycle (2023-2028)

Development	Watershed	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)
Existing	Potomac River	470.20	52.47
	Rappahannock River	58.69	10.78
New	Potomac River	0	0
	Rappahannock River	0	0
	TOTAL	**528.89**	**63.25**

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6. Implemented Means and Methods to Meet the Reduction Requirements

Per *General Permit Section II Section A. 12. b. (4)*, this section details the means and methods implemented by SCPS prior to November 1, 2023. These details on implemented BMPs and associated reductions were provided to show a how reductions required before the end of the second permit cycle (June 30, 2023).

A. Implemented Means and Methods - Management Practices

This section describes the management practices that were implemented between in the second permit cycle between July 1, 2018 and June 30, 2023 to achieve the 40% reductions required for new and existing development of the Second Phase of the Action Plan. The central feature of the SCPS MS4 program's POC reduction efforts to date was through contracted street sweeping efforts, initiated in Spring 2017 with Meritt Enterprises, Inc. Under the previous street sweeping contract, partially full sweeping trucks visited SCPS properties following routes including non-SCPS facilities as a cost-saving measure. This arrangement allowed for lower-cost sweeping services but has not resulted in reliable data for pounds of street solids removed specifically from SCPS properties. Landfill disposal weight records collected during this time period include solids removed from all properties on the sweeping route, and therefore did not reflect the weight of solids removed from MS4-regulated SCPS properties. The new contracted biannual sweeping effort targets accumulated sediment and sand applied during snow and ice control efforts in school and facility parking lots.

Per Appendix V.G of VDEQ Guidance Memo No. 15-2005, SCPS has used the Chesapeake Bay Program's published mass loading approach to calculate contaminant reductions from its established street sweeping practices, presented below in **Tables 6.1**. The mass (in pounds) of street solids collected during sweeping operations was measured at the landfill/disposal point and reported to SCPS by the contracted sweeping company. Street solids mass was then converted to dry weight pounds (70% of swept solids mass). Total suspended solids (TSS) load reduction was estimated by reducing the dry weight mass to the fraction of the swept material with particle sizes less than 250 microns (30% of dry weight mass). The nutrient content of the solids was calculated based on sediment enrichment data reported by Law et al (2008) for total nitrogen (0.25% of dry weight mass) and total phosphorous (0.1% of dry weight mass).

Table 6.1: SCPS Parking Lot Sweeping – MS4 Regulated Properties Second Permit Cycle 2018-2019

Property	River Basin	Sweeping Date	Street Solids Removed (lbs)	Dry Weight Removed (lbs)	TN Removal Per Year (lbs)	TP Removal Per Year (lbs)	TSS Removal Per Year (lbs)
A.G. Wright Middle School	Potomac	4/17/2018	350	245	0.6125	0.245	73.5
Administrative Office	Potomac	4/17/2018	400	280	0.7	0.28	84
Anne Moncure Elementary School	Potomac	4/10/2018	100	70	0.175	0.07	21
Anthony Burns Elementary School	Potomac	4/5/2018	300	210	0.525	0.21	63
Conway Elementary School	Rappahannock	4/2/2018	350	245	0.6125	0.245	73.5
Falmouth Elementary School	Rappahannock	4/2/2018	300	210	0.525	0.21	63
Ferry Farms Elementary School	Rappahannock	4/3/2018	300	210	0.525	0.21	63

Table 6.1: SCPS Parking Lot Sweeping – MS4 Regulated Properties Second Permit Cycle 2018-2019 (Continued)

Property	River Basin	Sweeping Date	Street Solids Removed (lbs)	Dry Weight Removed (lbs)	TN Removal Per Year (lbs)	TP Removal Per Year (lbs)	TSS Removal Per Year (lbs)
Gari Melchers Complex	Rappahannock	4/4/2018	300	210	0.525	0.21	63
Hampton Oaks Elementary School	Potomac	4/5/2018	250	175	0.4375	0.175	52.5
Kate Waller Barrett Elementary School	Potomac	4/10/2018	300	210	0.525	0.21	63
Margaret Brent Elementary	Potomac	4/10/2018	300	210	0.525	0.21	63
Mountain View High School	Potomac	4/10/2018	400	280	0.7	0.28	84
North Stafford High School	Potomac	4/5/2018	500	350	0.875	0.35	105
Operations and Maintenance	Potomac	4/2/2018	150	105	0.2625	0.105	31.5
Park Ridge Elementary School	Potomac	4/5/2018	300	210	0.525	0.21	63
Rockhill Elementary School	Potomac	4/15/2018	400	280	0.7	0.28	84
Rocky Run Elementary School	Rappahannock	4/4/2018	350	245	0.6125	0.245	73.5
Rodney Thompson Middle School	Potomac	4/17/2018	300	210	0.525	0.21	63
Shirley Heim Middle School	Potomac	4/19/2018	300	210	0.525	0.21	63
Stafford Elementary School	Potomac	4/8/2018	200	140	0.35	0.14	42
T. Benton Gayle Middle School	Rappahannock	4/18/2018	250	175	0.4375	0.175	52.5
Widewater Elementary School	Potomac	4/8/2018	400	280	0.7	0.28	84
Total 2018-2019 Potomac River Basin Street Sweeping Reduction:					8.70	3.48	1,039.50
Total 2018-2019 Rappahannock River Basin Street Sweeping Reduction:					3.24	1.30	388.50
Total 2018-2019 Street Sweeping Reductions:					**11.94**	**4.78**	**1,428.00**

B. Implemented Means and Methods – Unregulated Properties

Per VDEQ Guidance Memo 15-2005, best management practices implemented on unregulated lands which result in POC reductions beyond baseline requirements may contribute to the reductions required by the Special Condition. Practices on unregulated lands that do not exceed baseline requirements do not affect regulated land reductions positively or negatively. Based on the construction date of BMPs associated with unregulated lands, SCPS has determined that they will not claim credit from any reductions potentially achieved by BMPs on these unregulated lands. Allowed reductions for POCs in each river basin have been calculated in **Table 6.2.**

Multiple unregulated SCPS properties were swept during the 2018-2019 Permit Year. **Table 6.2** below presents the mass loading approach used to calculate POC reductions from established street sweeping practices on unregulated lands within the SCPS system.

Table 6.2: 2018 SCPS Parking Lot Sweeping – Unregulated Properties

Property	River Basin	Sweeping Date	Street Solids Removed (lbs)	Dry Weight Removed (lbs)	TN Removal Per Year (lbs)	TP Removal Per Year (lbs)	TSS Removal Per Year (lbs)
Brooke Point High School	Potomac	4/17/2018	600	420	1.05	0.42	126
Colonial Forge High School	Potomac	4/17/2018	450	315	0.7875	0.315	94.5
Dixon-Smith Middle School	Potomac	4/15/2018	300	210	0.525	0.21	63
Drew Middle School	Rappahannock	4/15/2018	250	175	0.4375	0.175	52.5
Fleet Services	Rappahannock	4/2/2018	100	70	0.175	0.07	21
Grafton Elementary School	Potomac	4/3/2018	400	280	0.7	0.28	84
H.H. Poole Middle School	Potomac	4/18/2018	350	245	0.6125	0.245	73.5
Hartwood Elementary School	Rappahannock	4/3/2018	400	280	0.7	0.28	84
Stafford High School	Rappahannock	4/2/2018	450	315	0.7875	0.315	94.5
Stafford Middle School	Potomac	4/17/2018	200	140	0.35	0.14	42
Transportation	Rappahannock	4/2/2018	100	70	0.175	0.07	21
Winding Creek Elementary School	Potomac	4/8/2018	300	210	0.525	0.21	63
Total 2018-2019 Potomac River Basin Street Sweeping Reduction (lbs):					4.56	1.83	546
Total 2018-2019 Rappahannock River Basin Street Sweeping Reduction (lbs):					2.28	0.91	273
Total 2018-2019 Street Sweeping Reduction (lbs):					**6.84**	**2.74**	**819**

Implemented Means and Methods – Retrofit Programs

Per General Permit Section II Section A. 12. b. (3-4), this section describes the retrofit programs (including improvements from redevelopment) that have been implemented prior to November 1, 2024 to achieve the required reductions. The structural BMPs are designed to meet VSMP requirements for the facilities they serve. **Table 6.3** below provides reductions achieved by BMP installations between July 1, 2009 and June 30, 2018. Calculations can be found in **Appendix B**.

