



City of Alexandria, Virginia

Municipal Separate Storm Sewer System (MS4) Program Plan



In compliance with Permit No. VAR040057, "General Virginia Pollutant Discharge Elimination System Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems."

Department of Transportation and Environmental Services
2900-B Business Center Drive
Alexandria, VA 22314
703-746-4014

Final June 30, 2015

Revised June 30, 2015

Revised June 30, 2016



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APPENDICES

Appendix A – Special Condition I B: Other Approved TMDL Action Plans

Appendix B – Special Condition I C: Chesapeake Bay TMDL Action Plan

Appendix C – MCM #3: Illicit Discharge Detection and Elimination Documents

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Appendix E – MCM #5: Post-Construction Stormwater Management Documents

Appendix F – MCM #6: Pollution Prevention / Good Housekeeping Documents

CERTIFICATION

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


Name

Deputy Director, T&ES

City of Alexandria

Title

9-30-16

Date

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City of Alexandria, Virginia

MEMORANDUM

DATE: SEPTEMBER 30, 2009

TO: WILLIAM SKRABAK, DIRECTOR, OFFICE OF ENVIRONMENTAL
QUALITY, TRANSPORTATION AND ENVIRONMENTAL SERVICES

FROM: JAMES K. HARTMANN, CITY MANAGER 

SUBJECT: DESIGNATED PERMIT MANAGER FOR THE SMALL MS4 (MUNICIPAL
SEPARATE STORM SEWER SYSTEM) GENERAL PERMIT

The purpose of this memorandum is to designate Director of Office of Environmental Quality ("Director", currently William Skrabak), who has the overall responsibility for environmental matters for the City of Alexandria, as the Permit Manager for the Small MS4 General Permit. As such, the Director is authorized to submit re-application and any reports required by this permit. As part of these submissions, he is also authorized to make any certifications that may be required for such submissions.

C: Mark Jinks, Deputy City Manager, City of Alexandria
Rich Baier, P.E., Director, T&ES
Emily A. Baker, P.E., City Engineer, T&ES

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City of Alexandria

Municipal Separate Storm Sewer System (MS4) Program Plan

A. Introduction

This document represents the City of Alexandria (City) plan to meet the requirements of 9VAC25-890-40 “General VPDES (Virginia Pollutant Discharge Elimination System) Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The City was originally issued on July 8, 2003 and (Permit No. VAR40057). The current five-year permit was re-issued on July 1, 2008 and expires on June 30, 2018. To achieve the required water quality goals, the permit requires the City to control the discharge of pollutants to the maximum extent practicable (MEP) by addressing the following six minimum control measures (MCMs).

Six Minimum Control Measures

1. Public Education and Outreach on Stormwater Impacts	4. Construction Site Stormwater Runoff Control
2. Public Involvement / Participation	5. Post-Construction Stormwater Management
3. Illicit Discharge Detection and Elimination	6. Pollution Prevention/Good Housekeeping for Municipal Operations

While the basic framework has not changed, several permit modifications require significant changes to the City’s stormwater management program. The most challenging condition is the requirement to develop and implement action plans to address pollutants found in the Chesapeake Bay Total Maximum Daily Load (TMDL) and local TMDLs for which the City has a wasteload allocation. (A TMDL establishes the maximum amount of a pollutant that can enter a water body without violating water quality standards.) The TMDL action plans and other required updates become part of the MS4 Program Plan following development and submittal to DEQ. This version of the MS4 Program Plan supersedes the previously dated Program Plans and specifically documents how the City will meet the requirements of its new permit through June 30, 2018.

The permit requires the City to update its Program Plan according to a timetable found in permit Table 1 and specific narrative requirements found in the MS4 permit minimum control measures; with specific items to be completed and implemented annually. For this reason, the Program Plan is a ‘living’ document, with updates due at the end of each Permit Year. The following table provides the schedule of MS4 Program Plan Updates that must be completed by the City throughout the permit cycle. This current version represents all required updates through June 30, 2016 and become effective in the 2016 – 2017 reporting period, or Permit Year 4 (PY4).

Schedule of MS4 Program Plan Updates		
Required Update	Due Date	Program Plan Reference
Public Education and Outreach Plan	June 30, 2014	MCM #1 and BMP 1A – 1C
Illicit Discharge Procedures		MCM #3 and Appendix C
Operator Owned Stormwater Management Inspection Procedures		MCM #5 and Appendix E
Single Family Stormwater Management Criteria		MCM #5 and Appendix E
Stormwater Pollution Prevention Plan (SWPPP) Locations		MCM #6 and BMP 6B
Nutrient Management Plan (NMP) Locations		MCM #6 and BMP 6D
Training Schedule and Program		MCM #6 and BMP 6E
Stormwater Management Compliance and Enforcement	June 30, 2015	MCM #5 and Appendix E
Daily Good Housekeeping Procedures		MCM #6 and BMP 6F
Outfall Map Completed	June 30, 2017	MCM #3 and BMP 3E
Full SWPPP Implementation		MCM #6 and BMP 6B
Full NMP Implementation		MCM #6 and BMP 6Df
TMDL Action Plans	Due Date	Program Plan Reference
Chesapeake Bay TMDL Action Plan	June 30, 2015	Section C and Appendix B
Updated TMDL Action Plans (TMDLs approved before July 2008)		Section B and Appendix A
Other TMDL Action Plans (TMDLs approved July 2008 – June 2013)	June 30, 2016	Section B and Appendix A

A key obligation contained in the permit is the requirement to submit an Annual Report by October 1st of each year. This Program Plan identifies the steps that are necessary for the City to maintain compliance with its MS4 General Permit, while the Annual Report documents the status of implementation of the Program Plan for each permit year. In effect, the Program Plan comprises a road map that must be followed, which requires continuous management efforts and substantial resource commitments on the part of the City.

B. Stormwater Management Program Organization

While stormwater activities and functions are divided among several different departments and divisions, the Department of Transportation and Environmental Services (T&ES) has the primary responsibility for coordinating compliance with the permit. VPDES permit compliance activities are coordinated through the Stormwater Division within the Department of Transportation and Environmental Services (T&ES-SWM). While T&ES-SWM is responsible for overall permit coordination, including the submittal of annual reports, several other departments and divisions have important roles in implementing the VPDES permit. The following organizational chart provides a summary of roles and responsibilities:

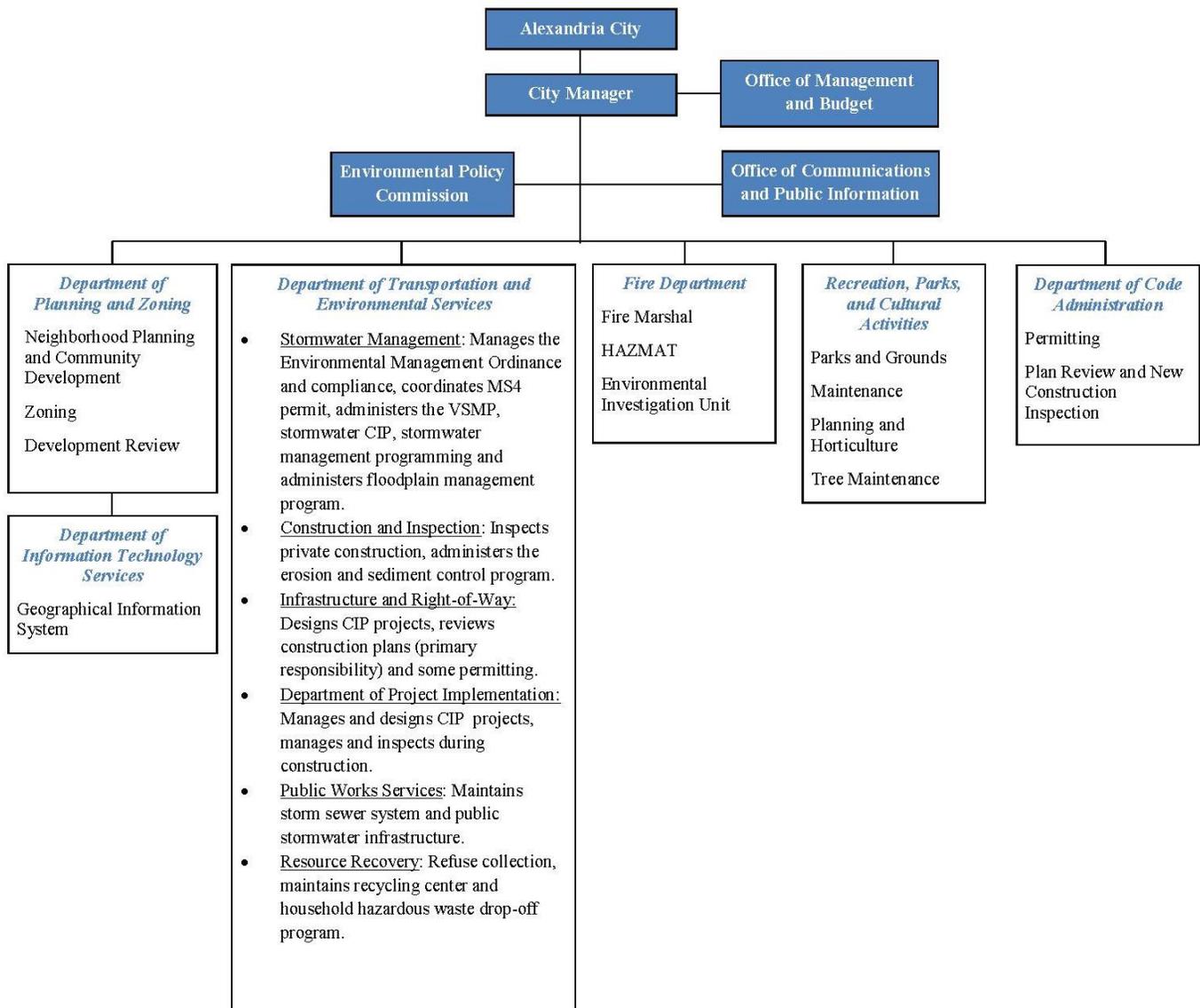


Figure 1. Organization of the City of Alexandria’s Stormwater Management Program

The following acronyms and abbreviations are used in this Plan are listed in the table below.

Department and Division Acronyms

Acronym	Department or Division
ARENEW	Alexandria Renew Enterprises
Code	Department of Code Administration
CPI	Communications and Public Information
EIU	Environmental Coordinating Group (from T&ES, Health Department, FD, RPCA, P&Z, General Services, Alexandria Renew Enterprises, Alexandria City Public Schools, Virginia American Water and OCPI)
EPC	Environmental Policy Commission
FD	Fire Department
GS-FSD	Department of General Services, Fleet Services Division
ITS	Department of Information Technology Services
ITS-GIS	Department of Information Technology Services, Geographic Information Systems Division
NVRC	Northern Virginia Regional Commission
OCPI	Office of Communications & Public Information
P&Z	Department of Planning and Zoning
RPCA	Department of Recreation, Parks, and Cultural Activities
SWCB	Virginia State Water Control Board
T&ES	Department of Transportation and Environmental Services
T&ES-I&ROW	T&ES, Infrastructure and Right-of-Way Division
T&ES-SWM	T&ES, Stormwater Management
T&ES-C&I	T&ES, Construction and Inspection Division
T&ES-PWS	T&ES, Public Works Services Division
T&ES-RR	T&ES, Resource Recovery Division

C. Special Conditions for Approved TMDLs

While the focus of the MS4 permit is on pollution prevention, the 2013 general permit includes new special conditions were added to address local TMDLs where a wasteload allocation (WLA) approved by the State Water Control Board (SWCB) and assigned to the City, and to address the Chesapeake Bay TMDL. The City’s updated MS4 Program Plan carries forward existing specific actions to address pollutants of concern for impaired waters, and incorporates new requirements as applicable. The table below presents a summary of the development schedule for the Chesapeake Bay TMDL and local TMDL action plans.

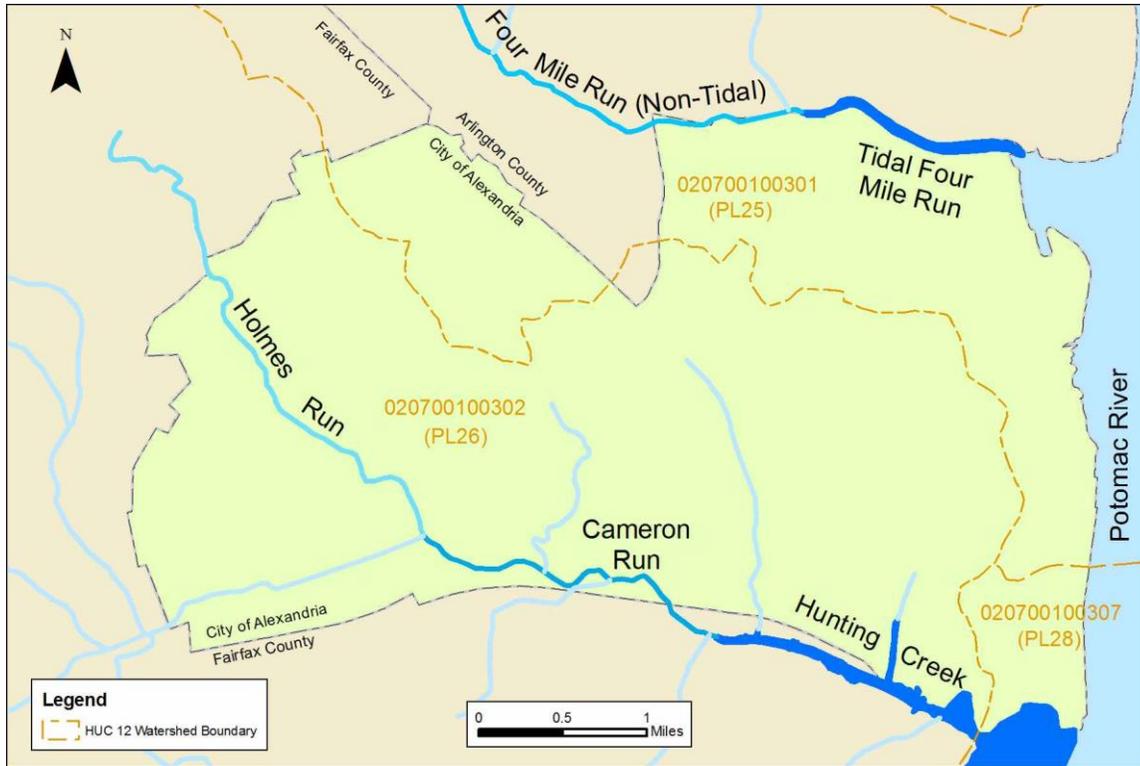


Figure 2. Alexandria’s Waterways with Local TMDLs

1. Chesapeake Bay TMDL

Finalized in December 2010 by the United States Environmental Protection Agency (EPA), the Chesapeake Bay TMDL and the associated Watershed Implementation Plans (WIPs) developed by the Commonwealth of Virginia, set limits on nitrogen, phosphorus and sediment entering the Bay. Pollutant reduction targets have been incorporated into the City’s MS4 General Permit. As a condition in the permit, the means and methods to achieve these reductions must be included in the City’s Chesapeake Bay TMDL Action Plan. The City was required to prepare the Action Plan by June 30, 2015 based on the requirements in Section I C of the General Permit, and using DEQ Guidance Memo No. 15-2005 dated May 18, 2015.

The Chesapeake Bay Action Plan addresses pollutant reductions for nitrogen, phosphorus and sediment, as required by the general permit. The Bay TMDL Action Plan was submitted to DEQ with the annual report for the 2014 – 2015 reporting period. It is included in Appendix A of this updated 2015 -2016 MS4 Program Plan.

2. Approved Local TMDLs

The City had two existing TMDLs with an approved WLA for the MS4 area prior to the current general permit. A TMDL for bacteria related to fecal coliform was approved in 2004 for the non-tidal portion of Four Mile Run, and in 2007 a TMDL for PCBs was approved for the Tidal Potomac watershed. Given that these TMDLs were approved prior to July 2008, TMDL Action Plans were due by June 30, 2015 and were submitted with the 2015-2016 Annual Report.

In 2010, the SWCB issued approval of bacteria TMDLs for Tidal Four Mile Run, and the Hunting Creek, Cameron Run, and Holmes Run watersheds (see Figure 2). In both recent TMDLs, bacterial water quality is based on levels of *E. coli*. Since these TMDLs were approved between July 2008 and June 2013, the corresponding TMDL Action Plans were due by June 30, 2016 and are included in this updated 2015-2016 MS4 Program Plan in Appendix A. Based on guidance and conversations with DEQ staff, the City developed a comprehensive Bacteria TMDL Action Plan that addresses bacteria impairments for those affected watersheds. Beginning with the Non-Tidal Four Mile Run TMDL Action Plan which was due by June 30, 2015, the City incorporated the successive TMDLs for Hunting Creek, Cameron Run, and Holmes Run to create a comprehensive Bacteria TMDL Action Plan.

Approved TMDLs	Action Plan Due Date
Chesapeake Bay TMDL <ul style="list-style-type: none"> • Nitrogen, phosphorus Sediment • EPA approval - December 2010 	June 30, 2015
<i>Fecal Coliform TMDL Development for Four Mile Run, Virginia</i> <ul style="list-style-type: none"> • Bacteria – fecal coliform • First listed – 1998 • SWCB approval – 4/11/2008 	
<i>Total Maximum Daily Loads of Polychlorinated Biphenyls (PCBs) for Tidal Portions of the Potomac and Anacostia Rivers in the District of Columbia, Maryland, and Virginia</i> <ul style="list-style-type: none"> • PCBs in Fish Tissue • EPA approval – 4/11/2008 	
<i>Bacteria TMDL for the Tidal Four Mile Run Watershed</i> <ul style="list-style-type: none"> • Bacteria – <i>E. coli</i> • First listed – 1996 • SWCB approval – 9/30/2010 	June 30, 2016
<i>Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds</i> <ul style="list-style-type: none"> • Bacteria – <i>E. coli</i> • First listed – 1998, 2008, 2004 (respectively) • SWCB approval – 8/4/2011 	

D. Minimum Control Measures

The following describes the best management practices (BMPs) that the City will utilize and implement to meet each of the six minimum control measures (MCMs). Included with each BMP is a description of:

- Policies, ordinances, schedules, inspection forms, written procedures, and other documents necessary for BMP implementation.
- The objective and expected results of each BMP in meeting the measurable goals of the minimum control measure.
- Parties responsible for BMP implementation.
- The implementation schedule for the proposed BMP.
- Documentation and the method that will be utilized to determine the effectiveness of the BMP.

1.0 MCM #1 — Public Education and Outreach on Stormwater Impacts

Permit Reference Section II.B.1.

Relevant Excerpts:

b. - The public education and outreach program should be designed with consideration of the following goals:

(1) Increasing target audience knowledge about the steps that can be taken to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns;

(2) Increasing target audience knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications; and

(3) Implementing a diverse program with strategies that are targeted towards audiences most likely to have significant stormwater impacts.

c. - The updated program shall be designed to:

(1) Identify, at a minimum, three high-priority water quality issues, that contribute to the discharge of stormwater (e.g., Chesapeake Bay nutrients, pet wastes and local bacteria TMDLs, high-quality receiving waters, and illicit discharges from commercial sites) and a rationale for the selection of the three high-priority water quality issues;

(2) Identify and estimate the population size of the target audience or audiences who is most likely to have significant impacts for each high-priority water quality issue;

(3) Develop relevant message or messages and associated educational and outreach materials (e.g., various media such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, websites, and social media) for message distribution to the selected target audiences while considering the viewpoints and concerns of the target audiences including minorities, disadvantaged audiences, and minors;

(4) Provide for public participation during public education and outreach program development;

(5) Annually conduct sufficient education and outreach activities designed to reach an equivalent 20% of each high-priority issue target audience. It shall not be considered noncompliance for failure to reach 20% of the target audience. However, it shall be a compliance issue if insufficient effort is made to annually reach a minimum of 20% of the target audience; and

(6) Provide for the adjustment of target audiences and messages including educational materials and delivery mechanisms to reach target audiences in order to address any observed weaknesses or shortcomings.

Program Plan Update Requirement



The City developed the Public Education and Outreach Plan in PY1 in accordance with the requirements of Section II.B.1 of the general permit. Updates were made in PY2 to enhance and clarify local efforts and documentation. No updates were made in PY3. The plan is incorporated below.

Public Education and Outreach Plan Development

The City seeks to change pollution causing behaviors through effective public education and outreach and has developed the Public Education and Outreach Plan In accordance with Section II.B.1 of the MS4 permit. The plan is integrated into the BMPs below for MCM #1 and has been revised with this updated Program Plan. The public education program is designed to provide general pollution prevention awareness and to target specific audiences to increase their knowledge about the steps that can be taken to reduce stormwater pollution and the hazards associated with illegal discharges and improper disposal of waste. The plan specifically focuses on reducing impacts to impaired waters and other local water pollution concerns.

Identification of High-Priority Water Quality Issues: The MS4 permit requires that the City identify a minimum of three high-priority water quality issues that contribute to stormwater pollution and provide a rationale for their selection. The program must be designed to annually reach approximately 20% of the target audience for each high-priority water quality issue starting in FY15. This will be accomplished by utilizing existing educational curriculum where possible, and by creating new opportunities to reach the targeted audiences for each of the selected high-priority issues.

The public education program will focus of the following high-priority water quality issues identified by the City:

1. Chesapeake Bay nutrients (phosphorus and nitrogen);
2. Bacteria from pet waste; and,
3. Illicit discharges and illegal dumping from commercial operations.

Each of these high-priority water quality issues will be addressed through the City's local efforts and participation in the Northern Virginia Regional Commission (NVRC) Clean Water Partners program. The following rationale provides the basis of selecting the top three high-priority issues:

1. Chesapeake Bay Nutrients

The Chesapeake Bay TMDL was developed by EPA in December 2010 to address nutrient and sediment contributions from the agricultural, wastewater, and urban stormwater sectors. Excess nutrients cause algae blooms, and when the algae die, they consume oxygen in the water, creating dead spots where aquatic life cannot survive. Sediment deposited in stream beds can smother aquatic life and harm fish. Virginia has adopted a Phase 1 and Phase 2 Watershed Implementation Plan (WIP) in response to the Bay TMDL and state reduction requirements, which identify specific strategies for reducing these pollutants. Specific nutrient and sediment reduction targets are included in the MS4 permit. These reductions will be achieved through the implementation of a

toolbox approach that includes current approved methods and possible future-approved methods. Primarily these reductions will be met through redevelopment credits generated through the new Virginia Stormwater Management Program regulations coupled with the City's more stringent local ordinance, retrofit of regional facilities, retrofits on City properties and rights-of-way, and enforcement of the state stormwater management and erosion and sediment control regulations. However, nutrient pollution can be significantly impacted through public education through messaging that targets the misapplication of fertilizers to urban lawns. The messages will target landscape and lawn maintenance providers and single-family homeowners.

2. Bacteria from Pet Waste Pollution Prevention

Bacteria from pet waste has been identified as the second of the top three high-priority water quality issues to target for education and outreach activities. Non-tidal and Tidal Four Mile Run stream segments are listed as impaired by DEQ for fecal coliform and TMDLs have been developed for both. While wildlife is considered potential large contributors to the bacteria load associated with parks and open space, pets are associated with residential lands and the potential bacteria sources associated with urban lands. Additionally, bacteria TMDLs (*E. coli*) have been developed and approved for Hunting Creek, Cameron Run, and Holmes Run watersheds. Potential key sources of bacteria from the MS4-permitted area may include pets and wildlife. Messaging will target pet owners in the City.

3. Illicit Discharges and Illegal Dumping from Commercial Operations

The improper handling and disposal of waste materials from commercial operations can pose potential impacts to local water quality and is the third of the top three high-priority water quality issues. The City has identified restaurant and food preparation (i.e., used cooking oils and waste grease, wash water, food waste and trash), carpet cleaning (wash water), automotive repair, and general light industrial as specific types of operations that have the potential to impact water quality. Public complaint reporting and observations from proactive investigations have identified these as potential sources of pollution and these operations will be targeted for messaging.

Coordination with Regional Efforts: In addition to local efforts, the City continues to participate with other MS4 communities in regional public education efforts through the Northern Virginia Regional Commission (NVRC) Clean Water Partners program. The program leverages local resources to reach a larger regional audience through a mix of media such as radio, TV, online and print. NVRC focuses on proper disposal of pet waste, used motor oil recycling, and proper lawn care practices. Public education and outreach efforts outlined in previous versions of the Program Plan during the first two permit reporting periods focused on these same top three high-priority water quality issues. However, annual surveys by NVRC revealed a trend away from individuals changing their own oil. In response, the Clean Water Partners program is considering replacing used motor oil education with education and outreach focused on illicit discharges and illegal dumping. This would more closely align the City's revised top three priorities with NVRC's regional efforts during the 2015 – 2016 reporting period.

Assessment: The City's Permit Year 1 (PY1) and Permit Year 2 (PY2) Program Plans focused on bacteria from pet waste, nutrients and used motor oil recycling. Based on the annual NVRC surveys showing that individual are less likely to change their own oil and the City's assessment that bears this out, the Program Plan was updated in Permit Year (PY3) to include a revision to the top three priorities by substituting "Illicit Discharges and Illegal Dumping from Commercial Operations" for "used motor oil

recycling.” However, this water quality issue will continue to be addressed from a commercial perspective at the local level. The City will implement the local education and outreach activities to address each of the three high-priority issues during the 2016 – 2017 reporting period (PY4). These program changes are also reflected in the 2015 – 2016 Annual Report. The City will demonstrate that it has met the goal of reaching 20% of each target audience in the annual report. The City will also annually assess the effectiveness of each measure toward meeting MS4 permit goals. If these selected BMPs are determined to not be meeting these goals, the City will document any further program changes and submit the documentation to DEQ through changes to the Program Plan. Prior to permit reapplication and during the 2017 – 2018 reporting period (PY5), the City will also evaluate the entire education and outreach program per the general permit for the following:

- Appropriateness of the high-priority stormwater issues;
- Appropriateness of the selected target audiences for each high-priority stormwater issue;
- Effectiveness of the message or messages being delivered; and,
- Effectiveness of the mechanism or mechanisms of delivery employed in reaching the target audiences.

The City will provide the results of the public education and outreach program evaluation with the annual report.

BMP 1A – Chesapeake Bay Nutrients

Objective and Expected Results: The urban landscape has the potential to impact stormwater runoff that is transported through the MS4 to local waters, the Potomac River, and the Chesapeake Bay through over-application and misapplication of fertilizer. The purpose of this BMP is to provide education and outreach on proper use and application of fertilizers to reduce and minimize the impact of nutrients.

Implementation Schedule: The City has identified all households and local lawn care and maintenance companies for nutrient-related education. In addition, the City has identified homeowners associations (HOAs) and condominium associations that manage open space as an additional target audience.

- Starting PY3, annually prepare and distribute two messages that address seasonally-specific stormwater pollution prevention tactics for nutrients. The messages will be distributed via electronic email to the City-wide eNews list serve and point readers back to the City’s website with additional information on the topic.
- Starting PY3, annually include a message on social media about the proper use and application of fertilizer.
- During PY3, the City will create webpage under “Stormwater Management” related to the proper application and use of fertilizers to protect water quality, and include a link to the NVRC www.onlyrain.org website.
- Continue to air PSAs throughout the year on both the government access channel (Channel 70) and the community access channel (Channel 69) dealing with stormwater pollution prevention, which includes information on nutrients.

- Starting PY3, annually distribute brochures through direct mail to 33% of HOA and condominium contacts about the proper use and application of fertilizers, and how to ensure that contractors are following best practices to protect water quality.
- Continue to participate in the NVRC Clean Water Partners regional efforts focused on nutrients.
- Starting PY3, annually distribute brochures through direct mail to 33% of lawn care and maintenance companies licensed to do business in the City.

Responsible Parties: The Transportation and Environmental Services, Stormwater Management Division (T&ES-SWM) will coordinate this BMP with the appropriate agencies, including Communications and Public Information (CPI). NVRC Clean Water Partners will manage the regional efforts.

Documentation and Measure of Effectiveness: A summary of activities, including examples of eNews releases, brochures and regional activities, etc. will be included in each annual report beginning PY3. The following will be included in the report to help document and assess the effectiveness of this BMP:

- An estimate of the number of residents exposed to the educational message distributed through eNews.
- An estimate of the number of residents reached with the social media message.
- The number of visits to the fertilizer-related webpage under Stormwater Management and a screen capture of the content.
- Provide the number of times the PSA airs and provide the message.
- An estimate of the number of associations exposed to the educational message and an example of the brochure sent.
- A summary of the results of the NVRC Clean Water Partners program efforts to reach City residents, a summary of the survey results, and an estimate of the number of individuals reached.
- An estimate of the number of lawn care and maintenance companies exposed to the educational message and an example of the brochure sent.

The total number of individuals reached by all efforts will be considered the percentage of the target audience to be reported starting PY3. If less than 20% of the goal is reached, the annual report will include changes to address the shortfall and the Program Plan will be appropriately updated. The following table provides target audience, strategy, and targeted reach information.

Target Audience	Strategy	Strategy Reach	Annual Targeted Reach
Single Family Households	eNews message	eNews Subscribers	To be determined based on subscribers.
	Social Media Message	Social Media Subscribers	To be determined based on subscribers.
	Webpage	Website visitors	To be determined based on number of web hits.
	PSAs	TV Viewers	To be determined by number of times aired.
	NVRC Clean Water Partners	City-wide	To be determined based on NVRC annual statistics.
HOAs and Condo Associations	Direct Mail	Association Boards	33% Annually
Lawn Care and Maintenance Companies	Direct Mail	Company Owners	33% Annually

BMP 1B – Bacteria from Pet Waste

Objective and Expected Results: The goal of the local and regional efforts is to reduce bacteria pollution by making it convenient for dog owners to pick up after their pets and properly dispose of waste and target them with pollution prevention messages.

Implementation and Schedule: Dog owners will be targeted with education and outreach efforts. The target audience is based on the number of residents holding a City of Alexandria pet license. The City will perform the following in support of this BMP:

- Starting PY3, annually prepare and distribute two messages stressing the importance of picking up after pets and disposing of the waste properly. The messages will be distributed via electronic email to the City-wide eNews list serve and point readers back to the City’s website with additional information on the topic.
- Starting PY3, annually include a message on social media about the picking up after pets and properly disposing of the waste.
- In PY3, revise the website related to bacteria from pet waste and insert a link to the NVRC www.onlyrain.org website.
- The City will maintain current pet waste stations and install new pet-waste stations where appropriate to make pick-up and disposal more convenient.
- During PY2, the City updated the “Pet Waste” brochure. Our continued efforts will include distributing the revised pet waste brochure at all appropriate events.
- Continue to distribute the pet waste brochure (using the updated version) at the Vola Lawson Animal Welfare League of Alexandria (Animal Shelter).

- Starting PY3, distribute educational materials at VCA (Duke and OT) and Old Towne School for Dogs.
- Continue to participate in the NVRC Clean Water Partners regional efforts.
- In PY3, include a message on the Animal Shelter online licensing webpage. <http://alexandriaanimals.org/pet-licensing-now-online/>

Responsible Parties: T&ES-SWM will take the lead on this effort with the assistance and cooperation of RPCA, the Animal Shelter and local businesses.

Documentation and Measure of Effectiveness: A summary of activities, including examples of eNews releases, brochures and regional activities, etc. will be included in each annual report beginning PY3. The following will be included in the report to help document and assess the effectiveness of this BMP:

- An estimate of the number of residents exposed to the educational message distributed through eNews.
- An estimate of the number of residents reached with the social media message.
- The number of visits to the pet waste-related webpage under Stormwater Management and a screen capture of the content.
- The number of pet stations in the City and the refills provided.
- An estimate of the number of brochures handed out at events.
- An estimate of the number of brochures distributed at the Animal Shelter during adoptions.
- An estimate of the number of brochures distributed at local businesses.
- A summary of the results of the NVRC Clean Water Partners program efforts to reach City residents, a summary of the survey results, and an estimate of the number of individuals reached.
- In PY3, include a pet waste message on the on the Animal Shelter online licensing webpage. <http://alexandriaanimals.org/pet-licensing-now-online/>.

The total number of individuals reached by all efforts will be considered the percentage of the target audience to be reported starting PY3. If less than 20% of the goal is reached, the annual report will include changes to address the shortfall and the Program Plan will be appropriately updated. The following table provides target audience, strategy, and targeted reach information.

Target Audience	Strategy	Strategy Reach	Annual Targeted Reach
Pet Owners	eNews message	eNews Subscribers	To be determined based on subscribers.
	Social Media Message	Social Media Subscribers	To be determined based on subscribers.
	Webpage	Website Visitors	To be determined based on number of web hits.
	Brochures at Animal Shelter	Residents Adopting Pets	To be determined based on data.

Target Audience	Strategy	Strategy Reach	Annual Targeted Reach
	Brochures at Businesses	Patrons	To be determined based on data.
	NVRC Clean Water Partners	City-wide	To be determined based on NVRC annual statistics.
Pet Owners	Direct Mail	Dog License Holders	33% Annually

BMP 1C – Illicit Discharges and Illegal Dumping from Commercial Operations

Objectives and Expected Results: The purpose of this effort is to generally engage local businesses with the high potential of discharging pollutants to protect water quality and prevention pollutant discharges. This BMP aims to reduce the discharge of fats, oils and grease from restaurant and food preparation operations, and automotive fluids from service centers. Additionally, the City will engage local residents as partners in recognizing and reporting illicit discharges.

Implementation and Schedule: The City has identified the improper handling and disposal of waste materials from commercial operations as causing potential impacts to local water quality. Restaurant and food preparation (i.e., used cooking oils and waste grease, wash water, food waste and trash), carpet cleaning (wash water), automotive repair, and general light industrial may pose specific threats to water quality.

- Starting PY3, annually prepare and distribute two general messages that address illicit discharge and illegal dumping. The messages will be distributed via electronic email to the City-wide eNews list serve and point readers back to the City’s website with additional information on the topic.
- Starting PY3, annually include a message on social media about illicit discharges and illegal dumping.
- During PY3, the City will create webpage under “Stormwater Management” related specifically to illicit discharges and illegal dumping for the targeted businesses and the general public, and include a link to the NVRC www.onlyrain.org website.
- Continue to air PSAs throughout the year on both the government access channel (Channel 70) and the community access channel (Channel 69) dealing with stormwater pollution prevention, which includes information on illicit discharges and illegal dumping.
- Continue to participate in the NVRC Clean Water Partners regional efforts focused on nutrients.
- Starting PY3, annually distribute brochures through regular mail to 33% of the targeted businesses on best practices to protect water quality.

Responsible Parties: T&ES-SWM will take the lead on this effort with the assistance and cooperation of the EIU and Communications and Public Information.

Documentation and Measure of Effectiveness: A summary of activities, including examples of eNews releases, brochures and regional activities, etc. will be included in each annual report beginning PY3. The following will be included in the report to help document and assess the effectiveness of this BMP:

- An estimate of the number of residents exposed to the educational message distributed through eNews.
- An estimate of the number of residents reached with the social media message.
- The number of visits to the fertilizer-related webpage under Stormwater Management and a screen capture of the content.
- Provide the number of times the PSA airs and provide the message.
- A summary of the results of the NVRC Clean Water Partners program efforts to reach City residents, a summary of the survey results, and an estimate of the number of individuals reached.
- An estimate of the number of targeted businesses exposed to the educational message and an example of the brochure sent.

The total number of individuals reached by all efforts will be considered the percentage of the target audience to be reported starting PY3. If less than 20% of the goal is reached, the annual report will include changes to address the shortfall and the Program Plan will be appropriately updated. The following table provides target audience, strategy, and targeted reach information.

Target Audience	Strategy	Strategy Reach	Annual Targeted Reach
Households and Business Owners	eNews message	eNews Subscribers	To be determined based on subscribers.
	Social Media Message	Social Media Subscribers	To be determined based on subscribers.
	Webpage	Website visitors	To be determined based on number of web hits.
	PSAs	TV Viewers	To be determined by number of times aired.
	NVRC Clean Water Partners	City-wide	To be determined based on NVRC annual statistics.
Targeted Business Owners	Direct Mail	Association Boards	33% Annually

BMP 1D - General Public Education and Outreach

Objective and Expected Results: The goal of this BMP is to continue to provide general stormwater quality education and outreach to a diverse range of audiences by engaging students, civic groups, and residents through presentations, discussions and distribution of materials by participating in numerous events.

Implementation and Schedule: Distributing general education brochures and participating in regional education outreach efforts increases individual and household knowledge about the steps that can be taken to reduce stormwater pollution and increases understanding of the legal implications of the improper disposal of waste.

- Continue to distribute brochures and other educational materials at events.
- Continue to present education materials to school and civic groups.
- Continue to distribute eNews to provide general stormwater education and to announce events and volunteer opportunities.
- Continue to participate in the NVRC Clean Water Partners regional efforts.

Responsible Party: T&ES-SWM will take the lead on this effort with the assistance and cooperation RPCA and other departments as applicable.

Documentation and Measure of Effectiveness: The City will document efforts to engage and educate citizens, students and other groups and report these efforts in the annual report. This will include the number of events attended and an estimate of the number of individuals reached.

BMP 1E – Stream Crossing Signs

The City has installed 33 signs at 18 locations where roads cross major waterways. In addition, the City has installed nine signs at major stream crossings on hike/bike trails. The signs display the name of the waterway and explain that the waterway is part of the Chesapeake Bay watershed.

Objective and Expected Results: Stream crossing signs help promote general citizen and visiting motorist awareness of the City’s surface water resources, water bodies, and drainage basins. The signs also help link local watershed protection efforts with larger Chesapeake Bay protection efforts.

Implementation and Schedule: Initial installation of the signs is complete and no additional signs have been identified as being needed at this time. The City will continue to maintain the existing signs during the permit period.

Responsible Party: T&ES-SWM

Documentation and Measure of Effectiveness: The City will document the maintenance of the signs in the annual report.

BMP 1F – Stormwater BMP Signage

The City has implemented a requirement for all new and redevelopment projects to provide signage or labeling to identify new surface structural stormwater BMPs.

Objectives and Expected Results: Signage and labeling of structural stormwater BMPs helps educate the general public and those maintaining structural stormwater BMPs about the purpose of these facilities.

Implementation and Schedule: This requirement is implemented for all new and redevelopment projects during the City site plan approval process.

Responsible Party: T&ES-SWM and P&Z

Documentation and Measure of Effectiveness: All final site plans will show the location and details of signage or labeling to identify new surface structural stormwater BMPs.

BMP 1G – Storm Drain Inlet Marking

The City was one of the first localities in Northern Virginia to implement a storm sewer marking program. To facilitate this program, the City has adopted a requirement for all new development and redevelopment to mark storm sewer inlet covers located within 50 feet of the property line. The City also works with volunteers to install markers in existing neighborhoods. When this is done, the City distributes a door hanger that explains the program and provides information on alternatives to dumping.

Objectives and Expected Results: The goal of the storm sewer inlet marking is to reduce dumping by providing a visual way of alerting residents and visitors that storm sewers empty into local streams and eventually the Chesapeake Bay. The door hanger provides specific information on where to properly dispose of commonly dumped materials. Finally, the program provides a way for citizens and community groups to become directly involved in pollution prevention activities.

Implementation and Schedule:

- All final site plans will require storm sewer inlets within 50 feet of the project to be marked. This will occur during the City site plan approval process.
- Continue to promote the storm sewer marking program at community events and on the web page to engage volunteers.

Responsible Party: T&ES-SWM is responsible for ensuring that the requirement to mark storm sewer inlet covers is satisfactorily implemented. P&Z is responsible for ensuring compliance with the overall site plan approval process.

Documentation and Measure of Effectiveness: The City will document that all final site plans have a requirement for storm water inlets within 50 feet of the project to be marked. In addition, the City will provide a table with the number of storm sewer markers installed and the number of groups involved in storm sewer marking projects that are hosted or promoted by the City.

BMP 1H – Water Quality Website

The City has developed a website dedicated to water quality and stormwater management. According to 2012 Census data, over 77% of Virginia households have access to the internet. The site provides information about the program, serves as a forum to distribute educational materials, and includes information on where to report suspected illegal dumping.

Objectives and Expected Results: The website is a tool to provide water quality and pollution prevention information to the general public in an easily accessible format. It also provides a way to make documents accessible to the public for review and comment.

Implementation and Schedule:

- Continue to host the website and update it with new information.
- In PY3, update the website to align with the organizational structure in T&ES by creating a “Stormwater management” website, which will also align and the modified perspective and organizational structure of the City website.

- Continue to use eNews and social media to distribute information on upcoming volunteer opportunities and ways to engage in environmental activities.
- Continue to maintain the Call.Click.Connect webportal.

Responsible Party: T&ES-SWM is responsible for keeping site content up-to-date and for assessing options for increasing site traffic. ITS is responsible for website hosting and technical development.

Documentation and Measure of Effectiveness: The City will provide information on the website and provide a snapshot of the web page in the annual report.

BMP 11 – Education Concerning PCBs

Tidal portions of the Potomac River are subject to a TMDL for PCBs. Most of this contamination is the result of past pollution, since most uses of PCBs have been banned since the 1970s. DEQ has identified potential sources of residual PCBs as industries that include the following SICs: 26&27 (Paper and Allied Products), 30 (Rubber and Misc. Plastics), 33 (Primary Metal Industries), 34 (Fabricated Metal Products), 37 (Transportation Equipment), 49 (Electrical, Gas, and Sanitary Services), 5093 (Scrap Metal Recycling), and 1221&1222 (Bituminous Coal).

Objective and Expected Results: By distributing information on the proper identification, handling, and disposal of PCBs, the City intends to encourage behavior that will reduce the potential for any residual PCBs to enter the storm drain system.

Implementation and Schedule:

- Continue to include standard condition language for all site plan (DSP and DSUP) requiring a site characterization for PCBs during the redevelopment of a property where PCBs have been historically used or stored, or during the redevelopment of a property that falls into a DEQ identified high risk category for PCBs. The language was updated in PY3 and included in all site plan reviews, placing the onus on the developer to perform due diligence; and is reviewed by the City.
- The PCB brochure will be updated in PY3 and replace the brochure posted on the web site and provided to target industries during normal interactions (inspections, permit review, etc.) or during the redevelopment process.
- Develop and implement the Tidal Potomac River PCB TMDL Action Plan which was completed June 30, 2015.

Responsible Party: T&ES-SWM and T&ES-IROW are responsible for ensuring that the standard condition language is included during site plan review.

Documentation and Measure of Effectiveness: A sample of the standard condition language for a site plan reviewed during the reporting period and a copy of the PCB brochure will be included in the annual report. The annual report will include a summary of the implementation and associated evaluation of the Tidal Potomac PCB TMDL Action Plan will be included in the annual report starting PY3. The TMDL Action Plan is provided in Appendix A.

2.0 MCM #2 — Public Involvement / Participation

Permit Requirement: Section II.B.2.

Relevant Excerpts

a. *Public involvement.*

(1) *The operator shall comply with any applicable federal, state, and local public notice requirements.*

(2) *The operator shall:*

(a) *Maintain an updated MS4 Program Plan. Any required updates to the MS4 Program Plan shall be completed at a minimum of once a year and shall be updated in conjunction with the annual report. The operator shall post copies of each MS4 program plan on its webpage at a minimum of once a year and within 30 days of submittal of the annual report to the department.*

(b) *Post copies of each annual report on the operator's web page within 30 days of submittal to the department and retain copies of annual reports online for the duration of this state permit; and*

(c) *Prior to applying for coverage as required by Section III M, notify the public and provide for receipt of comment of the proposed MS4 Program Plan that will be submitted with the registration statement. As part of the reapplication, the operator shall address how it considered the comments received in the development of its MS4 Program Plan. The operator shall give public notice by a method reasonably calculated to give actual notice of the action in question to the persons potentially affected by it, including press releases or any other forum or medium to solicit public participation.*

b. *Public participation. The operator shall participate, through promotion, sponsorship, or other involvement, in a minimum of four local activities annually e.g., stream cleanups; hazardous waste cleanup days; and meetings with watershed associations, environmental advisory committees, and other environmental organizations that operate within proximity to the operator's small MS4. The activities shall be aimed at increasing public participation to reduce stormwater pollutant loads; improve water quality; and support local restoration and clean-up projects, programs, groups, meetings, or other opportunities for public involvement.*

BMP 2A – Public Notice and Participation

Objective and Expected Results: Providing an opportunity for public input and comment allows the City to take advantage of the expertise of residents, strengthens community understanding of the program objectives, and ensures community support. The City is also committed to complying with all local, state, and federal public notice requirements for local ordinances or legislative actions related to the stormwater management program.

Implementation and Schedule:

- Meet all legal obligations with respect to public notice and comment.
- Post the updated MS4 Program Plan for continual review. Required updates to the Program Plan shall be completed at a minimum of once per year in conjunction with the annual report and posted on the City's webpage within 30 days.
- Each annual report shall be posted online within 30 days of submittal to the department. Annual reports shall be retained online for the duration of the permit.
- During PY5, as part of its permit reapplication process, the City shall give adequate public notice and provide for public comments on the draft MS4 Program Plan that will be submitted with the registration statement.

Responsible Party: T&ES-SWM is responsible for meeting public notice requirements and providing materials for release, and is assisted by OCPI.

Documentation and Measure of Effectiveness: The City will provide information of any actions taken and a summary of public comments received during the public information meeting on the draft MS4 Program Plan and draft annual reports. The City will provide documentation of public notices issued regarding the stormwater program and permit.

BMP 2B – Staff Support and Annual Water Quality Update to the EPC

T&ES-SWM provides ongoing staff support to the Environmental Policy Commission (EPC) in order to provide citizen/stakeholder input into the City’s stormwater program. The EPC is appointed by the City Council and makes recommendations on environmental issues, including stormwater management.

Objective and Expected Results: Citizen/stakeholder input strengthens the overall program. The EPC provides valuable feedback regarding the City’s stormwater management programs and helps to assess the effectiveness of different efforts from a citizen perspective.

Implementation and Schedule:

- TE&S-OEQ will continue to provide staff support to the EPC, which meets on a monthly basis.
- TE&S-SWM will continue to provide the EPC with an annual update on stormwater management program activities each year.

Responsible Party: T&ES-SWM with support from T&ES-SWM.

Documentation and Measure of Effectiveness: The City will provide annual reports by the EPC (as available) along with relevant meeting minutes to document ongoing staff support. The City will document the annual EPC stormwater program update meeting and provide a summary of significant feedback, as appropriate.

BMP 2C – Promote and Support Local Activities

Objective and Expected Results: The goal is to increase overall stormwater quality awareness and education, strengthen private environmental stewardship efforts, and provide citizens with a broad range of environmentally-related volunteer and engagement opportunities.

Implementation and Schedule:

- Continue to promote local water quality events and volunteer opportunities which may include stream cleanups, invasive species removal and riparian plantings.
- Participate in a minimum of four local water quality-related activities through promotion and/or sponsorship.
- Continue to actively sponsor and promote the annual Alexandria Earth Day. The event draws thousands of Alexandrians and provides them with an opportunity to learn about ways to protect their environment and engage in activities. Information can be found at <http://alexandriava.gov/EarthDay>.

Responsible Party: T&ES-SWM and RPCA support these efforts, send out information via Environmental News eNews, and develop press releases for the OCPI. T&ES-RR collects the bags of trash after events. RPCA and the Earth Day Committee serve as the City’s primary point of contact for Alexandria Earth Day events.

Documentation and Measure of Effectiveness: The City will document its sponsorship, participation, and promotion of local events in the Annual Report and provide information on efforts. Event organizers assess the success of the event each year and make changes as appropriate to ensure that the event is a success.

3.0 MCM #3 — Illicit Discharge Detection and Elimination

Permit Reference: Section II.B.3.

Relevant Excerpts:

a. The operator shall maintain an accurate storm sewer system map and information table and shall update it in accordance with the schedule set out in Table 1 of this section.

b. The operator shall effectively prohibit, through ordinance or other legal mechanism, nonstormwater discharges into the storm sewer system to the extent allowable under federal, state, or local law, regulation, or ordinance. Categories of nonstormwater discharges or flows (i.e., illicit discharges) identified in 4VAC50-60-400 D 2 c (3) must be addressed only if they are identified by the operator as significant contributors of pollutants to the small MS4. Flows that have been identified in writing by the Department of Environmental Quality as de minimis discharges are not significant sources of pollutants to surface water and do not require a VPDES permit.

d. The operator shall promote, publicize, and facilitate public reporting of illicit discharges into or from MS4s. The operator shall conduct inspections in response to complaints and follow-up inspections as needed to ensure that corrective measures have been implemented by the responsible party.

e. The MS4 Program Plan shall include all procedures developed by the operator to detect, identify, and address nonstormwater discharges to the MS4 in accordance with the schedule in Table 1 in this section. In the interim, the operator shall continue to implement the program as included as part of the registration statement until the program is updated to meet the conditions of this permit. Operators, who have not previously held MS4 permit coverage, shall implement this program in accordance with the schedule provided with the completed registration statement.



Program Plan Update Requirement

The City must have an accurate storm sewer system map that meets the requirements of Section II.B.3.a of the permit no later than June 30, 2017. The schedule and approach for meeting this requirement is found in BMP 3G. The City developed an Illicit Discharge Detection and Elimination Manual in accordance with Section II.B.3.c of the permit and included it in the PY1 update to the Program Plan. The Manual is included in Appendix C and is implemented in BMPs 3C – 3H.

BMP 3A – *Call.Click.Connect* and Nuisance Abatement Hotline

The City's *Call.Click.Connect* consists of a web-based problem reporting form and call center (703-746-HELP) that can be used by residents and others to report suspected illicit discharges and other environmental concerns. The reporting form can be found on the homepage at www.alexandriava.gov and is available on subordinate webpages. Reports of illicit discharges and investigation results are tracked using Cityworks™ asset management software and Permit Plan software. In addition, the City has established a 24-hour Nuisance Abatement Hotline (703-836-0041) for citizens and staff to report suspected illicit discharges. Reports of illicit discharges are investigated by the Fire Marshal's Environmental Investigation Unit (EIU), T&ES-SWM and T&ES-PWS on occasion. The City's policies

and procedures for responding to reports of illicit discharges are found in the City's Illicit Discharge Detection and Elimination (IDDE) manual, which is included in Appendix C.

Objective and Expected Results: The purpose of *Call.Click.Connect* and the Nuisance Abatement Hotline is to empower residents to report potential stormwater pollution or illicit discharges.

Implementation and Schedule: The City will maintain the Nuisance Abatement Hotline and the web-based reporting form. The City will continue to promote the availability of these tools through the website and education and outreach brochures.

Responsible Party: T&ES- SWM and T&E-PWS respond to complaints and ITS manages the web portal. Code Administration manages the Nuisance Abatement Hotline.

Documentation and Measure of Effectiveness: In the Annual Report, the City will provide a capture of the *Call.Click.Connect* web form and the call number and the Nuisance Abatement Hotline webpage. The City will also report the number and types of incidents handled through these two mechanisms.

BMP 3B – Household Hazardous Waste (HHW) Program

Household hazardous waste (HHW) has been identified by the City as a significant potential source of illicit discharges to the storm sewer system. To help prevent such discharges, the City has a long-standing HHW program. In addition to HHW, the program also accepts used oil, antifreeze, and other automotive fluids. The City produces a brochure that provides information on the types of materials that may be left at program drop-off points. The information is also available on the City's website.

Objective and Expected Results: The HHW program reduces illegal dumping by providing residents with an opportunity to properly dispose of hazardous household waste materials and used oil, antifreeze, and automotive fluids.

Implementation and Schedule: The City will continue to provide HHW collection services to all residents. In addition, the City will continue to produce and distribute materials promoting the program, as well as providing program information on the City's website.

Responsible Party: T&ES-RR operates the HHW facility.

Documentation and Measure of Effectiveness: In its Annual Report, the City will provide copies of the program website and brochure, track and report the number of residents taking advantage of the City's program, and report the number of barrels of HHW accepted by the City. The City will also report on any efforts by T&ES-RR to enhance program effectiveness.

BMP 3C – Prohibition on Illicit Discharges

In 2004, the City Attorney determined that the City's existing enforcement and right-of-entry tools meet MS4 permit requirements. These are found in Title 11, Chapter 13 of the City Code "Environmental Offenses."

Objective and Expected Results: This measure ensures that the legal tools are in place to effectively prohibit illicit discharges to the storm sewer system and to conduct necessary enforcement in the case of an illicit discharge.

Implementation and Schedule: This BMP is continuously implemented. The City Attorney has reviewed the City Code in the context of the new permit requirements and has determined that no additional changes are required.

Responsible Party: T&ES-SWM with support as necessary from the EIU and T&ES-PWS.

Documentation and Measure of Effectiveness:

- The City has adopted appropriate enforcement and right-of-entry provisions in the City Code.
- Enforcement policies and procedures for incidents of illicit discharges are contained in the City's IDDE manual (See Appendix C).
- Annually, the City will report the number of illicit discharges detected and provide a narrative on how the discharges were controlled or eliminated.
- After a significant enforcement activity, or where a pattern of illicit discharges indicates the need for more rigorous enforcement, the City will review policies, procedures, and ordinances and make recommendations for program enhancements as appropriate.

BMP 3D – Illicit Discharge Detection and Elimination Training

Staff from T&ES-SWM include training on “Recognizing and Reporting Illicit Discharges for Field Personnel.” This training is performed on a biennial basis and is described under BMP 6G – Pollution Prevention Policies and Procedures.

