MS4 PERMIT YEAR 2018 ANNUAL REPORT
JULY 1, 2017 TO JUNE 30, 2018

FOR

URBANIZED AREAS OF VIRGINIA
Virginia Department of Transportation Small Municipal Separate Storm Sewer System (MS4)

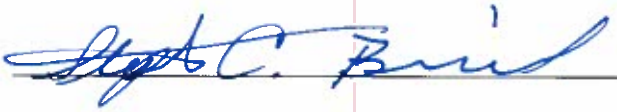
Registration # VA0092975
Coverage from July 1, 2017 to June 30, 2022

October 1, 2018

Virginia Department of Transportation
1401 East Broad Street
Richmond, Virginia 23219

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."

Signature 

Name Stephen C. Brich, P.E.

Title Commonwealth Transportation Commissioner

Date 9/26/2018

TABLE OF CONTENTS

APPENDICES

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
BMP	Best Management Practice
CGP	Construction General Permit
CRCIF	Construction Runoff Control Inspection Form
CWA	Clean Water Act
DCR	Virginia Department of Conservation and Recreation
DEQ	Virginia Department of Environmental Quality
DOD	Department of Defense
EPA	Environmental Protection Agency
ERAC	Environmental Research Advisory Committee
ESC	Erosion and Sediment Control
ESCCC	Erosion and Sediment Control Contractor Certification
FY	Fiscal Year
HUC	Hydrologic Unit Code
IDDE	Illicit Discharge Detection and Elimination
IP	Implementation Plan
L&D	Location & Design
LDA	Land-Disturbing Activity
LUP	Land Use Permit
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NMP	Nutrient Management Plan
O&M	Operations & Maintenance
ORI	Outfall Reconnaissance and Inventory
P2	Pollution Prevention
POD	Point of Discharge
PSA	Public Service Announcement
PY	Permit Year
RLD	Responsible Land Disturber
RLDA	Regulated Land Disturbance Activity
SWM	Stormwater Management
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TRB	Transportation Research Board
VAC	Virginia Administrative Code
VDOT	Virginia Department of Transportation
VESCLR	Virginia Erosion and Sediment Control Law and Regulations
VSMP	Virginia Stormwater Management Program
VPDES	Virginia Pollutant Discharge Elimination System
WIP	Watershed Implementation Plan
WLA	Wasteload Allocation

VDOT MS4 PROGRAM PLAN REVISION SUMMARY & ANNUAL REPORT BACKGROUND

The Virginia Department of Transportation (VDOT) is authorized to discharge stormwater from its municipal separate storm sewer system (MS4) by coverage under the Virginia Pollutant Discharge Elimination System (VPDES) *Individual Permit for the VDOT Municipal Separate Storm Sewer System (MS4)* (the Permit) within the urbanized areas of Virginia. As part of the original permit authorization (originally under a general permit), VDOT developed and implemented an MS4 Program Plan (the Plan) with best management practices (BMPs) to address the six minimum control measures (MCMs) and the special conditions for applicable total maximum daily loads (TMDLs) outlined in the Permit. The program plan has been refined and updated throughout the life of the program and permit(s).

In accordance with VDOT's coverage under the new 2017 Individual Permit, VDOT has updated its MS4 Program Plan to address new permit requirements (including the addition of MCM7 – Infrastructure Coordination) as well as enhance BMPs through the adaptive management process. This updated Program Plan was submitted to the Virginia Department of Environmental Quality (DEQ) on June 29, 2018. Implementation of these BMPs is consistent with the provisions of an iterative MS4 Program. Consistent with EPA interpretation, the DEQ has determined that implementation of the MS4 Program Plan, provided that the plan meets the requirements of the Permit, will reduce the discharge of pollutants to the Maximum Extent Practicable (MEP). No other revisions to the Plan have been made since the June submittal.

BMPs that are included in the Plan follow a prescribed alpha-numeric nomenclature that is based on the respective MCMs, the numbers of BMPs for each MCM, and the responsible Division. For example, BMP 3(B)(2) refers to the following:

BMP	3	MCM 3: Illicit Discharge Detection and Elimination
	(B)	The second BMP to address the requirements of MCM 3

Note: BMPs associated with the special conditions for approved TMDLs are assigned a BMP of SC1 (Chesapeake Bay TMDL) or SC2 (Local TMDLs), as appropriate.

The area regulated by the MS4 Permit (herein referred to as the regulated area) covers areas discharging to an MS4 that is owned and/or operated by VDOT and located within one of the urbanized areas of Virginia. Urbanized areas as identified by the 2010 Decennial Census are listed below.

- Blacksburg
- Bristol
- Charlottesville
- Fredericksburg
- Harrisonburg
- Kingsport
- Lynchburg
- Richmond
- Roanoke
- Virginia Beach
- Washington, DC
- Winchester
- Staunton-Waynesboro
- Williamsburg

ANNUAL REPORT ORGANIZATION

This Annual Report utilizes an outline similar to that of the Program Plan for organizational reporting purposes. The annual reporting elements referenced within the respective IP MCMs are identified in the MS4 Individual Permit Cross Reference table below and noted as *Annual Report requirements*. Each is addressed in the third column of each BMP as noted in the table and as appropriate. Notably, each Plan MCM component contains a BMP titled *Annual Report and Effectiveness*.

Permit Reference	Permit Description	MS4 Program Plan BMP
MCM1		
Section I.C.1.a.i-iv	Maintain a webpage	BMP 1(A)
Section I.C.1.b.i	Maintain a webpage	BMP 1(A)
Section I.C.1.b.ii	Program for illicit discharges, trash, debris and litter	BMP 1(A,B)
Section I.C.1.b.iii	Signage for pet waste, etc.	BMP 1(B)
Section I.C.1.c	Allowance for regional partnering	N/A
Section I.C.1.d	Include written procedures for Implementation	BMP 1(A-C)
Section I.C.1.e	Annual Report requirements	BMP 1 (C)*
MCM2		
Section I.C.2.a.i	Adopt-A Highway	BMP 2(A)
Section I.C.2.a.ii	Stenciling Program	BMP 2(B)
Section I.C.2.a.iii	Development of local TMDLs	BMP 2(C)
Section I.C.2.a.iv	Promote four stream cleanups	BMP 2(D)
Section I.C.2.b	Include written procedures	BMP 2(A-D)
Section I.C.2.c	Annual Report requirements	BMP 2(E) *
MCM3		
Section I.C.3.a	Prohibit non-stormwater discharges	BMP 3(B), 6(E)
Section I.C.3.b	Maintain IDDE manual	BMP 3(C)
Section I.C.3.c	Training program	BMP 3(C)
Section I.C.3.d	Spills	BMP 3(B)2
Section I.C.3.e	GIS System Map	BMP 3(A)
Section I.C.3.f.i	Program Plan requirements	MCM2 (footnote)
Section I.C.3.f.ii	Program Plan requirements	BMP 3(C)
Section I.C.3.f.iii	Program Plan requirements	MCM2 (footnote), 3(B)2
Section I.C.3.f.iv	Program Plan requirements	BMP 3(A)
Section I.C.3.g	Annual Report requirements	BMP 3(D)*
MCM4		
Section I.C.4.a	Standards and Specs	BMP 4(A)
Section I.C.4.b	Procedures for Compliance Inspections	BMP 4(B)
Section I.C.4.c	Track compliance	BMP 4(B)
Section I.C.4.d	Program Plan requirements	BMP 4(A), 4(B)
Section I.C.4.e	Annual Report requirements	BMP 4(B)*

Permit Reference	Permit Description	MS4 Program Plan BMP
MCM5		
Section I.C.5.a	Standards and Specs	BMP 5(A)
Section I.C.5.b	Standards and Specs	BMP 5(A)
Section I.C.5.c	Inspection BMPs	BMP 5(B)
Section I.C.5.d	Documentation of BMPs	BMP 5(B)
Section I.C.5.e	Definition of Maintenance	N/A
Section I.C.5.f	Database of BMPs	BMP 5(A)
Section I.C.5.g	Report installation for post construction	BMP 5(A)
Section I.C.5.h	Report installation not reported in 5.g	BMP 5(B)
Section I.C.5.i	Annual Report Requirements	BMP 5(C)*
MCM6		
Section I.C.6.a.i-v	Written maintenance procedures	BMP 6(A)1, 6(A)2
Section I.C.6.b	Dumping yard waste	BMP 6(A)
Section I.C.6.c	Management of leaked fluids	BMP 6(B)
Section I.C.6.d	Vehicle wash pad	BMP 6(A)
Section I.C.6.e	HPF SWPPPs	BMP 6(A)
Section I.C.6.f	Management of roadways and parking lots.	BMP 6(A)
Section I.C.6.g	Turf and Pesticide Management	BMP 6(A), 6(B)
Section I.C.6.h	Training	BMP 6(C)
Section I.C.6.i	Program Plan Requirements	N/A
Section I.C.6.j	Annual Report Requirements	BMP 6(E)*
MCM7		
Section I.C.7.a	Annual coordination meeting	BMP 7(A)
Section I.C.6.b	Mapping	BMP 7(A)
Section I.C.6.c	Chesapeake Bay TMDL Action Plans	BMP 7(A)
Section I.C.6.d	Other TMDL Action Plans	BMP 7(A)
Section I.C.6.e	Credit for TMDL Implementation	BMP 7(A)
Section I.C.6.f	IDDE	BMP 7(A)
Section I.C.6.g	Small MS4 Coordination	BMP 7(A)
Section I.C.6.h	Annual Report requirements	BMP 7(A)*
TMDL SC Requirements Affecting other MCMs		
Section I.E.3b	Septic Requirements	BMP 6(A)2
Section I.E.4.b	Excessive sediment loading	Annual S&S
Section I.E.4.c	Excessive sediment loading	BMP 3(C)
Section I.E.5.b	PCB reporting	BMP 3(C)

** NOTE – Each MCM in the Program Plan includes a BMP to address Annual Reporting requirements as highlighted in the Permit Cross Reference table above. While this BMP serves to summarize annual reporting requirements as specified in the IP, more detailed information is included within the "Annual Report Information" column of other BMPs as appropriate and referenced to provide supporting documentation.*

MCM#1:
PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS[1]

[1] VDOT's Permit does not define the term "public". However, VDOT is required to provide outreach to the public including its employees and contractors regarding proper disposal of pet waste and trash and identification and reporting of illicit discharges. VDOT is also required to implement the use of signage at its safety/rest areas to promote proper trash disposal. Therefore, the public, for the purposes of this permit condition, is considered to be VDOT's employees, hired contractors, and travelers using VDOT's fixed facilities such as rest areas. VDOT does not consider travelers along the roadway system as part of the "public" for the purpose of developing targeted public outreach strategies. However, VDOT has developed education material that may incidentally reach these travelers, which will have a positive benefit outside of VDOT's right-of-way.

BMP 1(A) – Maintain and Update Stormwater Webpage

Description and Measurable Goal:	Maintain and update a webpage dedicated to MS4 and stormwater, as it pertains to roads, highways, and permittee owned or operated facilities on the VDOT website (referred to herein as the "VDOT Stormwater Webpage").

Efforts and Expected Results in Meeting Measurable Goal	Implementation Schedule	Annual Report Information
Maintain and update VDOT Stormwater Webpage to communicate MS4 program elements.	Webpage was previously developed. VDOT will continue to update webpage with necessary information as discussed in other parts of this Program Plan.	VDOT has maintained its stormwater webpage with educational information including copies of the MS4 Program Plan and copies of the annual reports. VDOT will continue to maintain the website throughout the next permit year. (http://www.virginiadot.org//stormwater) This webpage includes the MS4 Program Plan, annual reports, other program documents, contact information, announcements, and other useful resources. .
Provide instructions for the public on how to report illicit discharges, improper disposal, or spills to the MS4 or other potential stormwater pollution concerns	Webpage was previously developed. VDOT will update webpage with necessary information as discussed in other parts of this Program Plan.	VDOT has maintained its link for the public to report illicit discharges, improper disposal.

BMP 1(B) – Signage at Rest Areas and Welcome Centers

Description and Measurable Goal:	Provide informational signage at rest areas identified in permit.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to install and maintain informational signage for disposal of pet waste, litter, debris and trash at rest areas and welcome centers within urbanized areas*.	Message signs were previously developed and reported to DEQ. Facility signage was installed during first six months of permit term. VDOT will continue to maintain signage.	Information signage for disposal of pet waste, litter, debris, and trash at rest areas and welcome centers within urbanized areas* were installed prior to January 1, 2018. The following is a summary of installations: a.) VDOT has installed 16 Litter control signs at 11 Rest Safety Areas/Welcome Centers, including: *1) Dale City;* *2) Fredericksburg;* *3) New Kent*;* *4) Manassas;* *5) Bristol;* *6) Abingdon;* *7) Troutville*; and* *8) Winchester.* *Those rest areas above denoted with an "*" are not physically located within a CUA; therefore, the municipal stormwater discharges from these rest areas are not regulated by the permit.* b.) Pet waste stations - The pet waste stations maintenance and restocking is part of VDOT's Monthly Quality Assessment Review/Safety Rest Area Inspection. This inspection reviews the Pet Stations for functionality and to assure they are being maintained and stocked. The pet waste stations are stocked with disposal bags as part of the normal maintenance operation. As part of the daily good housekeeping procedures for trash and debris removal, any pet waste discovered is picked up and placed in the appropriate trash receptacle. The number of pet stations remains the same as previously reported. No new Safety Rest Areas were established and no major rebuilds were completed this last year. During the last year deteriorated or damaged pet stations were replaced as needed

		Verification that signage is in place and functional will be conducted during year 5 of the permit and reported in the last annual report.

BMP 1(C) – Annual Reporting and Effectiveness Review

Description and Measurable Goal:	Provide annual reports and assess effectiveness of outreach efforts.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to post Program Plans and Annual Reports.	The Program Plan will be posted on the VDOT webpage within 30 days after submittal to DEQ. Within 30 days of any modification to the Program Plan, the latest version will be posted. Annual reports will be posted on the web page within 30 days of submittal to DEQ, or by November 1st of each year.	VDOT has continued to post its MS4 Program Plan and Annual Reports on its stormwater webpage located at: http://www.virginiadot.org//stormwater This past year represents the first year that VDOT operated under the IP, and an updated Program Plan to reflect this was prepared and submitted on June 29th, 2018, with a copy posted to the website within 30 days after this date. This Annual Report is also the first to be submitted under the IP period of coverage, and has been revised to reflect the updated IP and PP elements. This Annual Report will be posted within 30 days of final submittal to DEQ.
Assessment of the effectiveness of the outreach program	Annually	VDOT has evaluated each of the practices and we believe that the BMPs are appropriate and effective. Per Section I.C.1.e of the IP and in regards to Educational and Outreach Programs: 1.) Illicit discharge identification and public reporting and/or improper disposal of materials into the MS4 . VDOT has a dedicated IDDE email and point of contact for the public to report illicit discharges as advertised on its dedicated stormwater site. VDOT delivers training to appropriate staff, maintenance operators and contractors in how to identify and report illicit discharges. See MCM 3 in this Annual Report for more specific information. The estimated number of individuals reached through these activities is 599. This estimate was calculated by tallying the number staff trained during SWPPP and MS4 training sessions. 2.) Proper disposal of trash, debris, and litter. VDOT estimates that 12,000,000 people visited the

		11 Rest Areas/Welcome Centers where VDOT installed and had litter control signs posted and were exposed to that messaging. VDOT uses continuous vehicular monitoring equipment at some of its Rest Areas/Welcome Centers, and occasionally utilizes temporary counters at others, to provide a total count estimate of vehicular visits per day. The latest information for these areas is 2016, which was used by the Maintenance Division as the basis for approximating and estimating total visits by the public. 3.) Informational Signage for proper disposal of litter, debris and trash was installed at 11 Rest Areas/Welcome Centers as noted previously. VDOT estimates 12,000,000 people visited these sites. For pet waste, VDOT estimates that approximately 35,000,000 people visited all Rest Area and Welcome Centers during the past year where pet waste messaging and facilities were installed. VDOT uses continuous vehicular monitoring equipment at some of its Rest Areas/Welcome Centers, and occasionally utilizes temporary counters at others, to provide a total count estimate of vehicular visits per day. The latest information for these areas is 2016, which was used by the Maintenance Division as the basis for approximating and estimating total visits by the public. 4.) Other Educational and Outreach Programs a.) Watershed Signs – During PY18, one (1) watershed sign was installed. To date, VDOT has installed approximately 84 watershed signs and plans to continue to maintain them. b.) Through annual coordination meetings, VDOT met with eleven Phase 1 MS4s to discuss and coordinate illicit discharge reporting procedures, points of contact to assist with achievement of this MCM. Litter signage and the opportunity to use the LUP process to install additional signage was also discussed in some cases. The Public Education and Outreach component has been successful, however VDOT anticipates enhancing an aspect of this MCM in subsequent

		permit years. VDOT plans on communicating some of these program elements through a more user friendly centrally located web-based type platform. This may include, for example, the use of georeferenced events and interactive mapping to share with the public and staff activities that are underway or planned, and would allow for access to more information and the opportunity for more individuals, including the public, to increase their awareness of certain program elements (e.g. Pet Waste Stations at Rest Areas, etc).

MCM#2:
PUBLIC INVOLVEMENT/PARTICIPATION

BMP 2(A) – BMPs for Public Involvement Activities: Adopt a Highway

Description and Measurable Goal:	Promote, support, and maintain public involvement activities that encourage public awareness of stormwater pollution

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to promote the Adopt-A-Highway program.	Annually promote Adopt-A-Highway through use of VDOT's stormwater webpage*.	VDOT estimates at this time that as of June 30, 2018, the Adopt-a-Highway (AAH) program has: - A total of almost 8,584 miles of roadway adopted, including Interstate highways and interchanges, primary roads and secondary roads; - Currently 351 adoptee groups involving a total of 3,679 individuals; - Achieved 1,307 pickups during the most recent permit year. This is a new reporting requirement for VDOT. The above information is VDOT's current best estimate based on the available reported information and existing AAH Access database that is currently in use at this time. However, VDOT is aiming to collect this data in the future using a new geo-referenced GIS database, updated guidance, and associated interactive mapping tool, which VDOT believes will improve accuracy and reporting during subsequent permit years. In addition, VDOT anticipates this will facilitate future assessments including an analysis of whether public participation has increased or decreased in the previous 5 years, but that information is not available at this time. See BMP 2(E) for more information.

BMP 2(B) – BMPs for Public Involvement Activities: Storm Drain Stenciling

Description and Measurable Goal:	Promote, support, and maintain public involvement activities that encourage public awareness of stormwater pollution

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Promote and support a public storm drain stenciling program through the Land Use Permit Program to promote public awareness of stormwater pollution	Annually promote storm sewer stenciling through use of VDOT's stormwater webpage.	VDOT did not issue any storm drain stenciling permits in the urbanized areas during the PY. While no permits were issued, VDOT has determined this BMP is still appropriate to the program. During the updates to the stormwater webpage, VDOT included a link to the Land Use Permit program should individuals desire additional information. These include: - LUP-A: Land Use Permit Application for Storm Sewer Stenciling - LUP-SPG Permittee Agreement for Storm Sewer Stenciling

BMP 2(C) – Participation with Other Stakeholders

Description and Measurable Goal:	Track activities in which VDOT participated related to development of Local TMDLs.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to participate in the development of local TMDLs in watersheds located within the CUA and in which the VDOT MS4 discharges.	Annually participate on local TMDL technical advisory committees, when applicable.	VDOT participated on 5 TMDL technical advisory committee meetings during the reporting year. A list of these committee meetings is provided in Appendix A.
Continue to participate in the development of local TMDLs in watersheds located within the CUA and in which the VDOT MS4 discharges.	Annually participate in local TMDL and watershed implementation plans, when applicable.	VDOT participated in 10 local TMDL and watershed implementation plan meetings. A list of these meetings is provided in Appendix A.
Continue to participate in activities with goals to reduce stormwater pollutant loads; improving water quality, & supporting local water quality restoration.	Annually participate in activities, when applicable and appropriate.	VDOT participated in 39 activities. VDOT will participate in similar activities in subsequent permit years, when applicable and appropriate.

BMP 2(D) – BMPs for Public Involvement Activities: Stream Cleanups

Description and Measurable Goal:	Promote, support, and maintain public involvement activities that encourage public awareness of stormwater pollution

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Promote four local area stream clean-ups sponsored by VDOT or other organizations.	Annually promote Local Stream Clean-Ups through use of VDOT's stormwater webpage.	VDOT promoted several Stream Cleanup Events during the reporting year including: 1.) Friends of the Rappahannock Stream Clean-Up Event, 06/02/2018; This event was promoted in the Culpeper District on twitter and received a total of 602 twitter impressions. 2.) Suffolk River Clean-Up, 03/26/2018; This event was promoted in the Hampton Roads District on twitter and received a total of 962 twitter impressions. 3.) Suffolk River Clean-Up, 03/30/2018; This event was promoted in the Hampton Roads District on twitter and received a total of 1,213 twitter impressions. In addition to those listed above, VDOT Central Office coordinated with VDOT Districts through the Communications Division to promote several additional events. These events were either cancelled or not posted due to weather events and flooding that were beyond VDOT's control. These include: 4.) Montgomery County – Broomin & Bloomin, 04/28/2018; Salem District. 5.) Renew the New: Ramps "n" Roads, 03/24/2018; Salem District. 6.) Clean Valley Council: Clean Valley Day, 04/06/2018; Salem District. 7.) Clean Valley Council: Roanoke Riverfest, 06/29/18; Salem District. 8.) Blacks River Clean-Up Day in Harrisonburg, 04/13/2018; Staunton District.