Table 6.3: Retrofit BMP Load Reductions. See Appendix B for reduction calculations

Potomac River Basin					
BMP Type	Date Installed	Practice Description	Total Allowed Reductions (lbs)		
			N	P	TSS
Bioretention	7/1/2009	Alvin York Bandy Biobed	5.14	0.42	298.94
Bioretention	7/1/2009	Alvin York Bandy Biobed	4.66	0.40	282.54
Bioretention	7/1/2009	Alvin York Bandy Biobed	6.83	0.50	332.70
Bioretention	7/1/2009	Alvin York Bandy Biobed	3.96	0.35	247.40
Bioretention	7/1/2009	Alvin York Bandy Biobed	10.86	0.82	560.42
Bioretention	1/1/2007	Kate Waller Barret ES Biobed	97.83	7.50	5,186.18
Bioretention	1/1/2013	Stafford ES Biobed 1	5.09	0.39	269.90
Bioretention	1/1/2013	Stafford ES Biobed 2	10.72	0.83	578.69
Total Retrofit BMP Reductions (2022 – 2023):			**145.09**	**11.21**	**7,756.77**

C. Total Year 5 of Second Permit Term (2022-2023) Reductions

During Year 5 of the Second Permit Cycle, SCPS met approximately 91.48% of reduction requirements for nitrogen, 57.43% of reduction requirements for phosphorus, and 54.44% of reduction requirements for total suspended solids. A summary of Year 5 POC reductions is provided below in **Table 6.4**.

Table 6.4: Summary of POC reduction requirements and POC reductions achieved during Year 5 of the Second Permit Cycle.

Potomac		POC Reduction Per Year (lbs)			Total Annual POC Reduction (lbs)		
		N	P	TSS	N	P	TSS
Year 5 2022-2023	Retrofit BMPs	145.09	11.21	7,756.77	145.09	11.21	7,756.77
	Street Sweeping	0	0	0			
	Non-MS4 BMPs	0	0	0			
	Credits	0	0	0			
Rappahannock		**POC Reduction Per Year (lbs)**			**Total Annual POC Reduction (lbs)**		
		N	P	TSS	N	P	TSS
Year 5 2022-2023	Retrofit BMPs	0	0	0	0	0	0
	Street Sweeping	0	0	0			
	Non-MS4 BMPs	0	0	0			
	Credits	0	0	0			
Total		**POC Reduction Per Year (lbs)**			**Total Annual POC Reduction (lbs)**		
		N	P	TSS	N	P	TSS
Year 5 2022-2023	Retrofit BMPs	145.10	11.18	7,756.76	145.09	11.21	7,756.77
	Street Sweeping	0	0	0			
	Non-MS4 BMPs	0	0	0			
	Credits	0	0	0			
40% Annual Reduction Required (Potomac) - Second Permit Cycle:					**137.86**	**15.72**	**12,981.54**
40% Annual Reduction Required (Rappahannock) – Second Permit Cycle:					**20.75**	**3.80**	**1,267.97**
Percentage of Second Permit Cycle Reduction Met (Potomac):					**105.24%**	**71.31%**	**59.75%**
Percentage Second Permit Cycle Reduction Met (Rappahannock):					**0.00%**	**0.00%**	**0.00%**
Credits Needed to Meet 40% Reduction (Potomac):					**0.00**	**4.51**	**5224.77**
Credits Needed to Meet 40% Reduction (Rappahannock):					**20.75**	**3.80**	**1,267.97**

7. Planned Means and Methods to Meet the Required Reductions

(General Permit Section II.A.12. b. (5) 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, A 4, and A 5, including as applicable: Type of BMP, Project name, location, percent removable efficiency for each pollutant of concern, and reduction calculation.

This section details the means and methods SCPS plans to implement in order to meet or exceed reductions required by the end of the third permit cycle (October 31, 2028).

A. Planned Means and Methods – Management Practices

This section describes the management practices that SCPS plans to implement between November 1, 2023 and the end of the third permit cycle (October 31, 2028). SCPS plans to purchase nutrient credits to meet the 40% reduction requirement for the second permit cycle as soon as possible, to retroactively meet the reduction threshold. SCPS plans to meet the 100% reduction requirement by the end of the third permit cycle by the purchasing of the remaining 60% worth of credits, bringing the total to 100% reductions achieved.

B. Planned Means and Methods – Unregulated Properties

SCPS plans to continue utilizing and maintaining currently installed BMPs on unregulated properties throughout the 2023-2028 permit cycle. SCPS expects to maintain approximately equivalent POC reductions on unregulated properties. The 2020 census increased the total acreage of MS4-regulated land within SCPS property reducing the number of BMPs on unregulated land. Due to the date of construction of BMPs on unregulated properties, no calculations were performed to determine the reductions achieved by the BMPs located on unregulated properties.

C. Planned Means and Methods – Retrofit Programs

SCPS plans to maintain currently installed retrofit BMPs to maintain associated POC reductions. Total annual retrofit BMP reductions are presented in **Table 6.4** of this document, and calculations can be observed in **Appendix C**.

D. Total Year 1 of the Third Permit Term (2023-2024) Reductions

During Year 1 of the Third Permit Cycle, SCPS met approximately 27.43% of reduction requirements for nitrogen and 17.72% of reduction requirements for phosphorus. This amount is lower than the previous year primarily due to three reasons. The first is street sweeping can no longer be counted toward reduction credits. The second is due to multiple schools being added to the MS4 regulated area for the Third Permit Term, which invalidated credits received for their reductions in the past when they were non-regulated. The third is that previously counted schools within the unregulated area are now not being counted whatsoever, due to a discussion held between VDEQ, Apex and SCPS. A summary of Year 1 POC reductions is provided below in **Table 7.2**.

Table 7.2: Summary of POC reduction requirements and POC reductions achieved during Year 1 of the Third Permit Cycle.

Potomac		POC Reduction Per Year (lbs)			Total Annual POC Reduction (lbs)	
		N	P	TSS	N	P
Year 1 2023-2024	Retrofit BMPs	145.09	11.21	7,756.77	145.09	11.21
	Non-MS4 BMPs	0	0	0		
	Credits	0	0	0		
Rappahannock		**POC Reduction Per Year (lbs)**			**Total Annual POC Reduction (lbs)**	
		N	P	TSS	N	P
Year 1 2023-2024	Retrofit BMPs	0	0	0	0	0
	Non-MS4 BMPs	0	0	0		
	Credits	0	0	0		
Total		**POC Reduction Per Year (lbs)**			**Total Annual POC Reduction (lbs)**	
		N	P	TSS	N	P
Year 1 2023-2024	Retrofit BMPs	145.10	11.18	7,756.76	145.09	11.21
	Non-MS4 BMPs	0	0	0		
	Credits	0	0	0		
100% Annual Reduction Required (Potomac) - Third Permit Cycle:					**470.20**	**52.47**
100% Annual Reduction Required (Rappahannock) – Third Permit Cycle:					**58.69**	**10.78**
Percentage of Third Permit Cycle Reduction Met (Potomac):					**30.86%**	**21.36%**
Percentage Third Permit Cycle Reduction Met (Rappahannock):					**0.00%**	**0.00%**
Credits Needed to Meet 100% Reduction (Potomac):					**325.11**	**41.26**
Credits Needed to Meet 100% Reduction (Rappahannock):					**58.69**	**10.78**

E. Reductions Schedule

The schedule includes estimates of when management practices will be initiated. These estimates are provided below in **Table 7.3** to show credits needed to meet the 40% reduction required by the second permit cycle, and **Table 7.4** to show the credits to be purchased in order to meet 100% total reduction by the end of the third permit cycle.