Objective and Expected Results: City employees are essential partners in ensuring that City operations do not contribute to stormwater pollution. The objective of this measure is to help employees identify potential illicit discharges while out in the field or simply out in the community.

Schedule and Implementation: This BMP is continuously implemented. The City will continue to incorporate illicit discharge and dumping prevention into its pollution prevention training to municipal staff on a biennial basis.

Responsible Party: T&ES-SWM is responsible and may be assisted by other divisions within T&ES as necessary.

Documentation and Measure of Effectiveness: Training activities will be tracked and documented in the BMP 6F of the Annual Report.

BMP 3E – Identification of Permitted Stormwater Discharges

Staff with T&ES-SWM obtained information from DEQ on all permitted stormwater discharges in the City and incorporated the information into their GIS data. This provides a visual tool for identifying

permitted and non-permitted discharges during outfall field screening, and when investigating reports of illicit discharges, such as those received via *Call.Click.Connect* or the Nuisance Abatement Hotline.

Objective and Expected Results: The purpose of this effort is to provide T&ES-SWM staff with the ability to quickly identify and better monitor permitted discharges. It also provides staff with a tool to identify if a reported discharge has a permit, so they may locate the source quickly, if it is determined it is not a permitted discharge.

Implementation and Schedule: The City will download updated information from DEQ's website to create a table and incorporate changes into a GIS map.

Responsible Party: Updated information will be kept at T&ES-SWM.

Documentation and Measure of Effectiveness: Staff with T&ES-SWM will maintain an up-to-date map and a list of State-permitted stormwater discharges within the City limits.

BMP 3F – Prohibition of Outdoor Cleaning of Restaurant Equipment

The City has included as standard language on all special use permits (SUPs) issued for restaurant facilities, a prohibition against outdoor cleaning of equipment and the deposition of cooking residue into the storm sewer system.

Objective and Expected Result: Outdoor cleaning of restaurant equipment has been identified by the City as a potential source of stormwater pollution. Prohibiting outdoor cleaning of equipment will reduce the likelihood that cooking residue will enter the storm sewer system.

Implementation and Schedule: This BMP is continuously implemented for all SUPs issued for restaurant facilities.

Responsible Party: P&Z is responsible for ensuring compliance with the overall SUP approval process, with review assistance from T&ES-SWM.

Documentation and Measure of Effectiveness: All applicable SUPs will contain the appropriate prohibition against outdoor cleaning of restaurant equipment and the deposition of restaurant cooking residue into the storm sewer system. The City will include a sample SUP (if one was approved during the year) in each annual report.

BMP 3G – Storm Sewer System Map

The City has developed a storm sewer system map showing all stormwater outfalls discharging to the waters of the Commonwealth, pipes, catch basins, and inlets. Periodic quality assurance and quality control is performed as needed. The map shall be updated in accordance with the 2013-2018 permit.

Objective and Expected Results: This measure ensures that the City has a full understanding of the storm sewer system and also enables the City to conduct outfall field screening as required in the 2013-2018 permit, and described in BMP 3H – Outfall Field Screening.

Implementation and Schedule:

- The City shall maintain an up-to-date storm sewer system map and outfall information table for review upon request by the public or by DEQ.
- The City shall update the storm sewer map and outfall information table to include those items listed in permit Section II.B.3.a. Map updates shall be completed by the end of PY4.
- The updated outfall information table shall be submitted as an appendix to the PY4 annual report.
- Downstream regulated MS4s shall be notified in writing of any physical interconnections as they are identified by the City.

Responsible Party: T&ES-SWM, and T&ES-SSI and T&ES-I&ROW work cooperatively to maintain the storm sewer system map.

Documentation and Measure of Effectiveness: The City will continuously collect any new data and record updates to the City's storm sewer outfall map. The City will provide a summary of annual activities regarding map updates and will provide a copy of the City's storm sewer outfall map and associated outfall information table in the PY4 annual report. The City will include as part of its annual reports a list of any written notifications of physical interconnections given by the City to other MS4s during that permit year.

BMP 3H – Dry Weather Outfall Field Screening and Illicit Discharge Investigations

During PY1, the City developed written policies and procedures for the detection, investigation, and elimination of illicit discharges. The City's 2014 IDDE manual provides policies, procedures, methodologies and legal authority for dealing with illicit discharges. Outfall field screening shall be performed in accordance with Section II.B.3.c of the 2013-2018 permit. The City's IDDE manual is found in Appendix C.

Objective and Expected Results: The purpose of this BMP is to detect and eliminate illicit discharges.

Implementation and Schedule:

- The City will perform dry weather field screening on 50 priority outfalls annually.
- Outfalls shall be prioritized for field screening by the City in accordance with the procedures in its IDDE manual.
- Dry weather discharges will be investigated in accordance with the IDDE manual. Those discharges suspected of being sanitary sewage or significantly contaminated discharges are to be investigated first.
- Enforcement actions and legal penalties shall be used for incidents of illicit discharge, when necessary, by the City.
- Incidents of illicit discharge, as well as the outcome of investigations and any follow up investigations or actions will be tracked in the City's database.

Responsible Party: T&ES-SWM

Documentation and Measure of Effectiveness: The City will document and track reported illicit discharges or illicit discharges discovered during dry weather field screening, and the results of any investigations in accordance with the requirements in Section II.B.3.c.(1)(h) of the 2013-2018 permit. The City will include with each annual report the results of outfall screenings for that permit year. Any follow-up actions required for illicit discharges discovered during the field screening shall also be included. The annual report shall also include a summary of each investigation performed for reported illicit discharges to include investigation results, resolution, and date of investigation closure.

4.0 MCM #4 — Construction Site Stormwater Runoff Control

Permit Reference: Section II.B.4.

Relevant Excerpt:

e. MS4 Program requirements. The operator's MS4 Program Plan shall include:

(1) A description of the legal authorities utilized to ensure compliance with the minimum control measure in Section II related to construction site stormwater runoff control such as ordinances, permits, orders, specific contract language, and interjurisdictional agreements;

(2) Written plan review procedures and all associated documents utilized in plan review;

(3) For the MS4 operators who obtain department-approved standards and specifications, a copy of the current standards and specifications;

(4) Written inspection procedures and all associated documents utilized during inspection including the inspection schedule;

(5) Written procedures for compliance and enforcement, including a progressive compliance and enforcement strategy, where appropriate; and

(6) The roles and responsibilities of each of the operator's departments, divisions, or subdivisions in implementing the minimum control measure in Section II related to construction site stormwater runoff control. If the operator utilizes another entity to implement portions of the MS4 Program Plan, a copy of the written agreement must be retained in the MS4 Program Plan. The description of each party's roles and responsibilities, including any written agreements with third parties, shall be updated as necessary.

Reference may be made to any listed requirements in this subdivision provided the location of where the reference material can be found is included and the reference material is made available to the public upon request.

f. Reporting requirements. The operator shall track regulated land-disturbing activities and submit the following information in all annual reports: (1) Total number of regulated land-disturbing activities; (2) Total number of acres disturbed; (3) Total number of inspections conducted; and (4) A summary of the enforcement actions taken, including the total number and type of enforcement actions taken during the reporting period.



Program Plan Update Requirement

The City must ensure that impacts to water quality are minimized from construction activities, and that they meet all applicable local, state and federal requirements. The following details the City's program and adherence to the general permit.

Description of Legal Authorities

The construction site stormwater runoff control program includes Chapter 4 of Title 5 of the Code of the City of Alexandria, the "Erosion and Sediment Control" ordinance. Chapter 4 implements requirements of the Virginia Erosion and Sediment Control Law (VESCL) and attendant regulations. The City amended the ordinance and adopted the changes at the June 10, 2015 City Council Legislative Meeting. The changes were precipitated when the Erosion and Sediment Control program was transferred from the Virginia Department of Conservation and Recreation (DCR) to DEQ. This transfer required a renumbering of state law and code. To more closely align the City code with the revised State code, editorial revisions to Title 5, 20 Chapter 4 of the Code of Alexandria. No substantive changes were made to the ordinance and it remains consistent with the VESCL and attendant regulations. The June 10 City Council docket and amendments to the ordinance are included in Appendix D.

The City submitted the requisite applications to DEQ to receive designation as a local Virginia Stormwater Management Program (VSMP) authority for land-disturbing activities. The City submitted the application for final approval on January 15, 2014, which included amendments to Article XIII of the Zoning Ordinance (the Environmental Management Ordinance). This application included pending amendments to the Environmental Management Ordinance (EMO) that went through the local approval process and was subsequently adopted by the City Council on March 15, 2014. However, actions in the 2014 General Assembly required DEQ to make late changes to the VSMP regulations as incorporated into the EMO. The DEQ comments on the January 15, 2014 VSMP application were reviewed based on the late-incorporated changes to the VSMP regulations and received May 6, 2014 – after the EMO was adopted. These late changes to the VSMP were minor; however, the City was required to incorporate the changes. On June 12, 2014, the City sent a letter to DEQ requesting “Provision Approval” to administer the local VSMP effective July 1, 2014 until the minor amendments could be adopted into the EMO. These required amendments went through the approval process and was adopted by the City Council on October 18, 2014. The City submitted final documentation to DEQ and received Full Approval on November 4, 2014. The approval letter is included in Appendix E.

During PY1, the City reviewed the Erosion and Sediment Control (E&SC) Ordinance for consistency with the changes to the EMO. Amendments made to the E&SC ordinance were adopted by City Council on June 10, 2015. Documentation is provided in Appendix D.

Written Plan Review Procedures

T&ES is the plan approving authority with respect to this MCM – with P&Z being the ultimate plan approving authority. The Watershed Management Planner in T&ES-SWM is the program administrator for the E&S program and the VSMP. The City reviews erosion and sediment control plans and stormwater management plans for proposed land-disturbing activities of 2,500 square feet or greater. Projects must receive approval prior to the commencement of land-disturbing activities. The City’s **Development Review Process** plan review procedures provided in Appendix D are used to ensure that plans meet ordinance requirements.

Written Inspection and Enforcement Procedures

City inspectors maintain certification status to perform erosion and sediment control inspections and appropriate staff have received DEQ Stormwater Inspector Training in order to perform periodic comprehensive onsite stormwater pollution prevention plan (SWPPP) inspections. Inspectors complete inspection reports and note corrective action if applicable. Failure to comply can trigger penalties in the E&S ordinance or Article XIII of the Alexandria Zoning Ordinance. The City’s formalized policies and procedures for construction site inspections. The document, *Policies and Procedures for Construction Site Runoff Control Inspections* found in Appendix D contains legal authority, procedures for E&S and VSMP inspections, as well as compliance and enforcement policies and documents.

Roles and Responsibilities

T&ES-IROW and T&ES-C&I, along with T&ES-SWM review and approve E&S plans. T&ES-SSI and T&ES-IROW review and approve stormwater management plans.

Construction site inspection and enforcement is conducted by T&ES-C&I in consultation with the program administrator. The City’s inspection and enforcement program is unique in that inspectors’ responsibilities go beyond E&S and stormwater responsibilities. Inspectors with T&ES-C&I are tasked

to perform multiple inspections and enforcement multiple permits required by the City. Most onsite activities require the oversight of the City's onsite inspector. These activities may range from the installation of onsite infrastructure, placement of fill material, enforcement of excavation permits. Because of the multiple functions performed by the inspection staff, onsite visits are conducted at a frequency that may require the inspector to visit the site multiple times daily. Because of this, the City is able to provide enhanced construction oversight for City projects.

Public Reporting Mechanism

General Permit Section II.B.4.c (4) requires the City to maintain and promote a mechanism for receiving public complaints associated with land-disturbing activities. Complaints may be received through *Call.Click.Connect*, or can be received through email or phone and logged in Cityworks™ or Permit Plan. Promotion of the public compliant mechanism is accomplished through Public Education and Outreach efforts. See BMP 4D below for more information.

BMP 4A – Maintain Erosion and Sediment Control Program Consistency

Objective and Expected Results: The 2013-2018 MS4 permit requires the City to ensure land disturbing activities obtain the proper permits and approval prior to commencement of land disturbing activities, and ensure that discharges into the MS4 from those land disturbing activities meet the requirements set forth in the VESCL and regulations.

Implementation and Schedule:

- The City will continue to implement the Erosion and Sediment Control Program consistent with State regulations.
- During PY2, the City amend and adopt changes to the City's Erosion and Sediment Control Ordinance.

Responsible Party: The Watershed Program Administrator from T&ES-SWM is the Erosion and Sediment Control Program Authority. Staff from TE&S-C&I and T&ES-I&ROW perform site plan reviews, and staff from T&ES-C&I perform construction site inspections.

Documentation and Measure of Effectiveness: The effectiveness of the City's program is measured by consistency with State regulations as determined by staff from the Stormwater and Sanitary Infrastructure division. Should differences be identified between the City and State Program requirements, the City will take action to address them.

BMP 4B – VPDES Construction General Permit

The City received local VSMP authority approval to administer the Construction General Permit effective July 1, 2014. All applicable construction sites must submit a stormwater pollution prevention plan (SWPPP) to the City for review and approval in order to secure coverage under the General VPDES Permit for Stormwater Discharges Associated with Construction Activities prior to final site plan release. The City has incorporated language into its plan review checklist, policies and procedures, and Environmental Management Ordinance (Sec. 13-111) which requires for applicable proposed land disturbing activity and secure coverage prior to commencing land-disturbing activities.

T&ES-C&I inspectors perform other duties beyond E&SC inspections. The City's Progressive Compliance and Enforcement Strategy uses the fact that inspectors may visit a site up to two times daily

to perform a whole list of duties as a way to provide added E&SC oversight. During these more frequent site visits, inspectors may provide verbal direction regarding E&SC and stormwater measures. This verbal direction is considered formal, but may not always be documented formally in an inspection report unless a required inspection and report is due, or if a major corrective action is required. Due to this enhanced oversight, City inspectors provide continual direction which tends to keep a site in order and not create the need for enforcement action: however any necessary enforcement action will be included in the associated annual report.

Objective and Expected Result: This measure implements permit requirements to ensure that all construction site owners and operators secure a separate VPDES stormwater permit for construction activities and implement a SWPPP.

Implementation and Schedule:

- Continue to require applicable land-disturbing activities secure coverage under the construction general permit.
- In PY2, begin administration as a local VSMP authority.
- Review and approve SWPPPs submitted as part of plan review for projects required to seek coverage under the VPDES stormwater permit for construction activities, and ensure SWPPP implementation.

Responsible Party: T&ES-SWM is responsible for implementing this BMP with support from TE&S-C&I and T&ES-Site Plan.

Documentation and Measure of Effectiveness: The City’s plan review policies and procedures as well as checklists used during plan reviews can be found in Appendix D.

Article XIII of the Zoning Ordinance (the Environmental Management Ordinance) can be found on the City’s website at <http://alexandriava.gov/CityCode>.

BMP 4C – Site Inspections and Tracking of Land Disturbing Activities

Administration of the Erosion and Sediment Control Program and Section II.B.4.c of the permit requires the City to conduct inspections of land-disturbing activities. Land disturbing activities are tracked by T&ES-IROW Site Plan section through the plan review process. The information is recorded and logged when final approved plan mylars and grading plans are released. Reports are sent to T&ES-SWM. Inspectors and plan reviewers are required to maintain the appropriate certification of competency from the state.

Objective and Expected Results: The purpose of this activity is to ensure that a land-disturbing activities are properly tracked and comply with an approved erosion and sediment control plan and VSMP permit where applicable.

Implementation and Schedule:

- Continue to maintain a database log for tracking all land disturbing activities in accordance with permit requirements, and provide reports to DEQ on a quarterly basis.
- Continue to inspect land-disturbing activities in compliance with the E&S ordinance, the EMO and written policies and procedures.

- Ensure inspectors and plan reviewers obtain and hold certificates of competence in accordance with 9VAC25-850-40, and keep records on file.
- Continue to utilize its legal authority to require compliance with an approved plan or require plan revisions or modifications if the inspection shows an approved plan to be inadequate to control stormwater runoff.

Responsible Party: T&ES-IROW, T&ES-SWM and T&ES-C&I

Documentation and Measure of Effectiveness: A copy of the City's inspection policies and procedures document is included in Appendix D. The City will track and inspect regulated land disturbing activities and will document the following in the annual report:

- Total number of inspections conducted
- Total number and type of enforcement actions taken during the reporting period as well as a summary of the enforcement actions.

BMP 4D – Citizen Complaint Reporting Mechanism

As with complaints other public complaints for water quality issues, residents may use *Call.Click.Connect* or the Nuisance Abatement Hotline to file erosion and sediment control complaints. Citizens may also contact T&ES-C&I staff directly. Complaints are logged into Cityworks™ for tracking. Calls to the T&ES-C&I are logged into the Permit Plan software database.

Objective and Expected Results: The purpose of this activity is to ensure that all complaints are logged into a central database so that staff can track investigations.

Implementation and Schedule: The City will continue to maintain a database log for tracking the disposition of E&SC complaints.

Responsible Party: Data collection responsibility is shared between T&ES-SWM and T&ES-C&I. Complaints are entered into Cityworks™ by T&ES-SWM staff, while T&ES-C&I staff maintain complaint data in the PERMIT-PLAN database.

Documentation and Measure of Effectiveness: The City will provide a summary of program implementation and a summary of all complaints from the most recent reporting year and screenshots of databases utilized.

5.0 MCM #5 — Post Construction Stormwater Management

Permit Reference: Section II B. 5

Relevant Excerpt:

d. MS4 Program Plan requirements. The operator's MS4 Program Plan shall be updated in accordance with Table I in this section to include: (1) A list of the applicable legal authorities such as ordinance, state and other permits, orders, specific contract language, and interjurisdictional agreements to ensure compliance with the minimum control measure in Section II related to post-construction stormwater management in new development and development on prior developed lands;

(2) Written policies and procedures utilized to ensure that stormwater management facilities are designed and installed in accordance with Section II B 5 b;

(3) Written inspection policies and procedures utilized in conducting inspections;

(4) Written procedures for inspection, compliance and enforcement to ensure maintenance is conducted on private stormwater facilities to ensure long-term operation in accordance with approved design;

(5) Written procedures for inspection and maintenance of operator-owned stormwater management facilities;

(6) The roles and responsibilities of each of the operator's departments, divisions, or subdivisions in implementing the minimum control measure in Section II related to post-construction stormwater management in new development and development on prior developed lands. If the operator utilizes another entity to implement portions of the MS4 Program Plan, a copy of the written agreement must be retained in the MS4 Program Plan. Roles and responsibilities shall be updated as necessary.

e. Stormwater management facility tracking and reporting requirements. The operator shall maintain an updated electronic database of all known operator-owned and privately-owned stormwater management facilities that discharge into the MS4. The database shall include the following:

(1) The stormwater management facility type;

(2) A general description of the facility's location, including the address or latitude and longitude;

(3) The acres treated by the facility, including total acres, as well as the breakdown of pervious and impervious acres;

(4) The date the facility was brought online (MM/YYYY). If the date is not known, the operator shall use June 30, 2005, as the date brought online for all previously existing stormwater management facilities;

(5) The sixth order hydrologic unit code (HUC) in which the stormwater management facility is located;

(6) The name of any impaired water segments within each HUC listed in the 2010 § 305(b)/303(d) Water Quality Assessment Integrated Report to which the stormwater management facility discharges;

(7) Whether the stormwater management facility is operator-owned or privately-owned;

(8) Whether a maintenance agreement exists if the stormwater management facility is privately owned; and

(9) The date of the operator's most recent inspection of the stormwater management facility.

In addition, the operator shall annually track and report the total number of inspections completed and, when applicable, the number of enforcement actions taken to ensure long-term maintenance. The operator shall submit an electronic database or spreadsheet of all stormwater management facilities brought online during each reporting year with the appropriate annual report. Upon such time as the department provides the operators access to a statewide web-based reporting electronic database or spreadsheet, the operator shall utilize such database to complete the pertinent reporting requirements of this state permit.



Program Plan Update Requirement

The City must meet applicable regulatory requirements to ensure that post-construction stormwater controls are properly installed and adequately maintained to minimize impacts to water quality from development and redevelopment. The following is an overview of the City's program to meet these requirements and adhere to the general permit.

Description of Legal Authorities

The City's post-construction stormwater requirements are found in Article XIII of the Zoning Ordinance – the Environmental Management Ordinance (EMO). As described in the "Description of Legal Authorities" under MCM#4, the City has amended the EMO and created the appropriate policies and procedures to receive full approval by DEQ as a local VSMP authority.

Written Stormwater Facility Design and Installation Procedures

Stormwater management facilities must be properly designed and installed, to ensure proper functioning. The City reviews development site plans to ensure water quality and water quantity designs meet the VSMP regulations, the Virginia BMP Clearinghouse, Virginia Stormwater Management Handbook and approved design standards. Projects must use the Virginia Runoff Reduction Method spreadsheet to demonstrate compliance and project plans must contain a note that the stormwater facility will be installed under the supervision of the design professional and certified. Stormwater facilities must be installed under the general supervision of the design engineer, and as-built plan submission must be signed/sealed by the design professional and include a separate certification that the facility was installed as designed.

Written Inspection, Compliance, and Enforcement Procedures

Stormwater facilities require periodic inspections to determine if maintenance is needed to ensure proper long-term functioning in order to provide water quality benefits. The City inspects privately-owned facilities at least once every five years and requires private owners to perform maintenance as needed per Section 13-109(G) of the EMO. The City inspects public facilities at least once annually and performs maintenance as needed. Policies, procedures, checklists, and guidelines for the program are found in Appendix E.

Roles and Responsibilities

T&ES-SWM conducts inspection of private stormwater management facilities at least once every five years. T&ES-PWS conducts inspections of public facilities at least annually and performs maintenance as needed. The City Attorney, with support from T&ES-SMS conducts enforcement procedures as necessary.

Individual Residential Lot Special Criteria

During PY1, the City reviewed its ordinances concerning maintenance agreements for BMPs used to treat stormwater solely from individual residential lots, and revised the ordinance to exempt single-family residential detached projects from meeting state phosphorus requirements. The City has eliminated the requirement of BMP maintenance agreements for *individual residential lots* separately build and not part of a larger common plan of development or sale. Instead, a combination of homeowner outreach and education, in accordance with Section II.B.5.c.(1).(d) is provided. Information sheets have been

developed for each type of stormwater BMP that may be implemented on individual residential lots in the City for the education activities.

Reporting of Historical BMPs

DEQ Guidance Memo 15-2005 dated May 18, 2015 instructs localities on compliance with Special Conditions related to the development and implementation of the Chesapeake Bay TMDL Action Plan. The City submitted the full database of “Historical BMPs” to DEQ by September 1. Based on Part IV 2 of the Guidance, localities may receive nutrient and sediment reduction credits for historical water quality BMPs installed between January 1, 2006 and June 30, 2009 if this data is submitted to DEQ by September 1, 2105 and included the Chesapeake Bay TMDL Action Plan. Confirmation that the City met the September 1, 2015 reporting deadline is included in Appendix E. The Bay Action Plan also includes the requisite reporting and is included in Appendix B of this Program Plan.

BMP 5A – Stormwater Facility BMP Inventory

Stormwater facility best management practices (BMPs) are tracked in an electronic database. Information tracked includes the type of BMP, location, discharging water body, project number, and a breakdown of the impervious and pervious of acres treated.

Objective and Expected Results: The purpose of this BMP is to continue to maintain a database for tracking required information for BMPs installed in the City. This information enables a better understanding of areas being treated by BMPs and is used to for Chesapeake Bay Action Plan reporting purposes.

Implementation and Schedule:

- Ensure that required information for all new certified BMPs are entered into the City’s database.
- The current permit contains a new requirement for the breakdown of impervious and pervious area draining to each BMP. The need for this information was anticipated prior to permit issuance and work was completed to incorporate this breakdown, which is maintained in the City’s BMP database.

Responsible Party: T&ES-SWM is responsible for this BMP.

Documentation and Measure of Effectiveness: The City will provide a spreadsheet of all certified BMPs brought online during the reporting period. The database information will include the project number/unique identifier, type of BMP, location, impaired water body where the facility discharges, existence of maintenance agreement, date of last inspection and breakdown of impervious and pervious drainage area.

BMP 5B –BMP Maintenance Agreement and Inspection Schedule

During the site plan review process, projects other than single-family residential that are separately built and not part of a larger common plan of development or sale, are required to implement stormwater facility BMPs must submit a BMP maintenance agreement and attached inspection schedule and guidelines for review. Following approval of the draft, the project owner must execute the agreement and provide proof of recordation prior to release of the site plan. T&ES-SWM performs the review. Individual residential lot criteria requires annual educational materials mailed to applicable facility owners. The information is captured in the City’s database.

Objective and Expected Results: Legally executed and enforceable maintenance agreements help ensure that structural BMPs continue to provide their intended water quality functions.

Implementation and Schedule:

- Continue to review and ensure that all appropriate BMPs have executed BMP maintenance agreements and inspection schedules, and that these are recorded in Land Records.
- Plans shall be tracked to ensure that appropriate BMP maintenance agreements are tracked in the BMP database.
- Beginning in PY2, a combination of homeowner outreach and education will be implemented for owners of BMPs on individual residential lots.

Responsible Party: T&ES-I&ROW staff ensure that the BMP maintenance agreement is submitted during site plan review. Staff from T&ES-SWM are responsible for ensuring that BMP maintenance agreements are executed and enforced. The City Clerk of the Circuit Court files the agreements with the appropriate land records.

Documentation and Measure of Effectiveness: A copy of the City's BMP maintenance agreement form is included in Appendix E.

BMP 5C – Implementation Bay Act and Local VSMP Authority

The City amended the Environmental Management Ordinance for consistency with the new VSMP regulations, and maintained consistency with the Chesapeake Bay Act requirements. The City received provisional approval as a local VSMP authority effective July 1, 2014 and received full approval in November 2014.

Objective and Expected Results: The Environmental Management Ordinance ensures that post-construction runoff is controlled to the maximum extent practicable in accordance with permit requirements.

Implementation and Schedule: The City will continue to implement a stormwater management program that is compliant with the Chesapeake Bay Preservation Area Designation and Management Regulations, and the VSMP regulations, through the City's Environmental Management Ordinance.

Responsible Party: T&ES-SWM staff has primary responsibility for ensuring City consistency with the Chesapeake Bay Preservation Area Designation and Management Regulations, and the VSMP regulations.

Documentation and Measure of Effectiveness: The revised and adopted ordinance (Article XIII.– Environmental Management) can be found in Appendix E. Bay Act reporting requirement is submitted separately to DEQ.

BMP 5D – Stormwater Facility BMP Design Guidelines

Section 13-109 of the Environmental Management Ordinance, as amended, requires that development and redevelopment projects subject to VSMP Part II.B technical criteria conform to the design specifications of the Virginia BMP Clearinghouse for stormwater facility BMPs, and utilize the Virginia Runoff Reduction Method spreadsheet to demonstrate compliance with water quality and quantity requirements. Grandfathered projects and those meeting the "Time Limits" associated with coverage under the

construction general permit are subject to the Part II. C technical criteria and may use stormwater facility BMPs previously approved by the City and adhere to the design guidelines in the Alexandria Supplement to the Northern Virginia BMP Handbook. The City has also adopted a Green Building Policy to encourage development to meet green building standards such as LEED certification or equivalent, which includes incentives to comply with stormwater management requirements by implement Low Impact Development (LID) or Green Infrastructure (GI) techniques.

BMP use may be limited in accordance with policies established by the director of T&ES in accordance with 13-104(c) of the City Code.

Objective and Expected Results: To ensure that the City's BMP design guidelines are consistent with the requirements of the VSMP regulations.

Implementation and Schedule: Ensure that BMP design is consistent with the VSMP regulations and be protective of water quality.

Responsible Party: T&ES-SWM and T&ES-I&ROW

Documentation and Measure of Effectiveness: See amended and adopted ordinance in Appendix E.

BMP 5E – Public Stormwater Facility BMP Inspection and Maintenance

Publicly-owned stormwater facility BMPs include those installed as a requirement of development an redevelopment, as a target of opportunity during infrastructure work, and those installed to meet the nutrient and sediment target reductions under the permit special conditions for the Chesapeake Bay TMDL. Inspection and maintenance of all publicly-owned BMP is the responsibility of the City.

During PY1, the City developed written policies and procedures for the inspection and maintenance of publicly owned BMP facilities. These policies and procedures can be found in Appendix E.

Objective and Expected Results: Maintenance of public BMP facilities is essential to ensuring that these investments continue to provide their intended water quality benefits.

Implementation and Schedule: The City will inspect each publicly owned BMP facility annually.

- Regular maintenance will be performed according to the maintenance schedule and guideline specific to each BMP.
- Utilize the state's online reporting database when it becomes available.

Responsible Party: T&ES-PWS is responsible for this effort, with assistance from T&ES-SWM.

Documentation and Measure of Effectiveness: Annually document the number of BMPs inspected and maintenance activities performed during the reporting period.

BMP 5F – Private Stormwater Facility BMP Inspection and Enforcement

Privately-owned stormwater BMPs must be inspected at least once every five years. During PY1, the City developed written policies and procedures for the inspection and enforcement of maintenance for privately owned BMP facilities. These policies and procedures can be found in Appendix E.

In accordance with Section II.B.5.c.(1).(d) the City will be implementing methods other than maintenance agreements to promote the long-term maintenance of stormwater control measures that treat stormwater

runoff from individual residential lots only. The City will use homeowner outreach and education to promote maintenance of BMPs on individual residential lots.

Objective and Expected Results: Maintenance of private BMP facilities is essential to ensuring that these investments continue to provide their intended water quality benefits.

Implementation and Schedule: The VSMP permit regulations require the City to implement a BMP inspection program based on the Virginia Stormwater Management Regulations. The City will implement an inspection program in accordance with the following:

- Inspect each applicable privately-owned BMP at least once every five years.
- Enforcement procedures will follow the procedures outlined in the City's Policies and Procedures for Post-Construction BMP Operation and Maintenance.
- Utilize the state's online reporting database when it becomes available.
- Ensure inspectors and plan reviewers have appropriate certifications and keep them on file.

Responsible Party: T&ES-SWM staff is responsible for this effort, with assistance from T&ES-PWS.

Documentation and Measure of Effectiveness: The City will document the number of BMPs inspected each year and provide statistics on the number of facilities for which follow-up enforcement action was required. This information will be included with the City's Annual Report.

6.0 MCM #6 — Pollution Prevention/Good Housekeeping for Municipal Operations

Permit Requirement: Section II B. 6

Relevant Excerpt:

f. At a minimum, the MS4 Program Plan shall contain: (1) The written protocols being used to satisfy the daily operations and maintenance requirements; (2) A list of all municipal high-priority facilities that identifies those facilities that have a high potential for chemicals or other materials to be discharged in stormwater and a schedule that identifies the year in which an individual SWPPP will be developed for those facilities required to have a SWPPP. Upon completion of a SWPPP, the SWPPP shall be part of the MS4 Program Plan. The MS4 Program Plan shall include the location in which the individual SWPPP is located; (3) A list of lands where nutrients are applied to a contiguous area of more than one acre. Upon completion of a turf and landscape nutrient management plan, the turf and landscape nutrient management plan shall be part of the MS4 Program Plan. The MS4 Program Plan shall include the location in which the individual turf and landscape nutrient management plan is located; and (4) The annual written training plan for the next reporting cycle.



Program Plan Update Requirement

The general permit requires that the updated program plan to include 1) Identification of Locations Requiring SWPPPs, 2) Identification of Nutrient Management Plan (NMP) Locations, and 3) a Training Schedule and Program by June 30, 2014. Additionally, the program plan must include Daily Good Housekeeping Procedures by June 30, 2015. The development and implementation of SWPPPs and NMPs must occur per the general permit schedule, and training must be conducted biennially. The following BMPs provide an overview of the City's program to meet these requirements and adhere to the general permit.

BMP 6A – Environmental Stakeholder Groups

Objective and Expected Results: Internal stakeholder groups create ties across the organization among the various departments and divisions that are responsible for implementing the MS4 Program Plan, allows for interactions and collaborative problem solving, fosters team building, and creates organizational ownership for the program. They also provide a forum for the exchange of ideas and allows for the input of staff expertise from varied disciplines to help create a more holistic stormwater program.

Implementation and Schedule: The Fire Department’s Environmental and Industrial Use Unit (EIU) acted as lead with representatives from all City departments to meet monthly during PY5 to help coordinate environmental issues, including water quality investigation, enforcement, and documentation.

The City Manager has established two internal stakeholder groups to work on stormwater issues and make policy decisions to ensure regulatory compliance and shape the stormwater program. The Water Quality Steering Committee is comprised of deputy city managers, department heads, and staff from T&ES-SWM, and is charged with making policy decisions and setting the course for the City’s stormwater programming. The Water Quality Work Group (Work Group) as an internal stakeholder group comprised of staff from the deputy director, division chief and supervisory level. The Work Group’s mission is to develop and coordinate the City’s response across various City departments to permit requirements, including the Chesapeake Bay TMDL. The Work Group is charged with developing policies, programs and plans to administer the Virginia Stormwater Management (VSMP) Local Program and the MS4 general permit. The Work Group makes recommendations on topics and brings these to the Steering Committee for approval or revision. The Steering Committee guides the activities of the Work Group to ensure cost efficient compliance with the regulatory framework.

- The EIU will continue to focus on environmental issues and meet regularly.
- The Water Quality Steering Committee will meet monthly to provide policy direction for the stormwater program.
- The Water Quality Work Group will meet monthly.

Responsible Parties: The City Manager’s Office and department heads comprise the Steering Committee, with support from T&ES-SWM technical staff. The Work Group is comprised of deputy directors, division chiefs and supervisors, with support from T&ES-SWM technical staff.

Documentation and Measure of Effectiveness: Sample meeting agenda from meetings held during the reporting period will be included in the annual report.

BMP 6B – Stormwater Pollution Prevention Plans for High-Priority Facilities

Objective and Expected Results: Developing and implementing SWPPPs for high-priority municipal facilities will greatly reduce the potential for pollutant discharges in stormwater runoff through the implementation and periodic inspection of good housekeeping and pollution prevention best practice for municipal facilities. High-priority facilities may include any of the following: composting, equipment storage and maintenance, recycling, solid waste handling and transfer, salt storage, pesticide storage, public works yards, and vehicle storage and maintenance yards. Stormwater pollution prevention plans (SWPPPs) must then be developed for these high-priority facilities.

Implementation and Schedule: During PY1, the City identified its high-priority municipal facilities that may require the development and implementation of a SWPPP. This list was further refined for those municipal facility with a high potential for discharging pollutants. During the previous permit cycle, the City developed an inspection checklist to be used at municipal facilities. The checklist covers good housekeeping practices, material storage and handling, as well as maintenance practices. The checklist will be revised and included in the development of SWPPPs.

The City will develop and implement SWPPPs for the high-priority facilities identified under this BMP. Facilities implementing SWPPPs shall keep an updated copy onsite, and SWPPPs will be incorporated into the pollution prevention training given to municipal employees. SWPPPs will be developed and implemented periodically to meet the June 30, 2017 deadline. The following table provides the list of high-priority facilities requiring SWPPPs and pertinent information, to include the due date for the SWPPPs, the date completed and the onsite SWPPP location.

Division	Facility*	Facility Location	Site Activity	Due	Done	SWPPP Location
<i>Transportation and Environmental Services</i>						
Transportation	Transportation Division Sign Shop	3220 Colvin Street	Material and Equipment Storage	PY4		
Resource Rec.	Household Hazardous Waste (HHW)	3224 Colvin Street	Waste Storage and Transfer	PY4	PY2	Onsite materials storage shed
Maintenance, SW	Equipment and Materials Storage ¹	133 South Quaker Lane	Vehicle, Material and Equipment Storage	PY4		
Maintenance, Streets	Lower Property Yard ²	Across from 133 South Quaker Lane	Material and Waste Storage	PY4		
Maintenance, Streets	Field Operations Center ³	2900-B Business Center Drive	Vehicle, Material and Equipment Storage	PY4	PY3	Administration Desk for T&ES
Streets	Composting Facility	4125 Eisenhower Avenue	Material Storage	PY4		
Transportation	Transportation Division Impound Lot	5249 Eisenhower Avenue	Vehicle Storage	PY4		
<i>General Services</i>						
Fleet	Fueling Station	3550 Wheeler Avenue	Vehicle Fueling and Fuel Transfer	PY4		
Fleet	Vehicle and Equipment Maintenance Center ⁴	133 South Quaker Lane & Wheeler Ave	Vehicle, Material and Equipment Storage	PY4		

Division	Facility*	Facility Location	Site Activity	Due	Done	SWPPP Location
Fleet	Impound Lot	3000 Business Center Drive	Vehicle Storage	PY4		
Recreation, Parks and Cultural Activities						
Park Ops	Equipment and Materials Storage ¹	133 South Quaker Lane	Vehicle, Material and Equipment Storage	PY4		
Park Ops	Lower Property Yard ²	across from 133 S. Quaker	Material and Waste Storage	PY4		
Park Ops & Natural Res.	Field Operations Center ³	2900-A Business Center Drive	Vehicle, Material and Equipment Storage	PY4	PY3	Administration Desk for RCPA
Fire Department						
Maintenance	Vehicle Maintenance Bay ⁴	133 South Quaker Lane & Wheeler Ave	Vehicle, Material and Equipment Storage	PY4		

Responsible Party: T&ES-SWM will oversee the development of SWPPPs for high-priority facilities, and ensure proper implementation of the plans by working with the departments and divisions listed above.

Documentation and Measure of Effectiveness: Based on discussions with staff and additional site visits, the list was updated last permit cycle to reflect those high-priority facilities requiring SWPPPs. Each facility will keep an updated copy of the site-specific SWPPP onsite. Completed SWPPPs will be considered part of the MS4 program Plan. Upon completion of a SWPPP, the table in the Program Plan shall be updated with the location where the individual SWPPP may be found.

A summary of the development and implementation of SWPPPs for high-priority facilities, and any changes to the list of facilities, will be included in annual reports.

BMP 6C – Street Sweeping and Leaf Collection Programs

The City continues to implement a street sweeping program in the MS4 area. The leaf collection program also continues to operate to remove leaves from properties, sidewalk and roadways within the City.

Objective and Expected Results: Removing trash, debris, organic material and sediment from roadways ensures that these materials do not enter the storm sewer system and later get deposited in local waterways, the Potomac River and the Chesapeake Bay. Removing leaves from properties within the City keeps this organic material out of the storm sewer system, and removes possible sources of nutrients and impacts on Biological and Chemical Oxygen Demand in surface waters.

Implementation and Schedule:

- Continue to perform street sweeping.

- Continue to operate the leaf collection program.

Responsible Party: T&ES-RR is responsible for implementing the street sweeping and leaf collection programs.

Documentation and Effectiveness: Each annual report will include statistics for street sweeping and leaf collection.

BMP 6D – Catch Basin and Inlet Cleaning Program

The City has a long-standing program to inspect and clean stormwater catch basins and inlets. Catch basin cleaning varies year by year depending on the weather.

Objective and Expected Results: The catch basin and inlet cleaning program is meant to both reduce spot flooding and drainage problems as well as to prevent materials, including floatables and vegetative debris captured in inlets, from continuing to local streams.

Implementation and Schedule: The City will continue catch basin and inlet cleaning operations without significant change.

Responsible Party: T&ES-PWS is responsible for implementing the City’s catch basin and inlet cleaning program.

Documentation and Measure of Effectiveness: The City will report catch basin and inlet cleaning statistics in its Annual Report.

BMP 6E – Employee Complaint Reporting

Objective and Expected Results: Trusting employees to be the “eyes and ears” of the City and providing a reporting mechanism empowers employees and encourages ownership. It also allows the quick and efficient routing of possible problems so that they may be addressed. The “Report a Problem” program page on the intranet is linked to the *Call.Click.Connect* online and phone reporting portals. This allows issues to be routed and addressed in the same manner as citizen complaints.

Implementation and Schedule: The City will continue to operate this portal and include the Report a Problem page on the intranet. This program and page, along with the ability for employees to use the public-facing website for reporting, will continue to be maintained.

Responsible Party: T&ES-PWS and T&ES-SWM are the main agencies addressing water quality concerns, with staff City-wide having access to report a complaint.

Documentation and Measure of Effectiveness: A screen capture of the web portal will be included in each annual report.

BMP 6F - Turf and Landscape Nutrient Management

Objective and Expected Results: Landscape nutrients, if improperly applied, have the potential to pollute the local waterways, the Potomac River and the Chesapeake Bay. By implementing turf and landscape nutrient management plans (NMPs) developed by a certified nutrient planner consistent with § 10.1-104.2 of the Code of Virginia on applicable municipal lands, stormwater impacts can be minimized.

Implementation and Schedule:

- During PY1, applicable properties were identified where nutrients are applied to a contiguous area of one acre or more.
- NMPs will be implemented on no less than 15% of the total identified acreage by June 30, 2015
- NMPs will be implemented on no less than 40% of the total identified acreage by June 30, 2016
- NMPs will be implemented on no less than 75% of the total identified acreage by June 30, 2017
- NMPs will be implemented on no less than 100% of the total identified acreage by June 30, 2018
- RPCA and General Services will continue to ensure that municipal employees responsible for applying nutrients on municipal land receive and maintain proper certification.
- Continue to require that all contractors engaging in the application of nutrients abide by manufacturer’s recommendations.
- The City will not apply deicing agents containing urea or other forms of nitrogen or phosphorus to roadways, parking lots, sidewalks, or other paved surfaces per permit Section II.B.6.c.(3).

Responsible Party: RPCA, T&ES-PWS and General Services, in coordination with T&ES-SWM.

Documentation and Measure of Effectiveness: The list of municipal lands where nutrient management plans are required and the location where individual nutrient management plans are kept is presented below:

Facility	Street Address	Latitude	Longitude	Ac.	Plan (Y/N)	Date of Plan	Total
Joseph Hensley Park	4200 Eisenhower Avenue	38°48'12"N	77° 6'29"W	6.04	Y	6/18/2017	12.48%
Ben Brenman Park	4800 Duke Street	38°48'30"N	77° 6'52"W	1.70	Y	6/18/2017	3.51%
Simpson Park	426 East Monroe Street	38°49'18"N	77° 3'4"W	5.34	Y	6/18/2017	11.04%
Four Mile Run Park	3700 Commonwealth Avenue	38°50'24"N	77° 3'34"W	6.11	Y	6/18/2017	12.63%
Waterfront Park	1A Prince Street	38°48'12"N	77° 2'21"W	1.00			0.00%
Founders Park	351 North Union Street	38°48'27"N	77° 2'20"W	5.10			0.00%
Windmill Hill Park	501 South Union Street	38°47'58"N	77° 2'30"W	4.30			0.00%

Facility	Street Address	Latitude	Longitude	Ac.	Plan (Y/N)	Date of Plan	Total
Rivergate Park	2 Montgomery Street	38°48'46"N	77° 2'17"W	1.57			0.00%
Montgomery Park	200 Montgomery Street	38°48'51"N	77° 2'27"W	1.09			0.00%
Oronoco Bay Park	100 Madison Street	38°48'40"N	77° 2'23"W	4.61			0.00%
Miracle Field	1001 Jefferson Street	38°47'53"N	77° 3'10"W	1.59			0.00%
President Gerald Ford Park	1426 Janneys Lane	38°49'1"N	77° 5'20"W	1.01			0.00%
Armistead Booth	520 Cameron Station Boulevard	38°48'18.9" N	77°07'37.5" W	2.56	Y	6/18/2017	5.29%
Luckett Field	3540 Wheeler Avenue	38°48'26.3" N	77°05'22.8" W	1.31	Y	6/18/2017	2.71%
Braddock Park	1005 Mt. Vernon Ave.	38°49'15.6" N	77°03'13.4" W	5.05	Y	2/18/2018	10.44%
			Total	48.38			58.1%

The City shall summarize the development and implementation of NMPs in each annual report. The summary will include the total number of acres where NMPs are required and the total number of acres with an implemented NMP. The list of municipal lands requiring NMPs shall be updated as NMPs are developed and implemented in compliance with the permit schedule.

BMP 6G – Training of Field Personnel in Recognizing and Reporting Illicit Discharges

Objective and Expected Results: Staff whose normal duties require a considerable amount of field work play a valuable role in identifying and addressing illicit discharges. Training will provide the appropriate tools for field staff to recognize, document relevant information and report the incident for follow up by the appropriate staff

Implementation and Schedule: The City will provide biennial training for the field positions listed below. Training tools may include, but are not limited to, videos, presentation, manuals, desktop exercises, and field exercises, as appropriate. Training may be coordinated with SWPPP training in BMP 6B and may be conducted with the entire group or smaller functional areas as appropriate to minimize

impact on carrying out normal duties. See Section F for more information on staff positions and the schedule for planned training to be provided.

Responsible Party: T&ES-SWM will coordinate the overall effort with the assistance from listed agencies and personnel. Other municipal agencies may provide training as appropriate.

Documentation and Measure of Effectiveness: A list of training events held, the date, number of staff attending and the objective of the training will be provided in each associated annual report. Sign-in sheets and materials will be retained for a minimum of three years.

BMP 6H – Pollution Prevention and Good Housekeeping Training

Objective and Expected Results: City staff engages in daily activities that have the potential to adversely impact water quality. The likelihood of these impacts occurring may be minimized or avoided by providing staff training on pollution prevention and good housekeeping. Permit Section II.B.6.d requires training for specific categories, including staff working in and around recreational, public works and maintenance facilities, and staff performing road, street and parking lot maintenance.

Implementation and Schedule: The City will provide biennial training to staff in these specific categories. Training tools may include, but are not limited to, videos, presentations, manuals, desktop exercises and field exercises, as appropriate. Training may be coordinated with SWPPP training in BMP 6B and may include portions of applicable Daily Standard Operating Procedures in BMP 6H. In addition, contractors are required to maintain the proper certifications if engaging in the application of pesticides or herbicides on city property.

See Section F for more information on staff positions and the schedule for planned training to be provided. Additionally, Emergency Spill Response Training must be reported on annually for emergency response employees.

Responsible Party: T&ES-SWM will coordinate the overall effort with the assistance from listed agencies and personnel. Other municipal departments may assist with training when appropriate.

Documentation and Measure of Effectiveness: A list of training events held, the date, number of staff attending and the objective of the training will be provided in each associated annual report. Sign-in sheets and materials will be retained for a minimum of three years. Documentation of emergency spill response training will be included in each annual report.

BMP 6I –Standard Operating Procedures for Daily Operations

Objectives and Expected Results: Permit Section II.B.6.a requires the development and implementation of standard operating procedures (SOPs) to minimize or prevent pollutant discharge from daily operations such as road, street, and parking lot maintenance; equipment maintenance; and the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers.

Implementation and Schedule:

- During PY2, review and update existing SOPs as appropriate, or create new SOPs to address the required categories.
- Develop written SOPs for daily operations by the end of PY2.
- Beginning PY3, implement the SOPs.

- Incorporate SOPs into pollution prevention and good housekeeping training in BMP 6G.

Responsible Party: T&ES-SWM will take the lead in developing SOPs with assistance and cooperation as needed from T&ES-PWS, RPCA, and GS.

Documentation and Measure of Effectiveness: The City will include the written policies and procedures in Appendix F and a reference to the SOPs will be included in the PY3 annual report.

BMP 6J – Contractor Oversight

Objective and Expected Results: Contractors perform work on behalf of the City must use the appropriate control measures and standard procedures to control impacts to the MS4 from stormwater discharges. Contractors must follow the appropriate laws and regulations, and secure applicable permits as required.

Implementation and Schedule: Continue to ensure that contractors follow proper procedures and employ required control measures.

Responsible Party: Various divisions in T&ES and DPI are responsible for implementing this BMP.

Documentation and Measure of Effectiveness: Provide an annual summary on the types of tools used to ensure compliance.

E. Annual Report and Program Evaluation

Annual Report

The City will submit annual reports to DEQ each year covering the period of July 1st through June 30th. The annual report will be submitted to DEQ no later than October 1st of each year. The information provided to DEQ will be in accordance with MCM-specific items in the general permit, as well as the provisions of [9VAC25-890-40](#) Section II.E.3, which includes the following:

Permit Section	Annual Report Requirements
I.B.2.5	<p>a. The operator shall submit the required TMDL Action Plans with the appropriate annual report and in accordance with the associated schedule identified in this state permit.</p> <p>b. On an annual basis, the operator shall report on the implementation of the TMDL Action Plans and associated evaluation including the results of any monitoring conducted as part of the evaluation.</p>
I.C.4	<p>a. In accordance with Table 1 in this section, the operator shall submit the Chesapeake Bay Action Plan with the appropriate annual report.</p> <p>b. Each subsequent annual report shall include a list of control measures implemented during the reporting period and the cumulative progress toward meeting the compliance targets for nitrogen, phosphorus, and total suspended solids.</p> <p>c. Each subsequent annual report shall include a list of control measures, in an electronic format provided by the department , that</p>

	<p>were implemented during the reporting cycle and the estimated reduction achieved by the control. For stormwater management controls, the report shall include the information required in Section II B 5 e and shall include whether an existing stormwater management control was retrofitted, and if so, the existing stormwater management control type retrofit used.</p> <p>d. Each annual report shall include a list of control measures that are expected to be implemented during the next reporting period and the expected progress toward meeting the compliance targets for nitrogen, phosphorus, and total suspended solids.</p>
II.B.1.g	<p>The operator shall include the following information in each annual report submitted to the department during this permit term:</p> <p>(1) A list of the education and outreach activities conducted during the reporting period for each high-priority water quality issue, the estimated number of people reached, and an estimated percentage of the target audience or audiences that will be reached; and</p> <p>(2) A list of the education and outreach activities that will be conducted during the next reporting period for each high-priority water quality issue, the estimated number of people that will be reached, and an estimated percentage of the target audience or audiences that will be reached.</p>
II.B.2.a.2	<p>(a) Maintain an updated MS4 Program Plan. Any required updates to the MS4 Program Plan shall be completed at a minimum of once a year and shall be updated in conjunction with the annual report. The operator shall post copies of each MS4 program plan on its webpage at a minimum of once a year and within 30 days of submittal of the annual report to the department.</p> <p>(b) Post copies of each annual report on the operator's web page within 30 days of submittal to the department and retain copies of annual reports online for the duration of this state permit;</p>
II.B.2.d	<p>Each annual report shall include:</p> <p>(1) A web link to the MS4 Program Plan and annual report; and</p> <p>(2) Documentation of compliance with the public participation requirements of this section.</p>
II.B.3.a.3	<p>Within 48 months of coverage under this state permit, the operator shall have a complete and updated storm sewer system map and information table that includes all MS4 outfalls located within the boundaries identified as "urbanized" areas in the 2010 Decennial Census and shall submit the updated information table as an appendix to the annual report.</p>

II.B.3.f	Each annual report shall include: <ol style="list-style-type: none">(1) A list of any written notifications of physical interconnection given by the operator to other MS4s;(2) The total number of outfalls screened during the reporting period, the screening results, and detail of any follow-up actions necessitated by the screening results; and(3) A summary of each investigation conducted by the operator of any suspected illicit discharge. The summary must include: (i) the date that the suspected discharge as observed, reported, or both; (ii) how the investigation was resolved, including any follow-up, and (iii) resolution of the investigation and the date the investigation was closed.
II.B.4.f	The operator shall track regulated land-disturbing activities and submit the following information in all annual reports: <ol style="list-style-type: none">(1) Total number of regulated land-disturbing activities;(2) Total number of acres disturbed;(3) Total number of inspections conducted; and(4) A summary of the enforcement actions taken, including the total number and type of enforcement actions taken during the reporting period.
II.B.5.e (pg. 20)	The operator shall submit an electronic database or spreadsheet of all stormwater management facilities brought online during each reporting year with the appropriate annual report. Upon such time as the department provides the operators access to a statewide web-based reporting electronic database or spreadsheet, the operator shall utilize such database to complete the pertinent reporting requirements of this state permit.
II.B.6.c.1.a	Within 12 months of state permit coverage, the operator shall identify all applicable lands where nutrients are applied to a contiguous area of more than one acre. A latitude and longitude shall be provided for each such piece of land and reported in the annual report.
II.B.6.d.8	The appropriate emergency response employees shall have training in spill responses. A summary of the training or certification program provided to emergency response employees shall be included in the first annual report.
II.B.6.g	Annual reporting requirements. <ol style="list-style-type: none">(1) A summary report on the development and implementation of the daily operational procedures;(2) A summary report on the development and implementation of the required SWPPPs;(3) A summary report on the development and implementation of the turf and landscape nutrient management plans that includes:

	<p>(a) The total acreage of lands where turf and landscape nutrient management plans are required; and</p> <p>(b) The acreage of lands upon which turf and landscape nutrient management plans have been implemented; and</p> <p>(4) A summary report on the required training, including a list of training events, the training date, the number of employees attending training and the objective of the training.</p>
II.C	<p>If the program the operator is using requires the approval of a third party, the program must be fully approved by the third party, or the operator must be working towards getting full approval. Documentation of the program's approval status, or the progress towards achieving full approval, must be included in the annual report required by Section II E 3. The operator remains responsible for compliance with the permit requirements if the other entity fails to implement the control measures (or component thereof).</p>
II.D	<p>In the annual reports that must be submitted under Section II E 3, the operator must specify that another entity is being relied on to satisfy some of the state permit requirements.</p>
II.E.3	<p>The operator must submit an annual report for the reporting period of July 1 through June 30 to the department by the following October 1 of that year. The reports shall include:</p> <p>a. Background Information.</p> <p>(1) The name and state permit number of the program submitting the annual report;</p> <p>(2) The annual report permit year;</p> <p>(3) Modifications to any operator's department's roles and responsibilities;</p> <p>(4) Number of new MS4 outfalls and associated acreage by HUC added during the permit year; and</p> <p>(5) Signed certification.</p> <p>b. The status of compliance with state permit conditions, an assessment of the appropriateness of the identified best management practices and progress towards achieving the identified measurable goals for each of the minimum control measures;</p> <p>c. Results of information collected and analyzed, including monitoring data, if any, during the reporting period;</p> <p>d. A summary of the stormwater activities the operator plans to undertake during the next reporting cycle;</p> <p>e. A change in any identified best management practices or measurable goals for any of the minimum control measures including steps to be taken to address any deficiencies;</p>

	<p>f. Notice that the operator is relying on another government entity to satisfy some of the state permit obligations (if applicable);</p> <p>g. The approval status of any programs pursuant to Section II C (if appropriate), or the progress towards achieving full approval of these programs; and</p> <p>h. Information required for any applicable TMDL special condition contained in Section I.</p>
II.F.1.a	Adding (but not eliminating or replacing) components, controls, or requirements to the MS4 Program may be made by the operator at any time. Additions shall be reported as part of the annual report.
II.F.1.b	Updates and modifications to specific standards and specifications, schedules, operating procedures, ordinances, manuals, checklists, and other documents routinely evaluated and modified are permitted under this state permit provided that the updates and modifications are done in a manner that (i) is consistent with the conditions of this state permit, (ii) follow any public notice and participation requirements established in this state permit, and (iii) are documented in the annual report.
III.C.1	The operator shall submit the results of the monitoring required by this state permit with the annual report unless another reporting schedule is specified elsewhere in this state permit.

