Town of Vienna, Virginia

Final Phase II Chesapeake Bay TMDL Action Plan

Submittal to DEQ – October 31, 2019

Town of Vienna
Department of Public Works
127 Center Street, South
Vienna, Virginia 22180

Prepared with assistance by:
Wood Environment & Infrastructure Solutions
Chantilly, Virginia

TOWN OF
VIENNA

wood.

Prepared in Compliance with Municipal Separate Storm Sewer System (MS4)
Permit No. VAR040066

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Town of Vienna, Virginia

October 31, 2019

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CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name	Title	Date
[signature]	TOWN MANAGER	10/31/19

Final Phase II Chesapeake Bay TMDL Action Plan
Town of Vienna, Virginia

October 31, 2019

1. Introduction

1.1. Purpose

This Phase II Chesapeake Bay TMDL Action Plan builds on the Town of Vienna's initial Chesapeake Bay TMDL Action Plan approved by the Virginia Department of Environmental Quality (DEQ) on December 28, 2015. The plan documents how the Town 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). A draft Phase II Chesapeake Bay TMDL Action Plan was submitted to DEQ in May 2018. In accordance with the 2018 MS4 permit, the Town must submit a final plan to DEQ no later than 12 months after the effective date of the permit.

The Town's MS4 permit requires the development and implementation of action plans for impaired streams where a Total Maximum Daily Load (TMDL) assigns a waste load allocation (WLA) to the Town that has been approved by the State Water Control Board. A TMDL establishes the maximum amount of a pollutant that can enter a water body without violating water quality standards.

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 adopted a Watershed Implementation Plan (WIP) that establishes the framework for meeting the Chesapeake Bay TMDL. The Virginia WIP 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 the end of the second permit cycle (2023); and, 100% by the end of the third permit cycle (2028).

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

1.2. Cooperative Approach to Implementation

The Town has entered into a cooperative agreement with Fairfax County and the Town of Herndon to share pollutant reductions from certain jointly implemented projects. The agreement, included as Appendix A, was originally adopted by the Town of Vienna on October 28, 2013 and by Fairfax County on April 1, 2014. The agreement was updated by all parties effective March 8, 2017.

The agreement provides that the Town receives 3.5% credit for any project funded by the County's Stormwater Service District Fee starting July 1, 2009. This is regardless of the project's location in Vienna, Herndon, or Fairfax County. The credit is in proportion to the percentage of the total load reductions that have been established for each locality. The Town's proportion of the load reduction was averaged among TN, TP, and TSS. Shared credit projects include Structural Retrofits, Stream Restoration, and In-Lake Forebay Retrofits. The County's DEQ-approved Chesapeake Bay TMDL Action Plan also reflects this credit-sharing approach.

1.3. Summary of Required Reductions and BMPs to Achieve Reductions

The Town 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. The Town performed a comprehensive update of its MS4 area map as part of the requirement to develop stormwater outfall tables in accordance with Part II B 3 a of the 2013 MS4 permit. This update included a refinement of the extent of areas draining to the Town's regulated outfalls. The map is shown in Appendix B.

The next step is to identify the BMPs to achieve the required POC reductions. The Town's overall strategy for achieving the reductions is presented in Section 4 and summarized below:

- Redevelopment since July 1, 2009 that has resulted in a decrease in pollutant loads.
- Shared credit projects under the cooperative agreement with Fairfax County.
- Street sweeping.
- Purchased nutrient credits.
- More stringent regulation of land disturbing activities under one acre.
- Additional BMPs that may be implemented in accordance with DEQ's Chesapeake Bay TMDL Special Conditions Guidance.

Section 5 summarizes reductions achieved during the first permit cycle. Section 6 describes the BMPs that have been or will be implemented during the second permit cycle to meet the required 40% POC reductions.

Table 1.A provides a summary of the required reductions, reductions achieved during the first permit cycle, additional reductions implemented and planned through the end of the second permit cycle, and the anticipated percent progress toward achieving the 100% reduction target.

Table 1.A – Summary of Required Reductions and Implemented and Planned BMPs

	Total Nitrogen (lbs/year)	**Total Phosphorus (lbs/year)**	**Total Suspended Solids (lbs/year)**
Existing Source Reductions to Meet 40% Target	878.86	103.85	86,628.34
+ New Source Offsets	18.19	2.64	1,237.02
+ Grandfathered Offsets	51.34	7.44	3,491.43
= Total Required Reductions and Offsets	948.40	113.93	91,356.79
- BMPs Prior to July 1, 2018	1,578.18	337.34	122,200.59
- BMPs July 1, 2018 and On	495.60	151.29	46,921.67
= Total BMPs	2,073.78	488.63	169,122.26
Remainder/(Excess) To Achieve 40% Target	(1,125.38)	(374.70)	(77,765.47)
Progress Toward 100% Target	94.4%	188.2%	78.1%

1.4. Permit Compliance Crosswalk

Table 1.B 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 1.B – 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 5	Part II A 11 c	The total reductions achieved as of July 1, 2018 for each pollutant of concern in each river basin.
Section 5 and Appendix D	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 6 and Appendix E	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; (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 8 and Appendix F	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.

2. Program and Legal Authority

The Town has adopted an MS4 Program Plan that documents implementation of all 2018 MS4 permit requirements, including the programmatic and legal authorities required to meet the "Chesapeake Bay TMDL Special Condition." The full MS4 Program Plan can be found at https://www.viennava.gov/stormwater.

Table 2.A provides a summary of elements of the six minimum control measures (MCMs) implemented by the Town that relate to controlling total nitrogen, total phosphorus, and total suspended solids.

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

Minimum Control Measure	MS4 Program Plan Elements Related to Controlling TN, TP, and TSS
Public Education and Outreach on Stormwater Impacts	The Town's MS4 Public Education and Outreach Plan identifies Chesapeake Bay nutrients and sediment and other illicit discharges as two of its three high-priority pollutants for the focus of the Town's public education program during the permit cycle. Actions specific to nutrients include: • At least once annually, distribute information on proper fertilizing techniques using one of the following: (1) seasonally-appropriate press release; (2) article in the Vienna Voice newsletter; (3) message in the Town Calendar; or, (4) message in the quarterly residential water bill. • At least once annually, include a message about the proper use and application of fertilizers using a social media platform. • In FY21, mail information to HOA and condominium contacts about proper use and application of fertilizers and how to ensure contractors are using water friendly practices. Actions specific to sediment include: • At least one annually, promote the means by which the public can report a suspected illicit discharge using one of the following: (1) press release; (2) article in the Vienna Voice newsletter; (3) message in the Town Calendar; or, (4) message in the quarterly residential water bill.

Minimum Control Measure	MS4 Program Plan Elements Related to Controlling TN, TP, and TSS
	• At least once annually, include a message about how the public can report a suspected illicit discharge using a social media platform.
Public Involvement and Participation	The Town has designed a program to involve the public in the decision-making process by meeting all public notice requirements and to provide an opportunity for public involvement to improve water quality and support local restoration and clean-up projects.
Illicit Discharge Detection and Elimination	The Town 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 total nitrogen and total phosphorus as well as total suspended solids.
Construction Site Stormwater Runoff Control	The Town'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.
Post-Construction Stormwater Management	The Town's construction site stormwater runoff control program is designed to be fully consistent with the water quality control requirements of the Virginia Stormwater Management Act and its attendant regulations.
Pollution Prevention and Good Housekeeping for Municipal Operations	The Town has included in its MS4 Program Plan actions to meet the pollution prevention and good housekeeping requirements for municipal operations. This includes implementing a SWPPP for the Northside Property Yard, employee training, and ensuring proper staff and contractor certifications for erosion and sediment control.

The Town has reviewed its existing MS4 Program Plan and legal authorities and finds that no additional legal authorities are required for compliance with the "Chesapeake Bay TMDL Special Condition" at this time.

3. Load and Cumulative Reduction Calculations

The following sections describe the methodology used by the Town 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

Reductions and offsets are calculated based on the extent of the MS4 service area within the 2010 Census Urbanized Area.

Storm sewer pipes, outfall locations, and elevation data have been analyzed by qualified engineers in a GIS environment to delineate the watershed boundaries of the Town's regulated storm sewer system. Artificial conveyances and natural drainage features were thoroughly reviewed to accurately account for storm sewer drainage areas and determine break points between the manmade and natural hydrologic systems. Sheet flow crossing the Town boundary was also considered and analyzed. This approach rendered a delineation of regulated and unregulated areas within the Town. With the exception of two natural stream valleys, the vast majority of Vienna's total land area consists of regulated impervious and pervious cover. Note that much of the area comprising Westwood Country Club drains directly to a tributary of Wolftrap Creek without going through the Town's MS4.

In accordance with Part II.2 of the Chesapeake Bay TMDL Special Conditions Guidance, the Town of Vienna and Fairfax County have cooperatively agreed to utilize the following methodology for allocating pollutant loadings where drainage flows across jurisdictional boundaries:

- *Town MS4 Draining to the County MS4 Through a Pipe:* Any pollutant loading from the Town's MS4 that drains through a pipe or other conveyance to the County's MS4 is the responsibility of the Town up-flow of the interconnection.
- *County MS4 Draining to the Town MS4 Through a Pipe:* Any pollutant loading from the County's MS4 that drains through a pipe or other conveyance to the Town's MS4 is the responsibility of the County up-flow of the interconnection.
- *Town Sheetflow Draining to the County MS4:* Any pollutant loading from an area of the Town that sheet flows across jurisdictional boundaries to the County's MS4 is the responsibility of the Town within the Town's boundary.
- *County Sheetflow Draining to the Town MS4:* Any pollutant loading from an area of the County that sheet flows across jurisdictional boundaries to the Town's MS4 is the responsibility of the County within the County's boundary.

- *Fairfax County Public Schools Property:* Fairfax County Public Schools is covered under the County's MS4 permit. Any pollutant loading from property owned by Fairfax County Public Schools within the Town is not the responsibility of the Town.

The Virginia Department of Transportation's MS4 service area, identified as its right-of-way in the VDOT Chesapeake Bay TMDL Action Plan, is excluded from the Town's MS4 service area. This represents only a very small area of the Town.

In accordance with DEQ's Chesapeake Bay TMDL Special Guidance, the Town may exclude from its MS4 service area land regulated under any general VPDES permit that addresses industrial stormwater and forested land one half contiguous acre or more that meets specific criteria. The Town does not have within its boundary any property with a VPDES industrial stormwater permit. The Town has identified 13.2 acres of potential forested area within the MS4, which is less than one percent of the total MS4 area. Further analysis would be required to determine whether these acres meet the requirements for exclusion in accordance with the DEQ guidance. Since this amount is *de minimis*, the Town has opted not to exclude these areas for this plan, but may choose to conduct the additional analysis at a later date.

The Town's MS4 service area map is presented in Appendix B. Based on the above analysis, the Town has determined that a total of 2,395.40 acres is served by the regulated MS4.

3.2. Pervious and Impervious Surface Delineation Methodology

A GIS approach was used to determine the Town's regulated urban impervious and regulated urban pervious acres. Planimetric impervious cover GIS data was developed by Fairfax County from 2009 aerial imagery. This impervious cover dataset contains the entire Town as well as areas within the County. Impervious cover surfaces include buildings, roads, parking lots, sidewalks, recreational surfaces, and other similar features. To calculate the 2009 impervious regulated area, the 2009 planimetric impervious cover features were clipped using the MS4 boundary polygon layer and the resulting acres were totaled. Regulated pervious acres were calculated by subtracting the regulated impervious acres from the total MS4 acres.

Based on the above analysis the Town's MS4 service area of 2,395.40 acres is divided into 821.10 impervious acres and 1,574.30 pervious acres.

3.3. Reduction Requirements

The Town is located within the Potomac River Basin. Therefore, reduction requirements are calculated in accordance with Part II A 3, Table 3b of the 2018 MS4 permit.

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

Table 3.A – 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	821.10	13,843.75	0.09	0.40	498.38	878.86
TN	Perv.	10.07	1,574.30	15,853.20	0.06	0.40	380.48	
TP	Imp.	1.62	821.10	1,330.18	0.16	0.40	85.13	103.85
TP	Perv.	0.41	1,574.30	645.46	0.07	0.40	18.72	
TSS	Imp.	1171.32	821.10	961,770.85	0.20	0.40	76,941.67	86,628.34
TSS	Perv.	175.8	1,574.30	276,761.94	0.09	0.40	9,686.67	

3.4. New Source Offset

Part II A 4 of the 2018 MS4 permit requires the Town 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.

During the period of July 1, 2009 and June 30, 2014, one project with a land disturbance of one acre or greater resulted in increases in pollutant loadings. The Town calculates total required offsets as follows: 18.19 pounds for TN; 2.64 pounds for TP; and, 1,237.02 pounds for TSS. While the Town is only required to offset 40%, sufficient overall reductions have been made by the Town to offset 100% of these POCs. Detailed calculations are located in the initial action plan submitted to and approved by DEQ.

3.5. Grandfathered Projects Offset

Part II A 5 of the 2018 MS4 permit requires the Town to offset any grandfathered projects that disturb one acre or greater that begin construction after July 1, 2014 and where the project utilizes an average land cover condition greater than 16%. Since the initial action plan, the Town

has identified three grandfathered projects that were not included in the original calculations. Table 3.B provides a summary of required grandfathered project offsets. Calculations are located in Appendix C. While the Town is only required to offset 40%, sufficient overall reductions have been made by the Town to offset 100% of these POCs.

Table 3.B – Required Grandfathered Project Offsets

Pollutant	Conversion Factor from Table 4 of DEQ Guidance	Offset Required (lbs/year)
TN	6.9	51.34
TP	1	7.44
TSS	469.2	3,491.43

3.6 Total Reduction and Offset Requirements

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

Table 3.C – Total Reduction and Offset Requirements

Reductions and Offsets	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Existing Source Reductions to Meet 40% Target	878.86	103.85	86,628.34
+ New Source Offsets	18.19	2.64	1,237.02
+ Grandfathered Offsets	51.34	7.44	3,491.43
Total Reductions and Offsets	**948.40**	**113.93**	**91,356.79**

4. Overall Strategy for Achieving Reductions

The Town's overall strategy for achieving POC reductions includes a combination of BMPs as described below:

4.1. Redevelopment

The Town will take credit for pollutant reductions from redevelopment regardless of the initial land cover condition of the site in accordance with the Chesapeake Bay TMDL Special Condition Guidance. This includes any redevelopment project initiated after July 1, 2009. For any portion of redevelopment that results in a direct impervious surface reduction, Table 4 from the 2018 MS4 permit will be used to determine the equivalent credit for TN and TSS associated with the TP reduction. For the portion of redevelopment that results in a reduction due to a stormwater management facility, the methodology described in Appendix V.E of the DEQ guidance will be utilized.

Wolftrap stream restoration during construction. This project is one of the shared credit projects with Fairfax County.

4.2. Shared Credit Projects

The Town receives 3.5% credit for any project funded by the County's Stormwater Service District Fee starting July 1, 2009 in accordance with the cooperative agreement with Fairfax County. This is regardless of the project's location in Vienna, Herndon, or Fairfax County. These projects include Structural Retrofits, Stream Restoration, and In-Lake Forebay Retrofits.

One of the Town's street sweepers.

4.3. Street Sweeping

Street sweeping programs that meet certain requirements can be used to achieve POC reductions. The Town took credit for its street sweeping program in the initial Chesapeake Bay TMDL Action Plan. Based on communications with DEQ, the methodology described in Appendix V.G of the Chesapeake Bay TMDL Special Conditions Guidance will be replaced by the methodology described in Recommendations of the Expert Panel to Define Removal Rates for Street and Storm Drain Cleaning Practices (May 19,

2016). As a result, the Town's program no longer meets the minimum requirements for credit. The Town will continue to assess its program. Any changes that result in credit will be documented to DEQ in the Town's annual reports.