Table 7.3: SCPS Management Practice Schedule to meet 40% reduction

Management Practice	Start Date of Nutrient Purchasing	Total N Removal (lbs)	Total P Removal (lbs)	Total TSS Removal (lbs)
Offsite Nutrient Purchases (Potomac)	2025	0	≥ 4.51	≥ 5,224.77
Offsite Nutrient Purchases (Rappahannock)	2025	≥ 20.75	≥ 3.80	≥ 1,267.97

Table 7.4: SCPS Management Practice Schedule to meet 100% reduction

Management Practice	Start Date of Nutrient Purchasing	Total N Removal (lbs)	Total P Removal (lbs)
Offsite Nutrient Purchases (Potomac)	2027	≥ 325.11	≥ 41.26
Offsite Nutrient Purchases (Rappahannock)	2027	≥ 58.69	≥ 10.78

8. Reduction Implementation Cost Estimate

An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle.

Permittees are required to provide an estimate of the expected cost to implement the necessary reductions. This estimate should cover the expected cost to the permittee and will be updated as additional information becomes available. Permittees are encouraged to be as detailed as possible as this information will be reviewed by the state when it reevaluates the amount of funding that will be available to aid localities with their programs.

The leading strategy SCPS is incorporating to achieve the required reductions will be through the purchasing of nutrient credits from an undetermined entity. SCPS is currently in a negotiation phase in order to find the source of nutrients to be purchased to reach the 40% reduction requirement for the second permit term. For the third permit term, SCPS is planning to acquire the future credits needed in order to reach the 100% required reduction in the third permit cycle by the end of 2027. Estimates of the costs for the purchased nutrients to meet the requirements are detailed in **Table 8.1.**

Table 8.1: Purchase of Credits Costs

Nutrient Purchased	Property/Location	Credit Cost Estimate*
Nitrogen	Offsite Nutrient Purchases/TBD	~$15,000
Phosphorus	Offsite Nutrient Purchases/TBD	~$15,000
*Cost estimates are dependent on multiple factors, and negotiations have not been made with offsite locations in order to determine the full cost of these purchases.		

9. Public Comments on Draft Action Plan

(General Permit Section II.A.13) An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan.

This section describes the public comment process and period, including how the process was advertised to the public.

A. Public Access

SCPS accepted public comments on the draft Chesapeake Bay TMDL Action Plan from October 17 to 31, 2024 in order to fulfill the 15-day requirement. The plan has been summarized and made available for electronic download via the SCPS Facilities Services Operations & Maintenance web site.

(https://www.staffordschools.net/about-us/departments/finance-and-operations/stormwater-management)

B. Public Feedback

All feedback on the draft plan must have been submitted by 5 p.m. October 31, 2024. Written comments will be directed to Joshua Schimpf, Energy Management and Regulatory Compliance Coordinator, at:

Operations and Maintenance Department
25 Wyatt Lane
Fredericksburg, Virginia 22406

Comments also may be emailed schimpfje@staffordschools.net or faxed to 540-373-1432.

To request additional information or a copy of the plan, commenters may email Joshua Schimpf or call 540-654-9005.

C. Summary of Feedback

SCPS received no public comment on this 2024 Chesapeake Bay Action Plan during the 15 day public comment period. Any future public feedback is received will be documented and addressed appropriately.

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APPENDIX A

FIRST PERMIT CYCLE REDUCTIONS CALCULATIONS

APEX

2014-2015 BMPS on Unregulated Land in the Potomac River Basin

Property	Property Area			Baseline Reduction Requirements - Potomac (lbs)			Practice Description	BMP Load Reduction (lbs)			Total Allowed Reductions (lbs)		
	Total Acres	Total Impervious Acres	Total Pervious Acres	N (impervious acres*0.08 +pervious acres*0.03)*20	P (impervious acres*0.01 +pervious acres*0.001)*20	TSS (impervious acres*11.71 +pervious acres*0.77)*20		N	P	TSS	N	P	TSS
Brooke Point HS and Stafford MS	87.45	19.71	67.74	72.18	5.2968	5659.278	Street Sweeping	0	0	0	2.05142	2.46303	0
							STMS SWB 1	74.23142	7.75983	3316.482			
Colonial Forge HS	61.73	15.63	46.1	52.668	4.048	4370.486	Street Sweeping	0	0	0	28.72013	4.399565	0
							CFHS SWB 1	46.86118	4.18803	1648.594			
							CFHS SWB 2	24.68071	2.840415	1265.757			
							CFHS Filterra	9.84624	1.41912	1368.102			
Grafton Village and Dixon-Smith MS	60.73	12.04	48.69	48.478	3.3818	3569.594	Street Sweeping	0	0	0	8.012105	2.575165	0
							GVES SWB 1	34.13162	3.08433	1222.028			
							GVES SWB 2	11.89276	1.34106	592.6163			
							Biobed	4.41525	0.71847	622.9766			
							Biobed	3.51615	0.44253	347.2748			
							Biobed	2.534325	0.370575	309.5657			
H.H. Poole MS	36.62	6.48	30.14	28.452	1.8988	1981.772	Street Sweeping	0	0	0	14.71994	1.93649	0
							HHPMS SWB 1	14.94046	1.52439	644.0684			
							HHPMS SWB 2	28.23148	2.3109	860.3147			
Winding Creek ES	20.89	3.75	17.14	16.284	1.0928	1142.206	Street Sweeping	0	0	0	0.97986	0.76813	0
							WCES SWB 1	17.26386	1.86093	806.5303			
							Total 2017-2018 Potomac River Basin Non-MS4 Reductions:				54.483455	12.14238	0

2014-2015 BMPS on Unregulated Land in the Rappahannock River Basin

Practice Description	Property Area			Baseline Reduction Requirements - Rappahannock (lbs)			Practice Description	Load Reduction (lbs)			Total Allowed Reductions (lbs)		
	Total Acres	Total Impervious Acres	Total Pervious Acres	N (impervious acres*0.04 +pervious acres*0.02)*20	P (impervious acres*0.01 +pervious acres*0.002)*20	TSS (impervious acres*4.24 +pervious acres*0.25)*20		N	P	TSS	N	P	TSS
Drew MS	15.31	4.44	10.87	3.9868	1.3228	430.862	Street Sweeping	0	0	0	0	0	0
Fleet Services and Support Services	22	9.64	12.36	8.2064	2.4224	879.272	Street Sweeping	0	0	0	0	0	0
							SSF SWB 1	5.41138	0.937365	161.9228			
							Biobed	1.2079	0.271665	90.54782			
Hartwood ES	29.52	3.71	25.81	4.0004	1.7744	443.658	Street Sweeping	0	0	0	0	0	0
Stafford HS	110.89	19.27	91.62	19.0808	7.5188	2092.196	Street Sweeping	0	0	0	22.97428	0	0
							STHS SWB 1	36.38956	5.75763	929.3161			
							Filterra	5.66552	1.27746	512.1558			
							Total 2017-2018 Rappahannock River Basin Non-MS4 Reductions:				22.97428	0	0
							Total 2014-2015 Non-MS4 Reductions:				77.457735	12.14238	0

2014-2015 MS4 Retrofit BMP Reductions

Bioretention					Pollutant of Concern Load (Potomac) - 2015 guidance table 2b						Total Load			Bioretention reduction load (2014-2015) Table V.A.1		
Date Installed	**Practice Description**	**Total Acres**	**Impervious Acres Treated**	**Pervious Acres Treated**	**Impervious Nitrogen (*16.86)**	**Pervious Nitrogen (*10.07)**	**Impervious Phosphorus (*1.62)**	**Pervious Phosphorus (*0.41)**	**Impervious TSS (*1171.32)**	**Pervious TSS (*175.8)**	**Nitrogen Load**	**Phosphorus Load**	**TSS Load**	**N**	**P**	**TSS**
7/1/2009	Alvin York Bandy Biobed	0.54	0.28	0.26	4.72	2.62	0.45	0.11	327.97	45.71	7.34	0.56	373.68	1.83	0.25	205.52
7/1/2009	Alvin York Bandy Biobed	0.48	0.27	0.21	4.55	2.11	0.44	0.09	316.26	36.92	6.67	0.52	353.17	1.67	0.24	194.25
7/1/2009	Alvin York Bandy Biobed	0.78	0.28	0.50	4.72	5.04	0.45	0.21	327.97	87.90	9.76	0.66	415.87	2.44	0.30	228.73
7/1/2009	Alvin York Bandy Biobed	0.40	0.24	0.16	4.05	1.61	0.39	0.07	281.12	28.13	5.66	0.45	309.24	1.41	0.20	170.08
7/1/2009	Alvin York Bandy Biobed	1.21	0.49	0.72	8.26	7.25	0.79	0.30	573.95	126.58	15.51	1.09	700.52	3.88	0.49	385.29
1/1/2013	Stafford ES Biobed 1	0.56	0.24	0.32	4.05	3.22	0.39	0.13	281.12	56.26	7.27	0.52	337.37	1.82	0.23	185.56
1/1/2013	Stafford ES Biobed 2	1.17	0.52	0.65	8.77	6.55	0.84	0.27	609.09	114.27	15.31	1.11	723.36	3.83	0.50	397.85
													Total:	16.88	2.21	1,767.27