BMP 2(E) – Annual Reporting and Effectiveness Review

Description and Measurable Goal:	Report efforts and results of Public Involvement/Participation BMPs in the Annual Report and Monitor Effectiveness

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Summarize Activities in BMP 2A-2D as required by permit.	Annually.	The information to demonstrate compliance with each control measure practice for this MCM are itemized in BMPs 2A-2D above.
Summarize other public involvement activities.	Annually.	The following is a summary of other activities (other than those listed under BMP 2A-2D) in which VDOT participated or was the sponsor with the goal of improving water quality; and supporting local water quality restoration include: 1.) VDOT participated in meetings, workshops, or conferences with environmental organizations during the reporting year: A list of these meetings is provided in Appendix A. 2.) VDOT participated in 13 coordination meetings with other Localities to discuss MS4 and infrastructure coordination during the reporting year. A list of these meetings is provided under Annual Report Information in MCM 7. 3.) Other Public Involvement Activities: - Detect something report it – 04/28/2018 - Part of the Solution – 12/19/2017 Activities listed in #1 and #2 above are anticipated to continue in subsequent permit years. Activities similar to those listed under #3 above may continue, however the specific events may vary and increase or decrease as the opportunities arise and as appropriate.
Evaluate and describe effectiveness of each strategy and practice.	Annually.	VDOT has evaluated each of the practices and we believe that the BMPs are appropriate and effective. Notable achievements and potential future activities leading to increased effectiveness are described below. VDOT made a number of advancements and achievements over past reporting year including: - VDOT has been active with public participation and involvement over the past year through a

		variety of venues including workshops, conferences, TMDL meetings, public events, MS4 coordination meetings, and others. - Stream cleanup events represent a new IP element for this PY. VDOT L&D Division coordinated effectively with its Communications Division at both the Central Office and Districts to communicate through existing channels on social media. - Adopt-a-Highway Program represents a new IP element for this PY. The agency has begun the process of updating the tracking and reporting database associated with this program during this PY. The following are program elements that VDOT anticipates undertaking over the permit cycle including in part or in whole during the upcoming PY: - Adopt-a-Highway (AAH) Program – The existing AAH database is an Access based system. VDOT is in the process of updating and converting this system to a new geo-referenced database, and anticipates that we should be able to better track and report information in the future. This includes conducting an analysis of whether there has been an increase or decrease in public participation over time.

MCM#3:
ILLICIT DISCHARGE DETECTION AND ELIMINATION[2]

[2] BMP 3(C) – Illicit Discharge Detection and Elimination Program Note: VDOT has developed an Illicit Discharge Detection and Elimination (IDDE) Program to address illicit discharges that originate within VDOT's property and right-of-way as well those that originate outside of VDOT's right-of-way, but enter VDOT's MS4. VDOT actively screens, investigates, and eliminates illicit discharges that originate within its right-of-way to the MEP. VDOT actively screens and investigates illicit discharges that enter its MS4 from an external source. However, VDOT does not have direct legal authority to prohibit or eliminate these sources, as VDOT has limited enforcement authority outside its right of way or property boundaries. As such, VDOT refers discovered illicit dischargers to the regulatory agencies and other MS4s as described in VDOT's IDDE manual.

In addition to any regulatory requirements, VDOT, DEQ, and VDEM have established guidelines regarding coordination of transportation-related pollution incidents. The guidelines were outlined in the April 5, 2005 version of the DEQ Pollution Response Manual and provide a framework whereby DEQ, VDEM, and VDOT work with first responders (e.g. local fire departments, state and local police) to ensure these incidents are handled appropriately and in an efficient manner. The spill response program may include a combination of response actions by the permittee, and/or another public or private entity. For purposes of this permit:

- Fluids from vehicular accidents are not handled through the IDDE program;
- For Section I.C.3.g.ii-"Significant spills" is defined as those that require formal regulatory reporting or pose an imminent threat to human health or the environment.

BMP 3(A) – Storm Sewer Map

Description and Measurable Goal:	Develop and maintain a storm sewer map that supports a successful Illicit Discharge Detection and Elimination (IDDE) Program. The map, at a minimum, will include: • The permittee's MS4 service area based on the CUA as determined by the U.S. Census Bureau's 2010 census; • Location of all outfalls owned or operated by the permittee discharging to state waters; • Known points of discharge to downstream, directly adjacent MS4s; • A unique identifier for each outfall and point of discharge; • Names of receiving waters to which the outfalls discharge; and • Stormwater management facilities owned or operated by the permittee.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Complete storm sewer system map.	Storm sewer map was previously developed. VDOT will update with necessary information as needed.	VDOT has developed and updated over time a storm sewer map which includes as described herein a compilation of VDOT's MS4 service area, outfalls discharging to state waters and known points of discharge with unique identifies, and stormwater management facilities owned or operated by VDOT. Outfalls and known points of discharge, each with unique identifies, are hosted in an ArcGIS Online mapping database. Over the past reporting period, VDOT generated a statewide Up-to-date Service Area GIS map based on its 2017 Linear Referencing System (LRS) road centerline layer release and 2010 CUA for areas inside and outside the Chesapeake Bay in accordance with written procedures that were developed for documentation purposes. Over the past two reporting periods, VDOT has worked to consolidate more than nine separate District Access databases that stored stormwater management facility BMP Inventory and Inspection information into one uniform centralized cloud based database solution on ArcGIS Online. These facilities are kept up to date in accordance with written procedures and by trained staff in each of the nine (9) VDOT Districts through the inventorying of BMPs as they come online through project delivery and inspection/acceptance procedures throughout the year. VDOT's storm sewer mapping GIS components are continually

		reviewed by VDOT and improved over time to maintain an updated mapping database.

BMP 3(B)1 - Prohibition of Non-Stormwater Discharge

Description and Measurable Goal:	Prohibit non-stormwater discharges into the storm sewer system through updated manuals of practice.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to develop and refine appropriate practices in the Maintenance Best Practices Manuals to prohibit non-stormwater discharges from VDOT operations.	This BMP is currently implemented and is continuously updated. An opportunity to update this Manual has been identified. A revision to this Manual is expected by 12/2019.	The VDOT Maintenance Best Practices Manual continues to be implemented, in order to ensure that discharges of pollutants from roads, streets and parking lot maintenance are being prevented or minimized. Maintenance Division anticipates providing some updates to existing sections and adding a new "Environmental" chapter during the next 18 month, with the estimated completion date December 31, 2019.

BMP 3(B)2 - Prohibition of Non-Stormwater Discharge

Description and Measurable Goal:	Prohibit non-stormwater discharges into the storm sewer system

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to develop and refine appropriate practices in the Waste Management & Pollution Prevention Guides to prohibit non-stormwater discharges from VDOT operations.	This aspect of the BMP is currently implemented and is an ongoing effort. The WM/PP Guide will be reviewed each year.	The January 2015 Waste Management and Pollution Prevention Guide remains the current version. The VDOT Environmental Division thoroughly reviewed the guide in February 2018. During the next reporting year, we anticipate issuing an updated guide to also incorporate new guide sections such as the proper use, maintenance, and storage of portable toilets.
Continue to support VDOT's role consistent with the guidelines detailed in the DEQ, VDOT, and VDEM Coordination of Transportation-Related Incidents, or subsequent agreement, in response to spills that may discharge into the MS4 via roadside ditches.	This aspect of the BMP is currently implemented and is an ongoing effort.	VDOT continues to support its role in multi-agency coordination of transportation related incidents.

BMP 3(B)3 – Prohibition of Non-Stormwater Discharge

Description and Measurable Goal:	Review of legal authorities to continue providing adequate legal authority.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Review and update legal authorities, if necessary, such as permits, orders, contracts, and inter-jurisdictional agreements.	24 months from permit effective date (6/30/2019).	VDOT will provide a summary of the review of legal authorities and associated changes with the annual report due October 2019. A review has not occurred during the most recent permit reporting year.

BMP 3(C) – Illicit Discharge Detection and Elimination Program

Description and Measurable Goal:	Utilize written procedures to detect, identify, and address unauthorized non-stormwater discharges, including illegal dumping, to VDOT's MS4.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Ensure that proper notifications are made if certain pollutants are identified as entering VDOT's system from non-VDOT sources.	Incorporate notification provisions into VDOT Program IDDE Manual no later than 01/2019.	Language has been incorporated into the draft versions of the updated IDDE Field Guide and Program Manual to address the newer notification requirements.
Maintain, modify and update the IDDE Program Manual and Field Guide, as warranted.	This aspect of the BMP is currently implemented and is an ongoing effort.	The IDDE Field Guide and Program Manual are updated as appropriate to address required modifications to the program and incorporate new program tools and references.
Develop, update, offer and deliver IDDE Training Materials for appropriate VDOT staff, maintenance operators, and contractors in how to identify and report illicit discharges.	This aspect of the BMP is currently implemented and is an ongoing effort. Appropriate VDOT maintenance operators and contractors will be offered IDDE training once every five years.	VDOT's Environmental Division is currently reviewing updates to the IDDE video and delivery methods for contractors. A total of 599 staff were trained in IDDE related information through VDOT Environmental Division's SWPPP and MS4 Training modules. A new IDDE reporting application has been developed for use on telephones and other mobile devices.
Continue to perform investigations associated with potential illicit discharges as appropriate using VDOT's IDDE Program Manual procedures. Effort is to be coordinated with Maintenance Division and other VDOT Divisions, as appropriate.	This aspect of the BMP is currently implemented and is an ongoing effort – follow-up investigations will be performed in accordance with the VDOT IDDE Program Manual.	During the reporting year, VDOT investigated 26 potential illicit discharges that were reported through VDOT's IDDE program. Based on follow-up investigation, 8 reported discharges were determined not to be illicit discharges and were closed out. VDOT's effort to resolve the 18 verified discharges are discussed below. VDOT or VDOT contractors were the responsible party in 7 verified illicit discharges. None of the incidents where VDOT was the responsible party were determined to be "significant spill" to the MS4. A summary is provided in the table below, with a narrative description for each of the verified illicit discharges below the table.

District	Investigated	Verified
Bristol	0	0
Culpeper	0	0
Fredericksburg	0	0
Hampton Roads	1	1
Lynchburg	1	0
Northern Virginia	12	7
Richmond	7	6
Salem	4	3
Staunton	1	1
TOTAL	**26**	**18**

Summary of IDDE's verified:

Hampton Roads District

1. An illegal dump site consisting of two 55-gallon and two 25-gallon abandoned drums containing used oil were reported on Slocum Road. After confirmation of discharge, report was referred to VDOT Accomac Residency for assistance with cleanup. VDEM and Eastern Shore Hazmat performed cleanup and spill containment. A follow up investigation indicated all recoverable oil had been removed, and the IDDE report was closed.

Northern Virginia (NOVA) District

2. Arlington County notified VDOT of a Notice of Violation-Warning issued to Arthur Construction Co. for washing equipment on residential Old Dominion Drive, allowing oily wash water to drain directly to a stormwater inlet during a VDOT paving/resurfacing job. The illicit discharge was into Arlington County's MS4, but a VDOT contractor was responsible for the discharge. The contractor was notified and immediately ceased washing and cleaned up the dirt/debris resulting from the washing. The IDDE report was closed.

3. A VDOT Operations Manager reported sheetflow containing sediment and

		concrete washout exiting the Titan America concrete company lot and entering the VDOT ditch system off Electronic Drive. NOVA Prep Coordinator and Fairfax County stormwater personnel were notified. Fairfax Co. performed a field investigation and confirmed the presence of an illicit discharge containing concrete wash water. The NOVA Prep Coordinator notified the DEQ compliance officer for the facility for further enforcement and the IDDE report was closed. 4. An asphalt contractor experienced an equipment failure along Ironhorse Drive in Prince William County, resulting in an asphalt tack emulsion discharge to a stormwater inlet. DEQ and Prince William County were notified, and contractor was required to clean up the illicit discharge. 5. Fairfax County reported to VDOT that plaster from a local contractor (JW Contracting, Inc.) was dumped down VDOT curb inlets in a residential area off Ceralene Drive. The drop inlets and pipes were part of VDOT's MS4, but the outfall belonged to Fairfax County. VDOT coordinated with the contractor and Fairfax County to clean all affected storm drains and outfalls. Photodocumentation showed that cleanup was successful and the IDDE report was closed. 6. VDOT was notified by Fairfax County of a sewage discharge resulting from a blocked private sanitary pipe from the Moon Inn in Alexandria off Hwy 1 and Fairhaven Ave. Hotel staff had pumped sewage from the basement of the business through a garden hose, into a VDOT-maintained curb inlet. Fairfax County Wastewater Management instructed staff to immediately cease the discharge and Stormwater Management notified DEQ Northern Regional Office and the Fairfax County Health Dept. The hotel was required to clean up the discharge and

		repair their sanitary sewer system. No further issues were experienced, the IDDE report was then closed. 7. During an asset data collection effort, a VDOT inspector noted a potential illicit discharge originating from a pipe discharging vehicle wash water off the Vulcan Materials Co. property in Fairfax County on Terminal Road. A plant representative indicated the facility had a VPDES permit allowing discharges to the MS4. The VDOT NOVA District MS4 Coordinator requested that DEQ perform an inspection to verify the discharge was allowed by the permit, and if VDOT had been notified. Follow-up inspection and the official report by DEQ revealed discharges were allowed, but the facility indicated they discharge to Fairfax County's MS4, rather than VDOT's. Additionally, one of the overflow pipes from a treatment tank that discharged to the VDOT MS4 had a pH below the permitted minimum limit. VDOT was notified of the allowable discharge, the facility installed a pH controller and acid pump in the tank to bring the discharges up to allowable pH limits, and the IDDE report was closed. 8. A local fire department determined that a large amount of white powder present on the roadway in the residential area surrounding the intersections of N. Chambliss Street and Kling Drive appeared to be dry concrete mix. It is believed to have been the result of an approximately 50 lb. bag that had fallen off a vehicle and spilled, partially entering a curb inlet. VDOT was unable to determine the source, but Maintenance crews cleaned up all recoverable materials. The IDDE report was closed.

		Richmond District 9. Bridge painting work along Greenwood Road over the Chickahominy River resulting in a paint release to the waterway. The Piedmont DEQ PREP Coordinator was notified immediately. The VDOT Richmond District MS4 Coordinator, DEQ and the painting subcontractor reacted quickly to contain the downstream end of the spill with turbidity curtains until an environmental cleanup contractor arrived to contain the upstream end and perform cleanup. Cleanup efforts were completed the following evening and the IDDE report was closed. 10. A VDOT paint marker truck experienced a high pressure paint line rupture during work at the intersection of Woods Edge & Ruffin Mill Roads in Chesterfield County, resulting in approximately 2-3 gallons of paint spilled. The crew quickly shut the pump off and diluted the paint spilled on the roadway with water to avoid the need for abrasive eradication. Due to the nearby storm sewer pipe being clogged with sediment, no paint wastewater reached an outfall. Following evaluation by the Regional Hazmat Manager and District MS4 Coordinator, crews pumped the residual wash water from the pipe into a sealed container, and wash water was sent to the appropriate disposal facility. The IDDE report was closed. 11. VDOT personnel observed a contractor cleaning a paint tray out into a stormwater inlet. Contractor was immediately told to cease the activity and educated on proper pollution prevention. Follow-up investigation revealed no impact to the storm sewer system and the IDDE report was closed. 12. Richmond District Area Construction Engineer notified the District MS4 Coordinator of asphalt tack emulsion

		runoff to ditches. Discharge was the result of thunderstorm occurrence prior to the tack completely drying on the roadway after paving. The majority of the project lie outside of the MS4 area. The MS4 Coordinator evaluated the site, and concluded that grass on the shoulders had filtered the majority of tack out of the ditch, and no evidence of tack emulsion reaching any outfall was found. All tack emulsion had dried prior to site visit and it was determined that the dried tack posed no environmental concern and any removal of affected soil/grass along the median would result in unnecessary environmental impact. The IDDE report was closed. 13. A sewage discharge from the City of Richmond's Right-of-Way onto the VDOT Right-of-Way was noted off Fairfield Ave near Kane Street and I-64. The issue was referred to the City of Richmond Department of Public Utilities and DEQ was notified. The issue was determined to be a blocked sanitary line resulting from fat, oil and grease (FOG) buildup. The backup was cleared the IDDE report was closed. 14. VDOT was notified of improper wash water disposal from Kingz Quarters car-washing facility along Staples Mill Road near Greencourt Rd. The facility was allowing disposal of wash water from car washing to drain into storm sewer inlets. DEQ was notified and a site visit conducted. After speaking with facility owner the problem was resolved and the IDDE report closed. **Salem District** 15. A citizen notified the District MS4 Coordinator of an apparent illicit discharge of concrete washout originating from I-81/Route 220 bridge repair work over Route 1836/Bell Haven Road. A site visit verified wash water had been

		discharged to the concrete ditch, but did not reach any drop inlets or outfalls due to sediment deposition damming the channel. The project's construction inspector was informed that the staining in the concrete ditch needed to be cleaned, and associated wash water pumped out and disposed of accordingly. Appropriate controls were put in place and photodocumentation showed that cleanup was properly executed and the IDDE report was closed. 16. During bridge repair work along Route 11 in Botetourt County near Vista Drive, a contractor hit an unmarked water line leading to a sediment discharge to Tinker Creek. The water discharged was potable, but the allowable discharge resulted in erosion of a bank and subsequent sediment discharge. The local water department was notified, and a repair made. Re-energizing of the pipe resulting in the repair failing. Water department personnel arrived back at the site and completed the repair. Water quality permitting agencies were notified, and the IDDE report was closed. 17. The Salem Hazmat manager notified IDDE staff that an illicit graywater connection was discovered to a VDOT ditch along Scott Avenue in New Castle. The Craic County Health Department (DPH) referred IDDE staff to the Allegheny District Office. DPH staff indicated local personnel would be sent to investigate. As the reported illicit discharge lies outside of the MS4 area, the IDDE report was then closed. **Staunton District** 18. A citizen reported to VDEM that a cleaning company was dumping their cleaning water directly from their van into a storm inlet off Waterford Loop in Augusta County. VDEM forwarded the report to Augusta County who notified VDOT. Augusta County conducted a site

		visit and determined that the storm drains were located on a private road, thus the jurisdiction of the County rather than VDOT. Augusta County issued warning letters and the IDDE report was closed.

BMP 3(D) – Annual Reporting and Effectiveness Review

Description and Measurable Goal:	Report efforts and results of IDDE Efforts in the Annual Report and Monitor Effectiveness

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Annual Report containing permit required elements.	Annually.	The information to demonstrate compliance with each control measure practice for this MCM are itemized in BMPs 3A-3C above.
Evaluate and describe effectiveness of each strategy and practice.	Annually.	VDOT has evaluated each of the practices and we believe that the BMPs are appropriate and effective. Notable achievements and potential future activities leading to increased effectiveness are described below. VDOT has made a number of advancements and achievements over the past reporting year including: - A new IDDE ArcGIS online application was developed to facilitate the entry, tracking and reporting of potential illicit discharges. - This MCM requires extensive collaboration among several VDOT Divisions as well as other partners and the public. VDOT believes this has been a positive and effective effort. - A new governance document IIM-258 was created to address certain responsibilities of partners on projects where VDOT is not the CGP permittee, such as Locally Administered Projects (LAP). Through this process, VDOT incorporated an outfall inventory form and procedures to enable LAP to inventory new outfalls coming into the system as projects are delivered. The following are program elements that VDOT anticipates undertaking over the permit cycle including in part or in whole during the upcoming PY:

		- The Maintenance Division anticipates providing some updates to existing sections of the Maintenance Best Practices Manual, as well as adding a new "Environmental" chapter during the next 18 months, with the estimated completion date December 31, 2019. - The Environmental Division anticipates updating the Waste Management and Pollution Prevention Guide, which was last released in January of 2015, over the upcoming permit year. New guide sections to be incorporated would include topics such as the proper use, maintenance, and storage of portable toilets. - The L&D Division anticipates continuing to coordinate with the Local Assistance Division (LAD), Land Use Permit (LUP), SSAR, and SSR to incorporate outfall inventorying procedures and processes into part of the project delivery process, including updating of respective program manuals, etc.

MCM#4:
CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

BMP 4(A) – Annual Standards and Specifications

Description and Measurable Goal:	VDOT will utilize its annual ESC and SWM Standards & Specifications to address discharges entering the MS4 from VDOT land-disturbing activities regulated by the VPDES and VSMP.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to obtain annual approval of VDOT's ESC and SWM Standards & Specifications from DEQ.	Update components of the Standards & Specifications as regulations and operations warrant.	The Annual Standards and Specifications for ESC and SWM covering FY19 were submitted during the reporting year and approved by DEQ on June 27, 2018. VDOT has made continual modifications, revisions, and updates to VDOT Road and Bridge Specifications, Special Provisions, and Standards and updated and/or created new Instructional and Informational Memorandums (IIMs) to address discharges entering the MS4 from land disturbing activities regulated by the VPDES and VSMP during the reporting year to maintain compliance with applicable regulatory and permit requirements. VDOT has continued coordination with DEQ during the reporting year prior to facilitate the approval process and to address comments and update various components.
Continue to require the ESC plan to be developed in accordance with VDOT's annual ESC Standards & Specifications prior to commencing land disturbing activities.	This aspect of the BMP is currently implemented and is an ongoing annual effort.	All ESC Plans for RLDAs were developed in accordance with VDOT's Annual Standards and Specifications for ESC.
Continue to require applicable RLDA to secure the necessary state permit authorizations from DEQ to discharge stormwater from construction sites.	This aspect of the BMP is currently implemented and is an ongoing annual effort.	VDOT has continued to require applicable RLDA to secure the necessary state permit authorizations from DEQ to discharge stormwater from construction sites. During the reporting year from July 1, 2017 to June 30, 2018, within the MS4 urbanized area there were: (1) Total number of regulated land-disturbing activities that required CGP coverage = 23; and (2) Total number of acres disturbed that required CGP coverage = 232.8 acres.