4.4. Purchased Off-Site Nutrient Credits

The Town has the option of purchasing off-site nutrient credits under the provisions of §62.1-44.15:35 of the Code of Virginia. Any off-site nutrient credits purchased by the Town will be documented to DEQ in the Town's annual reports.

4.5. More Stringent Regulation of Land Disturbing Activities

The Town has adopted stormwater quality requirements for single family residential development under one acre that are more stringent than the minimum VSMP requirements. While the Virginia Stormwater Management Regulations and the Chesapeake Bay Preservation Act regulate land disturbing activities 2,500 square feet and greater, localities may exempt single family residential development under one acre not part of a common plan of development. Town Code Chapter 23, Article 3 "Stormwater Management" applies the 0.41 pounds of phosphorus per acre per year standard to single family residential development 2,500 square feet and greater.

In accordance with the Chesapeake Bay TMDL Special Condition Guidance the Town will take credit for the difference between the pollutant load that could have been allowed for single family residential property under the state's minimum water quality criteria and the pollutant load that was actually allowed for the property under the Town's more stringent requirements. These include reductions from structural retrofits and credit purchased by the developer.

4.6. Additional BMPs

The Town 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 Town's annual reports.

5. BMPs Implemented During the First Permit Cycle

Table 5.A documents that the Town exceeded the 5% pollutant reduction target during the first permit cycle. Part II A 4 of the 2018 MS4 permit requires the Town to provide a list of the BMPs implemented prior to July 1, 2018 to achieve these reductions. The list of BMPs, including the date of implementation and the reductions achieved, is included in Appendix D.

Table 5.A – Summary of BMPs Implemented During the First Permit Cycle

BMPs	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Redevelopment	61.31	9.85	4,760.49
Shared Credit Projects	1,399.55	314.40	117,440.10
Street Sweeping	0.00	0.00	0.00
Purchased Nutrient Credits	0.00	0.00	0.00
More Stringent Development	117.31	13.10	0.00
Additional BMPs	0.00	0.00	0.00
Total BMPs	1,576.24	337.06	122,200.59
Reduction to Meet 5% Target	109.86	12.98	10,828.54
Remainder/(Excess) To Achieve 5% Target	(1,468.32)	(324.36)	(111,372.05)

6. BMPs Implemented or Planned for the Second Permit Cycle

This section describes the BMPs that have been or 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.

6.1. Redevelopment

Table 6.A provides a summary of redevelopment projects that are used for TMDL compliance. One redevelopment project has already been implemented in the second permit cycle as reported in the Town's FY19 annual report. This involved the installation of bioretention and grass swales as part of an upgrade to the Town Hall parking area. Calculations are included in Appendix E. Future reductions, including project details and calculations, will be reported to DEQ in the Town's MS4 annual reports.

Table 6.A – Summary of Reductions from Redevelopment

		TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
First Permit Cycle		61.31	9.85	4,760.49
Second Permit Cycle	Achieved	3.46	0.44	218.87
	Planned	To be determined.	To be determined.	To be determined.
Total		64.77	10.29	4,979.36

6.2. Shared Credit Projects

Table 6.B provides a summary of shared credit projects that are used for TMDL compliance. Reductions achieved in the first permit cycle as well as during FY19 have been documented in Fairfax County's annual reports to DEQ. Reductions planned for the remainder of the permit cycle have been included in Fairfax County's draft Phase II Chesapeake Bay TMDL Action Plan and are included in Appendix E.

Table 6.B – Summary of Reductions from Shared Credit Projects

		TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
First Permit Cycle		1,399.55	314.40	117,440.10
Second Permit Cycle	Achieved	186.11	49.63	17,941.85
	Planned	276.92	97.16	28,760.95
Total		1,862.58	461.19	164,142.90

6.3. Street Sweeping

As indicated in Table 6.C, the Town is not currently proposing to take credit for its street sweeping program. While the Town did take credit during the first permit cycle, this credit has been removed as a result of a change in DEQ's credit calculation methodology. Any changes to the program that result in pollutant reduction credit will be reported in the Town's annual reports to DEQ.

Table 6.C – Summary of Reductions from Street Sweeping

		TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
First Permit Cycle		0.00	0.00	0.00
Second Permit Cycle	Achieved	0.00	0.00	0.00
	Planned	To be determined.	To be determined.	To be determined.
Total		0.00	0.00	0.00

6.4. Purchased Off-Site Nutrient Credits

As indicated in Table 6.D, the Town is not currently proposing to take credit for the purchase of off-site nutrient credits. Any future purchase of off-site nutrient credits will be reported in the Town's annual reports to DEQ.

Table 6.D – Summary of Reductions from Off-Site Nutrient Credits

		TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
First Permit Cycle		0.00	0.00	0.00
Second Permit Cycle	Achieved	0.00	0.00	0.00
	Planned	To be determined.	To be determined.	To be determined.
Total		0.00	0.00	0.00

6.5. More Stringent Regulation of Land Disturbing Activities

Table 6.E provides a summary of reductions from more stringent water quality requirements that are used for TMDL compliance. Several projects have already been implemented in the second permit cycle as reported in the Town's FY19 annual report. Calculations are included in Appendix E. Future reductions, including project details and calculations, will be reported to DEQ in the Town's MS4 annual reports.

Table 6.E – Summary of Reductions from More Stringent Regulation of Land Disturbing Activities

		TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
First Permit Cycle		117.31	13.10	0.00
Second Permit Cycle	Achieved	29.12	4.06	0.00
	Planned	To be determined.	To be determined.	To be determined.
Total		146.43	17.16	0.00

6.6. Additional BMPs

As indicated in Table 6.F, the Town is not currently proposing to take credit for additional BMPs. Any future credits will be reported in the Town's annual reports to DEQ.

Table 6.F – Summary of Reductions from Additional BMPs

		TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
First Permit Cycle		0.00	0.00	0.00
Second Permit Cycle	Achieved	0.00	0.00	0.00
	Planned	To be determined.	To be determined.	To be determined.
Total		0.00	0.00	0.00

6.7. Summary of BMPs

Tables 6.G provides a summary of the total implemented and planned reductions as a result of BMPs described in sections 6.1 through 6.6.

Table 6.G – Summary of BMPs

BMP	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Redevelopment	67.77	10.29	4,979.36
Shared Credit Projects	1,862.58	461.19	164,142.90
Street Sweeping	0.00	0.00	0.00
Purchased Nutrient Credits	0.00	0.00	0.00
More Stringent Development	146.43	17.16	0.00
Additional BMPs	0.00	0.00	0.00
Total BMPs	**2,073.78**	**488.63**	**169,122.26**

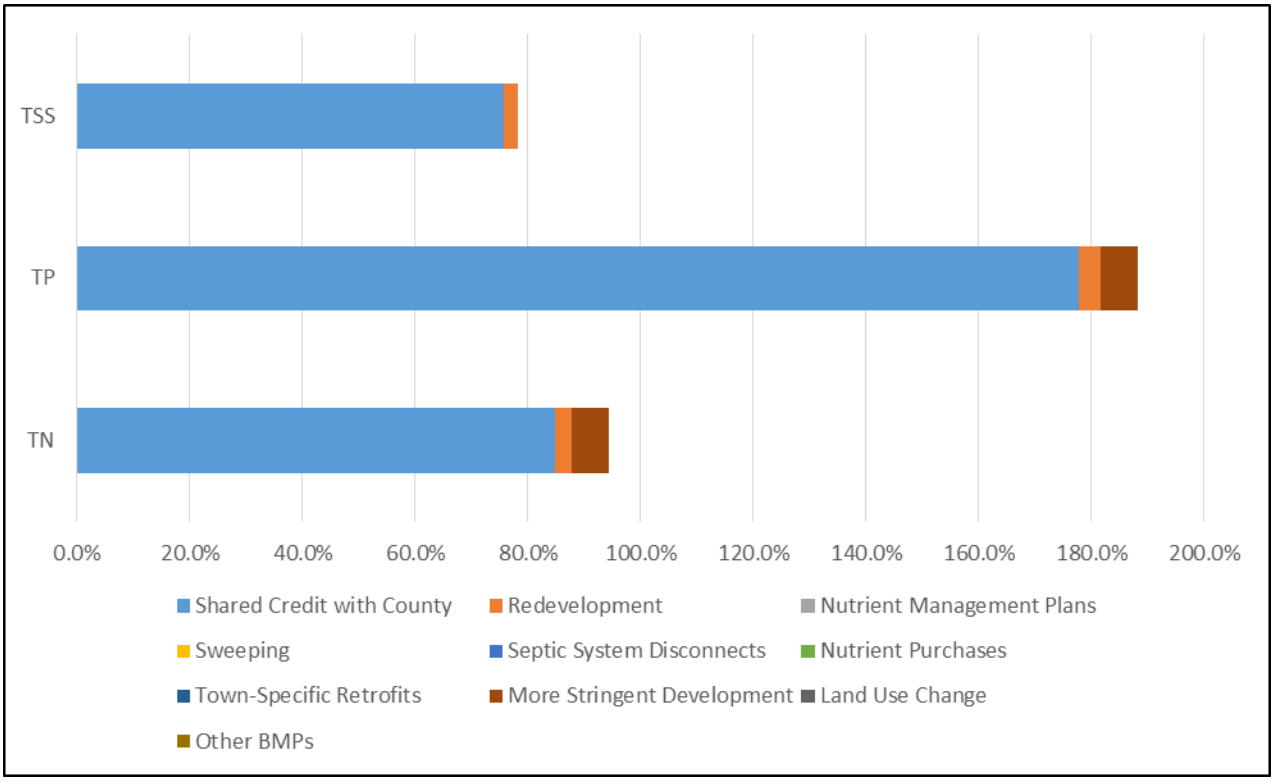
7. Overall Compliance Ledger

Table 7.A provides an overall compliance ledger demonstrating how the Town meets the Chesapeake Bay TMDL conditions in accordance with the MS4 permit. The ledger shows the reductions required from Section 3 and the total credit achieved by BMPs identified in Section 6. The last two rows show the amount of credit that will be carried forward to the third permit cycle and the anticipated percent progress toward achieving the 100% reduction target.

Table 7.A – Overall Compliance Ledger – Table

	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Existing Source Reductions to Meet 40% Target	878.86	103.85	86,628.34
+ New Source Offsets	18.19	2.64	1,237.02
+ Grandfathered Offsets	51.34	7.44	3,491.43
= Total Required Reductions and Offsets	948.40	113.93	91,356.79
- Total BMPs from Section 6	2,073.78	488.63	169,122.26
Redevelopment	67.77	10.29	4,979.36
Shared Credit Projects	1,862.58	461.19	164,142.90
Street Sweeping	0.00	0.00	0.00
Purchased Nutrient Credits	0.00	0.00	0.00
More Stringent Development	146.43	17.16	0.00
Additional BMPs	0.00	0.00	0.00
= Remainder/(Excess) To Achieve 40% Target	(1,125.38)	(374.70)	(77,765.47)
Progress Toward 100% Target	94.4%	188.2%	78.1%

Table 7.B – Overall Compliance Ledger – Chart



8. Public Comments

In accordance with Part II A 11 f of the 2018 MS4 permit, the public must 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. The plan was posted on the Town's stormwater webpage on October 15, 2019. The public was then notified through social media about the opportunity to review and provide comments on the plan. No comments were received. Appendix F provides a snapshot of the social media post and the stormwater webpage.

Appendix A

Cooperative Agreement with Fairfax County and the Town of Herndon

COOPERATIVE AGREEMENT BETWEEN THE FAIRFAX COU7.NTY BOARD OF SUPERVISORS, THE TOWN OF VIENNA, and TOWN OF HERNDON TO SHARE CERTAIN STORMWATER SERVICE DISTRICT FEES AND RESPONSIBILITY FOR RELATED SERVICES

This Agreement ("Agreement") is entered into on this 8TH day of MARCH, 2017, by and between the BOARD OF SUPERVISORS OF FAIRFAX COUNTY, VIRGINIA ("FAIRFAX"), the TOWN COUNCIL OF VIENNA, VIRGINIA ("VIENNA"), and the TOWN COUNCIL OF HERNDON, VIRGINIA ("HERNDON") (referenced collectively as the "Parties" or "the Governing Bodies", and individually as the "Party").

WITNESSETH:

WHEREAS the Towns of Vienna and Herndon (also referenced herein as "the Towns") are located within Fairfax County (also referenced herein as "the County"); and

WHEREAS Fairfax County, the Town of Vienna, and the Town of Herndon each maintain, operate, and improve stormwater systems that affect one another; and

WHEREAS Fairfax County and the Towns are each subject to a Municipal Separate Storm Sewer System ("MS4") permit issued by the Virginia Department of Environmental Quality ("DEQ"); and

WHEREAS FAIRFAX has cooperated with VIENNA and HERNDON to maintain, operate, and improve their respective stormwater systems and wish to continue such cooperation in the future in the best interests of their residents; and

WHEREAS pursuant to Va. Code Ann. § 15.2-2400 (2012), FAIRFAX has established a Stormwater Service District ("Service District"), and is authorized, pursuant to Va. Code Ann. § 15.2403(6) (Supp. 2016) to levy and collect an annual fee upon any property located within such Service District ("the Service District Fee"); and

WHEREAS the Towns of Vienna and Herndon are located within Fairfax County's Service District; and

WHEREAS, pursuant to Va. Code Ann. § 15.2-2403(6), Fairfax County collects revenues from properties located within the Towns of Vienna and Herndon; and

WHEREAS, pursuant to Va. Code Ann. § 15.2-2403.3 (Supp. 2016), by virtue of the Towns' maintenance of separate MS4 permits and their location within the Service District, the Towns are entitled to the Service District Fee revenues collected by Fairfax County within their respective jurisdictions; and

WHEREAS, the actual amount of revenues collected from the Service District Fee will vary from year to year; and

WHEREAS, each MS4 permit, among other things, assigns jurisdiction-specific, pollutant load reduction requirements for nitrogen, phosphorus, and sediment to address the Chesapeake Bay Total Maximum Daily Load (referred to herein as "TMDL"), and requires each MS4-permit jurisdiction to develop a Chesapeake Bay TMDL Action Plan that identifies the practices, means, and methods that are to be implemented by the permittee to achieve the required pollutant reductions; and

WHEREAS, the Commonwealth's Chesapeake Bay TMDL Watershed Implementation Plan (referred to herein as "the WIP") establishes the total pollutant reduction loads required to achieve the Chesapeake Bay TMDL and the timeframe for MS4-permit jurisdictions to achieve their assigned pollutant reductions; and

WHEREAS, each MS4 permit also requires the development of action plans for other pollutants where a TMDL assigns a wasteload allocation ("WLA") to the permittee; and

WHEREAS, pursuant to their respective MS4 permits, the Towns submitted their initial Chesapeake Bay TMDL Action Plans to DEQ prior to the deadline of October 1, 2015 while the County's initial Chesapeake Bay TMDL Action Plan will be submitted to DEQ prior to the deadline of April 1, 2017. Action plans for other TMDLs are submitted in accordance with the schedule contained in each MS4 permit; and

WHEREAS, while each MS4-permit jurisdiction is ultimately responsible for compliance with its MS4 permit, MS4 permits allow and encourage cooperation and coordination among permit holders, and such cooperation and coordination can mutually benefit MS4-permit jurisdictions through more effective and cost-efficient protection of water resources in each jurisdiction; and

WHEREAS, the purpose this Agreement, in part, is for the Parties to work cooperatively to satisfy the pollutant load reduction requirements of their current and future MS4 permits by implementing stormwater management practices within the Parties' jurisdiction that reduce the discharge of pollutants; and

WHEREAS, FAIRFAX, VIENNA, or HERNDON may terminate this Agreement as set forth by the terms herein if, pursuant to applicable law, either locality chooses not to participate under this Agreement or chooses not to share the Stormwater Service District Fees; and

WHEREAS FAIRFAX, VIENNA, and HERNDON have determined and agreed that the best interests of each locality's residents are fulfilled if FAIRFAX utilizes a portion of the Service District Fees collected by FAIRFAX from properties within the Towns to assist the Towns in maintaining, operating, and improving their respective stormwater systems to achieve the goals of effective regional water quality improvement and local initiatives in these localities and to satisfy certain MS4 permit requirements;

NOW, THEREFORE, in consideration of the mutual obligations set forth herein and other good and valuable consideration, so long as FAIRFAX continues to administer the Service District in FAIRFAX that encompasses VIENNA and HERNDON, and so long as VIENNA and HERNDON qualify to receive the Service District Fees collected by FAIRFAX from properties within the Towns, FAIRFAX, VIENNA, and HERNDON agree as follows:

1. FAIRFAX will continue to engage in a coordinated approach with VIENNA, and HERNDON to maintain and operate their respective stormwater systems throughout the incorporated and unincorporated parts of FAIRFAX. Moreover, FAIRFAX, VIENNA, and HERNDON will engage in a coordinated approach for future improvements to their respective stormwater systems.