Evaluation of Effectiveness: During the annual reporting process, the City will provide an annual evaluation of the effectiveness of BMPs, to include the effectiveness of BMPs.

Record Keeping: The City will retain records required by the MS4 permit for at least three years and make them available to DEQ and the public as requested.

F. Annual Training Plan and Schedule

BMP 6G and 6H provide specificity for biennial training to meet requirements of permit Section II B 6.d. While some training topics may overlap to provide holistic understanding, “Reporting and Recognizing Illicit Discharges for Field Personnel” will be concentrated in PY3 and PY5. “Pollution Prevention and Good Housekeeping Training” for applicable staff will be provided in PY2 and PY4. The table below provides the Training Plan and Schedule to comply with permit requirements.

Department	Division	Position	FTEs	IDDE Training	PPGH Training
Transportation and Environmental Services	Street Maintenance	Superintendent	1	PY3 & PY5	PY2 & PY4
		Assistant Superintendent	1	PY3 & PY5	PY2 & PY4
		Pavement Inspector	3	PY3 & PY5	PY2 & PY4
		Asphalt Crew	3	PY3 & PY5	PY2 & PY4
		Concrete/Brick Crew	1	PY3 & PY5	PY2 & PY4
		Concrete/Crew	4	PY3 & PY5	PY2 & PY4
		Utility Crew	3	PY3 & PY5	PY2 & PY4
	Sewer Maintenance	Superintendent	1	PY3 & PY5	PY2 & PY4
		Assistant Superintendent	1	PY3 & PY5	PY2 & PY4
		Supervisor	4	PY3 & PY5	PY2 & PY4
		Heavy Equip. Operator (HEO)	3	PY3 & PY5	PY2 & PY4
		Equip. Operator (EO)	4	PY3 & PY5	PY2 & PY4
		Labor II	5	PY3 & PY5	PY2 & PY4
		Inspector I	2	PY3 & PY5	PY2 & PY4
		Labor III	1	PY3 & PY5	PY2 & PY4
		Coordinator	1	PY3 & PY5	PY2 & PY4
	Refuse Collection	HEO	6	PY3 & PY5	PY2 & PY4
		EO II	1	PY3 & PY5	PY2 & PY4
		EO I	1	PY3 & PY5	PY2 & PY4
		HEO (Swing)	2	PY3 & PY5	PY2 & PY4
		EO II (Swing)	1	PY3 & PY5	PY2 & PY4
		Temps (Swing)	6	PY3 & PY5	PY2 & PY4

Department	Division	Position	FTEs	IDDE Training	PPGH Training
	Traffic Operations	Division Chief	1	PY3 & PY5	PY2 & PY4
		Management Analyst	1	PY3 & PY5	PY2 & PY4
		Superintendent	1	PY3 & PY5	PY2 & PY4
		Assistant Superintendent	1	PY3 & PY5	PY2 & PY4
		Traffic Services Worker III	6	PY3 & PY5	PY2 & PY4
		Sign Fabricator	1	PY3 & PY5	PY2 & PY4
		Traffic Signal Repair Tech	2	PY3 & PY5	PY2 & PY4
		Traffic Operations Tech	1	PY3 & PY5	PY2 & PY4
		Meter Repair Technician	2	PY3 & PY5	PY2 & PY4
		Traffic Signal Supervisor	1	PY3 & PY5	PY2 & PY4
		Traffic Signal Repair Tech	2	PY3 & PY5	PY2 & PY4
	C&I	Chief Inspector	1	PY3 & PY5	
		Inspector	5	PY3 & PY5	
RPCA	Park Ops	Staff	52	PY3 & PY5	PY2 & PY4
General Services	Facility Maintenance	Building Engineers	11		PY2 & PY4
		Facility Maintenance Spec.	4		PY2 & PY4
		Laborers	3		PY2 & PY4
	Fleet Services	Supervisors	2		PY2 & PY4
		Management Analyst	1		PY2 & PY4
		Fleet Technician	8		PY2 & PY4
		Automotive Service Worker	1		PY2 & PY4
		Laborers	1		PY2 & PY4
		Auto Service Advisor	1		PY2 & PY4
		Auto diagnostician	1		PY2 & PY4
		Auto Parts Specialist	1		PY2 & PY4

Department	Division	Position	FTEs	IDDE Training	PPGH Training
Code Administration	New Construction	Manager	3	PY3 & PY5	
		Inspectors	13	PY3 & PY5	
	Maintenance Code	Division Chief	1	PY3 & PY5	
		Staff	5	PY3 & PY5	

Notes:

Pollution Prevention & Good Housekeeping training given to all municipal employees includes good housekeeping and pollution prevention practices employed during road, street, and parking lot maintenance, in and around maintenance and public works facilities, and in and around recreational facilities as required by permit Sections II.b.6.d.(2), (3), & (7).

Emergency response employees with Hazmat certification are required to have 24 hours of training annually in order to retain certification.

G. Schedule and Summary of Compliance Activities

The following table provides a summary of specific BMPs used to implement the Minimum Control Measures and a schedule of implementation.

MCM #1 Implementation Schedule							
BMP	Task	Year(s) to Implement					Responsibility
		PY1	PY2	PY3	PY4	PY5	
1A	Distribute two eNews messages on nutrients.			▶	▶	▶	T&ES-SWM, CPI
	Social media nutrients message.			▶	▶	▶	T&ES-SWM, CPI
	Create “Stormwater Management” webpage.			■			T&ES-SWM, CPI
	Maintain “Stormwater Management” webpage.				▶	▶	T&ES-SWM, CPI
	Air PSAs on Channel 70 and 69.	▶	▶	▶	▶	▶	T&ES-SWM, CPI
	Distribute direct mail brochures to HOA and Condo associations.			▶	▶	▶	T&ES-SWM
	Participate in NVRC.	▶	▶	▶	▶	▶	T&ES-SWM
	Distribute direct mail brochures to lawn care and maintenance companies.			▶	▶	▶	T&ES-SWM

1B	Distribute two eNews messages on proper disposal of pet waste.			▶	▶	▶	T&ES-SWM, CPI
	Social media pet waste message.			▶	▶	▶	T&ES-SWM, CPI
	Revise website message to include link to www.onlyrain.org .			■			T&ES-SWM, CPI
	Maintain pet waste stations and install new as applicable.	▶	▶	▶	▶	▶	T&ES-SWM
	Distribute brochures at events.	▶	▶	▶	▶	▶	T&ES-SWM
	Distribute brochures at Animal Shelter.	▶	▶	▶	▶	▶	T&ES-SWM
	Distribute brochures at VCA and Old Towne School for dogs.			▶	▶	▶	T&ES-SWM
	Participate in NVRC.	▶	▶	▶	▶	▶	T&ES-SWM
	Explore including message on Animal Shelter licensing website.			■			T&ES-SWM
1C	Distribute two eNews messages on illicit discharges and illegal dumping.			▶	▶	▶	T&ES-SWM, CPI
	Social media message.			▶	▶	▶	T&ES-SWM, CPI
	Create “Stormwater Management” webpage with link to www.onlyrain.org .			■			T&ES-SWM, CPI
	Maintain “Stormwater Management” webpage.				▶	▶	T&ES-SWM, CPI
	Air PSAs on Channel 70 and 69.	▶	▶	▶	▶	▶	T&ES-SWM, CPI
	Participate in NVRC.	▶	▶	▶	▶	▶	T&ES-SWM
	Distribute direct mail brochures to targeted businesses.			▶	▶	▶	T&ES-SWM
1D	Distribute brochure at community events.	▶	▶	▶	▶	▶	TE&S-SWM
	Present educational materials to schools and civic groups.	▶	▶	▶	▶	▶	TE&S-SWM
	Distribute general eNews messages.	▶	▶	▶	▶	▶	TE&S-SWM
	Continue participation in regional education programs.	▶	▶	▶	▶	▶	TE&S-SWM
1E	Maintain stream crossing signs.	▶	▶	▶	▶	▶	T&ES-Trans

1F	Implement stormwater BMP signage.	▶	▶	▶	▶	▶	T&ES-SWM
1G	Implement storm drain inlet marking.	▶	▶	▶	▶	▶	T&ES-SWM
1H	Host water quality web site.	▶	▶	▶	▶	▶	T&ES-SWM
1I	Incorporate PCB standard condition in all development site plan reviews.	▶	▶	▶	▶	▶	T&ES-SWM
	Update PCB education brochure for businesses and industry.		■				T&ES-SWM

MCM #2 Implementation Schedule

BMP	Task	Year(s) to Implement					Responsibility
		PY1	PY2	PY3	PY4	PY5	
2A	Meet all public notice requirements.	▶	▶	▶	▶	▶	T&ES-SWM
	Receipt of public comment on draft Chesapeake Bay TMDL Action Plan.		■				T&ES-SWM, CPI
	Post MS4 Program Plan updates on website.	▶	▶	▶	▶	▶	T&ES-SWM
	Post all annual reports on web site.	▶	▶	▶	▶	▶	T&ES-SWM
	Notice and receipt of public comment on draft MS4 Program Plan for reapplication		■				T&ES-SWM, CPI
2B	Provide staff support to the Environmental Policy Commission.	▶	▶	▶	▶	▶	T&ES-SWM
	Provide annual water quality update to the EPC.	▶	▶	▶	▶	▶	T&ES-SWM
2C	Sponsor annual Alexandria Earth Day.	▶	▶	▶	▶	▶	RP&CA; Earth Day Committee
	Sponsor, promote, and participate in at least four local events.	▶	▶	▶	▶	▶	T&ES-SWM, RR, SWM; RPCA,

MCM #3 Implementation Schedule

BMP	Task	Year(s) to Implement					Responsibility
		PY1	PY2	PY3	PY4	PY5	
3A	Maintain Call.Click.Connect and Nuisance Abatement Hotline and web based reporting form.	▶	▶	▶	▶	▶	EIU;T&ES-SWM; CPI; ITS
3B	Provide HHW and used oil	▶	▶	▶	▶	▶	T&ES-RR

	collection services.						
3C	Enforce prohibition on illicit discharges (Chapter 13 of City Code).	▶	▶	▶	▶	▶	T&ES-SWM; Code; EIU
3D	Provide staff IDDE training on Recognizing and Reporting Illicit Discharges.	▶	▶	▶	▶	▶	T&ES-SWM
3E	Keep map and list of permitted stormwater discharges up-to-date and distribute to field crews.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-PWS
3F	Enforce prohibition on outdoor cleaning of restaurant equipment.	▶	▶	▶	▶	▶	T&ES-SWM; DP&Z
3G	Maintain an up-to-date storm sewer map.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-IROW
	Update the GIS storm sewer map and outfall table.				■		T&ES-SWM; T&ES-SSI
	Identify physical interconnections with other MS4s and notify neighboring MS4s.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-IROW
3H	Perform annual dry weather screening on 50 outfalls.	▶	▶	▶	▶	▶	T&ES-SWM
MCM #4 Implementation Schedule							
BMP	Task	Year(s) to Implement					Responsibility
		PY1	PY2	PY3	PY4	PY5	
4A	Maintain E&SC program consistency with State regulations.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-C&I
4B	Require applicable projects secure coverage under the CGP.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-C&I
	Administer program as a local VSMP authority.		▶	▶	▶	▶	T&ES-SWM; T&ES-C&I
4C	Maintain land-disturbing activity database and report quarterly to DEQ	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-C&I
	Inspect land-disturbing activities in compliance with the E&S ordinance, the EMO and written policies and procedures.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-C&I

4C	Ensure inspectors and plan reviewers are certified and keep records on file.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-C&I
	Require compliance to approved plans, or require modifications.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-C&I
4D	Maintain citizen complaint tracking system.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-C&I
MCM #5 Implementation Schedule							
BMP	Task	Year(s) to Implement					Responsibility
		PY1	PY2	PY3	PY4	PY5	
5A	Maintain BMP database and enter new data.	▶	▶	▶	▶	▶	T&ES-SWM
	Update BMP database to include a breakdown of impervious and pervious area treated.	■					T&ES-SWM
5B	Execute BMP maintenance agreements and ensure recordation in land records.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-IROW; Clerk of Circuit Court
	Track plans to ensure maintenance agreements are executed.	▶	▶	▶	▶	▶	T&ES-SWM
	Implement individual residential lot criteria using homeowner outreach.	▶	▶	▶	▶	▶	T&ES-SWM
5C	Implement the City's Environmental Management Ordinance as Bay Act locality and local VSMP authority.	■	▶	▶	▶	▶	T&ES-SWM
5D	Ensure that BMP design is consistent with the VSMP regulations	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-IROW
5E	Inspect public BMPs annually.	▶	▶	▶	▶	▶	T&ES-PWS; T&ES-SWM
5F	Inspect private stormwater facility BMPs facilities at least once every five years.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-PWS
	Follow written enforcement procedures.		▶	▶	▶	▶	T&ES-SWM
	Utilize the DEQ online database when it becomes available						T&ES-SWM

5F	Ensure inspectors and reviewers are certified.	▶	▶	▶	▶	▶	T&ES-SWM; T&ES-PWS; T&ES-IROW
MCM #6 Implementation Schedule							
BMP	Task	Year(s) to Implement					Responsibility
		PY1	PY2	PY3	PY4	PY5	
6A	EIU will meet regularly.	▶	▶	▶	▶	▶	EIU
	Water Quality Steering Committee will meet monthly.	▶	▶	▶	▶	▶	CMO
	Water Quality Work Group will meet monthly.	▶	▶	▶	▶	▶	T&ES
6B	Identify high-priority municipal facility locations needing SWPPs.	■					
	Develop and implement SWPPs for high-priority municipal facilities					▶	T&ES-SWM
6C	Continue the City’s street sweeping program.	▶	▶	▶	▶	▶	T&ES-PWS
	Continue Leaf Collection program.	▶	▶	▶	▶	▶	T&ES-PWS
6D	Continue the City’s catch basin and inlet cleaning program.	▶	▶	▶	▶	▶	T&ES-PWS
6E	Implement employee “Report a Problem” program.	▶	▶	▶	▶	▶	ITS
6F	Develop and implement NMPs for at least 15% of total required acres.		■				RPCA; T&ES-SWM
	Develop and implement NMPs for at least 40% of total required acres.			■			RPCA; T&ES-SWM
	Develop and implement NMPs for at least 75% of total required acres.				■		RPCA; T&ES-SWM
	Develop and implement NMPs for at least 100% of total required acres.					■	RPCA; T&ES-SWM
6G	Conduct biennial training on “Reporting and Recognizing Illicit Discharges for Field Personnel.”			■		■	T&ES-SWM, C&I, PWS, Trans; Code
6H	Conduct biennial training for Pollution Prevention and Good Housekeeping		■		■		T&ES-SWM, PWS, Trans; General Services; RPCA

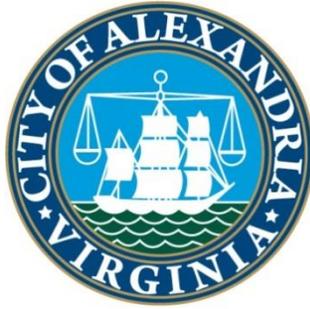
6I	Develop and implement SOPs for Daily Operations.	■	▶	▶	▶		T&ES-SWM, PWS; RPCA; GS
6J	Provide contractor oversight.	▶	▶	▶	▶	▶	T&ES-PWS; RPCA

APPENDIX A. TMDL ACTION PLANS FOR POLLUTANTS ALLOCATED TO THE MS4 IN APPROVED LOCAL TMDLS

The City of Alexandria's *General Permit for Discharges from Small Municipal Separate Storm Sewer Systems* (General Permit No. VAR040057) requires a TMDL Action Plan to be developed for each approved local TMDL within 24 months of permit coverage (i.e. by June 30, 2015).

CONTENTS

1. Alexandria Bacteria TMDL Action Plan
2. Potomac River PCB TMDL Action Plan



City of Alexandria, Virginia

**Bacteria
Total Maximum Daily Load (TMDL)
Action Plan**

**For compliance with 9VAC25-890, "General VPDES Permit for
Discharges of Stormwater from Small Municipal Separate Storm Sewer
Systems, Permit No. VAR040057"**

**June 17, 2015
Revised November 20, 2015
Revised June 30, 2016**

Prepared by:

City of Alexandria, Virginia
Department of Transportation and Environmental Services
Stormwater Management Division

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1. Introduction

Section I B of the General VPDES Permit (Virginia Pollutant Discharge Elimination System) Permit for Discharges of Storm Water from Municipal Separate Storm Sewer Systems (MS4) No. VAR040057 issued to the City of Alexandria (City) effective July 1, 2013 contains special conditions for total maximum daily loads (TMDLs) other than the Chesapeake Bay TMDL. This section requires the permittee to develop action plans to address TMDLs where a wasteload allocation (WLA) has been assigned to the MS4. These TMDL Action plans must be developed and incorporated into the updated MS4 program plan, to be implemented over multiple permit cycles using an iterative approach to adequately reduce the pollutant in a manner consistent with the assumptions and requirements of the specific WLA in the TMDL. The action plans will identify best management practices measurable goals and milestones, and evaluation measures to be implemented during the current permit term, assess all significant sources, and include a method to assess effectiveness of the plan in reducing the WLA pollutant. In accordance with permit Table 1, the permittee must develop action plans no later than June 30, 2015 for TMDLs approved by the State Water Control Board (SWCB) or the U.S. Environmental Protection Agency (EPA) prior to July 2008 and no later than June 30, 2016 for TMDLs approved between July 2008 and June 2013. The action plan and updates developed in accordance with the permit become effective and enforceable and incorporated into the MS4 Program Plan 90 days after the date received by the Virginia Department of Environmental Quality (DEQ) unless specifically denied in writing. This action plan was developed based on the requirements in the MS4 general permit and the local TMDL Guidance memo dated April 2015 issued by DEQ. The Non-Tidal Four Mile Run Action Plan submitted in PY2 was updated to include all of the current bacteria TMDLs within the City to create a holistic “Bacteria TMDL Action Plan”. This includes incorporating the Tidal Four Mile Run TMDL, and the Holmes Run, Cameron Run and Hunting Creek TMDL into the existing plan to create the City’s “Bacteria TMDL Action Plan”.

2. Background

This TMDL Action Plan is a comprehensive plan for the City to address their bacteria TMDLs. Currently, the City is subject to three different bacteria TMDLs which are listed below:

Approved Bacteria TMDLs
<p><i>Fecal Coliform TMDL Development for Four Mile Run, Virginia (Non-Tidal)</i></p> <ul style="list-style-type: none"> • Bacteria – fecal coliform • First listed – 1998 • EPA approval – 5/31/2002 • SWCB approval – 6/17/2004
<p><i>Bacteria TMDL for the Tidal Four Mile Run Watershed</i></p> <ul style="list-style-type: none"> • Bacteria – <i>E. coli</i> • First listed – 1996 • EPA approval – 6/14/2010 • SWCB approval – 9/30/2010

Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds

- Bacteria – *E. coli*
- First listed – 1998, 2008, 2004 (respectively)
- EPA approval – 11/10/2010
- SWCB approval – 8/4/2011

The Virginia Department of Environmental Quality (VADEQ) listed the Four Mile Run watershed on the Commonwealth's 1998 303(d) TMDL Priority List of Impaired Waters (VADEQ, 1998). Four Mile Run is a direct tributary of the Potomac River and is located in Virginia River Segment VAN-A12R. The non-tidal portion of Four Mile Run associated with the City of Alexandria (City) starts at the western border with Arlington County and extends to approximately the Mount Vernon Avenue Bridge across Four Mile Run. The *Fecal Coliform TMDL Development for Four Mile Run, Virginia* (Non-Tidal Four Mile Run TMDL), addresses a fecal coliform impairment includes approximately 17.0 square miles of the watershed that was approved by the SWCB on June 17, 2004. According to Section 5.2 of the TMDL document, "there are no WLAs for fecal coliform bacteria in the non-tidal portion of the Four Mile Run watershed." Given the distinction of the requirement in permit Section I B to develop action plans for TMDLs for which the City has been assigned a WLA, this may preclude the City from developing this Local TMDL Action Plan. However, since the TMDL does anticipate the issuance of the MS4 permit, the City has taken a proactive approach to protecting local water quality by developing this Action Plan. The City's MS4 was assigned a WLA for the bacteria impairment in the non-tidal portion of Four Mile Run with the TMDL. The WLA includes regulated stormwater as a permitted point source.

The impaired tidal portion of Four Mile Run associated with the City starts at approximately the Mount Vernon Avenue Bridge and continues east to the confluence with the Potomac River. The corresponding TMDL document for this section of stream is entitled *Bacteria TMDL for the Tidal Four Mile Run Watershed* and was approved by SWCB on September 30, 2010. The TMDL report provides an aggregate WLA for the City.

Hunting Creek, Cameron Run, and Holmes Run are all located within the Potomac River basin within HUC PL26. The impaired segment of Homes Run extends from the confluence of Holmes Run and Backlick Run upstream to the mouth of Lake Barcroft in Fairfax County. The impaired segment of Cameron Run extends from approximately Telegraph Road upstream to the confluence of Holmes Run and Backlick Run. The impaired segment of Hunting Creek extends from the confluence with the Potomac River at the state boundary to Telegraph Road. The corresponding TMDL document for these impaired stream sections is entitled *Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds* and was approved by EPA in November 2010. The TMDL report provides an aggregated WLA for the City for each of the three streams.

This action plan identifies best management practices and other interim milestone activities that will be implemented during the 2013 – 2018 permit term, as well as activities to be continued beyond the current permit cycle. Any new or modified requirements will be considered and incorporated as applicable.

3. Legal Authorities to Reduce Pollutant of Concern

The City has a number of legal tools available to address the possible discharge of bacteria from municipal facilities, development and redevelopment projects or private properties.

The MS4 general permit regulates discharges from properties that are owned or operated by the City. The City may use its expressed or implied authorities to regulate private lands with regard to stormwater management and MS4 permit requirements. This action plan addresses possible pollutant sources from private properties as well as municipal properties. The City may utilize its rights as the property owner or lessee to address possible sources of bacteria which may originate from the property.

Article XII of the Alexandria Zoning Ordinance (the Environmental Management Ordinance) contains the requirements for standard plan submission requirements. Standard conditions developed during the plan review and Special Use Permit (SUP) processes are enforceable through the Zoning Ordinance. Development plans and SUPs subject to standard conditions must go before the Planning Commission and City Council for consideration before approval.

Section 5-7-42.1 of the City Code prohibits leaving dog waste in public parks or playgrounds, and Section 5-7-46 allows for levying fines for pet owners that do not pick up after their pets. Pet owners not cleaning up after their pet or disposing of pet waste bags in a storm drain may be subject to other parts of the City code.

For pet owners improperly disposing of pet waste, staff from the Fire Marshall's Office with the Environmental Investigations Unit (EIU) may enforce Chapter 13 of Title 11 of the City Code (Environmental Offenses), which prohibits non-stormwater discharges to the storm sewer system.



4. Planning Framework

a. Principles

The City has established the following overarching principles to guide the approach to meet the goals of this action plan:

- Utilize existing programs and efforts
- Encourage voluntary, practical, and cost-effective practices
- Follow an adaptive, iterative approach
 - Replaces dependency on numerical models and traditional planning by applying a focused “learning-by-doing” approach to decision making
- Focus on phased implementation over multiple permit cycles
- Identify additional funding needs

b. Action Goals

The City has established the following goals consistent with the principles in developing the action plan:

- **Consistent:** The action plan is consistent with the assumptions and requirements of the TMDL, and conforms to general permit requirements and current MS4 program plan efforts to reduce pollutants to the maximum extent practicable.
- **Flexible:** The controls, BMPs, design and methods discussed to reduce the pollutant of concern can be revised based on the observed effectiveness of these measures over multiple permit cycles, stakeholder involvement in the development of an implementation plan, change to a water quality standard, or introduction of new technologies and innovations to address the pollutant.
- **Cost Effective:** The 2008 – 2013 general permit contained special conditions associated with existing TMDLs, which were integrated into program plan compliance activities. The appropriateness of existing efforts is considered first before revising these efforts. The cost of revising current efforts or creating additional measures, along with the incremental benefit of each, is taken into consideration.

5. TMDL Development and Load Determination

The following sections provide an overview about the development of the bacteria TMDLs and corresponding WLA for the City.

All Virginia waters are designated for the following uses: recreational uses, e.g., swimming and boating; the propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them; wildlife; and the production of edible and marketable natural resources, e.g., fish and shellfish.

a. Four Mile Run Non-Tidal

The recreation designated use for the non-tidal section of Four Mile Run is currently impaired. The impairment for the non-tidal portion of Four Mile Run was originally listed in 1996 as impaired for bacteria in Virginia's 2008 305(b)/303(d) Water Quality Assessment Integrated report due to exceedances of the state's water quality criteria for fecal coliform. The fecal coliform TMDL was approved by the SWCB on June 17, 2004 and the U.S. Environmental Protection Agency (EPA) decision rationale dated May 31, 2002. The impairment for the non-tidal segment begins at the headwaters of Four Mile Run just over nine miles upstream of its confluence with the Potomac River and extends to the tidal/non-tidal boundary approximately 1.5 miles upstream of the Potomac River. Although the entire Four Mile Run watershed includes approximately 19.7 square miles of Northern Virginia, only 17.0 square miles were considered for this TMDL Study. The City of Alexandria makes up about 10% or 1.7 square miles of the portion of the watershed included in the study.

The TMDL was developed prior to the issuance of the City's first MS4 general permit. Per Section 5.2.1 of the Non-Tidal Four Mile Run TMDL, since the City was expected to receive

an MS4 permit in the soon after the TMDL was developed, WLAs for the TMDL were developed based on contributions from impervious surfaces in the study area. Yet per Section 5.2 of the Non-Tidal Four Mile Run TMDL, there is technically no WLA assigned to the City; which may preclude the applicability of MS4 permit Section I B with respect to the requirement for developing and implementing an action plan for this TMDL. However, the non-tidal section of Four Mile Run being included in this action plan is part of the City's ongoing proactive approach to protecting water resources. In general, "the Commonwealth intends for the required reductions to be implemented in an iterative process" as evidenced by the types of strategies discussed in the *Implementation Plan for Fecal Coliform TMDL (Total Maximum Daily Load) for Four Mile Run, Virginia* (March, 2004).

b. Four Mile Run Tidal

The fish consumption and recreation designated uses for the tidal section of Four Mile Run are currently impaired due to water quality exceedance associated with E. coli bacteria. The impairment for the tidal portion of Four Mile Run was originally listed in 2008, and the TMDL developed for the E. coli bacteria was approved by the SWCB on September 30, 2010 with the EPA decision rationale published June 14, 2010. The impairment for the tidal segment is from rivermile 1.46 (tidal/non-tidal boundary) downstream until the confluence with the Potomac River.

The *Bacteria TMDL for the Tidal Four Mile Run Watershed* was built upon the TMDL for the non-tidal portion of the river, with WLAs developed only for the tidal drainage below the non-tidal portion of Four Mile Run. The model simulated fecal coliform bacteria which were converted to the equivalent E. coli bacteria using an instream translator. The TMDL documents an aggregate WLA of 1.53E+13 for the City, VDOT, and the George Washington Memorial Parkway. According to the TMDL, this equates to a 94% reduction for those regulated sources. A TMDL Implementation Plan has not been developed in response to this TMDL.

Permit Number	MS4 Permit Holder	Wasteload Allocation (cfu/year)	Percent Reduction (%)
VA0088579	Arlington County	2.23E+13	88%
VAR040062	VDOT		
VAR040111	George Washington Memorial Parkway		
VAR040057	City of Alexandria	1.53E+13	94%
VAR040062	VDOT		
VAR040111	George Washington Memorial Parkway		

c. Hunting Creek, Cameron Run, and Holmes Run

Hunting Creek, Cameron Run, and Holmes Run are all located within the Potomac River basin. The impaired segment of Hunting Creek extends from the confluence with the Potomac River at the state boundary to Telegraph Road. Hunting Creek is currently listed as impaired for the designated uses of aquatic life, fish consumption, open-water aquatic life, and recreation beginning in 2008.

According to the Reporting Year 2014 Water Quality Assessment Integrated Report, Cameron Run is no longer impaired for recreation, as in the 2012 report. As a result, Cameron Run was submitted for delisting in 2014 for the recreational use impairment (the only documented impairment for the stream). Similar to Hunting Creek, Cameron Run was also initially listed as impaired for bacteria in 2008. The previously impaired segment of Cameron Run extends from Telegraph Road upstream to the confluence of Holmes Run and Backlick Run.

The impaired segment of Homes run extends from the confluence of Holmes Run and Backlick Run upstream to the mouth of Lake Barcroft. The designated use of recreation has a current status of impaired. Similarly to Hunting Creek and Cameron Run, Holmes Run was also listed as impaired for bacteria in 2008.

The *Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds* were developed using Hydrologic Simulation Program-Fortran (HSPF) and Euler-Lagrangian Circulation (ELCIRC) models.

The tables below present for the WLAs for the City (aggregated with other regulated MS4 permittees) for each stream. E. coli bacteria concentrations are measured in coliform forming units (cfu) expressed annually. The WLA for Hunting Creek is 3.73E+13 cfu/yr or a 92% total reduction from all sources. The WLA for Holmes Run is 2.40E+13 cfu/yr or an 83% total reduction from all sources. The WLA for Cameron Run is 3.20E+13 cfu/yr or an total 83% reduction from all sources.

Table 5-8: E. Coli Wasteload Allocation for MS4 Permits for Hunting Creek ¹				
Permit Number	MS4 Permit Holder	Wasteload Allocation (cfu/day)	Wasteload Allocation (cfu/year)	Percent Reduction (%) ²
VA0088579	Arlington County	1.01E+09	3.68E+11	98%
VAR040062	VDOT			
VAR040057	City of Alexandria			
VAR040062	VDOT	1.02E+11	3.73E+13	92%
VAR040111	George Washington Memorial Parkway			
VA0088587	Fairfax County			
VAR040104	Fairfax County Public Schools	2.79E+11	1.02E+14	83%
VAR040062	VDOT			
VAR040111	George Washington Memorial Parkway			
VAR040065	City of Falls Church	1.40E+10	5.12E+12	83%
VAR040062	VDOT			

Table 5-6: E. Coli Wasteload Allocation for MS4 Permits for Holmes Run ¹				
Permit Number	MS4 Permit Holder	Wasteload Allocation (cfu/day)	Wasteload Allocation (cfu/year)	Percent Reduction (%) ²
VAR040057	City of Alexandria	6.58E+10	2.40E+13	83%
VAR040062	VDOT			
VA0088587	Fairfax County			
VAR040104	Fairfax County Public Schools	1.50E+11	5.47E+13	83%
VAR040062	VDOT			
VAR040065	City of Falls Church	1.40E+10	5.12E+12	83%
VAR040062	VDOT			

Table 5-7: <i>E. Coli</i> Wasteload Allocation for MS4 Permits for Cameron Run ¹				
Permit Number	MS4 Permit Holder	Wasteload Allocation (cfu/day)	Wasteload Allocation (cfu/year)	Percent Reduction (%) ²
VAR040057	City of Alexandria	8.77E+10	3.20E+13	83%
VAR040062	VDOT			
VA0088587	Fairfax County	2.63E+11	9.60E+13	83%
VAR040104	Fairfax County Public Schools			
VAR040062	VDOT			
VAR040065	City of Falls Church	1.40E+10	5.12E+12	83%
VAR040062	VDOT			

¹For MS4 permits, the permittee may address the TMDL WLAs for stormwater through the iterative implementation of programmatic BMPs.

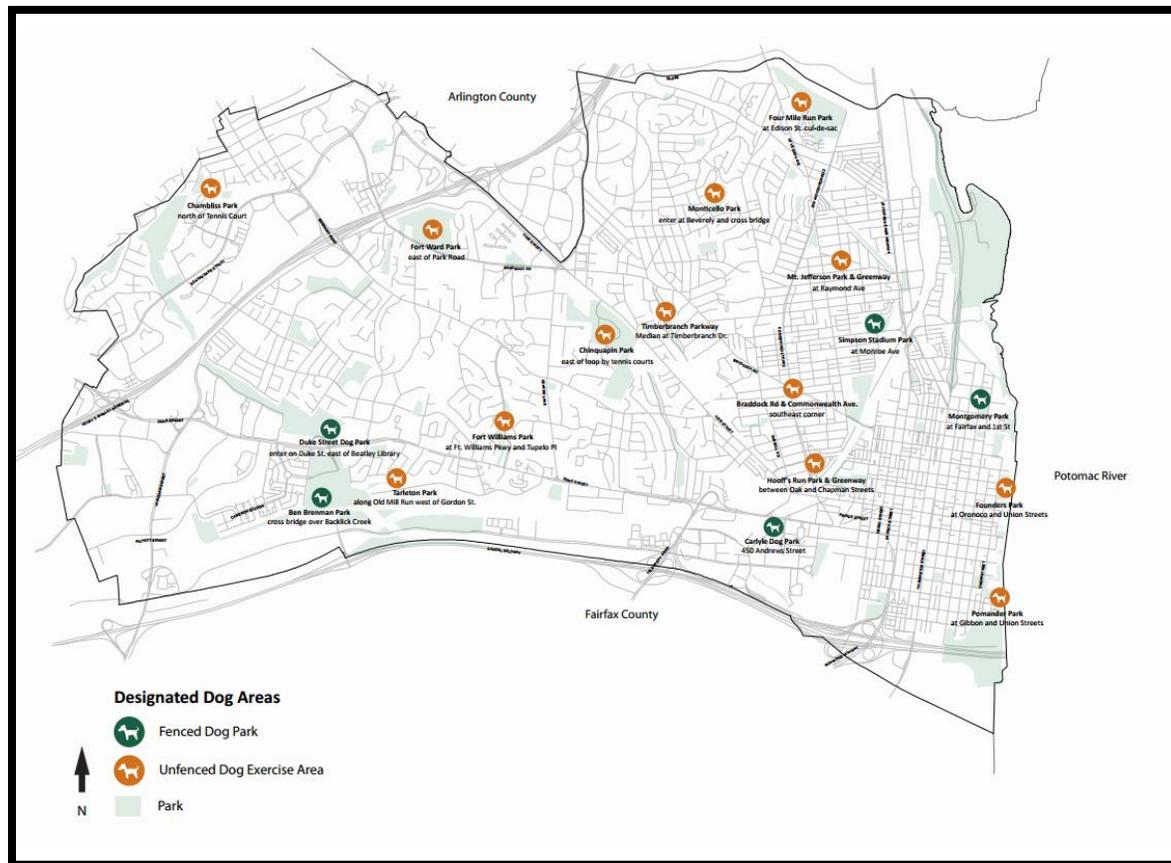
² Percent reduction is based on average annual WLA, and is computed as a reduction from the baseline loadings.

6. Possible Significant Sources of Bacteria

Potential contributors to the bacterial impairments, as documented in the TMDL reports, include wildlife (deer, raccoon, muskrat, beaver, and waterfowl), canine, human and other. Controlling anthropogenic sources will primarily focus on addressing combined sewer overflows through the development and implementation of the City’s Long Term Control Plan for the combined sewer system (<https://www.alexandriava.gov/Sewers>).

As is the case for many streams, reductions from wildlife sources are not realistic and do not meet EPA’s guidance for reasonable assurance. According to analyses of the water quality modeling, many streams with high wildlife inputs “will not attain standards under all flow regimes at all times.” While there are a few options available, “the reduction of wildlife or changing a natural background condition is not the intended goal of a TMDL.” According to the City’s bacterial TMDLs, “Virginia and EPA are not proposing the elimination of wildlife to allow for the attainment of water quality standards.”

The City does have several fenced dog parks and unfenced dog exercise areas as seen in the figure below. These locations have been identified as having the potential to produce bacterial pollutant loadings which are greater than the average loading for the City’s MS4 area. As a result, the City targets dog owners for outreach and education. In addition, the City distributes dog waste bags and supports pet waste stations. See Section 7 for additional information.



7. Best Management Practices, Controls, and Design

As referenced in the Local TMDL Guidance Memo, adaptive management is an iterative implementation process that makes progress toward achieving water quality goals while using new data and information to reduce uncertainty and adjust implementation activities. The focus is oriented towards increasingly efficiently enforcing pet waste laws, educating the public on the impact of pet waste, implementation of the illicit discharge and dumping program, and performing routine inspection and maintenance of the infrastructure. Strategies may change if warranted by new data and information.

NDPES regulations allow the use of non-numeric, BMP-based water quality based effluent limits (WQBELs) where “Numeric effluent limitations are infeasible; or [t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.” (40 CFR 122.44(k)3-4) Adaptive implementation principles used to implement BMPs to address bacteria sources are appropriate due to the uncertainty associated with the TMDL loading capacity and specific allocation scheme.

The non-tidal Four Mile Run TMDL does not contain specific numeric waste load allocations for MS4 permits in the watershed, but rather discusses a number of best management practices that may be employed to address possible pollutant sources within the watershed. The tidal Four Mile Run and Hunting Creek/Cameron Run/Holmes Run TMDLs included WLAs for the

City's MS4; however, these values were grouped with other MS4 permittees (VDOT and George Washington Memorial Parkway).

Many of the BMPs discussed in the Four Mile Run Fecal Coliform Implementation Plan (FMR IP) have been and continue to be implemented by the City to address the bacteria impairment in the watershed. The City's MS4 Program Plan submitted to DEQ on October 1, 2015 was updated during the 2014 – 2015 reporting period to provide more specific local education and outreach strategies to address "Bacteria from Pet Waste" as one of the identified top three high-priority water quality issues. BMPs discussed below are consistent with the FMR IP and the updated MS4 Program Plan.

a. Pet Ordinance

Section 5-7-46 of the City Code allows for levying fines for pet owners that do not pick up after their pets at public parks. Pet owners not cleaning up after their pet or disposing of pet waste bags in a storm drain may be subject to the City Code of Ordinances Title 11, Chapter 13 Environmental Offenses for illicit discharges to the storm drain system.

Milestones, Measureable Goals and Assessment Methods

The City has found that these two codes sections are effective in reinforcing proper behavior for pet owners. The City will review the effectiveness of the pet ordinance and the Environmental Offenses annually. This effort will include a review of the annual follow-up survey data that is provided by the Northern Virginia Regional Commission (NVRC) Clean Water Partners – of which the City is a member partner – with the previous year's survey data. Additionally, the City tracks citizen complaints and results of proactive staff efforts related to improper disposal of pet waste in an asset management system database and/or the permit tracking system. Annual results exported from these databases that are associated with pet waste will be compared to the previous year's results.

The goal of these code sections is to illuminate and reinforce proper behavior. This review will seek to identify trends in behavior using these two metrics. If this review shows a precipitous upward trend in improper behavior, the City will consider revising the code to better address increased improper behavior. The results of these activities will be presented in each year's MS4 annual report.

b. Education and Outreach

An enhancement to the MS4 Public Education and Outreach Plan that increased efforts and created more measureable goals and specifically identified "Bacteria from Pet Waste" as one of the top three high-priority water quality issues was presented in the PY2 MS4 Program Plan update. While BMPs have been implemented for this priority during the first two reporting periods of the current permit, BMPs to address bacteria were introduced in the City's inaugural permit for the 2003 – 2008 permit cycle, as well as the 2008 – 2013 permit cycle. This is in addition to the City's continued participation as an active partner in the NVRC Clean Water Partners regional education and outreach program. The goal of these efforts is to reduce bacteria pollution from pet sources by educating owners of the importance of picking up after their pets, while making it convenient for them to dispose of

the waste after picking it up. Therefore, dog owners will continue to be targeted with education and outreach efforts.

Milestones, Measureable Goals and Assessment Methods

Education and outreach messaging use various forms of media and message delivery, while pet waste stations make it more convenient for dog owners to perform this task. Given that addressing bacteria from pet waste is one of the City's high-priority water quality issues, the goal of the outreach effort is to reach at least 20% of pet owners annually to comply with permit requirements. The City's proposed efforts are captured in the MS4 Program Plan and actions are included in each year's annual report

- Create and distribute annually at least one education message for distribution via the City's electronic email alert system (eNews), and estimate the number of dog owners reached.
- Create and distribute annually at least one message on social media about picking up after pets and properly disposal of the waste and estimate the number of dog owners reached.
- Distribute the Pet Waste brochure annually at appropriate events, at the Animal Shelter and local businesses, and estimate the number of residents reached.
- Distribute direct mailers annually to approximately 20% of the City's dog license holders.
- During the 2015 – 2016 reporting period, create a City webpage related to illicit discharges that includes pet waste information, and track the number of visits annually.
- Continue to participate in the NVRC Clean Water Partners regional efforts and estimate the number of Alexandria residents reached through messaging.
- Starting in PY3, illicit discharge staff training for field personnel will include information on pet waste.



The effectiveness of the City's education and outreach efforts will be assessed annually using the NVRC Survey that is conducted following the annual campaign. The survey has been conducted for a number of years and is useful in showing trends over time. The City will also perform a survey at the annual Earth Day celebration and/or send out a survey via eNews to gauge possible changed behavior due to the City's local efforts. Results will be provided in each annual report for the corresponding permit term.

c. Pet Stations, Dog Parks and Street Cans

The City continues to support the installation of pet waste stations on public and private property. The City has installed pet waste stations in public parks and continues to look for opportunities for installations. "Dog bone" shaped pet waste dispensers that can be attached to a dog collar are handed out at public outreach events as a more mobile way of dispensing pet waste bags.

The City Council approved the Master Plan for Dog Exercise Areas in September 2000, which defines areas for unleashed dog exercise and established guidelines for the creation of any new fenced dog parks and exercise areas, and to ensure that these facilities do not contribute to bacteria from pet waste. The Plan for Dog Parks and Dog Exercise Areas (Revised Winter 2011) provides detailed information and rules governing the City's designated dog park and exercise areas. One of the reasons for having dog exercise areas is to concentrate activity and provide the City with a way to focus education and outreach efforts. The plan includes recommendations for providing plastic bags at dog runs and the strategic placement of waste receptacles. The plan also requires new dog exercise areas to be located more than 75 feet from bodies of water, and in most cases outside the Resource Protection Area (RPA) associated with waterbodies and wetlands.

The City places "street cans" in parks and along public streets where residents can deposit used pet waste bags and routinely empties the cans to further encourage their use and to mitigate the emanation of odors.

Milestones, Measureable Goals and Assessment Methods

The City will continue to support installation of pet waste stations and report on new stations installed in the annual report for the corresponding reporting period. Statistics on "dog bone" pet waste dispensers is included in annual reports. Street cans will be provided and maintained for parks and public streets.

- The number of pet stations, bags used, and the number of newly installed pet waste stations will be documented and included in each annual report.
- The City will continue ongoing implementation of the master plan and revise it as necessary. Any changes to the plan will be reported with the associated annual report.
- Street cans, especially in parks, are widely used by dog owners for disposal of pet waste. These will continue to be routinely emptied and staff will note any precipitous drop-off in pet waste in the cans that is not related to seasonal variations.

d. Illicit Discharge Detection and Elimination Program

The City has performed dry weather screening of regulated outfalls during the previous permit based on local the TMDLs. The current permit requires that City to perform dry weather screening on at least 50 outfalls annually. However, as noted in the Fecal Coliform Non-Tidal Four Mile Run TMDL, Optical Brightener Monitoring (OBM) conducted on every outfall in the watershed “lends evidence that storm sewer outfalls are largely free from illicit connections.” An analogous conclusion can be inferred from the interpretation of similar analytical data for the Tidal Four Mile Run TMDL, and Holmes Run, Cameron Run and Hunting Creek TMDL – that storm sewer outfalls in those local watersheds are largely free from illicit connections and that OBM is not the preferred assessment approach to be implemented during outfall screening. The City continues to implement screening methods found in the Illicit Discharge Detection and Elimination Manual included in the MS4 Program Plan

In addition to dry weather outfall screening, the City maintains a public reporting mechanism to receive complaints. The City’s *Call.Click.Connect* system consists of a web-based problem reporting form and call center (703-746-HELP) that can be used by residents and others to report suspected illicit discharges and other environmental concerns. The reporting form can be found at the homepage at www.alexandriava.gov and is available on subordinate webpages. Incidents are routed to the proper staff and cases may be tracked for resolution. In general, reports of illicit discharging are investigated within 24-hours. Once a responsible party is identified, the pet waste ordinance of the City Ordinance Title 11, Chapter 13 Environmental Offenses may be used to penalize the offender.

Finally, formal training is provided to staff per the schedule in the program plan, while and informal staff training is provided continually as the opportunity arises. The public also receives informal messaging on recognizing and reporting illicit discharges to the storm drain system.

Milestones, Measureable Goals and Assessment Methods

- Annually conduct dry weather screening on at least 50 outfalls and note results of the screening, to include if sanitary cross connections are found in each year’s annual report.
- Report on the number of complaints received related to illicit bacteria discharges in the annual report.

e. Routine Infrastructure Cleaning and Maintenance

As part of the Illicit Discharge Detection and Elimination (IDDE) Program, the City performs routine cleaning of storm drain inlets and catch basins, and frequent street sweeping to remove debris, organics and other items from the system so that these materials are not transported to nearby surface waters during a subsequent storm. Street sweeping is performed routinely from March to October annually and suspended during the snow season. If blockages of the storm drain system are observed during routine maintenance, staff may perform CCTV of the lines to determine the extent of the blockage and the best course of remedial action required to remove the blockage. Proactive CCTV of storm and

sewer lines is also performed on a regular basis. Assessing the condition of sanitary sewer lines can serve to catch an issue with blockage, deflection or root intrusion and prevent sanitary overflows or backups from occurring. Reconstruction and remediation of sanitary sewers such as relining old sewers, joint sealing, rerouting connections and manhole repairs are performed as warranted as part of the inflow and infiltration (I&I) program.

Milestones, Measureable Goals and Assessment Methods

- The City is divided in to 11 separate sweeping areas that receive three passes annually from March to October – outside of snow season. Crews sweep approximately 30,000 lane miles each year and this information is provided in the annual report.
- Crews perform proactive catch basin and inlet cleaning from March to October annually based on 12 separate zones that correlate to the snow zones, with the goal of reaching all 12 separate zones every two years.
- Crews perform proactive catch basin and inlet cleaning following the leaf collection activities to remove leaf and organic material that may have accumulated.
- Crews perform reactive catch basin and inlet clearing according to service requests, resident complaints, and weather-related activities.
- For FY16, proactive periodic CCTV inspections are conducted in the 12 separate zones that correlate to the snow zones, , with priority inspections occurring ahead of paving work. FY17 proactive inspections will continue in this manner and be refined during subsequent years, with a goal of hitting each zone at least once during the FY17-FY18 time period.
- Reactive CCTV inspections occur in response to resident complaints on sewer mains associated with private backups.

The City will continue to perform ongoing routine maintenance, cleaning and investigations of the sewer system and report related information in the associated annual report.

8. Methods to Assess Action Plan Effectiveness

The current permit suggests demonstration of adequate progress may be achieved through tracking, monitoring, and/or reporting of BMP implementation, and/or other strategies as approved by DEQ as part of the TMDL Action Plan. Consistent with the Commonwealth's approach and the types of implementation strategies discussed in the Local TMDL Guidance Memo, the City will implement those BMPs discussed in Section 7 above per the milestones, measureable goals and assessment tools.

Pursuant to the 2008 – 2013 MS4 General Permit and submitted with the 2009 – 2010 MS4 annual report, municipal facilities of concern were previously assessed as to whether these facilities may be expected to constitute a significant source of bacteria. The City has been implementing BMPs to address bacteria for successive permit cycles. Chapter 8 of the *Implementation Plan for the Fecal Coliform TMDL (Total Maximum Daily Load) for Four Mile Run, Virginia* (NVR, March 31, 2004) sites "actions taken" and "water quality data" as two

types of criteria to be monitored to ensure implementation and evaluate efficacy. *Actions taken* related to the separate storm sewer area are identified as those actions in Chapter 6 of the Non-Tidal Four Mile Run Implementation Plan (Non-Tidal FMR IP).

As mentioned previously, implementation plans for Tidal Four Mile Run and the Hunting Creek/Cameron Run/Holmes Run TMDLs have not yet been developed. Therefore, the following actions were identified for non-tidal Four Mile Run but can also be considered as applicable for the City's other bacteria TMDLs. The submitted delisting for Cameron Run may be partially attributed to the City's commitment to protecting our waters and preventing bacterial contamination.

a. Actions Taken

In the absence of implementation plans for the Tidal Four Mile Run TMDL, and the Holmes Run, Cameron Run, and Hunting Creek TMDL, the City has taken a holistic approach to addressing bacteria impairments by applying the following items that are discussed in the Non-Tidal Four Mile Run Fecal Coliform TMDL Implementation Plan (Tidal FMR IP) to other watersheds draining to impaired waters in the City. Other actions discussed herein constitute additional efforts the City performs to address bacteria impairments using this holistic approach. These City-wide actions are discussed in detail below:

Sanitary Sewer Infrastructure

- Sewer rehabilitation has taken place and continues to take place City-wide.
- The City completed the ArcGIS mapping project prior to the previous MS4 permit cycle. Ongoing refinements, if made, are included in the associated annual report.
- Inspection and maintenance is performed as discussed in Section 7.e. above.

IDDE

- The Non-Tidal FMR IP required a pilot program that has since matured through successive permit cycles. Annual dry weather inspections are conducted on at least 50 outfalls City-wide, given that bacteria impairments within the City's watersheds.
- The local ordinance was updated in 2001 to include City Ordinance Title 11, Chapter 13 Environmental Offenses in the Environmental Management Ordinances per the Tidal FMR IP, and continues to be enforced City-wide.
- The Environmental and Industrial Unit (EIU) was created in July 1, 2009 to coordinate environmental issues among departments, with staff from the EIU enforcing Chapter 13 with support from Transportation and Environmental Services.
- The City maintains a Complaint Reporting system through Call-Click-Connect for resident and staff complaint response and tracking.

Proper Pet Waste Disposal

- Consistent with the Non-Tidal FMR IP, the entire City is targeted for the installation of pet waste stations and signage to promote responsible owner behavior.
- The City performs additional efforts annually per Section 7.c. and will report of the activities annually.

Stormwater Treatment

- As a local Virginia Stormwater Management Program (VSMP) authority, the City administers the VSMP Regulations and the Chesapeake Bay Act. The VSMP Regulations have superseded the Bay Act for stormwater quality requirements, while existing portions of the Bay Act related to Resource Protection Area (RPA) protection and enhancement is retained.
- City has been awarded grants through the Stormwater Local Assistance Fund (SLAF) for retrofits under the Chesapeake Bay TMDL for Lake Cook and Ben Brenman (Cameron Station) Pond. When retrofitted, these practices will include features to enhance the exclusion of geese and improve water quality in the Cameron Run Watershed, the Potomac River and the Chesapeake Bay.
- The City inspects and maintains public stormwater facilities, inspects private facilities, and requires private facility owners to maintain private facilities.
- The City has retrofitted publicly-owned facilities with stormwater management BMPs. The Burke Library with a StormFilter™ and bioretention facility, and pervious pavers and bioretention at Four Mile Run Park are a few examples.

Street and Infrastructure Management

- City streets are swept per Section 7.e.
- Catch basins and inlets are cleaned per Section 7.e.
- The City has completed the ArcGIS mapping exercise, and provides updates and maintenance to the database, as needed.

Stream Corridor Restoration

- The City completed the City-wide two-phase stream corridor assessment and is now planning to undertake a new stream assessment project in FY17, subject to funding approval.
- The Four Mile Run Wetlands Restoration Project was completed in FY16.
- The City is considering the restoration of Lucky Run stream, with feasibility design projected to occur during FY17.

Stormwater Runoff Reduction and Reuse

- The City completed a number of retrofit projects recently, to include installation of green infrastructure at Charles Barrett Elementary School and Four Mile Run Park, and the installation of a cistern at Fire Station 206.
- The City ensures that municipal redevelopment projects explore the feasibility of implementing stormwater controls beyond VSMP requirements to address Chesapeake Bay TMDL target reductions and provide other ancillary benefits.

b. Water Quality and Estimation of Discharge

Per the Non-Tidal FMR IP, water quality data will be reported by DEQ through its own bacteria monitoring efforts. The ultimate goal is for that the water quality in Four Mile Run will respond to actions in the watershed. The FMR IP was created jointly by jurisdictions in the watershed, since it will require the actions on behalf of all parties to improve water quality in the run. DEQ also performs bacteria monitoring on other impaired streams in the

City. The City will rely on this water quality data for other TMDLs consistent with the Non-Tidal FMR IP approach. The City will continue to implement structural and non-structural BMPs to address bacteria impairments in its receiving waters.