BMP 4(B) – Annual Reporting and Effectiveness Review

Description and Measurable Goal:	Inspect and enforce compliance with the VPDES Construction General Permit and attending regulations on applicable projects.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Perform ESC construction oversight inspections for compliance with Annual ESC and SWM Standards & Specifications.	This aspect of the BMP is currently implemented and is an ongoing effort – VDOT will inspect regulated land-disturbing activities in accordance with the Annual ESC and SWM Standards & Specifications.	The construction inspection schedule of every five business days and within 48 hours after any measurable storm event (or once every four business days) has been applied statewide regardless of whether or not Impaired, TMDL, or Exceptional water is present. In addition, ESC Construction oversight compliance inspections have been conducted by District NPDES Coordinators in accordance with VDOT's Annual Standards and Specifications for Erosion and Sediment Control.
Require compliance with SWPPP plans including the ESC Plan, and require changes/ modifications to SWPPPs, as necessary, to maintain compliance with applicable regulations. Also, utilize enforcement authority if necessary.	This aspect of the BMP is currently implemented and is an ongoing effort.	VDOT estimates a total of 221 ESC construction oversight inspections within the MS4 service area that were conducted and reported by District NPDES Coordinators. These inspections represent a portion of all inspections performed within the urbanized area and are conducted for oversight purposes in accordance with VDOT's ESC AS&S. Of these, approx. 1,548 erosion and sediment control and Construction Stormwater General Permit deficiencies were noted; and 1,277 corrective actions were executed. A summary of the most frequent types of deficiencies and associated corrective actions reported by NPDES Coordinators were: - Temporary Stabilization - Silt fence maintenance - Good housekeeping / material storage - Check Dam & Inlet Prot. Maintenance - Construction Entrance Replenishing VDOT utilized enforcement measures, including stop work orders in certain cases, to address insufficient ESC measures and to correct deficiencies.
Develop procedures to perform periodic compliance inspections.	This aspect of the BMP is currently implemented and is an ongoing effort.	VDOT developed procedures for periodic construction oversight inspections with the new IIM 256 policy. This IIM outlines roles and

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
	Periodic compliance inspections are conducted quarterly.	responsibilities for the L&D Division and District NPDES Coordinators. It includes a new color classification system for project status and level of engagement by Management, formalizing the process. The draft IIM was included in VDOT's Annual Standards and Specifications.
Develop a mechanism to track ESC construction oversight inspections and associated deficiencies.	No later than June 30, 2019, VDOT must develop a mechanism for tracking of compliance inspections, deficiencies noted, corrective actions and nature of corrective actions.	VDOT is in the process of developing a tracking mechanism that will allow for the reporting annually on the number of compliance inspections where deficiencies were discovered, the number of corrective actions completed and a summary of the type of corrective actions. VDOT developed and implemented an ArcGIS online tracking system that allows for periodic construction inspections to be completed by District NPDES Coordinators using mobile tablets over the reporting period. This system has been rolled out to Coordinators at this time, however VDOT is continuing to work on its functionality to improve issues and address the reliability and capabilities of the new system, including print report features.
Evaluate and describe effectiveness of each strategy and practice.	Annually.	VDOT has evaluated each of the practices and we believe that the BMPs are appropriate and effective. Notable achievements and potential future activities leading to increased effectiveness are described below. VDOT made a number of advancements and achievements over past reporting year: - Approval of VDOT's Annual Standards and Specifications for ESC. - NPDES Coordinators additional resourcing to support construction oversight inspections to facilitate compliance. - NPDES Coordinators moved to a higher reporting structure in the Districts. - Development of new ArcGIS online cloud based tracking system to be used in the field with mobile tablets by Inspectors during construction

Expected Efforts and Results in Meeting Measurable Goal	Implementation Schedule	Annual Report Information
		inspections. Training of staff in the use of forms and the tracking system. - Adaptations made to construction oversight inspection program and new policy to address issues raised during initial roll out. - Review and updating of VDOT's Road and Bridge Standards associated with EC and associated Approved Product List (APL), and Special Products Evaluation List (SPEL). - Advancing ESC aspects within the VDOT Drainage Manual edits, Chapter 10. The following are program elements that VDOT anticipates undertaking over the permit cycle including in part or in whole during the upcoming PY: - VDOT anticipates continuing to enhance the tracking mechanism for NPDES Construction Inspections to improve functionality and reliability. This would include addressing current issues such as generation of standard reports and full functionality. It would also include a greater ability to support annual reporting to document the number of compliance inspections where deficiencies were discovered, the number of corrective actions completed and a summary of the type of corrective actions.

MCM#5:
POST-CONSTRUCTION STORMWATER MANAGEMENT

BMP 5(A) – Standards and Specifications

Description and Measurable Goal:	VDOT will utilize its annual ESC and SWM Standards & Specifications to address post-construction stormwater runoff that enters the MS4 from regulated land-disturbing activities.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to obtain annual approval of VDOT's ESC and SWM Standards & Specifications.	Update components of the Standards & Specifications as regulations and operations warrant. Incorporate most current DEQ approved standards and specifications for post-construction SWM. Update the approval dates for standards and specifications within the program plan within 30 days of DEQ approval for any changes.	The Annual Standards and Specifications for ESC and SWM covering FY19 were submitted during the reporting year and approved by DEQ on June 27, 2018. VDOT has made continual modifications, revisions, and updates to VDOT Road and Bridge Specifications, Special Provisions, and Standards and updated and/or created new Instructional and Informational Memorandums (IIMs) to address discharges entering the MS4 from land disturbing activities regulated by the VPDES and VSMP during the reporting year to maintain compliance with applicable regulatory and permit requirements. VDOT has continued coordination with DEQ during the reporting year to facilitate the approval process and to address comments and update various components.
Continue to specify design criteria for post-construction stormwater runoff controls.	This aspect of the BMP is currently implemented and is an ongoing annual effort.	VDOT continues to require SWM Plans to incorporate design criteria for post-construction stormwater runoff controls in accordance with the VDOT Annual ESC and SWM Standards & Specifications.
Continue to develop stormwater management plans that are in accordance with VDOT's annual ESC and SWM Standards & Specifications	This aspect of the BMP is currently implemented and is an ongoing annual effort.	All SWM Plans for RLDAs were developed in accordance with VDOT's Annual Standards and Specifications for ESC and SWM.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to inventory post-construction SWM facilities and related hydraulic and design information.	VDOT has previously implemented this requirement and will continue to inventory new BMPs as they are brought online.	A summary table of new stormwater BMP facilities brought online during the PY18 period within the urbanized area is provided in Appendix B. Note that these BMPs do not include those water quality BMPs already reported to DEQ through VDOT's monthly CGP permit termination process, or those where the project and CGP permit was administered by others such as a Locality (e.g. Locally Administered Project) in accordance with Part I.C.5.f-h.
Land Disturbing Projects and SWM facilities follow appropriate requirements and are reported properly to DEQ.	VDOT will adjust queries and reports from current databases to develop such that BMPs can be reported in the next reporting period in a format compatible with the Virginia Construction Stormwater Database.	VDOT has submitted information for SWM water quality BMP facilities implemented in accordance with the Standards and Specifications for the control of post construction stormwater runoff from areas of new development and development on prior developed lands to the DEQ through VDOT's regular monthly permit termination process, in accordance with Part I.C.5.g.

BMP 5(B) – Long-Term Care and Maintenance of SWM Facilities

Description and Measurable Goal:	Provide adequate long-term operation and maintenance of its SWM facilities in accordance with the VDOT BMP Inspection and Maintenance Manuals.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to annually inspect VDOT post-construction SWM facilities in accordance with VDOT BMP Inspection Manual, and record inspections in SWM facility database.	This aspect of the BMP is currently implemented and is an ongoing effort.	The stormwater facility BMPs within the urbanized area were inspected during the reporting year in accordance with VDOT's BMP Inspection Manual. Record inspections are located in VDOT's SWM facility Inspection database. A summary of the total number of BMPs inspected and the number of inspections performed by each of the nine (9) Districts is provided in Appendix C.
Continue maintenance on its post-construction SWM facilities in accordance with the VDOT BMP Maintenance Manual	This aspect of the BMP is currently implemented and is an ongoing effort.	VDOT's permanent SWM BMPs/facilities continue to be maintained in accordance with the VDOT BMP Maintenance Manual. VDOT's current BMP database cannot produce a list of maintenance activities that were necessary to address structural deficiencies or other significant maintenance tasks at this time without some very time-consuming, BMP-by-BMP research into the annual inspection files to see what structural/significant maintenance was needed. VDOT is in the process of updating this system and plans to incorporate this capability in the future.
Report BMP Data in a format acceptable to DEQ	VDOT will modify database reports and queries as needed to adapt to reporting format required by DEQ for the next reporting period.	VDOT has reported to DEQ through its monthly CGP project termination process stormwater quality BMP facilities that were brought online during the reporting period. In addition, a summary table of other stormwater BMP facilities brought online during the PY18 reporting period within the urbanized area, not reported through this monthly permit termination process, is provided in Appendix B, in accordance with Part I.C.5.f-h .

BMP 5(C) – Annual Reporting and Effectiveness Review

Description and Measurable Goal:	Report efforts and results of Post-Construction Stormwater BMPs in the Annual Report and Monitor Effectiveness

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Summarize Activities in BMP 5A-5B as required by permit.	Annually.	The information to demonstrate compliance with each control measure practice for this MCM are itemized in BMPs 5A-5B above.
Evaluate and describe effectiveness of each strategy and practice.	Annually.	VDOT has evaluated each of the practices and we believe that the BMPs are appropriate and effective. Notable achievements and potential future activities leading to increased effectiveness are described below. VDOT has made a number of advancements and achievements over past reporting year: - Approval of VDOT's Annual Standards and Specifications for SWM. - Consolidation of nine (9) separate District stormwater BMP databases (Access) into one unified cloud based database. - Development of new inventory and inspection electronic forms to be used on mobile tablets in the field; - Training for District staff on how to inventory new BMPs when they come online and how to log inspections; - Research on Inspections for each individual stormwater BMP type, in order to update both the inspection form and the Maintenance Division's BMP Inspection and Maintenance Manual, which is currently underway. - VTRC research and publications, including porous asphalt installation, Lorton Road ongoing monitoring of post-construction BMPs, continuing research into off-site trading and use of nutrient credits - Updates and edits to VDM Chapter 11 - Partnering meeting with DEQ periodically throughout the reporting year The following are program elements that VDOT anticipates undertaking over the permit cycle

		including in part or in whole during the upcoming PY: - Improve reporting capabilities, both for annual reporting, as well as for District staff to facilitate Inspectors with their work. This includes 1.) Ability to report structural deficiencies for annual reporting 2.) Ability to generate reports useful to Districts such as pulling requests for remaining BMPs that need to be inspected for the PY. 3.) Ability to link appropriate maintenance/repairs to identified inspection needs with semi-automated reports from the BMP Inspection database. This capability will leverage the research work completed this reporting year. 4.) Incorporation of workflow processes to send work orders to maintenance crews and feedback confirmation on when that work has been executed.

MCM#6:
POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR VDOT OPERATIONS

BMP 6(A)1 – Procedures for Operation and Maintenance Activities

Description and Measurable Goal:	Develop and refine written procedures designed to minimize or prevent pollutant discharge from support facilities, daily operations, equipment maintenance, and the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers.
Lead Division:	Maintenance

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to develop and refine applicable sections of the Maintenance Best Practices Manual for MS4 regulated activities	This aspect of the BMP is currently implemented and is an ongoing effort. The manual currently under review and improvements will be completed within 24 months of the effective date of the permit (6/30/2019).	The VDOT Maintenance Best Practices Manual continues to be implemented, in order to ensure that discharges of pollutants from roads, streets and parking lot maintenance are being prevented or minimized. Maintenance Division will be providing some updates to existing sections and adding a new "Environmental" chapter during the next 18 months, with the expected completion date December 31, 2019.
Prohibit the dumping of yard waste and grass clippings into the MS4.	This aspect of the BMP is currently implemented through the Road and Bridge Specifications (2016).	VDOT's Roadside Development Stds & Specs (Division VI of the VDOT Road and Bridge Specifications, 2016) continue to be implemented and include management specifications for handling of yard waste and grass clippings. VDOT's Maintenance Best Practices Manual, Waste Management and Pollution Prevention Guide do not currently include standards and specifications for handling yard waste and grass clippings. It does address tree trimming and brush disposal. However, Maintenance Division is embarking on an update of the Maintenance Best Practices Manual, to be completed by December 31, 2019. This update will include a new "Environmental" chapter and will include guidance for handling yard waste and grass clippings.

BMP 6(A)2 – Procedures for Operation and Maintenance Activities

Description and Measurable Goal:	Develop and refine, as appropriate, written procedures designed to minimize or prevent pollutant discharge from high-priority support facilities, daily operations, equipment maintenance, and the application, storage, and disposal of pesticides, herbicides, and fertilizers.
Lead Division:	Environmental

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to develop and refine applicable sections of Waste Management and Pollution Prevention Guide that apply to MS4 regulated activities	This aspect of the BMP is currently implemented and is an ongoing effort. The WM/PP Guide will be reviewed each year.	The January 2015 Waste Management and Pollution Prevention Guide remains the current version. The VDOT Environmental Division thoroughly reviewed the guide in February 2018. During the next reporting year, we anticipate issuing an updated guide to also incorporate new guide sections such as the proper use, maintenance, and storage of portable toilets.
Prohibit vehicle washing except on approved wash pads.	This aspect of the BMP is currently implemented and is an ongoing effort.	VDOT's Waste Management and Pollution Prevention Guide, Guide 3.23 addresses vehicle and equipment washing at VDOT facilities. The Guide establishes approved areas for washing, as well as detailed un-approved washing activities. Compliance with the washing requirements is periodically evaluated through environmental compliance assessments.
Identify High Priority Facilities as defined by the Individual Permit	The effort has been completed. The list will be annually evaluated to determine if additional facilities are determined to be high priority.	VDOT maintains a list of high-priority facilities. Currently, there are 71 facilities that are identified as high-priority facilities, and require SWPPP development and implementation. These SWPPPs were developed during the previous reporting periods (Sept 2016 and February 2017) and are up to date. There are no new high priority facilities owned or operated by VDOT that were identified or for which SWPPPs were developed during the current reporting period.
Continue to develop and refine SWPPPs for High Priority Facilities	This aspect of the BMP is currently implemented and is an ongoing effort. Each SWPPP is reviewed annually.	VDOT has developed SWPPPs for all high-priority facilities in the VDOT MS4 regulated area. VDOT provided SWPPP training to District personnel during the reporting year. VDOT will continue to implement the SWPPPs, and will revise and modify SWPPPP as identified appropriate.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to perform annual MS4 compliance assessments at VDOT High Priority Facilities within the MS4 Areas	This aspect of the BMP is currently implemented and is an ongoing effort.	VDOT performed MS4 compliance assessment for all high-priority facilities within the MS4 areas. One aspect of the assessments is to evaluate compliance with Department procedures to 1) minimize and prevent the discharge of potential pollutants to the MS4, 2) evaluate the proper management and disposal of wastes, 3) minimize the discharge of pollutants from bulk storage areas associated with facility activities.
Develop a list of facilities with onsite septic in local watersheds with a bacteria TMDL that allocates a WLA to VDOT's MS4.	Maintain list and guidance and communicate requirements to District Maintenance and/or Facilities to inspect and/or pump out septic tanks once every 5 years.	There are three VDOT Facilities with on-site septic systems in local water sheds with a bacteria TMDL. Chester Area Headquarters' septic tank was pumped in May 2018. Merrifield Area Headquarters' septic tank was pumped in 2017. Winchester Residency Complex's septic tank was not pumped during the current reporting year.

BMP 6(B) – Turf and Landscape Management

Description and Measurable Goal:	Develop and refine turf and landscape nutrient management plans (NMPs) that have been developed by a certified turf and landscape nutrient management planner to minimize or prevent pollutant discharge from turf and landscape management
Lead Division:	Maintenance

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Identify all applicable lands where nutrients are applied to a contiguous area of more than one acre.	This effort has been completed. The list will be evaluated annually to determine if updates are required.	There are no longer any VDOT facilities (and no new lands exceeding one acre) where nutrients are applied; therefore, no new individual Nutrient Management Plans are needed.
Continue to develop and refine NMPs on all lands where nutrients are applied to a contiguous area of more than one acre.	This aspect of the BMP is currently implemented and is an ongoing effort.	VDOT has two existing DCR-approved Nutrient Management Plans for other non-facility locations: (1) one plan applicable to new construction; (2) the other plan applicable to roadside management.
Continue to develop and refine Nutrient Management Standards & Specifications as approved by DCR for roadside development during construction and maintenance activities.	This aspect of the BMP is currently implemented with approved district specific NMPs and is an ongoing effort.	VDOT personnel continue to implement provisions of two DCR-approved Nutrient Management Plans: (1) "Nutrient Management Plan for Turf Establishment on Construction Projects"; and (2) "Nutrient Management Plan for Turf Establishment on Roadside Projects"
Continue to specify criteria for managing yard waste and grass clippings in VDOT's Roadside Development Standards and Specifications.	This aspect of the BMP is currently implemented through the Road and Bridge Specifications (2016).	VDOT's Roadside Development Stds & Specs (Division VI of the VDOT Road and Bridge Specifications, 2016) continue to be implemented and include management specifications for handling of yard waste and grass clippings.

BMP 6(C)1 – Training of VDOT Forces

Description and Measurable Goal:	Continue to implement VDOT's efforts to prevent and reduce stormwater pollution from VDOT-related activities through development, deployment, and delivery of training courses and events.
Lead Division:	Environmental (for division specific elements of VDOT's Employee Training Program for MS4 and Stormwater)

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Deliver a training plan to include, but not limited to, training on the IDDE program, Good Housekeeping/Pollution Prevention, SWPPP and appropriate spill prevention and responses.	This aspect of the BMP is currently implemented and is an ongoing effort.	The following is a summary of training provided by the Environmental Division for the reporting year. There were 1213 attendees during the reporting year, over a **95% increase** from the previous reporting year. Training were conducted at multiple locations and via various mechanisms, including multi-media modules via electronic bulletin boards and VDOT University SCORM individual modules, in—person classroom training, and webinar-style computer-to-computer trainings; these training sessions were held throughout PY18 from July 1, 2017 to June 30, 2018 and in some cases were delivered through an on-demand type of schedule. Spill Prevention Control and Countermeasure (SPCC) training is delivered at facilities that operate under an SPCC plan. It includes aspects of proper and improper disposal of materials in addition to Pollution Prevention and Good Housekeeping (PPGH). SPCC trainings were conducted between 07/10/2017 to 06/25/2018. Storm Water Pollution Prevention Plan (SWPPP) training is delivered at MS4 high priority facilities that have site specific SWPPP plans, and includes elements of VDOT's Illicit Discharge Detection and Elimination (IDDE) Program and PPGH. The Facility SWPPP training module released in the previous reporting year and distributed via the VDOT Virtual Campus and posted on Electronic Bulletin Board (EBB) found at every facility, resulted in a significant increase in the number trained in both IDDE and GHPP in and around facilities owned by VDOT. Facility SWPPP Trainings took place from 07/14/2017 to 06/26/2018.

		The objective of MS4 training is two-fold: 1) PPGH during road and street maintenance operations within the right-of-way and at VDOT facilities, and 2) IDDE Training. MS4 Trainings took place from 02/23/2017 to 04/17/2018. DOT Hazardous Materials Awareness training is delivered to VDOT staff that are considered hazmat employees and includes parts of PPGH. DOT HazMat Trainings took place from 07/07/2017 to 06/26/2018. A *VDOT Salt Infrastructure: Good Housekeeping and Pollution Prevention* module and a *Facility Leak and Spill Prevention* module were developed and released through the VDOT Virtual Campus and posted on the EBBs. Salt Infrastructure Training took place from 08/11/2017 to 04/12/2018. Additional training modules will be released in the 2018-2019 permit year, and may include: • Updated IDDE module • MS4 for Contractors VDOT also had a booth at the Statewide Roadeo in August 2017, and provided general awareness of pollution prevention/good housekeeping practices, and illicit discharges. Over 700 people attended this event.

BMP 6(C)2 – Training of VDOT Forces

Description and Measurable Goal:	Continue to develop and refine VDOT's efforts to prevent and reduce stormwater pollution from VDOT-related activities.
Lead Division:	Maintenance (for division specific elements of VDOT's Employee Training Program for MS4 and Stormwater)

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Ensure that VDOT employees and contractors who apply pesticides and herbicides are properly trained or certified in accordance with the Virginia Pesticide Control Act.	This aspect of the BMP is currently implemented and is an ongoing effort.	VDOT has a partnership with Virginia Cooperative Extension (VCE) where by VCE agents provided 20 hours of Registered Technician (RT) classroom training. Topics included: Pesticide Use in Virginia, Principles of Pest Control, Pesticide Labeling, Pesticide Formulations, Pesticides in the Environment, Harmful Effects and Emergency Response, Personal Protective Equipment, Pesticide Handling Decisions, Application Equipment (Calibration and Methods), Calculating the Correct Amount to Apply, and Transportation, Storage, Containment, Disposal and Spill Management. VDOT also has a partnership with Virginia Tech Weed Science Department to administer 20 hours of hands on RT Training. The hands on RT training reiterates the classroom material and provides practical training using a backpack sprayer. In addition, it provides a weed identification laboratory exercise. The overall objective of the RT training is to train VDOT employees to become Registered Technician pesticide applicators per VDACS requirements. VDOT currently has 130 certified RT pesticide applicators. Classroom training was conducted on April 24-25 for 29 employees, and on May 7-9 for 35 employees. Hands-0n field training was conducted May 14-16 for 18 employees, May 22-24 for 10 employees, and June 25-27 for 32 employees. **Confirmation Statement:** VDOT continues to control the discharge of pollutants related to storage and application of pesticides, herbicides, and fertilizers applied to our rights of way and support facilities by those individual that are certified as Registered Technicians.

<table>
<tr>
<td>Ensure that VDOT employees and contractors are trained in good housekeeping and pollution prevention practices and the IDDE Program.</td>
<td>This aspect of the BMP is currently implemented and is an ongoing effort</td>
<td>Currently, various kinds of MS4 related training are provided independently by VDOT Districts and Divisions. What tracking occurs is managed and monitored by VDOT's Worforce Development/ VDOT University staff. However, that probably does not capture all relevant participation at this time. VDOT has an inter-Divisional project underway with our Worforce Development/ Training staff to update the agency's MS4 Training Plan. We are identifying more specifically who needs to have which kinds of training and ways to more accurately monitor and track that to ensure the proper staff actually receive the training at recurring intervals stipulated in our MS4 permit. This process should be completed by December 31, 2018.

<table>
<tr><th>Type of Training</th><th># Employees Trained</th></tr>
<tr><td>Environmental Compliance for Maintenance Activities</td><td>97</td></tr>
<tr><td>Environmental, MS4 and Materials Training for AHQ’s</td><td>49</td></tr>
<tr><td>TOTAL</td><td>146</td></tr>
</table>

The following is a summary of training provided by the Maintenance Division for the reporting year: 146 individuals attended training focused on regulations and procedures pertaining to pollution prevention, MS4 requirements, erosion and sediment control, and stormwater management</td>
</tr>
</table>

BMP 6(C)3 – Training of VDOT Forces

Description and Measurable Goal:	Continue to train VDOT forces to prevent and reduce stormwater pollution from VDOT-related activities.
Lead Division:	Construction (for division specific elements of VDOT's Employee Training Program for MS4 and Stormwater)

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Ensure applicable construction personnel receive training on the IDDE program and appropriate spill responses.	Starting in the second year of permit coverage, provide training to applicable field personnel.	A total of 1,049 VDOT individuals are certified through the DEQ ESC and/or SWM Certification Program, of which illicit discharge and spill response is a subject element. The following list identifies the total number of VDOT individuals certified or re-certified this reporting period: DEQ ESC/SWM Certifications — Certified — Recertified SWM Program Administrator — 3 — 0 SWM Inspector — 43 — 9 SWM Plan Reviewer — 13 — 5 SWM Combined Administrator — 11 — 1 ESC Program Administrators — 5 — 0 ESC Inspector — 490 — 73 ESC Plan Reviewer — 16 — 3 ESC Combined Administrators — 49 — 9 Responsible Land Disturber — 276 — 40 Dual Combined Administrator — 23 — 2 Dual Inspector — 162 — 47 Dual Plan Reviewer — 8 — 1 This relates only to the certifications awarded by DEQ.