Biofilterra					Pollutant of Concern Load (Potomac) - 2015 guidance table 2b						Total Load			Biofilterra reduction load (2015-2016) Table V.A.1		
Date Installed	**Practice Description**	**Total Acres**	**Impervious Acres Treated**	**Pervious Acres Treated**	**Impervious Nitrogen (*16.86)**	**Pervious Nitrogen (*10.07)**	**Impervious Phosphorus (*1.62)**	**Pervious Phosphorus (*0.41)**	**Impervious TSS (*1171.32)**	**Pervious TSS (*175.8)**	**Nitrogen Load**	**Phosphorus Load**	**TSS Load**	**N**	**P**	**TSS**
1/1/2011	Anne E. Moncure ES (old) Biofilterras (3)	1.21	1.21	0.00	20.40	0.00	1.96	0.00	1,417.30	0.00	20.40	1.96	1,417.30	8.16	1.18	1,133.84
													Total:	8.16	1.18	1,133.84

Total Retrofit BMP Reductions (2014-2015):	25.04	3.39	2,901.11

2014-2015 SCPS Parking Lot Sweeping – MS4 Regulated Properties							
Property	Sweeping Date	Street Solids Removed (Tons)	Street Solids Removed (lbs)	Dry Weight Removed (lbs)	TN Removal Per Year (lbs)	TP Removal Per Year (lbs)	TSS Removal Per Year (lbs)
NONE							

2015-2016 BMPS on Unregulated Land in the Potomac River Basin

	Property Area			Baseline Reduction Requirements - Potomac (lbs)				BMP Load Reduction (lbs)			Total Allowed Reductions (lbs)		
Property	Total Acres	Total Impervious Acres	Total Pervious Acres	N (impervious acres*0.08 +pervious acres*0.03)*20	P (impervious acres*0.01 +pervious acres*0.001)*20	TSS (impervious acres*11.71 +pervious acres*0.77)*20	Practice Description	N	P	TSS	N	P	TSS
Brooke Point HS and Stafford MS	87.45	19.71	67.74	72.18	5.2968	5659.278	Street Sweeping	0.9625	0.385	115.5	3.01392	2.84803	0
							STMS SWB 1	74.23142	7.75983	3316.482			
Colonial Forge HS	61.73	15.63	46.1	52.668	4.048	4370.486	Street Sweeping	0.875	0.35	105	29.59513	4.749565	16.96744
							CFHS SWB 1	46.86118	4.18803	1648.594			
							CFHS SWB 2	24.68071	2.840415	1265.757			
							CFHS Filterra	9.84624	1.41912	1368.102			
Grafton Village and Dixon-Smith MS	60.73	12.04	48.69	48.478	3.3818	3569.594	Street Sweeping	1.575	0.63	189	9.587105	3.205165	0
							GVES SWB 1	34.13162	3.08433	1222.028			
							GVES SWB 2	11.89276	1.34106	592.6163			
							Biobed	4.41525	0.71847	622.9766			
							Biobed	3.51615	0.44253	347.2748			
							Biobed	2.534325	0.370575	309.5657			
H.H. Poole MS	36.62	6.48	30.14	28.452	1.8988	1981.772	Street Sweeping	0.2625	0.105	31.5	14.98244	2.04149	0
							HHPMS SWB 1	14.94046	1.52439	644.0684			
							HHPMS SWB 2	28.23148	2.3109	860.3147			
Winding Creek ES	20.89	3.75	17.14	16.284	1.0928	1142.206	Street Sweeping	0.525	0.21	63	70.5603	0.35782	0
							WCES SWB 1	86.3193	1.24062	806.5303			
							Total 2015-2016 Potomac River Basin Non-MS4 Reductions:				127.7389	13.20207	16.96744

2015-2016 BMPS on Unregulated Land in the Rappahannock River Basin

	Property Area			Baseline Reduction Requirements - Rappahannock (lbs)				Load Reduction (lbs)			Total Allowed Reductions (lbs)		
Property	Total Acres	Total Impervious Acres	Total Pervious Acres	N (impervious acres*0.04 +pervious acres*0.02)*20	P (impervious acres*0.01 +pervious acres*0.002)*20	TSS (impervious acres*4.24 +pervious acres*0.25)*20	Practice Description	N	P	TSS	N	P	TSS
Drew MS	15.31	4.44	10.87	3.9868	1.3228	430.862	Street Sweeping	0.525	0.21	63	0	0	0
Fleet Services and Support Services	22	9.64	12.36	8.2064	2.4224	879.272	Street Sweeping	0.4375	0.175	52.5	0	0	0
							SSF SWB 1	5.41138	0.937365	161.9228			
							Biobed	1.2079	0.271665	90.54782			
Hartwood ES	29.52	3.71	25.81	4.0004	1.7744	443.658	Street Sweeping	1.05	0.42	126	0	0	0
Stafford HS	110.89	19.27	91.62	19.0808	7.5188	2092.196	Street Sweeping	0.7	0.28	84	23.67428	0	0
							STHS SWB 1	36.38956	5.75763	929.3161			
							Filterra	5.66552	1.27746	512.1558			
							Total 2015-2016 Rappahannock River Basin Non-MS4 Reductions:				23.67428	0	0

Total 2015-2016 Non-MS4 Reductions:	151.41318	13.20207	16.96744

2015-2016 MS4 Retrofit BMP Reductions

Bioretention					Pollutant of Concern Load (Potomac) - 2015 guidance table 2b						Total Load			Bioretention reduction load (2014-2015) Table V.A.1		
Date Installed	**Practice Description**	**Total Acres**	**Impervious Acres Treated**	**Pervious Acres Treated**	**Impervious Nitrogen (*16.86)**	**Pervious Nitrogen (*10.07)**	**Impervious Phosphorus (*1.62)**	**Pervious Phosphorus (*0.41)**	**Impervious TSS (*1171.32)**	**Pervious TSS (*175.8)**	**Nitrogen Load**	**Phosphorus Load**	**TSS Load**	**N**	**P**	**TSS**
7/1/2009	Alvin York Bandy Biobed	0.54	0.28	0.26	4.72	2.62	0.45	0.11	327.97	45.71	7.34	0.56	373.68	1.83	0.25	205.52
7/1/2009	Alvin York Bandy Biobed	0.48	0.27	0.21	4.55	2.11	0.44	0.09	316.26	36.92	6.67	0.52	353.17	1.67	0.24	194.25
7/1/2009	Alvin York Bandy Biobed	0.78	0.28	0.50	4.72	5.04	0.45	0.21	327.97	87.90	9.76	0.66	415.87	2.44	0.30	228.73
7/1/2009	Alvin York Bandy Biobed	0.40	0.24	0.16	4.05	1.61	0.39	0.07	281.12	28.13	5.66	0.45	309.24	1.41	0.20	170.08
7/1/2009	Alvin York Bandy Biobed	1.21	0.49	0.72	8.26	7.25	0.79	0.30	573.95	126.58	15.51	1.09	700.52	3.88	0.49	385.29
1/1/2013	Stafford ES Biobed 1	0.56	0.24	0.32	4.05	3.22	0.39	0.13	281.12	56.26	7.27	0.52	337.37	1.82	0.23	185.56
1/1/2013	Stafford ES Biobed 2	1.17	0.52	0.65	8.77	6.55	0.84	0.27	609.09	114.27	15.31	1.11	723.36	3.83	0.50	397.85
													Total:	16.88	2.21	1,767.27