In addition to the individual milestones and measureable goals discussed in Section 7 and the actions discussed above, the City will perform an estimation of discharges and characterization for the WLA pollutant. Section I B 9 of the previous general permit required the City to conduct annual characterization to “estimate for the volume of stormwater discharged, in cubic feet, and the quantity of pollutant identified in the WLA, in a unit consistent with the WLA discharged by the regulated small MS4 for each WLA”. Based on previous guidance from the state, the City will utilize the Basic L-THIA (Long-Term Hydrologic Impact Assessment) model developed by the Purdue Research Foundation and hosted by the Local Government Environmental Network in performing this estimation. Land use information generated from ArcGIS was used to populate the model. The following land use categories and acreage were used:

- Commercial/Office
- Industrial/Utility
- Medium/High Density Residential
- Low Density Residential
- Parks and Open Space

The City will utilize the L-THIA model, or a similar appropriate model, to perform this assessment during the 2017-2018 reporting period and summarize the results in the associated annual report.

c. Schedule

The Local TMDL Guidance Memo includes a list of action plan content which includes a schedule of interim milestones. Since the majority of the best management practices documented in this plan are currently being implemented, a formal implementation schedule has not been included. Further details regarding the implementation of the BMPs to address bacteria can be found under each BMP listed in Section 7.

As discussed in Section 8.b, modeling using L-THIA or similar model will be used to assess the stormwater volume discharged and the associated quantity of bacteria.

9. References

Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds. Prepared by the Interstate Commission on the Potomac River Basin. November 2, 2010.

Bacteria TMDL for the Tidal Four Mile Run Watershed. Prepared by the Interstate Commission on the Potomac River Basin. April 21, 2010.

Commonwealth of Virginia Department of Environmental Quality, Water Division. Guidance Memo No. GM15-XXXX for developing Local TMDL Action Plans. April XX, 2015.

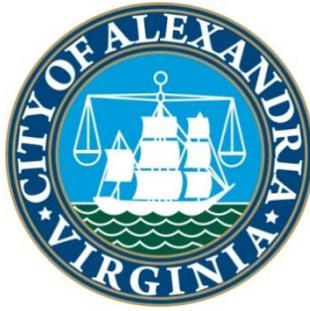
Fecal Coliform TMDL (Total Maximum Daily Load) Development for Four Mile Run, Virginia. Northern Virginia Regional Commission. May 31, 2002

General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems. Virginia Department of Environmental Quality. Effective Date: July 1, 2013.

General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems. Virginia Department of Conservation and Recreation. Effective Date: July 9, 2008.

Implementation Plan for Fecal Coliform TMDL (Total Maximum Daily Load) for Four Mile Run, Virginia. Prepared by the Northern Virginia Regional Commission. March 31, 2004

Plan for Dog Parks and Dog Exercise Areas. City of Alexandria, Virginia. Revised Winter 2011.



City of Alexandria, Virginia

**Tidal Potomac Polychlorinated Biphenyls
(PCBs) Total Maximum Daily Load (TMDL)
Action Plan**

**For compliance with 9VAC25-890, "General VPDES Permit for
Discharges of Stormwater from Small Municipal Separate Storm Sewer
Systems, Permit No. VAR040057"**

June 28, 2015

Prepared by:

City of Alexandria, Virginia
Department of Transportation and Environmental Services
Infrastructure and Environmental Quality

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1. Introduction

Section I B of the General VPDES Permit (Virginia Pollutant Discharge Elimination System) Permit for Discharges of Storm Water from Municipal Separate Storm Sewer Systems (MS4) No. VAR040057, issued to the City of Alexandria (City) effective July 1, 2013, contains special conditions for total maximum daily loads (TMDLs) other than the Chesapeake Bay TMDL. This section requires the permittee to develop action plans to address TMDLs where a wasteload allocation (WLA) has been assigned to the MS4. These TMDL Action plans must be developed and incorporated into the updated MS4 program plan, to be implemented over multiple permit cycles using an iterative approach to adequately reduce the pollutant in a manner consistent with the assumptions and requirements of the specific WLA in the TMDL. The action plan identifies best management practices, measureable goals and milestones, and evaluation measures to be implemented during the current permit term. Also included is an assessment of possible significant source, and methods to assess effectiveness of the plan in reducing the WLA pollutant. In accordance with general permit Table 1, the City must develop action plans no later than June 30, 2015 for TMDLs approved by the State Water Control Board (SWCB) or the U.S. Environmental Protection Agency (EPA) prior to July 9, 2008, where the TMDL assigns a WLA to the MS4. The action plan and updates developed in accordance with the permit become effective and enforceable and incorporated into the MS4 Program Plan 90 days after the date received by the Virginia Department of Environmental Quality (VDEQ) unless specifically denied in writing. This action PCB TMDL Action Plan was developed based on the requirements in the MS4 general permit and the local TMDL Guidance memo dated April 2015 issued by VDEQ.

2. Background

The City of Alexandria (City) MS4 has been assigned a WLA for polychlorinated biphenyls (PCBs) in fish tissue documented in the TMDL report entitled: *Total Maximum Daily Loads of Polychlorinated Biphenyls (PCBs) for Tidal Portions of the Potomac and Anacostia Rivers in the District of Columbia, Maryland, and Virginia* (September 2007, with revisions October 2007). Given that the TMDL was developed for multiple states, the TMDL was developed in collaboration with the respective state agencies and EPA, and approved by EPA on April 11, 2008. Given that the TMDL was approved prior to July 9, 2008, this PCB TMDL Action Plan is required to be completed by June 30, 2015 and submitted with the annual report for the 2014-2015 reporting period due October 1, 2015. This action plan identifies best management practices and other interim milestone activities that will be implemented during the 2013 – 2018 permit term, as well as activities that will continue beyond the current MS4 permit cycle. Any new or modified requirements will be considered and incorporated as applicable.

PCBs are considered a legacy pollutant that was used as coolants and insulators, particularly in transformers, hydraulic equipment and electrical equipment. The manufacture of PCBs was banned in 1979; however, PCBs are very persistent in the environment and do not readily decompose under normal conditions. They also tend to sink into the sediment of waterways or adsorb to terrestrial soils. PCBs may be released into the environment through leaks or fires in PCB containing equipment, accidental spills during transport, illegal or improper disposal, burning of PCB containing oils in incinerators, leaks from hazardous waste sites, and historical releases during manufacture, use, and disposal.

3. Legal Authorities to Reduce Pollutant of Concern

The City has a number of legal tools available to address the possible discharge of PCBs from municipal facilities, development and redevelopment projects or private properties not under development. This action plan addresses possible pollutant sources from municipal properties as well as private properties.

The MS4 general permit regulates discharges from properties that are owned or operated by the City and discharges from private properties which drain to the MS4. The City may use expressed or implied authorities to regulate private lands with regard to stormwater management and MS4 permit requirements. The City may utilize its rights as the property owner or lessee to address possible sources of PCBs which may originate from City owned or operated properties.

Article XIII of the Alexandria Zoning Ordinance (the Environmental Management Ordinance) contains the requirements for standard plan submission requirements. Standard conditions developed during the plan review process and Special Use Permit (SUP) process are enforceable through the Zoning Ordinance. Development plans and SUPs subject to standard conditions must go before the Planning Commission for approval. Contaminated lands issues must be addressed by the applicant prior to approval.

Implementation of the City's Erosion and Sediment Control program derives authority from Chapter 4 (Erosion and Sediment Control) of Title 5 (Transportation and Environmental Services) of the Code of the City of Alexandria. This code requires that land-disturbing activities greater than or equal to 2,500 square feet develop an Erosion and Sediment Control (E&SC) plan to be submitted for review and approval. Disturbances less than this threshold must implement E&SC measures as needed to prevent transport and deposition of sediment offsite. City staff performs inspections of land-disturbing activities per the requirements of the ordinance.

Chapter 13 of Title 11 of the City Code (Environmental Offenses) prohibits non-stormwater discharges to the storm sewer system. Transportation & Environmental Services (T&ES) works closely with the Fire Marshall's Office Environmental Investigations Unit (EIU) to investigate and enforce illegal dumping and illicit discharge incidents.

4. Planning Framework

a. Principles

The City has established the following overarching principles to guide the approach to meet the goals of this action plan:

- Utilize existing programs and efforts;
- Encourage voluntary, practical, and cost-effective practices;
- Follow an adaptive, iterative approach ;
 - Replaces dependency on numerical models and traditional planning by applying a focused "learning-by-doing" approach to decision making;
- Focus on phased implementation over multiple permit cycles; and
- Identify additional funding needs as necessary.

b. Action Goals

The City has established the following goals consistent with the principles in developing the action plan:

- **Consistent:** The action plan is consistent with the assumptions and requirements of the TMDL, and conforms to general permit requirements and current MS4 program plan efforts to reduce pollutants to the maximum extent practicable.
- **Flexible:** The controls, BMPs, design and methods discussed to reduce the pollutant of concern can be revised based on the observed effectiveness of these measures over multiple permit cycles, stakeholder involvement in the development of an implementation plan, changes to water quality standards, or introduction of new technologies and innovations to address the pollutant.
- **Cost Effective:** The 2008 – 2013 general permit contained special conditions associated with existing TMDLs, which were integrated into program plan compliance activities. The appropriateness of existing efforts is considered first before revising these efforts. The cost of revising current efforts or creating additional measures, along with the incremental benefit of each, is taken into consideration.

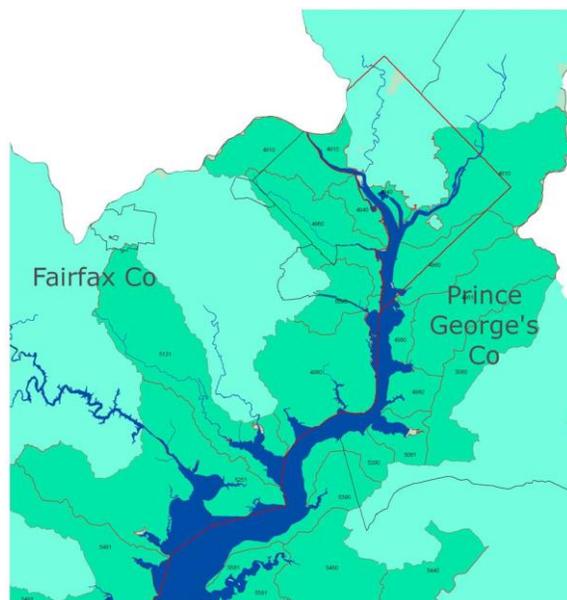
5. TMDL Development and Load Determination

The PCB TMDL study area includes the tidal waters of Virginia on the Potomac River. The 2006 Integrated Assessment report was used for the development of the TMDL and provides specific descriptions of the geographic extent of the impairments. The TMDL WLA includes regulated stormwater as a permitted point source and lists MS4 permits in Table 10, which contains the following qualifier: “Some of the permits

may cover areas located in direct drainage as well as tributary watershed segments, but the stormwater WLAs apply only to the direct drainage areas....” Table 12 of the TMDL document lists the impaired segments and associated WLAs, and contains an additional qualifier related to the applicable TMDLs which reads: “Direct drain loads were allocated to watershed segments and to FIPS [Federal Information Processing Standards] code jurisdictions within segments, and apply only to the portion of jurisdictions that are in direct drain watersheds.” And finally, the TMDL states that “...the NPDES regulated stormwater WLAs, shown in Tables 5-7 and 12 apply only to the direct drainage portions of the MS4 permitted jurisdictions. ...tributary stormwater WLAs have not been characterized as part of this TMDL effort.”

While it is clear that the WLA does not apply to the entire MS4 area, the City will target reduction strategies for the entire MS4 area, as appropriate. The figure from the TMDL document shows the location of direct drain watersheds in green which were used to calculate the WLA for MS4 permits.

Figure 1. Direct drain watershed segments



The TMDL states that the data and information used for setting loads are not detailed enough to determine WLAs for individual regulated outfalls; therefore, loads from regulated NPDES stormwater outfalls are expressed in the TMDL document as single stormwater WLAs for each impaired waterbody. These stormwater WLAs are calculated by multiplying the PCB direct drainage load by the percent of developed land. The table below provides the WLAs associated with impaired segments in the City.

Impaired Waterbody	Watershed Code	WLA (g/yr)
Lower Potomac and Four Mile Run	4960	2.98
Lower Potomac and Hooff's Run & Hunting Creek	4980	0.503
Hooff's Run & Hunting Creek	5090	6.79
Total		10.3

6. Best Management Practice, Controls, and Design

As referenced in the TMDL document, adaptive management is an iterative implementation process that makes progress toward achieving water quality goals while using new data and information to reduce uncertainty and adjust implementation activities. The focus is oriented towards increasingly efficient management and restoration. Strategies may change if warranted by new data and information. The jurisdictions involved in the tidal Potomac PCB TMDL effort agreed that following the adaptive implementation guidelines is appropriate due to the uncertainty associated with the TMDL loading capacity and specific allocation scheme. Therefore, implementation strategies may include additional data collection concurrently with activities to reduce PCB loadings.

NPDES regulations allow the use of non-numeric, BMP-based water quality based effluent limits (WQBELs) where "Numeric effluent limitations are infeasible; or [t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA." (40 CFR 122.44(k)3-4) According to the implementation section of the TMDL document, non-numeric WQBELs are used to comply with the provisions of the WLA "because BMPs are appropriate and reasonably necessary to achieve water quality standards and to carry out the goals of the CWA for the tidal Potomac PCB TMDL." The TMDL document further states that these BMPs are intended to focus on PCB source tracking and elimination at the source, rather than end-of-pipe controls; and that the TMDL program does not impart new implementation authorities. Therefore, consistent with the Commonwealth's approach, the City's main focus is the "use existing programs in order to attain its water quality goals."

This approach focuses on the development and implementation of procedures based on historical activity and land use that identifies potential high-risk properties. It also focuses on enhanced education and outreach, and employee training to eliminate and reduce potential PCB loads. Based on this understanding and current permit requirements, the City will implement the following strategies, which are discussed in greater detail in the preceding sections:

- Site review and evaluation of municipal facilities;

- Focus on screening for PCBs during the plan review process for development and redevelopment projects;
- Implementation of the erosion and sediment control program; and
- Enhanced education and outreach, and employee training.

a. Site Evaluation and Inspections for Municipal Facilities

The previous MS4 permit special conditions require the City to 1) perform outfall reconnaissance (Section I B.5.) and to 2) evaluate all owned or operated properties for potential sources of the pollutant identified in the WLA (Section I B.6.). Within three years of the July 8, 2008 effective date, the operator had to “conduct a site review and characterize the runoff for these properties where it determines that the pollutant identified in the WLA is currently stored, or has been transferred, transported or historically disposed of in a manner that would expose it to precipitation.” Through this evaluation, the City has determined that it does not have any facilities that should be categorized as a “high risk” for PCBs, and therefore did not warrant stormwater runoff characterization to be performed for this WLA pollutant. This evaluation was conducted during the 2009-2010 reporting period and included in the associated annual report. As part of this action plan and per the special condition requirements in the current general permit, the City will reassess possible significant sources of PCBs from facilities of concern owned or operated by the City that are not covered under a separate VPDES permit through the analyses of historical use. According to the current MS4 general permit, a significant source of pollutants from a facility of concern means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL. Additionally, municipal facility inspections are required to be conducted according to the requirements of Stormwater Pollution Prevention Plans (SWPPPs) being developed and implemented in compliance with Table the general permit.

i. Evaluation of Municipal Facilities

A list of municipal facilities will be compiled that consists of all properties owned or operated by the City to be further evaluated. The evaluation will include research to determine if PCBs are currently stored; or has been transferred, transported or historically disposed of in a manner that would expose it to precipitation. To accomplish this, staff will focus on current and past use of properties, identify the likely presence of PCB-containing transformers, and research environmental site assessments that may have been performed on target properties.

A combination of historical data, aerial photos, interviews with City personnel, and review of the Alexandria County Land Records will be used to ascertain the likelihood of past PCB contamination at municipal properties. This research will focus on those properties which may have operated at one time under one of DEQ’s high risk categories for PCBs. Identified high risk category sites for potential sources of residual PCBs, which includes the following SICs: 26&27 (Paper and Allied Products), 30 (Rubber and Misc. Plastics), 33 (Primary Metal Industries), 34 (Fabricated Metal Products), 37 (Transportation Equipment), 49 (Electrical, Gas, and Sanitary Services), 5093 (Scrap Metal Recycling), and 1221&1222 (Bituminous Coal).

The City will research the U.S. Environmental Protection Agency (EPA) PCB Transformer Registration Database at <http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/data.htm> to determine if any municipal properties are registered sites, indicating the presence and location of PCB-containing transformers that may be located on municipal properties.

Finally, the City will review data to determine if a Phase I Environmental Site Assessment (ESA) was performed and available for any municipal properties in conjunction with a real estate transaction or intention of develop / redevelop a property.

Milestones and Measurable Goals

During the 2017-2018 reporting period, the City will evaluate the likelihood of PCB contamination at City-owned or operated properties, where stormwater runoff from these properties may likely be impacted. The results of these site evaluations will be included in the 2017-2018 annual report.

ii. Municipal Facility Inspections

During the 2008-2009 reporting period of the previous permit cycle, the City developed a Facility Inspection Report form to use during performance of municipal facilities determined to have the potential to discharge pollutants. This form was based on inspection requirements and sample forms used for facilities to comply with coverage under industrial stormwater permits. Following development of the form, the City performed municipal facility inspections during the 2009-2010 and the 2011-2012 reporting periods and included a summary of the results in the associated annual reports. Section II.B.6.b (3) requires the development and implementation of SWPPPs for municipal high-priority facilities that have a high potential for discharging pollutants. These SWPPPs will require quarterly visual inspections and annual comprehensive compliance evaluations. While the SWPPP lists possible site pollutants that may be discharged, the quarterly and annual inspections are conducted comprehensively such that other pollutants can be identified if present. Additionally, if the evaluations in section 6.a. above demonstrate the likelihood of the presence of PCBs due to past use, the SWPPP will include specific procedures to identify possible discharges of PCBs.

Milestones and Measurable Goals

The City will perform the SWPPP inspections following the development and implementation of SWPPPs. While the general permit requires SWPPPs to be developed and implemented by June 30, 2017, the City will create an internal schedule to meet the 2017 deadline. This will require that some SWPPPs will be completed each reporting period. After the SWPPP is developed and implemented, SWPPP inspections will be performed and documented in the SWPPP for that facility on a routine basis. A summary of the implementation and inspections performed during the reporting period will be included in the appropriate associated annual report. SWPPP implementation and inspections will continue past the end of the current permit cycle

b. Remediation Projects

If environmental investigations reveal the onsite presence of PCBs on a City owned or operated property, further investigations will be performed to determine the extent of onsite contamination. Remediation may be conducted if it is determined that remediation of the site is warranted. During the 2009-2010 reporting period under the previous permit, a PCB remediation project conducted at the Hume Substation tract, a former electrical substation at the southwest corner of the intersection between Commonwealth Avenue and Reed Avenue. The resultant cleanup of the 0.53 acre former substation site resulted in a minor reduction in the overall City loading rate as modeled in the associated annual report.

Milestones and Measureable Goals

The City will coordinate with VDEQ in the ongoing consideration and execution of cleanup efforts for City owned and operated facilities as warranted and include any activities in the associated annual report.

c. Plan Review for Development and Redevelopment

The City has adopted a standard condition that is used during the site plan review process and in development special use permits (SUPs) requiring the screening for PCBs as part of the site characterization for sites that fall into the Department of Environmental Quality's identified high risk categories for PCBs. This standard condition was adopted during the 2009-2010 reporting period for the previous permit and was revised during the 2014-2015 reporting period. The language reads:

If past use of the site is found to include one of the following VDEQ identified high risk category sites for potential sources of residual PCBs, the applicant shall screen for PCBs as part of the site characterization. High risk categories include the following SICs: 26&27 (Paper and Allied Products), 30 (Rubber and Misc. Plastics), 33 (Primary Metal Industries), 34 (Fabricated Metal Products), 37 (Transportation Equipment), 49 (Electrical, Gas, and Sanitary Services), 5093 (Scrap Metal Recycling), and 1221&1222 (Bituminous Coal).

If environmental investigations discover the presence of PCBs onsite, the applicant must develop and implement, and submit for review, the proper environmental management plans prior to approval of the final site plan. These may include, but are not limited to, a Site Characterization Report/Extent of Contamination Study detailing the location, applicable contaminants, and the estimated quantity of any contaminated soils and/or groundwater at or in the immediate vicinity of the site; a Risk Assessment indicating any risks associated with the contamination; a Remediation Plan detailing how any contaminated soils and/or groundwater will be dealt with, including plans to remediate utility corridors. Utility corridors in contaminated soil shall be over excavated by 2 feet and backfilled with "clean" soil; a Health and Safety Plan indicating measures to be taken during remediation and/or construction activities to minimize the potential risks to workers, the neighborhood, and the environment.

During the 2009-2010 reporting period for the previous permit, the City developed a brochure about PCBs and why they are a concern in Alexandria. This brochure may be provided to target property owners during normal interactions (inspections, permit reviews, etc.) or during the redevelopment process.

Milestones and Measurable Goals

The City will continue to include the standard condition and SUP language during the development review process. Brochures will continue to be provided as necessary

d. Implementation of Erosion and Sediment Control Program

Reductions in sediment from construction sites and development areas will also be of benefit for addressing the discharge of PCBs. The City administers a local Erosion and Sediment Control (E&SC) program and Virginia Stormwater Management Program (VSMP). Staff are trained and receive certification through the Commonwealth for reviewing site plans for development and redevelopment, and for inspecting construction sites. Since PCBs may be associated with soils, the City will use designation of a responsible land disturber (RLD) per the Virginia Erosion and

Sediment Control Regulations (VESCR) and project specifications to hold construction contractors responsible for the proper implementation and maintenance of E&SC measures during development and redevelopment. The local E&SC program requires that any land-disturbing activity equal to or greater than 2,500 square feet must submit a grading plan and E&SC plan for review and approval prior to commencing a land-disturbing activity.

Additionally, the City operates a local VSMP effective July 1, 2014. Inspections related to E&SC and VSMP requirements are performed by the same staff. Inspection reports are completed every five business days and 48 hours following a measureable storm event. However, the inspectors also perform inspections for right-of-way, excavation, and other local permits. Therefore, the inspection staff actually visits active construction sites approximately every day; sometimes performing multiple visits. This level of oversight far exceeds regulatory requirements and helps provide extra assurance that E&SC measure are properly installed and maintained to control the export of soils.

Milestones and Measurable Goals

The City will continue to implement the local E&SC and VSMP requirements, to include construction site inspection and reporting.

e. Promotion of Elimination and Reduction

The standard condition language used during site plan review and Special Use Permits (SUP) also serves to educate the development community on PCBs and raise awareness of the possibility to encounter PCBs during redevelopment of private properties in the City. Given that the manufacture of PCBs was banned in 1979, the general public is not likely to encounter PCBs. However, the City developed a brochure about PCBs and why they are a concern in Alexandria. This brochure can be provided to target property owners during normal interactions (inspections, permit reviews, etc.) or during the redevelopment process. The brochure can be shared with staff and residents and is available to be viewed downloaded from the City's website at <https://www.alexandriava.gov/uploadedFiles/tes/oeq/info/BrochurePCB2010Rev.pdf>.

Employees receive training on Pollution Prevention and Good Housekeeping and Recognizing and Reporting Illicit Discharges. It is unlikely that staff will encounter PCBs during routine daily activities. However, if the site review and evaluation demonstrates the possible presence of PCBs at a municipal facility, staff working around of near the location will be trained measures to avoid exposure and how to identify possible discharges that may contain PCBs.

Finally, staff perform investigations in response to public complaints about possible illicit discharges to the storm sewer system and surface waters. Staff from the Fire Marshall's Office with the Environmental Investigations Unit (EIU) may enforce Chapter 13 of Title 11 of the City Code (Environmental Offenses), which prohibits non-stormwater discharges to the storm sewer system. EIU staff educates residents about illicit discharges, which may include distribution of the PCB brochure and related information.

Milestones and Measurable Goals

The City will continue to include the standard conditions during site plan and SUP reviews. The brochure will continue to be shared with staff and residents and can be viewed online. Education and outreach efforts related to PCBs will be summarized in each reporting period's annual report.

7. Methods to Assess Action Plan Effectiveness

The current permit suggests demonstration of adequate progress may be achieved through tracking, monitoring, and/or reporting of BMP implementation, and/or other strategies as approved by DEQ as part of the TMDL Action Plan. Consistent with the Commonwealth's approach and the types of implementation strategies discussed in the TMDL document, the City will implement those BMPs discussed in Section 6 above.

The Site Review will be performed during the 2017-2018 reporting period. Site inspections associated with the development and implementation of SWPPPs for identified municipal facilities will begin in the 2017-2018 reporting period and continue through the permit cycle based on the City's internal implementation schedule. Remediation projects will occur on an as-needed basis. Plan review for development and redevelopment projects, to include review of SUP applications, is an ongoing process and standard conditions are included on all site plans related to the City's requirement to screen for PCBs if warranted based on past use. Sites whose past use included SIC codes that have been identified by VDEQ as have a likelihood of being associated with PCBs will be required to screen for PCBs during environmental investigations. The City implements an aggressive E&SC program and VSMP that includes daily site visits and the requisite inspection reports completed at the required intervals. This level of oversight far exceeds the regulatory requirements and helps provide extra assurance that control measures are properly installed and maintained to control sediment export. Finally, the City has a robust illicit discharge and dumping investigation and enforcement program, along with an active education and outreach program for the possible presence of PCBs.

The successful implementation of the milestones and measurable goals of this TMDL action plan will demonstrate the effectiveness of the plan. A summary of activities and representative work products related to the milestones and measurable goals will be provided in each subsequent annual report.

8. References

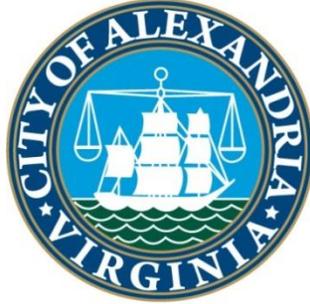
Total Maximum Daily Loads of Polychlorinated Biphenyls (PCBs) for Tidal Portions of the Potomac and Anacostia Rivers in the District of Columbia, Maryland, and Virginia (September 2007, with revisions October 2007).

Commonwealth of Virginia Department of Environmental Quality, Water Division. Guidance Memo No. GM15-XXXX for developing local TMDL action plans. April XX, 2015.

Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators, February 2009, EPA 833-B-09-002

APPENDIX B. CHESAPEAKE BAY TMDL ACTION PLAN

The City of Alexandria's *General Permit for Discharges from Small Municipal Separate Storm Sewer Systems* (General Permit No. VAR040057) requires a Chesapeake Bay TMDL Action Plan to be developed within 24 months of permit coverage (i.e. by June 30, 2015).



City of Alexandria, Virginia

**Chesapeake Bay Total Maximum Daily Load
(TMDL) Action Plan for 5% Compliance**

June 30, 2015

**For compliance with 9VAC25-890 et. seq., “General VPDES Permit for
Discharges of Stormwater from Small Municipal Separate Storm Sewer
Systems, Permit No. VAR040057**

Prepared by:

City of Alexandria, Virginia
Department of Transportation and Environmental Services
Infrastructure and Environmental Quality

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City of Alexandria, Virginia

Chesapeake Bay TMDL Action Plan Phase I for 5% Compliance

June 30, 2015

Executive Summary

The purpose of this Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan is to comply with Section I C “Special condition for the Chesapeake Bay TMDL” of the 2013 – 2018 General Virginia Pollution Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), No. VAR040057 issued to the City of Alexandria (City). This Action Plan has been developed to provide a review of the current MS4 program and demonstrate the City’s ability to comply with the required 5% reductions for existing sources as of June 30, 2009, increased loads from 2009-2014 New Sources, and increased loads from Grandfathered projects (9VAC25-870-48). The Action Plan includes the requisite planning items found in permit Section I C.2., according to the procedures provided in the Virginia Department of Environmental Quality (DEQ) Guidance Memo No. 15-2005 dated May 18, 2015 (Guidance). The main focus of the Action Plan is to provide the means and methods and a general level of effort that will be needed for the City to meet the 5% Chesapeake Bay TMDL reduction targets in the MS4 permit for phosphorus, nitrogen, and sediment developed by the United States Environmental Protection Agency (EPA) in December 2010.

The TMDL contains aggregate wasteload allocations (WLAs) for regulated stormwater and no specific WLAs for the City’s MS4. The Phase I Virginia Watershed Implementation Plan (WIP I) submitted to EPA on November 29, 2010 contains general requirements for permittees. The Phase II WIP that was submitted to EPA on March 20, 2012 builds on the Phase I WIP as the state’s primary planning tool to establish strategies, targets, and expectations for different sectors; including urban stormwater for local governments. The Phase II WIP requires the implementation of urban stormwater controls to meet specific nutrient and sediment reductions – Level 2 (L2) scoping implementation – to address the TMDL. The WIPs identify the use of state-issued stormwater permits as the tool for compliance by requiring target reductions for the TMDL. The MS4 general permit reissued by DEQ and effective July 1, 2013 contains special conditions requiring the implementation of strategies to meet 5% reductions of the overall L2 scoping for nitrogen, phosphorus and sediment, along with offsets for new sources and grandfathered projects. The permit also requires the completion of a Chesapeake Bay TMDL Action Plan by June 30, 2015, which must contain the means and methods to meet the pollutant reduction targets. This 5% goal – or Phase I – must be implemented no later than the end of the current 5-year MS4 permit period (by June 30, 2018).

The following excerpt from the WIP II provides more information on the L2 scoping:

The Commonwealth will utilize MS4 permits to ensure BMP implementation on existing developed lands achieves nutrient and sediment reductions equivalent to Level 2 (L2) scoping run reductions by 2025. Level 2 implementation equates to an average reduction of 9 percent of nitrogen loads, 16 percent of phosphorus loads, and 20 percent of sediment loads from impervious regulated acres and 6 percent of nitrogen loads, 7.25 percent of phosphorus loads and 8.75 percent sediment loads beyond 2009 progress loads for pervious regulated acreage. These reductions are beyond urban nutrient management reductions for pervious regulated acreage.

According to the WIP II and MS4 general permit, the City will have three full MS4 permit cycles to implement the required reductions (Phase I: 2013-2018; Phase II: 2018-2023; and Phase III: 2023-2028). During the first cycle (Phase I), the City will need to implement practices sufficient to achieve 5% of the reduction targets. During the second cycle (Phase II), the City will need to implement additional practices sufficient to achieve 35% reductions for a total of 40%. Finally, the remaining 60% for the total reduction target must be achieved by 2028 (Phase III). Pursuant to the permit, this Action Plan is only required to address the 5%, or Phase I, reductions required during the permit term. While the WIP II contains a range of strategies applicable to urban land uses, the City can only be required to implement strategies that are enforceable through the MS4 permit based on the City's regulated land contained in the MS4 service area.

The technical and fiscal challenges of meeting the Chesapeake Bay TMDL as required in the MS4 general permit will be significant. Since the development of the TMDL and WIPs, the City engaged internal and external support to assist in an analysis to meet the reduction requirements and to develop a better overall understanding of the potential cost and feasibility of different combinations of stormwater best management practices (BMPs). The Action Plan builds on the previous technical and planning-level work and refines previous analysis of the potential strategies discussed by the City's internal stakeholders – the Water Quality Steering Committee and Water Quality Work Group – and external stakeholders in order to meet the MS4 general permit target reductions.

A. MS4 Service Area

Calculation of phosphorus, nitrogen, and sediment existing source loads are based on impervious and pervious land uses regulated by the MS4 permit. The existing pollutant loads and the targeted reductions depend on the amount of pervious and impervious land cover in the City's MS4 service area. The area served by the MS4 includes those areas draining to a regulated stormwater outfall. Lands that are regulated under a separate VPDES stormwater permit, lands that sheet flow directly to waters of the state, wetlands and open waters, and forested areas are not considered part of the MS4 service area.

The City's ArcGIS impervious cover and storm sewer data were used to determine the estimated size and extent of the regulated MS4 service area for the June 30, 2009 baseline condition as the starting point for estimating existing loads towards meeting TMDL target reductions.

B. Existing Source Loads and Calculated Reductions

Following the determination of the MS4 service area and the breakdown of impervious and pervious land uses, the total baseline load from existing sources and the target reductions in pounds for phosphorus, nitrogen, and sediment was determined. MS4 general permit Table 2b assigns existing source loads for regulated impervious and regulated pervious land use in the Potomac River Basin. Permit Table 3b incorporates the required L2 reductions by discounting the overall loading rate for the Potomac River Basin. However, using the discounted loading rate in permit Table 3b yields a slightly different required reduction for the first permit cycle than calculating a 5% target reduction using the overall reductions and the L2 scoping. Part II 2 on page 7 of the Guidance provides the more accurate discounted loading rates for the Potomac River Basin than those in permit Table 3b. The Guidance allows either Table 3b or the Guidance; however, DEQ will need to address this discrepancy during subsequent MS4 permit cycles and guidance. This Action Plan addresses the required reductions presented in Table 6b using the Guidance 5% loading rates

Table E1 presents the total pollutant loads from existing sources using permit Table 2b. The 5% reduction requirements were calculated using permit Table 3b.

Table E1 – Total Pollutant Loads and Required Reductions

Subsource	Pollutant of Concern	Est. MS4 Service Area (ac)	Loading Rates (lbs/ac/yr)	Load per Land Cover (lbs/yr)	Total Existing Load (lbs/yr)	Est. Total Required (lbs/yr)*	Required Phase I (lbs/yr)
Regulated Impervious	TN	3417.24	16.86	57,615	97,809.78	7,597.03	379.85
Regulated Pervious		3991.57	10.07	40,195			
Regulated Impervious	TP	3417.24	1.62	5,536	7,172.47	1,004.40	50.22
Regulated Pervious		3991.57	0.41	1,637			
Regulated Impervious	TSS	3417.24	1,171.32	4,002,682	4,704,399.56	861,936.64	43,096.83
Regulated Pervious		3991.57	175.8	701,718			

**Based on 100% of the L2 scoping loads.*

C. Increased Loads from 2009-2014 Sources

The MS4 general permit also requires the City to offset increases from development and redevelopment projects initiating construction between July 1, 2009 and June 30, 2014. During that period, post-development stormwater quality requirements were predicated on an average land cover condition of 41% imperviousness. This approach was consistent with the Chesapeake Bay Act of using 16% as the average land cover condition, or opting to use the average land cover condition of the City of 41% imperviousness. However, TMDL special conditions in the MS4 general permit require the City to offset any increased loads that may have occurred as a difference of using 41% instead of 16% land cover condition. The City is required to offset these differences at a rate of 5%, 35%, and 60% of the total offsets to coincide with the 2013-2018, 2018-2023, and 2023-2028 permit cycles, respectively. Due to the highly impervious nature of our urban landscape and the preponderance of urban infill redevelopment, the use of 41% imperviousness resulted in a minimal increase in load. Additionally beneficial was that the City’s local stormwater quality requirements were more stringent during that period and required development and redevelopment to treat

the first ½” of stormwater over all impervious areas with the site, otherwise known as the water quality volume default. Due to these two factors, the amount of pollutant potential loading offsets is greatly reduced. However, Table E2 presents the total pollutant of concern (POC) loads from existing sources and the 5% required reductions for existing sources and 2009-2014 increased loads, but does not include credits from stormwater BMPs installed as part of the project. Those are captured in the “Post-2009 BMP” credits.

Table E2 – Existing Baseline Loads and Required 5% Reductions

Subsource	Pollutant	Land Change		Required Phase I (5%) Pollutant Reductions		
		Pre Site (ac)	Post Site (ac)	Loading Rates (lbs/ac/yr)	Est. Full Offset	2009 - 2014 Offsets
Regulated Impervious	Nitrogen	26.3	31.1	16.86	80.93	4.05
Regulated Pervious		27.3	22.5	10.07		
Regulated Impervious	Phosphorus	26.3	31.1	1.62	7.78	0.39
Regulated Pervious		27.3	22.5	0.41		
Regulated Impervious	Total Suspended Solids	26.3	31.1	1,171.32	5622.34	281.12
Regulated Pervious		27.3	22.5	175.80		

**Does not include credits from BMPs installed with the project.*

D. Grandfathered Projects

The State Stormwater Management Regulations provide the opportunity for qualifying development and redevelopment projects initiating construction after July 1, 2014 to design post-construction stormwater management controls in accordance with the old water quality technical criteria in effect prior to July 1, 2014. However, the MS4 general Permit requires the City to offset potential increased loads from grandfathered projects disturbing one acre or greater that initiate construction after July 1, 2014. Much like the 2009-2014 new sources, increased loads from grandfathered projects are somewhat compensated through most projects being redevelopment of existing project imperviousness, coupled with the more stringent water quality volume default, requiring projects to install BMPs. Unlike the 2009-2014 increased loads from new sources that must be offset by 5%, 35% and 60% through three successive MS4 permit cycles; any increased loads grandfathered projects must be offset prior to completion. Table E3 presents the increased loads from grandfathered projects.

Table E3 – Increased Loads from Grandfathered Projects

	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
Offset Loads to Reduce	73.12	504.56	34309.97
Loads Removed by BMPs*	69.79	475.22	32315.21
Total Load Remaining	3.34	29.33	1994.76

**Loads removed by project BMPs are subtracted from the offset to calculate the total.*

E. Means and Methods to Meet Target Reductions

The City has used an iterative approach in continually refining the list of potential pollutant reduction strategies through a series of planning level exercises to address meeting the TMDL target reductions. This includes the first “Chesapeake Bay TMDL Analysis and Options” (Final Draft August 2012), the City’s February 1, 2012 response to the Virginia Department of Conservation and Recreation (DCR) “local letter” (November 9, 2011) and the “Draft Chesapeake Bay TMDL Phase I (5%) Action Plan” (June 26, 2014). This early draft action plan, which focused mainly on potential strategies and cost, was based on the draft action plan guidance provided by DEQ and built on the previous work and the continued input of internal stakeholder groups.

Since the target reduction requirements are greatly increased for the two subsequent permit cycles, the City has set an internal planning goal for the first permit cycle that extends beyond the 5% target to approximately 15-20% of the anticipated total reductions. This approach enables the City to ramp up planning and design to increase the likelihood of success in achieving reduction goals in the second and third permit cycles. The City is using an adaptive management approach that is based on an “all of the above” strategy for identifying likely candidate projects for implementation. This approach puts the greatest number of strategies on the table, and allows the City to consider any and all of the strategies based on existing site, economic and water quality conditions. This will allow the City to realize efficiencies through maximization of benefits and minimize of cost and external impacts. However, the means and methods implemented during this Action Plan are only required to meet the current 2013 – 2018 MS4 General Permit due by the end of this permit cycle on June 30, 2018. Based on the analysis to date, the following means and methods are proposed in the City’s adaptive management approach.

Structural BMPs implemented prior to January 1, 2006 are included in the calibration and baseline conditions of the Bay Model and are not available for credit towards reductions. Credit for existing stormwater management BMPs are calculated according to the Guidance.

- **Credits for 2006 – 2009 Stormwater BMPs.** Structural BMPs implemented on or after January 1, 2006 and prior to July 1, 2009 will be credited.
- **Credits for Post-2009 Stormwater BMPs.** Structural BMPs implemented on or after July 1, 2009.

Structural BMPs are implemented to retrofit existing facilities and as new facilities to treat existing impervious areas. Redevelopment projects requiring the implementation of stormwater management BMPs to meet the new technical criteria for projects initiating construction after July 1, 2014 can be credited towards reductions.

- **Projected Redevelopment.** Stormwater quality BMPs implemented to meet the new VSMP regulations, effective July 1, 2014, and the City’s more stringent ordinance. Note that new development also must comply with the more stringent water quality volume default.
- **Regional Facilities.** Retrofitting flood control facilities to provide water quality treatment and enhancing existing facilities to provide increase reductions.
- **Public-Private Partnerships (P3).** Informal arrangement for implementation of regional facilities during the development process that provide for treatment of impervious area beyond the required site area, in exchange for other onsite consideration as well as treating offsite stormwater.
- **Retrofits on City Properties.** Retrofitting City-owned properties that are not currently treated.

- **Right-of-Way Retrofits.** Retrofitting public streets, especially taking advantage of CIP road projects where implementation is deemed feasible.
- **Urban Stream Restoration.** Restoration of urban streams.

The following additional strategies may be pursued by the City to address the targeted reductions; however, these are currently not part of the core strategies being implemented.

- **Street Sweeping.** Removing nutrients and sediment from roadways before transported offsite in stormwater flows.
- **Urban Nutrient Management.** Pollutant reductions from nutrient management plans implemented beyond those required by law or statute.
- **Land Use Change.** Credit for lands converted to a land use with a lower associated pollutant load.
- **Forest Buffers.** Implementing buffers and enhancing Resource Protection Areas (RPAs) to protect local waterways and receive pollutant reduction credits.
- **Public-Private Partnerships (P3).** Consideration of more formal P3 arrangements such as the Community Based Public-Private Partnership (CBP3) approach.
- **Nutrient Trading.** Purchasing pollutant credits from the expanded nutrient credit exchange.
- **Integrated Approach.** Applying credits generated from controls implemented in the City's VPDES Combined Sewer System (CSS) permit to the MS4 service area.

F. Summary of Reductions

The above strategies or “means and methods” are based on projects that have been implemented, are in the design phase, or represent viable opportunities that may be implemented. Yet the list is not exhaustive and may be further refined given in depth onsite investigations and site-specific conditions. Full implementation of specific means and methods that have been implemented or are in the design phase will likely provide reductions beyond the 5% target requirements for nitrogen, phosphorus, and sediment. This action plan is only required to focus specifically on means and methods to meet the 5% reduction goals that must be implemented by June 30, 2018; however, the suite of strategies considered in the “all of the above” approach will provide approximately 20% of the total required reductions for nitrogen, phosphorus, and sediment. Since reduction requirements greatly increase beyond the initial 5% for the two subsequent permit cycles for an additional 35% and 60%, respectively, by 2028, the City's approach is to consider setting an internal goal for the first permit cycle that extends beyond the 5% target to ramp up planning and design and increase the likelihood of success. Table E4 presents a summary of the required total reductions from existing sources and 2009-2014 offsets, along with the required 5% reductions. Table E5 presents a summary of potential strategies, their potential pollutant reductions in pounds, and the potential percentage of the overall target reduction goals.

Table E4 – Summary of Required Reductions for Existing Sources

Subsource	POC	Total Exiting Load (lbs/yr)	Est. Total Required (lbs/yr)	2009 - 2014 Offsets	G.F. Offsets*	Required Phase I (lbs/yr)**
Regulated Impervious	TN	97,809.78	7,597.03	4.05	3.34	383.90
Regulated Pervious						
Regulated Impervious	TP	7,172.47	1,004.40	0.39	29.33	50.61
Regulated Pervious						
Regulated Impervious	TSS	4,704,399.56	861,936.64	281.12	1,944.76	43,377.95
Regulated Pervious						

*Must be offset prior to project completion, not on the 5% schedule.

**Include 5% reductions from existing sources and 5% offsets for 2009-2014 increased loads; does not include grandfathered projects.

G. Estimated Costs and Reductions per Strategy

The potential strategies outlined above will require significant additional resources beyond the City’s current programs; however, funding for design and feasibility of some of these potential strategies was originally included in the CIP budget starting FY13. Further, as noted, full implementation of these potential strategies will meet greater than the 5% Chesapeake Bay TMDL compliance targets for reduction of nitrogen, phosphorus, and sediment. While this report focuses on potential strategies to meet the 5% reduction goals that must be implemented by June 30, 2018, reduction requirements are greatly increased for the two subsequent permit cycles. Yet by ramping up planning and design to increase the likelihood of success in achieving reduction goals in the second and third MS4 permit cycles, the City can also help spread the costs over time for full compliance.

Order of magnitude costs were developed in previous planning-level exercises to estimate the total cost of 100% compliance with the target loads in order to determine the impact on the CIP budget over the short and long terms. Cost assumptions were based on best engineering practices, local assumptions, discussions with regional partners, and a draft report researching the costs of various BMPs (King and Hagen, 2011) prepared for the Maryland Department of Environment. The analyses employed during the previous planning level exercise identified specific possible retrofit strategies that may be implemented based on assumptions about the type of retrofit most likely to be implemented for each specific strategy, and limitations associated with each strategy. A range of technologies were assumed applicable and an average removal efficiency and unit cost per acre treated were derived for each strategy. For instance, most Retrofits of City Rights-of-Way would likely involve manufactured BMPs (such as tree box filters) or similar structures with an average removal efficiency of approximately 45% at a unit cost of approximately \$112,000 per acre treated. This and other assumptions for other types of strategies, along with the assumed long-term operations and maintenance costs, may or may not hold true. With regard to those strategies needed to fill the pollutant reduction gap (that is, those generic strategies needed to reach reduction targets after implementation of the specific strategies addressed in this report) no assumptions were made regarding whether these would be sited on public or private land. As a result, cost estimates do not include the cost of purchasing land or easements – which could be considerable.

The approximate cost to implement the potential means and methods to meet the total nitrogen, phosphorus and sediment reductions through FY2023 may range as high as \$50M and depends of the type and mix of technologies implemented, whereas total compliance may reach as high as \$100M. Table E5 presents the means and methods, the pounds of each pollutant of concern, percentage of the total L2 scoping targets and the estimated costs.

The approximate cost to implement the potential means and methods to meet the total nitrogen, phosphorus and sediment reductions by 2028 are estimated at \$100M. Table E5 presents the means and methods, the pounds of each pollutant of concern, percentage of the total L2 scoping targets and the estimated costs.

Table E5 – Estimated Percent Reduction and Costs per Potential Strategy¹

Reduction Strategies	N (lbs)	100% Goal²	P (lbs)	100% Goal	TSS (lbs/yr)	100% Goal	Est. Cost³
2006-2009 BMPs	1104.02	14.53	160.00	15.48	75,073.26	8.69	\$0
Post-2009 BMPs	317.33	4.18	45.89	4.44	39,629.17	4.59	\$0
Regional Facilities – Lake Cook	1,586.97	20.88	163.25	15.79	131,334.00	15.20	\$2.7M ⁴
Regional Facilities – Pond 19	159.21	2.09	15.68	1.52	11,262.74	1.35	\$0
Retrofits on City Property	2.21	0.03	15.28	1.48	1,039.16	0.12	\$1.0M ⁵
Urban Stream Restoration – Four Mile Run	194.8	2.56	40	3.87	14,914.00	1.73	\$1.8M ⁶
Total	3,364.54	44.26	280.10	42.57	273,612.33	31.67	\$5.5M

1. Assumes all grandfathered projects to be offset this permit cycle.
2. 100% goal is based on L2 scoping.
3. The City did not incur direct costs for BMPs implemented by developers.
4. Includes \$1.2M SLAF grant.
5. Includes SLAG grant funding.
6. Includes grant funding. Individual project costs may be less.

1. Introduction

The purpose of this Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan is to comply with Section I C “Special condition for the Chesapeake Bay TMDL” of 9VAC25-890, the 2013 – 2018 General Virginia Pollution Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), No. VAR040057 issued to the City of Alexandria (City) effective July 1, 2013. This Action Plan has been developed to provide a review of the current MS4 program and to demonstrate the City’s ability to comply with the required target reductions during the first permit cycle. The Action Plan includes the requisite planning items found in permit Section I C.2., according to the procedures provided in the Virginia Department of Environmental Quality (DEQ) Guidance Memo No. 15-2005 dated May 18, 2015 (Guidance). The main focus of the Action Plan is to provide the means and methods and a general level of effort needed to meet the Chesapeake Bay TMDL 5% reduction targets and offsets for phosphorus, nitrogen, and sediment developed by the United States Environmental Protection Agency (EPA) in December 2010.

The TMDL contains aggregate wasteload allocations (WLAs) for regulated stormwater and no specific WLAs for the City’s MS4. The Phase I Virginia Watershed Implementation Plan (WIP I) submitted to EPA on November 29, 2010 contains general requirements for permittees. The Phase II WIP that was submitted to EPA on March 20, 2012 builds on the Phase I WIP as the state’s primary planning tool to establish strategies, targets, and expectations for different sectors; including urban stormwater for local governments. The Phase II WIP requires the implementation of urban stormwater controls to meet specific nitrogen, phosphorus and sediment reductions – Level 2 (L2) scoping implementation – to address the TMDL. The WIPs identify the use of state-issued stormwater permits as the tool for compliance by requiring target reductions for the TMDL.

The MS4 general permit contains special conditions requiring the implementation of strategies to meet 5% reductions of the overall L2 scoping for nitrogen, phosphorus and sediment, along with offsets for new sources and grandfathered projects. The permit also requires the completion of a Chesapeake Bay TMDL Action Plan by June 30, 2015, which must contain the means and methods to meet the pollutant reduction targets. This 5% goal – or Phase I – must be implemented no later than the end of the current 5-year MS4 permit period (by June 30, 2018).

According to the Phase II WIP the City will have three full MS4 permit cycles to implement the required reductions (2013-2018; 2018-2023; and 2023-2028). The percentage of the reduction targets are calculated as a percentage of the L2 implementation requirements in the Phase I WIP beyond the 2009 progress loads, which equates to an average reduction of 9% of nitrogen loads, 16% of phosphorus loads, and 20% of sediment loads from regulated impervious acreage; and 6% of nitrogen loads, 7.25% of phosphorus loads, and 8.75% sediment loads from regulated pervious acreage. According to the MS4 permit, the City will need to implement practices sufficient to achieve 5% of the reduction targets during the first permit. During the second cycle, the City will need to implement additional practices sufficient to achieve 35% of the reduction target, for a total of 40%. Finally, the City will need to achieve the remaining total reduction target by 2028.

The “means and methods” or reduction strategies discussed will require significant additional resources beyond the City’s current programs; however, funding for some of these potential strategies has been included in the City’s CIP budget as early as FY13. Further, as noted, implementation of practicable strategies will likely reach beyond the 5% of the City’s total Chesapeake Bay TMDL compliance targets for nitrogen, phosphorus, and sediment based on the 5.3.2 Bay Model, which forms the basis of the requirements in the 2013 – 2018 MS4 General Permit. While this report focuses on potential strategies to meet the 5% reduction goals that must be implemented by June 30, 2018, reduction requirements are greatly increased for the two subsequent permit cycles. Therefore, the City has set an internal goal for the first permit cycle that extends beyond the 5% target, in order to achieve the escalating total reductions in the required timeframe towards meeting the overall total. The City’s “all of the above” strategy is an iterative, adaptive approach that considers a range of potential strategies based on extant conditions, which enables the City to ramp up planning and design to increase the likelihood of success in achieving reduction goals in the second and third MS4 permit cycles.

Following development of the Bay TMDL and during the development of the WIPs, the City engaged in the process of planning and analyses of potential strategies, including the implementation of structural stormwater quality best management practices (BMPs), towards meeting the target pollutant reductions. The first official planning-level exercise began in fall 2011 with the first draft of the “Chesapeake Bay TMDL Analysis and Options” in February 2012 and the final draft in August of 2012. This planning effort focused first on the overall requirements by examining potential strategies, identifying potential gaps, and order of magnitude costs to implement the reductions.

This Action Plan is a refinement of the City’s efforts to date and focus on meeting the 5% (Phase I) requirements in the current MS4 Permit. The Action Plan contains updated analyses that focus on high-priority projects that are currently in the planning and design phase, potential strategies that may be implemented during the permit cycle, credit for existing structural BMPs, and the cost to implement the required reductions that would be sufficient to meet the Chesapeake Bay TMDL special conditions in the current MS4 permit. The following steps are required per the MS4 permit and the Guidance:

- Current Program and Legal Authority
- Delineation of the MS4 Service Area
- Existing Source Loads and Calculating Target Reductions
- Increased Loads from 2009 – 2014 New Sources
- Increased Loads from Grandfathered Projects
- Estimated Future Grandfathered Projects
- Means and Methods to Meet Target Reductions
- Estimated Cost of Implementation

Since the reduction requirements are greatly increased for the two subsequent permit cycles (35% and 60%, respectively), the City has set an internal goal for the first permit cycle that extends beyond the 5% target in order to achieve the total reductions in the required timeframe. This approach will enable the City to ramp up planning and design to increase the likelihood of success in achieving reduction goals in the second

and third permit cycles. To this effect, the Action Plan contains concrete strategies to achieve the 5%, with the flexibility to choose from a menu of options as contingency measures and/or to begin addressing the future requirements. In all, the means and methods discussed in section 9 will achieve approximately 40% of the overall target reductions. However, implementation requirements in this Action Plan are limited to the target reductions embodied in the current MS4 General Permit target reductions for nitrogen, phosphorus and sediment calculated using permit Table 3b that are due by the end of this permit cycle on June 30, 2018.