2. This Agreement's duration shall be for one fiscal year and shall renew at the beginning of each fiscal year thereafter unless terminated pursuant to the terms set forth herein below. For the purposes of this Agreement, "fiscal year" shall mean Fairfax County's fiscal year, which, at the time of the execution of this agreement, ends on June 30.

3. This Agreement's purpose is to set forth how the Parties shall share revenues to be collected pursuant to the Service District Fee, including revenues collected from properties within VIENNA and HERNDON, and the respective obligations of the Parties with respect to the stormwater management services described herein.

STORMWATER FEE REVENUE SHARING

4. FAIRFAX shall collect all revenues to be collected pursuant to the Service District Fee, including revenues collected from properties within the Towns.

5. Revenues actually collected throughout the Service District are referred to herein as "STORMWATER FEE REVENUES."

6. At the end of each fiscal year, FAIRFAX shall calculate separately the total amount of stormwater fee revenues that were actually collected from properties within VIENNA and HERNDON from the amount of stormwater fee revenues collected elsewhere in FAIRFAX (the "VIENNA STORMWATER FEE" and "HERNDON STORMWATER FEE").

7. On or before October 30th of each fiscal year, FAIRFAX shall estimate the anticipated VIENNA STORMWATER FEE and HERNDON STORMWATER FEE for that year, and shall pay to VIENNA and HERNDON an amount equal to twenty-five percent (25%) of the estimated VIENNA STORMWATER FEE and HERNDON STORMWATER FEE, respectively, for that fiscal year, rounded to the nearest penny (the "PAID VIENNA REVENUES" and "PAID HERNDON REVENUES").

8. The Parties acknowledge and agree that PAID VIENNA REVENUES and/or PAID HERNDON REVENUES may be more or less than the amount that is actually due and owing to either or both of the Towns, and which amount is calculated at the end of each fiscal year.

9. If the PAID VIENNA REVENUES for a particular fiscal year are determined to have been less than 25% of the actual VIENNA STORMWATER FEE actually collected for that fiscal year, then FAIRFAX shall pay VIENNA the difference between the PAID VIENNA REVENUES and 25% of the VIENNA STORMWATER FEE actually collected for that fiscal year. FAIRFAX shall pay this difference at the same time as it pays the next fiscal year's PAID VIENNA REVENUES.

10. If the PAID HERNDON REVENUES for a particular fiscal year are determined to have been less than 25% of the actual stormwater fee actually collected for that fiscal year in HERNDON, then FAIRFAX shall pay HERNDON the difference between the PAID

HERNDON REVENUES and 25% of the HERNDON STORMWATER FEE actually collected for that fiscal year in HERNDON. FAIRFAX shall pay this difference at the same time as it pays the next fiscal year's PAID HERNDON REVENUES.

11. If the PAID VIENNA REVENUES for a particular fiscal year are determined to have been more than 25% of the actual VIENNA STORMWATER FEE actually collected for that fiscal year, then FAIRFAX shall deduct the difference between the PAID VIENNA REVENUES and 25% of the VIENNA STORMWATER FEE actually collected for that fiscal year from the amount that FAIRFAX pays for the next fiscal year's PAID VIENNA REVENUES.

12. If the PAID HERNDON REVENUES for a particular fiscal year are determined to have been more than 25% of the actual HERNDON STORMWATER FEE actually collected for that fiscal year, then FAIRFAX shall deduct the difference between the PAID HERNDON REVENUES and 25% of the HERNDON STORMWATER FEE actually collected for that fiscal year from the amount that FAIRFAX pays for the next fiscal year's PAID HERNDON REVENUES.

13. Once FAIRFAX has determined the amount of the actual VIENNA STORMWATER FEE and HERNDON STORMWATER FEE, which shall occur within 90 days of the fiscal year end, FAIRFAX shall forward the respective amounts to the Towns' Mayors in writing ("FINAL ACCOUNTING"). If VIENNA and/or HERNDON disputes the amount of the FINAL ACCOUNTING, then within 30 days of the Mayors' receipt of this FINAL ACCOUNTING, VIENNA and/or HERNDON, shall state the complete factual basis for any such dispute in writing to the Fairfax County Executive, and the Parties shall endeavor in good faith to resolve any such dispute. Upon the resolution of any such dispute, or if VIENNA and/or

HERNDON fails to dispute the amount of the FINAL ACCOUNTING within 30 days of either Mayor's receipt thereof, then VIENNA and/or HERNDON shall be deemed to have accepted payment of the respective fiscal year's PAID VIENNA REVENUES or PAID HERNDON REVENUES, which shall result in the waiver of any right to request from FAIRFAX any additional amount of the collected STORMWATER FEE REVENUES. VIENNA's and/or HERNDON's waiver of any such balance, however, is conditioned upon FAIRFAX's obligations to VIENNA and/or HERNDON pursuant to this Agreement.

14. Pursuant to Va. Code Ann. § 15.2-2403.3 VIENNA and HERNDON shall expend the PAID VIENNA REVENUES and PAID HERNDON REVENUES, respectively, only for costs directly related to the Towns' stormwater systems and not for non-stormwater-system costs, such as public safety, schools, or road maintenance.

15. Under this Agreement, neither VIENNA nor HERNDON is required to expend any of the paid revenues within any specific amount of time. This Agreement does not affect any other authority that VIENNA or HERNDON might have to carry over revenues from year-to-year or to expend revenues in one fiscal year when the revenues were collected in a previous fiscal year.

16. If, at any time in the future, either VIENNA or HERNDON becomes unincorporated or ceases to qualify to receive paid revenues for any reason or terminates its stormwater program or ceases to maintain its stormwater systems, none of the previously paid revenues shall be expended for anything other than the maintenance, operation, and improvement of such Town's stormwater systems. If any such amounts are returned to FAIRFAX they may be used for other qualified uses in the Service District as FAIRFAX, or its designee, in its or his sole discretion, deems appropriate.

TMDL COMPLIANCE AND THE TMDL ADVISORY COMMITTEE

17. Fairfax, Vienna, and Herndon agree that Fairfax will implement stormwater management practices throughout the County and in the Towns sufficient to achieve the TMDL pollutant load reduction requirements that are incorporated into each Party's respective current and future MS4 permit.

18. A TMDL Compliance Advisory Committee (hereinafter referred to as the "Advisory Committee") shall be established and shall be comprised of one or more representatives from each governing body.

19. Regardless of the number of representatives appointed by each governing body, each locality will have one vote on the Advisory Committee.

20. The Advisory Committee shall:

a. establish, pursuant to each Party's respective MS4 permit, the nitrogen, phosphorus, and sediment (referred to as "pollutants of concern" or "POCs") load reductions necessary for each individual Party to achieve full compliance with the Chesapeake Bay TMDL and the WIP (referred to herein as "the Chesapeake Bay TMDL Endpoint").

b. establish the "TOTAL POLLUTANT REDUCTION," which is the total amount of each POC that the Parties must reduce in order to reach the Chesapeake Bay TMDL Endpoint.

c. establish the percentage of the TOTAL POLLUTANT REDUCTION for which each locality is responsible. That percentage assigned to each Party shall hereinafter be referred to, respectively, as the "FAIRFAX PERCENTAGE," "VIENNA PERCENTAGE," and "HERNDON PERCENTAGE."

d. as determined by the Advisory Committee, the FAIRFAX PERCENTAGE, VIENNA PERCENTAGE, and the HERNDON PERCENTAGE may be established for each POC, an average of POCs, or by another mutually agreed upon methodology that will allocate pollutant reduction credits for projects completed under this Agreement as provided for in paragraph 27 below, in a manner necessary to meet the Chesapeake Bay TMDL Endpoint.

e. establish a watershed-specific FAIRFAX PERCENTAGE, VIENNA PERCENTAGE, and HERNDON PERCENTAGE to allocate pollutant reduction credits for projects implemented within a watershed to meet a non-Chesapeake Bay TMDL Endpoint.

21. VIENNA and HERNDON may at any time provide FAIRFAX with a list of stormwater management projects to be considered for implementation. Before submitting any such project, the submitting Town must thoroughly investigate and analyze each project to ensure that any such project is feasible. Any project submitted before June 30 of each year will be considered by FAIRFAX for implementation during the following fiscal year. If a project is not implemented, it will continue to be considered for implementation in subsequent fiscal years until such time that the project is determined to be infeasible. Selection of projects for implementation and determination of final feasibility are at the sole discretion of the Director of the Fairfax County Department of Public Works and Environmental Services ("Director").

22. By April 1 of each year, the Director will send to the Towns of VIENNA and HERNDON and/or their designees a proposed list of projects within their jurisdiction.

23. Within 30 days after each Mayors' receipt of this list, the Towns shall provide comments and suggestions regarding each project, its timing, and its costs for implementation,

lifetime maintenance, and replacement. If the Towns provide any comments or suggestions, the Director shall fully consider any such comments, and may, but shall not be obligated to implement or adhere to them. In the event that a dispute exists regarding implementation of any project on the list sent by the Director, the Director and the disputing Town shall endeavor in good faith to resolve any such dispute, but final authority for the implementation of any such projects rests solely with Fairfax County and the Director.

24. FAIRFAX will pay for the development of the updated Chesapeake Bay TMDL Action Plan for each Town that is due at the beginning of each new MS4 permit cycle. Each Town will be responsible for routine annual updates as required in the MS4 permits. FAIRFAX will also pay for the initial development of other TMDL action plans necessary for compliance with each Town's MS4 permit and any substantial updates to these action plans required in future permit cycles. The action plans will include all information necessary to demonstrate compliance with MS4 permit requirements. Changes or additions to projects identified in the action plans will be reported to each Town annually in accordance with paragraph 31.

25. FAIRFAX shall be solely responsible for implementing projects under this Agreement, excluding the acquisition of any permanent or temporary land rights necessary to construct and maintain a project located within a Town. The Parties may, as necessary, have agreements that are separate from this Agreement that address the Parties' responsibilities over specific projects, facilities, and other funding.

26. A project is subject to this Agreement if it is funded in whole or in part by the Service District Fee and substantially completed on or after July 1, 2009.

27. For each project substantially completed under this Agreement on or after July 1, 2009, whether the project or facility is located within VIENNA, HERNDON, or elsewhere

within Fairfax County, the Parties will receive a pollutant reduction credit for each POC. The reduction credit is determined by applying the VIENNA PERCENTAGE and the HERNDON PERCENTAGE to the estimated total POC load reductions for each project that is substantially completed pursuant to this Agreement (the "VIENNA CREDIT," "HERNDON CREDIT," "FAIRFAX CREDIT," and collectively "REDUCTION CREDITS"). For completed projects and facilities, the REDUCTION CREDITS shall survive any termination of this Agreement unless otherwise agreed to by the Parties or in the event that a constructed facility or improvement is not maintained in accordance with paragraph 28 of this Agreement.

28. The Party in whose jurisdiction any stormwater management facility or improvement is constructed under this Agreement shall ensure that the long-term maintenance of such facility or improvement is performed as necessary to maintain the functionality and performance thereof. Each party shall ensure long-term maintenance in accordance with Va. Code Ann. § 62.1-44.15.15:27(E)(2) and 9 Va. Admin. Code §§ 25-870-58 and 112. In the event that a Party's failure to maintain a project completed under this Agreement results in a decrease in the amount of POCs removed therefrom, as determined by DEQ, then that Party shall, at its sole cost, maintain or improve the facility to restore the facility to its original functionality.

29. In the event that a Party is unable to meet its load reduction requirement for a specific reporting period, and another Party has exceeded its load reduction requirement, the Director may, with written notification to the Parties, transfer credit from shared credit projects among Parties in a manner to ensure that each Party is able to meet its load reduction requirement. Any such transfer shall be temporary and last only as long as it is needed to address the immediate shortfall. Further, no transfer will occur or stay in force that would result in a donating Party being in non-compliance with an MS4 permit condition.

30. Any Party that completes a stormwater management project from funds not generated by or transferred through Fairfax County shall be entitled to claim all resulting load reduction credits for purposes of satisfying its MS4 permit requirements.

31. FAIRFAX will prepare an annual report that details the activities performed under this Agreement. The report will provide sufficient detail so that each locality may use it to meet their respective MS4 permit reporting obligations to DEQ. Fairfax will provide the report annually no later than one month before the date the annual report is due to DEQ.

STAFF TRAINING

32. Without any additional invitation or payment, VIENNA's and/or HERNDON's staff may attend MS4 permit-related training programs that are conducted or hosted by FAIRFAX. FAIRFAX will provide VIENNA and HERNDON with at least one-month's advance notice of such training opportunities.

TERMINATION

33. Any Party may terminate this Agreement by resolution of that Party's governing body. Any such resolution shall be at a public meeting with notice in writing to the non-terminating Parties. Notice shall be made at least three weeks in advance of any such meeting to the Mayor(s) or, as applicable, the County Executive, of Fairfax County. After adoption of any such resolution, the terminating Party shall notify the remaining Parties. The termination shall be effective no earlier than the end of the fiscal year in which the governing body's vote for the resolution for the termination occurs.

34. If this Agreement is terminated by any party other than FAIRFAX, the Agreement shall remain in force as to the remaining parties. The terminating Town shall have responsibility to maintain and replace, as necessary, any facility constructed under this Agreement that is

located within its boundaries and shall assume all liability for such facility. Unless otherwise agreed to by the Parties, neither Town shall have any liability or responsibility for any facility that is located outside of its jurisdictional boundaries and was developed and implemented under this Agreement.

ADDITIONAL PROVISIONS

35. This Agreement is integrated and contains all provisions of the Agreement between the Parties.

36. In the event of a conflict between any term(s) of this Agreement and either of the Parties' MS4 permits or other permit requirements, either Party's respective permit provision(s), shall control.

37. Any provision or term of this Agreement may be modified only by a writing that is approved by resolution at a public meeting of each of the localities' respective governing bodies.