Biofilterra					Pollutant of Concern Load (Potomac) - 2015 guidance table 2b						Total Load			Biofilterra reduction load (2015-2016) Table V.A.1		
Date Installed	**Practice Description**	**Total Acres**	**Impervious Acres Treated**	**Pervious Acres Treated**	**Impervious Nitrogen (*16.86)**	**Pervious Nitrogen (*10.07)**	**Impervious Phosphorus (*1.62)**	**Pervious Phosphorus (*0.41)**	**Impervious TSS (*1171.32)**	**Pervious TSS (*175.8)**	**Nitrogen Load**	**Phosphorus Load**	**TSS Load**	**N**	**P**	**TSS**
1/1/2011	Anne E. Moncure ES (old) Biofilterras (3)	1.21	1.21	0.00	20.40	0.00	1.96	0.00	1,417.30	0.00	20.40	1.96	1,417.30	8.16	1.18	1,133.84
													Total:	8.16	1.18	1,133.84

Total Retrofit BMP Reductions (2015-2016):	25.04	3.39	2,901.11

2015-2016 SCPS Parking Lot Sweeping – MS4 Regulated Properties							
Property	**River Basin**	**Sweeping Date**	**Street Solids Removed (lbs)**	**Dry Weight Removed (lbs)**	**TN Removal Per Year (lbs)**	**TP Removal Per Year (lbs)**	**TSS Removal Per Year (lbs)**
A.G. Wright Middle School	Potomac	3/29/2016	250	175	0.4375	0.175	52.5
Administrative Office	Potomac	3/29/2016	400	280	0.7	0.28	84
Anne Moncure Elementary School	Potomac	3/26/2016	200	140	0.35	0.14	42
Anthony Burns Elementary School	Potomac	3/30/2016	250	175	0.4375	0.175	52.5
Conway Elementary School	Rappahannock	3/29/2016	300	210	0.525	0.21	63
Falmouth Elementary School	Rappahannock	3/26/2016	500	350	0.875	0.35	105
Ferry Farms Elementary School	Rappahannock	3/28/2016	300	210	0.525	0.21	63
Gari Melchers Complex	Rappahannock	3/29/2016	400	280	0.7	0.28	84
Hampton Oaks Elementary School	Potomac	3/29/2016	100	70	0.175	0.07	21
Kate Waller Barrett Elementary School	Potomac	3/29/2016	150	105	0.2625	0.105	31.5
Margaret Brent Elementary	Potomac	3/29/2016	200	140	0.35	0.14	42
Mountain View High School	Potomac	3/29/2016	250	175	0.4375	0.175	52.5
North Stafford High School	Potomac	3/3/1/2016	250	175	0.4375	0.175	52.5
Operations and Maintenance	Potomac	3/28/2016	250	175	0.4375	0.175	52.5
Park Ridge Elementary School	Potomac	3/30/2016	100	70	0.175	0.07	21
Rockhill Elementary School	Potomac	3/29/2016	250	175	0.4375	0.175	52.5
Rocky Run Elementary School	Rappahannock	3/30/2016	300	210	0.525	0.21	63
Rodney Thompson Middle School	Potomac	3/31/2016	200	140	0.35	0.14	42
Shirley Heim Middle School	Potomac	3/26/2016	350	245	0.6125	0.245	73.5
Stafford Elementary School	Potomac	3/30/2016	250	175	0.4375	0.175	52.5
T. Benton Gayle Middle School	Rappahannock	3/31/2016	200	140	0.35	0.14	42
Widewater Elementary School	Potomac	3/26/2016	550	385	0.9625	0.385	115.5
Total 2015-2016 Potomac River Basin Street Sweeping Reduction:					7.00	2.80	840.00
Total 2015-2016 Rappahannock River Basin Street Sweeping Reduction:					3.50	1.40	420.00
Total 2015-2016 Street Sweeping Reductions:					10.50	4.20	1260.00

2015-2016 PWCS Parking Lot Sweeping – Non-MS4 Regulated Properties							
Property	**River Basin**	**Sweeping Date**	**Street Solids Removed (lbs)**	**Dry Weight Removed (lbs)**	**TN Removal Per Year (lbs)**	**TP Removal Per Year (lbs)**	**TSS Removal Per Year (lbs)**
Brooke Point High School	Potomac	3/31/2016	400	280	0.7	0.28	84
Colonial Forge High School	Potomac	3/29/2016	500	350	0.875	0.35	105
Dixon-Smith Middle School	Potomac	3/26/2016	500	350	0.875	0.35	105
Drew Middle School	Rappahannock	3/28/2016	300	210	0.525	0.21	63
Fleet Services	Rappahannock	3/28/2016	150	105	0.2625	0.105	31.5
Grafton Elementary School	Potomac	3/26/2016	400	280	0.7	0.28	84
H.H. Poole Middle School	Potomac	3/26/2016	150	105	0.2625	0.105	31.5
Hartwood Elementary School	Rappahannock	3/26/2016	600	420	1.05	0.42	126
Stafford High School	Rappahannock	3/28/2016	400	280	0.7	0.28	84
Stafford Middle School	Potomac	3/29/2016	150	105	0.2625	0.105	31.5
Transportation	Rappahannock	3/28/2016	100	70	0.175	0.07	21
Winding Creek Elementary School	Potomac	3/30/2016	300	210	0.525	0.21	63

2016-2017 BMPS on Unregulated Land in the Potomac River Basin

Property	Property Area			Baseline Reduction Requirements - Potomac (lbs)			Practice Description	BMP Load Reduction (lbs)			Total Allowed Reductions (lbs)		
	Total Acres	Total Impervious Acres	Total Pervious Acres	N (impervious acres*0.08 +pervious acres*0.03)*20	P (impervious acres*0.01 +pervious acres*0.001)*20	TSS (impervious acres*11.71 +pervious acres*0.77)*20		N	P	TSS	N	P	TSS
Brooke Point HS and Stafford MS	87.45	19.71	67.74	72.18	5.2968	5659.278	Street Sweeping	2.1	0.84	252	4.15142	3.30303	0
							STMS SWB 1	74.23142	7.75983	3316.482			
Colonial Forge HS	61.73	15.63	46.1	52.668	4.048	4370.486	Street Sweeping	0.7	0.28	84	29.42013	4.679565	0
							CFHS SWB 1	46.86118	4.18803	1648.594			
							CFHS SWB 2	24.68071	2.840415	1265.757			
							CFHS Filterra	9.84624	1.41912	1368.102			
Grafton Village and Dixon-Smith MS	60.73	12.04	48.69	48.478	3.3818	3569.594	Street Sweeping	1.05	0.42	126	9.062105	2.995165	0
							GVES SWB 1	34.13162	3.08433	1222.028			
							GVES SWB 2	11.89276	1.34106	592.6163			
							Biobed	4.41525	0.71847	622.9766			
							Biobed	3.51615	0.44253	347.2748			
							Biobed	2.534325	0.370575	309.5657			
H.H. Poole MS	36.62	6.48	30.14	28.452	1.8988	1981.772	Street Sweeping	0.2625	0.105	31.5	14.98244	2.04149	0
							HHPMS SWB 1	14.94046	1.52439	644.0684			
							HHPMS SWB 2	28.23148	2.3109	860.3147			
Winding Creek ES	20.89	3.75	17.14	16.284	1.0928	1142.206	Street Sweeping	0.35	0.14	42	1.32986	0.90813	0
							WCES SWB 1	17.26386	1.86093	806.5303			
							Total 2016-2017 Potomac River Basin Non-MS4 Reductions:				58.945955	13.92738	0

2016-2017 BMPS on Unregulated Land in the Rappahannock River Basin

Property	Property Area			Baseline Reduction Requirements - Rappahannock (lbs)			Practice Description	Load Reduction (lbs)			Total Allowed Reductions (lbs)		
	Total Acres	Total Impervious Acres	Total Pervious Acres	N (impervious acres*0.04 +pervious acres*0.02)*20	P (impervious acres*0.01 +pervious acres*0.002)*20	TSS (impervious acres*4.24 +pervious acres*0.25)*20		N	P	TSS	N	P	TSS
Drew MS	15.31	4.44	10.87	3.9868	1.3228	430.862	Street Sweeping	0.35	0.14	42	0	0	0
Fleet Services and Support Services	22	9.64	12.36	8.2064	2.4224	879.272	Street Sweeping	0.35	0.14	42	0	0	0
							SSF SWB 1	5.41138	0.937365	161.9228			
							Biobed	1.2079	0.271665	90.54782			
Hartwood ES	29.52	3.71	25.81	4.0004	1.7744	443.658	Street Sweeping	0.875	0.35	105	0	0	0
Stafford HS	110.89	19.27	91.62	19.0808	7.5188	2092.196	Street Sweeping	1.05	0.42	126	24.02428	0	0
							STHS SWB 1	36.38956	5.75763	929.3161			
							Filterra	5.66552	1.27746	512.1558			
							Total 2016-2017 Rappahannock River Basin Non-MS4 Reductions:				24.02428	0	0