2. Current Program and Legal Authority

The City takes pride in being a waterfront community on the Potomac River – the nation’s river – and understands the integral part that our water resources play in our economy, our environment and the social well-being of our community. Being a waterfront community in the Chesapeake Bay, the City has long enacted local environmental ordinances to protect our water resources. In 1992 the City incorporated requirements of the Chesapeake Bay Act for protection of land in the watershed and stormwater quality into local ordinance through Article XIII of the Zoning Ordinance – the Environmental Management Ordinance. During the process of adopting Bay Act requirements, the City took a more conservative route and chose to be more protective by implementing 100’ Resource Protection Area (RPA) requirements in the City, and designating all other non-RPA land acreage as Resource Management Areas (RMAs). The City even went a step further and implemented 50’ buffers for intermittent streams and isolated wetlands. In addition to the minimum water quality requirements, the City also adopted a more stringent requirement for development and redevelopment to treat the first ½” of runoff from impervious surfaces, known as the water quality volume default. More recently, the City adopted amendments to the Environmental Management Ordinance that incorporate the Virginia Stormwater Management Regulations, while retaining the more stringent water quality volume default requirements, and currently operates a local Virginia Stormwater Management Program.

The City was initially issued an MS4 general permit in 2003 to regulate stormwater discharges. The permit was reissued in 2008, with the City currently regulated under the 2013-2018 MS4 general permit.

3. Delineation of the MS4 Service Area

The City’s MS4 permit is the regulatory mechanism used to require implementation of stormwater quality BMPs or purchase of nutrient credits necessary to meet the Chesapeake Bay TMDL. The MS4 permit requires the City to define the size and extent of the existing impervious and pervious area within the MS4 service area. Areas of the City that sheet flow directly to waters of the state, or otherwise drain to waters of the state through means other than a regulated outfall, are not considered part of the MS4 service area. Properties within the jurisdictional boundary that are regulated under a separate VPDES stormwater permit, forested areas, wetlands, and open waters are also not considered part of the MS4 service area.

The first step in the analysis involved distinguishing between regulated and unregulated land areas to define the MS4 service area. To perform this analysis, the City utilized local ArcGIS data and tools, a review of other state stormwater permits under the VPDES program, and discussions with regulating agencies. A digital elevation model (DEM) for the entire City was built using two-foot contour data. Storm sewer pipes, represented as lines, were burned into the DEM. MS4 outfall locations, stored as points in ArcGIS, were treated as small watershed outlets and the ArcGIS Desktop Hydrology toolset was utilized to generate small

watersheds draining to each MS4 outfall. These small watersheds were manually reviewed and edited for greater accuracy. Finally, the breakdown of impervious and pervious area was determined by clipping the impervious surface cover to the MS4 service area, with the assumption that all non-impervious areas were pervious.

The above approach coupled with GIS impervious surface data rendered a delineation of impervious versus pervious areas within the regulated and unregulated areas. Unregulated areas include land with direct drainage to surface waters with no connection to the MS4, stream corridors, and areas covered under separate MS4 or VPDES industrial stormwater permits. The exclusion of these categories from the MS4 regulated area was initially confirmed by the Virginia Department of Conservation and Recreation (DCR) during their previous administration of the MS4 program. Additional confirmation of this approach is provided in the Chesapeake Bay TMDL Action Plan guidance and current MS4 general permit. Federal lands not covered under a separate stormwater permit were not simply excluded, but were categorized as regulated or unregulated based on this above approach. The Combined Sewer System (CSS) in the Old Town area is covered under a separate non-stormwater-related VPDES permit and is considered independently of the MS4 in the Chesapeake Bay TMDL.

Lands associated with separate individual or general MS4 or industrial stormwater permits were removed from the Alexandria MS4 service area totals and are listed in Table 1.

Table 1 – Permit Holders Excluded from MS4 Service Area

Permit Holder	Permit
George Washington Parkway	MS4
Northern Virginia Community College	MS4
VDOT	MS4
United Parcel Service - Alexandria	Industrial
US Postal Service - Alexandria Vehicle Maintenance Facility	Industrial
Covanta Alexandria Arlington Incorporated	Industrial
WMATA - Alexandria Metro Rail Yard	Industrial
Virginia Paving Company Alexandria Plant	Industrial
Alexandria Renew Enterprises Wastewater Treatment Plant	Industrial
Gordon Recycling Limited Liability Corporation	Industrial

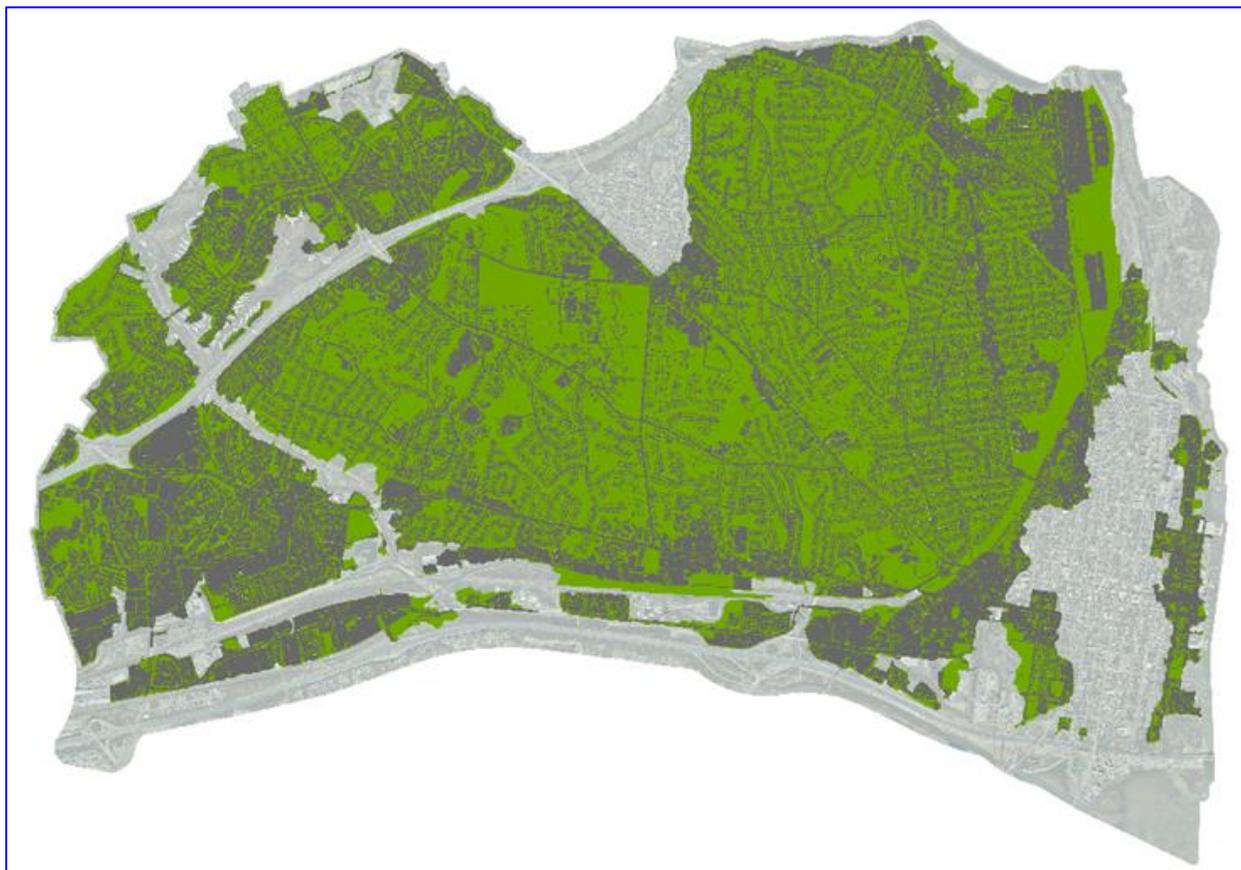
Based on the above analysis, the estimated land areas draining to the Alexandria MS4 service area, non-Alexandria MS4, and CSS is presented in Table 2. Figure 1 shows the size and extent of the delineated pervious and impervious land uses for the MS4 service area in green.

Table 2 – Alexandria MS4, Non-Alexandria MS4, and CSS Land Area¹

Land Area	Impervious (ac)	Pervious (ac)	Totals (ac)
Alexandria MS4 Service Area (regulated)	3417.24	3991.57	7408.81
CSS (regulated)	398.75	177.85	576.6
Non-Alexandria MS4 (unregulated)	452.17	1387.68	1839.85

1. Approximate acreage in Old Town – the historic portion of the City.

Figure 1 – Regulated City of Alexandria MS4 (in Green)



4. Existing Source Loads and Calculating 5% Compliance Reductions

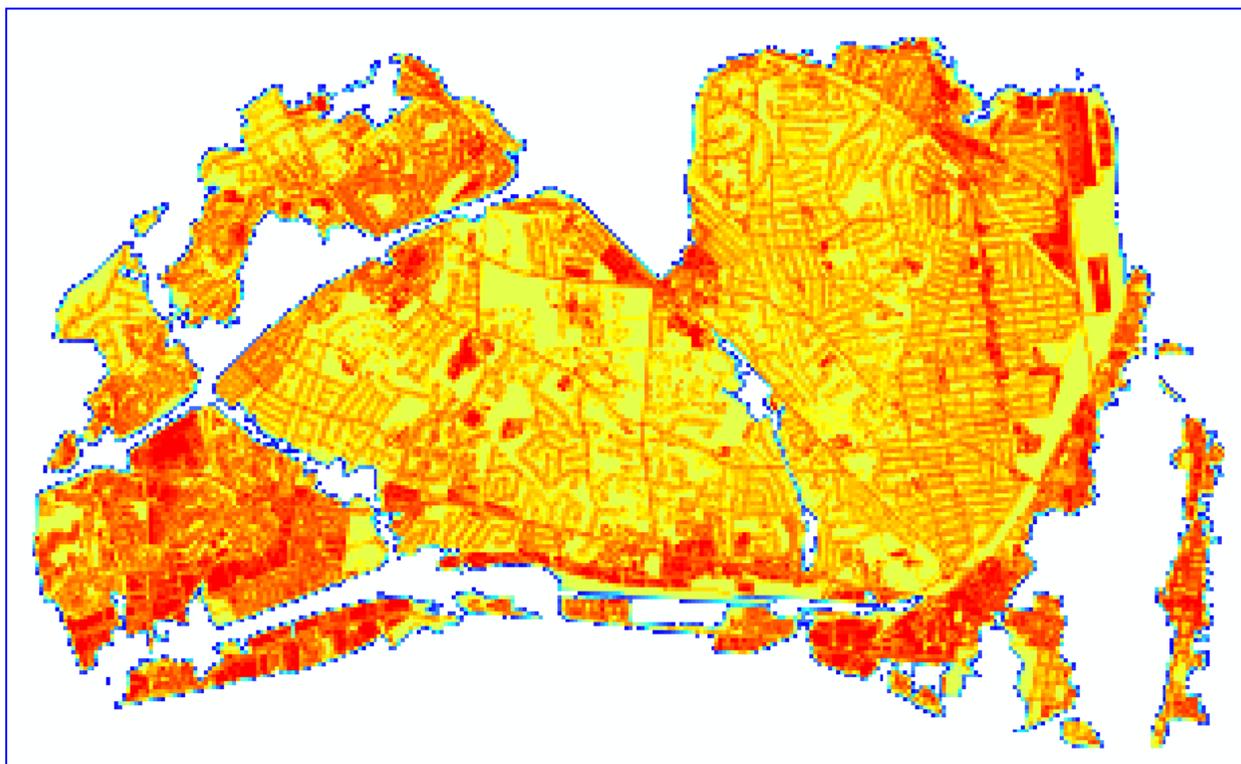
Baseline loads for nitrogen, phosphorus, and sediment were established using the City’s impervious surface GIS data that represent the best available data for total existing acres served by the MS4 as of June 30, 2009, along with loading rate data for each pollutant of concern found in Table 2b (Potomac River Basin) of the MS4 general permit. In working with our consultant, AMEC Environment and Infrastructure, ALERT (AMEC Loading Estimation and Reduction Tool) was used to calculate total loads from the MS4 service area and generate spatial data to help visualize areas of higher and lower loading rates.

Total loads from existing impervious and pervious sources are presented below in Table 3. Figure 2 is a “heat map” that presents existing nitrogen loads in a graphic format that was generated using ALERT. Existing loads for phosphorus and sediment will generally show similar intensity differentials.

Table 3 – Existing Source Loading Rates for Nitrogen, Phosphorus, and Sediment

Subsource	Pollutant of Concern	Est. MS4 Service Area (ac)	Loading Rates (lbs./ac)	Load per Land Cover (lbs.)	Total Exiting Load (lbs.)
Regulated Impervious	Nitrogen	3417.24	16.86	57,614.67	97,809.78
Regulated Pervious		3991.57	10.07	40,195.11	
Regulated Impervious	Phosphorus	3417.24	1.62	5,535.93	7,172.47
Regulated Pervious		3991.57	0.41	1,636.54	
Regulated Impervious	Total Suspended Solids	3417.24	1,171.32	4,002,681.56	4,704,399.56
Regulated Pervious		3991.57	175.8	701,718.01	

Figure 2 – Graphic Representation of Existing Nitrogen Loads



The Phase I WIP and MS4 General Permit special conditions state that MS4 permittees will need to meet L2 scoping reduction requirements for existing sources. During the first MS4 permit cycle (2013-2018), the City will need to implement practices sufficient to achieve 5% of the L2 reduction target. This report focuses on these 5%, or Phase I, reductions; however, potential strategies considered may achieve reductions beyond the 5%, given the need to comply with increasing reduction requirements in successive

permit cycles. During the second permit cycle (2018-2023), the City will need to implement additional practices sufficient to achieve 35% of the L2 reduction target, for a total of 40%. Finally, the City will need to achieve the remaining 60% or total reduction targets by 2028. The L2 reductions for total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) applied to the regulated MS4 service area are presented in Table 4.

Table 4 – Level 2 Reduction Requirements

Land Cover Type	Required Reduction		
	TN	TP	TSS
Regulated Impervious	9.00%	16.00%	20.00%
Regulated Pervious	6.00%	7.25%	8.75%

Table 5 presents the total required reductions through three permit cycles. The total loads were calculated using MS4 general permit Table 2b loading rates for the Potomac River Basin and the impervious and pervious areas within the MS4 service area. Estimated total required reductions were calculated using the total L2 scoping requirements in the Phase I WIP (Table 4 above). These represent the estimated 100% target reductions to be met by the end of the third MS4 general permit cycle (by June 30, 2028).

Table 5 – Existing Source Loads and Total L2 Pollutant Reductions¹

Land Cover Type	Pollutant	Total Existing Loads (lbs)	Estimated Total Required Reductions (lbs/yr)
Regulated Impervious	TN	97,810.78	7,597.03
Regulated Pervious			
Regulated Impervious	TP	7,172.47	1,004.40
Regulated Pervious			
Regulated Impervious	TSS	4,704,400.56	861,937.64
Regulated Pervious			

1. Approximate L2 scoping total reductions.

Table 6a presents the final estimated pollutant reductions broken out by MS4 general permit cycle based strictly on meeting 5%, 35%, and 60% (or total) of the L2 scoping requirements.

Table 6a – Estimated Pollutant Reductions Broken Out by MS4 Permit Cycle¹

Permit Cycle	N (lbs/yr)	P (lbs/yr)	S (lbs/yr)
First MS4 Cycle Target (5%)	379.85	50.21	43,096.83
Second MS4 Cycle Target (35%)	2,658.96	351.54	301,677.82
Third MS4 Cycle Target (60%)	4,558.22	602.64	517,161.98
TOTAL REDUCTION (100%)	7,597.03	1,004.40	861,936.64

1. These estimates are based on percentages of the L2 requirements.

The MS4 General Permit requires the City to use permit Table 3b to determine the 5% reductions required by the end of the current permit cycle (June 30, 2018). Table 6b presents the 5% reduction requirements for existing sources by multiplying the general permit discounted loading rates (permit Table 3b) by impervious and pervious MS4 service area. The table incorporates the required L2 reductions by discounting the overall loading rate for the Potomac River Basin. However, using the discounted loading rate in permit Table 3b yields a slightly different required reduction for the first permit cycle than calculating a 5% target reduction using the overall reductions and the L2 scoping. Part II 2 on page 7 of the Guidance provides the more accurate discounted loading rates for the Potomac River Basin than those in permit Table 3b. The Guidance allows the use of either approach; however, DEQ may need to address this discrepancy during subsequent MS4 permit cycles. This Action Plan addresses the required reductions presented in Table 6b using the Guidance 5% loading rates.

Table 6b – First Permit Cycle Pollutant Reductions Calculated per the MS4 Permit¹

Subsource	Pollutant	Existing MS4 Service area in acres (as of 6/30/2009)	5% Loading Rate from Guidance (lbs/ac/yr)	Total Reduction Required First Permit Cycle (lbs/yr)	Required Phase I Reductions (lbs/yr)
Regulated Impervious	TN	3,417	0.07587	259.27	379.85
Regulated Pervious		3,992	0.03021	120.59	
Regulated Impervious	TP	3,417	0.01296	44.29	50.22
Regulated Pervious		3,992	0.00148625	5.93	
Regulated Impervious	TSS	3,417	11.7132	40026.82	43,096.83
Regulated Pervious		3,992	0.769125	3070.02	

1. These reduction estimates are calculated using Guidance page 7 table for Potomac River Basin.

5. Increased Loads from 2009 – 2014 New Sources

The City first adopted the Chesapeake Bay Act requirements into local ordinance in 1992. This included land protection and water quality requirements being adopted locally. The Bay Act required that post-construction stormwater quality requirements be calculated based on an average land cover condition. While localities were required to adopt the new stormwater quality requirements, they were given the option of setting the average land cover condition at 16% impervious – the calculated average for the Bay watershed – or using the existing average impervious area for a local watershed. Using the average impervious land cover condition existing in the City at that time was the most feasible alternative for urbanized communities like the City. Requiring development to go back to 16% impervious cover would be overly restrictive given the existing urbanized conditions. Consistent with the Act, the City adopted a local average land cover condition of 41% impervious for post-construction stormwater quality design and required development to meet this criteria. This represented the existing condition, so that new development and redevelopment projects could not increase the pollutant load above this average. In addition, the City went a step further and adopted the more stringent “water quality volume default” requirements to treat the first ½” over the site impervious surface – or first flush – for post-construction stormwater design. More recently, the City has amended Article XIII of the Zoning Ordinance (the Environmental Management Ordinance) effective July 1, 2014 to incorporate the water quality technical criteria in the Virginia Stormwater Management Regulations (9VAC25-870). However, the MS4 General

Permit Section 1.C.2.a.(7) requires the City to offset increased loads from new sources initiating construction between July 1, 2009 and June 30, 2014 that disturb one acre or greater, which use the 41% average impervious cover for calculating post-construction water quality requirements. Please note that the majority of land-disturbing activities in the City do not reach the one acre or greater threshold.

The City used the aggregate approach discussed in the Guidance to determine the increased loads from projects disturbing greater than one acre that initiated construction within this time period. Loading rates in permit Table 2b were used to calculate the existing (pre-site) and resultant (post-site) loads for changes in impervious and pervious area as a result of these projects. The estimated full offset was calculated by subtracting the pre-site from the post-site, with the current required offsets calculated as 5% of the total. Table 7 provides the changes in land use for qualifying projects, the associated increased load, and the 5% offset required during this permit cycle. Please note that credits from BMPs installed as part of the 2009-2014 projects are included in the Post-2009 BMPs in Section 9.2 and are not reflected in Table 7.

Table 7 – Increased Loads and Pollutant Reductions 2009-2014 New Sources

Subsource	Pollutant	Land Change		Required Pollutant Reductions		
		Pre-Site Impervious (ac)	Post-Site Impervious (ac)	Loading Rates (lbs/ac/yr)	Est. Full Offset	2009 - 2014 Offsets
Regulated Impervious	Nitrogen	26.3	31.1	16.86	80.93	4.05
Regulated Pervious		27.3	22.5	10.07		
Regulated Impervious	Phosphorus	26.3	31.1	1.62	7.78	0.39
Regulated Pervious		27.3	22.5	0.41		
Regulated Impervious	Total Suspended Solids	26.3	31.1	1,171.32	5622.34	281.12
Regulated Pervious		27.3	22.5	175.80		

6. Increased Loads from Grandfathered Projects

The Virginia Stormwater Management Regulations (9VAC25-870-48) provide the opportunity for qualifying development and redevelopment projects to calculate post-construction stormwater quality requirements in accordance with the old water quality technical criteria in place in the City prior to the implementation of the new state stormwater requirements effective July 1, 2014. However, MS4 general permit Section I.C.2.a.(8) requires the City to offset increased loads from grandfathered projects disturbing one acre or greater that initiate construction after July 1, 2014.

As discussed in the previous section, the City implemented the Chesapeake Bay Act stormwater quality requirements utilizing an average land cover condition of 41% impervious. Additionally, the City continues to retain the more stringent requirement for projects to treat the first ½” of runoff associated with impervious surfaces – the water quality volume default. The permit requires that the City to offset the difference between the existing impervious condition of the project and the final impervious condition when applying the 41% land cover condition requirement. The City maintains a BMP database in a Microsoft Access format. Required BMP information and additional pertinent information is added to the database during

the plan and construction record drawings review and approval processes. Projects where post-construction stormwater quality requirements were calculated using the old technical criteria and have not commenced construction, but are fairly certain to initiate construction during this MS4 permit term, are labeled in the database as “planned.” Increased loads associated with planned projects disturbing equal to or greater than one acre must be offset by the City prior to completion of the grandfathered project. Given that the permit and Guidance are silent on what constitutes completion, this plan assumes that approval of as-built plans and certification by a professional engineer that the stormwater management BMP is functioning properly is a reasonable measure of completion for each project.

Appendix II of the Guidance was followed to calculate the offsets. The simple method was used to determine the loading rate from the existing pre-site impervious cover. The simple method was also used to determine the loading rate from the final or post-site impervious cover condition. The pre-site loading rate (lb/ac/yr) was subtracted from the post site loading rate (lb/ac/yr), and the difference was multiplied by the post site area (ac) to yield the increased load (lb/yr). This is the amount that must be offset prior to applying the credit received for BMPs implemented for these projects. The credits for installed BMPs were calculated according to Part III of the Guidance using the Chesapeake Bay Program BMP efficiencies in Table V.C.1.

Since these Grandfathered projects generate minimal offsets, due in large part to the existing impervious cover of the site and the more stringent requirements to treat water quality volume default. Considering the most aggressive scenario that all of the projects were completed before June 2018, the minimal loads requiring offsetting would be in place through other strategies such as credit generated from 2006-2009 BMPs or Post-2009 BMPs discussed in Section 9. The City identified 13 projects implementing 26 BMPs to meet the old water quality technical criteria and the more stringent Alexandria water quality volume default. Summary calculations are presented in Table 8.

Table 8 – Summary of Remaining Offset Loads from Grandfathered Projects

	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
Offset Loads to Reduce	73.12	504.56	34309.97
Loads Removed by BMPs*	69.79	475.22	32315.21
Total Load Remaining	3.34	29.33	1994.76

**These BMP reductions are not included in Post-2009 BMP credits.*

7. Estimated Future Grandfathered Projects

Estimated future grandfathered projects may disturb greater than one acre and qualify as future grandfathered in accordance with 9VAC25-870-48. These projects have been approved or have an obligation of funding prior to July 1, 2012, but have not received coverage under the VPDES Construction General Permit prior to July 1, 2014. Given that these are either projected or in the early planning stages, project data has not been captured in the BMP database as “planned” for this list of projects, and it is uncertain when these projects may initiate construction. Approximately 428 acres of projects are estimated to be grandfathered; however, that estimate is likely high given that stormwater quality has been provided for some of the common plan of development projects that have stormwater BMPs in place, while others will likely only be changes to the previously approved floor area ratios. The list of future grandfathered projects is provided in Appendix A.

8. Means and Methods to Meet Target Reductions

The City has used an iterative approach in continually refining the list of potential pollutant reduction strategies through a series of planning level exercises to address meeting the TMDL target reductions. This includes the first “Chesapeake Bay TMDL Analysis and Options” (Final Draft August 2012), the City’s February 1, 2012 response to the Virginia Department of Conservation and Recreation (DCR) “local letter” (November 9, 2011) and the “Draft Chesapeake Bay TMDL Phase I (5%) Action Plan” (June 26, 2014). The early draft action plan, which focused mainly on potential strategies and cost, was based on draft action plan guidance provided by DEQ, and built on the previous work through continued input of internal stakeholder groups.

The City will employ the following potential strategies described in the preceding sections as the toolbox of means and methods to meet the required target pollutant for reductions total nitrogen, total phosphorus and total suspended solids. This includes reductions for 1) Existing Sources 2) New Sources, 3) Increased Loads from 2009 – 2014 New Sources, and 4) Increased Loads from Grandfathered Projects. The Guidance stipulates BMPs implemented for credit should be in the Virginia Stormwater BMP Clearinghouse or be approved by the Chesapeake Bay Program. The City is using a menu of means and methods that fit this stipulation to meet the reduction requirements for each of the categories listed above. This type of adaptive management approach is an iterative “all of the above” strategy to identify likely candidate projects for implementation. This approach puts the greatest number of strategies on the table, and allows the City to consider any and all of the strategies based on conditions present at the time.

The means and methods in this Action Plan represent the synthesis of the analysis and options reports and the planning-level exercises, and the feasibility study to address pollutant target reductions by June 30, 2018. In considering an iterative approach that employs adaptive management principles and retains maximum flexibility in choosing the appropriate means and methods, the City has identified a number of potential strategies to reach target reduction goals. A mix of the following strategies will be implemented, where practicable, to address the reductions due by June 30, 2018; while additionally working towards meeting anticipated reductions required during the next permit cycle.

Structural stormwater BMPs implemented prior to January 1, 2006 are included in the calibration and baseline conditions of the Bay Model and are not available for credit towards reductions. Credit for existing stormwater management BMPs are calculated according to the Guidance.

- **Credits for 2006 – 2009 Stormwater BMPs.** Structural BMPs implemented on or after January 1, 2006 and prior to July 1, 2009 will be credited.
- **Credits for Post-2009 Stormwater BMPs.** Structural BMPs implemented on or after July 1, 2009 providing treatment for previously uncontrolled.

Projected redevelopment requiring the implementation of stormwater management BMPs meeting the new technical criteria for projects initiating construction after July 1, 2014 can be credited towards reductions and reported as credits following implementation. Structural BMPs such as retrofitting existing facilities and implementing new facilities to retrofit existing impervious areas are included in the means and methods to meet reductions. The City’s “all of the above” approach is focused on strategies that are complete, under construction, or in the design phase are listed below. However, other strategies listed below may also be implemented.

- **Projected Redevelopment.** Stormwater quality BMPs implemented to meet the new VSMP regulations, as adopted into the City's Environmental Management Ordinance effective July 1, 2014 and the City's more stringent ordinance. Note that new development also must comply with the more stringent water quality volume default.
- **Regional Facilities.** Retrofitting flood control facilities to provide water quality treatment and enhancing existing facilities to provide increase reductions.
- **Public Private Partnerships (P3).** Informal arrangement for implementation of regional facilities during the development process that provide for treatment of impervious area beyond the required site area, in exchange for other onsite consideration as well as treating offsite stormwater.
- **Retrofits on City Properties.** Retrofitting City-owned properties that are not currently treated by stormwater quality BMPs.
- **Right-of-Way Retrofits.** Retrofitting public streets, especially in conjunction with CIP road projects where implementation is deemed feasible.
- **Urban Stream Restoration.** Urban streams restored using one of the five expert panel report methodologies, as adjusted to account for the unregulated baseline load.

The following additional strategies may be pursued by the City to address the targeted reductions; however, these are currently not part of the core strategies being implemented.

- **Street Sweeping.** Removing nutrients and sediment from roadways by mechanical means before pollutants may be transported offsite in stormwater flows.
- **Urban Nutrient Management.** Pollutant reductions from nutrient management plans implemented beyond those required by law or statute.
- **Land Use Change.** Credit for converted lands to a land use with a lower associated pollutant load.
- **Forest Buffers.** Implementing buffers and enhancing RPAs to protect local waterways and receive pollutant reduction credits.
- **Public-Private Partnerships (P3).** Consideration of more formal P3 arrangements such as the Community Based Public-Private Partnership (CBP3) approach.
- **Nutrient Trading.** Purchasing pollutant credits through the expanded nutrient credit exchange.
- **Integrated Approach.** Applying credits generated from controls implemented in the City's VPDES Combined Sewer System (CSS) permit to the MS4 service area.

Since the target reduction requirements are greatly increased for the two subsequent permit cycles, the City believes it prudent to set an internal planning goal for the first permit cycle that extends beyond the 5% target. This approach will enable the City to ramp up planning and design to increase the likelihood of success in achieving reduction goals in the second and third permit cycles. However, implementation requirements in this Action Plan relate only to reductions required in the current 2013 – 2018 MS4 general permit due by the end of this permit cycle on June 30, 2018. The mix of potential strategies presented above are discussed in further detail in the following sections.

8.1 Credits for 2006 – 2009 Unreported Stormwater BMPs

DEQ strongly encourages permittees to submit historical data for stormwater management BMP installed on regulated and unregulated lands prior to June 30, 2013 to be used as an input for the next run of the Bay Model. Per Part IV 2, of the Guidance, the City is affirming that the complete list of historical BMPs will

be submitted to DEQ by September 1, 2015 as part of the “Historical Data Clean-Up” effort as DEQ has requested. By affirming that the City will provide the complete historical list, and submitting historical BMPs installed between January 1, 2006 and June 30, 2009, DEQ Guidance states that this list of BMPs will be credited towards TMDL target reductions.

The City BMP database was queried for BMPs installed during this timeframe. Pollutant loads associated with the impervious and pervious area draining to project BMPs were calculated using the Potomac River Basin loading rates permit Table 2b loading rates. Removal efficiencies for the BMPs were assigned using the Chesapeake Bay Program Efficiencies found in Guidance Table V.C.2. A full list of BMPs per project with all pertinent data and calculations can be found in Appendix B. The summary of the 2006 – 2009 BMP reductions for nitrogen, phosphorus and sediment are presented in Table 9.

Table 9 – Reductions Achieved for 2006 – 2009 BMPs

Number of Projects	Total Number of BMPs	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approx. Cost
19	63	1,104.02	160.00	75,073.26	\$0 ¹

1. Developer bears installation and long-term operation and maintenance costs.

8.2 Credits for Post-2009 Stormwater BMPs

The City maintains a current digital inventory of stormwater management BMPs that are required as part of the development process or that have been implemented as retrofits on City properties. This database was used to identify and gather data on BMPs for projects initiating construction on or after July 1, 2009, which qualify for water quality treatment credit according to Part III 3 of the Guidance. In addition to the Chesapeake Bay ordinance water quality requirements, the City implemented the water quality volume default requirement for development and redevelopment during this time period. BMPs installed prior to January 1, 2006 are included in the baseline existing conditions in the Bay Model and not given credit towards treatment. (Credit for BMPs installed on or after January 1, 2006 and before July 1, 2009 are discussed in 9.1.) An analysis was conducted to determine the total load reductions achieved by post-June 30, 2009 BMPs within the MS4 service area.

The BMP database was used to determine the acres treated per type of BMP installed after the 2009 baseline. Pollutant loads for impervious and pervious areas draining to each BMP were calculated using the Potomac River Basin loading rates from permit Table 2b. Specific BMP types and associated pollutant removal efficiencies were based on the Chesapeake Bay Program Efficiencies and Retrofit Curves data, as applicable. These credits are associated with the 2009 – 2014 projects that generated some minor increased loads and offsets to be applied towards required reductions discussed in Section 6.0. The resulting reductions in nitrogen, phosphorus, and sediment for these projects are presented in Table 10.

Table 10 – Reductions Achieved Through Post-June 30, 2009 BMPs

BMP Status	Total Acres Treated	Impervious Acres Treated	Estimated Pollutant Reductions (lbs/yr)			Approx. Cost ¹
			TN	TP	TSS	
Constructed	44.89	33.62	92.93	12.71	10,551.71	\$0
Planned - Under Construction	100.07	72.95	225.40	33.17	29,077.46	\$0
Total	144.96	106.58	317.33	45.89	39,629.17	\$0

1. Developer bears the cost of installation and long-term operation and maintenance.

8.3 Projected Redevelopment

Redevelopment over time is a significant opportunity for the City to achieve pollutant reductions, since corresponding pollutant reductions will be credited towards Bay TMDL targeted reductions. The City is almost completely built out and was done so largely prior to stormwater quality regulations adopted in 1992. The Virginia Stormwater Management Regulations, implemented by the City on July 1, 2014 through the updated Environmental Management Ordinance, require that all redevelopment greater than or equal to one acre must achieve a 20% reduction in phosphorus from existing site conditions. Redevelopment less than an acre must reduce phosphorus 10% from existing conditions. New development that is subject to the new stormwater management regulations will have to meet nitrogen, phosphorus and sediment loading rates associated with pervious area, or a 0.41 lbs/ac/yr TP loading rate. This equates to no net increase and is therefore considered neutral with respect to loads. However, in addition to the state water quality standards, the City has retained the more stringent requirement of treating the first ½” of runoff associated with all the impervious area of the site – the water quality volume default. This more stringent requirement will continue to translate to increased reductions beyond the state minimum water quality requirements for both development and redevelopment projects.

While future redevelopment projects will provide nutrient and sediment credits, given the highly speculative nature of potential credits generated from projected development from now until 2018, there is no guarantee that these projects will occur to be credited towards the 5% reductions required in the first permit cycle. For this reason, credits associated with projected redevelopment are not presented here. However, the City will include reductions from development and redevelopment projects in the required reporting on progress towards achieving the overall targets.

8.4 Regional Facilities

A number of existing and potential stormwater pond sites were considered to evaluate planning-level retrofit feasibility for new or enhanced water quality benefits. The viability of retrofitting existing regional ponds and potential construction of new stormwater management ponds was addressed through a multi-year “Feasibility Study for Retrofit of Existing Ponds and Construction of New Stormwater Management Ponds” that was finalized December 2014. That report represents a refinement from the previous planning-level exercise for large regional projects, and provides more specificity based on the City’s Water Quality Steering Committee and Water Quality Work Group internal stakeholder discussions about viability and

potential for these projects to go forward. Some barriers to implementation included minimal water quality benefits and site-specific restraints which included lack of available area, ownership and competing interests, among others. The potential strategy involves the retrofit of existing water quantity-only facilities (detention ponds) to provide water quality benefits by, enhancing the pollutant removal of an existing pond, or increasing the amount of treated impervious area draining to the facility.

For regional facilities that provide no effective water quality benefit, the improved stormwater treatment would provide a removal efficiency and the entire associated pollutant reduction will be credited. For existing regional BMPs that are enhanced to provide an extra water quality benefit, the increased pollutant reductions will be credited. Through refinement of the initial lists of potential sites, the City has identified the following large-scale regional facilities. Figure 3 presents the location and drainage areas for the first three of these facilities discussed below.

- Lake Cook,
- Eisenhower Block 19 Pond (Pond 19),
- Cameron Station Pond, and
- Lucky Run Pond

Lake Cook

Funding for the feasibility and design of Lake Cook were included in the City's FY2013 CIP. This existing fishing pond was identified in early planning-level exercises initiated in late 2011 as a retrofit candidate, included in the City's Response to DCR's November 2011 Information Request, and was considered in a subsequent feasibility study initiated in March 2013. Lake Cook is an existing facility that is currently used as a fishing pond that provides water quantity only (detention). Lake Cook will be retrofitted to provide enhanced pollutant removal or to increase the capture volume and level of treatment. In December 2013, the City received a Stormwater Local Assistance Fund (SLAF) 50% matching grant from DEQ to help fund the conversions of Lake Cook from a recreational fishing lake to a stormwater management BMP. Lake Cook drains approximately 390 acres of urban land, with approximately 127 acres of the drainage area being impervious. The lake's primary use is recreational and it is regularly stocked with fish by the Virginia Department of Game and Inland Fisheries.

Pollutant loads for lands draining to Lake Cook were computed using the MS4 General Permit Table 2b loading rates. Removal efficiencies were calculated using the Bay Program Curves according to "Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Projects" dated January 20, 2015" and the associated Guidance section. Pollutant loads removed are based on these calculated loads and efficiencies. The Technical Memorandum in Appendix C provides a detailed approach of the planned retrofit, the calculated pollutant removal efficiencies, and the associated pollutant removal credits. Lake Cook is considered the City's main retrofit strategy towards meeting initial Bay TMDL reduction goals for the current and next permit cycle. This project is currently in the design phase and is scheduled to begin construction in fall 2016, with project completion late 2017 or early 2018. Table 11a provides a summary of acres treated, pollutant reductions, and costs for this retrofit project. The total estimated CIP cost of the projects is approximately \$2.7M.

Table 11a: Lake Cook Existing Loads and Pollutant Removal

Pollutant	Drainage Area Load (lbs/yr)	Removal Efficiency	Annual Pollutant Removal (lbs/yr)
Nitrogen	4,599.20	35%	1,586.97
Phosphorus	302.80	55%	163.25
Sediment	191,628.70	70%	131,334

Eisenhower Pond 19

This regional facility is being constructed by the private developer of the property; however, the impervious area treated was negotiated by City staff to be greater than that required during the development review process. Any pollutant reductions beyond those required are credited towards the City’s Bay TMDL reduction requirements. Since this practice goes well beyond the reductions required for development and redevelopment, this pond is not included in the previous section as a “Credit for Post-2009 BMPs”. The pond assumes efficiencies based on 17% TP removal based on design and treatment considerations. Removal efficiencies of 15% for TN and 18% for TSS were subsequently derived using the Chesapeake Bay stormwater treatment curves. Table 11c presents data for this regional facility.

Table 11b: Block 19 Pond Treatment¹

Total Treated (ac)	Impervious Treated (ac)	Pervious Treated (ac)	Estimated Pollutant Reductions (lbs/yr)			Approximate Total Cost
			TN	TP	TSS	
70.00	52.50	17.50	159.21	15.68	11,622.74	\$0 ²

1. Assumes efficiencies based on 17% TP, 15% TN, and 18% TSS from Chesapeake Bay curves.

2. Developer bears the cost of installation and long-term operation and maintenance. Opportunity costs for alternate uses of the land are considered inconsequential given the current use and therefore not factored into the costs.

Cameron Station Pond

This City-owned and maintained facility drains over 240 acres of mostly private land, but currently provides water quality treatment for only approximately 94 acres. A proposed retrofit of the pond assumes 215 acres of treatment and a conversion from a Level 1 Wet Pond to a Level 2 Wet Pond. This would create additional water quality volume to provide treatment for nearly the entire drainage area of the pond. This project received a SLAF 50% matching grant in December 2014, and is likely slated for completion beyond the scope of this Action Plan and permit cycle. It is included here for reference and to highlight the City’s iterative approach and internal planning goal of exceeding current regulatory requirements to begin the process of addressing anticipated requirements in the next permit cycle. Table 11b presents the estimation of pollutant removal and the approximate total CIP cost. However, retrofitting this pond is not included in the final summary of reductions for this Action Plan.

Table 11c: Cameron Station Pond Treatment

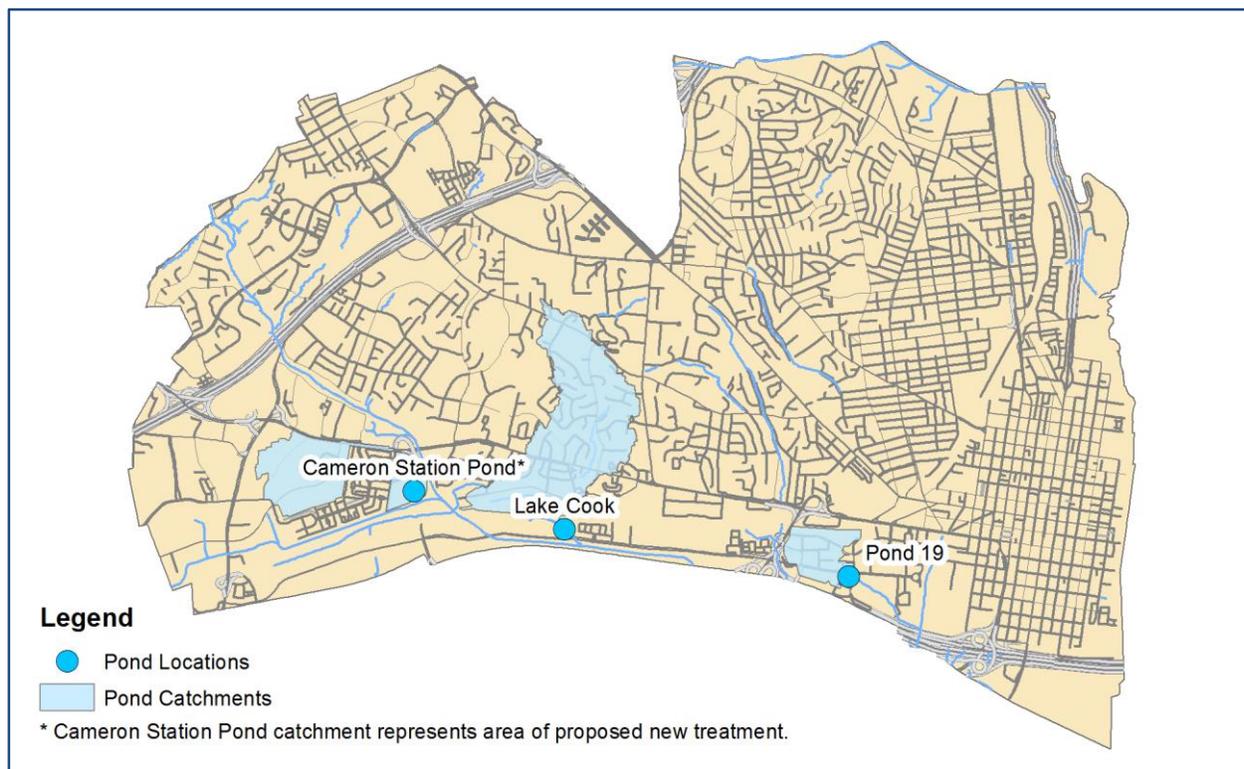
Total Treated (ac)	Impervious Treated (ac)	Pervious Treated (ac)	Estimated Pollutant Reductions (lbs/yr)			Approximate Total CIP Cost ¹
			TN	TP	TSS	
248.10	159.80	88.30	496.93	92.08	31,071.94	\$3.5M

1. Opportunity costs for alternate uses of the land are considered inconsequential given the current use and therefore not factored into the costs.

Lucky Run Pond

Lucky Run Wet Pond is located in the northwest portion of the City, northeast of the intersection of Interstate 395 and West Braddock Road adjacent to the Stonegate Scenic Easement. The Lucky Run Pond drainage area is a mixture of urban residential and commercial land uses. The total treated drainage area of the pond is 225 acres, with 133 acres of impervious area.

Figure 3 – Potential Large-Scale Regional Facilities Locations



8.5 Retrofits on City Property

This strategy involves retrofits on City properties to treat existing impervious areas that are not currently treated by stormwater quality BMP. Even prior to the Bay TMDL reduction requirements, the City actively sought opportunities to retrofit existing impervious areas on City properties to provide water quality benefits for local streams, the Potomac River, and the Chesapeake Bay. A number of these retrofits were implemented prior to June 30, 2009 and cannot be credited towards the current reduction targets. However, the City continues to look for opportunities to retrofit City properties. Treatment of these previously untreated areas are strictly retrofits and generate credits towards meeting the required reductions. During earlier planning exercises, the City refined a list of existing properties as candidates for BMP retrofits. This list of potential projects was based on the following criteria:

- 1) ≥ 1 acre of untreated impervious area, and
- 2) The property not being slated for redevelopment in the near term.

For planning purposes, the list of potential City properties was assumed to be retrofitted with an average type of technology for the range of BMPs that may be installed to generate pollutant reductions. For planning purposes, it is assumed that approximately 50% of existing untreated impervious area could be treated by retrofits. Also, for planning and discussion purposes, a range of technologies was assumed for implementation. Pollutant removal efficiencies for this range of technologies were derived by averaging the efficiencies for several types of BMPs that would be likely candidates for this application on City properties: Filtering Practices, Bioretention, Dry Swale and Grass Channel. The resulting average efficiencies assigned to this range of technologies is: 30% TN, 50% TP, and 60% TSS. These were used to generate possible pollutant reductions for this range of technologies that may be implemented. The identification of specific practices can then be refined during subsequent onsite planning and design when the project becomes feasible. Final retrofits implemented and the associated removal efficiencies will determine the reductions achieved.

The City will continue to use the above criteria to identify other likely candidates for retrofit opportunities. Table 12 presents the retrofits that have been implemented on City properties after June 30, 2009 and the related pollutant reductions.

Table 12 – Retrofits on City Property

Project	Total Treated (ac)	Impervious Treated (ac)	Bay Program Efficiency	TP Removed (lbs/yr)	TN Removed (lbs/yr)	TSS Removed (lbs/yr)	Approximate Total Cost
Fire Station #206	0.55	0.55	60%	0.53	3.69	250.85	\$252,240 ¹
Burke Library	0.98	0.92	50%	0.76	0.38	2.61	\$143,372
Charles Barrett Elementary	0.73	0.62	60%	0.63	4.34	295.47	\$252,240 ¹
Charles Barrett Elementary	1.62	1.38	45%	1.05	7.25	492.83	\$252,240 ¹
Totals				2.22	15.31	1,041.34	\$900,092

1. The total cost was evenly divided, however actual costs varied for each.

8.6 Retrofits of City Rights-of-Way

City right-of-way retrofits is a potential strategy for treating smaller areas with each practice, but collectively may net large areas of impervious surface cover being treated. This approach has the benefit of using public property, which avoids the cost of land acquisition. These retrofits treat public spaces such as public streets and medians. Retrofits may include low impact development (LID) such as bioretention for the medians and sidewalks, inlet tree box filters or various manufactured BMPs such as hydrodynamic or filters to treat roadways. These retrofits tend to treat relatively small areas due to size constraints and gradient changes. As a result, a large number of facilities are required to achieve meaningful reductions. Considering median retrofits in conjunction with inlet retrofits generally provides for the treatment of a greater contiguous area.

The City has identified possible medians and nearby stormwater inlets as retrofit candidates. Potential medians considered as likely candidates for retrofit were wide enough to accommodate the typical dimensions of a bioretention facility. Inlets considered were located in the vicinity of the potential median

projects. The location of utilities and mature street trees were not considered and must be taken into consideration when performing more in depth onsite investigations.

For planning purposes, acres treated and the impervious acres treated may vary since it may not be practical that the entire median area can be directed to a BMP and treated. Average efficiencies assigned to this range of technologies is: 30% TN, 50% TP, and 60% TSS. These efficiencies consider a range of technologies that may be implemented. The identification of specific practices and the target locations will be further refined during subsequent onsite planning and design. The most advantageous time to implement such practices is during planned transportation improvements. The City continues to look for ways to implement these types of retrofits through coordination with other departments and divisions during the internal planning and review process for CIP transportation projects. Implementation of retrofit practices will determine the actual pollutant loads removed to be reported.

8.7 Urban Stream Restoration

According to Appendix V.I of the Guidance, urban stream restoration projects initiating construction on or after January 1, 2006 and those not conforming to any of the four expert panel protocols must use the interim approved removal rates developed by the Bay Program. (Expert Panel, September 2014) Projects initiating construction after January 1, 2006 may use one of the four applicable protocols to determine removal rates.

Following years of design, public outreach and inter-jurisdictional collaboration, the Four Mile Run Stream Restoration began construction in May 2015. The project includes a tidal wetland restoration that the City assessed using Protocol 3 – Credit for Floodplain Reconnection Volume. The protocol provides mass sediment and nutrient reduction credit since the project will provide a reconnection of the Four Mile Run main stream channel to the floodplain over a wide range of storm events. The pollutant removal capability of the wetland will be a function of sediment deposition, plant pollutant uptake, denitrification, and other biological and physical processes. The approach and the determination of pollutant removal credits is discussed in the Technical Memorandum in Appendix D. Please note that although the memo references an older version of the expert panel report, staff has reviewed the memo against the most recent expert panel report and deemed that the approach remains valid and the calculated credits are consistent with the latest expert panel recommendations. The project is scheduled to be completed by spring/summer 2016. Table 13 presents the reductions for each pollutant of concern and the approximate project cost.

Table 13 - Four Mile Run Stream Restoration Pollutant Reductions

TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)	Approximate Cost*
194.8	40.0	14,914	\$1.8M

**Estimate from the total costs of multiple projects in one package.*

The City initiated a restoration of a segment of Holmes Run that was completed in 2011. Dubbed “Chambliss Crossing” this restoration used natural channel techniques to provide water quality credits and to mitigate flooding in the vicinity. The City is working with the project engineer to determine what

removal credits can be assigned to the project. Since the project pre-dated the Expert Panel report, the City will provide the calculated credits and approach at a later date.

8.8 Street Sweeping

Street sweeping is an effective strategy of removing nutrient and sediment loads prior to them being transported in stormwater runoff. Frequent sweeping of prioritized areas is an effective strategy to receive pollutant reduction credits to meet Bay TMDL targets. There are two approaches for calculating pollutant removal, these include the mass loading approach and the qualifying street lanes method. The Chesapeake Bay BMP Expert Panel approved this credit in March 2011. Methods and efficiencies are still pending approval, to include the possible frequency requirement that must be met prior to receiving credit. (Bay Program Memo, March 2011)

Street sweeping must be credited annually using one of the two approved methods reductions, with the pounds of pollutants reduced included in each MS4 annual report.

8.9 Urban Nutrient Management

According to Section II.B.6.c of the MS4 general permit, the City is required to develop and implement nutrient management plans (NMPs) for lands owned and operated by the City which receive nutrients and are greater than one contiguous acre. The Commonwealth has also implemented the ban of use phosphorus-containing fertilizers during routine applications. The City does not receive pollutant reduction credits for reductions required by Virginia statute or law. However, the City can receive pollution reduction credits for the development and implementation of NMPs for unregulated lands outside the MS4 service area, on public lands less than one contiguous acre, and on private lands, other than golf courses, where nutrients are applied. (Expert Panel, March 2013)

The City continues to develop and implement NMPs according to applicability and schedule found in the MS4 general permit. The City is considering the feasibility for the implementation of NMPs on unregulated lands and private lands, following the Guidance and the Expert Panel report. The City can receive credit for these other NMPs and the associated pollutant reductions, and will include these in the City's annual report, as applicable.

8.10 Land Use Change

As part of the "all of the above" approach, the City will look for opportunities to receive credit for land use change conversions and apply the appropriate credit per Appendix V.G of the Guidance. This may include converting impervious to forest, impervious to grass, impervious to pervious, pervious to forest, or pervious to grass. Upon completion of a land use change BMP, the City will use the Table V.G.1 Land Use Change Conversion Efficiency table found in the Guidance to calculate the reductions. Pollutant reductions credited will be reported in the annual report for the appropriate period.

8.11 Forest Buffers

This BMP is another tool in the "all of the above" approach and similar to the previous BMP. The City will look for opportunities to protect local waterways and create credits by implementing forest buffer BMPs and/or providing enhancements to RPAs. Credits will be calculated using the efficiencies found in Table V.H.1 of the Guidance, and will be reported with the appropriate annual report.

8.12 Public-Private Partnerships

The use of public-private partnerships (P3) can optimize all available technical and financial resources to reduce the cost burden borne by the City. These partnerships are often used as a means to provide more cost effective financial strategy to build and manage public infrastructure that can carry huge financial obligations. Examples include toll roads, military housing, and wastewater and recycling services. Historically, wastewater has been the leader in this arena related to water quality. Today, governments at all levels are considering public-private partnerships to address fiscal challenges related to the construction, operation, and maintenance of infrastructure, expansion of services, and repair of aging infrastructure. However, stormwater retrofits to meet the Bay TMDL has provided a new set of financial concerns.

Municipalities are considering this approach to help reduce costs and risks related to retrofits. Prince George's County, Maryland is pioneering this P3 effort in the region to address Bay TMDL requirements. The County has established an innovative P3 pilot program to help fund projects to retrofit of about 8,000 acres of existing impervious surfaces at an estimated cost of \$1.2B. The private partners will get paid from stormwater utility fees collected by the County that are based on impervious area, while the County may reduce its costs of the retrofit program by 40%.

While the P3 for stormwater retrofits and infrastructure is modeled on past approaches, a related but somewhat different approach being promoted by EPA through their Green Infrastructure initiative is Community Based Public-Private Partnerships (CBP3s). While a CBP3 uses many of the same financial and procurement arrangements as a traditional P3, there are differences as well. The nature of the contract, wider range of retrofit opportunities and the flexibility of the adaptive management approach are a few of the key differences. The biggest difference is the optimization of equity and the focus on the community inherent in the approach. In a CBP3, conditions must be appropriate for the community and the contractor so that both receive equitable benefits for all actions and gains from efficiencies. (EPA Region 3, April 2015)

The Prince George's P3 pilot program and the CBP3 may prove to be the most efficient and equitable models for localities trying to meet the overwhelming cost of the retrofits required by the Bay TMDL. But this program is complicated and the data points are just now being generated, therefore; these are not viable as a solution to meet the 5% reductions due by June 30, 2018. However, the P3 and CBP3 strategies are being considered to help achieve reductions required in Phase II and III for a total of 40% and 100%, respectively. Additionally, the City has set aside funding for the study of a local stormwater utility. The City will continue to monitor the effectiveness of Prince George's P3 program and stay abreast of other cases that may materialize.