38. This Agreement shall be binding on the Parties' respective agencies, employees, agents, and successors-in-interests.

39. This Agreement shall not be assigned by either of the Parties unless both of the Parties agree to such an assignment in writing.

40. Nothing in this Agreement otherwise limits the respective regulatory and police powers of the Parties.

41. The Parties agree that nothing in this Agreement creates a third-party beneficiary. The Parties also agree that this Agreement does not confer any standing or right to sue or to enforce any provision of this Agreement or any other right or benefit to any person who is not a

party to this Agreement, including but not limited to a citizen, resident, private entity, or local, state, or federal governmental or public body.

42. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one in the same Agreement.

43. This Agreement shall be governed by Virginia law, and any litigation relating to this Agreement shall be brought and/or maintained only in the Circuit Court of Fairfax County, Virginia.

IN WITNESS WHEREOF, the Parties have executed this Agreement, as verified by their signatures below.

[Signatures appear on the following pages.]

TOWN OF VIENNA

By: Laurie A DiRocco
Laurie A. DiRocco
Mayor
Town of Vienna, VA

STATE OF VIRGINIA :
: to-wit
COUNTY OF FAIRFAX :

The foregoing Agreement was acknowledged before me by Laurie A. DiRocco of the Town of VIENNA, this 21st day of February 2017 on behalf of the Town of VIENNA.

MELANIE J. CLARK
NOTARY PUBLIC
REGISTRATION # 7290978
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES
JUNE 30, 2017

Melanie J Clark
Notary Public

My commission expires: June 30, 2017
Notary Registration Number: 7290978

TOWN OF HERNDON

By:_____
(Name and Title)
Lisa C. Merkel
Mayor

STATE OF VIRGINIA :
: to-wit
COUNTY OF FAIRFAX :

The foregoing Agreement was acknowledged before me by Lisa C. Merkel of the Town of HERNDON, this 2nd day of March 2017 on behalf of the Town of HERNDON.

Cynthia M. Yurewicz
Notary Public

My commission expires: 11/30/2018
Notary Registration Number: 325308

CYNTHIA M. YUREWICZ
NOTARY PUBLIC
REGISTRATION # 325308
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES
NOVEMBER 30, 2018

APPROVED AS TO FORM:

Lesa J. Yeatts
Town Attorney

BOARD OF SUPERVISORS OF
FAIRFAX COUNTY, VIRGINIA

By: Edward L Long Jr.
Edward L. Long Jr.
County Executive
Fairfax County, Virginia

STATE OF VIRGINIA :
: to-wit
COUNTY OF FAIRFAX :

The foregoing Agreement was acknowledged before me by Edward L. Long Jr., ~~of the~~ County Executive, on behalf of the Board of Supervisors of Fairfax County, Virginia this 9th day of March ~~2016~~. 2017

SUSAN STANNERS ROBINSON
Registration # 7646782
My Commission Expires
March 31, 2019

Susan Stanners Robinson
Notary Public

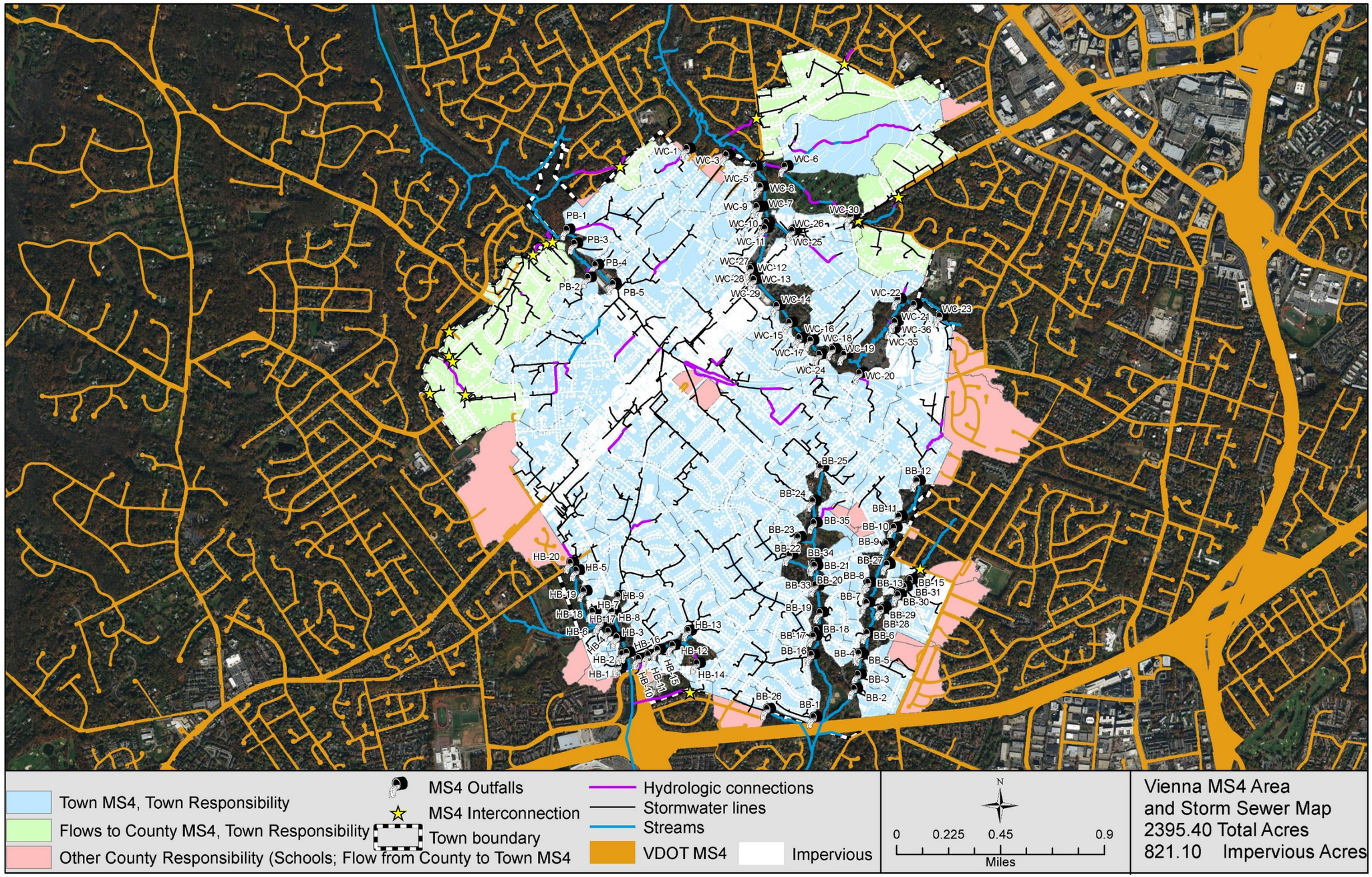
My commission expires: March 31, 2019

Notary Registration Number: 7642019

Approved as to form: _____
Office of the County Attorney
Fairfax, Virginia

Appendix B

Town of Vienna MS4 Service Area Delineation


WC-1
WC-3
WC-6
WC-5
WC-8
WC-9
WC-7
WC-30
PB-1
WC-10
WC-26
PB-3
WC-11
WC-25
WC-27
WC-12
PB-4
WC-28
WC-13
PB-2
PB-5
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BB-28
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HB-3
BB-18
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HB-4
BB-16
BB-4
HB-12
HB-2
BB-5
HB-15
HB-14
BB-3
HB-11
HB-10
BB-26
BB-2
BB-1
Town MS4, Town Responsibility
Flows to County MS4, Town Responsibility
Other County Responsibility (Schools; Flow from County to Town MS4
MS4 Outfalls
MS4 Interconnection
Town boundary
Hydrologic connections
Stormwater lines
Streams
VDOT MS4
Impervious
N
0
0.225
0.45
0.9
Miles
Vienna MS4 Area
and Storm Sewer Map
2395.40 Total Acres
821.10 Impervious Acres

Appendix C

Grandfathered Project Offset Calculations

All calculations are made in accordance with DEQ's Chesapeake Bay TMDL Special Guidance Document. These grandfathered projects were not included in the initial action plan. Therefore the calculations are included in their entirety.

Pollutant => FY	Conversion from Table 4 of Guidance	Offset
TN	6.9	51.34
TP	1	7.44
TSS	469.2	3,491.43

Onondio Cove		
Information	**Input**	**Using Redevelopment VSMP Scenario 3**
Date Completed	Construction Start 2015; Complete 2016	
Rainfall	40	
Site Area (SF)	154202.4	
Site Area (AC)		3.54
Pre-2014 Watershed I %		16
Pre-I Area (SF)	63223.0	
Pre-I Area (AC)		1.45
Pre-I Area (%)		41.00
Pre C Value		1.08
Pre-TP Load		**13.07**
Post-I Area (SF)	78643.224	
Post-I Area (AC)		1.81
Post-I Area (%)		51.00
Post C Value		1.08
Post-TP Load		**15.88**
Increase/Decrease		2.81
Stormwater Controls		
BMP 1	Purchased Credits (Ches Bay Nutrient Land Trust 3/23/15)	
Efficiency	0	
I Area (AC)	0	
TP Removed		1.11
BMP 2		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
BMP 3	-	
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
Final Load		14.77
Total Increase/Decrease		**1.70**

VSMP Situation 3: Land disturbing activities where the existing percent impervious cover (41%) is greater than the average land cover condition (16%).	
Requirement: The pollutant discharge after disturbance shall not exceed the pollutant discharge based on existing conditions less 10%.	
Initial Amount to be Made Up: Difference between existing load less 10% and post load, plus reductions achieved by the BMP.	3.00
Offset Required: Offset is only the net increase per discussion with Virginia DEQ.	1.70

Andrew Minor Subdivision		
Information	**Input**	**Using Redevelopment VSMP Scenario 2**
Date Completed	Construction Start 2014; Complete July 2017	
Rainfall	40	
Site Area (SF)	82676.88	
Site Area (AC)		1.90
Pre-2014 Watershed I %		16
Pre-I Area (SF)	7405.2	
Pre-I Area (AC)		0.17
Pre-I Area (%)		8.96
Pre C Value		.26
Pre-TP Load		**0.53**
Post-I Area (SF)	24393.6	
Post-I Area (AC)		0.56
Post-I Area (%)		29.50
Post C Value		1.08
Post-TP Load		**5.28**
Increase/Decrease		4.75
Stormwater Controls		
BMP 1		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
BMP 2		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
BMP 3	-	
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
Final Load		5.28
Total Increase/Decrease		**4.75**

VSMP Situation 2: Land disturbing activities where the existing percent impervious cover is less than or equal to the average land cover condition (16%) and the proposed improvements will create a total percent impervious cover which is greater than the average land cover condition (29.5%).	
Requirement: The pollutant discharge after disturbance (5.28) shall not exceed the existing pollutant discharge based on the average land cover condition (0.53).	
Initial Amount to be Made Up: 5.28 - 0.53 = 4.75.	4.75
Amount to be Made Up After BMP: 4.75 - 0.00 = 4.75	4.75
Required Offset = 4.75	4.75

120 Church Street		
Information	**Input**	**Using Redevelopment VSMP Scenario 3**
Date Completed	Construction Start 2015; Complete October 2016	
Rainfall	40	
Site Area (SF)	23827.32	
Site Area (AC)		0.55
Pre-2014 Watershed I %		16
Pre-I Area (SF)	17641.8	
Pre-I Area (AC)		0.41
Pre-I Area (%)		74.04
Pre C Value		1.08
Pre-TP Load		**3.45**
Post-I Area (SF)	23086.8	
Post-I Area (AC)		0.53
Post-I Area (%)		96.89
Post C Value		1.08
Post-TP Load		**4.44**
Increase/Decrease		0.99
Stormwater Controls		
BMP 1		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
BMP 2		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
BMP 3	-	
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
Final Load		4.44
Total Increase/Decrease		**0.99**

VSMP Situation 3: Land disturbing activities where the existing percent impervious cover (74.04%) is greater than the average land cover condition (16%).	
Requirement: The pollutant discharge after disturbance shall not exceed the pollutant discharge based on existing conditions less 10%.	
Initial Amount to be Made Up: Difference between existing load less 10% and post load, plus reductions achieved by the BMP.	1.34
Offset Required: Offset is only the net increase per discussion with Virginia DEQ.	0.99

Appendix D

List of BMPs Implemented During the First Permit Cycle

All calculations and supporting documentation were included in the initial Chesapeake Bay TMDL Action Plan and/or MS4 annual reports provided to DEQ.

Redevelopment

The following redevelopment projects were implemented and reported to DEQ in annual reports during the first permit cycle.

Redevelopment Project	TN Credit	TP Credit	TSS Credit	Year
Vienna Community Center	12.04	2.15	1,271.28	2018
135 Center Street S	0.63	0.18	86.32	2018
1008 Electric Ave	48.64	7.52	3,402.89	2018

Shared Credit Projects

Shared credit projects include those projects constructed prior to July 1, 2016 from Tables 5.A (Structural Retrofits), 5.B (Stream Restoration), and 5.F (In-Lake Forebay Retrofits) of the Fairfax County Chesapeake Bay TMDL Action Plan approved by DEQ on August 15, 2017. Shared credit projects also include projects constructed from July 1, 2016 to prior to July 1, 2018 as reported in Fairfax County's FY2017 and FY2018 MS4 annual reports. Projects planned for the second permit cycle are shown in FY23 and are detailed in Appendix E.

Total Cumulative Town Credit						
Pollutant	**Through FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**
TN	1399.55	1585.67	1585.67	1585.67	1585.67	1862.58
TP	314.40	364.03	364.03	364.03	364.03	461.19
TSS	117440.10	135381.95	135381.95	135381.95	135381.95	164142.90
Total Cumulative County-Wide Credit						
Pollutant	**Through FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**
TN	39987.24	45304.76	45304.76	45304.76	45304.76	53216.47
TP	8982.73	10400.82	10400.82	10400.82	10400.82	13176.73
TSS	3355431.36	3868055.72	3868055.72	3868055.72	3868055.72	4689797.20
Implemented Structural Retrofits - Insert Cumulative Reductions Each Year						
Pollutant	**Through FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**
TN	6421.36	6979.75	6979.75	6979.75	6979.75	7317.20
TP	614.62	667.58	667.58	667.58	667.58	706.18
TSS	749226.15	794588.14	794588.14	794588.14	794588.14	825921.67
Implemented Stream Retrofits - Insert Cumulative Reductions Each Year						
Pollutant	**Through FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**
TN	26398.07	31157.20	31157.20	31157.20	31157.20	38731.46
TP	7943.54	9308.67	9308.67	9308.67	9308.67	12045.98
TSS	2437149.69	2904412.06	2904412.06	2904412.06	2904412.06	3694820.01
Implemented In-Lake Forebays - Insert Cumulative Reductions Each Year						
Pollutant	**Through FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**
TN	7167.81	7167.81	7167.81	7167.81	7167.81	7167.81
TP	424.57	424.57	424.57	424.57	424.57	424.57
TSS	169055.52	169055.52	169055.52	169055.52	169055.52	169055.52

More Stringent Development

FY2018 Structural Facilities

More Stringent Single Family Residential Development -- Structural Facilities

The following table demonstrates pollutant reductions achieved as a result of more stringent regulation of single family residential development under one acre as required by the Town's Stormwater Management Ordinance. Reductions are from structcural facilities designed in accordance with the VRRM.