Total 2016-2017 Non-MS4 Reductions:	82.970235	13.92738	0

2016-2017 MS4 Retrofit BMP Reductions

Bioretention					Pollutant of Concern Load (Potomac) - 2015 guidance table 2b						Total Load			Bioretention reduction load (2016-2017) Table V.A.1		
Date Installed	Practice Description	Total Acres	Impervious Acres Treated	Pervious Acres Treated	Impervious Nitrogen (*16.86)	Pervious Nitrogen (*10.07)	Impervious Phosphorus (*1.62)	Pervious Phosphorus (*0.41)	Impervious TSS (*1171.32)	Pervious TSS (*175.8)	Nitrogen Load	Phosphorus Load	TSS Load	N	P	TSS
7/1/2009	Alvin York Bandy Biobed	0.54	0.28	0.26	4.72	2.62	0.45	0.11	327.97	45.71	7.34	0.56	373.68	1.83	0.25	205.52
7/1/2009	Alvin York Bandy Biobed	0.48	0.27	0.21	4.55	2.11	0.44	0.09	316.26	36.92	6.67	0.52	353.17	1.67	0.24	194.25
7/1/2009	Alvin York Bandy Biobed	0.78	0.28	0.50	4.72	5.04	0.45	0.21	327.97	87.90	9.76	0.66	415.87	2.44	0.30	228.73
7/1/2009	Alvin York Bandy Biobed	0.40	0.24	0.16	4.05	1.61	0.39	0.07	281.12	28.13	5.66	0.45	309.24	1.41	0.20	170.08
7/1/2009	Alvin York Bandy Biobed	1.21	0.49	0.72	8.26	7.25	0.79	0.30	573.95	126.58	15.51	1.09	700.52	3.88	0.49	385.29
1/1/2013	Stafford ES Biobed 1	0.56	0.24	0.32	4.05	3.22	0.39	0.13	281.12	56.26	7.27	0.52	337.37	1.82	0.23	185.56
1/1/2013	Stafford ES Biobed 2	1.17	0.52	0.65	8.77	6.55	0.84	0.27	609.09	114.27	15.31	1.11	723.36	3.83	0.50	397.85
													Total:	16.88	2.21	1,767.27

Biofilterra					Pollutant of Concern Load (Potomac) - 2015 guidance table 2b						Total Load			Biofilterra reduction load (2016-2017) Table V.A.1		
Date Installed	Practice Description	Total Acres	Impervious Acres Treated	Pervious Acres Treated	Impervious Nitrogen (*16.86)	Pervious Nitrogen (*10.07)	Impervious Phosphorus (*1.62)	Pervious Phosphorus (*0.41)	Impervious TSS (*1171.32)	Pervious TSS (*175.8)	Nitrogen Load	Phosphorus Load	TSS Load	N	P	TSS
1/1/2011	Anne E. Moncure ES (old) Biofilterras (3)	1.21	1.21	0.00	20.40	0.00	1.96	0.00	1,417.30	0.00	20.40	1.96	1,417.30	8.16	1.18	1,133.84
													Total:	8.16	1.18	1,133.84

Total Retrofit BMP Reductions (2016-2017):	25.04	3.39	2,901.11

2016-2017 SCPS Parking Lot Sweeping – MS4 Regulated Properties							
Property	River Basin	Sweeping Date	Street Solids Removed (lbs)	Dry Weight Removed (lbs)	TN Removal Per Year (lbs)	TP Removal Per Year (lbs)	TSS Removal Per Year (lbs)
A.G. Wright Middle School	Potomac	4/17/2017	250	175	0.4375	0.175	52.5
Administrative Office	Potomac	4/15/2017	600	420	1.05	0.42	126
Anne Moncure Elementary School	Potomac	4/19/2017	200	140	0.35	0.14	42
Anthony Burns Elementary School	Potomac	4/18/2017	200	140	0.35	0.14	42
Conway Elementary School	Rappahannock	4/15/2017	200	140	0.35	0.14	42
Falmouth Elementary School	Rappahannock	4/15/2017	300	210	0.525	0.21	63
Ferry Farms Elementary School	Rappahannock	4/15/2017	300	210	0.525	0.21	63
Gari Melchers Complex	Rappahannock	4/15/2017	400	280	0.7	0.28	84
Hampton Oaks Elementary School	Potomac	4/19/2017	100	70	0.175	0.07	21
Kate Waller Barrett Elementary School	Potomac	4/19/2017	100	70	0.175	0.07	21
Margaret Brent Elementary	Potomac	4/19/2017	300	210	0.525	0.21	63
Mountain View High School	Potomac	4/19/2017	400	280	0.7	0.28	84
North Stafford High School	Potomac	4/18/2017	350	245	0.6125	0.245	73.5
Operations and Maintenance	Potomac	4/15/2017	150	105	0.2625	0.105	31.5
Park Ridge Elementary School	Potomac	4/17/2017	250	175	0.4375	0.175	52.5
Rockhill Elementary School	Potomac	4/17/2017	400	280	0.7	0.28	84
Rocky Run Elementary School	Rappahannock	4/15/2017	200	140	0.35	0.14	42
Rodney Thompson Middle School	Potomac	4/17/2017	300	210	0.525	0.21	63
Shirley Heim Middle School	Potomac	4/19/2017	250	175	0.4375	0.175	52.5
Stafford Elementary School	Potomac	4/15/2017	200	140	0.35	0.14	42
T. Benton Gayle Middle School	Rappahannock	4/18/2017	200	140	0.35	0.14	42
Widewater Elementary School	Potomac	4/19/2017	400	280	0.7	0.28	84
Total 2016-2017 Potomac River Basin Street Sweeping Reduction:					7.7875	3.115	934.5
Total 2016-2017 Rappahannock River Basin Street Sweeping Reduction:					2.8	1.12	336
Total 2015-2016 Street Sweeping Reductions:					10.5875	4.235	1270.5

2016-2017 SCPS Parking Lot Sweeping – Non-MS4 Regulated Properties							
Property	River Basin	Sweeping Date	Street Solids Removed (lbs)	Dry Weight Removed (lbs)	TN Removal Per Year (lbs)	TP Removal Per Year (lbs)	TSS Removal Per Year (lbs)
Brooke Point High School	Potomac	4/15/2017	700	490	1.225	0.49	147
Colonial Forge High School	Potomac	4/17/2017	400	280	0.7	0.28	84
Dixon-Smith Middle School	Potomac	4/15/2017	200	140	0.35	0.14	42
Drew Middle School	Rappahannock	4/15/2017	200	140	0.35	0.14	42
Fleet Services	Rappahannock	4/15/2017	100	70	0.175	0.07	21
Grafton Elementary School	Potomac	4/15/2017	400	280	0.7	0.28	84
H.H. Poole Middle School	Potomac	4/18/2017	150	105	0.2625	0.105	31.5
Hartwood Elementary School	Rappahannock	4/15/2017	500	350	0.875	0.35	105
Stafford High School	Rappahannock	4/15/2017	600	420	1.05	0.42	126
Stafford Middle School	Potomac	4/17/2017	500	350	0.875	0.35	105
Transportation	Rappahannock	4/15/2017	100	70	0.175	0.07	21
Winding Creek Elementary School	Potomac	4/17/2017	200	140	0.35	0.14	42