Until further consideration provides for information on the suitability of a P3 or CBP3 approach, the City has taken a less formal collaborative approach. Negotiations between the City and the developer may produce reduction credits beyond those required in local ordinance. This strategy may include the implementation of regional facilities during the development process that provide for treatment of impervious area beyond the required site area in exchange for other onsite considerations as well as treating offsite water. Credits generated under this strategy would be negotiated during construction and be the property of the City. Based on desktop analyses and current conditions, it was concluded that private parcels with greater than five acres of untreated impervious area could be potential candidates for the program. This threshold was

chosen because the level of effort would outpace the return on investment for parcels with smaller untreated areas. The following criteria were then applied and three categories emerged from this group of properties: 1) parcels that may be redeveloped before 2018 can be negotiated at the project level with project-specific innovations that go beyond reductions required per the City's stormwater ordinance, while the creation of a larger P3 program is under consideration, 2) parcels that may redevelop after 2018 but before 2028 should be considered during the Phase 2 and 3 planning effort under a new P3 program, 3) parcels not likely to be developed before the TMDL implementation deadline of 2028 cannot be counted credited toward reductions.

8.13 Nutrient Trading

The Commonwealth of Virginia is expanding the current program to allow urban stormwater to be included in the sectors that may trade nutrient credits to meet reduction requirements. The City has identified nutrient trading as a potential strategy to meet target reductions. Nutrient credits to meet overall stormwater reductions must be kept in perpetuity to meet final goals. However, wastewater dischargers currently use the program to trade credits annually. This annual trading can also be a valuable tool to assist localities in complying with their MS4 permits while working to implement the required reductions.

The City also strongly encourages DEQ to allow "annual" credit trading for the implementation of urban stormwater practices that exceed the requirements set out in the MS4 permits for each permit cycle and beyond. This would work much the same way that the current program works for permitted wastewater discharges, but would be based on a five-year permit period. In the wastewater sector annual credits are available for nutrient trading when a facility demonstrates discharges below permitted levels. These credits are traded to other wastewater facilities that are still working to complete scheduled upgrades on their facilities to meet requirements. This annual trading incentivizes discharges below permitted limits for some and allows other permittees to remain in compliance while working to upgrade their facilities.

Likewise, urban stormwater pollutant reduction practices functioning beyond the pollutant reductions required in each MS4 permit cycle generate credits in advance of permitted requirements. These credits should be available for "annual" trading in the expanded nutrient credit exchange. For instance, if the City exceeds the 5% pollutant reduction requirements for 2018, these credits should be available for the City to trade in 2018 to other permittees that may need more time to reach the required June 30, 2018 pollutant reductions. The pollutant credits would be purchased by another MS4 permittee until the City is required to use the credits per the MS4 general permit. This approach protects water quality by incentivizing early implementation of urban stormwater reduction practices and helping to ensure that the largest number of MS4 permittees are in compliance. This expansion of the program would complement the current nutrient trading program allows for annual trading, and provide sediment credits for trading.

8.14 Integrated Approach

The City operates a VPDES-permitted Combined Sewer System (CSS) located in the older historic district. The Bay TMDL assigns a wasteload allocation (WLA) to the CSS for nutrients and sediment. Additionally, the Hunting Creek/Cameron Run TMDL assigns a WLA to three of the four CSS outfalls and requires substantial reductions that are enforced through the VPDES CSS permit. Taken separately, the CSS and MS4 permits require infrastructure investments on the order of \$100-200M each. By integrating these efforts to help identify efficiencies in how to best prioritize capital investments and facilitate the use of sustainable and comprehensive solutions, the City can minimize the overall additive cost while maximizing

economic and water quality benefits. (EPA Memo, June 2012) CSS controls implemented as the result of the Long-Term Control Plan Update (LTCPU) will likely achieve substantial nitrogen, phosphorus and sediment reductions below the assigned WLA for the CSS. Pollution reduction credits generated from these controls will be applied towards MS4 target reductions.

The City is currently considering a number of CSS overflow control alternatives to reduce discharges. While some of the smaller, green infrastructure practices may be implemented prior to June 30, 2018, the larger grey alternatives will likely be available in subsequent permit cycles when pollutant reductions are greatly increased through the MS4 permit. The City is currently carefully considering and planning for the long term with this integrated approach in mind.

9. Summary of Required Reductions

The BMP strategies discussed in this action plan as part of the City’s “means and methods” to meet target pollutant reductions. It is noted that the reduction strategies listed below are either implemented, under construction or in the design phases, other potential strategies discussed above are for planning purposes. However, the list is not exhaustive and may be further refined given in-depth onsite investigations and site-specific conditions. Further, as noted, full implementation of the specific BMPs discussed as identified means and methods are being pursued for reductions beyond the 5% requirement in this action plan in order to meet TMDL compliance targets for nitrogen, phosphorus, and sediment anticipated in subsequent permit cycles. While the WIP II contains a range of strategies applicable to urban land uses, the City can only be required to implement strategies that are enforceable through the MS4 permit based on the City’s regulated land contained in the MS4 service area. This action plan is only required to focus specifically on means and methods to meet the 5% reduction goals that must be implemented by June 30, 2018. The suite of strategies presented below and those considered in the “all of the above” approach will provide reductions above the total required reductions for nitrogen, phosphorus, and sediment. However, since reduction requirements greatly increase beyond the initial 5% for the two subsequent permit cycles that span the additional 35% and 100% implementation by 2028, the City’s approach is to consider setting an internal goal for the first permit cycle that extends beyond the 5% target, in order to achieve the total reductions in the required timeframe to maintain permit compliance. This approach enables the City to ramp up planning and design to increase the likelihood of success. Table 14 presents a summary of the required total reductions for each pollutant of concern (POC), 2009-2014 offsets, grandfathered projects, and 5% required reductions.

Table 14 – Summary of Required Reductions for Existing Sources

Subsource	POC	Total Exiting Load (lbs/yr)	Est. Total Required (lbs/yr)	2009 - 2014 Offsets (lbs/yr)	G.F. Offsets (lbs/yr)*	Required Phase I (lbs/yr)*
Regulated Impervious	TN	97,809.78	7,597.03	4.05	3.34	383.90
Regulated Pervious						
Regulated Impervious	TP	7,172.47	1,004.40	0.39	29.33	50.61
Regulated Pervious						
Regulated Impervious	TSS	4,704,399.56	861,936.64	281.12	1,944.76	43,377.95
Regulated Pervious						

**Must be offset prior to project completion, not on the 5% schedule.*

***Include 5% reductions from existing sources and 5% offsets for 2009-2014 increased loads; does not include grandfathered projects.*

10. Estimated Costs and Reductions per Strategy

The cost for credits for BMPs implemented during development and redevelopment are borne by the developer. But the majority of the cost to implement the strategies outlined in this study will largely fall to the City. While small amounts of grant funding may be available from state and federal agencies, Virginia has acknowledged that the planning, implementation, operation, and maintenance of BMPs “will be costly and likely borne by local government.” (Virginia Senate Finance Committee, November 2011)

Order of magnitude costs were developed in previous planning-level exercises to estimate the total cost of 100% compliance with the target loads in order to determine the impact on the CIP budget over the short and long terms. Cost assumptions were based on best engineering practices, local assumptions, discussions with regional partners, and a draft report researching the costs of various BMPs (King and Hagen, 2011) prepared for the Maryland Department of Environment. The analyses employed during the previous planning level exercise identified specific possible retrofit strategies that may be implemented based on assumptions about the type of retrofit most likely to be implemented for each specific strategy, and limitations associated with each strategy. A range of technologies were assumed applicable and an average removal efficiency and unit cost per acre treated were derived for each strategy. For instance, most Retrofits of City Rights-of-Way would likely involve manufactured BMPs (such as tree box filters) or similar structures with an average removal efficiency of approximately 45% at a unit cost of approximately \$112,000 per acre treated. This and other assumptions for other types of strategies, along with the assumed long-term operations and maintenance costs, may or may not hold true. With regard to those strategies needed to fill the pollutant reduction gap (that is, those generic strategies needed to reach reduction targets after implementation of the specific strategies addressed in this report) no assumptions were made regarding whether these would be sited on public or private land. As a result, cost estimates do not include the cost of purchasing land or easements – which could be considerable.

The approximate cost to implement the potential means and methods to meet the total nitrogen, phosphorus and sediment reductions through FY2023 may range as high as \$50M and depends of the type and mix of technologies implemented, whereas total compliance may reach as high as \$100M. Table E5 presents the means and methods, the pounds of each pollutant of concern, percentage of the total L2 scoping targets and the estimated costs.

To meet these increased costs, funding for specific regional opportunities was first included in the FY2013 CIP. While the City dedicates a portion of the property tax towards funding the stormwater program, increased costs has outpaced these revenues. To meet these increasing costs, the City has earmarked FY16 funds to study the feasibility of a stormwater utility to create a more equitable funding strategy and increase the level of funding.

Table 15 presents a summary of potential strategies, their potential pollutant reductions in pounds and the potential percentage of the overall target reduction goals.

Table 15 – Estimated Percent Reduction and Costs per Potential Strategy¹

Reduction Strategies	N (lbs)	100% Goal²	P (lbs)	100% Goal	TSS (lbs/yr)	100% Goal	Est. Cost³
2006-2009 BMPs	1104.02	14.53	160.00	15.48	75,073.26	8.69	\$0
Post-2009 BMPs	317.33	4.18	45.89	4.44	39,629.17	4.59	\$0
Regional Facilities – Lake Cook	1,586.97	20.88	163.25	15.79	131,334.00	15.20	\$2.7M ⁴
Regional Facilities – Pond 19	159.21	2.09	15.68	1.52	11,262.74	1.35	\$0
Retrofits on City Property	2.21	0.03	15.28	1.48	1,039.16	0.12	\$1.0M ⁵
Urban Stream Restoration – Four Mile Run	194.8	2.56	40	3.87	14,914.00	1.73	\$1.8M ⁶
Total	3,364.54	44.26	280.10	42.57	273,612.33	31.67	\$5.5M

1. Assumes all grandfathered projects to be offset this permit cycle.
2. 100% goal is based on L2 scoping.
3. The City did not incur direct costs for BMPs implemented by developers.
4. Includes \$1.2M SLAF grant.
5. Includes SLAG grant funding.
6. Includes grant funding. Individual project costs may be less.

11. Public Comment

A more streamlined version of the Action Plan dated June 2014 was posted on the City's website for public review and comment. This version focused on costs and percent reductions and was used as a tool for internal stakeholder groups and budgeting purposes. This Action Plan incorporates required elements found in Part I C of the MS4 general permit and DEQ's Guidance. The following outreach activities are part of the public comment approach:

- A public notice was placed in the Alexandria Times/Gazette inviting the public to learn about and comment on the draft by attending the May 18, 2015 Environmental Policy Commission (EPC) Public Meeting.
- A presentation based on this draft will be provided during the May 18, 2015 EPC Public Meeting, inviting the EPC and members of the community to comment on the draft.
- Posting the draft on the City website with contact information for receipt of comment.
- Including in the June City Manager's Report online.
- Sending an electronic notice via eNews directing subscribers to the online draft and contact for receipt of comment.

12. References

Expert Panel Reports

Guidance Memo No. 15-2005, Virginia Department of Environmental Quality, May 18, 2015

Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Projects, January 20, 2015

Recommendation of the Expert Panel to Define Removal Rates for Urban Nutrient Management, March 2013

Recommendation of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects, September 2014

Community Based Public-Private Partnerships (CBP3s) and Alternative Market-Based Tools for Integrating Green Stormwater Infrastructure; EPA Region 3; Water Protection Division, April 2015

March 2011 Memo from the Bay Program to the Urban Stormwater Workgroup, Street Sweeping/BMP Era Recommendations

Chesapeake Stormwater Network Technical Bulletin No. 9, Stormwater Nutrient Accounting.

June 5, 2012 Memo from EPA Regional Administrators to Acting Assistant Administrator for the Office of Water, Integrated Municipal Stormwater and Wastewater Planning Approach Framework

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Appendix A

Future Grandfathered Projects

**City of Alexandria, Virginia
Chesapeake Bay TMDL Action Plan
Phase I for 5% Compliance**

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Estimated Future Grandfathered Projects

Project Name	Address	Approx.
Potomac Yard Landbay I & J East	2301 Main Line Boulevard	12.31
Potomac Yard Landbay G (Infrastructure)	2801 Main Line Boulevard	15.66
Potomac Yard Partial I & J West, L	2501 Jefferson Davis Highway	20.16
The Calvert	3110 Mount Vernon Avenue	6.77
Mount Vernon Village Shopping Center	3809 Mount Vernon Avenue	14.61
Charles Barrett Modular Addition	1115 Martha Custis Drive	1.89
James Polk Elementary	5000 Polk Avenue	1.36
Patrick Henry Modular Addition	4643 Taney Avenue	1.98
Harris Teeter Old Town	735 North Saint Asaph Street	5.33
The Madison	800 North Henry Street	8.29
Landbay L – Multifamily	1400 South Main Line	7.04
Braddock Gateway – Phase I	1219 First Street	6.39
Edmonson Plaza	1701 Duke Street	2.94
Safeway on King Street	3526 King Street	2.90
James Bland – Phase V - Block F	998 North Alfred Street	1.91
Braddock Metro Place	1261 Madison	3.43
Potomac Yard – Landbay G – Building C	2801 Main Line Boulevard	7.73
Potomac Yard – Landbay G – Building F	2801 Main Line Boulevard	4.33
East Reed AHC Multifamily	118 East Reed Avenue	2.31
Landmark Gateway (Phase I)	631 South Pickett Street	12.62
James Bland Phase III – Block D	918 North Columbus Street	2.06
Stevenson Ave Residences Extension	6125 Stevenson Avenue	4.22
ATA Development Extension Block 20	2200 Mill Road	13.43
Braddock Gateway Phase II	1100 North Fayette Street	4.20
Jefferson Houston School	1501 Cameron Street	3.52
Potomac Yard Landbay J Multifamily	1800 Main Line Boulevard	6.88
Potomac Yard Landbay G, Block H	2900 Main Line Boulevard	11.26
EESAP Block 19 Residential Building	2250 Mill Road	11.68
Washington Suites Residences	100 South Reynolds Street	5.14
Hunting Terrace	1199 South Washington Street	10.88
Hoffman Blocks 11 and 12	2210 Eisenhower Avenue	26.91
Victory Center Extension	5001 Eisenhower Avenue	24.00
Mercedes Benz	200 South Pickett Street	1.53
Enterprise Rent-a-car	4700 Eisenhower Avenue	1.30
Potomac Yard Landbay G - Block D	701 East Glebe Road	9.15
Alexandria Assisted Living	2805 King Street	1.84
Cummings Hotel	220 South Union Street	2.32

The Gateway at King & Beauregard	4600 King Street	15.97
Cameron Park	450 South Pickett Street	15.57
Landmark Mall	5801 Duke Street	15.59
Southern Towers	5055 Seminary Road	9.18
King Street Condos	1604 King Street	2.04
Block 8 - Hoffman Town Center	2401 Eisenhower Avnue	16.01
Alexandria Renew Administration Building	340 Hooffs Run Drive	1.65
Carlyle Plaza Two (Amendments)	760 John Carlyle Street	53.88
Seminary Overlook	4800 Kenmore Avenue	17.72
	Total	427.91

Appendix B

2006 – 2009 BMPs Per Project

**City of Alexandria, Virginia
Chesapeake Bay TMDL Action Plan
Phase I for 5% Compliance**

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Appendix B: Alexandria 2006 - 2009 BMPs

BMP ID	BMP_Type_Full	Plan Name	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	Area Treated (ac)	Impervious Treated (ac)	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	BMP Efficiency
1995-0019 01	D.C. Sand Filter	Bishop Ireton High School	11.05	76.23	5183.91	1.65	0.95	1.10	7.56	514.06	0.6
1995-0019 02	D.C. Sand Filter	Bishop Ireton High School	0.00	0.00	0.00	1.05	0.86	0.88	6.09	414.14	0.6
1998-0015 01	Stormceptor® Stormwater Treatment System	Dartmouth Place	2.34	16.16	1098.73	5.40	0.93	0.33	2.30	156.68	0.1
1998-0015 02	Vegetated Buffer	Dartmouth Place	0.00	0.00	0.00	0.95	0.05	0.05	0.31	21.11	0.1
2000-0009 01	Bioretention Filter	Mount Vernon Village Center	6.92	47.75	3246.86	2.11	1.69	1.31	9.03	613.91	0.45
2001-0003 01	Alexandria Compound Sand Filter	Carlyle - Block L - Post at Carlyle (Post Carlyle Square)	4.61	31.82	2164.02	1.15	1.15	1.12	7.71	524.47	0.6
2001-0003 02	Alexandria Compound Sand Filter	Carlyle - Block L - Post at Carlyle (Post Carlyle Square)	0.00	0.00	0.00	1.20	1.20	1.17	8.05	547.27	0.6
2001-0014 01	StormFilter™ Stormwater Treatment System	Northampton Place Apartments - Phase I (Northampton Place Condominiums)	2.62	18.08	1229.26	1.00	1.00	0.97	6.71	456.06	0.6
2001-0014 03	StormFilter™ Stormwater Treatment System	Northampton Place Apartments - Phase II (The Alexander Apartments)	1.52	10.47	711.87	1.11	0.78	0.84	5.79	393.48	0.6
2001-0014-A 01	Regional Wet Pond	Park Center Pond Retro-Fit (Lucky Run Pond)	253.18	1746.94	118792.06	225.00	133.00	113.93	786.12	53456.43	0.45
2002-0001 01	Stormceptor® Stormwater Treatment System	The Preston Condominium and Townhomes	1.65	11.35	771.93	1.05	0.83	0.14	0.99	67.32	0.1
2002-0022 01	StormFilter™ Stormwater Treatment System	Tuscany at Landmark	2.95	20.39	1386.44	2.02	1.37	1.49	10.29	699.83	0.6
2002-0048 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Quaker Ridge	2.27	15.63	1062.98	1.06	0.42	0.09	0.65	43.95	0.1
2002-0048 02	Aqua-Swirl® Stormwater Hydrodynamic Separator	Quaker Ridge	0.00	0.00	0.00	1.24	0.67	0.13	0.91	61.61	0.1
2003-0010 01	Alexandria Compound Sand Filter	Carlyle - Block G - Lot 711 - Office / Retail Building	1.58	10.93	743.54	0.96	0.96	0.93	6.45	438.28	0.6
2003-0016 01	StormFilter™ Stormwater Treatment System	Duncan Library	0.32	2.19	148.83	0.28	0.19	0.21	1.43	97.04	0.6
2003-0016 02	Green Roof	Duncan Library	0.00	0.00	0.00	0.07	0.07	0.06	0.39	26.19	0.53
2003-0035 01	StormFilter™ Stormwater Treatment System	Park Tower Condominium (Halstead Tower Apartments)	1.86	12.85	873.70	1.56	0.99	1.10	7.61	517.29	0.6
2003-0039 01	Dry Vault Sand Filter	Pentagon Federal Credit Union Headquarters (Alexandria Tech Center - Phase V)	1.72	11.88	808.12	0.81	0.81	0.79	5.43	369.41	0.6
2003-0041 01	Alexandria Compound Sand Filter	Carlyle - Block F - Mixed-Use	2.08	14.32	973.70	1.32	1.22	1.21	8.33	566.58	0.6
2003-0042 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Wiecking Property (Lots 701 & 702)	1.47	10.17	691.69	1.20	0.12	0.06	0.44	29.90	0.1
2003-0042 02	Aqua-Swirl® Stormwater Hydrodynamic Separator	Wiecking Property (Lots 704 & 705)	0.00	0.00	0.00	0.13	0.13	0.02	0.15	9.88	0.1
2004-0014 01	StormFilter™ Stormwater Treatment System	Jamestown Village Apartments (Parkside @ Alexandria)	0.19	1.29	87.90	0.15	0.10	0.11	0.78	52.74	0.6
2004-0014 02	StormFilter™ Stormwater Treatment System	Jamestown Village Apartments (Parkside @ Alexandria)	0.31	2.12	144.13	0.28	0.16	0.18	1.27	86.48	0.6
2004-0019 01	D.C. Sand Filter	Fairchild Property	0.72	4.95	336.74	0.38	0.38	0.37	2.55	173.30	0.6
2004-0020 01	Delaware Sand Filter	ARHA Scattered - W. Braddock Rd.	0.39	2.69	182.99	0.35	0.28	0.29	2.00	135.78	0.6
2004-0021 01	Delaware Sand Filter	ARHA Scattered - S. Reynolds St.	0.84	5.82	395.91	0.57	0.45	0.47	3.22	219.06	0.6
2004-0022 01	D.C. Sand Filter	ARHA Scattered - S. Whiting St.	1.16	8.03	546.29	0.75	0.62	0.63	4.38	297.76	0.6
2004-0025 01	D.C. Sand Filter	Foxchase Shopping Center - UNKNOWN PLAN	15.73	108.53	7380.28	1.40	1.05	1.11	7.64	519.26	0.6

Appendix B: Alexandria 2006 - 2009 BMPs

BMP ID	BMP_Type_Full	Plan Name	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	Area Treated (ac)	Impervious Treated (ac)	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	BMP Efficiency
2004-0025 02	CDS* Stormwater Treatment System	Foxchase Shopping Center	0.00	0.00	0.00	7.83	7.57	1.24	8.54	580.40	0.1
2004-0025 03	CDS* Stormwater Treatment System	Foxchase Shopping Center	0.00	0.00	0.00	1.77	1.29	0.23	1.58	107.29	0.1
2004-0041 01	Aqua-Swirl* Stormwater Hydrodynamic Separator	Eisenhower Center III	2.10	14.47	984.21	1.73	1.59	0.26	1.81	123.25	0.1
2005-0005 01	D.C. Sand Filter	Mill Race - Building One	8.06	55.63	3782.50	2.99	2.82	2.78	19.20	1305.72	0.6
2005-0011 01	StormFilter™ Stormwater Treatment System	Marriott Residence Inn @ Mill Road	1.06	7.33	498.34	0.25	0.18	0.19	1.34	91.19	0.6
2005-0011 02	StormFilter™ Stormwater Treatment System	Marriott Residence Inn @ Mill Road	0.00	0.00	0.00	0.44	0.42	0.41	2.86	194.42	0.6
2005-0015 01	Alexandria Compound Sand Filter	Carlyle - Block J - Lot 712 - Retail / Office Building	1.11	7.69	522.99	0.48	0.45	0.44	3.04	206.87	0.6
2005-0019 PLT 01	Vegetated Filter Strip	Episcopal High School - Proposed Faculty Homes	1.05	7.23	491.44	1.02	0.52	0.10	0.72	49.14	0.1
2005-0019 PLT 02	Permeable Pavement	Episcopal High School - Proposed Faculty Homes	0.00	0.00	0.00	0.01	0.01	0.00	0.02	1.37	0.2
2005-0019 PLT 03	Permeable Pavement	Episcopal High School - Proposed Faculty Homes	0.00	0.00	0.00	0.01	0.01	0.00	0.02	1.37	0.2
2005-0020 01	D.C. Sand Filter	Mill Race - Building Two	8.06	55.63	3782.50	1.34	1.27	1.25	8.64	587.28	0.6
2005-0028 01	Alexandria Compound Sand Filter	Carlyle - Block K - Lot 715 - Retail / Office Building	1.20	8.27	562.48	0.57	0.57	0.55	3.82	259.96	0.6
2005-0810 BLD 01	Green Roof	City of Alexandria - Health Department	1.29	8.93	607.32	0.15	0.15	0.13	0.89	60.43	0.53
2006-0009 PLT 01	Infiltration System	Episcopal High School - Hummel Bowl and Greenway Field Renovation	1.22	8.39	570.73	2.10	0.00	0.73	5.05	343.38	0.85
2006-0009 PLT 02	Infiltration System	Episcopal High School - Hummel Bowl and Greenway Field Renovation	1.68	11.56	786.07	4.09	0.00	1.42	9.83	668.16	0.85
2006-0018 PLT 01	StormFilter™ Stormwater Treatment System	Virginia Paving Company	6.17	42.58	2895.31	2.26	1.60	1.72	11.87	806.90	0.6
2006-0018 PLT 02	StormFilter™ Stormwater Treatment System	Virginia Paving Company	0.00	0.00	0.00	10.18	10.18	9.89	68.28	4642.72	0.6
2006-0018 PLT 03	Stream Buffer Restoration	Virginia Paving Company	0.00	0.00	0.00	11.27	1.28	3.09	21.29	1447.65	0.5
2006-0036 PLT 01	Vortechs* Stormwater Treatment System	Jiffy Lube - Stormwater Runoff Collection & Water Quality Inlet Installation Plan	0.66	4.54	309.04	0.68	0.34	0.07	0.48	32.67	0.1
2006-0101 01	Tree Box Filter	Duke Street Bridge Pedestrian Access Improvements at Ben Brenman Park	0.41	2.79	190.03	0.25	0.25	0.18	1.26	85.51	0.45
2006-0101 02	Tree Box Filter	Duke Street Bridge Pedestrian Access Improvements at Ben Brenman Park	0.00	0.00	0.00	0.25	0.25	0.18	1.26	85.51	0.45
2006-0101 03	Tree Box Filter	Duke Street Bridge Pedestrian Access Improvements at Ben Brenman Park	0.00	0.00	0.00	0.25	0.25	0.18	1.26	85.51	0.45
2007-0004 PLT 01	Aqua-Swirl* Stormwater Hydrodynamic Separator	Hoffman Properties - Additions to the Existing Warehouse Shops @ Eisenhower Ave. East	2.82	19.44	1321.92	0.59	0.59	0.10	0.66	44.69	0.1
2007-0004 PLT 02	Aqua-Swirl* Stormwater Hydrodynamic Separator	Hoffman Properties - Additions to the Existing Warehouse Shops @ Eisenhower Ave. East	0.00	0.00	0.00	0.67	0.67	0.11	0.75	50.93	0.1
2007-0004 PLT 03	Aqua-Swirl* Stormwater Hydrodynamic Separator	Hoffman Properties - Additions to the Existing Warehouse Shops @ Eisenhower Ave. East	0.00	0.00	0.00	0.52	0.46	0.08	0.53	36.06	0.1
2007-0010 PLT 01	Vegetated Filter Strip	Episcopal High School - Proposed North Quaker Lane Entrance Renovation	0.18	1.26	85.82	0.48	0.42	0.07	0.49	33.08	0.1
2007-0016 PLT 01	StormFilter™ Stormwater Treatment System	Fort Ward Replacement Field	4.75	32.76	2227.90	2.13	1.71	1.77	12.18	828.34	0.6
2007-0101 01	Tree Box Filter	Valley Drive Traffic Calming Design	0.81	5.59	380.05	0.50	0.50	0.36	2.52	171.02	0.45
2007-0101 02	Tree Box Filter	Valley Drive Traffic Calming Design	0.00	0.00	0.00	0.50	0.50	0.36	2.52	171.02	0.45
2007-0102 01	Green Roof	Fire Station 202	0.00	0.00	0.00	0.01	0.01	0.01	0.05	3.22	0.53
2008-0018 PLT 01	StormFilter™ Stormwater Treatment System	Alexandria Firearms Training Facility	1.09	7.49	509.46	0.73	0.65	0.65	4.50	305.67	0.6
2008-0101 01	Tree Box Filter	Pegram St. & Pickett St. Sidewalk & Traffic Calming	0.35	2.41	163.56	0.26	0.20	0.16	1.08	73.60	0.45
2008-0101 02	Tree Box Filter	Pegram St. & Pickett St. Sidewalk & Traffic Calming	0.38	2.60	176.94	0.30	0.21	0.17	1.17	79.62	0.45
Totals:			362	2,497	169,810	313	189	160.00	1,104.02	75,073.26	

Appendix C

Lake Cook Technical Memorandum

**City of Alexandria, Virginia
Chesapeake Bay TMDL Action Plan
Phase I for 5% Compliance**

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Date: April 23, 2015

To: City of Alexandria
Department of Transportation and Environmental Services
2900-B Business Center Drive
Alexandria, VA 22314

From: URS Corporation
12420 Milestone Center Drive, Suite 150
Germantown, MD 20876

**RE: City of Alexandria- Lake Cook Retrofit Design
Draft Technical Memorandum- Chesapeake Bay TMDL Water Quality Credits
URS No. 15304189**

Executive Summary

The City of Alexandria has identified retrofitting existing ponds as an initial step in meeting the Chesapeake Bay Total Maximum Daily Load TMDL reductions specified in its Municipal Separate Storm Sewer System (MS4) permit. A study commissioned by the City in March 2013 identified Lake Cook as a candidate for water quality retrofits. In December 2013, the City received a Stormwater Local Assistance Fund (SLAF) Grant from the Virginia Department of Environmental Quality (VA DEQ) to help fund the conversion of Lake Cook from a recreational fishing lake to a stormwater best management practice (BMP). The purpose of this technical memorandum is to describe the proposed BMPs for Lake Cook and summarize the water quality benefits in terms of pounds of nitrogen, phosphorus, and total suspended solids that will be removed annually by Lake Cook after retrofits are made.

With the exception of treatment volume storage, proposed retrofits to Lake Cook will meet the criteria for a Level 1 Design Wet Pond, as listed in the *Virginia DEQ Stormwater Design Specification No. 14 – Wet Pond, Version 1.9*, dated March 1, 2011. The design specification can be found on the Virginia Stormwater Management BMP Clearinghouse website (<http://www.vwrrc.vt.edu/swc/>). As a retrofitted wet pond with an upflow filter, Lake Cook will remove approximately 1,610 pounds of nitrogen, 167 pounds of phosphorus, and 134,140 pounds of total suspended solids annually.

While Lake Cook is considered to be a recreational lake in its existing state, it appears on the City's BMP inventory with a credit for the treatment of 15 acres draining to it from the adjacent Animal Welfare League property and a portion of Cameron Run Regional Park. According to DEQ's Draft Revised Guidance Memo No. 14-2012, and the SLAF Program Guidelines, if an existing BMP is retrofitted, nutrient removal credit will be allowed for the differences between the reported annual pollutant removals of the BMP before retrofits were made (existing condition) and the calculated removals after

retrofitting. The existing pollutant removal rates for Lake Cook were calculated using the methods outlined in VA DEQ's Draft Revised Guidance Memo No. 14-2012 for the 15 acres draining from the Animal Welfare League property and Cameron Run Regional Park. The annual removal rates for Lake Cook in its existing condition are 23, 3, and 2,806 pounds of nitrogen, phosphorus, and total solids, respectively. Since the 15 acres the City is taking credit for treating represents less than four percent of the total watershed actually draining to Lake Cook, the City will get credit for the annual removal of approximately 1,587 pounds of nitrogen, 163 pounds of phosphorus, and 131,334 pounds of total solids after completing retrofit improvements. The methods used to calculate the existing and post-retrofit annual pollutant removal rates are discussed below as well as design criteria that will be met as part of the Lake Cook retrofit.

Other design elements such as floating wetlands were included as additional features in the feasibility study, which may be incorporated into the overall project. However, this memorandum addresses only those water quality retrofits approved for nutrient removal credit by the Virginia Stormwater Management BMP Clearinghouse.

Background

Located in the Cameron Run watershed, Lake Cook was originally constructed in the 1970s, and drains approximately 390 acres of urban land in Alexandria. Approximately 127 acres, or 33 percent, of the area draining to Lake Cook, is impervious. The lake has a surface area of approximately 3 acres, and receives stormwater inflows primarily from Strawberry Run. As part of Cameron Run Regional Park, the lake's primary use is recreational and it is regularly stocked by the Virginia Department of Game and Inland Fisheries.

Description of Proposed Retrofits

Improvements to Lake Cook include retrofitting the lake to meet the criteria for a Level 1 Wet Pond, with the exception of treatment volume storage, as outlined by [VA DEQ's Stormwater Design Specification No. 14](#), and the installation of an upflow filter. Some design elements, such as multiple storage cells meet the criteria for a Level 2 Wet Pond design. The following is a description of the required retrofits:

Treatment Volume – A treatment volume of approximately 14.8 acre-feet is required for a Level 1 design, based on the Virginia Runoff Reduction Methodology spreadsheets. This treatment volume may consist of storage entirely below the normal pool elevation, or a combination of extended detention storage above the normal pool elevation plus the storage volume below the normal pool elevation. Because Lake Cook is located within a

Federal Emergency Management Agency (FEMA) regulated floodplain, URS recommends that extended detention storage not be used to achieve the required treatment volume, and that treatment volume storage be contained below the normal pool elevation. Due to site constraints and conditions within the existing pond, the City believes that providing a storage volume of 14.8 acre-feet below the normal pool elevation is not feasible. The City would like to propose creating a storage volume that correlates to a runoff treatment depth of 1 inch over the impervious area within the Lake Cook watershed. With approximately 127.5 impervious acres in the watershed, that volume is approximately 10.6 acre-feet.

Single Pond Cell – Currently, storage in the lake is provided within a single area. The proposed design calls for a two-cell design. Multiple pond cells meet the criteria for a Level 2 Wet Pond design.

Sediment Forebay – A significant amount of accumulated sediment can be seen in aerial photographs at the mouth of Strawberry Run. Two sediment forebays will be incorporated into the proposed design. Each pond cell will have a separate sediment forebay.

Aquatic Benches – Aquatic benches will be provided according to the Level 1 Design criteria. The location of the benches is yet to be determined.

Upflow Filter – Additional water quality improvements will be provided by the construction of an upflow filter. While not a requirement for a Level 1 Design, it will provide additional water quality benefits within the lake.

The proposed upflow filter design does not meet the Virginia Stormwater Management BMP Clearinghouse criteria and has not been approved by VA DEQ as a water quality BMP; therefore, the City will not get any additional nutrient removal credit.

The use of an upflow filter meeting the Virginia Stormwater Management BMP Clearinghouse criteria would provide an additional 40-percent reduction in phosphorus. When applied to the remaining phosphorus load untreated by the wet pond itself, an additional 65 pounds of phosphorus could be removed annually.

Nutrient Removal Credit for Design Retrofits.



In order to calculate the pounds of nutrients removed by Lake Cook after retrofits are completed, the pollutant loads of nitrogen, phosphorus, and total suspended solids generated by the Lake Cook watershed were calculated first. The pollutant loading rates for the three pollutants were taken from Table 2b: *Calculation Sheet for Estimating Existing Source Loads for the Potomac River Basin*, found in Alexandria's 2013-2018 MS4 permit for Regulated Urban Impervious and Regulated Urban Pervious land uses. The pollutant loading rates for forested land were taken from Table III.1 *Forested loading rates by basin*: from DEQ's Draft Revised Guidance Memo 14-2012. Table 1 shows the land use acres served by Lake Cook, the pollutant loads for each nutrient by land use, and the total pollutant loads generated by the Lake Cook watershed.

Table 1. Lake Cook Watershed Pollutant Loads

Land Use	Pollutant	Total Acres Served	Loading Rate (lbs/ac/yr)	Pollutant Load (lbs/yr)	Total Load (lbs/yr)
Regulated Urban Impervious	Nitrogen	127.54	16.86	2,150.32	4,599.20
Regulated Urban Pervious	Nitrogen	221.51	10.07	2,230.61	
Forest	Nitrogen	41.26	5.29	218.27	
Regulated Urban Impervious	Phosphorus	127.54	1.62	206.61	302.80
Regulated Urban Pervious	Phosphorus	221.51	0.41	90.82	
Forest	Phosphorus	41.26	0.13	5.36	
Regulated Urban Impervious	Total Suspended Solids	127.54	1,171.32	149,390.15	191,628.70
Regulated Urban Pervious	Total Suspended Solids	221.51	175.80	38,941.46	
Forest	Total Suspended Solids	41.26	79.91	3,297.09	

Because the proposed wet pond design does not strictly meet all of the Virginia Stormwater BMP Clearinghouse standards for a Level 1 Wet Pond, the Clearinghouse removal efficiencies, strictly speaking, cannot be used to calculate the annual pollutant removals for the pond. Virginia DEQ’s Draft Revised Guidance Memo No. 14-2012 (dated March 19, 2015) states that the Chesapeake Bay Program Retrofit Curves should be used to determine pollutant removal efficiencies when a BMP cannot meet the Virginia Stormwater BMP Clearinghouse criteria. Based on a treatment depth of 1 inch over the impervious acres in the Lake Cook watershed, the Chesapeake Bay Program Retrofit Curves give removal efficiencies of 35% for nitrogen, 55% for phosphorus and 70% for sediment for Stormwater Treatment Practices (ST) such as wet ponds. Table 2 shows the annual pollutant removal rates based on the Lake Cook watershed pollutant loads and nutrient removal efficiencies from the Bay Program Retrofit Curves (without the benefit of an approved upflow filter). The City would like to use the removal efficiencies from Bay Program Retrofit Curves to calculate the nutrient reduction credit

for the proposed retrofit design for three reasons. First, recent correspondence with DEQ confirmed that the Bay Program Retrofit curves must be used to calculate nutrient reduction efficiencies for BMPs that do not meet the BMP Clearinghouse criteria, and given a lack of other methods to compute efficiencies, permittees may use those efficiencies calculated by the curves. Secondly, the proposed retrofit design meets all other criteria for a Level 1 Wet Pond design, and even meets the criteria for a Level 2 Wet Pond design by providing multiple cells, each having its own sediment forebay.

Thirdly, the proposed retrofit design still provides storage for a runoff treatment depth of 1 inch over the impervious acreage within the watershed.

Table 2. Annual Nutrient Removal by Lake Cook After Retrofitting

Pollutant	Annual Pollutant Load Input from Watershed (lbs/yr)	Removal Efficiency (%)	Annual Pollutant Removal (lbs/yr)
Nitrogen	4,599.20	35	1,609.72
Phosphorus	302.80	55	166.54
Total Suspended Solids	191,628.70	70	134,140.09

The conversion of Lake Cook to a Level 1 Design Wet Pond through retrofitting will result in the removal of approximately 1,610 pounds of nitrogen, 167 pounds of phosphorus, and 134,140 pounds of total suspended solids.

Existing BMP Nutrient Removal

Per DEQ’s Draft Revised Guidance Memo No. 14-2012 and the SLAF Program Guidelines, pollutant removal rates for an existing BMP must be calculated and subtracted from the removal rates for the BMP after upgrades and retrofitting are complete. In the case of Lake Cook, the nutrient removal provided by the lake in its existing state was calculated for the 15-acre Animal Welfare League that drains to the lake, which is the reported acreage serviced by Lake Cook in the City’s BMP inventory. Since the lake does not meet the Virginia Stormwater Management BMP Clearinghouse standards for a wet pond in its existing state, the Chesapeake Bay Program BMP removal efficiencies for a wet pond (nitrogen – 20 percent, phosphorus – 45 percent, and total suspended solids – 60 percent) were used as a starting point for the calculations, per Example V.D.2 in the Draft Revised Guidance Memo 14-2012.

Due to the age of the lake and the lack of original design criteria, downward modifications were made to the Chesapeake Bay Program’s removal efficiencies. Specifically, 10-percent reductions in efficiency were taken for age since the lake was constructed in the 1970s. The age of the lake combined with the lack of a sediment forebay and the lack of aquatic benches resulted in a total downward reduction of 30 percent. The resulting pollutant removal efficiencies used for calculating the existing pollutant removal rates are: 14 percent, 31.5 percent, and 42 percent for nitrogen, phosphorus, and sediment, respectively.

Tables 3 and 4 show the existing pollutant loads and the pollutant removal rates credited to Lake Cook for treatment of the 15-acre Animal Welfare League site. The pollutant

loads were based on 4.44 acres of urban impervious, 6.64 acres of urban pervious, and 3.92 acres of forested land.

Table 3. Existing Pollutant Loads from the Animal Welfare League/Cameron Run Regional Park

Land Use	Pollutant	Total Acres Served	Loading Rate (lbs/ac/yr)	Pollutant Load (lbs/yr)	Total Load (lbs/yr)
Regulated Urban Impervious	Nitrogen	4.44	16.86	74.86	162.46
Regulated Urban Pervious	Nitrogen	6.64	10.07	66.86	
Forest	Nitrogen	3.92	5.29	20.74	
Regulated Urban Impervious	Phosphorus	4.44	1.62	7.19	10.42
Regulated Urban Pervious	Phosphorus	6.64	0.41	2.72	
Forest	Phosphorus	3.92	0.13	0.51	
Regulated Urban Impervious	Total Suspended Solids	4.44	1,171.32	5,200.66	6,681.22
Regulated Urban Pervious	Total Suspended Solids	6.64	175.80	1,167.31	
Forest	Total Suspended Solids	3.92	79.91	313.25	

Table 4. Pollutant Removals for Existing Lake Cook

Pollutant	Annual Pollutant Load Input from Watershed (lbs/yr)	Removal Efficiency (%)	Annual Pollutant Removal (lbs/yr)
Nitrogen	162.46	14	22.74
Phosphorus	10.42	31.5	3.28
Total Suspended Solids	6,681.22	42	2,806.11

Based on the differences between the annual pollutant removal rates calculated for Lake Cook as an existing BMP treating 15 acres of the Lake Cook watershed (as reported by

the City) and the pollutant removal rates that will be provided by the new water quality retrofits, the City of Alexandria should be allowed to take credit for an incremental increase of 1,587 pounds of nitrogen, 163 pounds of phosphorus, and 131,334 pounds of total suspended solids towards meeting its Chesapeake TMDL reductions. Table 5 summarizes the existing and future pollutant removals, and incremental increase in nutrient removal credit.

Table 5. Existing, Future, and Incremental Pollutant Load Reductions

Pollutant	Existing Annual Pollutant Load Reductions (lbs/yr)	Annual Pollutant Removal Rates After Retrofitting (lbs/yr)	Incremental Difference Between Annual Pollutant Removal Rates (lbs/yr)
Nitrogen	22.74	1,609.72	1,586.97
Phosphorus	3.28	166.54	163.25
Total Suspended Solids	2,806.11	134,140.09	131,334

Appendix D

Four Mile Run Stream Restoration Technical Memorandum

City of Alexandria, Virginia
Chesapeake Bay TMDL Action Plan
Phase I for 5% Compliance

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Technical Memorandum

To: City of Alexandria

From: Brian Finerfrock, Eliana Rios
Rummel, Klepper & Kahl, LLP

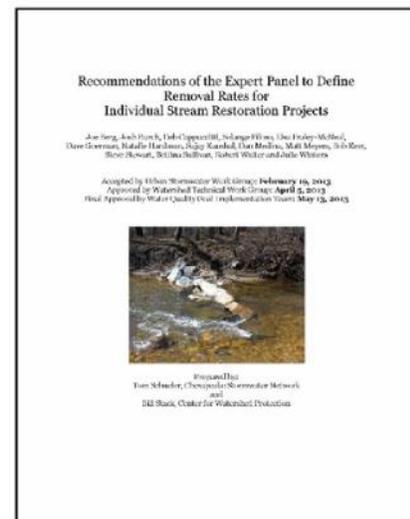
Date: September 11, 2014

Subject: Four Mile Run Stream Restoration – Tidal Wetland Pollutant Removal – Protocol 3

The following memorandum documents the use of the “Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects” prepared by Tom Schueler (Chesapeake Stormwater Network) and Bill Stack (Center for Watershed Protection) to determine the pollutant removal amount for the proposed tidal wetland restoration site associated with the Four Mile Run Tidal Restoration project.

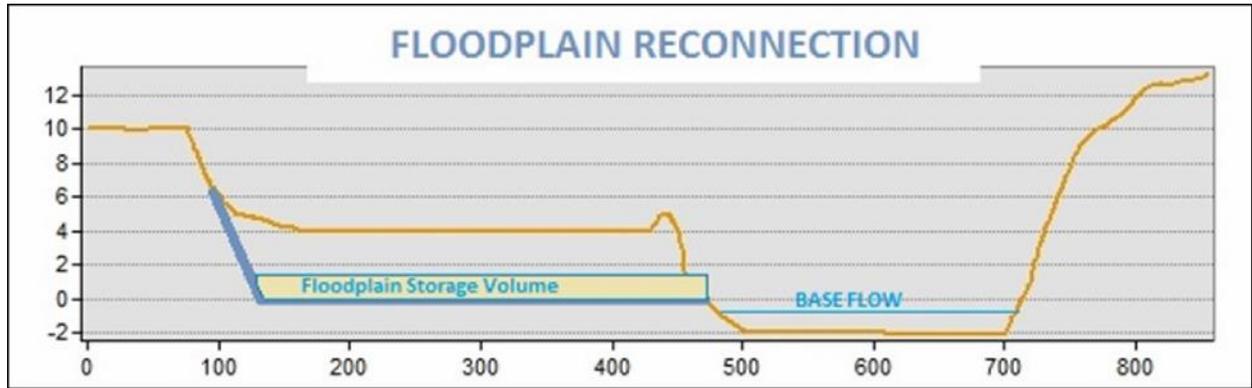
Introduction

The tidal wetland restoration site will be assessed using Protocol 3-Credit for Floodplain Reconnection Volume. The intent of this protocol is to provide mass sediment and nutrient reduction credit for projects which provide a reconnection of stream channels to their flood plains over a wide range of storm events. This criteria matches the intended function of the proposed wetland by providing a floodplain connection to the main channel (Four Mile Run). It should be noted that the Virginia Runoff Reduction Methodology Standard Constructed Wetland, is not an appropriate assessment of the pollutant removal conditions of the proposed wetland because the Constructed Wetland design and function relies on the long term storage of water over a wetland vegetation which is a function of a stand riser. Whereas the pollutant removal capability of the proposed wetland will be a function of the sediment deposition, plant pollutant uptake, denitrification, and other biological and physical processes.



METHOD AND QUALIFYING CONDITIONS

The applicable mass sediment and nutrient reduction credit is limited to the volume of water, up to 1 foot, captured by the wetland (floodplain reconnection).



A few criteria are required to be evaluated to determine applicability:

1. Is the project primarily designed to protect public infrastructure by bank armoring or riprap?- NO
2. Is the stream reach greater than 100 feet in length and still actively enlarging or grading in response to upstream development or adjustment to previous disturbances in the watershed? Yes
3. Does the project utilize a comprehensive approach to the stream/wetland restoration design? Yes
4. Will the project comply with state and federal permitting?- Yes
5. Are activities being proposed in a high function portion of the urban stream corridor?- No

Site Conditions

The proposed wetland is a tidally influenced wetland, located in the Four Mile Run Park, in the City of Alexandria. The proposed wetland is planned to be 2 acres in size, with a design intended to minimize phragmite colonization.

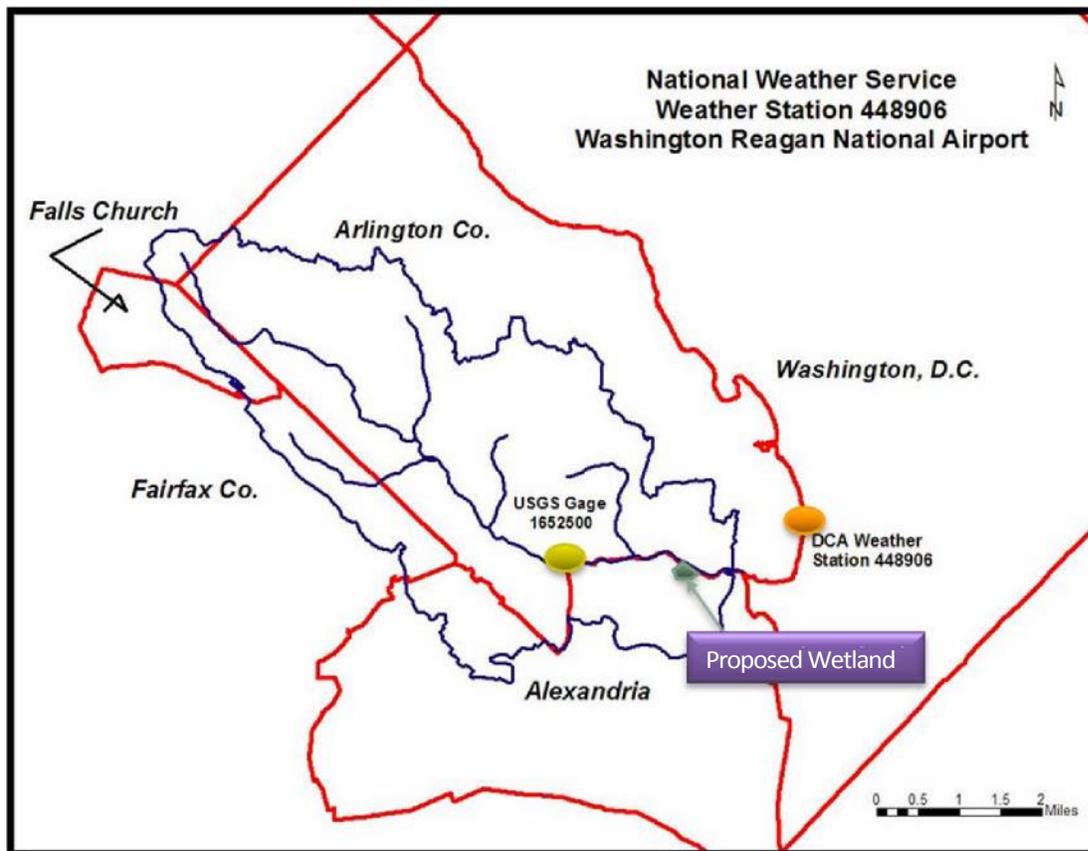


Site Computations:

Step 1: Estimate Floodplain Connection Volume

The proposed wetland is tidally influenced, therefore there is a baseflow condition. For pollutant removal efficiencies we determined which portion of the 1-inch storm event (Water Quality Volume event) will be available to the wetland for potential treatment. We determined the full range of 1-inch watershed inches if available to the wetland for potential treatment.

It should be noted that determination of the use of 1-inch storm events for purposes of treatment volume for the runoff reduction methodology was based an analysis of rainfall data at Reagan National Airport, which is very close to the project site and applicable for use in determining rainfall-runoff



characteristics of Four Mile Run.

Step 2: Estimate Phosphorus, Nitrogen and Total Suspended Solids (TSS) Removal Rate Available to Floodplain Reconnection

Under the guidance of the protocols, the maximum removal efficiency for wetland/floodplain reconnection is 30%. Based on the available volume in the proposed wetland with a maximum depth of 1.0 feet, we conclude that for treatment purposes, storm events up to the 0.5 inch storm event with a floodplain storage volume (watershed inches) of 1-inch, will allow for our wetland to achieve a

Tidal Wetland Pollutant Removal- Protocol 3

phosphorus (P), nitrogen (N) and total suspended solids (TSS) removal efficiency of 10%, 6.8% and 6.8% respectively.

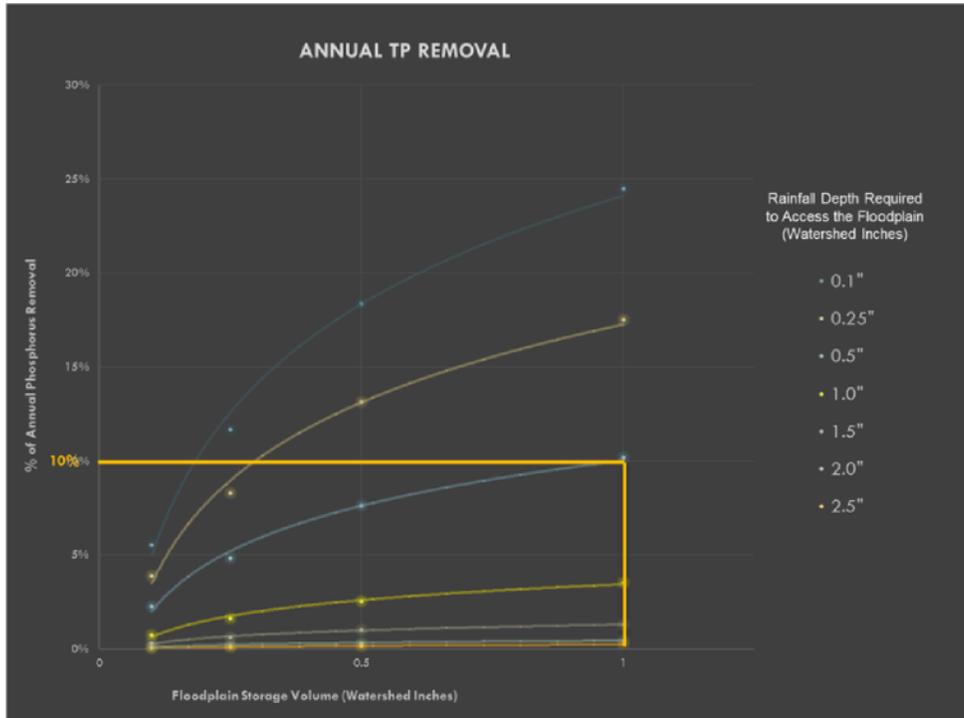
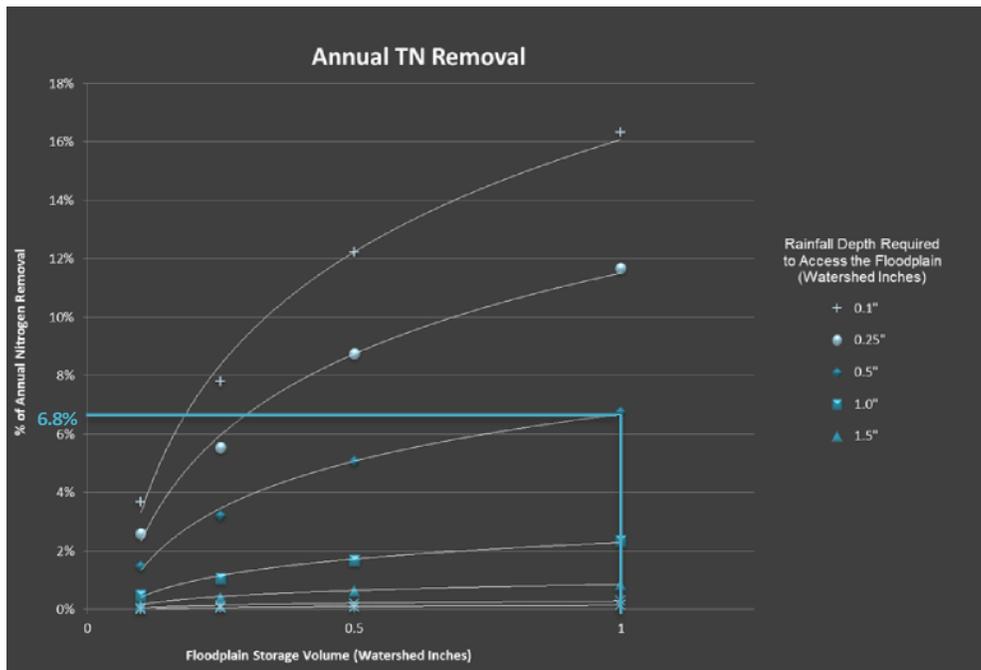


Figure 1-Annual Total Phosphorus (TN) removal as a function of floodplain storage volume for several rainfall thresholds that allow runoff to access the floodplain.