BMP 6(C)4 – Training of VDOT Forces

Description and Measurable Goal:	Continue to implement VDOT's efforts to prevent and reduce stormwater pollution from VDOT-related activities.
Lead Division:	Workforce Development (for division specific elements of VDOT's Employee Training Program for MS4 and Stormwater)

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Ensure that VDOT employees and consultants serving as plan reviewers and inspectors obtain the appropriate certifications as specified in VDOT's annual ESC and SWM standards and specifications.	This aspect of the BMP is currently implemented and is an ongoing effort.	A total of 1,049 VDOT individuals are certified through the DEQ ESC and/or SWM Certification Program, of which illicit discharge and spill response is a subject element. The following list identifies the total number of VDOT individuals certified or re-certified this reporting period: DEQ ESC/SWM Certifications — Certified — Recertified SWM Program Administrator — 3 — 0 SWM Inspector — 43 — 9 SWM Plan Reviewer — 13 — 5 SWM Combined Administrator — 11 — 1 ESC Program Administrators — 5 — 0 ESC Inspector — 490 — 73 ESC Plan Reviewer — 16 — 3 ESC Combined Administrators — 49 — 9 Responsible Land Disturber — 276 — 40 Dual Combined Administrator — 23 — 2 Dual Inspector — 162 — 47 Dual Plan Reviewer — 8 — 1 This relates only to the certifications awarded by DEQ.
Provide training opportunities through the Erosion and Sediment Control Contractor Certification (ESCCC) Program.	This aspect of the BMP is currently implemented and is an ongoing effort.	The VDOT ESCCC Program provides an integral service to VDOT contractors, maintenance forces, and land-use permittees. The course topics include: the VESCLR, the erosion process, ESC control measures, and the VDOT contract enforcement process. The training is provided by four outside vendors who schedule classes through the year. There were 2,287 individuals trained during this reporting year.

BMP 6(D) – Oversight of VDOT Maintenance Contractors

Description and Measurable Goal:	Contractual oversight procedures for VDOT contractors for maintenance of roadway or operation and use of VDOT facilities.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Continue to require that contractors use appropriate control measures and procedures for stormwater discharges to the VDOT's MS4 System.	This aspect of the BMP is currently implemented and is an ongoing effort	VDOT continues to require that contractors comply with contract language, VDOT's Annual Standards and Specifications, and all other relevant documentation providing stipulations regarding use of appropriate control measures for stormwater discharges and prevention of non-stormwater discharges from the VDOT MS4 system.

BMP 6(E) – Annual Reporting and Effectiveness Review

Description and Measurable Goal:	Report efforts and results of Pollution Prevention/Good Housekeeping BMPs in the Annual Report and Monitor Effectiveness

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Summarize Activities in BMP 6A-6D as required by permit.	Annually.	The information to demonstrate compliance with specific control measure practices for this MCM are itemized in BMPs 6A-6D above. Other reporting items are listed below.
Assure that protocols are followed	Annually.	VDOT maintains design criteria for infrastructure related to the storage of deicing materials. The infrastructure and guidance detailed in the waste management and pollution prevention guide are designed to control and minimize pollutant discharge. Compliance with the guidance are periodically assessment during facility compliance assessments. As part of the Department's New Product Review process for chemicals proposed to be used within the Department or applied to Department Right of Way, no deicing chemicals containing urea or other forms of nitrogen or phosphorus were reviewed for use by VDOT during the reporting year. These written procedures together with the *Procedures for Operation and Maintenance Activities* outlined in BMP 6(A)2 Environmental, and the *Annual Standards and Specifications for ESC* outlined in BMP 4(A) reduce the discharge of pollutants associated with VDOT owned or operated facilities and road, street, and parking lot maintenance per Part I.C.6.f. The Procedures for Operation and Maintenance Activities outlined in BMP 6(A)1 Maintenance, and the Turf and Landscape Management practices outlined in BMP 6(B) that cover pesticide, herbicide, and fertilizer application were followed as discussed in the reporting of those BMPs and per Part I.C.6.g.
Evaluate and describe effectiveness of each strategy and practice.	Annually.	VDOT has evaluated each of the practices and we believe that the BMPs are appropriate and effective. Notable achievements and potential

		future activities leading to increased effectiveness are described inline through the above BMP responses, as appropriate.

MCM#7:
INFRASTRUCTURE COORDINATION

BMP 7(A) – Infrastructure Coordination

Description and Measurable Goal:	Coordinate with other large MS4s regarding physical interconnection of systems.

<table>
<tr><th>Expected Efforts and Results in Meeting Measurable Goal</th><th>Implementation Schedule</th><th>Annual Report Information</th></tr>
<tr><td>Meet* annually with each Phase 1 MS4 permittee for the purpose of coordination on priority issues for the Program Plan and TMDL Action Planning relevant to interconnectivity.</td><td>This aspect of the BMP is currently being implemented and is an ongoing effort.</td><td>VDOT coordinated and met with the following Phase 1 MS4 localities during the reporting year.
<table><tr><th>Locality</th><th>Date</th></tr><tr><td>Prince William County</td><td>07/13/17</td></tr><tr><td>Arlington County</td><td>10/11/17</td></tr><tr><td>Chesterfield County</td><td>11/30/17</td></tr><tr><td>Henrico County</td><td>11/30/17</td></tr><tr><td>Chesapeake</td><td>05/03/18</td></tr><tr><td>Hampton</td><td>05/03/17</td></tr><tr><td>Newport News *</td><td>05/03/17</td></tr><tr><td>Norfolk</td><td>05/03/17</td></tr><tr><td>Virginia Beach</td><td>05/03/17</td></tr><tr><td>Portsmouth</td><td>05/03/17</td></tr><tr><td>Fairfax County</td><td>05/18/18</td></tr></table>*In person and in a WebEx meeting

The primary issues discussed during the meetings with each Phase 1 permittee included:
- Priority issues, updates, and new elements of VDOT’s Program Plan to reflect new IP;
- Status of Mapping program;
- Chesapeake Bay TMDL Action Plans - means, methods and schedule;
- Other TMDL Action Plans;
- Credit for TMDL Implementation – BMPs and strategies to meet reduction requirements;
- IDDE – Coordination on high risk industrial facilities, contact information and process;</td></tr>
<tr><td>Participate in coordination efforts initiated by Phase 1 MS4 and Small MS4 operators when the VDOT MS4 is physically-interconnected.</td><td>Engage and participate with Phase 1 and Small MS4s as requested.</td><td>VDOT participated in coordination efforts initiated by Small MS4 operators where the VDOT MS4 is physically interconnected as follows:
<table><tr><th>Locality</th><th>Date</th></tr><tr><td>Albemarle County</td><td>02/28/18</td></tr><tr><td>Lynchburg</td><td>05/30/18</td></tr></table></td></tr>
</table>

*Note: * Meetings may be conducted individually with permittees or in a group meeting and face to face meetings, conference calls, or using electronic meeting technology may constitute a meeting.*

SC#1:
SPECIAL CONDITIONS FOR CHESAPEAKE BAY TMDL[3]

[3] *Special condition for the Chesapeake Bay TMDL. The Commonwealth in its Phase I and Phase II Chesapeake Bay TMDL Watershed Implementation Plans (WIP) committed to a phased approach for MS4s, affording MS4 operators up to three full five-year permit cycles to implement necessary reductions. This permit is consistent with the Chesapeake Bay TMDL and the Virginia Phase I and II WIPs to meet the Level 2 (L2) scoping run for existing developed lands as it represents an implementation of a cumulative 36.0% of L2 as specified in the 2010 Phase I WIP. Conditions of future permits will be consistent with the TMDL or WIP conditions in place at the time of permit issuance.*

(1) In accordance with Part I, Section D.3 of the permit, the operator shall develop and submit to the DEQ for its review an amended Chesapeake Bay TMDL Action Plan that addresses a cumulative reduction of at least 36% of the total Level 2 Scoping Run reductions.

BMP SC1(A) – Action Plan for Chesapeake Bay Watershed TMDL

Description and Measurable Goal:	Develop and implement 2nd Phase TMDL Action Plan for the Chesapeake Bay Watershed TMDL

<table>
<tr><th>Expected Efforts and Results in Meeting Measurable Goal</th><th>Implementation Schedule</th><th>Annual Report Information</th></tr>
<tr><td>Develop 2nd Phase Chesapeake Bay TMDL Action Plan for the four river basins.</td><td>Develop 2nd Phase Action Plan within 12 months of receiving permit coverage 6/30/18.</td><td>The 2nd Phase Chesapeake Bay TMDL Action Plan was completed and submitted to DEQ by 6/30/2018.</td></tr>
<tr><td>A list of BMPs and/or strategies implemented during the reporting period and the estimated reduction of pollutant(s) achieved by each reported in pounds per acre per year.</td><td>Report annually</td><td>See Appendix F for details on BMP implementation, credits achieved to-date and the Urban BMP Reporting Spreadsheet.</td></tr>
<tr><td>The progress toward meeting the required cumulative reductions for total nitrogen, total phosphorus, and total suspended solids</td><td>Report annually</td><td>
<table>
<tr><th></th><th colspan="3">Parameter</th></tr>
<tr><th></th><th>TN (lb/yr)</th><th>TP (lb/yr)</th><th>TSS (lb/yr)</th></tr>
<tr><td>James</td><td>3579.52</td><td>10057.93</td><td>1337549.36</td></tr>
<tr><td>Potomac</td><td>2521.53</td><td>8847.75</td><td>1160685.62</td></tr>
<tr><td>Rappahannock</td><td>111.09</td><td>514.62</td><td>176658.17</td></tr>
<tr><td>York</td><td>119.43</td><td>337.18</td><td>39749.32</td></tr>
<tr><td>Total Reductions Reported to Date (all basins):</td><td>6331.57</td><td>19757.48</td><td>2714642.47</td></tr>
</table>
</td></tr>
<tr><td>A list of control measures that are planned to be implemented during the next reporting period</td><td>Report annually</td><td>See Appendix F for details on the proposed FY19 implementation schedule.</td></tr>
</table>

SC#2:
SPECIAL CONDITIONS FOR APPROVED LOCAL TMDLS[4]

[4] *Special conditions for approved total maximum daily loads (TMDL) other than the Chesapeake Bay TMDL. An approved TMDL may allocate an applicable wasteload to a small MS4 that identifies a pollutant or pollutants for which additional stormwater controls are necessary for the surface waters to meet water quality standards The permittee shall develop and implement a local TMDL action plan for each pollutant for which wasteloads have been allocated to the permittee's MS4 in TMDLs approved by the Environmental Protection Agency (EPA) and listed in Attachment A of the permit as described below:*

a. For TMDLs approved by the EPA prior to July 1, 2013, the permittee shall update the previously approved local TMDL action plans in order to meet the conditions of Part I.E.2, 3, 4, and 5, as applicable, no later than 12 months after the permit effective date.

b. For TMDLs approved by EPA on or after July 1, 2013 and prior to April 1, 2017, the permittee shall develop and initiate implementation of action plans for each pollutant for which wasteloads have been allocated to the permittee's MS4 in order to meet the conditions of Part I.E.2, 3, 4, and 5, as applicable no later than 24 months after the permit effective date.

BMP SC2(A) – Local TMDL

Description and Measurable Goal:	Develop and implement applicable TMDL Action Plans for approved TMDLs that have assigned VDOT's MS4 a wasteload allocation.

Expected Efforts and Results in Meeting Measurable Goal	**Implementation Schedule**	**Annual Report Information**
Summary of actions conducted to Implement Local TMDL Action Plans.	In accordance with schedule identified in each Local TMDL Action Plan.	Summary of actions to implement the Action Plans is reported in Appendix G.

*Note: * Copies of the Local TMDL Action Plans for Bacteria, PCBs and Sediment are available at Environmental Division's Central Office location.*

PROGRAM EVALUATION, MODIFICATION, AND REPORTING

Through the MS4 Steering Committee meetings, VDOT will annually evaluate the effectiveness of each strategy or practice. VDOT routinely evaluates specific standards and specifications, schedules, manuals, checklists, and other documents. Revisions to the MS4 Program Plan are expected throughout the life of this permit as part of the iterative process to reduce pollutant loading and protect water quality. As such, revisions made in accordance with this permit as a result of the iterative process do not require modification of this permit. VDOT will document revisions to the MS4 Program Plan as part of the Annual Report, including an explanation as to why a specific BMP was replaced or eliminated. No modifications have been made to the Program Plan since the most recent submittal in June 2018.

Documents, policies, and procedures listed in the Program Plan are updated internally at VDOT as needed (to comport with changes to laws, regulations, implementation approach or other factors not related to MS4/Stormwater).

Appendix A
List of TMDL Committees, Meetings & Activities

Local TMDL Technical Advisory Committee Meetings

Meeting Name/Venue	Date
Blacks Run and Cooks Creek TMDL TAC Meeting	08/20/2017
Blacks Run and Cooks Creek TMDL TAC Meeting	10/04/2017
New River PCB TMDL TAC Meeting & Public Meeting	1/25/2018
SAMS Stakeholder Advisory Committee Meeting	02/28/2018
SAMS Stakeholder Advisory Committee Meeting	06/13/2018

Local TMDL & Watershed Implementation Plan Meetings

Meeting Name/Venue	Date
Blacks Run TMDL Modification (DEQ)	07/31/2017
Blacks Run and Cooks Creek TMDL TAC Meeting	08/20/2017
Blacks Run and Cooks Creek TMDL TAC Meeting	10/04/2017
Blacks Run and Cooks Creek TMDL Public Meeting	11/15/2017
Rudee Inlet Watershed TMDL Public Meeting	1/10/2018
Accotink Creek TMDL Public Meeting	1/17/2018
New River PCB TMDL Technical Advisory Committee Meeting & Public Meeting	1/25/2018
SAMS Stakeholder Advisory Committee Meeting	02/28/2018
SAMS Technical Training	05/24/2018
SAMS Stakeholder Advisory Committee Meeting	06/13/2018

Activities

Meeting Name/Venue	Date
HB 1774 Study Committee Meeting	07/11/2017
Chesapeake Bay Foundation (Trees)	07/24/17
VDOT/DGIF Shoreline BMP Project Coordination Meeting	08/02/17
VDOT/DCR Shoreline BMP Project Coordination Meeting	08/03/17
StormCon 2017	08/28-31/2017
WaterJam 2017	09/13-14/2017
VDOT/National Park Service Stream Restoration BMP Meeting	09/20/17
Middle James Roundtable Annual Meeting	10/23/2017
Virginia Association of Wetland Professionals Fall Meeting	11/16/2017
Bay TMDL BMP Collaboration Meeting with DOF	11/20/17
VDOT/DGIF Shoreline BMP Project Coordination Meeting	12/6/17
VDOT/DCR Shoreline BMP Project Coordination Meeting	12/8/17
CSN Webinar – The Impervious Cover Model	12/14/2018
Bay TMDL BMP Collaboration Meeting with DOF	1/11/18
CSN Webinar – New Year, New Model, New WIPs	01/25/2018
Shoreline Projects for VDOT's TMDL Program Meeting w/VIMS	01/30/18
CSN Webinar – Road Salt and Stream Health	02/08/2018
Chesapeake Bay TMDL Phase III WIP Interagency Team Meeting	2/14/18
VDOT/DCR Shoreline BMP Project Coordination Meeting	02/28/18
NCHRP 25-53 (The Efficacy of Treating Highway Runoff to Meet Watershed TMDL Goals) Panel Meeting	02/22/2018
Albemarle County Stormwater Pocket BMPs Conference Call	02/28/18
VLWA Spring Conference	3/5-6/2018

Meeting Name/Venue	Date
Chesapeake Bay TMDL Phase III WIP Interagency Team Meeting	03/13/18
VDOT Statewide Environmental Meeting	03/19-20/18
USACE Meeting RE: Belle Isle State Park Shoreline Restoration BMP	03/23/18
Environment Virginia	4/3-5/2018
Chesapeake Bay TMDL Phase III WIP Interagency Team Meeting	04/11/18
Urban SW WG - MdSHA Alternative Headwater and Outfall Crediting Protocol discussion	04/17/18
FHWA Peer Exchange on Nature Based Solutions for Coastal Highway Resilience	04/19/2018
NFWF Dry Fork Site Review	04/26/18
Chesapeake Bay Stakeholder Advisory Group	04/30/18
Center for Watershed Protection VEE Project Discussion	05/10/18
EPA Region III DOT Peer Exchange	05/15-16/2018
Chesapeake Bay TMDL Phase III WIP Interagency Team Meeting	05/30/18
VDOT/DGIF Shoreline BMP Project Coordination Meeting	06/01/18
Chesapeake Bay Stakeholder Advisory Group	06/04/18
HRPDC Regional Environmental Committee Meeting	06/07/18
RES Workshop – Innovative TMDL Compliance Workshop	06/12/18
VIMS Tidal Wetlands Workshop	06/14/18

Appendix B
New Stormwater Management Facilities Brought Online During the Reporting Year

MS4 Reporting Year FY18 (July 1, 2017 through June 30, 2018) New SWM Facilities brought online within Census Urban Areas. MCM #5; BMP 5(B)*								
Facility Type	**Latitude**	**Longitude**	**Total Acres Controlled / Treated (Acres)**	**Pervious Acres Controlled/ Treated (Acres)**	**Impervious Acres Controlled/ Treated (Acres)**	**Date brought Online**	**6th Order HUC**	**Date Last Inspected**
Other Infiltration Type	38.7342	-77.5427	2.6			07/18/17	PL34	07/18/17
Dry Detention Basin - IIC	38.8142	-77.6446	6.8	1.6	5.2	07/25/17	PL32	07/25/17
	37.1332	-80.3722				07/26/17	NE58	07/26/17
Manufactured	38.8300	-77.3161				08/18/17	PL46	08/18/17
Bioretention Basin - IIC	38.9484	-77.4293	1.2	0.7	0.5	08/24/17	PL18	08/24/17
Water Quality Swale/Bioswale - IIC	38.9523	-77.4292	5.7	4.2	1.5	08/24/17	PL18	08/24/17
Water Quality Swale/Bioswale - IIC	38.9548	-77.4292	4.4	1.4	3.0	08/24/17	PL18	08/24/17
Bioretention Basin - IIC	38.9879	-77.4319	1.1	0.6	0.5	08/24/17	PL18	08/24/17
Water Quality Swale/Bioswale - IIC	38.9879	-77.4314	0.6	0.2	0.4	08/24/17	PL18	08/24/17
Enhanced Extended Detention Basin - IIC	38.9784	-77.4300	3.3	1.6	1.7	08/24/17	PL18	08/24/17
Water Quality Swale/Bioswale - IIC	38.9771	-77.4295	0.4	0.1	0.3	08/24/17	PL18	08/24/17
Enhanced Extended Detention Basin - IIC	38.9593	-77.4295	1.8	1.1	0.7	08/24/17	PL18	08/24/17
Dry Detention Basin - IIC	37.4152	-77.6126				10/18/17	JA42	10/18/17
Dry Detention Basin - IIC	37.4124	-77.6153				10/18/17	JA42	10/18/17
Dry Detention Basin - IIC	37.2440	-77.4202	12.3			10/19/17	JA40	10/19/17
Dry Detention Basin - IIC	37.4312	-77.6877				10/19/17	JA41	10/19/17

MS4 Reporting Year FY18 (July 1, 2017 through June 30, 2018) New SWM Facilities brought online within Census Urban Areas. MCM #5; BMP 5(B)*								
Facility Type	**Latitude**	**Longitude**	**Total Acres Controlled / Treated (Acres)**	**Pervious Acres Controlled/ Treated (Acres)**	**Impervious Acres Controlled/ Treated (Acres)**	**Date brought Online**	**6th Order HUC**	**Date Last Inspected**
Dry Swale	37.7004	-77.5127	0.9	0.6	0.3	11/30/17	JL17	11/30/17
Extended Detention - IIC	38.3143	-77.4999	9.0	4.0	5.0	12/04/17	RA46	12/04/17
Manufactured	37.1337	-80.3719				12/12/17	NE58	12/12/17
Retention Basin I - IIC	37.3735	-79.1260	20.7	8.7	12.0	01/30/18	JM11	01/30/18
Permeable Pavement Level 1 - IIB	37.3157	-80.0556	2.0	0.2	1.8	02/13/18	RU10	02/13/18
MTD - Rinker Materials Stormceptor STC	38.7873	-77.5408				05/04/18	PL34	05/04/18
MTD - Rinker Materials Stormceptor STC	38.7870	-77.5408				05/04/18	PL34	05/04/18
Manufactured Filtering	37.2972	-79.9586	0.2	0.1	0.2	05/09/18	RU13	05/09/18
Manufactured Filtering	37.2972	-79.9586	0.2	0.1	0.1	05/09/18	RU13	05/09/18
Underground Detention Storage	37.2972	-79.9586	9.4			05/09/18	RU13	05/09/18
Manufactured Filtering	37.2792	-79.9586	0.4	0.2	0.2	05/09/18	RU13	05/09/18
Manufactured Filtering	37.2972	-79.9586	0.5	0.3	0.2	05/09/18	RU13	05/09/18
Manufactured Filtering	37.2972	-79.9586	0.5	0.2	0.3	05/09/18	RU13	05/09/18
Manufactured Filtering	37.2972	-79.9586	0.4	0.2	0.2	05/09/18	RU13	05/09/18
Manufactured Filtering	37.2972	-79.9586	0.2	0.0	0.2	05/09/18	RU13	05/09/18

MS4 Reporting Year FY18 (July 1, 2017 through June 30, 2018) New SWM Facilities brought online within Census Urban Areas. MCM #5; BMP 5(B)*								
Facility Type	**Latitude**	**Longitude**	**Total Acres Controlled / Treated (Acres)**	**Pervious Acres Controlled/ Treated (Acres)**	**Impervious Acres Controlled/ Treated (Acres)**	**Date brought Online**	**6th Order HUC**	**Date Last Inspected**
Manufactured Filtering	37.2972	-79.9586	0.2	0.0	0.1	05/09/18	RU13	05/09/18
Underground Detention Storage	37.2972	-79.9586	19.5			05/09/18	RU13	05/09/18
MTD - Rinker Materials Stormceptor STC	38.7863	-77.5365				06/20/18	PL34	06/20/18

* Stormwater BMP facilities represent those within the urbanized area brought online during the PY18 period. Note that these BMPs do not include those water quality BMPs already reported to DEQ through VDOT's monthly CGP permit termination process, or those where the project and CGP permit was administered by a locality (e.g. LAP project) in accordance with Part I.C.5.f-h.