2017-2018 BMPS on Unregulated Land in the Potomac River Basin

Property	Property Area			Baseline Reduction Requirements - Potomac (lbs)			Practice Description	BMP Load Reduction (lbs)			Total Allowed Reductions (lbs)		
	Total Acres	Total Impervious Acres	Total Pervious Acres	N (impervious acres*0.08 +pervious acres*0.03)*20	P (impervious acres*0.01 +pervious acres*0.001)*20	TSS (impervious acres*11.71 +pervious acres*0.77)*20		N	P	TSS	N	P	TSS
Brooke Point HS and Stafford MS	87.45	19.71	67.74	72.18	5.2968	5659.278	Street Sweeping	0	0	0	2.05142	2.46303	0
							STMS SWB 1	74.23142	7.75983	3316.482			
Colonial Forge HS	61.73	15.63	46.1	52.668	4.048	4370.486	Street Sweeping	0	0	0	28.72013	4.399565	0
							CFHS SWB 1	46.86118	4.18803	1648.594			
							CFHS SWB 2	24.68071	2.840415	1265.757			
							CFHS Filterra	9.84624	1.41912	1368.102			
Grafton Village and Dixon-Smith MS	60.73	12.04	48.69	48.478	3.3818	3569.594	Street Sweeping	0	0	0	8.012105	2.575165	0
							GVES SWB 1	34.13162	3.08433	1222.028			
							GVES SWB 2	11.89276	1.34106	592.6163			
							Biobed	4.41525	0.71847	622.9766			
							Biobed	3.51615	0.44253	347.2748			
							Biobed	2.534325	0.370575	309.5657			
H.H. Poole MS	36.62	6.48	30.14	28.452	1.8988	1981.772	Street Sweeping	0	0	0	14.71994	1.93649	0
							HHPMS SWB 1	14.94046	1.52439	644.0684			
							HHPMS SWB 2	28.23148	2.3109	860.3147			
Winding Creek ES	20.89	3.75	17.14	16.284	1.0928	1142.206	Street Sweeping	0	0	0	0.97986	0.76813	0
							WCES SWB 1	17.26386	1.86093	806.5303			
							Total 2017-2018 Potomac River Basin Non-MS4 Reductions:				54.483455	12.14238	0

2017-2018 BMPS on Unregulated Land in the Potomac River Basin

Property	Property Area			Baseline Reduction Requirements - Rappahannock (lbs)			Practice Description	Load Reduction (lbs)			Total Allowed Reductions (lbs)		
	Total Acres	Total Impervious Acres	Total Pervious Acres	N (impervious acres*0.04 +pervious acres*0.02)*20	P (impervious acres*0.01 +pervious acres*0.002)*20	TSS (impervious acres*4.24 +pervious acres*0.25)*20		N	P	TSS	N	P	TSS
Drew MS	15.31	4.44	10.87	3.9868	1.3228	430.862	Street Sweeping	0	0	0	0	0	0
Fleet Services and Support Services	22	9.64	12.36	8.2064	2.4224	879.272	Street Sweeping	0	0	0	0	0	0
							SSF SWB 1	5.41138	0.937365	161.9228			
							Biobed	1.2079	0.271665	90.54782			
Hartwood ES	29.52	3.71	25.81	4.0004	1.7744	443.658	Street Sweeping	0	0	0	0	0	0
Stafford HS	110.89	19.27	91.62	19.0808	7.5188	2092.196	Street Sweeping	0	0	0	22.97428	0	0
							STHS SWB 1	36.38956	5.75763	929.3161			
							Filterra	5.66552	1.27746	512.1558			
							Total 2017-2018 Rappahannock River Basin Non-MS4 Reductions:				22.97428	0	0

Total 2017-2018 Non-MS4 Reductions:	77.457735	12.14238	0

2017-2018 MS4 Retrofit BMP Reductions

Bioretention					Pollutant of Concern Load (Potomac) - 2015 guidance table 2b						Total Load			Bioretention reduction load (2014-2015) Table V.A.1		
Date Installed	**Practice Description**	**Total Acres**	**Impervious Acres Treated**	**Pervious Acres Treated**	**Impervious Nitrogen (*16.86)**	**Pervious Nitrogen (*10.07)**	**Impervious Phosphorus (*1.62)**	**Pervious Phosphorus (*0.41)**	**Impervious TSS (*1171.32)**	**Pervious TSS (*175.8)**	**Nitrogen Load**	**Phosphorus Load**	**TSS Load**	**N**	**P**	**TSS**
7/1/2009	Alvin York Bandy Biobed	0.54	0.28	0.26	4.72	2.62	0.45	0.11	327.97	45.71	7.34	0.56	373.68	1.83	0.25	205.52
7/1/2009	Alvin York Bandy Biobed	0.48	0.27	0.21	4.55	2.11	0.44	0.09	316.26	36.92	6.67	0.52	353.17	1.67	0.24	194.25
7/1/2009	Alvin York Bandy Biobed	0.78	0.28	0.50	4.72	5.04	0.45	0.21	327.97	87.90	9.76	0.66	415.87	2.44	0.30	228.73
7/1/2009	Alvin York Bandy Biobed	0.40	0.24	0.16	4.05	1.61	0.39	0.07	281.12	28.13	5.66	0.45	309.24	1.41	0.20	170.08
7/1/2009	Alvin York Bandy Biobed	1.21	0.49	0.72	8.26	7.25	0.79	0.30	573.95	126.58	15.51	1.09	700.52	3.88	0.49	385.29
1/1/2013	Stafford ES Biobed 1	0.56	0.24	0.32	4.05	3.22	0.39	0.13	281.12	56.26	7.27	0.52	337.37	1.82	0.23	185.56
1/1/2013	Stafford ES Biobed 2	1.17	0.52	0.65	8.77	6.55	0.84	0.27	609.09	114.27	15.31	1.11	723.36	3.83	0.50	397.85
													Total:	16.88	2.21	1,767.27

Biofilterra					Pollutant of Concern Load (Potomac) - 2015 guidance table 2b						Total Load			Biofilterra reduction load (2015-2016) Table V.A.1		
Date Installed	**Practice Description**	**Total Acres**	**Impervious Acres Treated**	**Pervious Acres Treated**	**Impervious Nitrogen (*16.86)**	**Pervious Nitrogen (*10.07)**	**Impervious Phosphorus (*1.62)**	**Pervious Phosphorus (*0.41)**	**Impervious TSS (*1171.32)**	**Pervious TSS (*175.8)**	**Nitrogen Load**	**Phosphorus Load**	**TSS Load**	**N**	**P**	**TSS**
1/1/2011	Anne E. Moncure ES (old) Biofilterras (3)	1.21	1.21	0.00	20.40	0.00	1.96	0.00	1,417.30	0.00	20.40	1.96	1,417.30	8.16	1.18	1,133.84
													Total:	8.16	1.18	1,133.84

Total Retrofit BMP Reductions (2017-2018):	25.04	3.39	2,901.11

2017-2018 PWCS Parking Lot Sweeping – MS4 Regulated Properties							
Property	Sweeping Date	Street Solids Removed (Tons)	Street Solids Removed (lbs)	Dry Weight Removed (lbs)	TN Removal Per Year (lbs)	TP Removal Per Year (lbs)	TSS Removal Per Year (lbs)
NONE							

Stafford County Public Schools
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APPENDIX B

SECOND PERMIT CYCLE REDUCTIONS CALCULATIONS

APEX

Calculation Sheet for Estimating Existing Source Loads for the Potomac River Basin 40% reduction

Pollutant	Subsource	Loading Rate (lbs/acre)	Total Existing Acres Served by MS4 (06/30/09)	Load (lbs/yr)	Percentage of MS4 required Chesapeake Bay total L2 loading Reducton	40% cumulative reduction required by 10/31/2023	Sum of 40% cumulative reduction (lbs/yr)
Nitrogen	Regulated Urban Impervious	16.86	121.04	2,040.73	9	73.47	137.86
	Regulated Urban Pervious	10.07	266.44	2,683.05	6	64.39	
Phosphorus	Regulated Urban Impervious	1.62	121.04	196.08	16	12.55	15.72
	Regulated Urban Pervious	0.41	266.44	109.24	7.25	3.17	
Total Suspended Solids	Regulated Urban Impervious	1,171.32	121.04	141,776.57	20	11,342.13	12,981.54
	Regulated Urban Pervious	175.80	266.44	46,840.15	8.75	1,639.41	

Calculation Sheet for Estimating Existing Source Loads for the Rappahannock River Basin 40% reduction