Tidal Wetland Pollutant Removal- Protocol 3

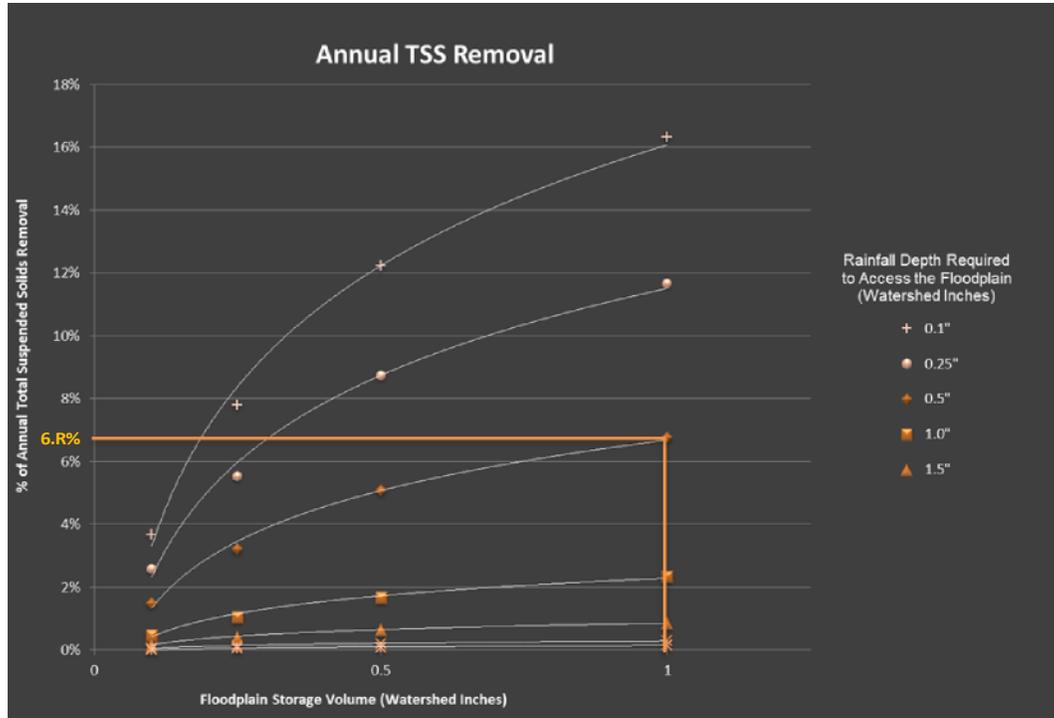
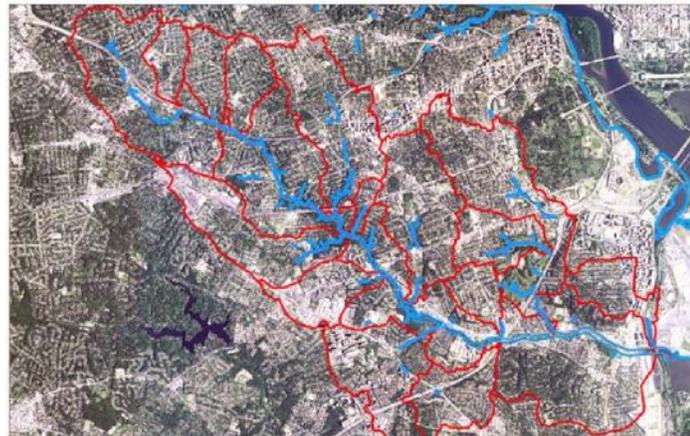


Figure 3-Annual Total Suspended Solids (TSS) removal as a function of floodplain storage volume for several rainfall thresholds that allow runoff to access the floodplain

Step 3: Compute Annual Phosphorus, Nitrogen and Total Suspended Solids Load

Our analysis performed a watershed analysis of the watershed to determine the potential phosphorus loading for Four Mile Run. Four Mile Run watershed drainage area to the wetland is approximately 10,560 acres, comprised of a highly urbanized watershed, with 10% B soils and 90% D soils in average.



Our analysis utilized two methodologies of determining the potential phosphorus and nitrogen loads: Virginia Runoff Reduction

Methodologies and Chesapeake Bay Watershed Model projections (CBWM). The later methodology was also used for computing TSS loads. Using these two methods, the results for phosphorus and nitrogen loads were comparable:

- **Runoff Reduction Methodology:** 21,074 lbs/yr for Phosphorus and 150,759 lbs/yr for Nitrogen.
- **Chesapeake Bay Watershed Model (CBWM):** 21,648 lbs/yr (using 2.21 lbs/acre/yr of impervious cover & 0.6 lbs/acre/yr for pervious cover) for Phosphorus, 142,879 lbs/yr (using 13.9 lbs/acre/yr of impervious cover & 10.2 lbs/acre/yr for pervious cover) for Nitrogen and

Tidal Wetland Pollutant Removal- Protocol 3

11,355,168 lb/yr (using 1,175 lbs/acre/yr of impervious cover & 178 lbs/acre/yr for pervious cover)for Total Suspended Solids.

Due to the wide acceptance of Runoff Reduction, we chose to utilize the Runoff Reduction Methodology Loadings: 21,074 lbs/yr for Phosphorus and 150,759 lbs/yr for Nitrogen. As only one methodology was evaluated for Total Suspended Solid the Chesapeake Bay model loadings will be utilized: *11,355,168 lb/yr.*

Step 4: Compute Annual Pollutant Reduction Credit

From step 2, we determined the wetland will have a phosphorus removal rate of approximately 10%. With an estimated pollutant loading of 21,074 lbs/year the total potential phosphorus removal would be 2,107.4 lbs/year. But, due to the wetland area being less than 1% of the watershed area, we cannot take full credit for the load reduction, but rather a portion of the removal (0.019%), this yields a phosphorus credit of **40.0 lbs/year of removal.**

Again, from step 2, we determined the wetland will have a nitrogen removal rate of approximately 6.8%. With an estimated pollutant loading of 150,759 lbs/year the total potential nitrogen removal would be 10,252 lbs/year. But, due to the wetland area being less than 1% of the watershed area, we cannot take full credit for the load reduction, but rather a portion of the removal (0.019%), this yields a nitrogen credit of **194.8 lbs/year of removal.**

Lastly, from step 2, we determined the wetland will have a Total Suspended Solids (TSS) removal rate of approximately 6.8%. With an estimated pollutant loading of 11,355,168 lbs/year the total potential TSS removal would be 784,933 lbs/year. But, due to the wetland area being less than 1% of the watershed area, we cannot take full credit for the load reduction, but rather a portion of the removal (0.019%), this yields a TSS credit of **14,914 lbs/year of removal.**

Tidal Wetland Pollutant Removal- Protocol 3

Appendix A:

**Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration
Projects (May 2013)**



**DEPARTMENT OF TRANSPORTATION
AND ENVIRONMENTAL SERVICES**

**P.O. Box 178 - City Hall
Alexandria, Virginia 22313
703-746-4025
www.alexandriava.gov**

December 14, 2015

Via Email: kelsey.brooks@deq.virginia.gov

Kelsey Brooks
MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219

RE: City of Alexandria Response to DEQ Additional Information Request: MS4 VAR040057
Chesapeake Bay TMDL 5% Action Plan

Ms. Brooks:

The City received the electronic correspondence entitled “VAR040057 Chesapeake Bay TMDL Action Plan – Additional Info Request” on November 30, 2015 in response to the City’s June 30, 2015 “Chesapeake Bay TMDL Action Plan for 5% Compliance” submitted to the Virginia Department of Environmental Quality (DEQ) on October 1, 2015 in compliance with the MS4 permit. The responses below are provided to address the additional information and/or clarifications requested to aid in review of the submitted action plan and will be considered as an addendum to the action plan.

Your request is provided in italics below in its entirety, along with the City’s responses in non-italics.

Hi Jesse,

The Chesapeake Bay TMDL Action Plan for the City of Alexandria is currently under review. However, the following supplemental and/or clarifying information is necessary before the review of the Action Plan can be completed:

- 1. **Current Program and Legal Authority** – Please provide an affirmative statement that the permittee has sufficient legal authorities in place to meet the requirements of the TMDL.*

Response: Please note that Section 2 of the action plan contains detailed information illustrating the City’s ability to meet the requirements of the TMDL. The City affirms that it has sufficient legal authorities in place to meet the requirements of the TMDL.

- 2. **Service Area Delineation** – Please provide additional information on the method the permittee used to verify the forested acres that were excluded from the service area are greater than or equal to 900m² contiguous and are otherwise undeveloped.*

Response: The City took a conservative approach to forested acres in delineating the MS4 service area. Forested areas located in Resource Protection Areas that are undeveloped and/or greater than 900 square meters were excluded. Forested areas draining to a regulated outfall that are not associated with an undeveloped RPA were considered as pervious, regardless of size.

3. ***Gordon Recycling Limited Liability Corporation*** – *Our records indicate this facility is no longer active. The permittee should not exclude the lands draining from this site from its service area. Please revise the loading calculations appropriately.*

Response: This property was previously not included in the service area and loading calculations due to the active VPDES permit and that the property does not drain to the delineated service area. In the absence of an active permit, the property continues to be excluded from the service area and loading calculations since it is not within the delineated service area.

4. **Historical BMPs** – Please provide the list of Historical BMPs that are being submitted for credit towards the TMDL. The list should include the following for each BMP:
1. The date the BMP was installed
 2. The BMP type
 3. The method that was used to determine the BMP efficiency for each POC
 4. The BMP efficiency for each POC
 5. The reductions for each POC

Response: Historical BMP data was included in Appendix B of the Chesapeake Bay TMDL Action Plan dated June 30, 2015 that included #2 (VA Clearinghouse name), #4 (TP only) and #5 above. The table did not contain the date installed since it was given that the BMPs presented were indeed installed between January 1, 2006 and June 30, 2009. The table has been revised to include the requested information. 2006 – 2009 BMPs are presented here in Attachment 1A, and 2009 – 2014 BMP credits (see below for offsets) are presented in Attachment 1B

5. ***Lake Cook*** – *Please clarify if the lake is being expanded – it is unclear from the information provided how the lake is treating 15 acres in its present condition, but will treat 390 acres once it is upgraded.*

Response: Lake Cook is a fishing pond created prior to 1992 that was not built for water quality and quantity purposes and does not conform to any standard. As such, the pond provides no water quality benefit. The 15 acres assigned to the pond is associated with a water park that was constructed on City property. The Lake Cook Retrofit Project was awarded a Stormwater Local Assistance Fund (SLAF) grant in FY2014, and includes the installation of a sediment forebay, aquatic bench and capture volume to treat approximately 390 acres to the 1” water quality standard.

6. ***Eisenhower Pond 19*** – *The method the permittee used to determine the efficiencies used to determine the reductions for this pond is unclear from the information provided. Please provide the following information:*

1. *The project’s required reductions (total acres, percent impervious)*
2. *The pond’s total reductions*
3. *The RD value that was used to determine the BMP’s efficiencies*
4. *The date the BMP was implemented.*

In addition the TSS value provided in the description does not appear to match the value for TSS provided in Table 15. Please verify which value is correct.

Response: This regional wet pond implemented in “Eisenhower Block 19” treats additional acreage than required to meet the project’s water quality requirements. The project is currently under construction (Site Plan DSP2012-00028) by a private developer and slated for completion Spring 2016, so the date of installation requested per #4 is not yet applicable. City staff negotiated with the developer to provide reductions beyond those required for the development project. The following provides project information:

- The RD value is 0.40” based on $RD = (1.81 \text{ ac-ft.})(12) / 53.68 \text{ Ia}$, using the Bay Curves for a Stormwater Treatment (ST) practice since this is a wet pond.
- Bay Curve efficiencies: TP = 38%, TN = 22.5%, TSS = 45%
- Pond drains a total of 67.1 acres (53.68 impervious aces)
- Project considered new development with 0% impervious existing and about 50% proposed. (see lines #3 and #4 below)
- Reductions required to meet the 16% land cover condition was calculated by subtracting #5 from #3.
- Total reductions in #2 minus the required reductions for the project #6 (old technical criteria requirements and offset to 16%) equals the additional credits in #7 beyond those required by the development and credited towards Bay TMDL reductions.

The following table provides the requested information summarized for Pond 19.

		Total Area (ac)	Ia (ac)	TP (lbs/yr)	TN (lbs/yr)	TSS (lbs/yr)
1.	Total Drainage Area	67.1	53.68	117.80	812.83	55272.12
2.	Total Reductions Provided (TP=38%, TN=22.5%, TSS=45%)			44.8	182.9	24,872.5
3.	Development Site Post Conditions	2.88	1.45	3.30	22.80	1550.11
4.	Existing Site Conditions	2.88	0	0.33	2.27	154.05
5.	16% Land Cover Condition	2.88	0.46	1.27	8.78	596.94
6.	Total Required Reductions to Meet 16% Land cover			2.03	14.02	953.17
7.	Additional Credits Reductions (#2 - #6)			42.7	168.9	23,919.3

7. **Cameron Station Pond** – Similarly to the Lake Cook project it is unclear to the Department why the pond is treating 94 acres prior to the ponds upgrade and 248.1 acres after the ponds upgrade if the facility’s footprint is not increasing. Please provide additional information concerning the change in the pond’s drainage area.

Response: The Cameron Station Pond was originally designed in the 1990’s as a Level 1 pond to the ½” standard for the Cameron Station project, which drained approximately 100 acres from the project and an additional 119.4 acres draining to the pond, equaling a total of 219.4 acres draining to the pond in this configuration. The proposed retrofit will enhance the pond to a Level 2 design standard, which will include increasing the size of the forebay, create two cells, and enhance the aquatic bench. Additionally, the project includes diverting an additional 33ac to the pond for treatment.

As stated in the action plan, this project will not likely be constructed before June 30, 2018 and were not included in summarized strategies to comply with the 5% target reductions of the current MS4 permit cycle. The information in the action plan was based on an outdated approach. The table below presents current information on this retrofit.

Cameron Pond Specification (Note: Proposed conditions includes 33- acres of offsite area to be treated)	TP (lbs/yr)	TN (lbs/yr)	TSS (lbs/yr)
Existing Level I Wet Pond, collects 137.3 acres impervious and 82.1 acres turf (total 219 acres)	169	727	79,294.8
Proposed Level II Wet Pond, which will collect 160.9 acres impervious and 91.9 acres turf (total 252.8 acres)	296	1,129	138,833.2
Water Quality Treatment Achieved through this Retrofit (Proposed minus Existing Conditions)	127	402	59,588.4

8. **Section 8.5** – Please provide the following information for each BMP summarized in Table 12:
1. The date the BMP was installed
 2. The BMP type
 3. The BMP efficiency for each POC

Please note the values in Table 12 do not appear to match the values in Table 15. Please verify which of the reported values are correct.

Response: The Table in question is related to the Retrofits on City Property that have already been implemented towards the target reductions. The requested information is included in Attachment 2. The revised Table 15 is provided below.

9. **Four Mile Run Stream Restoration** – Please note that it is not appropriate to apply the stream restoration protocols to streams that are tidally influenced. Based on the information provided in this section, it does not appear that the application of Protocol 3 is appropriate.

Response: The Four Mile Run Stream Restoration is a floodplain reconnection project that closely aligns with the goals of the Expert Panel’s protocol 3 for floodplain reconnection. This project meets all of the basic qualifying criteria and protocol-specific criteria set forth in the Expert Panel report. The tidal limit for Four Mile Run is approximately at the Mount Vernon Bridge, which is only about 500 feet upstream of this project. Because the primary goal of the project was floodplain reconnection and the project meets all of the basic and protocol specific qualifying conditions, we believe that protocol 3 does apply to this stream restoration project.

10. **Aggregate Method Applications** – Please note that the calculations the permittee provided in Table 7 do not appear to match the method provided in Guidance Memo 15-2005. The permittee should also take in to account the change in pervious acres when applying the aggregate accounting method. Please revise the provided calculations.

Response: The revised information is provided in Attachment 3.

11. **Grandfathered Projects** – Please provide the list of grandfathered projects summarized in Table 8. Also, please provide the same information as requested in comment 3 for the BMPs that were included in Table 8.

Response: The list of Grandfathered BMP Credits is proved in Attachment 4A and Grandfather Project Offsets is provided in Attachment 4B.

12. **Public Comment Period** – This process should have been completed prior to the Action Plan submittal. If the permittee has posted the plan and solicited comments, please let us know. If not, this process should be undertaken as soon as possible.

Response: The City provided for a public comment period on the draft Action Plan prior to finalizing on June 30, 2015. The below provides additional information on the process:

- A public notice was placed in the Alexandria Times/Gazette inviting the public to learn about and comment on the draft by attending the May 18, 2015 Environmental Policy Commission (EPC) Public Meeting.
- A presentation based on this draft will be provided during the May 18, 2015 EPC Public Meeting, inviting the EPC and members of the community to comment on the draft.
- Solicitation of public comment by posting the draft action plan on the City website with contact information for receipt of comment.
- Solicitation of public comment through posting in the June 5, 2015 City Manager's Report on the City's website online.
- Public comment period was picked up by AlexandriaNews.org (a very well-read online news source) and circulated on June 5, 2015 email alert and online posting.
- Finally, the Final action plan was placed on the City Council docket for September 8, 2015; where the recommendation to submit the June 30, 2015 action plan to DEQ was passed by consensus.

Please provide the above information no later than **December 14, 2015**. If there is information in the Action Plan that explains these issues that has been overlooked, please let me know.

Thanks for this opportunity to provide clarifying information for the action plan to facilitate your review. As presented in the action plan and here in this response to your request, the 5% goal of the action plan – including 2009-2014 offsets and grandfathered projects – is nearly achieved through credits from Post-2009 BMPs from redevelopment. Factoring in the reductions for 2006-2009 Historical BMPs exceeds the requirement by nearly 200%. Based on the above clarifications, the following table (revised from Table 15 in the action plan) summarizes the City's requirements and reductions:

Reduction Strategies	N (lbs)	100% Goal ²	P (lbs)	100% Goal ²	TSS (lbs/yr)	100% Goal ²
2006-2009 BMPs	1305.10	17.2	158.00	15.48	150,452.00	8.69
Post-2009 BMPs	110.24	1.5	14.88	4.44	17,051.59	4.59
Regional Facilities – Lake Cook	1586.97	20.9	163.25	15.79	131,334.00	15.2
Regional Facilities – Pond 19	168.90	2.2	42.70	1.52	23,919.30	1.35
Retrofits on City Property	17.57	0.2	2.67	1.48	2,804.69	0.12
Urban Stream Restoration – Four Mile Run	194.80	2.6	40.00	3.87	14,914.00	1.73
Total Proposed Reductions	3364.54	44.5	280.10	42.58	273,612.33	31.68
<i>Total Required Reductions (3 permit cycles)</i>	<i>7,597.00</i>	<i>100%</i>	<i>1,004.40</i>	<i>100%</i>	<i>861,936.64</i>	<i>100%</i>

1. Assumes all grandfathered projects to be offset this permit cycle.
2. 100% goal is based on L2 scoping.

Please note that the City will provide annual compliance reporting on the implementation of strategies to meet the City’s Bay TMDL targets per the requirements of the MS4 general permit and DEQ’s Guidance. Please feel free to contact me at jesse.maines@alexandriava.gov or 703-746-4643 should you have any additional questions.

Sincerely,



Jesse E. Maines, MPA, CPESC
Watershed Management Planner
Transportation and Environmental Services
Stormwater & Sanitary Infrastructure Division

Cc: William J. Skrabak, Deputy Director, T&ES Infrastructure and Environment
Lalit K. Sharma, PE, Division Chief, T&ES, Stormwater & Sanitary Infrastructure Division
Brian Rahal, PE, T&ES, S&SI, Stormwater Section Lead

Attachments: Attachment 1A – 2006-2009 Historical BMPs
Attachment 1B – 2009-2014 BMP credits
Attachment 2 – City Property Retrofits
Attachment 3 – Aggregate Accounting 2009-2014 Offsets
Attachment 4A – Grandfathered BMP Credits
Attachment 4B – Grandfathered Required Offsets

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
1995-0019 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	4/13/2006	1.65	0.95	1.83	23.07	1,236	60%	40%	80%	1.10	9.23	988.65	Chesapeake Bay Program
1995-0019 02	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	4/13/2006	1.05	0.86	1.47	16.41	1,041	60%	40%	80%	0.88	6.57	832.59	Chesapeake Bay Program
1998-0015 01	Stormceptor® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	1/3/2007	5.40	0.93	3.34	60.69	1,875	20%	13%	50%	0.67	7.72	937.58	VA BMP Clearinghouse-MTD
1998-0015 02	Vegetated Buffer	Vegetated Open Channels C/D soils, no underdrain	Vegetated Buffer	1/3/2007	0.95	0.05	0.45	9.91	217	10%	10%	50%	0.05	0.99	108.39	Chesapeake Bay Program
2000-0009 01	Bioretention Filter	Bioretention C/D soils, underdrain	Bioretention Filter	1/17/2007	2.11	1.69	2.91	32.71	2,051	45%	25%	55%	1.31	8.18	1128.26	Chesapeake Bay Program
2001-0003 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	7/11/2008	1.15	1.15	1.86	19.39	1,347	60%	40%	80%	1.12	7.76	1077.61	Chesapeake Bay Program
2001-0003 02	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	7/11/2008	1.20	1.20	1.94	20.23	1,406	60%	40%	80%	1.17	8.09	1124.47	Chesapeake Bay Program
2001-0014 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	5/22/2008	1.00	1.00	1.62	16.86	1,171	45%	29%	80%	0.73	4.83	937.06	VA BMP Clearinghouse-MTD
2001-0014 03	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	5/4/2007	1.11	0.78	1.40	16.49	970	45%	29%	80%	0.63	4.72	776.14	VA BMP Clearinghouse-MTD
2001-0014-A 01	Regional Wet Pond	Wet Ponds and Wetlands	Regional Wet Pond	5/28/2008	225.00	133.00	253.18	3168.82	171,959	45%	30%	60%	113.93	946.73	102758.87	Retrofit Curves
2002-0001 01	Stormceptor® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	8/19/2008	1.05	0.83	1.43	16.21	1,011	20%	13%	50%	0.29	2.06	505.44	VA BMP Clearinghouse-MTD
2002-0022 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	6/27/2007	2.02	1.37	2.49	29.64	1,719	45%	29%	80%	1.12	8.49	1375.18	VA BMP Clearinghouse-MTD
2002-0048 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	1/5/2009	1.06	0.42	0.94	13.49	599	20%	13%	50%	0.19	1.72	299.74	VA BMP Clearinghouse-MTD
2002-0048 02	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	1/5/2009	1.24	0.67	1.31	17.00	880	20%	13%	50%	0.26	2.16	440.01	VA BMP Clearinghouse-MTD
2003-0010 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	3/4/2008	0.96	0.96	1.56	16.20	1,126	60%	40%	80%	0.93	6.48	900.51	Chesapeake Bay Program
2003-0016 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	9/19/2008	0.28	0.19	0.34	4.11	238	45%	29%	80%	0.16	1.18	190.70	VA BMP Clearinghouse-MTD
2003-0016 02	Green Roof	NOT APPLICABLE	Green Roof	9/25/2008	0.07	0.07	0.11	1.10	76	53%	45%	56%	0.06	0.49	42.64	Retrofit Curves
2003-0035 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	9/8/2006	1.56	0.99	1.84	22.43	1,260	45%	29%	80%	0.83	6.43	1007.85	VA BMP Clearinghouse-MTD
2003-0039 01	Dry Vault Sand Filter	Filtering Practices	Dry Vault Sand Filter	3/6/2006	0.81	0.81	1.31	13.66	949	60%	40%	80%	0.79	5.46	759.02	Chesapeake Bay Program
2003-0041 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	10/16/2006	1.32	1.22	2.01	21.55	1,443	60%	40%	80%	1.21	8.62	1154.09	Chesapeake Bay Program
2003-0042 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/8/2009	1.20	0.12	0.64	12.90	330	20%	13%	50%	0.13	1.64	165.21	VA BMP Clearinghouse-MTD
2003-0042 02	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/8/2009	0.13	0.13	0.21	2.19	152	20%	13%	50%	0.04	0.28	76.14	VA BMP Clearinghouse-MTD
2004-0014 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	9/12/2006	0.15	0.10	0.19	2.22	130	45%	29%	80%	0.08	0.64	103.92	VA BMP Clearinghouse-MTD
2004-0014 02	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	9/12/2006	0.28	0.16	0.31	3.90	208	45%	29%	80%	0.14	1.12	166.01	VA BMP Clearinghouse-MTD
2004-0019 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	8/9/2006	0.38	0.38	0.62	6.41	445	60%	40%	80%	0.37	2.56	356.08	Chesapeake Bay Program
2004-0020 01	Delaware Sand Filter	Filtering Practices	Delaware Sand Filter	1/16/2006	0.35	0.28	0.48	5.43	340	60%	40%	80%	0.29	2.17	272.22	Chesapeake Bay Program
2004-0021 01	Delaware Sand Filter	Filtering Practices	Delaware Sand Filter	1/16/2006	0.57	0.45	0.78	8.80	548	60%	40%	80%	0.47	3.52	438.55	Chesapeake Bay Program
2004-0022 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	1/16/2006	0.75	0.62	1.06	11.76	749	60%	40%	80%	0.63	4.70	599.26	Chesapeake Bay Program
2004-0025 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	4/13/2007	1.40	1.05	1.84	21.23	1,291	60%	40%	80%	1.11	8.49	1033.13	Chesapeake Bay Program
2004-0025 02	CDS® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/13/2007	7.83	7.57	12.37	130.25	8,913	20%	13%	50%	2.47	16.57	4456.30	VA BMP Clearinghouse-MTD

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2004-0025 03	CDS® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/13/2007	1.77	1.29	2.29	26.58	1,595	20%	13%	50%	0.46	3.38	797.69	VA BMP Clearinghouse-MTD
2004-0041 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	8/8/2006	1.73	1.59	2.63	28.15	1,882	20%	13%	50%	0.53	3.58	941.16	VA BMP Clearinghouse-MTD
2005-0005 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	1/21/2008	2.99	2.82	4.64	49.26	3,333	60%	40%	80%	2.78	19.70	2666.41	Chesapeake Bay Program
2005-0011 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	10/10/2008	0.25	0.18	0.32	3.76	226	45%	29%	80%	0.15	1.08	180.90	VA BMP Clearinghouse-MTD
2005-0011 02	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	10/10/2008	0.44	0.42	0.69	7.29	497	45%	29%	80%	0.31	2.09	397.83	VA BMP Clearinghouse-MTD
2005-0015 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	2/23/2009	0.48	0.45	0.73	7.82	528	60%	40%	80%	0.44	3.13	422.15	Chesapeake Bay Program
2005-0019 PLT 01	Vegetated Filter Strip	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	8/30/2007	1.02	0.52	1.05	13.80	697	10%	10%	50%	0.10	1.38	348.49	Chesapeake Bay Program
2005-0019 PLT 02	Permeable Pavement	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	8/30/2007	0.01	0.01	0.01	0.15	11	20%	10%	55%	0.00	0.02	5.80	Chesapeake Bay Program
2005-0019 PLT 03	Permeable Pavement	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	8/30/2007	0.01	0.01	0.01	0.15	11	20%	10%	55%	0.00	0.02	5.80	Chesapeake Bay Program
2005-0020 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	1/21/2008	1.34	1.27	2.09	22.12	1,500	60%	40%	80%	1.25	8.85	1,200	Chesapeake Bay Program
2005-0028 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	2/23/2009	0.57	0.57	0.92	9.61	668	60%	40%	80%	0.55	3.84	534	Chesapeake Bay Program
2005-0810 BLD 01	Green Roof	NOT APPLICABLE	Green Roof	3/25/2006	0.15	0.15	0.24	2.53	176	53%	45%	56%	0.13	1.13	98	Retrofit Curves
2006-0009 PLT 01	Infiltration System	Infiltration Practices w/o Sand, Veg.	Infiltration System	5/12/2007	2.10	0.00	0.86	21.15	369	85%	80%	95%	0.73	16.92	351	Chesapeake Bay Program
2006-0009 PLT 02	Infiltration System	Infiltration Practices w/o Sand, Veg.	Infiltration System	5/12/2007	4.09	0.00	1.68	41.15	718	85%	80%	95%	1.42	32.92	682	Chesapeake Bay Program
2006-0018 PLT 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	10/17/2007	2.26	1.60	2.87	33.64	1,993	45%	29%	80%	1.29	9.64	1,595	VA BMP Clearinghouse-MTD
2006-0018 PLT 02	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	10/17/2007	10.18	10.18	16.49	171.63	11,924	45%	29%	80%	7.42	49.17	9,539	VA BMP Clearinghouse-MTD
2006-0018 PLT 03	Stream Buffer Restoration	Wetland Restoration: Coastal Plain Dissected Uplands Non-Tidal; Coastal Plain Dissected Uplands Tidal; Coastal Plain Lowlands Tidal; Coastal Plain Uplands Tidal; Coastal Plain Lowlands Non-Tidal; Coastal Plain Uplands Non-Tidal	Stream Buffer Restoration	10/17/2007	11.27	1.28	6.17	122.16	3,257	50%	25%	15%	3.09	30.54	489	Chesapeake Bay Program
2006-0036 PLT 01	Vortechs® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	11/13/2008	0.68	0.34	0.70	9.21	463	20%	13%	50%	0.14	1.17	231	VA BMP Clearinghouse-MTD
2006-0101 01	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	1/26/2007	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161	Chesapeake Bay Program
2006-0101 02	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	1/26/2007	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161	Chesapeake Bay Program
2006-0101 03	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	1/26/2007	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161	Chesapeake Bay Program
2007-0004 PLT 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/3/2008	0.59	0.59	0.95	9.91	689	20%	13%	50%	0.19	1.26	344	VA BMP Clearinghouse-MTD
2007-0004 PLT 02	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/3/2008	0.67	0.67	1.09	11.30	785	20%	13%	50%	0.22	1.44	392	VA BMP Clearinghouse-MTD
2007-0004 PLT 03	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/3/2008	0.52	0.46	0.77	8.35	548	20%	13%	50%	0.15	1.06	274	VA BMP Clearinghouse-MTD
2007-0010 PLT 01	Vegetated Filter Strip	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	8/8/2008	0.48	0.42	0.71	7.69	503	10%	10%	50%	0.07	0.77	251	Chesapeake Bay Program

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method	
2007-0016 PLT 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	11/20/2008	2.13	1.71	2.94	33.06	2,077	45%	29%	80%	1.32	9.47	1,661	VA BMP Clearinghouse-MTD	
2007-0101 01	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	8/16/2008	0.50	0.50	0.81	8.43	586	45%	25%	55%	0.36	2.11	322	Chesapeake Bay Program	
2007-0101 02	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	8/16/2008	0.50	0.50	0.81	8.43	586	45%	25%	55%	0.36	2.11	322	Chesapeake Bay Program	
2007-0102 01	Green Roof	NOT APPLICABLE	Green Roof	12/31/2007	0.01	0.01	0.01	0.13	9	53%	45%	56%	0.01	0.06	5	Retrofit Curves	
2008-0018 PLT 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	2/12/2009	0.73	0.65	1.09	11.76	775	45%	29%	80%	0.49	3.37	620	VA BMP Clearinghouse-MTD	
2008-0101 01	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	5/27/2009	0.26	0.20	0.35	3.98	245	45%	25%	55%	0.16	0.99	135	Chesapeake Bay Program	
2008-0101 02	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	5/27/2009	0.30	0.21	0.38	4.45	262	45%	25%	55%	0.17	1.11	144	Chesapeake Bay Program	
Totals					313	189	357.33	4,435	243,470				Totals	158.0	1,305.1	150,452	

*TN Efficiency for the Manufactured Treatment Devices was estimated from the Retrofit Curves and the VA BMP Clearinghouse TP efficiency.

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
1995-0021 01	Dry Detention Ponds & Hydrodynamic Structures	Dry Detention Ponds and Hydrodynamic Structures	Regional Dry Pond	8/19/2013	34.65	22.72	41.70	503.19	28,710	10%	5%	10%	4.17	25.16	2870.97	Chesapeake Bay Program
1998-0019 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	7/21/2009	1.84	1.66	2.76	29.80	1,976	20%	13%	50%	0.55	3.79	988.02	VA BMP Clearinghouse-MTD
1999-0018 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	3/16/2011	0.0263	0.0263	0.04	0.44	31	45%	25%	55%	0.02	0.11	16.94	Chesapeake Bay Program
2000-0028 01	Underground Sand Filter	Filtering Practices	Dry Vault Sand Filter	9/21/2009	3.392	2.942	4.95	54.13	3,525	60%	40%	80%	2.97	21.65	2820.11	Chesapeake Bay Program
2000-0028 02	Underground Sand Filter	Filtering Practices	Dry Vault Sand Filter	9/21/2009	5.813	4.842	8.24	91.41	5,842	60%	40%	80%	4.95	36.57	4673.79	Chesapeake Bay Program
2000-0028 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	9/21/2009	1.73	1.73	2.80	29.17	2,026	20%	13%	50%	0.56	3.71	1013.19	VA BMP Clearinghouse-MTD
2000-0028 04	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	9/21/2009	1.55	1.55	2.51	26.13	1,816	20%	13%	50%	0.50	3.33	907.77	VA BMP Clearinghouse-MTD
2001-0012 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	9/1/2009	0.8	0.2	0.57	9.41	340	45%	25%	55%	0.26	2.35	186.86	Chesapeake Bay Program
2001-0012 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	9/1/2009	0.2	0.06	0.15	2.42	95	45%	25%	55%	0.07	0.61	52.19	Chesapeake Bay Program
2001-0012 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	9/1/2009	0.399	0.1	0.28	4.70	170	45%	25%	55%	0.13	1.17	93.33	Chesapeake Bay Program
2001-0012 05	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	9/1/2009	0.517	0.172	0.42	6.37	262	45%	25%	55%	0.19	1.59	144.16	Chesapeake Bay Program
2001-0012 06	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	9/1/2009	0.3	0.06	0.20	3.43	112	10%	10%	50%	0.02	0.34	56.24	Chesapeake Bay Program
2001-0012 07	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	9/1/2009	0.5	0.06	0.28	5.44	148	10%	10%	50%	0.03	0.54	73.82	Chesapeake Bay Program
2001-0012 08	Vegetated Open Channels	Vegetated Open Channels C/D soils, no underdrain	Grass Swale	9/1/2009	0.2	0.09	0.19	2.63	125	10%	10%	50%	0.02	0.26	62.38	Chesapeake Bay Program
2001-0012 PLT 01	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	9/1/2009	0.36	0.16	0.34	4.71	223	10%	10%	50%	0.03	0.47	111.29	Chesapeake Bay Program
2002-0009 01	Underground Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	4/8/2011	0.23	0.23	0.37	3.88	269	60%	40%	80%	0.22	1.55	215.52	Chesapeake Bay Program
2002-0044 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	1/14/2010	1.22	0.862	1.54	18.14	1,073	20%	13%	50%	0.31	2.31	536.31	VA BMP Clearinghouse-MTD
2002-0044 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	1/14/2010	1.19	0.889	1.56	18.02	1,094	20%	13%	50%	0.31	2.29	547.11	VA BMP Clearinghouse-MTD
2002-0044 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	1/14/2010	0.755	0.503	0.92	11.02	633	20%	13%	50%	0.18	1.40	316.74	VA BMP Clearinghouse-MTD
2002-0044 04	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	1/14/2010	1	0.573	1.10	13.96	746	20%	13%	50%	0.22	1.78	373.12	VA BMP Clearinghouse-MTD
2002-0044 05	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	1/14/2010	2.898	2.512	4.23	46.24	3,010	45%	29%	80%	1.90	13.25	2408.17	VA BMP Clearinghouse-MTD
2002-0044 06	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	1/14/2010	3.19	1.489	3.11	42.23	2,043	45%	25%	55%	1.40	10.56	1123.72	Chesapeake Bay Program
2002-0044 07	Reduction of Impervious Surface	Already included in aggregate method for determining increase in impervious areas	Cistern	1/14/2010	5.892	5.892	9.55	99.34	6,901							Chesapeake Bay Program
2002-0044 08	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	1/14/2010	0.182	0.182	0.29	3.07	213	85%	80%	90%	0.25	2.45	191.86	Chesapeake Bay Program
2003-0006 01	Vegetated Open Channels	Vegetated Open Channels C/D soils, no underdrain	Grass Swale	5/20/2011	0.48	0.08	0.29	5.38	164	10%	10%	50%	0.03	0.54	82.01	Chesapeake Bay Program
2003-0007 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	6/11/2011	1.6	0.4	1.14	18.83	679	20%	13%	50%	0.23	2.40	339.74	VA BMP Clearinghouse-MTD
2003-0013 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	0.28	0.25	0.42	4.52	298	20%	13%	50%	0.08	0.57	149.05	VA BMP Clearinghouse-MTD

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2003-0013 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	0.35	0.31	0.52	5.63	370	20%	13%	50%	0.10	0.72	185.07	VA BMP Clearinghouse-MTD
2003-0013 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	1.4	0.54	1.23	17.76	784	20%	13%	50%	0.25	2.26	391.85	VA BMP Clearinghouse-MTD
2003-0019 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	6/22/2012	1.39	1.1	1.90	21.47	1,339	45%	29%	80%	0.86	6.15	1071.55	VA BMP Clearinghouse-MTD
2003-0019 02	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	6/22/2012	0.259	0.259	0.42	4.37	303	85%	80%	90%	0.36	3.49	273.03	Chesapeake Bay Program
2003-0030 01	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	2/1/2010	1.65	0.11	0.81	17.36	400	10%	10%	50%	0.08	1.74	199.79	Chesapeake Bay Program
2003-0030 02	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	2/1/2010	1.85	0.56	1.44	22.43	883	10%	10%	50%	0.14	2.24	441.36	Chesapeake Bay Program
2003-0030 03	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	2/1/2010	0.114	0.114	0.18	1.92	134	20%	10%	55%	0.04	0.19	73.44	Chesapeake Bay Program
2003-0030 04	Dry Detention Ponds & Hydrodynamic Structures	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	2/1/2010	0.68	0.14	0.45	7.80	259	10%	5%	10%	0.04	0.39	25.89	Chesapeake Bay Program
2003-0037 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	10/15/2012	1.83	0.56	1.43	22.23	879	20%	13%	50%	0.29	2.83	439.60	VA BMP Clearinghouse-MTD
2004-0010 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	11/12/2009	1.4	0.96	1.74	20.62	1,202	45%	29%	80%	0.78	5.91	961.46	VA BMP Clearinghouse-MTD
2004-0018 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	11/3/2010	1.84	1.4	2.45	28.03	1,717	45%	29%	80%	1.10	8.03	1373.76	VA BMP Clearinghouse-MTD
2004-0018 02	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	11/3/2010	0.54	0.5	0.83	8.83	593	45%	29%	80%	0.37	2.53	474.15	VA BMP Clearinghouse-MTD
2004-0032 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/18/2010	0.44	0.34	0.59	6.74	416	20%	13%	50%	0.12	0.86	207.91	VA BMP Clearinghouse-MTD
2004-0032 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	10/18/2010	0.13	0.11	0.19	2.06	132	45%	25%	55%	0.08	0.51	72.80	Chesapeake Bay Program
2004-0032 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	10/18/2010	0.17	0.15	0.25	2.73	179	45%	25%	55%	0.11	0.68	98.57	Chesapeake Bay Program
2004-0038 01	Urban stream restoration	600 ft of Stream Restoration - DSP 2007-0018	Stream Restoration	1/31/2012	2.7	0.9	2.20	33.30	1,371				40.80	45.00	26928.00	Chesapeake Bay Program
2004-0038 03	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	1/31/2012	0.104	0.104	0.17	1.75	122	20%	10%	55%	0.03	0.18	67.00	Chesapeake Bay Program
2005-0003 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/22/2009	0.83	0.76	1.26	13.52	903	20%	13%	50%	0.25	1.72	451.25	VA BMP Clearinghouse-MTD
2005-0003 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/22/2009	0.26	0.24	0.40	4.25	285	20%	13%	50%	0.08	0.54	142.32	VA BMP Clearinghouse-MTD
2005-0013 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.62	0.54	0.91	9.91	647	45%	29%	80%	0.41	2.84	517.26	VA BMP Clearinghouse-MTD
2005-0013 02	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.85	0.6	1.07	12.63	747	45%	29%	80%	0.48	3.62	597.39	VA BMP Clearinghouse-MTD
2005-0013 03	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.54	0.39	0.69	8.09	483	45%	29%	80%	0.31	2.32	386.55	VA BMP Clearinghouse-MTD
2005-0016 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/28/2009	1.46	1.17	2.01	22.65	1,421	20%	13%	50%	0.40	2.88	710.71	VA BMP Clearinghouse-MTD
2005-0018 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	12/4/2013	0.66	0.56	0.95	10.45	674	20%	13%	50%	0.19	1.33	336.76	VA BMP Clearinghouse-MTD
2005-0024 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	9/17/2009	0.9	0.7	1.22	13.82	855	20%	13%	50%	0.24	1.76	427.54	VA BMP Clearinghouse-MTD
2005-0038 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.66	2.3	3.87	42.40	2,757	20%	13%	50%	0.77	5.40	1378.66	VA BMP Clearinghouse-MTD
2005-0038 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	3.01	2.61	4.39	48.03	3,127	20%	13%	50%	0.88	6.11	1563.73	VA BMP Clearinghouse-MTD
2005-0038 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.8	2.16	3.76	42.86	2,643	20%	13%	50%	0.75	5.45	1321.28	VA BMP Clearinghouse-MTD
2005-0038 04	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	5.07	4.03	6.96	78.42	4,903	20%	13%	50%	1.39	9.98	2451.63	VA BMP Clearinghouse-MTD

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2005-0038 05	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.49	2.2	3.68	40.01	2,628	20%	13%	50%	0.74	5.09	1313.94	VA BMP Clearinghouse-MTD
2005-0038 06	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	9	7.06	12.23	138.57	8,611	20%	13%	50%	2.45	17.63	4305.29	VA BMP Clearinghouse-MTD
2005-0038 07	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	8.19	6.18	10.84	124.44	7,592	20%	13%	50%	2.17	15.84	3796.06	VA BMP Clearinghouse-MTD
2005-0038 08	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	3.22	2.75	4.65	51.10	3,304	20%	13%	50%	0.93	6.50	1651.88	VA BMP Clearinghouse-MTD
2005-0041 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	12/16/2010	1.214	1.164	1.91	20.13	1,372	45%	29%	80%	0.86	5.77	1097.77	VA BMP Clearinghouse-MTD
2006-0012 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	8/18/2009	0.69	0.62	1.03	11.16	739	20%	13%	50%	0.21	1.42	369.26	VA BMP Clearinghouse-MTD
2006-0012 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	8/18/2009	2.41	2.28	3.75	39.75	2,693	20%	13%	50%	0.75	5.06	1346.73	VA BMP Clearinghouse-MTD
2006-0019 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	StormTech® Isolator™ Row Stormwater Management System	7/8/2013	0.24	0.22	0.36	3.91	261	10%	5%	10%	0.04	0.20	26.12	Chesapeake Bay Program
2006-0023 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/11/2009	0.738	0.463	0.86	10.58	591	20%	13%	50%	0.17	1.35	295.33	VA BMP Clearinghouse-MTD
2006-0023 02	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	12/11/2009	0.244	0.244	0.40	4.11	286	85%	80%	90%	0.34	3.29	257.22	Chesapeake Bay Program
2006-0025 01	Dry Detention Ponds & Hydrodynamic Structures	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	12/1/2009	6.49	5.15	8.89	100.32	6,268	10%	5%	10%	0.89	5.02	626.79	Chesapeake Bay Program
2006-0025 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.46	0.46	0.75	7.76	539	60%	40%	80%	0.45	3.10	431.05	Chesapeake Bay Program
2006-0025 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.3	0.3	0.49	5.06	351	60%	40%	80%	0.29	2.02	281.12	Chesapeake Bay Program
2006-0025 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.35	0.35	0.57	5.90	410	60%	40%	80%	0.34	2.36	327.97	Chesapeake Bay Program
2006-0030 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	9/11/2010	1.19	1	1.70	18.77	1,205	20%	13%	50%	0.34	2.39	602.36	VA BMP Clearinghouse-MTD
2006-0031 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.285	0.224	0.39	4.39	273	45%	29%	80%	0.17	1.26	218.48	VA BMP Clearinghouse-MTD
2006-0031 02	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.315	0.248	0.43	4.86	302	45%	29%	80%	0.19	1.39	241.81	VA BMP Clearinghouse-MTD
2006-0031 03	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.197	0.155	0.27	3.04	189	45%	29%	80%	0.12	0.87	151.15	VA BMP Clearinghouse-MTD
2006-0031 04	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.226	0.178	0.31	3.48	217	45%	29%	80%	0.14	1.00	173.55	VA BMP Clearinghouse-MTD
2006-0036 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	3/22/2013	0.587	0.587	0.95	9.90	688	20%	13%	50%	0.19	1.26	343.78	VA BMP Clearinghouse-MTD
2007-0003 PLT 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	11/29/2012	0.062	0.002	0.03	0.64	13	45%	25%	55%	0.01	0.16	7.09	Chesapeake Bay Program
2007-0003 PLT 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	11/29/2012	0.35	0.35	0.57	5.90	410	20%	13%	50%	0.11	0.75	204.98	VA BMP Clearinghouse-MTD
2007-0004 01	Underground Sand Filter	Filtering Practices	Delaware Sand Filter	6/3/2013	0.859	0.45	0.90	11.71	599	60%	40%	80%	0.54	4.68	479.20	Chesapeake Bay Program
2007-0008 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	12/23/2009	0.884	0.401	0.85	11.62	555	20%	13%	50%	0.17	1.48	277.31	VA BMP Clearinghouse-MTD
2007-0011 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	6/15/2011	0.115	0.0955	0.16	1.81	115	45%	29%	80%	0.07	0.52	92.23	VA BMP Clearinghouse-MTD
2007-0011 02	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	6/15/2011	0.0164	0.0164	0.03	0.28	19	20%	10%	55%	0.01	0.03	10.57	Chesapeake Bay Program
2007-0013 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/11/2010	1.81	1.4	2.44	27.73	1,712	20%	13%	50%	0.49	3.53	855.96	VA BMP Clearinghouse-MTD
2007-0014 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/24/2012	2.21	1.59	2.83	33.05	1,971	20%	13%	50%	0.57	4.21	985.70	VA BMP Clearinghouse-MTD
2007-0014 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/24/2012	7.37	5.56	9.75	111.97	6,831	20%	13%	50%	1.95	14.25	3415.37	VA BMP Clearinghouse-MTD

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2007-0024 PLT 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	4/19/2012	0.09	0.09	0.15	1.52	105	45%	29%	80%	0.07	0.43	84.34	VA BMP Clearinghouse-MTD
2007-0025 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	4/11/2011	0.433	0.433	0.70	7.30	507	45%	29%	80%	0.32	2.09	405.75	VA BMP Clearinghouse-MTD
2007-0025 02	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	4/11/2011	0.069	0.069	0.11	1.16	81	20%	10%	55%	0.02	0.12	44.45	Chesapeake Bay Program
2007-0025 03	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	4/11/2011	0.026	0.026	0.04	0.44	30	20%	10%	55%	0.01	0.04	16.75	Chesapeake Bay Program
2007-0027 PLT 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/28/2009	0.741	0.6726	1.12	12.03	800	20%	13%	50%	0.22	1.53	399.93	VA BMP Clearinghouse-MTD
2007-0027 PLT 02	Water Quality Inlet		Oil / Grit Separator	12/28/2009	0.1	0.1	0.16	1.69	117							Chesapeake Bay Program
2007-0030 01	Underground Sand Filter	Filtering Practices	Sand Filter	6/19/2012	0.244	0.148	0.28	3.46	190	60%	40%	80%	0.17	1.38	152.19	Chesapeake Bay Program
2007-0031 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	7/19/2013	0.79	0.44	0.86	10.94	577	20%	13%	50%	0.17	1.39	288.46	VA BMP Clearinghouse-MTD
2007-0037 01	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	7/10/2013	1.44	0.12	0.74	15.32	373	10%	10%	50%	0.07	1.53	186.31	Chesapeake Bay Program
2007-0037 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.27	0.54	1.17	16.46	761	45%	25%	55%	0.53	4.11	418.47	Chesapeake Bay Program
2007-0037 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.16	0.86	1.52	17.52	1,060	45%	25%	55%	0.68	4.38	583.04	Chesapeake Bay Program
2007-0037 04	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.26	0.75	1.42	17.78	968	45%	25%	55%	0.64	4.45	532.48	Chesapeake Bay Program
2007-0037 05	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	0.95	0.68	1.21	14.18	844	45%	25%	55%	0.55	3.55	464.18	Chesapeake Bay Program
2007-0037 06	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	0.25	0.15	0.28	3.54	193	45%	25%	55%	0.13	0.88	106.30	Chesapeake Bay Program
2007-0037 07	Reduction of Impervious Surface	Already included in aggregate method for determining increase in impervious areas	Cistern	7/10/2013	0	0	0.00	0.00	0							Chesapeake Bay Program
2008-0008 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	11/27/2012	0.67	0.5624	0.96	10.57	678	20%	13%	50%	0.19	1.34	338.83	VA BMP Clearinghouse-MTD
2008-0008 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	11/27/2012	0.44	0.2827	0.52	6.35	359	20%	13%	50%	0.10	0.81	179.39	VA BMP Clearinghouse-MTD
2008-0008 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	11/27/2012	0.73	0.6996	1.15	12.10	825	20%	13%	50%	0.23	1.54	412.40	VA BMP Clearinghouse-MTD
2008-0012 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	0.73	0.68	1.12	11.97	805	20%	13%	50%	0.22	1.52	402.64	VA BMP Clearinghouse-MTD
2008-0012 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	1.1	1.1	1.78	18.55	1,288	20%	13%	50%	0.36	2.36	644.23	VA BMP Clearinghouse-MTD
2008-0012 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	1.1	1.1	1.78	18.55	1,288	20%	13%	50%	0.36	2.36	644.23	VA BMP Clearinghouse-MTD
2008-0012 04	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	3/27/2010	0.61	0.56	0.93	9.95	665	45%	29%	80%	0.42	2.85	531.78	VA BMP Clearinghouse-MTD
2008-0013 01	Filtering Practices - MTD	Filtering Practices	BayFilter™ Stormwater Filtration System	12/8/2010	1.86	1.49	2.57	28.85	1,810	50%	32%	80%	1.28	9.18	1448.25	VA BMP Clearinghouse-MTD
2008-0017 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.41	0.38	0.63	6.71	450	45%	25%	55%	0.28	1.68	247.71	Chesapeake Bay Program
2008-0017 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.58	0.395	0.72	8.52	495	45%	25%	55%	0.32	2.13	272.36	Chesapeake Bay Program
2008-0017 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.58	0.395	0.72	8.52	495	45%	25%	55%	0.32	2.13	272.36	Chesapeake Bay Program
2008-0035 PLT 01	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/Sand, Veg. C/D soils, underdrain	Permeable Pavement	2/27/2010	0.077	0.077	0.12	1.30	90	20%	20%	55%	0.02	0.26	49.61	Chesapeake Bay Program