Watershed	DATE_INSTA	BMP_NAME	IMPERVIOUS	TOTAL_ACRE	RUNOFF_CAP	MEASUREM	AMOUNT_A	LATITUDE	LONGITUDE	NITROGEN_L	REMAINING_	VRRM Nitrogen	VRRM Phosphoro	Ownership
Piney Branch	7/11/2017	Urban Bioretentio	0.05	0.05	69.00	CF	69.00	38.89454000	-77.26410600	0.50000000	1.25000000	0.50000000	0.06000000	Private
Hunters Branch	7/13/2017	Infiltration	0.02	0.06	57.00	CF	57.00	38.88959300	-77.26642200	0.30000000	1.39000000	0.29500000	0.04480000	Private
Wolftrap Creek	7/14/2017	Urban Bioretentio	0.03	0.03	41.00	CF	41.00	38.90371700	-77.25026100	0.29000000	2.02000000	0.29000000	0.04000000	Private
Piney Branch	7/21/2017	Bioretention	0.03	0.03	19.00	CF	19.00	38.90173600	-77.27360200	0.27000000	0.27000000	0.27000000	0.03000000	Private
Wolftrap Creek	7/27/2017	Infiltration Trenc	0.02	0.05	55.00	CF	55.00	38.91423200	-77.24628100	0.28000000	1.39000000	0.28	0.04000000	Private
Bear Branch	8/1/2017	Urban Bioretentio	0.03	0.03	35.00	CF	35.00	38.88704800	-77.25048000	0.25000000	1.48000000	0.25000000	0.03000000	Private
Piney Branch	8/10/2017	Bioretention	0.04	0.04	55.00	CF	55.00	38.89509600	-77.26275600	0.40000000	1.45000000	0.40000000	0.05000000	Private
Hunters Branch	8/11/2017	Infiltration 2	0.03	0.04	110.00	CF	110.00	38.88561400	-77.26462600	0.50000000	1.48000000	0.50000000	0.07000000	Private
Bear Branch	9/8/2017	Urban Bioretentio	0.02	0.02	28.00	CF	28.00	38.88254500	-77.25479500	0.00000000	0.00000000	0.20000000	0.02000000	Private
Bear Branch	9/8/2017	Urban Bioretentio	0.03	0.03	47.00	CF	47.00	38.89483300	-77.25838300	0.34000000	1.60000000	0.34000000	0.04000000	Private
Bear Branch	9/8/2017	Infiltration Trenc	0.06	0.08	105.00	CF	105.00	38.89215000	-77.25875500	0.54000000	1.55000000	0.59000000	0.09000000	Private
Wolftrap Creek	9/25/2017	Infiltration	0.03	0.11	265.00	CF	265.00	38.90857800	-77.25031300	1.21000000	2.47000000	1.21000000	0.17000000	Private
Wolftrap Creek	9/27/2017	Urban Bioretentio	0.02	0.02	28.00	CF	28.00	38.91695800	-77.25394800	0.20000000	1.91000000	0.20000000	0.02000000	Private
Piney Branch	9/28/2017	Bioretention	0.04	0.08	80.00	CF	80.00	38.90059600	-77.27623600	0.53000000	1.97000000	0.53000000	0.06000000	Private
Bear Branch	10/17/2017	Urban Bioretentio	0.03	0.03	49.31	CF	49.31	38.89473400	-77.24689600	0.25460000	1.86930000	0.25460000	0.03870000	Private
Bear Branch	10/18/2017	Urban Bioretentio	0.05	0.05	87.00	CF	87.00	38.88822900	-77.25970800	0.57000000	1.17000000	0.57000000	0.07000000	Private
Wolftrap Creek	10/18/2017	Conserved Open	0.05	0.10	94.00	CF	94.00	38.90318100	-77.25219200	0.42000000	1.20000000	0.42000000	0.06000000	Private
Bear Branch	10/19/2017	Urban Bioretentio	0.04	0.04	54.00	CF	54.00	38.89075800	-77.25906700	0.39000000	1.68000000	0.39000000	0.05000000	Private
Hunters Branch	10/19/2017	Urban Bioretentio	0.06	0.06	89.00	CF	89.00	38.88550500	-77.26488600	0.64000000	1.48000000	0.64000000	0.08000000	Private
Hunters Branch	10/26/2017	Urban Bioretentio	0.06	0.06	86.00	CF	86.00	38.88874000	-77.26688000	0.61000000	1.65000000	0.61000000	0.07000000	Private
Bear Branch	10/31/2017	Urban Bioretentio	0.04	0.04	59.00	CF	59.00	38.89472200	-77.25635000	0.43000000	1.24000000	0.43000000	0.05000000	Private
Bear Branch	11/16/2017	Urban Bioretentio	0.05	0.05	83.00	CF	83.00	38.89520000	-77.25478300	0.53000000	1.22000000	0.53000000	0.07000000	Private
Bear Branch	11/20/2017	Infiltration Trenc	0.03	0.06	102.00	CF	102.00	38.88656700	-77.25657300	0.47000000	1.45000000	0.47000000	0.07000000	Private
Bear Branch	12/11/2017	Bioretention	0.04	0.06	74.00	CF	74.00	38.88230500	-77.24864800	0.53000000	1.36000000	0.53000000	0.06000000	Private
Piney Branch	12/14/2017	Bioretention	0.01	0.01	19.00	CF	19.00	38.91182600	-77.26523900	0.13650000	1.89830000	0.13650000	0.01640000	Private
Wolftrap Creek	12/15/2017	Infiltration	0.02	0.05	96.00	CF	96.00	38.92136400	-77.25200200	0.44000000	1.63000000	0.44000000	0.06000000	Private
Piney Branch	1/19/2018	Infiltration Trenc	0.03	0.03	107.00	CF	107.00	38.91217300	-77.27103700	0.80000000	1.59000000	0.80000000	0.11000000	Private
Wolftrap Creek	1/19/2018	Rain Garden	0.07	0.09	52.00	CF	52.00	38.91362400	-77.24522100	1.08000000	1.41000000	1.08000000	0.15000000	Private
Hunters Branch	2/2/2018	Infiltration Trenc	0.04	0.13	101.00	CF	101.00	38.89128900	-77.26572000	0.56520000	1.36380000	0.56520000	0.08590000	Private
Bear Branch	2/9/2018	Infiltration Trenc	0.04	0.04	120.00	CF	120.00	38.89053800	-77.25903700	0.55000000	1.43000000	0.55000000	0.08000000	Private
Hunters Branch	2/9/2018	Infiltration Trenc	0.04	0.04	121.00	CF	121.00	38.88789400	-77.26082100	0.55000000	1.43000000	0.55000000	0.08000000	Private
Bear Branch	3/6/2018	Infiltration Trenc	0.02	0.06	109.00	CF	109.00	38.88543400	-77.25064100	0.50000000	1.46000000	0.50000000	0.07000000	Private
Bear Branch	3/13/2018	Urban Bioretentio	0.06	0.06	83.00	CF	83.00	38.89307100	-77.25288600	0.59000000	2.16000000	0.59000000	0.07000000	Private
Piney Branch	3/23/2018	Soils Amendment	0.05	0.13	0.00		0.00	38.89711600	-77.26395400	0.00000000	0.00000000	0.61000000	0.08000000	Private
Piney Branch	3/26/2018	Infiltration	0.15	0.15	78.00	CF	78.00	38.89813000	-77.26195500	0.39000000	1.29000000	0.39000000	0.06000000	Private
Bear Branch	4/9/2018	Infiltration	0.04	0.06	136.00	CF	136.00	38.88875000	-77.26029400	0.62260000	1.13550000	0.62260000	0.08800000	Private
Piney Branch	4/9/2018	Urban Bioretentio	0.03	0.03	46.52	CF	46.52	38.89790100	-77.26106800	0.33420000	1.48370000	0.33420000	0.04010000	Private
Hunters Branch	4/12/2018	Urban Bioretentio	0.03	0.03	46.00	CF	46.00	38.88621900	-77.26756700	0.33000000	1.39000000	0.33000000	0.04000000	Private
Piney Branch	4/18/2018	Infiltration Trenc	0.05	0.16	131.00	CF	131.00	38.89812400	-77.26262800	0.68000000	0.94000000	0.68000000	0.10000000	Private
Bear Branch	4/25/2018	Stormwater Plant	0.04	0.04	56.72	CF	56.72	38.88618300	-77.24942800	0.40750000	1.28160000	0.40750000	0.04890000	Private
Wolftrap Creek	4/27/2018	Urban Bioretentio	0.05	0.05	64.14	CF	61.14	38.90202700	-77.25202200	0.48950000	1.14600000	0.48950000	0.05880000	Private
Wolftrap Creek	5/2/2018	Sheetflow Conser	0.05	0.05	117.00	CF	117.00	38.90346000	-77.24987700	0.53000000	1.18000000	0.53000000	0.07000000	Private
Bear Branch	5/7/2018	Urban Bioretentio	0.03	0.03	40.00	CF	40.00	38.89191000	-77.25836300	0.28000000	0.00000000	0.28000000	0.03000000	Private
Wolftrap Creek	5/14/2018	Infiltration #2	0.07	0.12	258.00	CF	258.00	38.90786200	-77.26173000	1.18000000	2.67000000	1.18000000	0.17000000	Private
Piney Branch	6/5/2018	Soils Compost RR	0.05	0.13	120.00	CF	120.00	38.89593000	-77.26276300	0.00000000	0.00000000	0.54000000	0.08000000	Private
Piney Branch	6/18/2018	Urban Bioretentio	0.06	0.06	77.00	CF	77.00	38.89670400	-77.26177500	0.55000000	1.44000000	0.55000000	0.07000000	Private
Piney Branch	6/21/2018	Urban Bioretentio	0.04	0.04	53.00	CF	53.00	38.89646200	-77.26613000	0.38000000	1.39000000	0.38000000	0.05000000	Private
Piney Branch	6/27/2018	Infiltration	0.06	0.16	149.00	CF	149.00	38.90885100	-77.26886900	0.77000000	1.46000000	0.77000000	0.12000000	Private
Wolftrap Creek	5/18/2018	Grass Channel	0.07	0.21	317.00	CF	0.00	38.90703333	-77.25444444	0.00000000	0.00000000	0.68000000	0.09000000	Private
											Total	24.69	3.3	

FY2018 Purchased Credit

More Stringent Single Family Residential Development -- Purchased Credit

The following table demonstrates pollutant reductions achieved as a result of more stringent regulation of single family residential development under one acre as required by the Town's Stormwater Management Ordinance. All reductions consist of purchased off-site nutrient credits.

Street	Unit #	Credit Purchase Date	Purchased TN (lbs)	Purchased TP (lbs)
Cherry Street SW	208	7/27/2017	0.07	0.01
Elm Street SW	106	11/15/2017	0.07	0.01
Elm Street SW	205	3/2/2018	0.30	0.04
Battle Street SW	204	3/2/2018	0.45	0.06
Total			**0.89**	**0.12**

FY2017 Structural Facilities

More Stringent Single Family Residential Development -- Structural Facilities

The following table demonstrates pollutant reductions achieved as a result of more stringent regulation of single family residential development under one acre as required by the Town's Stormwater Management Ordinance. Reductions are from structcural facilities designed in accordance with the VRRM.

DATE_INSTA	BMP_NAME	IMPERVIOUS	TOTAL_ACRE	RUNOFF_CAP	MEASUREMEN	AMOUNT_APP	LATITUDE	LONGITUDE	LIFESPAN	NITROGEN_L	REMAININ G_	HUC	Watershed	Public or Private	VRRM Nitrogen Load Reduction Achieved	VRRM Phosphorous Load Reduction Achieved
8/19/2016	Urban Biore	0.0400	0.0400	51	CF	51	38.8976	-77.2643	20	0.00	0.00	PL22	Piney Branch	Private	0.37	0.04
8/25/2016	Urban Biore	0.0600	0.0600	83	CF	83	38.9047	-77.2720	20	0.00	0.00	PL22	Piney Branch	Private	0.81	0.1
8/25/2016	Infiltration	0.4800	0.7300	116	CG	116	38.8910	-77.2591	20	0.00	0.00	PL30	Bear Branch	Private	0.00	0.2
8/26/2016	Infiltratioi	0.0542	0.0880	108	CF	108	38.8856	-77.2670	20	0.00	0.00	PL30	Hunters Branch	Private	0.56	0.09
9/16/2016	Soil Amend	0.0200	0.1200	97	CF	97	38.8928	-77.2572	20	0.00	0.00	PL30	Bear Branch	Private	0.44	0.06
9/26/2016	Urban Biore	0.0170	0.0170	43	CF	0	38.8852	-77.2662	20	0.00	0.00	PL30	Hunters Branch	Private	0.28	0.04
9/28/2016	Urban Biore	0.0200	0.0200	25	CF	2	38.9058	-77.2542	20	0.00	0.00	PL22	Wolftrap Creek	Private	0.18	0.02
10/18/2016	Soils Amen	0.0700	0.0000	91	CF	91	38.9063	-77.2514	20	0.00	0.00	PL22	Wolftrap Creek	Private	0.58	0.08
10/18/2016	Infiltration	0.0600	0.3600	240	CF	240	38.9071	-77.2448	20	0.00	0.00	PL22	Wolftrap Creek	Private	1.24	0.19
10/18/2016	Infiltration	0.1100	0.4000	321	CF	321	38.9011	-77.2731	20	0.00	0.00	PL22	Piney Branch	Private	1.66	0.31
10/26/2016	Urban Biore	0.0400	0.0400	55	CF	55	38.8881	-77.2587	20	0.40	2.99	PL30	Bear Branch	Private	0.4	0.05
12/1/2016	Soil Amend	0.0200	0.0200	41	CF	41	38.8932	-77.2644	20	0.19	0.00	PL22	Piney Branch	Private	0.19	0.03
12/1/2016	Urban Biore	0.0400	0.0400	61	CF	61	38.8949	-77.2482	20	0.00	0.00	PL30	Bear Branch	Private	0.17	0.05
12/9/2016	Amended Si	0.0580	0.0580	125	CF	125	38.8932	-77.2663	20	0.56	1.69	PL30	Hunters Branch	Private	0.56	0.08
12/15/2016	Biorention	0.0260	0.0720	74	CF	74	38.9098	-77.2518	20	0.47	3.28	PL22	Wolftrap Creek	Private	0.47	0.06
12/19/2016	Infiltraton	0.0200	0.0300	55	CF	55	38.8974	-77.2629	20	0.00	0.19	PL22	Piney Branch	Private	0.00	0.04
1/5/2017	Urban Biore	0.0600	0.0600	109	CF	109	38.8948	-77.2617	20	0.64	1.14	PL22	Piney Branch	Private	0.64	0.08
1/24/2017	Urban Biore	0.0100	0.0100	20	CF	20	38.8992	-77.2542	20	0.14	1.46	PL22	Wolftrap Creek	Private	0.14	0.02
1/26/2017	Infiltration	0.0900	0.1600	187	CF	187	38.9130	-77.2641	20	0.97	3.54	PL22	Wolftrap Creek	Private	0.97	0.15
2/2/2017	Infiltration	0.1300	0.3000	299	CF	299	38.8901	-77.2515	20	1.43	2.97	PL30	Bear Branch	Private	1.43	0.22
2/3/2017	Urban Biore	0.0400	0.0400	55	CF	55	38.9084	-77.2535	20	0.40	2.60	PL22	Wolftrap Creek	Private	0.40	0.05
2/7/2017	Permeable	0.0400	0.0000	60	CF	60	38.8929	-77.2597	20	0.35	0.00	PL30	Bear Branch	Private	0.35	0.05
2/8/2017	Infiltration	0.0400	0.0400	63	CG	63	38.9055	-77.2732	20	0.33	1.62	PL22	Piney Branch	Private	0.33	0.05
3/3/2017	Amended Si	0.1010	0.1010	261	CF	261	38.9042	-77.2527	20	1.17	2.32	PL22	Wolftrap Creek	Private	1.17	0.16
3/3/2017	Infiltration	0.0296	0.0920	93	CF	93	38.8891	-77.2571	20	0.48	1.22	PL30	Bear Branch	Private	0.48	0.07
3/13/2017	Bioretentio	0.0300	0.0900	103	CF	103	38.8880	-77.2628	20	0.58	1.30	PL30	Hunters Branch	Private	0.58	0.08
3/13/2017	Urban Biore	0.0500	0.0500	65	CF	65	38.8974	-77.2656	20	0.47	1.48	PL22	Piney Branch	Private	0.47	0.06
3/21/2017	Bioretentio	0.0476	0.0996	85	CF	85	38.9038	-77.2532	20	0.00	0.00	PL22	Wolftrap Creek	Private	0.00	0.07
3/23/2017	Urban Biore	0.0800	0.0800	282	CF	282	38.9066	-77.2477	20	0.00	0.00	PL22	Wolftrap Creek	Private	0.00	0.09
3/27/2017	Infiltratoin	0.1700	0.4200	337	CF	337	38.9083	-77.2663	20	0.00	0.00	PL22	Piney Branch	Private	0.00	0.26
3/30/2017	Infiltration	0.0500	0.0700	98	CF	98	38.8919	-77.2557	20	0.51	1.26	PL30	Bear Branch	Private	0.51	0.08
4/10/2017	Soil Amend	0.1200	0.2900	293	CF	293	38.9076	-77.2620	20	1.32	3.00	PL22	Piney Branch	Private	1.32	0.18
4/24/2017	Disconnect	0.0400	0.1600	118	CF	118	38.8824	-77.2538	20	0.53	1.35	PL30	Bear Branch	Private	0.53	0.07
5/3/2017	Planter Box	0.0460	0.0460	63	CF	63	0.0000	0.0000	20	0.00	0.00	PL30	Bear Branch	Private	0.46	0.05
6/15/2017	Urban Biore	0.0450	0.2147	62	CF	62	38.8862	-77.2574	20	0.45	1.06	PL30	Bear Branch	Private	0.45	0.05
6/15/2017	Bioretentio	0.0300	0.0400	103	CF	103	38.8927	-77.2537	20	0.53	0.00	PL30	Bear Branch	Private	0.53	0.07
6/15/2017	Dry Well	0.0500	0.0500	169	CF	169	38.8953	-77.2495	20	0.77	0.99	PL30	Bear Branch	Private	0.77	0.11
6/15/2017	Infiltration	0.0700	0.2700	221	CF	221	38.9033	-77.2742	20	1.14	1.44	PL22	Piney Branch	Private	1.14	0.17
6/15/2017	Urban Biore	0.0200	0.0200	28	CF	28	38.8875	-77.2546	20	0.20	1.52	PL30	Bear Branch	Private	0.2	0.02
6/15/2017	Urban Biore	0.0600	0.0600	25	CF	25	38.9052	-77.2565	20	0.57	0.57	PL22	Wolftrap Creek	Private	0.57	0.07
6/26/2017	Dry Swale	0.0300	0.1400	81	CF	81	38.8870	-77.2674	20	0.50	1.68	PL30	Hunters Branch	Private	0.5	0.07
6/26/2017	Bioretentio	0.0500	0.1000	82	CF	82	38.9052	-77.2736	20	0.59	1.05	PL22	Piney Branch	Private	0.59	0.07
6/26/2017	Urban Biore	0.0400	0.0400	49	CF	49	38.8816	-77.2471	20	0.35	0.20	PL30	Bear Branch	Private	0.35	0.04
6/26/2017	Infiltration	0.0300	0.0400	107	CF	0	38.8957	-77.2638	20	0.49	0.49	PL22	Piney Branch	Private	0.49	0.07
6/26/2017	Infiltration	0.0400	0.0500	104	CF	104	38.8855	-77.2480	20	0.56	0.10	PL30	Bear Branch	Private	0.56	0.05
6/26/2017	Bioretentio	0.0200	0.0600	40	CF	40	38.9119	-77.2710	20	0.28	2.54	PL22	Piney Branch	Private	0.28	0.03
6/26/2017	Urban Biore	0.0500	0.0500	69	CF	69	38.9119	-77.2676	20	0.50	2.34	PL22	Piney Branch	Private	0.5	0.06