Pollutant	Subsource	Loading Rate (lbs/acre)	Total Existing Acres Served by MS4 (06/30/09)	Load (lbs/yr)	Percentage of MS4 required Chesapeake Bay total L2 loading Reducton	40% cuculative reduction required by 10/31/2023	Sum of 40% cumulative reduction (lbs/yr)
Nitrogen	Regulated Urban Impervious	9.38	33.06	310.10	9	11.16	20.75
	Regulated Urban Pervious	5.34	74.81	399.49	6	9.59	
Phosphorus	Regulated Urban Impervious	1.41	33.06	46.61	16	2.98	3.80
	Regulated Urban Pervious	0.38	74.81	28.43	7.25	0.82	
Total Suspended Solids	Regulated Urban Impervious	423.97	33.06	14,016.45	20	1,121.32	1,267.97
	Regulated Urban Pervious	56.01	74.81	4,190.11	8.75	146.65	

Table 2.8: Annual SCPS POC Reduction Requirements – Existing Development 40% Reduction

Watershed	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	TSS (lbs/yr)
Potomac Basin	137.86	15.72	12,981.54
Rappahannock Basin	20.75	3.80	1,267.97
TOTAL	158.61	19.52	14,249.51

2022-2023 MS4 Retrofit BMP Reductions

Potomac River Basin

Bioretention					Pollutant of Concern Load (Potomac) - 2021 DEQ CB Guidance Table 3B						Total Load			Bioretention reduction load (2018-2019) Table V.A.1		
Date Installed	**Practice Description**	**Total Acres**	**Impervious Acres Treated**	**Pervious Acres Treated**	**Impervious Nitrogen (*16.86)**	**Pervious Nitrogen (*10.07)**	**Impervious Phosphorus (*1.62)**	**Pervious Phosphorus (*0.41)**	**Impervious TSS (*1171.32)**	**Pervious TSS (*175.8)**	**Nitrogen Load**	**Phosphorus Load**	**TSS Load**	**N * .7**	**P* .75**	**TSS* 0.8**
7/1/2009	Alvin York Bandy Biobed	0.54	0.28	0.26	4.72	2.62	0.45	0.11	327.97	45.71	7.34	0.56	373.68	5.14	0.42	298.94
7/1/2009	Alvin York Bandy Biobed	0.48	0.27	0.21	4.55	2.11	0.44	0.09	316.26	36.92	6.66	0.53	353.18	4.66	0.40	282.54
7/1/2009	Alvin York Bandy Biobed	0.78	0.28	0.50	4.72	5.04	0.45	0.21	327.97	87.90	9.76	0.66	415.87	6.83	0.50	332.70
7/1/2009	Alvin York Bandy Biobed	0.40	0.24	0.16	4.05	1.61	0.39	0.07	281.12	28.13	5.66	0.46	309.25	3.96	0.35	247.40
7/1/2009	Alvin York Bandy Biobed	1.21	0.49	0.72	8.26	7.25	0.79	0.30	573.95	126.58	15.51	1.09	700.53	10.86	0.82	560.42
1/1/2007	Kate Waller Barret ES Biobed	10.77	4.61	6.16	77.72	62.03	7.47	2.53	5,399.79	1,082.93	139.75	10.00	6,482.72	97.83	7.50	5,186.18
1/1/2013	Stafford ES Biobed 1	0.56	0.24	0.32	4.05	3.22	0.39	0.13	281.12	56.26	7.27	0.52	337.38	5.09	0.39	269.90
1/1/2013	Stafford ES Biobed 2	1.17	0.52	0.65	8.77	6.55	0.84	0.27	609.09	114.27	15.32	1.11	723.36	10.72	0.83	578.69
													Total:	145.09	11.21	7,756.77

Total Retrofit BMP Reductions (2022-2023):	145.09	11.21	7,756.77

Stafford County Public Schools
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APPENDIX C

THIRD PERMIT CYCLE REDUCTIONS CALCULATIONS

APEX

Calculation Sheet for Estimating Existing Source Loads for the Potomac River Basin 100% reduction

Pollutant	Subsource	Loading Rate (lbs/acre)	Total Existing Acres Served by MS4 (06/30/09)	Load (lbs/yr)	Percentage of MS4 required Chesapeake Bay total L2 loading Reducton	100% cumulative reduction required by 10/31/2028	Sum of 100% cumulative reduction (lbs/yr)
Nitrogen	Regulated Urban Impervious	16.86	158.94	2,679.73	9	241.18	470.20
	Regulated Urban Pervious	10.07	379.05	3,817.03	6	229.02	
Phosphorus	Regulated Urban Impervious	1.62	158.94	257.48	16	41.20	52.47
	Regulated Urban Pervious	0.41	379.05	155.41	7.25	11.27	

Calculation Sheet for Estimating Existing Source Loads for the Rappahannock River Basin 100% reduction

Pollutant	Subsource	Loading Rate (lbs/acre)	Total Existing Acres Served by MS4 (06/30/09)	Load (lbs/yr)	Percentage of MS4 required Chesapeake Bay total L2 loading Reducton	100% cuculative reduction required by 10/31/2028	Sum of 100% cumulative reduction (lbs/yr)
Nitrogen	Regulated Urban Impervious	9.38	37.50	351.75	9	31.66	58.69
	Regulated Urban Pervious	5.34	84.36	450.48	6	27.03	
Phosphorus	Regulated Urban Impervious	1.41	37.50	52.88	16	8.46	10.78
	Regulated Urban Pervious	0.38	84.36	32.06	7.25	2.32	

Table 2.8: Annual SCPS POC Reduction Requirements – Existing Development 100% Reduction

Watershed	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)
Potomac Basin	470.20	52.47
Rappahannock Basin	58.69	10.78
TOTAL	528.89	63.25

2023-2028 MS4 Retrofit BMP Reductions

Potomac River Basin

Bioretention					Pollutant of Concern Load (Potomac) - 2021 DEQ CB Guidance Table 3B						Total Load			Bioretention reduction load (2018-2019) Table V.A.1		
Date Installed	**Practice Description**	**Total Acres**	**Impervious Acres Treated**	**Pervious Acres Treated**	**Impervious Nitrogen (*16.86)**	**Pervious Nitrogen (*10.07)**	**Impervious Phosphorus (*1.62)**	**Pervious Phosphorus (*0.41)**	**Impervious TSS (*1171.32)**	**Pervious TSS (*175.8)**	**Nitrogen Load**	**Phosphorus Load**	**TSS Load**	**N * .7**	**P* .75**	**TSS* 0.8**
7/1/2009	Alvin York Bandy Biobed	0.54	0.28	0.26	4.72	2.62	0.45	0.11	327.97	45.71	7.34	0.56	373.68	5.14	0.42	298.94
7/1/2009	Alvin York Bandy Biobed	0.48	0.27	0.21	4.55	2.11	0.44	0.09	316.26	36.92	6.66	0.53	353.18	4.66	0.40	282.54
7/1/2009	Alvin York Bandy Biobed	0.78	0.28	0.50	4.72	5.04	0.45	0.21	327.97	87.90	9.76	0.66	415.87	6.83	0.50	332.70
7/1/2009	Alvin York Bandy Biobed	0.40	0.24	0.16	4.05	1.61	0.39	0.07	281.12	28.13	5.66	0.46	309.25	3.96	0.35	247.40
7/1/2009	Alvin York Bandy Biobed	1.21	0.49	0.72	8.26	7.25	0.79	0.30	573.95	126.58	15.51	1.09	700.53	10.86	0.82	560.42
1/1/2007	Kate Waller Barret ES Biobed	10.77	4.61	6.16	77.72	62.03	7.47	2.53	5,399.79	1,082.93	139.75	10.00	6,482.72	97.83	7.50	5,186.18
1/1/2013	Stafford ES Biobed 1	0.56	0.24	0.32	4.05	3.22	0.39	0.13	281.12	56.26	7.27	0.52	337.38	5.09	0.39	269.90
1/1/2013	Stafford ES Biobed 2	1.17	0.52	0.65	8.77	6.55	0.84	0.27	609.09	114.27	15.32	1.11	723.36	10.72	0.83	578.69
													Total:	145.09	11.21	7,756.77

Total Retrofit BMP Reductions (2023-2024):	145.09	11.21	7,756.77