Appendix C
BMP Inspections Performed during the Reporting Year

District	Number of BMPs	Number of BMP Inspections*
Bristol	8	8
Culpeper	31	31
Fredericksburg	73	60 (1 removed, 5 under construction, 2 accounted for under Rest Area; 5 new)
Hampton Roads	107	105 (2 new)
Lynchburg	16	16
Northern Virginia	579	554 (3 new, 6 removed, 16 under construction)
Richmond	178	176 (1 removed, 1 new)
Salem	50	49 (1 new)
Staunton	48	44 (1 not maintained, 3 accounted for in Rest Area)
Rest Area	14	14

* Inspections reported for BMPs in the Urbanized Area.

Appendix D
VDOT Environmental Employee Training Summary

MS4 Permit Year 2017-2018	
Type of Training	**Number of Employees Trained**
SPCC	488
Facility SWPPP	545
MS4	54
DOT Hazmat Awareness	116
Salt Infrastructure	10
Total	**1213**

Appendix E
MCM 7 Infrastructure Coordination Meetings

Infrastructure Coordination Meetings with Other MS4s

Meeting Name/Venue	Date	Anticipated Future Participation
Prince William County & VDOT Annual Infrastructure Coordination Meeting	07/13/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Arlington County & VDOT Annual Infrastructure Coordination Meeting	10/11/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Chesterfield County & VDOT Annual Infrastructure Coordination Meeting	11/30/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Henrico County & VDOT Annual Infrastructure Coordination Meeting	11/30/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Chesapeake & VDOT Annual Infrastructure Coordination Meeting	05/03/18	Yes, anticipate Infrastructure Coordination meeting during PY19
Hampton & VDOT Annual Infrastructure Coordination Meeting	05/03/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Newport News & VDOT Annual Infrastructure Coordination Meeting	05/03/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Norfolk & VDOT Annual Infrastructure Coordination Meeting	05/03/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Virginia Beach & VDOT Annual Infrastructure Coordination Meeting	05/03/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Portsmouth & VDOT Annual Infrastructure Coordination Meeting	05/03/17	Yes, anticipate Infrastructure Coordination meeting during PY19
Fairfax County & VDOT Annual Infrastructure Coordination Meeting	05/18/18	Yes, anticipate Infrastructure Coordination meeting during PY19

Appendix F
CB TMDL Action Plan Implementation and Credits Achieved To-Date

TOTAL REDUCTIONS ACHIEVED TO-DATE IN CHESAPEAKE BAY WATERSHED

	Parameter		
	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)
James	3579.52	10057.93	1337549.36
Potomac	2521.53	8847.75	1160685.62
Rappahannock	111.09	514.62	176658.17
York	119.43	337.18	39749.32
Total Reductions Reported to Date (all basins):	**6331.57**	**19757.48**	**2714642.47**
Reduction Requirement (Special Condition D1- 5%)	670.00	3527.00	453715.00
% Complete to date (Special Condition D1- 5%)	945.01%	560.18%	598.31%

James River Basin

	Reductions			
	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	
Redevelopment				
Jamestown-Scotland Ferry (UPC 102110)	1.83	14.09	894.20	<--Previously reported in 2016 MS4 Annual Report
Rt. 264 (UPC 104331)	6.35	45.76	3465.59	<--Previously reported in 2016 MS4 Annual Report
Stream Restoration and Stabilization				
Lithia Road Stream Restoration	**93.70**	**103.30**	**61812.40**	**<--FY 2018 New**
Skiffes Creek Stream Restoration	**199.00**	**469.00**	**23000.00**	**<--FY 2018 New, Final numbers confirmed 8/29/2018**
Timsbury Creek Stream Restoration	**985.00**	**2700.38**	**103800.00**	**<--FY 2018 New, Final numbers confirmed 8/29/2018**
Outfall and Channel Stabilization				
Route 60 (UPC 105139)	3.53	3.89	784.57	<--Previously reported in 2017 MS4 Annual Report
Route 5 (UPC 106842)	1.22	1.35	272.34	<--Previously reported in 2017 MS4 Annual Report
Quarterpath Outfall	**5.44**	**6.00**	**1210.40**	**<--FY 2018 New**
Historical BMPs	3.00	22.00	3538.00	<--Previously reported in 2016 MS4 Annual Report
Forest Buffers				
Land Cover Conversion				
Skiffes Land Cover Conversion	**0.15**	**1.61**	**20.00**	**<--FY 2018 New, Final numbers confirmed 8/29/2018**
RDC Land Cover Conversion	**1.76**	**18.46**	**212.20**	**<--FY 2018 New**
Street Sweeping and Catch Basin Cleanout	**2097.00**	**6058.00**	**1130286.00**	**<--FY 2018 New (updated 8/24/2018)**
Nutrient Credit Purchase				
Swiss Dixie Nutrient Bank (6/21/16)	20.00	66.94	0.00	<--Previously reported in 2016 MS4 Annual Report
Cranston's Mill Pond Bank (5/19/15)	15.00	33.00	0.00	<--Previously reported in 2016 MS4 Annual Report
Swiss Dixie Nutrient Bank (6/2/17)	2.00	6.69	0.00	<--Previously reported in 2017 MS4 Annual Report
Swiss Dixie Nutrient Bank (6/2/17)	103.00	344.74	0.00	<--Previously reported in 2017 MS4 Annual Report
Hunts Creek Nutrient Bank (6/7/2018)	**15.12**	**50.61**	**TBD**	**<--FY 2018 New**
Namozine Nutrient Bank (6/7/2018)	**0.90**	**3.01**	**TBD**	**<--FY 2018 New**
Sams Nutrient Bank (6/7/18)	**6.90**	**31.00**	**TBD**	**<--FY 2018 New**
Incidental Retrofits				
Structural BMP Enhancement and Retrofit				
Lynchburg District Stormwater Pond	11.89	37.29	5708.01	<--Previously reported in 2017 MS4 Annual Report
VDOT Richmond District Outfall Retrofit	2.49	17.80	1160.00	<--Previously reported in 2017 MS4 Annual Report
Pine Chapel	2.22	8.27	1005.65	<--Previously reported in 2017 MS4 Annual Report
Skiffes Upland Dry Swale	**0.77**	**5.85**	**380.00**	**<--FY 2018 New, Final numbers confirmed 8/29/2018**
RDC Level Spreader	**1.25**	**8.89**	**0.00**	**<--FY 2018 New (additional credit being reported)**
Total Credit Reported	3579.52	10057.93	1337549.36	
Reduction Requirement (Special Condition D1- 5%)	249.00	896.00	115185.00	
% Complete to date (Special Condition D1- 5%)	1437.56%	1122.54%	1161.22%	

Project Name: *Lithia Road*

Location **UPC Code or BMP ID:** *0*

Geographic (County/City):	*Botetourt*	District:	*Salem*	Residency:	*Salem*	River Basin:	*James*
Inside Year 2000 Urbanized Area? (Y/N)	*No*	Latitude:	*37.487*	Longitude:	*-79.74*	Coastal/ Non-Coastal:	*Non-Coastal*

BMP Type: *Stream Restoration*

Project Description:

Stream design to alleviate road flooding.

Project Drainage Area:

Inside CUA	*Impervious Area (ac.)*	*0.00*	*Pervious Area (ac.)*	*0.00*			
Outside CUA	*Impervious Area (ac.)*	*64.36*	*Pervious Area (ac.)*	*8793.18*	*Forested Area (ac.)*		

Existing Conditions Proposed Improvements:

Compensatory? (Y/N)	*N*	Onsite stream relocation? (Y/N)	*N*
Condition of Existing Stream	*Eroded banks, an unstable braided stream section, and obstructions affecting stream flow.*		
Proposed Stream Designed using Natural Channel priniciples? (Y/N)	*Y*		
Linear Feet Restored (centerline)	*1,436.00*	Existing Avg Bank Height Restored (ft)	*3.00*
Method of Stabilization:	*Protocol 1*	Existing Avg Channel Top Width (ft)	*30.00*

Qualifying Conditions:

Project primarily designed to protect public infrastructure by bank armoring or rip rap? (Y/N)	N
Stream Reach > 100 L.F.? (Y/N) Y — Existing stream still actively enlarging or degrading? (Y/N)	Y
Project utilizing comprehensive approach to SR addressing long term stability of channels, banks, and floodplain? (Y/N)	Y
Will project comply with all state and federal permitting requirements, including 404 and 401 permits?	Y
Project proposed for sole purpose of receiving nutrient or sediment reduction?	N
Will project have a designated authority responsible for routine maintenance and long term repairs?	Y

Method of Estimating Bank Erosion

1.) Measured in-field pre-restoration	N	2.) BANCS Method	N	3.) Interim Rate	Y

Protocols applied: Protocol 1

Estimated Credit	TN	TP	TSS		
lbs/yr	103.30	93.70	61,812.40	*SDR applied? (Y/N)	Y

Discussion

Project is located outside the CUA, however forested drainage area. Therefore, pro-rating has minimal to no effect on crediting.
Project drainage area estimated using USGS Stream Stats.

Est. Implementation Date:	*1/31/2018*	**Project Contact Name:**	*Chris Swanson*
Project Completed:	*No*	**Contact Information (email/phone):**	*(804) 786-6839*

Photos, Plans and/or Project graphics

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) Y

Please include as attachments

Project Name: *Skiffes Creek*

Location — **UPC Code or BMP ID:** *0*

Geographic (County/City):	*James City*	District:	*Hampton Roads*	Residency:	*Williamsburg*	River Basin:	*James*
Inside Year 2000 Urbanized Area? (Y/N)	*Yes*	Latitude:	*37.215*	Longitude:	*-76.599*	Coastal/ Non-Coastal:	*Coastal*

BMP Type: *Stream Restoration*

Project Description:

Constructed under VDOT's TMDL implementation contract. Will be reported in VDOT's 2018 MS4 Annual Report.

Photos, Plans and/or Project graphics

Project Drainage Area:

Inside CUA	*Impervious Area (ac.)*	*0.00*	*Pervious Area (ac.)*	*0.00*			
Outside CUA	*Impervious Area (ac.)*	*8.663*	*Pervious Area (ac.)*	*14.838*	*Forested Area (ac.)*	*0.00*	

Existing Conditions Proposed Improvements:

Compensatory? (Y/N)	*N*	Onsite stream relocation? (Y/N)	*N*
Condition of Existing Stream	*Undergoing vertical and horizontal instability as a result of the excess shear stress and velocities.*		
Proposed Stream Designed using Natural Channel priniciples? (Y/N)	*Y*		
Linear Feet Restored (centerline)	*801.00*	Existing Avg Bank Height Restored (ft)	*8.00*
Method of Stabilization:	*Protocol 1*	Existing Avg Channel Top Width (ft)	*25.00*

Qualifying Conditions:

Project primarily designed to protect public infrastructure by bank armoring or rip rap? (Y/N)	N
Stream Reach > 100 L.F.? (Y/N) Y — Existing stream still actively enlarging or degrading? (Y/N)	Y
Project utilizing comprehensive approach to SR addressing long term stability of channels, banks, and floodplain? (Y/N)	Y
Will project comply with all state and federal permitting requirements, including 404 and 401 permits?	Y
Project proposed for sole purpose of receiving nutrient or sediment reduction?	N
Will project have a designated authority responsible for routine maintenance and long term repairs?	Y

Method of Estimating Bank Erosion

1.) Measured in-field pre-restoration	N	2.) BANCS Method	Y	3.) Interim Rate	N

Protocols applied: Protocol 1

Estimated Credit	TN	TP	TSS		
lbs/yr	469.00	199.00	23,000.00	*SDR applied? (Y/N)	Y

Discussion

Final numbers to based on as-built, provided by VDOT. Will be reported in 2018 MS4 Annual Report. Drainage Area calculations determined from Pond Pack Model.

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) Y

Please include as attachments

Est. Implementation Date:	*12/15/2017*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*804-371-6834*

Project Name: *Timsbury-RDC*

Location **UPC Code or BMP ID:** *0*

Geographic (County/City):	*Chesterfield*	District:	*Richmond*	Residency:	*Chesterfield*	River Basin:	*James*
Inside Year 2000 Urbanized Area? (Y/N)	*Yes*	Latitude:	*37.291*	Longitude:	*-77.401*	Coastal/ Non-Coastal:	*Non-Coastal*

BMP Type: *Stream Restoration*

Project Description:

Timsbury Creek is located near the Richmond District office complex grounds. It is a perennial stream with approximately 6,425 L.F. within the project area on VDOT property. The tributary to Timsbury Creek is an intermittent stream comprising approximately 999 L.F. within the VDOT property. Both are highly degraded channels and are good candidates for stream restoration.

Project Drainage Area:

Inside CUA	*Impervious Area (ac.)*	*509.00*	*Pervious Area (ac.)*	*4,249.00*			
Outside CUA	*Impervious Area (ac.)*	*0*	*Pervious Area (ac.)*	*0*	*Forested Area (ac.)*	*0.00*	

Existing Conditions Proposed Improvements:

Compensatory? (Y/N)	*N*	Onsite stream relocation? (Y/N)	*N*
Condition of Existing Stream	*Valley wall conflicts with the stream pattern, vertical walls exceeding 15 feet high in places.*		
Proposed Stream Designed using Natural Channel priniciples? (Y/N)	*Y*		
Linear Feet Restored (centerline)	*3,914.00*	Existing Avg Bank Height Restored (ft)	*5.00*
Method of Stabilization:	*Protocol 1*	Existing Avg Channel Top Width (ft)	*20.00*

Qualifying Conditions:

Project primarily designed to protect public infrastructure by bank armoring or rip rap? (Y/N)			N
Stream Reach > 100 L.F.? (Y/N)	Y	Existing stream still actively enlarging or degrading? (Y/N)	Y
Project utilizing comprehensive approach to SR addressing long term stability of channels, banks, and floodplain? (Y/N)			Y
Will project comply with all state and federal permitting requirements, including 404 and 401 permits?			Y
Project proposed for sole purpose of receiving nutrient or sediment reduction?			N
Will project have a designated authority responsible for routine maintenance and long term repairs?			Y

Method of Estimating Bank Erosion

1.) Measured in-field pre-restoration	Y	2.) BANCS Method	N	3.) Interim Rate	N

Protocols applied: Protocol 1

Estimated Credit	TN	TP	TSS		
lbs/yr	2,700.38	985.00	103,800.00	*SDR applied? (Y/N)	Y

Discussion

Final credit provided by VDOT after construction. Drainage areas and land cover values are estimates, VDOT to provide final values.

Est. Implementation Date:	*4/1/2018*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*804-371-6834*

Photos, Plans and/or Project graphics

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) Y

Please include as attachments

Project Name: *Quarterpath Crossing Outfall*

Location **UPC Code or BMP ID:** *0*

Geographic (County/City):	*City of Williams*	District:	*Hampton Roads*	Residency:	*Williamsburg*	River Basin:	*James*
Inside Year 2000 Urbanized Area? (Y/N)	*Yes*	Latitude:	*37.248221*	Longitude:	*-76.687225*	Coastal/ Non-Coastal:	*Yes*

BMP Type: *Outfall Stabilization*

Project Description:

This project consisted of outfall stabilization to repair erosion and sloughing banks from a private property of Quarterpath Crossing Shopping Center that discharges to a Virginia Department of Transportation(VDOT) right-of-way (ROW). The project involved piping the drainage to the toe of a slope further downstream, installing riprap, and filling in the eroded banks with topsoil and stabilizing with grass.

Project Drainage Area:

Inside CUA	*Impervious Acres:*	*0.00*	*Pervious Acres:*	*0.00*			
Outside CUA	*Impervious Acres:*	*0*	*Pervious Acres:*	*3.65*	*Forested Acres:*	*0.65*	

Existing Conditions Proposed Improvements:

Linear Feet Restored (centerline)	*80.00*	Existing Avg Bank Height Restored (ft)	*8.00*
Method of Stabilization:	*Pipe Extension/Sl*	Existing Avg Channel Top Width (ft)	*19.00*
Proposed Channel Geometry:	*N/A*		

Estimated Credit	TN	TP	TSS
lbs/yr	6.00	5.44	1,210.40

Discussion

The project is located in the Coastal region. The overall project length is estimated at approximately 80 L.F. Due to the outfall repair work done for the developer of Quarterpath Crossing Shopping Center, VDOT did not conduct pre-construction monitoring to estimate bank erosion or head cut migration rates for this project. Stantec reviewed the profile Exhibit A-1's fill and approximate lower limits of eroded channel to get an approximate average bank height restoration of 8 ft. With these values, the interim rate was utilized to estimate sediment and nutrient reductions, as pre-restoration monitoring was not conducted.

Implementation Date	*9/30/2017*	**Project Contact Name:**	*Jennifer Dail*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(757) 925-2543*

Photos, Plans and/or Project graphics

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) Y

Please include as attachments

Project Name: *Skiffes Land Cover Conversion*

Location **UPC Code or BMP ID:** *0*

Geographic (County/City):	*James City*	District:	*Hampton Roads*	Residency:	*Williamsburg*	River Basin:	*James*
Inside Year 2000 Urbanized Area? (Y/N)	*No*	Latitude:	*37.215*	Longitude:	*-76.599*		

BMP Type: *Land Cover Conversion*

Project Description:

Nutrient Credit Values provided by VDOt on 8/29/2018. Final areas to be determined and provided by VDOT.

Photos, Plans and/or Project graphics

Land Cover Conversion:

Conversion Area	From / To	Acres	TN lbs/yr	TP lbs/yr	TSS lbs/yr
		Edge of Stream Reductions by POC achieved by conversion			
Area 1	Insert Land Cover Conversion Type	0	1.61	0.15	20.00
Area 2					
Area 3					

Minimum Criteria for Forest Classification:

If coverting TO forest, minimum contiguous area of 30 meters by 30 meters (0.186 acres) met? (Y/N)	N
Is Minimum Tree Density Criteria met? Refer to table V.H.1 in DEQ Guidance Memo 15-2005	N

Forest Buffer (if applicable)

Converted riparian buffer (acres)	0
Upland area draining to forest buffer (acres):	0.00
Maximum upland acres creditable:	0.00

NOTE: Min. ratio of upland area to forest buffer is 2:1 (ex. 2 acres sheet flows to 1 acre of forest buffer).

Credit Achieved by Forest Buffer	TN	TP	TSS
lbs/yr			

NOTE: Load reductions achieved through land cover conversion and forest buffer installation are additive.

Discussion

Nutrient Credit Values provided by VDOt on 8/29/2018. Final areas to be determined and provided by VDOT.

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) N

Please include as attachments

Date BMP Functional:	*1/1/2018*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(804) 371-6834*

Project Name: *Richmond DC*

Location **UPC Code or BMP ID:** *0*

Geographic (County/City):		District:	*Richmond*	Residency:	*Chesterfield*	River Basin:	*James*
Inside Year 2000 Urbanized Area? (Y/N)	*Yes*	Latitude:	*37.291*	Longitude:	*-77.401*		

BMP Type: *Land Cover Conversion*

Project Description:

Converting grassy area in back of RDC area to forest.

Land Cover Conversion:

Conversion Area	From / To	Acres	Edge of Stream Reductions by POC achieved by conversion TN lbs/yr	TP lbs/yr	TSS lbs/yr
Area 1	Pervious to Forest	3.67	18.46	1.76	212.20
Area 2					
Area 3					

Minimum Criteria for Forest Classification:

If coverting TO forest, minimum contiguous area of 30 meters by 30 meters (0.186 acres) met? (Y/N)	Y
Is Minimum Tree Density Criteria met? Refer to table V.H.1 in DEQ Guidance Memo 15-2005	Y

Forest Buffer (if applicable)

Converted riparian buffer (acres)	0
Upland area draining to forest buffer (acres):	0.00
Maximum upland acres creditable:	0.00

NOTE: Min. ratio of upland area to forest buffer is 2:1 (ex. 2 acres sheet flows to 1 acre of forest buffer).

Credit Achieved by Forest Buffer

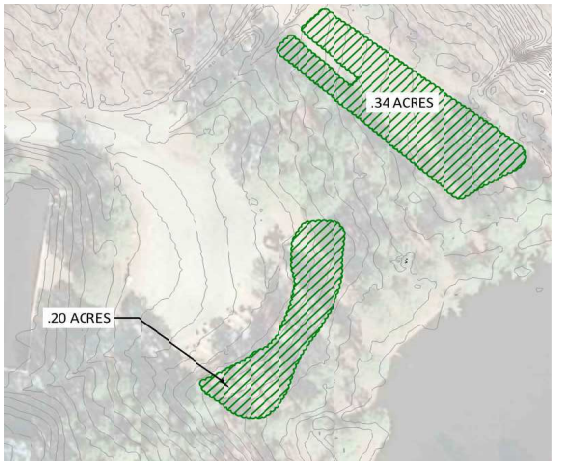
	TN	TP	TSS
lbs/yr			

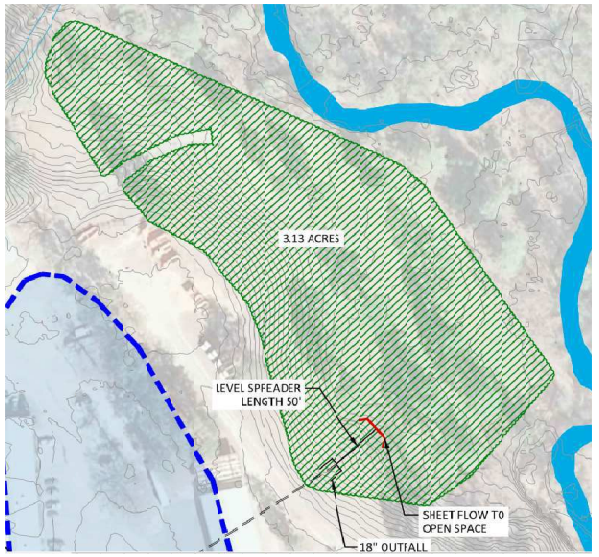
NOTE: Load reductions achieved through land cover conversion and forest buffer installation are additive.

Discussion

A total of 3.67 acres of mowed turf (urban pervious) was planted with native tree andshrub species at a density of 600 stems/acre.