FY2017 Purchased Credit

More Stringent Single Family Residential Development -- Purchased Credit

The following table demonstrates pollutant reductions achieved as a result of more stringent regulation of single family residential development under one acre as required by the Town's Stormwater Management Ordinance. All reductions consist of purchased off-site nutrient credits.

Street	Unit #	Redevelopment Load (lbs)	New Impervious Load (lbs)	Total Reduction Needed (lbs)	Credit Purchase Date	Purchased TN (lbs)	Purchased TP (lbs)
Echols St SW	904	0.03	0.09	0.12	7/5/2016	0.89	0.12
Pleasant St SW	227	0.05	0.21	0.26	7/28/2016	3.48	0.26
Battle St SW	122	0.03	0.06	0.09	8/11/2016	0.52	0.07
Moore Ave SW	105	0.02	0.02	0.04	8/19/2016	0.30	0.04
Desale St SW	908	0.02	0.04	0.06	8/22/2016	0.45	0.06
Wilmar Pl NW	109	0.01	0.04	0.05	8/25/2016	0.37	0.05
George St SW	304	0.03	0.03	0.06	9/21/2016	0.37	0.05
Mashie Dr SE	504	0.04	0.10	0.14	9/28/2016	0.30	0.04
Kelley St SW	1212	0.01	0.00	0.01	10/6/2016	0.13	0.01
Plum St SW	403	0.03	0.01	0.04	10/21/2016	0.30	0.04
Courthouse Rd SW	369	0.04	0.06	0.10	11/23/2016	1.56	0.10
Creek Crossing Rd NE	435	0.07	0.16	0.23	1/12/2017	2.01	0.27
Druid Hill NE	438	0.03	0.14	0.17	1/27/2017	0.22	0.03
Ross St SW	1211	0.02	0.00	0.02	2/13/2017	0.15	0.02
Church St NE	248	0.04	0.00	0.04	6/7/2017	0.30	0.04
Park St SE	400	0.01	0.00	0.01	6/13/2017	0.07	0.01

FY2016 Structural Facilities

Long	Lat	6th order HUC	Watershed1	Watershed2	HOUSE#	STREET	OWNER	BMP_NAME	AGREEMENT	OPERATION	3rd PARTY INSPECTION_ DATE	IA TREATED (ACRES)	TOTAL_ACRES _TREATED	RUNOFF_ CAPTURED (CU FT)	TP_LOAD_RE QUIRED	TOTAL_TP LOAD_BMP _ACHIEVED	NITROGEN_LO AD_ACHIEVED_ BMP
-77.2629	38.91159	PL22	Difficult Run	Wolftrap Cree	425	Nelson Dr NE	Private	Dry Well	YES	9/23/2015	9/4/2015	0.05	0.05	91.0	0.07	0.07	0.47
-77.2569	38.89156	PL30	Accotink	Bear Branch	905	Plum St SE	Private	Infiltration Trench	YES	10/15/2015	6/10/2015	0.03	0.10	79.0	0.05	0.06	0.41
-77.2587	38.89407	PL30	Accotink	Bear Branch	800	Desale St SW	Private	Infiltration Trench	YES	2/1/2016	10/18/2015	0.03	0.14	103.0	0.06	0.08	0.53

FY2016 Purchased Credit

Street Address	Unit Number	Redevelopment Load	New Impervious Load lbs	Total Load Reductio	Credit Purchase Date	Nitrogen	Phosphorus
Patrick St SW	303	0.02	0.04	0.05	1-Jul-15	0.67	0.05
Olympian Cir SW	908	0.02	0.04	0.06	10-Jul-15	0.54	0.04
Desale St SW	922	0.02	0.04	0.06	15-Jul-15	0.8	0.06
Dogwood St SW	108			0.04	24-Jul-15	0.63	0.04
Oak St SW	207	0.02	0.05	0.07	14-Aug-15	1.2	0.09
Valley Dr SE	517	0.02	0.02	0.05	18-Aug-15	0.67	0.05
Albrecht Cir SW	314	0.04	0.02	0.05	29-Aug-15	0.27	0.02
Cottage St SW	1115	0.02	0.04	0.06	1-Sep-15	0.8	0.06
Johnson St SW	306	0.03	0.01	0.04	1-Sep-15	0.53	0.04
Moore Ave SW	104	0.02	0.02	0.04	9-Sep-15	0.53	0.04
Nelson Dr NE	405	0.03	0.1	0.11	9-Sep-15	1.47	0.11
Johnson St SW	307	0.03	0.05	0.08	22-Sep-15	1.07	0.08
Ware St SW	1203	0.02	0.03	0.05	25-Sep-15	0.67	0.05
Nelson Dr NE	517	0.04	0.02	0.06	2-Oct-15	0.8	0.06
Hillcrest Dr SW	705	0.03	0.13	0.16	5-Oct-15	2.14	0.16
Orrin St SE	505	0.02	0	0.02	6-Oct-15	0.27	0.02
Berry St SW	308	0.03	0.11	0.14	19-Oct-15	1.87	0.14
Battle St SW	213	0.02		0.02	11-Nov-15	0.4	0.03
Delano Dr SE	509	0.03	0.02	0.05	19-Nov-15	0.67	0.05
Glyndon St SE	301	0.03	0.07	0.11	30-Nov-15	1.72	0.11
Park St NE	331	0.03	0.09	0.12	9-Dec-15	1.6	0.12
Alma St SE	507			0.2	22-Dec-15	0.27	0.02
Cottage St SW	1404	0.02	0.05	0.06	4-Jan-16	0.8	0.06
Park St SE	609	0.04	0.06	0.09	5-Jan-16	1.2	0.09
Cottage St SW	926	0.03	0.05	0.09	8-Jan-16	1.2	0.09
Melody Lane SW	120	0.02	0	0.02	8-Jan-16	0.27	0.02
Battle St SW	119	0.02	0	0.02	20-Jan-16	0.4	0.03
Drake St SW	1202	0.02	0.05	0.07	5-Feb-16	0.94	0.07
Johnson St SW	401	0.02	0.06	0.08	5-Feb-16	1.07	0.08
Kibler Cir SW	501	0.02	0.03	0.06	5-Feb-16	0.8	0.06
Hillcrest Dr SW	504	0.03	0.04	0.07	8-Feb-16	1.1	0.07
Hickory Cir SW	119	0.02	0.01	0.03	21-Mar-16	0.33	0.03
Plum St SW	511	0.02	0.02	0.04	21-Mar-16	0.44	0.04
Orchard St NW	343	0.02	0.08	0.09	31-Mar-16	0.98	0.09
Yeonas Dr SW	415	0.02	0.05	0.07	14-Apr-16	0.76	0.07
Yeonas Dr SW	100	0.02	0.05	0.08	28-Apr-16	0.87	0.08
Center St S	710	0.02	0	0.02	20-May-16	1.47	0.11
Niblick Dr SE	607	0.04	0.06	0.11	25-May-16	1.72	0.11
Lakewood Dr SW	1105	0.02	0.03	0.05	1-Jun-16	0.37	0.05

FY2015 Structural Facilities

Long	Lat	6th order HUC	Watershed1	Watershed2	HOUSE#	STREET	OWNER	BMP_NAME	AGREEMENT	OPERATION	3rd PARTY INSPECTION_ DATE	IA TREATED (ACRES)	TOTAL_ACRES _TREATED	RUNOFF_CAPT URED (CU FT)	TP_LOAD_ REQUIRED	TOTAL_TP LOAD_BMP_ ACHIEVED	TN_LOAD_ ACHIEVED_ BMP
-77.2558	38.88658	PL30	Accotink	Bear Branch	1024	Hillcrest Dr	Private	Bioretention	Yes	6/15/2015	5/12/2015	0.03	0.09	80.0	0.06	0.07	0.53

FY2015 Purchased Credit

Street Address	Unit Number	Redevelopment Load lbs	New Impervious Load lbs	Total Load Reduction lbs	Credit Purchase Date	Nitrogen	Phosphorus
Windover Ave NW	428	0.01	0.17	0.18	9-Oct-14	2.42	0.18
Birch St SW	602	0.02	0.05	0.07	27-Oct-14	0.68	0.05
Timber Lane SW	904	0.02	0.04	0.06	3-Dec-14	0.54	0.04
Walker St SW	510	0.02	0.04	0.07	5-Dec-14	0.94	0.07
Druid Hill NE	512	0.04	0.07	0.11	8-Dec-14	2.42	0.18
Battle St SW	214	0.02	0.07	0.09	8-Dec-14	1.21	0.09
John Marshall Dr NE	302	0.03	0.02	0.04	18-Dec-14	0.54	0.04
Kingsley Rd SW	131	0.04	0.05	0.09	26-Jan-15	1.21	0.09
Orchard St NW	449			0.07	28-Apr-15	1.1	0.07
West St NW	331			0.07	28-Apr-15	1.1	0.07
Berry St SE	416	0.04	0.07	0.11	9-Jun-15	0.44	0.1
Cottage St SW	800	0.02	0.05	0.07	11-Jun-15	0.94	0.07
Westbriar Ct NE	1110	0.04	0.14	0.18	19-Jun-15	2.42	0.18
Mashie Dr SE	405	0.04	0.07	0.11	23-Jun-15	1.48	0.11
Desale St SW	922	0.02	0.04	0.06	15-Jul-15	0.8	0.06
Oak St SW	207	0.02	0.05	0.07	14-Aug-15	1.2	0.09

Appendix E

Calculations and Supporting Documents for BMPs Implemented and Planned for the Second Permit Cycle

Summary of BMPs Implemented and Planned for the Second Permit Cycle

	Cumulative Reductions from Worksheets					
	Through FY18	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**
Shared Credit Projects						
TN	1,399.55	1,585.67	1,585.67	1,585.67	1,585.67	1,862.58
TP	314.40	364.03	364.03	364.03	364.03	461.19
TSS	117,440.10	135,381.95	135,381.95	135,381.95	135,381.95	164,142.90
Redevelopment Post-2014						
TN	61.31	64.77	64.77	64.77	64.77	64.77
TP	9.85	10.29	10.29	10.29	10.29	10.29
TSS	4,760.49	4,979.36	4,979.36	4,979.36	4,979.36	4,979.36
Sweeping						
TN	-	-	-	-	-	-
TP	-	-	-	-	-	-
TSS	-	-	-	-	-	-
More Stringent Development						
TN	115.37	144.49	144.49	144.49	144.49	144.49
TP	12.82	16.88	16.88	16.88	16.88	16.88
TSS	-	-	-	-	-	-
Other BMPs						
TN	-	-	-	-	-	-
TP	-	-	-	-	-	-
TSS	-	-	-	-	-	-
Total Reductions						
TN	1,576.24	1,794.93	1,794.93	1,794.93	1,794.93	2,071.84
TP	337.06	391.20	391.20	391.20	391.20	488.35
TSS	122,200.59	140,361.31	140,361.31	140,361.31	140,361.31	169,122.26

Redevelopment

One redevelopment project, which included improvements to the Town Hall parking lot, was implemented in FY2019. Calculations are divided into reductions associated with impervious area reduction and reductions associated with bioretention and grass swales.

Additional redevelopment projects will be reported annually with the Town's MS4 annual report.