Photos, Plans and/or Project graphics





Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) N

Please include as attachments

Date BMP Functional:	*1/1/2099*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*No*	**Contact Information (email/phone):**	*804-371-6834*

Rivanna River FY 18

No discount factors. Residency reports all sweeping is done within CUA and within Rivanna watershed

Date of Sweeping Event:_____

Authorized By:_____

Mechanical Sweeping						
Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
Interstates		75				
Primary Highways		90				
Secondary (transitional)		57				
Local/Residential Roads		31				
Other Roads**		17				
Ramps		31				
Totals	0			0.00	0.00	0.00

Vacuum-Assisted Sweeping						
Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
Interstates	2.36	75	21.45	16.52	2.57	6972.73
Primary Highways	31	90	338.18	260.40	40.58	109909.09
Secondary (transitional)	120.3	57	831.16	640.00	99.74	270128.18
Local/Residential Roads	39.1	31	146.92	113.13	17.63	47749.39
Other Roads**	0	17	0.00	0.00	0.00	0.00
Ramps	0	31	0.00	0.00	0.00	0.00
Totals	192.76			1030.05	160.53	434759

** Other roads include service, frontage, access etc.

**Widths can be adjusted to capture appropriate area/lanes swept. Do not exceed Maximum Width.

Richmond IMO FY 18

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in York county was calculated. Miles of VDOT maintained roads within the Richmond District: 396 and Miles of VDOT maintained roads within the CUA: 2.3. Ratio applied: 2.3/396 = 0.0059.

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in James county was calculated. Miles of VDOT maintained roads within the Richmond District: 396 and Miles of VDOT maintained roads within the CUA: 183. Ratio applied: 183/396 = 0.46.

Mechanical Sweeping

Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
0		0				
0		0				
0		0				
0		0				
0		0				
0		0				
Totals	0			0.00	0.00	0.00

Vacuum-Assisted Sweeping

Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
0	706.8	10	856.73	660	103	278436
0		10				
0		10				
0		10				
0		10				
0		10				
Totals	706.8		856.73	659.68	102.81	278436.36

Discount factor for James	305	48	128820
Discount factor for York	4	1	1634

	Total (IMO)	York (CUA)	James (CUA)
	395.876843	2.322689	183.15381
Percentage		0.0058672	0.462653508

** Other roads include service, frontage, access etc.

**Widths can be adjusted to capture appropriate area/lanes swept. Do not exceed Maximum Width.

July 2017 thru June 2018						
Tons of Material	Pounds of Material Collected	Dry Weight Ratio (lbs dry/lbs material)	TN Reduction	TP Reduction Ratio (lbs/yr)	TSS Reduction	Discount Factor (MS4)
191	382800	0.7	0.0025	0.001	0.3	

	Total	York (CUA)	James (CUA)
	145.524231	44.0902	48.549656
Weighted		0.3030	0.3336

James

TN Removed	**223**	lbs
TP Removed	**89**	lbs
TSS Removed	**26819**	lbs

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in James county was calculated. Miles of VDOT maintained roads within the Hampton Roads Peninsula District: 145 and Miles of VDOT maintained roads within the CUA: 49. Ratio applied: 49/145 = 0.33.

York

TN Removed	**203**	lbs
TP Removed	**81**	lbs
TSS Removed	**24356**	lbs

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in York county was calculated. Miles of VDOT maintained roads within the Hampton roads Peninsula District: 145 and Miles of VDOT maintained roads within the CUA: 44. Ratio applied: 44/145 = 0.30.

July 1, 2017 - June 30 2018 Sweeping Tonnage Estimate

Date	Dumps	Cubic Yds.	Tonnage	Notes
3/27/2017	5	23.6	15.95	
3/30/2017	4	18.88	12.76	
3/31/2017	6	28.32	19.14	
9/11/2017	4	18.88	12.76	
9/12/2017	3	14.16	9.57	
5/20/2018	4	18.88	12.76	
5/21/2018	6	28.32	19.14	
5/22/2018	5	23.6	15.95	
5/23/2018	5	23.6	15.95	
5/24/2018	4	18.88	12.76	
5/18/2018	3	14.16	9.57	
5/20/2018	3	14.16	9.57	
5/25/2018	5	23.6	15.95	
5/26/2018	3	14.16	9.57	
		283.2	191.4	

July 2017 thru June 2018						
Tons of Material Collected	Pounds of Material Collected	Dry Weight Ratio (lbs dry/lbs material)	TN Reduction Ratio (lbs/yr)	TP Reduction Ratio (lbs/yr)	TSS Reduction Ratio (lbs/yr)	Discount Factor
1895	3789720	0.7	0.0025	0.001	0.3	0.678

	Total	CUA
	467	317
Weighted		0.678

TN Removed	**4499**	lbs
TP Removed	**1800**	lbs
TSS Removed	**539888**	lbs

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in the county was calculated. Miles of VDOT maintained roads within the Hampton Roads Southside Interstate District: 467 and Miles of VDOT maintained roads within the CUA: 317. Ratio applied: 317/467 = 0.678.

Project Name: *Hunts Creek Nutrient Bank 6/7/2018*

Location					**VDOT Project #:**	
Bank Name:	*Hunts Creek Nutrient Bank*	PO #	*50100-0001178812*	River Basin:	*James*	
HUC (if provided):	*020802030101*	Contract #:	*43962*			

BMP Type: *Nutrient Credit*

Project Description:

Nutrient credits were purchased on June 6th, 2018. Applies to HUC: 02080203, 02080204, 02080205, 02080207.

Qualifying Criteria:		**Affidavit and/or Supporting Documents:**	
Were the credits purchased and retired for Chesapeake Bay TMDL Purpose	*Yes*	Affidavit/Supporting Documents available? (Y/N)	Y
Are the credits Perpetual Nutrient Credits (not term	*Yes*	Please include as attachments	
Has the transaction been completed	*Yes*		

Estimated Credit	TN	TP	TSS
lbs/yr	50.61	15.12	

Discussion

Sediment offsets to be determined per July 1. 2016 Virginia State Regulations, HB-438.

Purchase Date:	*6/7/2018*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(804) 371-6834*

EXHIBIT A

AFFIDAVIT OF NUTRIENT CREDITS

I, Ronald Pembelton, certify that I am now, and at all times mentioned herein have been, the Manager of R&J Investment, LC, a Virginia limited liability company (the "Company"), which is the owner of the Hunts Creek Nutrient Bank located in Buckingham County, Virginia, and as such I hereby certify the following:

1) Pursuant to that certain Contract #43962 ("The Contract") and Purchase Order #50100-0001178812 (Purchase Order), between Company (as Seller), and The Commonwealth of Virginia, Department of Transportation, ("Acquirer"), the Company , for the benefit of the Acquirer, agree to sell 15.12 pounds of phosphorus offsets, a pending number of sediment offset credits/pounds(July 1, 2016 Virginia State Regulations, HB-438), and retire 50.61 pounds of nitrogen (representing the ratio of nitrogen offsets to the phosphorus offsets at the offset generating facility) offsets to Acquirer;

2) The Company and the Acquirer will closed the transaction contemplated by the Agreement on June 6, 2018, (the "Closing Date") and, as of the date hereof, the Company shall reserve for Acquirer the phosphorus credits.

The execution and delivery of this Affidavit has been duly authorized and is not in violation of the Operating Agreement of the Company or any other agreement, document or obligation to which the Company is bound.

IN WITNESS WHEREOF, I have duly executed this Affidavit as of the 7 day of June, 2018.

R&J Investment, LC,
a Virginia limited liability company

By: _____
Name: Ronald Pembelton
Title: Manager

COMMONWEALTH OF VIRGINIA,

~~City~~/County of Amelia, to-wit:

Sworn to and subscribed before me this 7 day of June, 2018, the undersigned Notary Public for and in the jurisdiction aforesaid, by Ronald Pembelton, the Manager of R&J Investment, LC, a Virginia limited liability company.

_____
Notary Public

ELIZABETH POWELL MUH
NOTARY PUBLIC
REG # 291762
MY COMMISSION EXPIRES
8/31/2020
COMMONWEALTH OF VIRGINIA

My commission expires: 08/31/2020.
Registration No.: 291762

Acquirer: The Commonwealth of Virginia, Department of Transportation

VDOT Project#: "VDOT Chesapeake Bay TMDL Action Plan – James River Watershed"

District: _____

HUC: 02080203, 02080204, 02080205, 02080207

Phosphorus offsets: 15.12

Nitrogen offsets: 50.61

Sediment offsets: To Be Determined per July 1, 2016 Virginia State Regulations, HB-438

EXHIBIT B

BILL OF SALE

THIS BILL OF SALE is made as of the 7 day of June, 2018, by R&J Investment, LC, a Virginia limited liability company ("Seller") and The Commonwealth of Virginia, Department of Transportation, ("Purchaser").

Seller and Purchaser have entered into that certain Agreement for Purchase and Sale of Nutrient Offset Credits dated June 6, 2018, (the "Purchase Agreement"), the terms of which are incorporated herein by reference and made a part hereof, with respect to the sale by Seller and the purchase by Purchaser of nutrient offset credits generated by Seller's Hunts Creek Nutrient Bank located in Buckingham County, Virginia.

In consideration of the payment of the Purchase Price $145,136.88 and (as defined in the Purchase Agreement) and other good and valuable consideration, the receipt and sufficiency of which are mutually acknowledged, Seller hereby sells, transfers, assigns, conveys, delivers, and sets over to Purchaser, its successors or assigns the following nutrient offset credits (as defined in the Purchase Agreement):

Phosphorus: 15.12 lbs. and

Nitrogen: 50.61 lbs.

Sediment: Pending July1, 2016 Virginia State Regulations, HB-438

WITNESS the following authorized signature:

R&J Investment, LC,
a Virginia limited liability company

By: _____
Name: Ronald Pembelton
Title: Manager

Project Name: *Namozine Nutrient Bank 6/7/2018*

Location					**VDOT Project #:**	
Bank Name:	*Namozine Nutrient Bank*	PO #	*50100-0001178812*	River Basin:	*James*	
HUC (if provided):	*020802030101*	Contract #:	*43962*			

BMP Type: *Nutrient Credit*

Project Description:

Nutrient Credits purchased on June 6, 2018. Applies to HUC: 02080203, 02080205, 02080206, 02080207.

Qualifying Criteria:		**Affidavit and/or Supporting Documents:**	
Were the credits purchased and retired for Chesapeake Bay TMDL Purpose	*Yes*	Affidavit/Supporting Documents available? (Y/N)	Y
Are the credits Perpetual Nutrient Credits (not term	*Yes*	Please include as attachments	
Has the transaction been completed	*Yes*		

Estimated Credit	TN	TP	TSS
lbs/yr	3.01	0.90	

Discussion

Sediment offsets to be determined per July, 1 2016 Virginia State Regulations, HB-438.

Purchase Date:	*6/7/2018*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(804) 371-6834*

EXHIBIT A

AFFIDAVIT OF NUTRIENT CREDITS

I, Ronald Pembelton, certify that I am now, and at all times mentioned herein have been, the Manager of R&J Investment, LC, a Virginia limited liability company (the "Company"), which is the owner of the Namozine Nutrient Bank located in Amelia County, Virginia, and as such I hereby certify the following:

1) Pursuant to that certain Contract #43962 ("The Contract") and Purchase Order #50100-0001178812 (Purchase Order), between Company (as Seller), and The Commonwealth of Virginia, Department of Transportation, ("Acquirer"), the Company , for the benefit of the Acquirer, agree to sell 0.90 pounds of phosphorus offsets, a pending number of sediment offset credits/pounds(July 1, 2016 Virginia State Regulations, HB-438), and retire 3.01 pounds of nitrogen (representing the ratio of nitrogen offsets to the phosphorus offsets at the offset generating facility) offsets to Acquirer;

2) The Company and the Acquirer will closed the transaction contemplated by the Agreement on June 6, 2018, (the "Closing Date") and, as of the date hereof, the Company shall reserve for Acquirer the phosphorus credits.

The execution and delivery of this Affidavit has been duly authorized and is not in violation of the Operating Agreement of the Company or any other agreement, document or obligation to which the Company is bound.

IN WITNESS WHEREOF, I have duly executed this Affidavit as of the 7 day of June, 2018.

R&J Investment, LC,
a Virginia limited liability company

By: _____
Name: Ronald Pembelton
Title: Manager

COMMONWEALTH OF VIRGINIA,

~~City~~/County of Amelia, to-wit:

Sworn to and subscribed before me this 7 day of June, 2018, the undersigned Notary Public for and in the jurisdiction aforesaid, by Ronald Pembelton, the Manager of R&J Investment, LC, a Virginia limited liability company.

_____
Notary Public

ELIZABETH POWELL MUH NOTARY PUBLIC REG # 291762 MY COMMISSION EXPIRES 8/31/2020 COMMONWEALTH OF VIRGINIA

My commission expires: 08/31/2020
Registration No.: 291762

Acquirer: The Commonwealth of Virginia, Department of Transportation

VDOT Project#: "VDOT Chesapeake Bay TMDL Action Plan – James River Watershed"

District: _____

HUC: 02080203, 02080205, 02080206, 02080207

Phosphorus offsets: 0.90

Nitrogen offsets: 3.01

Sediment offsets: To Be Determined per July 1, 2016 Virginia State Regulations, HB-438

EXHIBIT B

BILL OF SALE

THIS BILL OF SALE is made as of the 7 day of June, 2018, by R&J Investment, LC, a Virginia limited liability company ("Seller") and The Commonwealth of Virginia, Department of Transportation, ("Purchaser").

Seller and Purchaser have entered into that certain Agreement for Purchase and Sale of Nutrient Offset Credits dated June 6, 2018, (the "Purchase Agreement"), the terms of which are incorporated herein by reference and made a part hereof, with respect to the sale by Seller and the purchase by Purchaser of nutrient offset credits generated by Seller's Namozine Nutrient Bank located in Amelia County, Virginia.

In consideration of the payment of the Purchase Price $8,639.10 and (as defined in the Purchase Agreement) and other good and valuable consideration, the receipt and sufficiency of which are mutually acknowledged, Seller hereby sells, transfers, assigns, conveys, delivers, and sets over to Purchaser, its successors or assigns the following nutrient offset credits (as defined in the Purchase Agreement):

Phosphorus: 0.90 lbs. and

Nitrogen: 3.01 lbs.

Sediment: Pending July1, 2016 Virginia State Regulations, HB-438

WITNESS the following authorized signature:

R&J Investment, LC,
a Virginia limited liability company

By: _____
Name: Ronald Pembelton
Title: Manager

Project Name: *Sams Nutrient Bank 6/7/2018 - A*

Location					**VDOT Project #:**	
Bank Name:	*Sams Nutrient Bank*	PO #	*50100-0001178812*	River Basin:	*James*	
HUC (if provided):	*020802030101*	Contract #:	*43962*			

BMP Type: *Nutrient Credit*

Project Description:

Nutrient Credits purchased on June 6th, 2018. Applies to HUC: 02080203, 02080204, 02080206, 02080207.

Qualifying Criteria:		**Affidavit and/or Supporting Documents:**	
Were the credits purchased and retired for Chesapeake Bay TMDL Purpose	*Yes*	Affidavit/Supporting Documents available? (Y/N)	Y
Are the credits Perpetual Nutrient Credits (not term	*Yes*	Please include as attachments	
Has the transaction been completed	*Yes*		

Estimated Credit	TN	TP	TSS
lbs/yr	31.00	6.90	

Discussion

Sediment offsets to be determind per July 1, 2016 Virginia State Regulations, HB-438.

Purchase Date:	*6/7/2018*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(804) 371-6834*

EXHIBIT A

AFFIDAVIT OF NUTRIENT CREDITS

I, Ronald Pembelton, certify that I am now, and at all times mentioned herein have been, the Manager of R&J Investment, LC, a Virginia limited liability company (the "Company"), which is the owner of the Sams Nutrient Bank located in Amelia County, Virginia, and as such I hereby certify the following:

1) Pursuant to that certain Contract #43962 ("The Contract") and Purchase Order #50100-0001178812 (Purchase Order), between Company (as Seller), and The Commonwealth of Virginia, Department of Transportation, ("Acquirer"), the Company , for the benefit of the Acquirer, agree to sell 6.90 pounds of phosphorus offsets, a pending number of sediment offset credits/pounds(July 1, 2016 Virginia State Regulations, HB-438), and retire 31.00 pounds of nitrogen (representing the ratio of nitrogen offsets to the phosphorus offsets at the offset generating facility) offsets to Acquirer;

2) The Company and the Acquirer will closed the transaction contemplated by the Agreement on June 6, 2018, (the "Closing Date") and, as of the date hereof, the Company shall reserve for Acquirer the phosphorus credits.

The execution and delivery of this Affidavit has been duly authorized and is not in violation of the Operating Agreement of the Company or any other agreement, document or obligation to which the Company is bound.

IN WITNESS WHEREOF, I have duly executed this Affidavit as of the 7 day of June, 2018.

R&J Investment, LC,
a Virginia limited liability company

By: _____
Name: Ronald Pembelton
Title: Manager

COMMONWEALTH OF VIRGINIA,

~~City/~~County of Amelia, to-wit:

Sworn to and subscribed before me this 7 day of June, 2018, the undersigned Notary Public for and in the jurisdiction aforesaid, by Ronald Pembelton, the Manager of R&J Investment, LC, a Virginia limited liability company.

_____
Notary Public

ELIZABETH POWELL MUH
NOTARY PUBLIC
REG # 291762
MY COMMISSION EXPIRES
8/31/2020
COMMONWEALTH OF VIRGINIA

My commission expires: 08/31/2020
Registration No.: 291762

Acquirer: The Commonwealth of Virginia, Department of Transportation

VDOT Project#: "VDOT Chesapeake Bay TMDL Action Plan – James River Watershed"

District: _____

HUC: 02080203, 02080205, 02080206, 02080207

Phosphorus offsets: 6.90

Nitrogen offsets: 31.00

Sediment offsets: To Be Determined per July 1, 2016 Virginia State Regulations, HB-438

EXHIBIT B

BILL OF SALE

THIS BILL OF SALE is made as of the 7 day of June, 2018, by R&J Investment, LC, a Virginia limited liability company ("Seller") and The Commonwealth of Virginia, Department of Transportation, ("Purchaser").

Seller and Purchaser have entered into that certain Agreement for Purchase and Sale of Nutrient Offset Credits dated June 6, 2018, (the "Purchase Agreement"), the terms of which are incorporated herein by reference and made a part hereof, with respect to the sale by Seller and the purchase by Purchaser of nutrient offset credits generated by Seller's Sams Nutrient Bank located in Amelia County, Virginia.

In consideration of the payment of the Purchase Price $66,233.10 and (as defined in the Purchase Agreement) and other good and valuable consideration, the receipt and sufficiency of which are mutually acknowledged, Seller hereby sells, transfers, assigns, conveys, delivers, and sets over to Purchaser, its successors or assigns the following nutrient offset credits (as defined in the Purchase Agreement):

Phosphorus: 6.90 lbs. and

Nitrogen: 31.00 lbs.

Sediment: Pending July1, 2016 Virginia State Regulations, HB-438

WITNESS the following authorized signature:

R&J Investment, LC,
a Virginia limited liability company

By: _____
Name: Ronald Pembelton
Title: Manager

Project Name: *Skiffes Upland Dry Swale*

Location — **UPC Code or BMP ID:** *0*

Geographic (County/City):	*James City*	District:	*Hampton Roads*	Residency:	*Williamsburg*	River Basin:	*James*
Inside Year 2000 Urbanized Area? (Y/N)	*No*	Latitude:	*37.215*	Longitude:	*-76.599*		

BMP Type: *Dry Swale*

Project Description:

Nutrient Credit Values provided by VDOT on 8/29/2018. Other information (DA's, cost, etc.) will be provided by VDOT at a later time.

Project Drainage Area:

Inside CUA	*Impervious Area (acres):*	*0.00*	*Pervious Area (acres):*	*0.00*
Outside CUA	*Impervious Area (acres):*	*0.00*	*Pervious Area (acres):*	*0.00*
			BMP runoff storage (acres feet)	*0.00*

Qualifying Criteria:

Does the BMP meet the design standards and specs in the Virginia Stormwater BMP Clearinghouse? *No*

Method for Crediting

None

Estimated Credit	TN	TP	TSS
lbs/yr	5.85	0.77	380.00

Discussion

Nutrient Credit Values provided by VDOT on 8/29/2018. Other information (DA's, cost, etc.) will be provided by VDOT at a later time.

Implementation Date	*1/1/2018*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(804) 371-6834*

Photos, Plans and/or Project graphics

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) N

Please include as attachments

Project Name: *VDOT Richmond District Level Spreader*

Location **UPC Code or BMP ID:** *0*

Geographic (County/City):	*Chesterfield*	District:	*Richmond*	Residency:		River Basin:	*James*
Inside Year 2000 Urbanized Area? (Y/N)	*Yes*	Latitude:	*37.291*	Longitude:	*-77.401*		

BMP Type: *Level Spreader*

Project Description:

Angler Environmental prepared a design for the construction of a level spreader to retrofit an existing 15" stormwater outfall that was draining uncontrolled into an open vegetated area. The plan included stabilization of an approximately 60-foot eroding earthen channel and a level spreader specified per DEQ requirements, using the Henrico County design standard for an energy dissipator.

Project Drainage Area:

Inside CUA	*Impervious Area (acres):*	*2.04*	*Pervious Area (acres):*	*1.64*
Outside CUA	*Impervious Area (acres):*	*0.00*	*Pervious Area (acres):*	*0.00*
			BMP runoff storage (acres feet)	*0.00*

Qualifying Criteria:

Does the BMP meet the design standards and specs in the Virginia Stormwater BMP Clearinghouse? *No*

Method for Crediting

None

Estimated Credit	TN	TP	TSS
lbs/yr	26.69	3.74	1,160.00

Discussion

Credit for pollutant load reduction was calculated using the Virginia Runoff reduction Method spreadsheet, based on the stormwater best management practice of sheetflow to a vegetated filter strip. This BMP was reported in 2017, but additional credit was achieved by converting the original vegetated filter strip to a forested conservation area.