Vienna Town Hall - IA Reduction		
Information	**Input**	**As Developed**
Date Completed	2019	
Rainfall		
Site Area (SF)	3920.4	
Site Area (AC)		0.09
Watershed I %		
Pre-I Area (SF)	2613.6	
Pre-I Area (AC)		0.06
Pre-I Area (%)		
Pre C Value		
Pre-TP Load (VRRM)		**0.15**
Post-I Area (SF)	871.2	
Post-I Area (AC)		0.02
Post-I Area (%)		
Post C Value		
Post-TP Load (VRRM)		**0.08**
Increase/Decrease		(0.07)
Stormwater Controls		
BMP 1		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
BMP 2		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
BMP 3		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
Total BMP TP Removed		**0.00**
Net Change in TP		**(0.07)**

Creditable Reductions for TN and TSS Per Guidance Appendix V.E			
TP Decrease for Impervious Reduction			(0.07)
TP Decrease for BMPs (Proportion of BMP Applied to TMDL Reduction)			
	0.00		0.00
Total Creditable TP Decrease			**(0.07)**
Total Associated TN Load	6.9		0.55
TN Decrease from Impervious Reduction			(0.48)
TN Decrease for BMPs	Efficiency	Proportion IA Treated by BMP	
BMP 1	0	0	-
BMP 2	0	0	-
BMP 3	0	0	-
TN Decrease for BMPs (Decrease * Prop. Applied to TMDL)			0
Total Creditable TN Decrease (Imp. Reduction + BMPs)			**(0.48)**
Total Associated TSS Loa	469.2		37.54
TSS Decrease from Impervious Reduction			(32.84)
TSS Decrease for BMPs	Efficiency	Proportion IA Treated by BMP	
BMP 1	0	0	-
BMP 2	0	0	-
BMP 3	0	0	-
TSS Decrease for BMPs (Decrease * Prop. Applied to TMDL)			-
Total Creditable TSS Decrease (Imp. Reduction + BMPs)			**(32.84)**

BMP Efficiency Methodology Description:
This worksheet reflects impervious area reductions at the Town Hall, which were calculated separatedly from BMP reductions. Pre-TP Load and Post-TP Load taken from Virginia Runoff Reduction Method Redevelopment Worksheet revised 3/16/2015. Methodology confirmed by email from Kelsey Brooks at DEQ received 5/18/2016.

Vienna Town Hall - BMPs		
Information	**Input**	**As Developed**
Date Completed	2019	
Rainfall		
Site Area (SF)	20473.2	
Site Area (AC)		0.47
Watershed I %		
Pre-I Area (SF)	12632.4	
Pre-I Area (AC)		0.29
Pre-I Area (%)		
Pre C Value		
Pre-TP Load (VRRM)		**0.73**
Post-I Area (SF)	12632.4	
Post-I Area (AC)		0.29
Post-I Area (%)		
Post C Value		
Post-TP Load (VRRM)		**0.73**
Increase/Decrease		-
Stormwater Controls		
BMP 1	Bioretention #1	
Efficiency	0.55	
I Area (AC)	0.25	
TP Removed		0.35
BMP 2	Grass Channel	
Efficiency	0.23	
I Area (AC)	0.04	
TP Removed		0.02
BMP 3		
Efficiency	0	
I Area (AC)	0	
TP Removed		0.00
Total BMP TP Removed		**0.37**
Net Change in TP		**(0.37)**

Creditable Reductions for TN and TSS Per Guidance Appendix V.E			
TP Decrease for Impervious Reduction			-
TP Decrease for BMPs (Proportion of BMP Applied to TMDL Reduction)			
	1.00		(0.37)
Total Creditable TP Decrease			**(0.37)**
Total Associated TN Load	6.9		5.04
TN Decrease from Impervious Reduction			-
TN Decrease for BMPs	Efficiency	Proportion IA Treated by BMP	
BMP 1	0.64	0.862068966	(2.78)
BMP 2	0.28	0.137931034	(0.19)
BMP 3	0	0	-
TN Decrease for BMPs (Decrease * Prop. Applied to TMDL)			-2.973566897
Total Creditable TN Decrease (Imp. Reduction + BMPs)			**(2.97)**
Total Associated TSS Loa	469.2		342.52
TSS Decrease from Impervious Reduction			-
TSS Decrease for BMPs	Efficiency	Proportion IA Treated by BMP	
BMP 1	0.55	0.862068966	(162.40)
BMP 2	0.5	0.137931034	(23.62)
BMP 3	0	0	-
TSS Decrease for BMPs (Decrease * Prop. Applied to TMDL)			(186.02)
Total Creditable TSS Decrease (Imp. Reduction + BMPs)			**(186.02)**

BMP Efficiency Methodology Description:

Pre-TP Load and Post-TP Load taken from Virginia Runoff Reduction Method Redevelopment Worksheet revised 3/16/2015. Methodology confirmed by email from Kelsey Brooks at DEQ received 5/18/2016. TP and TN efficiencies from Virginia BMP Clearinghouse for Bioretention #1 and Grass Channel. TSS efficiency from Chesapeake Bay Program Established Efficiencies. Note that Grass Channel pre-treatment to Bioretention is not included in the calculation.

Shared Credit Projects

The following shared credit projects are planned, but have not yet been implemented or otherwise reported to DEQ. These are also included Fairfax County's draft Chesapeake Bay TMDL Action Plan.

Stormwater Retrofit Projects

Project Name	Long.	Lat.	Type of Project or BMP	Treated (Ac)	Impervious Treated (Ac)	Pervious Treated (Ac)	Estimated Cost ($)	Estimated Amount of Total			Pollutant Reduction Calculation Method	% Treated Area Outside Regulated MS4	Baseline Reduction Provided for			Total Credit Received (lb/yr)		
								TN	TP	TSS			TN	TP	TSS	TN	TP	TSS
Luther Jackson I.S. (AC9179/DP0138)	-77.23171	38.866973	Constructed Wetland	37.17	31.07	6.10	$300,000	137.09	19.45	17,551.42	CBP Retrofits Expert Panel, ST, 0.42 inches of runoff treated	0%	0.00	0.00	0.00	137.09	19.45	17,551.42
Lower Potomac Ball Park	-77.210744	38.698525	Constructed Wetland	24.98	10.42	14.56	$910,000	70.55	9.91	8,009.62	CBP Retrofits Expert Panel, ST, 0.62 inches of runoff treated	0%	0.00	0.00	0.00	70.55	9.91	8,009.62
Nottoway Park BMP Retrofits (Phase 2)	-77.274818	38.885919	Bioretention	5.21	0.93	4.28	$85,566	21.68	1.40	848.03	CBP Retrofits Expert Panel, RR, 0.4 inches of runoff treated		2.17	0.14	84.80	19.51	1.26	763.22
	-77.274906	38.884787	Bioretention	1.27	0.07	1.2	$65,857	8.98	0.48	248.71	CBP Retrofits Expert Panel, RR, 2.5 inches of runoff treated		0.90	0.05	24.87	8.08	0.43	223.84
	-77.273892	38.885178	Bioretention	0.34	0.33	0.01	$9,163	1.17	0.13	100.72	CBP Retrofits Expert Panel, RR, 0.2 inches of runoff treated		0.12	0.01	10.07	1.05	0.12	90.65
	-77.272714	38.885142	Bioretention	0.96	0.35	0.61	$4,390	6.42	0.51	345.29	CBP Retrofits Expert Panel, RR, 0.7 inches of runoff treated		0.64	0.05	34.53	5.78	0.46	310.76
	-77.274254	38.884998	Constructed Wetland	28.58	1.87	26.71	$233,315	96.08	7.02	4,403.56	CBP Retrofits Expert Panel, ST, 0.8 inches of runoff treated		9.61	0.70	440.36	86.47	6.32	3,963.21
	-77.274038	38.885405	Dry Swale	0.69	0.05	0.64	$107,185	4.93	0.27	145.24	CBP Retrofits Expert Panel, RR, 2.5 inches of runoff treated		0.49	0.03	14.52	4.44	0.24	130.72
	-77.274973	38.885071	Dry Swale	1.58	0.64	0.94	$23,623	2.65	0.22	151.93	CBP Retrofits Expert Panel, RR, 0.1 inches of runoff treated		0.27	0.02	15.19	2.39	0.20	136.74
	-77.273789	38.884902	Dry Swale	0.35	0.24	0.11	$18,707	1.29	0.13	94.01	CBP Retrofits Expert Panel, RR, 0.2 inches of runoff treated		0.13	0.01	9.40	1.16	0.11	84.61
	-77.272805	38.88491	Dry Swale	0.35	0.25	0.1	$14,221	1.02	0.10	76.38	CBP Retrofits Expert Panel, RR, 0.2 inches of runoff treated		0.10	0.01	7.64	0.92	0.09	68.74
																337.45	38.60	31,333.53
																311.46	**35.62**	**28,920.84**
																14.17	**1.62**	**1316.01**
																11.81	**1.35**	**1096.67**

Stream Restoration Projects

Project Name	Longitude	Latitude	Type of Project or BMP	Acres Treated (Ac)	Impervious Acres Treated	Pervious Acres Treated	Estimated Cost ($)	Restored Length (LF)	Estimated Amount of Total			Pollutant Reduction Calculation Method	% Treated Area Outside	Baseline Reduction Provided for			Total Credit Received (lb/yr)		
									TN	TP	TSS			TN	TP	TSS	TN	TP	TSS
Flatlick Ph III	-77.448606	38.878373	Urban Stream Restoration	3331.058	1584.913	1746.145	$3,500,000	867.30	324.48	43.58	15,023.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 83 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 15.3 ft	37.9% Note 1	350.35	41.40	29,840.57	1,140.58	186.99	48,894.44
								1,716.80	550.85	32.55	11,222.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 62 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 16.7 ft							
								792.20	442.42	101.33	34,933.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 193 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 16.8 ft							
								212.80	59.91	12.60	4,344.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 24 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 4.6 ft							
								204.90	113.27	38.33	13,213.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 73 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 4 ft							
Indian Run at Indian Run Court (CA82-0001)	-77.17744	38.822846	Urban Stream Restoration	470.39	226.50	243.89	$3,960,000	1,197.00	298.94	45.51	15,690.89	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 87 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 4.8 ft	45%	179.83	30.09	12,356.12	222.47	50.09	15,286.20
								83.00	12.05	1.96	675.13	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 4 tons/yr, Sediment Delivery Ratio: 0.181							
								60.00	16.76	5.12	1,766.56	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 10 tons/yr, Sediment Delivery Ratio: 0.181							
								100.00	61.47	23.98	8,268.08	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 46 tons/yr, Sediment Delivery Ratio: 0.181							
								56.00	13.08	3.60	1,241.66	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 7 tons/yr, Sediment Delivery Ratio: 0.181							
Indian Run at Columbia Road (CA9240)	-77.176211	38.821069	Urban Stream Restoration	516.35	202.71	313.64	$850,000	430.00	113.45	19.43	6,697.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 37 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 5.4 ft	0.80	6.04	0.56	426.94	107.41	18.88	6,270.06
Difficult Run at Brittenford Dr.	-77.297957	38.943905	Urban Stream Restoration			115.81	$4,994,000	636.00	504.13	189.25	65,245.07	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 360.47 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 5 ft		65.54	9.84	7,633.67	438.60	179.41	57,611.40
						1.51		234.00	253.39	113.30	39,061.61	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 215.81 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 5 ft		32.94	5.89	4,570.21	220.45	107.41	34,491.40
						8.92		565.00	595.47	253.09	87,254.67	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 482.07 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 5.6 ft		77.41	13.16	10,208.80	518.06	239.93	77,045.87
						2.62		482.00	236.55	103.21	35,582.79	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 196.59 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 5.6 ft		30.75	5.37	4,163.19	205.80	97.84	31,419.60
						3.39		196.00	1,014.35	460.19	158,657.36	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 876.65 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 5.6 ft		131.87	23.93	18,562.91	882.48	436.26	140,094.45
						5.05		463.00	304.19	129.32	44,585.73	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 246.33 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 5.6 ft		39.55	6.72	5,216.53	264.65	122.60	39,369.20
						7.57		493.67	272.63	109.24	37,662.48	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 208.08 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 5.6 ft		35.44	5.68	4,406.51	237.18	103.56	33,255.97
						39.9		27.77	12.74	4.28	1,475.15	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 8.15 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 2.6 ft		1.66	0.22	172.59	11.08	4.06	1,302.56
						32.24		288.91	293.68	117.83	40,621.83	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 224.43 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 3.4 ft		38.18	6.13	4,752.75	255.50	111.70	35,869.08
						44.05		550.40	291.80	102.46	35,323.96	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 195.16 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 2.9 ft		37.93	5.33	4,132.90	253.86	97.13	31,191.06
						6.3		638.00	251.80	98.99	34,129.36	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 188.56 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 1.3 ft		32.73	5.15	3,993.14	219.07	93.85	30,136.22
						6.94		41.00	16.54	5.51	1,900.50	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 10.5 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 1.4 ft		2.15	0.29	222.36	14.39	5.23	1,678.14
						8.46		249.00	93.64	30.13	10,387.59	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 57.39 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 1.6 ft		12.17	1.57	1,215.35	81.47	28.56	9,172.24
						64.02		621.00	331.26	114.00	39,302.34	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 217.14 tons/yr, Sediment Delivery Ratio: 0.181; Protocol 2 - Average Stream Bank Width: 3.8 ft		43.06	5.93	4,598.37	288.20	108.07	34,703.97
Pike Branch Tributary at Ridgeview Park	-77.097927	38.785388	Urban Stream Restoration	438.54	161.47	277.07	$5,530,000	2,843.00	1,564.81	415.28	51,415.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 791 tons/yr, Sediment Delivery Ratio: 0.065; Protocol 2 - Average Stream Bank Width: 9.29 ft	0.27	89.43	8.01	6,103.92	1,475.38	407.27	45,311.09
Old Courthouse Spring Branch - Phase I @ Gosnell Road (DF82-0005)	-77.247156	38.925587	Urban Stream Restoration	324.80	238.63	86.17	$4,423,000	3,400.00	558.60	257.25	88,690.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 490 tons/yr, Sediment Delivery Ratio: 0.181	0.73	56.00	26.72	8,700.00	502.60	230.53	79,990.00
Flag Run at Elgar St			Urban Stream Restoration				$4,480,000	3,245.00	261.13	120.26	41,460.00	CBP Urban Stream Restoration Expert Panel: Protocol 1 -BANCS Sediment Load Estimate: 229.06 tons/yr, Sediment Delivery Ratio: 0.181		26.10	12.30	4,145.00	235.03	107.96	37,315.00
																	7,574.26	2,737.31	790,407.95
																	6,991.04	**2,526.54**	**729,546.53**
																	318.12	**114.97**	**33197.13**
																	265.1	**95.81**	**27664.28**

Fairfax Credit (92.3%)
Herndon Credit (4.2%)
Vienna Credit (3.5%)

Street Sweeping

Reductions from street sweeping, if any, will be reported in the Town's MS4 annual reports.

Purchased Nutrient Credits

Purchased nutrient credits, if any, will be reported in the Town's MS4 annual reports.

More Stringent Development

FY2019 Structural Facilities

More Stringent Single Family Residential Development -- Structural Facilities

The following table demonstrates pollutant reductions achieved as a result of more stringent regulation of single family residential development under one acre as required by the Town's Stormwater Management Ordinance.
Reductions are from structcural facilities designed in accordance with the VRRM.