Implementation Date	*7/27/2017*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(804) 371-6834*

Photos, Plans and/or Project graphics

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) Y

Please include as attachments

Potomac River Basin

	Reductions			
	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	
Redevelopment				
Gloucester Parkway (104418)	1.38	4.45	618.22	<--Previously reported in 2016 MS4 Annual Report
Stream Restoration and Stabilization				
Harrisonburg Stream Restoration	96.64	103.99	36680.00	<--Previously reported in 2016 MS4 Annual Report
Harrisonburg Stream Restoration-Protocol 3		136.70		**<--FY 2018 New (additional protocol credit being reported)**
Outfall and Channel Stabilization	0.00	0.00	0.00	
Historical BMPs	45.00	569.00	90783.00	<--Previously reported in 2016 MS4 Annual Report
Forest Buffers				
Harrisonburg Land Cover Conversion	0.10	12.50	436.00	<--Previously reported in 2017 MS4 Annual Report
Land Cover Conversion				
Harrisonburg Land Cover Conversion	8.41	158.45	2942.40	<--Previously reported in 2017 MS4 Annual Report
Street Sweeping and Catch Basin Cleanout	**2,108.00**	**5,916.00**	**1,029,226.00**	**<--Additional street sweeping data still be collected**
Nutrient Credit Purchase				
Edgecliff Bank (1/31/17)	112.00	832.16	0.00	<--Previously reported in 2017 MS4 Annual Report
CBAY-VA LLC (11/15/2017)	**150.00**	**1114.50**	**0.00**	**<--FY 2018 New**
Incidental Retrofits	0.00	0.00	0.00	
Structural BMP Enhancement and Retrofit	0.00	0.00	0.00	
Total Credit Reported	2521.53	8847.75	1160685.62	
Reduction Requirement (Special Condition D1- 5%)	359.00	2395.00	315811.00	
% Complete to date (Special Condition D1- 5%)	702.38%	369.43%	367.53%	

Project Name: *Dry Fork at Harrisonburg Residency*

Location **UPC Code or BMP ID:** *0*

Geographic (County/City):	*Harrisonburg*	District:	*Staunton*	Residency:		River Basin:	*Potomac*
Inside Year 2000 Urbanized Area? (Y/N)	*Yes*	Latitude:	*38.478*	Longitude:	*-78.814*	Coastal/ Non-Coastal:	*Non-Coastal*

BMP Type: *Stream Restoration*

Project Description:

Dry Fork Restoration project with support from NFWF grant. Occurred on Harrisonburg Residency property. Natural Channel Stream Design principles were used to alleviate unstable conditions on the north segment of the stream. Credited using Protocol 1 in 2016 and updated to include Protocol 2 in 2018. Land cover conversion also being done at this project site.

Project Drainage Area:

Inside CUA	*Impervious Area (ac.)*	*138.00*	*Pervious Area (ac.)*	*568.00*			
Outside CUA	*Impervious Area (ac.)*	*151*	*Pervious Area (ac.)*	*3218*	*Forested Area (ac.)*	*1,092.00*	

Existing Conditions Proposed Improvements:

Compensatory? (Y/N)	*N*	Onsite stream relocation? (Y/N)	*N*
Condition of Existing Stream			
Proposed Stream Designed using Natural Channel priniciples? (Y/N)	*Y*		
Linear Feet Restored (centerline)	*1,954.00*	Existing Avg Bank Height Restored (ft)	
Method of Stabilization:	*Protocol 1, Protocol 2*	Existing Avg Channel Top Width (ft)	

Qualifying Conditions:

Project primarily designed to protect public infrastructure by bank armoring or rip rap? (Y/N)	N
Stream Reach > 100 L.F.? (Y/N) Y — Existing stream still actively enlarging or degrading? (Y/N)	N
Project utilizing comprehensive approach to SR addressing long term stability of channels, banks, and floodplain? (Y/N)	N
Will project comply with all state and federal permitting requirements, including 404 and 401 permits?	N
Project proposed for sole purpose of receiving nutrient or sediment reduction?	N
Will project have a designated authority responsible for routine maintenance and long term repairs?	N

Method of Estimating Bank Erosion

1.) Measured in-field pre-restoration	N	2.) BANCS Method	N	3.) Interim Rate	N

Protocols applied: Protocol 1, Protocol 2

Estimated Credit	TN	TP	TSS		
lbs/yr	240.69	96.64	36,680.00	*SDR applied? (Y/N)	

Discussion

Nitrogen Credit for Protocol 2 is being claimed in FY 2018 MS4 Annual Report (136.7 lb/yr).
Cost does not reflect input from NFWF. Reduction for monitoring (50%) taken.

Est. Implementation Date:	*9/1/2015*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*804-371-6834*

Photos, Plans and/or Project graphics

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) Y

Please include as attachments

Date	Project Location	Where material originated from and Activity	Tons	Disposal Site (see list below)
Aug-17	Woodrow Wilson Bridge	**Sweeping**	39	Alexandria Waste Recovery
Oct-17	Woodrow Wilson Bridge	**Sweeping**	39	Alexandria Waste Recovery
Mar-18	Woodrow Wilson Bridge	**Sweeping**	35	Alexandria Waste Recovery
Jul-17	I-95/I-395	**Sweeping**	65	Potomac Landfill
Sep-17	I-95/I-395	**Sweeping**	46	Potomac Landfill
Oct-17	I-95/I-395	**Sweeping**	131	Potomac Landfill
Nov-17	I-95/I-395	**Sweeping**	87	Potomac Landfill
Feb-18	I-95/I-395	**Sweeping**	30	Potomac Landfill
May-18	I-95/I-395	**Sweeping**	25	Potomac Landfill
Jul-17	I-66	**Sweeping**	37	Broad Run
Aug-17	I-66	**Sweeping**	103	Broad Run
Sep-17	I-66	**Sweeping**	20	Broad Run
Oct-17	I-66	**Sweeping**	7	Broad Run
Feb-18	I-66	**Sweeping**	1	Broad Run
Mar-18	I-66	**Sweeping**	33	Broad Run
Apr-18	I-66	**Sweeping**	51	Broad Run
May-18	I-66	**Sweeping**	11	Broad Run
Oct-17	I-495	**Sweeping**	20.3	Potomac Landfill
Nov-17	I-495	**Sweeping**	12.5	Potomac Landfill
Dec-17	I-495	**Sweeping**	118.7	Potomac Landfill
Mar-18	I-495	**Sweeping**	31	Potomac Landfill
Mar-18	Arlington Primaries	**Sweeping**	12.50	
May-18	Arlington Primaries	**Sweeping**	7.6	
Jun-18	Arlington Primaries	**Sweeping**	11.3	

July 2017 thru June 2018

Tons of Material Collected	Pounds of Material Collected	Dry Weight Ratio (lbs dry/lbs material)	TN Reduction Ratio (lbs/yr)	TP Reduction Ratio (lbs/yr)	TSS Reduction Ratio (lbs/yr)	
974	1947800	0.7	0.0025	0.001	0.3	

For Ches Bay

TN Removed	**3319**	lbs
TP Removed	**1328**	lbs
TSS Removed	**398250**	lbs

A discount factor of 0.9736 was used to account for areas outside of the CUA

Length of NOVA CUA Interstates	869.415887 miles
Length of NOVA Interstates	892.965994 miles
Discount Factor	0.97363

Staunton District FY 18

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in the county was calculated. Miles of VDOT maintained roads within the Staunton District: 11,425 and Miles of VDOT maintained roads within the Potomac CUA: 1,150. Ratio applied: 1,150/11,425 = 0.10

Mechanical Sweeping						
Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
Interstates		10				
Primary Highways		10				
Secondary (transitional)		10				
Local/Residential Roads		10				
Other Roads**		10				
Ramps		10				
Totals	0			0.00	0.00	0.00

Vacuum-Assisted Sweeping						
Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
Interstates	912.29	10	1105.81	851	133	359387
Primary Highways		10				
Secondary (transitional)		10				
Local/Residential Roads		10				
Other Roads**		10				
Ramps		10				
Totals	912.29		1105.81	851.47	132.70	359386.97
Discount factor for Potomac				86	13	36172

** Other roads include service, frontage, access etc.

**Widths can be adjusted to capture appropriate area/lanes swept. Do not exceed Maximum Width.

Bull Run- Manassas AHQ FY 18

[f] Data collected from Manassas AHQ reflect street sweeping done in FY2018. Data does not represent street sweeping done within the CUA or watershed, so it was assumed to have been performed county-wide.

[g] To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in the county was calculated. For Ches Bay, ratio of CUA 0.82 was used to calculate credits

Prince William VDOT DCR Sweeping Report April-June

Date	County	Where material originated from and Activity	Quantity (# of Loads x	Tons	Disposal Site (see list below)
5/15/2018	Prince William	ManassasHdqts.Rte:663	10	13.5	Prince William Landfill
5/16/2018	Prince William	ManassasHdqts.Rte:612	10	13.5	Prince William Landfill
5/21/2018	Prince William	ManassasHdqts.Rte:234	20	27	Prince William Landfill
6/1/2018	Prince William	ManassasHdqts.Rte:1530	10	13.5	Prince William Landfill
6/5/2018	Prince William	ManassasHdqts.Rte:234	20	27	Prince William Landfill
6/27/2018	Prince William	ManassasHdqts.Rte:28	10	13.5	Prince William Landfill
6/27/2018	Prince William	ManassasHdqts.Rte:lot	40	54	Prince William Landfill
6/19/2018	Prince William	Lake Ridge Hdqts. Rte: 123	10	13.5	Prince William Landfill
6/26/2018	Prince William	Lake Ridge Hdqts. Rte:2000	10	13.5	Prince William Landfill
6/29/2018	Prince William	Lake Ridge Hdqts. Rte:784	10	13.5	Prince William Landfill
5/25/2018	Prince William	Gainesville Hdqts. Rte:1566	40	54	Prince William Landfill
5/29/2018	Prince William	Gainesville Hdqts. Rte:5300	80	108	Prince William Landfill
6/19/2018	Prince William	Gainesville Hdqts. Rte:1566	40	54	Prince William Landfill
6/29/2018	Prince William	Gainesville Hdqts. Rte: 619	40	54	Prince William Landfill

Sites

July 2017 thru June 2018

Tons of Material Collected	Pounds of Material Collected	Dry Weight Ratio (lbs dry/lbs material)	TN Reduction Ratio (lbs/yr)	TP Reduction Ratio (lbs/yr)	TSS Reduction Ratio (lbs/yr)	
473	945000	0.7	0.0025	0.001	0.3	

For Ches Bay, discounted by 0.82 to account for roads not in the CUA

TN Removed	**1363**	lbs
TP Removed	**545**	lbs
TSS Removed	**163536**	lbs

For Bull Run, discounted by 0.16 (Manassas residency is 230960, Bull Run CUA in Manassas Residency is 20919)

TN Removed	**269**	lbs
TP Removed	**107**	lbs
TSS Removed	**32228**	lbs

Chesepeake Bay Discount

Length of Roads in Ma	1849.131061	miles
Length of Roads in Ma	2243.90384	miles
Discount Factor	0.82	

Bull Run Discount

Length of Roads in Ma	364.408905	miles
Length of roads in Ma	2243.90384	miles
Discount Factor	0.16	

July 2017 thru June 2018							
Tons of Material Collected	Pounds of Material Collected	Dry Weight Ratio (lbs dry/lbs material)	TN Reduction Ratio (lbs/yr)	TP Reduction Ratio (lbs/yr)	TSS Reduction Ratio (lbs/yr)	Discount Factor (MS4)	Discount Factor (Bull Run)
100	200000	0.7	0.0025	0.001	0.3	0.51	0.06

	Total	CUA	Bull
	2542.514	1288.356	156.7476
Weighted		0.51	0.06

MS4

TN Removed	**177**	lbs
TP Removed	**71**	lbs
TSS Removed	**21282**	lbs

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in the county was calculated. Miles of VDOT maintained roads within the Loundon County District: 2542 and Miles of VDOT maintained roads within the CUA: 1288. Ratio applied: 1288/2542 = 0.51.

Bull Run Watershed

TN Removed	**22**	lbs
TP Removed	**9**	lbs
TSS Removed	**2589**	lbs

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in the county was calculated. Miles of VDOT maintained roads within the Loundon County District: 2542 and Miles of VDOT maintained roads within the CUA: 1288. Ratio applied: 157/2542 = 0.06.

Bull Run- Fairfax Residency 2018

Most of Fairfax is CUA- reduction not necessary for Bay.

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in the county was calculated. Miles of VDOT maintained roads within the Fairfax Residency: 5,622 and Miles of VDOT maintained roads within the Bull Run CUA: 686. Ratio applied: 686/5,622 = 0.12

Mechanical Sweeping						
Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
0		0				
0		0				
0		0				
0		0				
0		0				
0		0				
Totals	0			0.00	0.00	0.00

Vacuum-Assisted Sweeping						
Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
0	0	10	0	0.00	0.00	0.00
0	342.5	10	415.15	319.67	49.82	134924.24
0	540.23	10	654.82	504.21	78.58	212817.88
0	136	10	164.85	126.93	19.78	53575.76
0	15	10	18.18	14.00	2.18	5909.09
0	7	10	8.48	6.53	1.02	2757.58
Totals	1040.73		1261.49	971.35	151.38	409984.55

Discount for Bull Run Watershed	119	18	50043

** Other roads include service, frontage, access etc.

**Widths can be adjusted to capture appropriate area/lanes swept. Do not exceed Maximum Width.

Bull Run Discount		
Length of Roads in Fairfa:	686.251	miles
Length of Fairfax Res	5622.21	miles
Discount Factor	0.12	

Project Name: *Wancopin Nutrient Credit*

Location				**VDOT Project #:**	
Bank Name:	*CBAY-VA LLC*	PO #		River Basin:	*Potomac*
HUC (if provided):	*020700080505*	Contract #:	*45206*		

BMP Type: *Nutrient Credit*

Project Description:

Transer of 150 pounds of non-point source phosphorus credits to VDOT.

Qualifying Criteria:		**Affidavit and/or Supporting Documents:**	
Were the credits purchased and retired for Chesapeake Bay TMDL Purpose	*Yes*	Affidavit/Supporting Documents available? (Y/N)	N
Are the credits Perpetual Nutrient Credits (not term	*No*	Please include as attachments	
Has the transaction been completed	*Yes*		

Estimated Credit	TN	TP	TSS
lbs/yr	1,114.50	150.00	

Discussion

Purchase Date:	*11/15/2017*	**Project Contact Name:**	*Tracey Harmon*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(804) 371-6834*

CBAY-VA LLC

AFFIDAVIT OF TEMPORARY PHOSPHORUS CREDIT TRANSFER

CBAY-VA LLC, a Virginia limited liability company (the "Company"), and wholly owned subsidiary of Resource Environmental Solutions, LLC, ("RES"), hereby certifies the following:

1. Pursuant to that certain **Contract #45206** ("Contract") and **Task Order # 45206-6** ("Purchase Order"), between RES and **The Commonwealth of Virginia, Department of Transportation** ("Purchaser"), the Company, for the benefit of the Purchaser, agrees to transfer **150** pounds of nonpoint source phosphorus credits to Purchaser and reserve the associated ratio of nonpoint source nitrogen and sediment credits at the credit generating facility in the amounts specified below (the "Credits"), subject to the following conditions;

2. The Company shall retire the Credits from the ledger of the credit generating facility for use by the Purchaser toward compliance with the Bay TMDL provisions under its MS4 Permit on an annual basis until such time that an equivalent number of Credits are generated and certified for use by the Purchaser for MS4 compliance from the Wancopin Creek TMDL Stream Restoration Project, as described in the Task Order, at which time the Credits described herein shall automatically revert to Company's bank ledger.

WITNESS the following signature:

CBAY-VA LLC,
a Virginia limited liability company

By: _____
Sam Burley, Authorized Signatory

Date: 11/15/17

Sworn to and subscribed before me this 15th day of November, 2017, by Sam Burley, Authorized Signatory, on behalf of CBAY-VA LLC, a Virginia limited liability company.

My commission expires: 3/17/2020

State of: Texas
City/County of: Harris

MELANIE SNADER
NOTARY PUBLIC
ID# 130587550
State of Texas
Comm. Exp. 03-17-2020

_____
Notary Public

Permit #: Pending
Permittee: The Commonwealth of Virginia, Department of Transportation
Phosphorus Credits: 150 pounds
Nitrogen Reserved: 1,114.50 pounds
TSS Reserved: Pending DEQ Determination
VDOT Contract No: 45206 Task Order 6 (45206-6)

Rappahannock Basin

	Reductions			
	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	
Redevelopment	0.00	0.00	0.00	
Stream Restoration and Stabilization				
Industrial Drive Stream Restoration Project	110.00	475.00	176378.35	<--Previously reported in 2016 MS4 Annual Report
Industrial Drive Stream Restoration-Protocol 3		36.70		**<--FY 2018 New**
Outfall and Channel Stabilization	0.00	0.00	0.00	
Historical BMPs	0.00	0.00	0.00	
Forest Buffers	0.00	0.00	0.00	
Land Cover Conversion	0.00	0.00	0.00	
Street Sweeping and Catch Basin Cleanout	0.00	0.00	0.00	
Nutrient Credit Purchase	0.00	0.00	0.00	
Incidental Retrofits	0.00	0.00	0.00	
Structural BMP Enhancement and Retrofit	0.00	0.00	0.00	
Fredericksburg Filterras (89-062 and 89-063)	1.09	2.92	279.82	<--Previously reported in 2017 MS4 Annual Report
Total Credit Reported	111.09	514.62	176658.17	
Reduction Requirement (Special Condition D1- 5%)	27.00	116.00	9870.00	
% Complete to date (Special Condition D1- 5%)	411.44%	443.64%	1789.85%	

Project Name: *Industrial Drive*

Location **UPC Code or BMP ID:** *4254111*

Geographic (County/City):	*Spotsylvania*	District:	*Fredericksburg*	Residency:	*Fredericksburg*	River Basin:	*Rappahannock*
Inside Year 2000 Urbanized Area? (Y/N)	*Yes*	Latitude:	*38.263*	Longitude:	*-77.501*	Coastal/ Non-Coastal:	*Non-Coastal*

BMP Type: *Stream Restoration*

Project Description:

This project stabilizes 327 L.F. of existing stream channel that was severely eroded and continued to erode at a rapid rate. Vertical stream banks up to 20 feet high existed along with a more than 15 foot vertical headcut along the stream centerline and the headcut continued to migrate upwards.

Project Drainage Area:

Inside CUA	*Impervious Area (ac.)*	*65.27*	*Pervious Area (ac.)*	*21.27*			
Outside CUA	*Impervious Area (ac.)*	*0*	*Pervious Area (ac.)*	*0*	*Forested Area (ac.)*	*0.00*	

Existing Conditions Proposed Improvements:

Compensatory? (Y/N)	*N*	Onsite stream relocation? (Y/N)	*N*
Condition of Existing Stream			
Proposed Stream Designed using Natural Channel priniciples? (Y/N)	*Y*		
Linear Feet Restored (centerline)	*327.00*	Existing Avg Bank Height Restored (ft)	
Method of Stabilization:	*Protocol 1, Protocol 2*	Existing Avg Channel Top Width (ft)	

Qualifying Conditions:

Project primarily designed to protect public infrastructure by bank armoring or rip rap? (Y/N)	N
Stream Reach > 100 L.F.? (Y/N) Y — Existing stream still actively enlarging or degrading? (Y/N)	N
Project utilizing comprehensive approach to SR addressing long term stability of channels, banks, and floodplain? (Y/N)	N
Will project comply with all state and federal permitting requirements, including 404 and 401 permits?	N
Project proposed for sole purpose of receiving nutrient or sediment reduction?	N
Will project have a designated authority responsible for routine maintenance and long term repairs?	N

Method of Estimating Bank Erosion

1.) Measured in-field pre-restoration	N	2.) BANCS Method	N	3.) Interim Rate	N

Protocols applied: Protocol 1, Protocol 2

Estimated Credit	TN	TP	TSS		
lbs/yr	511.70	110.00	176,378.35	*SDR applied? (Y/N)	

Discussion

Bank pins were used- no monitoring discount. Additional Nitrogen Credit is being reported using Protocol 2 for FY 2018 MS4 Annual Report (36.7 additional lb/yr). The proposed improvements included re-aligning the stream channel with adjustments to the

Est. Implementation Date:	*6/1/2016*	**Project Contact Name:**	*Robert Condrey*
Project Completed:	*Yes*	**Contact Information (email/phone):**	*(804) 840-8095*

Photos, Plans and/or Project graphics

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) Y

Please include as attachments

York River Basin

	Reductions			
	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	
Redevelopment				
Lakeside (UPC 13714)	3.63	15.91	1467.60	<--Previously reported in 2016 MS4 Annual Report
Rt. 17 (UPC 60843)	15.50	46.14	7355.04	<--Previously reported in 2016 MS4 Annual Report
Stream Restoration and Stabilization	0.00	0.00	0.00	
Outfall and Channel Stabilization				
Stonehouse Road (UPC 103332)	1.71	1.88	379.68	<--Previously reported in 2017 MS4 Annual Report
Route 199 (UPC 106844)	5.44	6.00	1210.40	<--Previously reported in 2017 MS4 Annual Report
Pasture Circle (UPC 106845)	0.71	0.78	157.62	<--Previously reported in 2017 MS4 Annual Report
Historical BMPs	9.00	55.00	2631.00	<--Previously reported in 2016 MS4 Annual Report
Forest Buffers	0.00	0.00	0.00	
Land Cover Conversion	0.00	0.00	0.00	
Street Sweeping and Catch Basin Cleanout	**82.00**	**207.00**	**25,989.00**	**<--FY 2018 New (updated 8/24/2018)**
Nutrient Credit Purchase	0.00	0.00	0.00	
Incidental Retrofits	0.00	0.00	0.00	
Structural BMP Enhancement and Retrofit	0.00	0.00	0.00	
Seaford AHQ MTD	**1.44**	**4.47**	**558.98**	**<--FY 2018 New (updated 8/24/2018)**
Total Credit Reported	119.43	337.18	39749.32	
Reduction Requirement (Special Condition D1- 5%)	35.00	120.00	12849.00	
% Complete to date (Special Condition D1- 5%)	341.23%	280.98%	309.36%	

FY18 street-sweeping

Richmond IMO FY 18

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in York county was calculated. Miles of VDOT maintained roads within the Richmond District: 396 and Miles of VDOT maintained roads within the CUA: 2.3. Ratio applied: 2.3/396 = 0.0059.

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in James county was calculated. Miles of VDOT maintained roads within the Richmond District: 396 and Miles of VDOT maintained roads within the CUA: 183. Ratio applied: 183/396 = 0.46.

Mechanical Sweeping

Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
0		0				
0		0				
0		0				
0		0				
0		0				
0		0				
Totals	0			0.00	0.00	0.00

Vacuum-Assisted Sweeping

Road Type	Miles Swept	Total Width Captured during Sweeping***	Area Swept (Acres)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)
0	706.8	10	856.73	660	103	278436
0		10				
0		10				
0		10				
0		10				
0		10				
Totals	706.8		856.73	659.68	102.81	278436.36

Discount factor for James	305	48	128820
Discount factor for York	4	1	1634

	Total (IMO)	York (CUA)	James (CUA)
	395.876843	2.322689	183.15381
Percentage		0.0058672	0.462653508

** Other roads include service, frontage, access etc.

**Widths can be adjusted to capture appropriate area/lanes swept. Do not exceed Maximum Width.

July 2017 thru June 2018						
Tons of Material	Pounds of Material Collected	Dry Weight Ratio (lbs dry/lbs material)	TN Reduction	TP Reduction Ratio (lbs/yr)	TSS Reduction	Discount Factor (MS4)
191	382800	0.7	0.0025	0.001	0.3	

	Total	York (CUA)	James (CUA)
	145.524231	44.0902	48.549656
Weighted		0.3030	0.3336

James

TN Removed	**223**	lbs
TP Removed	**89**	lbs
TSS Removed	**26819**	lbs

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in James county was calculated. Miles of VDOT maintained roads within the Hampton Roads Peninsula District: 145 and Miles of VDOT maintained roads within the CUA: 49. Ratio applied: 49/145 = 0.33.

York

TN Removed	**203**	lbs
TP Removed	**81**	lbs
TSS Removed	**24356**	lbs

To determine street sweeping performed within CUA and watershed, the ratio of roads within CUA and watershed and all roads in York county was calculated. Miles of VDOT maintained roads within the Hampton roads Peninsula District: 145 and Miles of VDOT maintained roads within the CUA: 44. Ratio applied: 44/145 = 0.30.

July 1, 2017 - June 30 2018 Sweeping Tonnage Estimate

Date	Dumps	Cubic Yds.	Tonnage	Notes
3/27/2017	5	23.6	15.95	
3/30/2017	4	18.88	12.76	
3/31/2017	6	28.32	19.14	
9/11/2017	4	18.88	12.76	
9/12/2017	3	14.16	9.57	
5/20/2018	4	18.88	12.76	
5/21/2018	6	28.32	19.14	
5/22/2018	5	23.6	15.95	
5/23/2018	5	23.6	15.95	
5/24/2018	4	18.88	12.76	
5/18/2018	3	14.16	9.57	
5/20/2018	3	14.16	9.57	
5/25/2018	5	23.6	15.95	
5/26/2018	3	14.16	9.57	
		283.2	191.4	

Project Name: *Seaford AHQ BMP Retrofit*

Location | **UPC Code or BMP ID:** *0*

Geographic (County/City):	*York*	District:	*Hampton Roads*	Residency:	*Williamsburg*	River Basin:	*York*
Inside Year 2000 Urbanized Area? (Y/N)	*Yes*	Latitude:	*37.1849*	Longitude:	*-76.4605*		

BMP Type: *Sediment Basin*

Project Description:

Sediment basin installed at Seaford AHQ with 4' concrete weir, 2:1 side slopes, and 241 cubic yards of excavation.

Project Drainage Area:

Inside CUA	*Impervious Area (acres):*	*1.80*	*Pervious Area (acres):*	*0.00*
Outside CUA	*Impervious Area (acres):*	*0.00*	*Pervious Area (acres):*	*0.00*
			BMP runoff storage (acres feet)	*0.18*

Qualifying Criteria:

Does the BMP meet the design standards and specs in the Virginia Stormwater BMP Clearinghouse? *No*

Method for Crediting

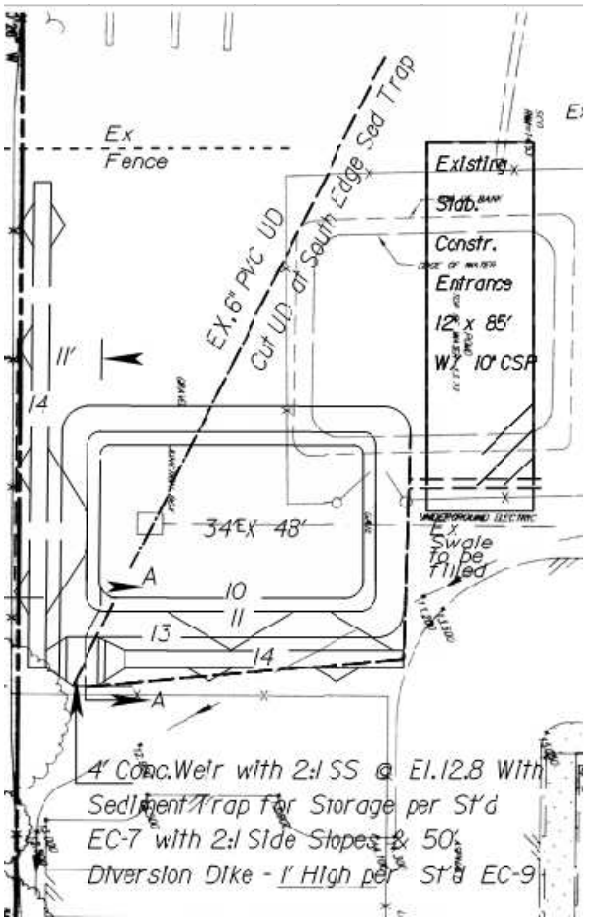
Methodology II - Chesapeake Bay Program Retrofit Curves/Equations

Estimated Credit	TN	TP	TSS
lbs/yr	4.47	1.44	558.98

Discussion

Cost information still being collected by Jeff Hancock.

Photos, Plans and/or Project graphics



Implementation Date *10/1/2017* **Project Contact Name:** *Jeff Hancock*

Project Completed: *Yes* **Contact Information (email/phone):** *(804) 786-4364*

Photos, Plans and/or Project graphics

Plans, Profile sheets available? (Y/N) Y

Please include as attachments

Urban BMP Reporting Spreadsheet

Date Installed	BMP Name	Practice Description	Impervious Acres Treated	Total Acres Treated	Runoff Captured (Ac-ft)	Measurement Unit	Amount Applied
1/31/2018	Lithia Road (James)	Urban Stream Restoration	64.36	8857.54	N/A	linear feet	1436.00
1/31/2018	Lithia Road (James)	Urban Stream Restoration	64.36	8857.54	N/A	lb TP/yr	93.70
1/31/2018	Lithia Road (James)	Urban Stream Restoration	64.36	8857.54	N/A	lb TN/yr	103.3
1/31/2018	Lithia Road (James)	Urban Stream Restoration	64.36	8857.54	N/A	lb TSS/yr	61812.40
12/15/2017	Skiffes Creek (James)	Urban Stream Restoration	8.66	23.5	N/A	linear feet	801.00
12/15/2017	Skiffes Creek (James)	Urban Stream Restoration	8.66	23.5	N/A	lb TP/yr	199.00
12/15/2017	Skiffes Creek (James)	Urban Stream Restoration	8.66	23.5	N/A	lb TN/yr	469.00
12/15/2017	Skiffes Creek (James)	Urban Stream Restoration	8.66	23.5	N/A	lb TSS/yr	23000.00
4/1/2018	Timsbury Creek (James)	Urban Stream Restoration	509	4758	N/A	linear feet	3914.00
4/1/2018	Timsbury Creek (James)	Urban Stream Restoration	509	4758	N/A	lb TP/yr	985.00
4/1/2018	Timsbury Creek (James)	Urban Stream Restoration	509	4758	N/A	lb TN/yr	2700.38
4/1/2018	Timsbury Creek (James)	Urban Stream Restoration	509	4758	N/A	lb TSS/yr	103800.00
9/30/2017	Quarterpath Crossing (James)	Outfall Stabilization	0	3.65	N/A	linear feet	80.00
9/30/2017	Quarterpath Crossing (James)	Outfall Stabilization	0	3.65	N/A	lb TP/yr	5.44
9/30/2017	Quarterpath Crossing (James)	Outfall Stabilization	0	3.65	N/A	lb TN/yr	6.00
9/30/2017	Quarterpath Crossing (James)	Outfall Stabilization	0	3.65	N/A	lb TSS/yr	1210.40
10/1/2017	Seaford AHQ (York)	Infiltration Basin	1.8	0	0.18	Acre (Total Area Treated)	1.80
10/1/2017	Seaford AHQ (York)	Infiltration Basin	1.8	0	0.18	lb TP/yr	1.44
10/1/2017	Seaford AHQ (York)	Infiltration Basin	1.8	0	0.18	lb TN/yr	4.47
10/1/2017	Seaford AHQ (York)	Infiltration Basin	1.8	0	0.18	lb TSS/yr	558.98
6/1/2016	Industrial Drive (Rappahannock)	Urban Stream Restoration	62.27	83.54	N/A	linear feet	327.00
6/1/2016	Industrial Drive (Rappahannock)	Urban Stream Restoration	62.27	83.54	N/A	lb TP/yr	0.00
6/1/2016	Industrial Drive (Rappahannock)	Urban Stream Restoration	62.27	83.54	N/A	lb TN/yr	36.70
6/1/2016	Industrial Drive (Rappahannock)	Urban Stream Restoration	62.27	83.54	N/A	lb TSS/yr	0.00
7/27/2018	RDC Level Spreader (James)	Outfall Stabilization	2.04	3.68	N/A	linear feet	60.00
7/27/2018	RDC Level Spreader (James)	Outfall Stabilization	2.04	3.68	N/A	lb TP/yr	1.25
7/27/2018	RDC Level Spreader (James)	Outfall Stabilization	2.04	3.68	N/A	lb TN/yr	8.89
7/27/2018	RDC Level Spreader (James)	Outfall Stabilization	2.04	3.68	N/A	lb TSS/yr	0.00
7/1/2018	RDC Land Cover Conversion (James)	Land Cover Conversion	0	3.67	N/A	Acre (Total Area Treated)	3.67
7/1/2018	RDC Land Cover Conversion (James)	Land Cover Conversion	0	3.67	N/A	lb TP/yr	1.76
7/1/2018	RDC Land Cover Conversion (James)	Land Cover Conversion	0	3.67	N/A	lb TN/yr	18.46
7/1/2018	RDC Land Cover Conversion (James)	Land Cover Conversion	0	3.67	N/A	lb TSS/yr	212.20
9/1/2015	Dry Fork Additional Credit (Potomac)	Urban Stream Restoration	138	4750	N/A	linear feet	1954.00
9/1/2015	Dry Fork Additional Credit (Potomac)	Urban Stream Restoration	138	4750	N/A	lb TP/yr	0.00
9/1/2015	Dry Fork Additional Credit (Potomac)	Urban Stream Restoration	138	4750	N/A	lb TN/yr	136.70
9/1/2015	Dry Fork Additional Credit (Potomac)	Urban Stream Restoration	138	4750	N/A	lb TSS/yr	0.00
1/1/2018	Street Sweeping (York)	Street Sweeping	N/A	N/A	N/A		
1/1/2018	Street Sweeping (York)	Street Sweeping	N/A	N/A	N/A	lb TP/yr	82.00
1/1/2018	Street Sweeping (York)	Street Sweeping	N/A	N/A	N/A	lb TN/yr	207.00
1/1/2018	Street Sweeping (York)	Street Sweeping	N/A	N/A	N/A	lb TSS/yr	25989.00

Latitude	Longitude	HUC12	State FIPS	Lifespan	Inspect Date	Maint Date	Contact Name	Contact Phone	Contact Email	NOTES
37.487	-79.74			5	1/31/2018		Chris Swanson	804-786-6839	chris.swanson@vdot.virginia.gov	
37.487	-79.74			5	1/31/2018		Chris Swanson	804-786-6840	chris.swanson@vdot.virginia.gov	
37.487	-79.74			5	1/31/2018		Chris Swanson	804-786-6841	chris.swanson@vdot.virginia.gov	
37.487	-79.74			5	1/31/2018		Chris Swanson	804-786-6842	chris.swanson@vdot.virginia.gov	
37.215	-76.599			5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.215	-76.599			5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.215	-76.599			5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.215	-76.599			5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.291	-77.401			5	4/1/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.291	-77.401			5	4/1/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.291	-77.401			5	4/1/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.291	-77.401			5	4/1/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.248221	-76.687225			5	9/30/2017		Jennifer Dail	(757) 925-2543	jennifer.dail@vdot.virginia.gov	
37.248221	-76.687225			5	9/30/2017		Jennifer Dail	(757) 925-2544	jennifer.dail@vdot.virginia.gov	
37.248221	-76.687225			5	9/30/2017		Jennifer Dail	(757) 925-2545	jennifer.dail@vdot.virginia.gov	
37.248221	-76.687225			5	9/30/2017		Jennifer Dail	(757) 925-2546	jennifer.dail@vdot.virginia.gov	
37.1849	-76.4605			5	10/1/2017		Jeff Hancock	(540) 372-3573	jeff.hancock@vdot.virginia.gov	Sediment Basin
37.1849	-76.4605			5	10/1/2017		Jeff Hancock	(540) 372-3573	jeff.hancock@vdot.virginia.gov	Sediment Basin
37.1849	-76.4605			5	10/1/2017		Jeff Hancock	(540) 372-3573	jeff.hancock@vdot.virginia.gov	Sediment Basin
37.1849	-76.4605			5	10/1/2017		Jeff Hancock	(540) 372-3573	jeff.hancock@vdot.virginia.gov	Sediment Basin
38.263	-77.501			5	6/1/2016		Robert Condrey	(804) 840-8095	robert.condrey@vdot.virginia.gov	ONLY ADDITIONAL CREDIT
38.263	-77.501			5	6/1/2016		Robert Condrey	(804) 840-8096	robert.condrey@vdot.virginia.gov	ONLY ADDITIONAL CREDIT
38.263	-77.501			5	6/1/2016		Robert Condrey	(804) 840-8097	robert.condrey@vdot.virginia.gov	ONLY ADDITIONAL CREDIT
38.263	-77.501			5	6/1/2016		Robert Condrey	(804) 840-8098	robert.condrey@vdot.virginia.gov	ONLY ADDITIONAL CREDIT
37.291	-77.401			5	7/27/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	ONLY ADDITIONAL CREDIT
37.291	-77.401			5	7/27/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	ONLY ADDITIONAL CREDIT
37.291	-77.401			5	7/27/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	ONLY ADDITIONAL CREDIT
37.291	-77.401			5	7/27/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	ONLY ADDITIONAL CREDIT
37.291	-77.401			5	7/1/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.291	-77.401			5	7/1/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.291	-77.401			5	7/1/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
37.291	-77.401			5	7/1/2018		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
38.478	-78.814			5	9/1/2015		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	ONLY ADDITIONAL CREDIT
38.478	-78.814			5	9/1/2015		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	ONLY ADDITIONAL CREDIT
38.478	-78.814			5	9/1/2015		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	ONLY ADDITIONAL CREDIT
38.478	-78.814			5	9/1/2015		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	ONLY ADDITIONAL CREDIT
N/A	N/A			N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
N/A	N/A			N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
N/A	N/A			N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	
N/A	N/A			N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov	

NUTRIENT CREDITS NOT INCLUDED (No Applicable CBPO BMP in reporting template)
HISTORICAL BMPs NOT INCLUDED (Previously reported to DEQ)

1/1/2018	Street Sweeping (James)	Street Sweeping	N/A	N/A	N/A		
1/1/2018	Street Sweeping (James)	Street Sweeping	N/A	N/A	N/A	lb TP/yr	2097.00
1/1/2018	Street Sweeping (James)	Street Sweeping	N/A	N/A	N/A	lb TN/yr	6058.00
1/1/2018	Street Sweeping (James)	Street Sweeping	N/A	N/A	N/A	lb TSS/yr	1130286.00
1/1/2018	Street Sweeping (Potomac)	Street Sweeping	N/A	N/A	N/A		
1/1/2018	Street Sweeping (Potomac)	Street Sweeping	N/A	N/A	N/A	lb TP/yr	2108.00
1/1/2018	Street Sweeping (Potomac)	Street Sweeping	N/A	N/A	N/A	lb TN/yr	5916.00
1/1/2018	Street Sweeping (Potomac)	Street Sweeping	N/A	N/A	N/A	lb TSS/yr	1029226.00
12/15/2017	Skiffes Creek Dry Swale (James)	Dry Swale	0.64	0.82	N/A	linear feet	
12/15/2017	Skiffes Creek Dry Swale (James)	Dry Swale	0.64	0.82	N/A	lb TP/yr	0.77
12/15/2017	Skiffes Creek Dry Swale (James)	Dry Swale	0.64	0.82	N/A	lb TN/yr	5.85
12/15/2017	Skiffes Creek Dry Swale (James)	Dry Swale	0.64	0.82	N/A	lb TSS/yr	380.00
12/15/2017	Skiffes LLC (James)	Land Cover Conversion	0	0.32	N/A		
12/15/2017	Skiffes LLC (James)	Land Cover Conversion	0	0.32	N/A	lb TP/yr	0.15
12/15/2017	Skiffes LLC (James)	Land Cover Conversion	0	0.32	N/A	lb TN/yr	1.61
12/15/2017	Skiffes LLC (James)	Land Cover Conversion	0	0.32	N/A	lb TSS/yr	20.00

NUTRIENT CREDITS NOT INCLUDED (No Applicable CBPO BMP in reporting template)
HISTORICAL BMPs NOT INCLUDED (Previously reported to DEQ)

N/A	N/A	N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
N/A	N/A	N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
N/A	N/A	N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
N/A	N/A	N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
N/A	N/A	N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
N/A	N/A	N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
N/A	N/A	N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
N/A	N/A	N/A	N/A	N/A	Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
37.215	-76.599	5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
37.215	-76.599	5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
37.215	-76.599	5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
37.215	-76.599	5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
37.215	-76.599	5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
37.215	-76.599	5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
37.215	-76.599	5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov
37.215	-76.599	5	12/15/2017		Tracey Harmon	(804) 371-6834	tracey.harmon@VDOT.virginia.gov

NUTRIENT CREDITS NOT INCLUDED (No Applicable CBPO BMP in reporting template)
HISTORICAL BMPs NOT INCLUDED (Previously reported to DEQ)

FY19 Project Implementation Schedule

Project Name	River Basin	Project Description	Estimated Credits
Richmond Outfall Stabilization	James River	1 outfall stabilizations (Harbour Point)	TN: 0.58; TP: 0.52; TSS: 347.8
Proctors Creek	James River	Stream restoration	TN: 100; TP: 46; TSS: 15,916
Richmond District Complex	James River	3 outfall stabilizations; land cover conversion; BMP enhancements	TN: 16; TP: 19; TSS: 12,566
Pike Branch	Potomac River	Stream restoration	TN: 1950; TP: 900
Lake Ridge Area Headquarters	Potomac River	Stream restoration	TN: 29.1; TP 13.4
Slatersville AHQ	James River	Stream restoration	TN: 264.4; TP: 118.0; TSS: 40,764.0
288 BMP retrofit – 20030	James River	Outfall Stabilization	TN: 147.2; TP: 32.5; TSS: 8,894
288 BMP retrofit – 20046	James River	Outfall Stabilization	TN: 140.5; TP: 33.4; TSS: 6,798.7

Appendix G
Local TMDL Action Plan Implementation Summary

Local TMDL Action Plan Implementation Summary

Local TMDL Action Plan	Implementation Summary
Abrams and Opequon Bacteria and Sediment TMDLs	VDOT will address the Abrams Creek Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT will address the Abrams Creek and Opequon Creek Sediment TMDLs by continuing to implement programmatic BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Lower Accotink Creek Bacteria TMDL	VDOT will address the Lower Accotink Creek Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Bull Run Sediment TMDL	VDOT will address the Bull Run Sediment TMDL by continuing to implement programmatic BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT also conducted street sweeping in the Bull Run watershed. 84,860 pounds of sediment were removed from the watershed in FY2017.

Local TMDL Action Plan	Implementation Summary
Chickahominy River and Tributaries Bacteria TMDL	VDOT will address the Chickahominy River and Tributaries Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation.
	No additional BMPs are necessary at this time.
Crab Creek Bacteria and Sediment TMDL	VDOT will address the Crab Creek Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT will address the Crab Creek sediment TMDL by continuing to implement programmatic BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT also conducted street sweeping in the Crab Creek watershed. 25,212 pounds of sediment were removed from the watershed in FY2017.
Difficult Run Bacteria and Sediment TMDL	VDOT will address the Difficult Run Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT will address the Difficult Run sediment TMDL by continuing to implement programmatic BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.

Local TMDL Action Plan	Implementation Summary
Four Mile Run Bacteria TMDL	VDOT will address the Four Mile Run Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Goose Creek Sediment TMDL	VDOT will address the Goose Creek sediment TMDL by continuing to implement programmatic
	BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Hoffler Creek Bacteria TMDL	VDOT will address the Hoffler Creek Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Hunting Creek, Cameron Run, and Holmes Run Bacteria TMDL	VDOT will address the Hunting Creek, Cameron Run, and Holmes Run Bacteria TMDLs by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
James River (City of Lynchburg) Bacteria TMDL	VDOT will address the James River Bacteria TMDL (Lynchburg area) by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.

Local TMDL Action Plan	Implementation Summary
James River (City of Richmond) Bacteria TMDL	VDOT will address the James River Bacteria TMDL (Richmond area) by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A),4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Neabsco Creek Bacteria TMDL	VDOT will address the Neabsco Creek Bacteria TMDL (Richmond area) by continuing to implement programmatic BMPs effective in
	reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B),3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Occoquan River and Tributaries Bacteria TMDL	VDOT will address the Occoquan River Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Popes Head Creek Sediment TMDL	VDOT will address the Popes Head Creek sediment TMDL by continuing to implement programmatic BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B),3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Potomac River PCB TMDL Watershed	VDOT will address the Potomac River PCB TMDL by continuing to implement programmatic BMPs effective in reducing potential PCB discharged from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.

Local TMDL Action Plan	Implementation Summary
Rappahannock River Bacteria TMDL	VDOT will address the Rappahannock River Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. No additional BMPs are necessary at this time.
Rivanna River Bacteria and Sediment TMDL	VDOT will address the Rivanna River Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges
	from VDOT's MS4. Refer to BMPs 11(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT will address the Rivanna River sediment TMDL by continuing to implement programmatic BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT also conducted street sweeping in the Rivanna River watershed. 434,759 pounds of sediment were removed from the watershed in FY2017.

Local TMDL Action Plan	Implementation Summary
Roanoke River Bacteria and Sediment TMDL	VDOT will address the Roanoke River Bacteria TMDL by continuing to implement programmatic BMPs effective in reducing bacteria discharges from VDOT's MS4. Refer to BMPs 1(A), 1(B), 2(C), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT will address the Roanoke River sediment TMDL by continuing to implement programmatic BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation. VDOT also conducted street sweeping in the Roanoke River watershed. 35,473 pounds of sediment were removed from the watershed in FY2017.
Stroubles Creek Sediment TMDL Watershed	VDOT will address the Stroubles Creek sediment TMDL by continuing to implement programmatic BMPs effective in reducing sediment discharges from VDOT's MS4. Refer to BMPs 1(A), 2(A), 2(B), 2(C), 2(D), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 6(A), 6(B), 6(C), 6(D) and SC2(A) for further information on implementation.