Long	Lat	6th Order HUC	Watershed	House #	Street	Owner	BMP Type	Operation Date	IA Treated (Acres)	Total Treated (Acres)	Runoff Captured (CU FT)	TN Reduction	TP Reduction
-77.26366818	38.9138348	PL22	Difficult Run	500	Druid Hill Rd NE	Private	Infiltration Trench,	7/10/2018	0.15	0.40	335.4	1.79	0.27
-77.28124605	38.9030647	PL22	Difficult Run	531	Highland St NW	Private	Urban Bioretentior	7/27/2018	0.05	0.05	65.9	0.47	0.06
-77.25623966	38.9017249	PL22	Difficult Run	500	Valley Dr SE	Private	Urban Bioretentior	7/27/2018	0.02	0.02	29.4	0.21	0.03
-77.26962579	38.9128109	PL22	Difficult Run	400	John Marshall Dr NE	Private	Infiltration Trench	8/1/2018	0.01	0.01	31.0	0.14	0.02
-77.27593259	38.9042169	PL22	Difficult Run	403	Colin Ln NE	Private	Infiltration Trench	8/2/2018	0.04	0.16	123.0	0.64	0.10
-77.27075866	38.9115774	PL22	Difficult Run	301	Roosevelt Ct NE	Private	Infiltration Trench	8/3/2018	0.03	0.03	107.0	0.49	0.07
-77.26751115	38.9021467	PL22	Difficult Run	118	Wilmar Pl NW	Private	Infiltration Trench	9/27/2018	0.05	0.15	129.6	0.67	0.10
-77.25109851	38.8868993	PL30	Accotink	1204	Kelley St SW	Private	Infiltration Trench	10/1/2018	0.06	0.06	183.1	0.84	0.12
-77.25860059	38.8923968	PL30	Accotink	818	Plum St SW	Private	Infiltration Trench	10/3/2018	0.03	0.10	85.0	0.44	0.07
-77.25717085	38.8920307	PL30	Accotink	901	Plum St SW	Private	Bioretention - Rain	10/3/2018	0.03	0.03	89.0	0.46	0.06
-77.2509175	38.8995629	PL22	Difficult Run	827	Ninovan Rd SE	Private	Infiltration Trench	10/4/2018	0.07	0.10	104.6	0.75	0.09
-77.25872423	38.8873921	PL30	Accotink	1003	Hillcrest Dr SW	Private	Urban Bioretentior	10/22/2018	0.04	0.04	53.0	0.38	0.05
-77.24631916	38.909492	PL22	Difficult Run	408	Kramer Dr SE	Private	Infiltration Trench	10/23/2018	0.07	0.31	235.1	1.21	0.18
-77.2438419	38.914769	PL22	Difficult Run	105	St Andrews Dr NE	Private	Infiltration Trench	11/1/2018	0.03	0.05	104.0	0.47	0.07
-77.24715961	38.8857153	PL30	Accotink	1401	Desale St SW	Private	Infiltration Trench	11/2/2018	0.04	0.17	130.7	0.67	0.10
-77.27404278	38.9046255	PL22	Difficult Run	605	John Marshall Dr NW	Private	Urban Bioretentior	11/9/2018	0.02	0.02	28.0	0.20	0.02
-77.27645408	38.9020665	PL22	Difficult Run	468	West St NW	Private	Infiltration Trench	11/9/2018	0.03	0.04	53.0	0.27	0.04
-77.25948925	38.8880588	PL30	Accotink	922	Hillcrest Dr SW	Private	Urban Bioretentior	11/13/2018	0.04	0.04	53.0	0.38	0.05
-77.2641107	38.8857998	PL30	Accotink	603	Kingsley Rd SW	Private	Infiltration Trench	11/15/2018	0.03	0.03	82.6	0.38	0.05
-77.25760042	38.8897812	PL30	Accotink	916	Timber Ln SW	Private	Infiltration Trench	11/16/2018	0.05	0.11	111.0	0.57	0.09
-77.26412572	38.911952	PL22	Difficult Run	411	Druid Hill Rd NE	Private	Infiltration Trench	12/6/2018	0.08	0.08	131.0	0.68	0.10
-77.25114416	38.8887161	PL30	Accotink	104	Yeonas Dr SE	Private	Infiltration Trench	12/7/2018	0.04	0.11	173.4	0.79	0.11
-77.26455289	38.9087634	PL22	Difficult Run	321	Sherwood Dr NE	Private	Bioretention - Rain	12/20/2018	0.05	0.13	177.0	0.92	0.13
-77.25618551	38.8803808	PL30	Accotink	1201	Ware St SW	Private	Bioretention - Rain	1/15/2019	0.07	0.13	117.0	0.84	0.10
-77.2545149	38.8968072	PL30	Accotink	807	Park St SE	Private	Urban Bioretentior	1/22/2019	0.04	0.04	59.0	0.42	0.05
-77.26880318	38.9034292	PL22	Difficult Run	107	Ayr Hill Ave NW	Private	Infiltration Trench	1/28/2019	0.03	0.28	157.4	0.81	0.12
-77.2513287	38.9052505	PL22	Difficult Run	504	Echols St SE	Private	Urban Bioretentior	1/28/2019	0.04	0.04	50.0	0.36	0.04
-77.26771579	38.8915002	PL30	Accotink	514	Meadow Ln SW	Private	Urban Bioretentior	2/4/2019	0.05	0.05	70.6	0.51	0.06
-77.27221972	38.8998196	PL22	Difficult Run	303	Windover Ave NW	Private	Infiltration Trench	2/13/2019	0.14	0.14	238.0	1.23	0.19
-77.28149145	38.9021515	PL22	Difficult Run	524	Highland St NW	Private	Infiltration Trench	3/8/2019	0.08	0.22	194.0	1.00	0.15
-77.25542064	38.8975106	PL22	Difficult Run	713	Park St SE	Private	Urban Bioretentior	3/14/2019	0.05	0.05	74.0	0.51	0.06
-77.2500133	38.8997609	PL22	Difficult Run	836	Ninovan Rd SE	Private	Infiltration Trench	3/14/2019	0.01	0.01	13.0	0.06	0.01
-77.25680449	38.8938188	PL30	Accotink	108	Elmar Dr SW	Private	Infiltration Trench	3/26/2019	0.03	0.12	91.4	0.47	0.07
-77.25503143	38.8891833	PL30	Accotink	121	Kingsley Rd SW	Private	Bioretention - Rain	3/29/2019	0.09	0.09	253.0	1.31	0.18
-77.26908425	38.8900941	PL30	Accotink	605	Meadow Ln SW	Private	Urban Bioretentior	4/11/2019	0.05	0.05	79.7	0.43	0.06
-77.25826361	38.8943344	PL30	Accotink	112	Moore Ave SW	Private	Infiltration Trench	4/19/2019	0.03	0.06	63.5	0.33	0.05
-77.25091723	38.908286	PL22	Difficult Run	303	Mashie Dr SE	Private	Infiltration Trench	4/19/2019	0.07	0.07	178.0	0.81	0.11
-77.26677755	38.8901254	PL30	Accotink	703	Ware St SW	Private	Infiltration Trench	4/23/2019	0.04	0.04	74.0	0.38	0.06
-77.27162966	38.889662	PL30	Accotink	505	Princess St SW	Private	Urban Bioretentior	4/25/2019	0.06	0.06	81.0	0.58	0.07
-77.26693319	38.9135148	PL22	Difficult Run	599	McKinley St NE	Private	Infiltration Trench	6/5/2019	0.04	0.04	71.0	0.37	0.06
-77.26587503	38.8884627	PL30	Accotink	603	Tapawingo Rd SW	Private	Infiltration Trench	6/6/2019	0.03	0.15	107.1	0.55	0.08
-77.26238043	38.9136818	PL22	Difficult Run	507	Druid Hill Rd NE	Private	Infiltration Trench	6/7/2019	0.04	0.17	119.3	0.62	0.09
											Total Reduction	**25.41**	**3.60**

FY2019 Purchased Credit

More Stringent Single Family Residential Development -- Purchased Credit

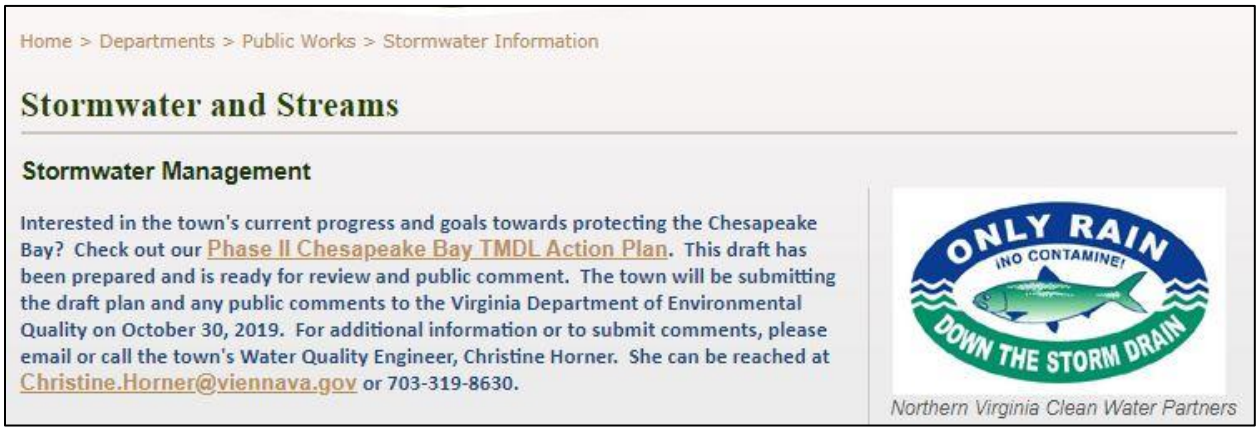
The following table demonstrates pollutant reductions achieved as a result of more stringent regulation of single family residential development under one acre as required by the Town's Stormwater Management Ordinance. All reductions consist of purchased off-site nutrient credits.

Street	Unit #	Credit Purchase Date	Purchased TN (lbs)	Purchased TP (lbs)
Elmar Dr SE	105	3/22/2018	0.3	0.04
Niblick Dr SE	405	3/22/2018	1.04	0.14
MacArthur Ave NE	401	6/21/2018	0.45	0.06
West St NW	468	2/2/2018	0.22	0.03
Branch Rd SE	204	2/5/2019	0.89	0.12
Elm St SW	221	6/6/2019	0.81	0.07
Total			**3.71**	**0.46**

Appendix F

Public Comments

No public comments were received during the public comment period. The following is the notice provided on Facebook and the information from the stormwater webpage.



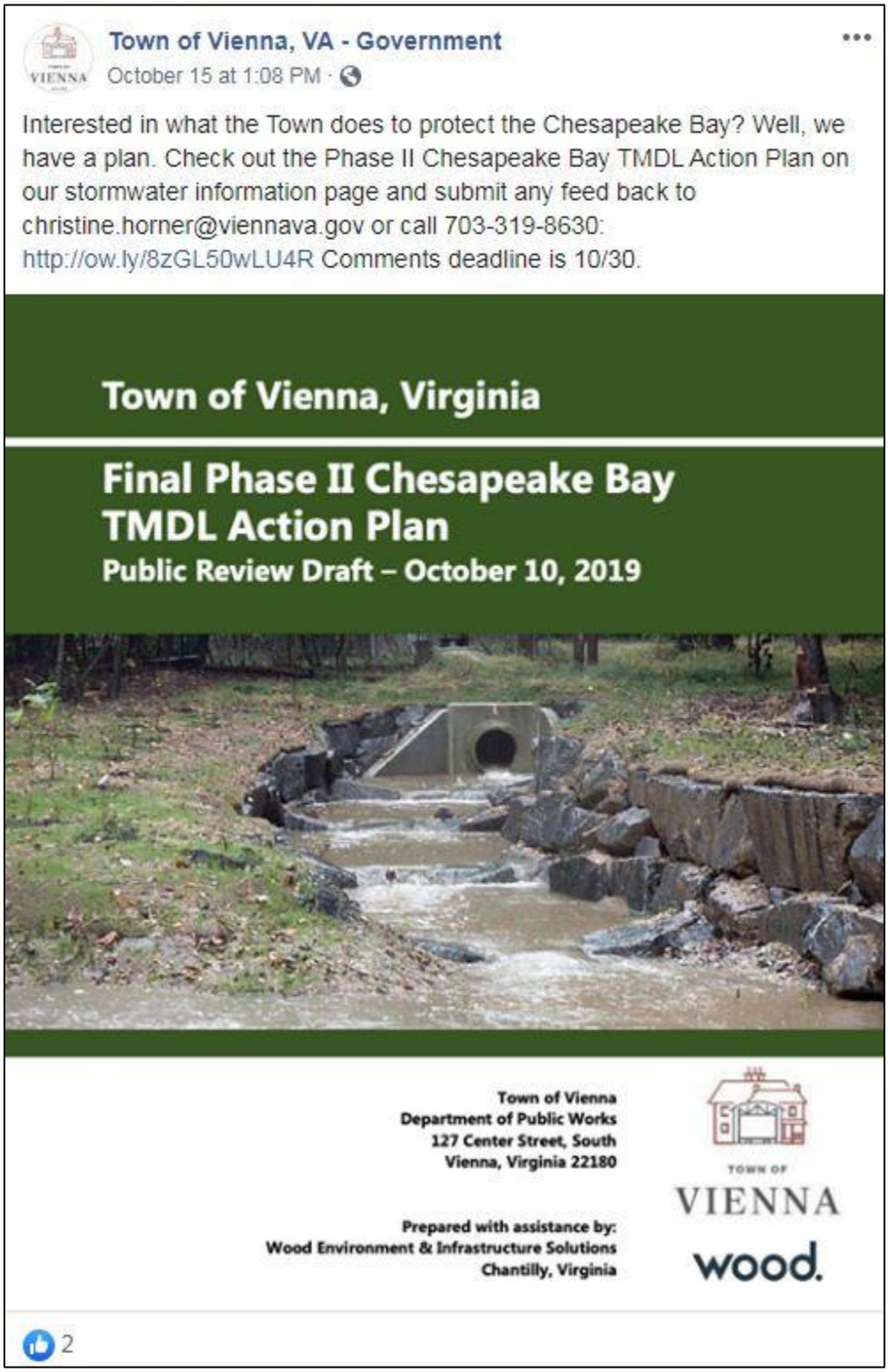
Home > Departments > Public Works > Stormwater Information

Stormwater and Streams

Stormwater Management

Interested in the town's current progress and goals towards protecting the Chesapeake Bay? Check out our Phase II Chesapeake Bay TMDL Action Plan. This draft has been prepared and is ready for review and public comment. The town will be submitting the draft plan and any public comments to the Virginia Department of Environmental Quality on October 30, 2019. For additional information or to submit comments, please email or call the town's Water Quality Engineer, Christine Horner. She can be reached at Christine.Horner@viennava.gov or 703-319-8630.

Northern Virginia Clean Water Partners


Town of Vienna, VA - Government
October 15 at 1:08 PM
Interested in what the Town does to protect the Chesapeake Bay? Well, we have a plan. Check out the Phase II Chesapeake Bay TMDL Action Plan on our stormwater information page and submit any feed back to christine.horner@viennava.gov or call 703-319-8630: http://ow.ly/8zGL50wLU4R Comments deadline is 10/30.
Town of Vienna, Virginia
Final Phase II Chesapeake Bay TMDL Action Plan
Public Review Draft – October 10, 2019
Town of Vienna
Department of Public Works
127 Center Street, South
Vienna, Virginia 22180
Prepared with assistance by:
Wood Environment & Infrastructure Solutions
Chantilly, Virginia
TOWN OF
VIENNA
wood.
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