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2008-0035 PLT 02	Dry Detention Ponds & Hydrodynamic Structures	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	2/27/2010	0.82	0.08	0.43	8.80	224	10%	5%	10%	0.04	0.44	22.38	Chesapeake Bay Program
2008-0102 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	5/9/2011	9.195	4.667	9.42	124.28	6,263	20%	13%	50%	1.88	15.82	3131.29	VA BMP Clearinghouse-MTD
2009-0003 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/3/2012	2.46	2.38	3.89	40.93	2,802	20%	13%	50%	0.78	5.21	1400.90	VA BMP Clearinghouse-MTD
2009-0003 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/3/2012	2.45	2.23	3.70	39.81	2,651	20%	13%	50%	0.74	5.07	1325.36	VA BMP Clearinghouse-MTD
2009-0006 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	9/29/2012	2.89	2.13	3.76	43.57	2,629	20%	13%	50%	0.75	5.54	1314.26	VA BMP Clearinghouse-MTD
2009-0006 02	Reduction of Impervious Surface	Already included in aggregate method for determining increase in impervious areas	Cistern	9/29/2012	0.33	0.33	0.53	5.56	387							Chesapeake Bay Program
2009-0006 03	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	9/29/2012	0.33	0.33	0.53	5.56	387	85%	80%	90%	0.45	4.45	347.88	Chesapeake Bay Program
2009-0008 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	9/15/2011	0.057	0.057	0.09	0.96	67	60%	40%	80%	0.06	0.38	53.41	Chesapeake Bay Program
2009-0008 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	9/15/2011	0.056	0.056	0.09	0.94	66	60%	40%	80%	0.05	0.38	52.48	Chesapeake Bay Program
2009-0009 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/26/2012	1.5	0.841	1.63	20.82	1,101	20%	13%	50%	0.33	2.65	550.47	VA BMP Clearinghouse-MTD
2009-0009 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.1691	0.1691	0.27	2.85	198	60%	40%	80%	0.16	1.14	158.46	Chesapeake Bay Program
2009-0009 04	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	8/11/2011	0.15	0.15	0.24	2.53	176	85%	80%	90%	0.21	2.02	158.13	Chesapeake Bay Program
2009-0009 05	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	8/11/2011	0.0146	0.0146	0.02	0.25	17	85%	80%	90%	0.02	0.20	15.39	Chesapeake Bay Program
2009-0013 01	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Buffer	7/8/2012	0.26	0.26	0.42	4.38	305	10%	10%	50%	0.04	0.44	152.27	Chesapeake Bay Program
2009-0014 GRD 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.068	0.066	0.11	1.13	78	45%	25%	55%	0.05	0.28	42.71	Chesapeake Bay Program
2009-0014 GRD 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.069	0.067	0.11	1.15	79	45%	25%	55%	0.05	0.29	43.36	Chesapeake Bay Program
2009-0014 GRD 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.052	0.046	0.08	0.84	55	45%	25%	55%	0.03	0.21	30.21	Chesapeake Bay Program
2009-0014 GRD 04	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.052	0.046	0.08	0.84	55	45%	25%	55%	0.03	0.21	30.21	Chesapeake Bay Program
2009-0101 01	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	1/24/2012	0.0142	0.0142	0.02	0.24	17	85%	80%	90%	0.02	0.19	14.97	Chesapeake Bay Program
2009-0101 02	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	1/24/2012	0.0124	0.0124	0.02	0.21	15	85%	80%	90%	0.02	0.17	13.07	Chesapeake Bay Program
2010-0001 01	Filtering Practices - MTD	Filtering Practices	BayFilter™ Stormwater Filtration System	10/31/2011	1.73	1.34	2.33	26.52	1,638	50%	32%	80%	1.17	8.44	1310.50	VA BMP Clearinghouse-MTD
2010-0005 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 05	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 06	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 07	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 08	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0135	0.0135	0.02	0.23	16	60%	40%	80%	0.01	0.09	12.65	Chesapeake Bay Program

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2010-0005 09	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0135	0.0135	0.02	0.23	16	60%	40%	80%	0.01	0.09	12.65	Chesapeake Bay Program
2010-0007 GRD 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	10/9/2009	0.8829	0.1221	0.51	9.72	277	45%	25%	55%	0.23	2.43	152.22	Chesapeake Bay Program
2010-0007 GRD 02	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	10/9/2009	0.0784	0.0784	0.13	1.32	92	85%	80%	90%	0.11	1.06	82.65	Chesapeake Bay Program
2010-0009 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0009 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0009 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0009 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0009 05	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0010 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 05	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 06	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 07	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 08	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 09	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 10	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0018 GRD 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/30/2011	0.28	0.02	0.14	2.96	69	45%	25%	55%	0.06	0.74	38.02	Chesapeake Bay Program
2010-0021 GRD 01	Urban Infiltration Practices	Infiltration Practices w/o Sand, Veg.	Infiltration System	9/7/2011	0.26	0.26	0.42	4.38	305	85%	80%	95%	0.36	3.51	289.32	Chesapeake Bay Program
2010-0023 GRD 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	7/20/2011	0.063	0.063	0.10	1.06	74	60%	40%	80%	0.06	0.42	59.03	Chesapeake Bay Program
2010-0024 GRD 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	7/20/2011	0.035	0.035	0.06	0.59	41	60%	40%	80%	0.03	0.24	32.80	Chesapeake Bay Program
2011-0003 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	11/19/2013	1.91	1.54	2.65	29.69	1,869	45%	29%	80%	1.19	8.51	1495.10	VA BMP Clearinghouse-MTD
2011-0008 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	11/14/2012	0.479	0.435	0.72	7.78	517	45%	25%	55%	0.33	1.94	284.49	Chesapeake Bay Program
2011-0008 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	11/14/2012	0.718	0.635	1.06	11.54	758	45%	25%	55%	0.48	2.89	417.11	Chesapeake Bay Program
2011-0015 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.141	0.07	0.14	1.90	94	45%	25%	55%	0.06	0.47	51.96	Chesapeake Bay Program
2011-0015 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.643	0.439	0.79	9.46	550	45%	25%	55%	0.36	2.36	302.54	Chesapeake Bay Program
2011-0015 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.277	0.213	0.37	4.24	261	45%	25%	55%	0.17	1.06	143.41	Chesapeake Bay Program
2011-0015 04	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.125	0.096	0.17	1.91	118	45%	25%	55%	0.08	0.48	64.65	Chesapeake Bay Program
2011-0015 05	Underground Sand Filter	Filtering Practices	D.C. Sand Filter	4/2/2014	0.8275	0.82	1.33	13.90	962	60%	40%	80%	0.80	5.56	769.44	Chesapeake Bay Program

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2011-0015 06	Underground Sand Filter	Filtering Practices	D.C. Sand Filter	4/2/2014	0.8275	0.82	1.33	13.90	962	60%	40%	80%	0.80	5.56	769.44	Chesapeake Bay Program
2011-0015 07	Underground Sand Filter	Filtering Practices	Delaware Sand Filter	4/2/2014	0.211	0.198	0.33	3.47	234	60%	40%	80%	0.20	1.39	187.37	Chesapeake Bay Program
2011-0020 GRD 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	5/9/2012	0.66	0.51	0.89	10.11	624	20%	13%	50%	0.18	1.29	311.87	VA BMP Clearinghouse-MTD
2011-0022 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	5/12/2014	1.868	1.548	2.64	29.32	1,869	45%	29%	80%	1.19	8.40	1495.57	VA BMP Clearinghouse-MTD
2011-0026 GRD 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	9/6/2012	1.34	1.14	1.93	21.23	1,370	20%	13%	50%	0.39	2.70	685.23	VA BMP Clearinghouse-MTD
2011-0026 GRD 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	9/6/2012	0.43	0.27	0.50	6.16	344	45%	25%	55%	0.23	1.54	189.41	Chesapeake Bay Program
2011-0026 GRD 03	Underground Sand Filter	Filtering Practices	D.C. Sand Filter	9/6/2012	2.34	2.19	3.61	38.43	2,592	60%	40%	80%	2.17	15.37	2073.25	Chesapeake Bay Program
2011-0026 GRD 04	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	9/6/2012	0.014	0.014	0.02	0.24	16	20%	10%	55%	0.00	0.02	9.02	Chesapeake Bay Program
2011-0026 GRD 05	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	9/6/2012	0.014	0.014	0.02	0.24	16	20%	10%	55%	0.00	0.02	9.02	Chesapeake Bay Program
2011-0032 GRD 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	8/1/2012	0.7575	0.0851	0.41	8.21	218	45%	25%	55%	0.19	2.05	119.84	Chesapeake Bay Program
2011-0032 GRD 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	8/1/2012	0.69	0.35	0.71	9.32	470	20%	13%	50%	0.14	1.19	234.87	VA BMP Clearinghouse-MTD
2011-0032 GRD 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	8/1/2012	0.0448	0.0448	0.07	0.76	52	60%	40%	80%	0.04	0.30	41.98	Chesapeake Bay Program
2011-0032 GRD 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	8/1/2012	0.0052	0.0052	0.01	0.09	6	60%	40%	80%	0.01	0.04	4.87	Chesapeake Bay Program
2012-0013 01 GRD	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	11/25/2013	0.126	0.126	0.20	2.12	148	45%	25%	55%	0.09	0.53	81.17	Chesapeake Bay Program
2012-0034 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.062	0.062	0.10	1.05	73	60%	40%	80%	0.06	0.42	58.10	Chesapeake Bay Program
2012-0034 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.062	0.062	0.10	1.05	73	60%	40%	80%	0.06	0.42	58.10	Chesapeake Bay Program
2012-0034 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.014	0.014	0.02	0.24	16	60%	40%	80%	0.01	0.09	13.12	Chesapeake Bay Program
2012-0034 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.047	0.047	0.08	0.79	55	60%	40%	80%	0.05	0.32	44.04	Chesapeake Bay Program
2012-0034 05	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.04	0.04	0.06	0.67	47	60%	40%	80%	0.04	0.27	37.48	Chesapeake Bay Program
2012-0034 06	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.04	0.04	0.06	0.67	47	60%	40%	80%	0.04	0.27	37.48	Chesapeake Bay Program
2012-0034 07	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	2/7/2014	9.195	4.667	9.42	124.28	6,263	45%	29%	80%	4.24	35.61	5010.06	VA BMP Clearinghouse-MTD
2012-0101 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	5/2/2012	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161.06	Chesapeake Bay Program
2012-0102 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	2.05	1.42	2.56	30.29	1,774	20%	13%	50%	0.51	3.85	887.01	VA BMP Clearinghouse-MTD
2012-0102 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	0.7	0.62	1.04	11.26	740	20%	13%	50%	0.21	1.43	370.14	VA BMP Clearinghouse-MTD
2012-0102 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	0.25	0.22	0.37	4.01	263	20%	13%	50%	0.07	0.51	131.48	VA BMP Clearinghouse-MTD
2012-0383 PRJ 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	12/15/2012	0.31	0.31	0.50	5.23	363	45%	25%	55%	0.23	1.31	199.71	Chesapeake Bay Program
2012-0383 PRJ 02	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Buffer	12/15/2012	0.46	0.46	0.75	7.76	539	10%	10%	50%	0.07	0.78	269.40	Chesapeake Bay Program
Totals					27.96	19.81	35.44	416	24,637	Totals			14.88	110.24	17,051.59	

*TN Efficiency for the Manufactured Treatment Devices was estimated from the Retrofit Curves and the VA BMP Clearinghouse TP efficiency.

Retrofits on City Property

Project	BMP ID	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method	
Fire Station #206	2012-0103 01	Filtering Practices	StormFilter™ Stormwater Treatment System	5/20/2015	0.55	0.55	0.89	9.27	644	45%	29%	80%	0.40	2.66	515.38	VA BMP Clearinghouse MTD	
Burke Library		Filtering Practices	StormFilter™ Stormwater Treatment System	5/1/2015	0.53	0.51	0.83	8.80	601	45%	29%	80%	0.38	2.52	480.71	VA BMP Clearinghouse MTD	
Burke Library		Bioretention C/D soils, underdrain	Bioretention C/D soils, underdrain	5/1/2015	0.78	0.41	0.82	10.64	545	45%	25%	55%	0.37	2.66	299.91	Chesapeake Bay Program	
Charles Barrett Elementary	2012-0104 01	Filtering Practices	StormFilter™ Stormwater Treatment System	5/20/2015	0.73	0.62	1.05	11.56	746	45%	29%	80%	0.47	3.31	596.45	VA BMP Clearinghouse MTD	
Charles Barrett Elementary	2012-0104 03	Bioretention C/D soils, underdrain	Bioretention Filter	5/20/2015	1.62	1.38	2.33	25.68	1,659	45%	25%	55%	1.05	6.42	912.24	Chesapeake Bay Program	
Totals					4.21	3.47	5.92	65.96	4,194.58				Totals	2.67	17.57	2,804.69	

*TN Efficiency for the Manufactured Treatment Devices was estimated from the Retrofit Curves and the VA BMP Clearinghouse TP efficiency.

Grandfathered Projects

Grandfathered Projects - BMP Reductions

Project	BMP ID	Chesapeake Bay Program BMP Type	BMP Name (Full)	Manufactured Treatment Device	Area Treated (ac)	Impervious Treated (ac)	TP Load [LB/YR]**	TN Load [LB/YR]**	TSS Load [LB/YR]**	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
Partial Landbay I & Partial Landbay H Multi-Family	2011-0021 01	Filtering Practices	BayFilter™ Stormwater Filtration System	TRUE	0.695	0.21	1.27	8.80	598	50%	32%	80%	0.64	2.80	478.49	VA BMP Clearinghouse MTD
Lynn House - Proposed Addition	2003-0026 01	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	1.16	0.69	1.02	7.07	481	45%	29%	80%	0.46	2.03	384.73	VA BMP Clearinghouse MTD
Lynn House - Proposed Addition	2003-0026 02	Hydrodynamic Structures	CDS® Stormwater Treatment System	TRUE	0.67	0.49	0.59	4.08	278	20%	13%	50%	0.12	0.52	138.88	VA BMP Clearinghouse MTD
Lynn House - Proposed Addition	2003-0026 03	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	FALSE	0.44	0.08	0.39	2.68	182	10%	10%	50%	0.04	0.27	91.21	Chesapeake Bay Program
Lynn House - Proposed Addition	2003-0026 04	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	FALSE	0.53	0.06	0.47	3.23	220	10%	10%	50%	0.05	0.32	109.86	Chesapeake Bay Program
Victory Center - Phase 1	2004-0037 01	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	4.49	3.44	7.72	53.28	3,623	20%	13%	50%	1.54	6.78	1811.60	VA BMP Clearinghouse MTD
5325 Polk Avenue	2005-0012 01	Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	TRUE	1.43	0.69	1.11	7.68	522	20%	13%	50%	0.22	0.98	260.99	VA BMP Clearinghouse MTD
Lindsay Lexus of Alexandria	2006-0006 01	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	1.51	1.33	2.66	18.37	1,249	45%	29%	80%	1.20	5.26	999.43	VA BMP Clearinghouse MTD
Woodmont Park Apartments	2007-0003 01	Hydrodynamic Structures	Vortechs® Stormwater Treatment System	TRUE	0.91	0.91	1.07	7.38	502	20%	13%	50%	0.21	0.94	250.95	VA BMP Clearinghouse MTD
Woodmont Park Apartments	2007-0003 02	Hydrodynamic Structures	Vortechs® Stormwater Treatment System	TRUE	0.85	0.85	1.00	6.89	469	20%	13%	50%	0.20	0.88	234.40	VA BMP Clearinghouse MTD
Woodmont Park Apartments	2007-0003 03	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	10.95	7.45	12.87	88.81	6,039	45%	29%	80%	5.79	25.44	4831.46	VA BMP Clearinghouse MTD
VEPCO - North Alexandria Electrical Substation	2007-0009 01	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	0.76	0.55	0.70	4.82	328	20%	13%	50%	0.14	0.61	163.99	VA BMP Clearinghouse MTD
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 20	2007-0017 01	Filtering Practices	Alexandria Compound Sand Filter	FALSE	0.96	0.82	1.38	9.51	647	60%	40%	80%	0.83	3.80	517.41	Chesapeake Bay Program
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 19	2007-0017 02	Filtering Practices	Alexandria Compound Sand Filter	FALSE	1.02	0.86	1.24	8.56	582	60%	40%	80%	0.74	3.42	465.45	Chesapeake Bay Program
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 19	2007-0017 03	Filtering Practices	Alexandria Compound Sand Filter	FALSE	1.86	1.55	2.26	15.60	1,061	60%	40%	80%	1.36	6.24	848.77	Chesapeake Bay Program
Hoffman Properties - Blocks 11 & 12	2009-0004 01	Filtering Practices	Dry Vault Sand Filter	FALSE	3.73	3.33	7.27	50.19	3,413	60%	40%	80%	4.36	20.07	2730.07	Chesapeake Bay Program
Hoffman Properties - Blocks 11 & 12	2009-0004 02	Bioretention C/D soils, underdrain	Bioretention Filter	FALSE	0.83	0.79	1.62	11.17	759	45%	25%	55%	0.73	2.79	417.65	Chesapeake Bay Program
Victory Center - Master Plan	2010-0011 01	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	4.43	3.83	7.22	49.83	3,388	20%	13%	50%	1.44	6.34	1694.08	VA BMP Clearinghouse MTD
Victory Center - Master Plan	2010-0011 02	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	1.03	0.88	1.68	11.58	788	20%	13%	50%	0.34	1.47	393.88	VA BMP Clearinghouse MTD
Victory Center - Master Plan	2010-0011 04	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	3.85	2.67	6.28	43.30	2,945	20%	13%	50%	1.26	5.51	1472.28	VA BMP Clearinghouse MTD
Victory Center - Master Plan	2010-0011 05	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	3.32	2.34	5.41	37.34	2,539	20%	13%	50%	1.08	4.75	1269.61	VA BMP Clearinghouse MTD
Potomac Yard Park (Pond P-2 Enlargement)	2010-0012 01	Wet Ponds and Wetlands	Wet Pond	FALSE	31.68	27.7	60.46	417.15	28,367	45%	20%	60%	27.21	83.43	17019.92	Chesapeake Bay Program
The Delaney	2011-0007 01	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	1.3378	1.3378	2.16	14.92	1,014	45%	29%	80%	0.97	4.27	811.38	VA BMP Clearinghouse MTD
The Delaney	2011-0007 02	Bioretention C/D soils, underdrain	Tree Box Filter	FALSE	0.2826	0.2584	0.46	3.15	214	45%	25%	55%	0.21	0.79	117.84	Chesapeake Bay Program
Landmark Gateway - Phase 2	2013-0005 01	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	0.83	0.73	1.33	9.21	626	45%	29%	80%	0.60	2.64	500.87	VA BMP Clearinghouse MTD
Totals					79.6	63.8	129.7	894.6	60,833.7	Totals			51.7	192.4	38,015.2	

*TN Efficiency for the Manufactured Treatment Devices was estimated from the Retrofit Curves and the VA BMP Clearinghouse TP efficiency.

**Simple Method was used

Grandfathered Projects

Grandfathered Projects - Offset Loads

Project	Project ID	Pre-Site Total Area (ac)	Pre-Site Impervious (ac)	Pre-Site Loading TP Rate (lb/ac/yr)	Post Site Total Area (ac)	Post Site Impervious (ac)	Post Site TP Loading Rate (lb/ac/yr)	TP LOAD to Offset [LB/YR]	TN Load to Offset [LB/YR]	TSS Load to Offset [LB/YR]
Partial Landbay I & Partial Landbay H Multi-Family	2011-0021	1.607	1.347	1.83	1.607	1.347	1.83	2.24	15.46	1,051
Lynn House - Proposed Addition	2003-0026	3.52	1.2	0.81	3.52	1.32	0.88	1.56	10.77	733
Victory Center - Phase 1	2004-0037	16.00	13.71	1.87	16	12.52	1.72	20.48	141.29	9,608
5325 Polk Avenue	2005-0012	2.38	0.15	0.24	2.38	0.77	0.78	0.80	5.55	377
Lindsay Lexus of Alexandria	2006-0006	1.63	1.52	2.03	1.63	1.31	1.76	2.16	14.88	1,012
Woodmont Park Apartments	2007-0003	17.69	8.06	1.05	17.69	9.15	1.18	13.01	89.77	6,105
VEPCO - North Alexandria Electrical Substation	2007-0009	1.63	0.4	0.62	1.63	0.64	0.92	0.78	5.40	367
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 20	2007-0017	2.81	1.96	1.55	2.81	1.81	1.44	2.80	19.31	1,313
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 19	2009-0004	2.85	0	0.11	2.85	1.53	1.22	2.21	15.25	1,037
Hoffman Properties - Blocks 11 & 12	2009-0004	4.27	3.79	1.94	4.27	3.82	1.95	6.45	44.49	3,025
Victory Center - Master Plan	2010-0011	16.00	13.71	1.87	16	11.82	1.63	19.04	131.38	8,934
Potomac Yard Park (Pond P-2 Enlargement)	2010-0012	31.68	13.31	0.98	31.68	27.7	1.91	46.52	320.97	21,826
The Delaney	2011-0007	2.33	2.24	2.09	2.33	1.7051	1.62	2.74	18.90	1,285
Landmark Gateway - Phase 2	2013-0005	6.32	5.99	2.06	6.32	4.6	1.61	7.38	50.92	3,463
Totals								128.2	884.4	60,137



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219

Mailing address: P.O. Box 1105, Richmond, Virginia 23218

www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

December 29, 2015

Mark B. Jinks
City Manager
City of Alexandria
301 King St., Room 3500
Alexandria, VA 22314

Transmitted electronically: mark.jinks@alexandriava.gov

RE: Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit VAR040057, City of Alexandria, Chesapeake Bay TMDL Action Plan Approval

Dear Mr. Jinks:

The Department of Environmental Quality (DEQ) has reviewed the Chesapeake Bay TMDL Action Plan received on October 1, 2015 in accordance with Section I.C of the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4). Based on this review, DEQ has determined that the items included in the Chesapeake Bay TMDL Action Plan are consistent with the permit requirements; however, additional information is required. Additional information was received on December 14, 2015.

The Chesapeake Bay TMDL Action Plan is provisionally approved and is considered an enforceable part of the MS4 Program Plan. This provisional approval is conditioned upon DEQ's receipt and review of requested revisions to the Chesapeake Bay TMDL Action Plan as communicated by DEQ staff (attached). Please submit the required revisions by January 12, 2016. After review DEQ will provide the final approval of the Chesapeake Bay TMDL Action Plan.

Thank you for your cooperation through the TMDL Action Plan review and approval process. Please contact Kelsey Brooks at (804) 698-4321 or at kelsey.brooks@deq.virginia.gov if you have any questions.

Sincerely,

A handwritten signature in black ink that reads 'Allan Brockenbrough II'.

Allan Brockenbrough II, P.E.
Manager, Office of VPDES Permits

Copies: File

Jesse Maines (Jesse.Maines@alexandriava.gov)

Bauer, Jaime (DEQ)

From: Brooks, Kelsey (DEQ)
Sent: Tuesday, December 29, 2015 1:33 PM
To: Jesse Maines
Subject: RE: VAR040057 Chesapeake Bay TMDL Action Plan - Additional Info Required

Hi Jesse,

Thank you for sending this additional information. We have a few follow up questions/comments:

1. As I mentioned in an email sent earlier today, the submission appears to be missing attachment 3. Please send that attachment.
2. We are unable to recreate the values in the summary table. If we add the reductions for each strategy provided in the table, we calculate the following values:

	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
Total Reductions	3383.58	421.5	340475.58

Please clarify whether the total proposed reductions provided in the addendum are correct or need to be updated.

If you have any questions, please let me know. Please provide this information no later than **January 12, 2016**.

Thank you,
Kelsey

From: Jesse Maines [mailto:Jesse.Maines@alexandriava.gov]
Sent: Monday, December 14, 2015 5:26 PM
To: Brooks, Kelsey (DEQ)
Cc: William Skrabak; Lalit Sharma; Brian Rahal; Joni Calmbacher; Jesse Maines
Subject: RE: VAR040057 Chesapeake Bay TMDL Action Plan - Additional Info Required

Kelsey,

Please find attached the City's response to the additional information request. Please feel free to call or email me if you have any additional questions. If I don't talk to you before, have a great holiday!

Thanks,

Jesse Maines, MPA
Watershed Management Planner
City of Alexandria
T&ES, Storm and Sanitary Infrastructure
703.746.4643 (direct)
571.414.8237 (mobile)

From: Brooks, Kelsey (DEQ) [mailto:Kelsey.Brooks@deq.virginia.gov]
Sent: Monday, November 30, 2015 11:43 AM
To: Jesse Maines
Subject: VAR040057 Chesapeake Bay TMDL Action Plan - Additional Info Required

Hello Jesse,

The Chesapeake Bay TMDL Action Plan for the City of Alexandria is currently under review. However, the following supplemental and/or clarifying information is necessary before the review of the Action Plan can be completed:

1. **Current Program and Legal Authority** – Please provide an affirmative statement that the permittee has sufficient legal authorities in place to meet the requirements of the TMDL.
2. **Service Area Delineation** – Please provide additional information on the method the permittee used to verify the forested acres that were excluded from the service area are greater than or equal to 900m² contiguous and are otherwise undeveloped.
3. **Gordon Recycling Limited Liability Corporation** – Our records indicate this facility is no longer active. The permittee should not exclude the lands draining from this site from its service area. Please revise the loading calculations appropriately.
4. **Historical BMPs** – Please provide the list of Historical BMPs that are being submitted for credit towards the TMDL. The list should include the following for each BMP:
 1. The date the BMP was installed
 2. The BMP type
 3. The method that was used to determine the BMP efficiency for each POC
 4. The BMP efficiency for each POC
 5. The reductions for each POC
5. **Lake Cook** – Please clarify if the lake is being expanded – it is unclear from the information provided how the lake is treating 15 acres in its present condition, but will treat 390 acres once it is upgraded.
6. **Eisenhower Pond 19** – The method the permittee used to determine the efficiencies used to determine the reductions for this pond is unclear from the information provided. Please provide the following information:
 1. The project's required reductions (total acres, percent impervious)
 2. The pond's total reductions
 3. The RD value that was used to determine the BMP's efficiencies
 4. The date the BMP was implemented.

In addition the TSS value provided in the description does not appear to match the value for TSS provided in Table 15. Please verify which value is correct.

7. **Cameron Station Pond** – Similarly to the Lake Cook project it is unclear to the Department why the pond is treating 94 acres prior to the ponds upgrade and 248.1 acres after the ponds upgrade if the facility's footprint is not increasing. Please provide additional information concerning the change in the pond's drainage area.
8. **Section 8.5** – Please provide the following information for each BMP summarized in Table 12:
 1. The date the BMP was installed
 2. The BMP type
 3. The BMP efficiency for each POC

Please note the values in Table 12 do not appear to match the values in Table 15. Please verify which of the reported values are correct.

9. **Four Mile Run Stream Restoration** – Please note that it is not appropriate to apply the stream restoration protocols to streams that are tidally influenced. Based on the information provided in this section, it does not appear that the application of Protocol 3 is appropriate.
10. **Aggregate Method Applications** – Please note that the calculations the permittee provided in Table 7 do not appear to match the method provided in Guidance Memo 15-2005. The permittee should also take in to account

the change in pervious acres when applying the aggregate accounting method. Please revise the provided calculations.

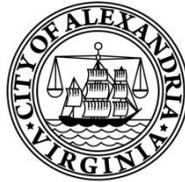
11. **Grandfathered Projects** – Please provide the list of grandfathered projects summarized in Table 8. Also, please provide the same information as requested in comment 3 for the BMPs that were included in Table 8.
12. **Public Comment Period** – This process should have been completed prior to the Action Plan submittal. If the permittee has posted the plan and solicited comments, please let us know. If not, this process should be undertaken as soon as possible.

Please provide the above information no later than **December 14, 2015**. If there is information in the Action Plan that explains these issues that has been overlooked, please let me know.

If you have any questions, please contact me at **804-698-4321** or kelsey.brooks@deq.virginia.gov.

Thank you,
Kelsey Brooks

MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219
P: (804) 698-4321
E: kelsey.brooks@deq.virginia.gov



**DEPARTMENT OF TRANSPORTATION
AND ENVIRONMENTAL SERVICES**

**P.O. Box 178 - City Hall
Alexandria, Virginia 22313
703-746-4025
www.alexandriava.gov**

January 7, 2016

Via Email: kelsey.brooks@deq.virginia.gov

Kelsey Brooks
MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219

RE: City of Alexandria Response to DEQ Additional Information Request: MS4 VAR040057
Chesapeake Bay TMDL 5% Action Plan

Ms. Brooks:

The City received an electronic letter regarding the “Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit VAR040057, City of Alexandria, Chesapeake Bay TMDL Action Plan Approval” dated December 29, 2015 and signed by Allan Brockenbrough II, P.E. This letter was in response to the City’s “Chesapeake Bay TMDL Action Plan for 5% Compliance” and the December 14, 2015 submittal of additional information based on a request from the Virginia Department of Environmental Quality (DEQ). The letter provided provisional approval of the City’s Chesapeake Bay TMDL Action Plan conditioned upon DEQ’s receipt and review of requested information, which is provided herein.

The responses below are provided to address the additional information and/or clarifications requested by DEQ staff in the December 29, 2015 provisional approval letter and will be considered as an addendum to the Action Plan. Your request is provided in italics below in its entirety, along with the City’s responses in non-italics. With this additional information and clarification, we look forward to receiving DEQ’s Final Approval of the Chesapeake Bay TMDL Action Plan.

Hi Jesse,

Thank you for sending this additional information. We have a few follow up questions/comments.

- 1. As I mentioned in an email I sent earlier today, the submission appear to be missing attachment 3. Please send the attachment.*

Response: Attachment 3 was inadvertently left off the previous response and is attached to this letter.

- 2. We are unable to recreate the values in the summary table. If we add the reductions for each strategy provided in the table, we calculate the following values:*

	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
Total Reductions	3383.58	421.5	340475.58

Please clarify whether the proposed reductions provided in the addendum are correct or need to be updated.

Response: The proposed reductions provided in the December 14, 2015 response letter needed to be updated. The table below has been updated and the values match the total proposed reductions you outlined above.

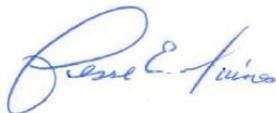
Reduction Strategies	N (lbs)	100% Goal ²	P (lbs)	100% Goal ²	TSS (lbs/yr)	100% Goal ²
2006-2009 BMPs	1305.10	17.2	158.00	15.48	150,452.00	8.69
Post-2009 BMPs	110.24	1.5	14.88	4.44	17,051.59	4.59
Regional Facilities – Lake Cook	1586.97	20.9	163.25	15.79	131,334.00	15.2
Regional Facilities – Pond 19	168.90	2.2	42.70	1.52	23,919.30	1.35
Retrofits on City Property	17.57	0.2	2.67	1.48	2,804.69	0.12
Urban Stream Restoration – Four Mile Run	194.80	2.6	40.00	3.87	14,914.00	1.73
Total Proposed Reductions	3383.58	44.5	421.50	42.58	340,475.58	31.68
<i>Total Required Reductions (3 permit cycles)</i>	<i>7,597.00</i>	<i>100%</i>	<i>1,004.40</i>	<i>100%</i>	<i>861,936.64</i>	<i>100%</i>

1. Assumes all grandfathered projects to be offset this permit cycle.
2. 100% goal is based on L2 scoping.

As noted in our December 14, 2015 response letter, the City will provide annual compliance reporting on the implementation of strategies to meet the City’s Bay TMDL targets per the requirements of the MS4 general permit and DEQ’s Guidance.

Please feel free to contact me at jesse.maines@alexandriava.gov or 703-746-4643 should you have any additional questions.

Sincerely,



Jesse E. Maines, MPA, CPESC
Watershed Management Planner
Transportation and Environmental Services
Stormwater & Sanitary Infrastructure Division

Cc: William J. Skrabak, Deputy Director, T&ES Infrastructure and Environment
Lalit K. Sharma, PE, Division Chief, T&ES, Stormwater & Sanitary Infrastructure Division
Brian Rahal, PE, T&ES, S&SI, Stormwater Section Lead

Attachment: Attachment 3 – Aggregate Accounting 2009-2014 Offsets



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

January 12, 2016

Mark B. Jinks
City Manager
City of Alexandria
301 King St.
Room 3500
Alexandria, VA 22314

Transmitted electronically: mark.jinks@alexandriava.gov

RE: Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit
VAR040057, City of Alexandria, Chesapeake Bay TMDL Action Plan Approval

Dear Mr. Jinks:

The Department of Environmental Quality (DEQ) has reviewed the Chesapeake Bay TMDL Action Plan received on October 1, 2015 in accordance with Section I.C of the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4). Additional information was received November 19, 2015 and January 7, 2016.

As submitted, the action plan will result in the following annual reduction of pollutants of concern in the Potomac River Basin:

Pollutant of Concern	Annual Load Reduction (lb/yr)	Percentage of L2 Reduction Achieved After Implementation	Percentage of New Source Reduction Achieved After Implementation
Total Nitrogen	3,383.58	44.44%	5%
Total Phosphorus	421.50	39.01%	5%
Total Suspended Solids	340,475.58	39.24%	5%

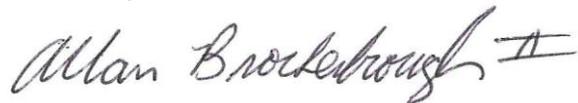
The Chesapeake Bay TMDL Action Plan is hereby approved and is an enforceable part of the MS4 Program Plan. The approved action plan is based on the 2000 Urbanized Area as designated by the U.S. Census Bureau; and reductions were calculated based on land use data from 2009. Please note that additional reductions may be required to address loads from expanded urbanized area as a result of the 2010 Census in accordance with Section II.C.5 of the MS4 General Permit.

Please note any modifications to the Chesapeake Bay TMDL Action Plan shall be made in accordance with the Program Plan Modification Section of the MS4 General Permit (Section II.F).

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty (30) days from the date you received this decision within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Virginia Department of Environmental Quality.

Please contact Kelsey Brooks at (804) 698-4321 or at kelsey.brooks@deq.virginia.gov if you have any questions.

Sincerely,



Allan Brockenbrough II, P.E.
Manager, Office of VPDES Permits

Copies: File

Jesse Maines (Jesse.Maines@alexandriava.gov)



**DEPARTMENT OF TRANSPORTATION
AND ENVIRONMENTAL SERVICES**

**P.O. Box 178 - City Hall
Alexandria, Virginia 22313
703-746-4025
www.alexandriava.gov**

February 11, 2016

Via Email: kelsey.brooks@deq.virginia.gov

Kelsey Brooks
MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219

RE: City of Alexandria Response to Calculation Table in DEQ Approval Letter: MS4 VAR040057
Chesapeake Bay TMDL 5% Action Plan

Ms. Brooks:

The City received an electronic letter regarding the “Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit VAR040057, City of Alexandria, Chesapeake Bay TMDL Action Plan Approval” dated January 12, 2016 and signed by Allan Brockenbrough II, P.E. This letter provided approval of the City’s “Chesapeake Bay TMDL Action Plan for 5% Compliance.”

We revisited the calculations related to the grandfathered projects and realized that the required pollutant reductions needed to be updated based on each project situation. The updated grandfathered calculations are attached. As a result, values for the “Percentage of L2 Reduction Achieved” also changed (see table below). This table follows the format and calculation methods that you previously provided.

Please keep in mind that the City’s requirement for projects to meet the Water Quality Volume Default (1/2” treatment over the site’s entire impervious surface) is a more stringent requirement beyond the application of the average land cover condition. Because of this, grandfathered projects achieved more reductions than would be expected if only the average land cover condition were applied.

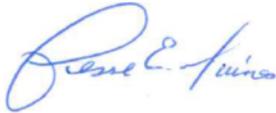
Summary - Annual Reduction of Pollutants of Concern (lb/yr)

Pollutant of Concern	Total Reductions from BMPs	Special Condition 6 Req'd Reductions - Table 3b	Total Req'd Reductions - All Cycles	Special Condition 7 New Sources Reductions	Special Condition 8 Grandfathered Reductions	BMP Removal to Meet L2	Percent of L2 Achieved
Total Nitrogen	3,383.58	379.85	7,597.03	1.63	72.79	3,309.16	43.56%
Total Phosphorus	421.50	50.22	1,004.40	0.29	-12.61	433.81	43.19%
Total Suspended Solids	340,475.58	43,096.83	861,936.64	238.92	-19,327.02	359,563.68	41.72%

As noted in our January 8, 2016 response letter, the City will provide annual compliance reporting on the implementation of strategies to meet the City's Bay TMDL targets per the requirements of the MS4 general permit and DEQ's Guidance.

I agree that the best way to proceed is with a revised approval letter with an updated calculation table. Please feel free to contact Joni Calmbacher at joni.calmbacher@alexandriava.gov or 703-746-4174 should you have any additional questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jesse E. Maines".

Jesse E. Maines, MPA, CPESC
Watershed Management Planner
Transportation and Environmental Services
Stormwater & Sanitary Infrastructure Division

Cc: William J. Skrabak, Deputy Director, T&ES Infrastructure and Environment
Lalit K. Sharma, PE, Division Chief, T&ES, Stormwater & Sanitary Infrastructure Division
Brian Rahal, PE, T&ES, S&SI, Stormwater Section Lead

Attachment: Updated Attachment 4b – Grandfathered Projects – Loads, BMP Reductions, and Net Loads

Grandfathered Projects

UPDATED Attachment 4B: Grandfathered Projects - Loads, BMP Reductions, and Net Loads

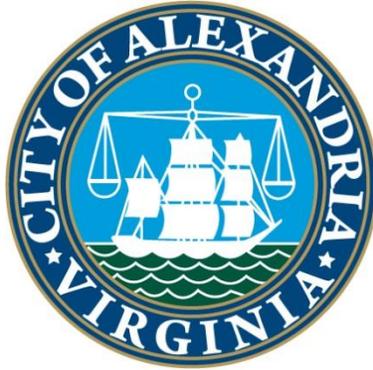
Project	Project ID	Pre-Site Total Area (ac)	Pre-Site Impervious (ac)	Pre-Site Loading TP Rate (lb/ac/yr)	Post Site Total Area (ac)	Post Site Impervious (ac)	Post Site TP Loading Rate (lb/ac/yr)	Existing % Impervious	Proposed % Impervious	Situation	TP Load to Offset [lb/yr]*	TN Load to Offset [lb/yr]*	TSS Load to Offset [lb/yr]*	TP Reduced by BMPs (lb/yr)	TN Reduced by BMPs (lb/yr)	TSS Reduced by BMPs (lb/yr)
Partial Landbay I & Partial Landbay H Multi-Family	2011-0021	1.607	1.347	1.83	1.607	1.347	1.83	84%	84%	SITUATION 3	0.29	2.03	138	0.64	2.80	478.49
Lynn House - Proposed Addition	2003-0026	3.52	1.2	0.81	3.52	1.32	0.88	34%	38%	SITUATION 1	0.25	1.70	116	0.67	3.14	724.68
Victory Center - Phase 1	2004-0037	16.00	13.71	1.87	16	12.52	1.72	86%	78%	SITUATION 3	0.55	3.82	260	1.54	6.78	1,811.60
5325 Polk Avenue	2005-0012	2.38	0.15	0.24	2.38	0.77	0.78	6%	32%	SITUATION 1	1.28	8.82	600	0.22	0.98	260.99
Lindsay Lexus of Alexandria	2006-0006	1.63	1.52	2.03	1.63	1.31	1.76	93%	80%	SITUATION 3	-0.10	-0.69	-47	1.20	5.26	999.43
Woodmont Park Apartments	2007-0003	17.69	8.06	1.05	17.69	9.15	1.18	46%	52%	SITUATION 3	3.89	26.86	1,827	6.21	27.26	5,316.81
VEPCO - North Alexandria Electrical Substation	2007-0009	1.63	0.4	0.62	1.63	0.64	0.92	25%	39%	SITUATION 1	0.49	3.40	231	0.14	0.61	163.99
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 20	2007-0017	2.81	1.96	1.55	2.81	1.81	1.44	70%	64%	SITUATION 3	0.13	0.87	59	0.83	3.80	517.41
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 19	2009-0004	2.85	0	0.11	2.85	1.53	1.22	0%	54%	SITUATION 2	2.21	15.25	1,037			
Hoffman Properties - Blocks 11 & 12	2009-0004	4.27	3.79	1.94	4.27	3.82	1.95	89%	89%	SITUATION 3	0.89	6.13	417	5.09	22.87	3,147.72
Victory Center - Master Plan	2010-0011	16.00	13.71	1.87	16	11.82	1.63	86%	74%	SITUATION 3	-0.88	-6.09	-414	4.12	18.08	4,829.86
Potomac Yard Park (Pond P-2 Enlargement)	2010-0012	31.68	13.31	0.98	31.68	27.7	1.91	42%	87%	SITUATION 3	30.19	208.31	14,165	27.21	83.43	17,019.92
The Delaney	2011-0007	2.33	2.24	2.09	2.33	1.7051	1.62	96%	73%	SITUATION 3	-0.61	-4.22	-287	1.18	5.06	929.22
Landmark Gateway - Phase 2	2013-0005	6.32	5.99	2.06	6.32	4.6	1.61	95%	73%	SITUATION 3	-1.55	-10.70	-728	0.60	2.64	500.87
Totals											37.0	255.5	17,374	49.6	182.7	36,701

Grandfathered Net Loads	-12.6	72.8	-19,327.0
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*Negative values indicate a pollutant credit

APPENDIX C. DOCUMENTS RELATED TO MCM #3, ILLICIT DISCHARGE DETECTION AND ELIMINATION

The City of Alexandria updated its *Illicit Discharge Detection and Elimination Manual* to meet the requirements in its *General Permit for Discharges from Small Municipal Separate Storm Sewer Systems* (General Permit No. VAR040057). This appendix contains the May 9, 2014 update of the IDDE manual.



**City of Alexandria, Virginia
Illicit Discharge Detection and Elimination Program**

5/09/2014

ECO-CITY  ALEXANDRIA

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Purpose

The purpose of the City of Alexandria, Virginia Illicit Discharge Detection and Elimination Program is to protect the public health, safety and welfare by reducing the discharge of pollutants from the City's Municipal Separate Storm Sewer System (MS4), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act and its attendant regulations.

Legal Authority

Legal authority regulating the discharge of materials into the stormwater system is provided by the Virginia Statewide Fire Prevention Code and the City of Alexandria, Virginia Code of Ordinances.

The Virginia Statewide Fire Prevention Code

2703.3

Hazardous materials in any quantity shall not be released into a sewer, storm drain, ditch, drainage canal, creek stream, river, lake, or tidal waterway or on the ground, sidewalk, street, highway or into the atmosphere.

Exceptions:

1. The release or emission of hazardous materials is allowed when in compliance with federal, state, or local governmental agencies, regulations, or permits.
2. The release of pesticides is allowed when used in accordance with registered label directions.
3. The release of fertilizer and soil amendments is allowed when used in accordance with manufacturer's specifications.

The Alexandria, Virginia Code of Ordinances

11-13-2

- (a) It shall be unlawful for any person to dump any waste on any property, in any waters, or in any sanitary sewer or stormwater system, except as authorized by law or by applicable permit. It shall be the burden of the alleged violator to show proof of any applicable permits.

Illicit Discharge Detection and Elimination Program Overview

The City of Alexandria, Virginia Illicit Discharge and Detection and Elimination Program provides a guideline for staff in the investigation of illicit discharges into the MS4 and local waterways.

As required by the City's MS4 permit, the City will annually screen for illicit discharges by:

1. Performing a dry weather screening risk assessment,
2. Screening a minimum of fifty priority outfalls per year, and
3. Investigating potential illicit discharges found during outfall field screening.

Staff will also respond to illicit discharge complaints filed with the City. All investigations will follow the procedures outlined in the program document.

In cases where the source and responsible party can be determined, staff will document all investigative procedures, notify the responsible party, and when deemed necessary will proceed to enforcement. Enforcement may involve issuing a court summons, a notice of violation (NOV), and/or abatement and cleanup of the illicit discharge.

All investigations will be performed in accordance with all state, federal, and local laws and regulations.

Dry Weather Screening Risk Assessment

Risk Assessment

The purpose of the risk assessment is to use mapping and other available data to determine the potential severity of illicit discharges within the City of Alexandria and to identify which outfalls merit priority investigation.

Risk assessments should be performed annually before dry weather outfall screenings begin. Areas with high illicit discharge potential will be the first areas of focus for inspection. Staff will use mapping data to visually assess areas of high illicit discharge potential based upon priority factors. A minimum of 50 outfalls per year will be inspected per the City's MS4 permit requirement.

Outfalls will be prioritized annually for dry weather field screening based on the following factors:

1. History of discharge complaints,
2. Poor dry weather water quality as determined from field screening data,
3. Type of development and zoning, and
4. Watershed TMDL(s).

Dry Weather Field Screening Procedures

Purpose

The purpose of field screening is to conduct field investigative work and involves rapid field screening of priority outfalls followed by indicator monitoring at suspect outfalls to characterize flow types and trace sources.

Procedure

Staff should be equipped with basic field mapping, outfall field screening forms, and equipment during field screening investigations. A blank outfall field screening form can be found in Appendix A and a checklist of field screening equipment can be found in Appendix B.

Field Screening Investigation

Field screening must be completed for at least 50 priority outfalls annually as identified in the risk assessment. Field screenings will be conducted using the outfall field screening form and procedures outlined in this document.

Each outfall investigation must include:

- 1) Completed outfall field screening form
- 2) Digital picture
- 3) Spray painting/marketing the outfall with the outfall ID number (where possible and safe)

The Outfall Field Screening Form

Section 1: Background Data

Facility ID:	Outfall Location:
Watershed / HUC:	Local Subwatershed:
Today's date:	Military Time:
Screening performed by:	Photo #(s):
Weather , Temp.(°F):	Time since last precipitation: Amount:
Local Land Use (Check all that apply):	
<input type="checkbox"/> Ultra-Urban Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space / Park	

Section one is used to indicate background information for each outfall. A picture of each outfall must be taken and the photo number recorded.

Rainfall data will be taken from NOAA's National Climatic Data Center using the station: FRANCONIA 1.3 SSE, VA US GHCND:US1VAFX0033. <http://www.ncdc.noaa.gov/>

Section 2-Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSION (in)	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Elliptical <input type="checkbox"/> Box <input type="checkbox"/> Other: _____	<input type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____	Diameter: _____	Water: <input type="checkbox"/> No <input type="checkbox"/> Partial <input type="checkbox"/> Fully Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partial <input type="checkbox"/> Fully
<input type="checkbox"/> Open Drainage	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____		Depth: _____ Width: _____ Top: _____ Bottom: _____	<input type="checkbox"/> No <input type="checkbox"/> Partial <input type="checkbox"/> Fully
Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, skip to Section 4)				
Flow Description	<input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial				

Section two is used to record basic information about each outfall including material, shape, size, and submergence. If flow is present, continue to section three to record data. If no flow is present, skip to section five to record data.

Section 3-Field Data for Flowing Outfalls

PARAMETER	RESULT	UNIT	EQUIPMENT USED
<input type="checkbox"/> Flow #1	Volume		
	Time to fill		
<input type="checkbox"/> Flow #2	Flow Depth		
	Flow Width		
	Measured length		
	Time of travel		
PARAMETER	RESULT	EQUIPMENT USED	ACTION LEVEL
Temperature			<input type="checkbox"/> Yes <input type="checkbox"/> No
pH			<input type="checkbox"/> Yes <input type="checkbox"/> No
Ammonia			<input type="checkbox"/> Yes <input type="checkbox"/> No
Conductivity			<input type="checkbox"/> Yes <input type="checkbox"/> No
Chlorine			<input type="checkbox"/> Yes <input type="checkbox"/> No
Other:			<input type="checkbox"/> Yes <input type="checkbox"/> No

Section three is used to record data for flowing outfalls.

Flow measurement

The first flow measurement technique records the time it takes to fill a one liter sample bottle or other container (cut out milk container marked to one liter of volume). The flow volume is determined as the volume of flow captured in the container per unit time.

The second technique measures flow rate based on velocity and cross sectional area, and is preferred for larger discharges where containers are too small to effectively capture the flow. Staff measures and marks off a fixed flow length (usually about five feet), crumbles leaves or other light material, and drops them into the discharge. Staff then measures the time it takes the material to travel across the length. The velocity of flow is computed as the length of the flow path (in feet) divided by the travel time (in seconds). Next, the cross-sectional flow area is measured by taking multiple readings (or best estimates) of the depth and width of flow. Lastly, cross-sectional area (in square feet) is multiplied by flow velocity (feet/second) to calculate the estimated flow rate (in cubic feet/second).

Indicator parameters

Temperature, pH, ammonia, conductivity, and chlorine are initially tested by using field sampling equipment including test strips and probes. If any of these parameters exceed the action level as specified in Appendix C, this is to be noted on the field screening form.

Section 4: Physical Indicators for Flowing Outfalls Only

Are Physical Indicators Present in the flow? Yes No *(If No, Skip to Section 5)*

PARAMETER	PRESENT	DESCRIPTION	SEVERITY		
Odor	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sewage <input type="checkbox"/> Sour <input type="checkbox"/> Other: <input type="checkbox"/> Sulfide <input type="checkbox"/> Gas	<input type="checkbox"/> 1-Faint	<input type="checkbox"/> 2-Moderate	<input type="checkbox"/> 3-Severe
Color	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> Yellow <input type="checkbox"/> Other:	<input type="checkbox"/> 1-Faint in sample bottle	<input type="checkbox"/> 2-Clearly visible in sample bottle	<input type="checkbox"/> 3-Clearly visible in outfall
Floatables	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sewage (toilet paper, etc.) <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> Suds <input type="checkbox"/> Other	<input type="checkbox"/> 1-Slight-no obvious origin	<input type="checkbox"/> 2-Moderate- indications of origin	<input type="checkbox"/> 3-Obvious- origin clear

Section four is only used to record data for flowing outfalls with physical indicators.

Indicator parameters

Odor- an indication of any smells from the discharge and/or outfall.

- A score of 1 is assigned when the odor is faint or when the field crew cannot agree on its presence or origin.
- A score of 2 is assigned when the odor is moderate within the discharge and/or outfall.
- A score of 3 is assigned when the odor is noticeable from a distance.

Color- the color of the discharge when a sample is taken in a clear sample bottle and held up to the light.

- A score of 1 is assigned when the color in the sample bottle is faint.
- A score of 2 is assigned when the color in the sample bottle is highly visible.
- A score of 3 is assigned when the color is visible in the outfall discharge.

Floatables- the presence of floatable materials in the outfall discharge (not including trash).

- A score of 1 is assigned when there are a few floatables with no known origin.
- A score of 2 is assigned when there are moderate floatables with indications of an origin.
- A score of 3 is assigned when there are a large number of floatables or the origin is obvious. Sewage is always designated a 3.

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? Yes No *(If No, Skip to Section 6)*

INDICATOR	PRESENT	DESCRIPTION	COMMENTS
Outfall damage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Breakage <input type="checkbox"/> Corrosion <input type="checkbox"/> Cracking/Chipping	
Deposits/Stains	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other:	
Abnormal Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited	
Poor pool quality	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Floatables <input type="checkbox"/> Oil <input type="checkbox"/> Suds <input type="checkbox"/> Algae <input type="checkbox"/> Other:	
Pipe benthic growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Brown <input type="checkbox"/> Green <input type="checkbox"/> Other:	

Section five describes physical indicators around all outfalls that can be indicators of past illicit discharges. Breakage in the outfall, deposits or stains along the outfall, an overgrowth of vegetation or inhibition of vegetation, poor pool quality, and benthic growth in the pipe are all potential indicators of past, transitory, or intermittent illicit discharges.

Section 6: Overall Outfall Illicit Discharge Characterization

<input type="checkbox"/> Unlikely	<input type="checkbox"/> Potential (2 or more indicators present)	<input type="checkbox"/> Suspect (Indicator with rank 3 severity)
<input type="checkbox"/> Obvious		

Section 7: Follow up

Follow-up needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Caulk dam needed and set?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Return for in-depth sample collection?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Laboratory sample needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Recheck for flow at different time interval?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Sections 6 and 7 evaluate flow for illicit discharge potential and outline follow up action to be performed.

After the outfall screening is complete, outfalls are to be designated by their illicit discharge potential.

1. Unlikely-shows no signs of illicit discharges. Follow-up on this outfall is low priority.
2. Potential-has two or more indicators present. Follow-up on this outfall is moderate priority. Return for in-depth sample collection and illicit discharge investigation if the discharge type cannot be determined. If the outfall is not flowing, return during different day and time intervals to determine if it is an intermittent discharge or set up a caulk dam to trap the discharge.
3. Suspect-has at least one indicator with a rank 3 severity. This outfall is a likely illicit discharge and follow-up is high priority. Return for in-depth sample collection and illicit discharge investigation if the discharge type cannot be determined. If the outfall is not flowing, return during different day and time intervals or set up a caulk dam to trap the discharge.
4. Obvious-this outfall has an obvious illicit discharge. Staff should begin immediately investigating the discharge to determine the responsible party. All suspected sanitary sewer discharges will be investigated first.

After completion of the outfall field screening, staff should also report any non-tidal submerged outfalls, outfalls that are blocked with sediment or plant material, majorly damaged outfalls, or other outfall repair needed using Cityworks.

Field screening data must then be entered into the database for record keeping and future analysis.

Illicit Discharge Investigations

Illicit discharge investigations are performed when:

1. An illicit discharge complaint has been received by the City, or
2. An illicit discharge is found during annual field screening of outfalls.

Investigation Procedure

1. Every effort will be made to coordinate efforts between the Fire Marshal's Office and Office of Environmental Quality. Whenever possible, staff from both departments should be present during illicit discharge investigations.
2. In cases of highly visible suspected illicit discharges, the Fire Marshal will issue an emergency notification through the Environmental Industrial Unit (EIU).
3. Whenever hazardous materials are suspected, notification will be made immediately to the Fire Department..
4. Upon location of a suspected illicit discharge, staff will perform a visual investigation to determine the source. If the type of discharge or suspected source cannot be determined by staff upon arrival to the site of the reported discharge, staff will perform an illicit discharge screening and/or illicit discharge tracking to determine the source.

Visual Investigation

Staff will visually inspect the suspected source area for illicit discharge indicators. These include:

1. Odor
2. Color
3. Abnormal vegetation
4. Deposits and stains
5. Floatables

In cases where the source can be determined through visual investigations, no further screening is necessary and staff may proceed to enforcement.

Sanitary Sewer Overflows

Sanitary sewer overflows will be reported as described in the City's Sanitary Sewer Overflow Response Plan Procedure TES-Maint-2012-08 which can be found in Appendix D. Suspected sanitary sewer overflows will be investigated before any other suspected illicit discharge.

Illicit Discharge Screening

If the type of illicit discharge is not known, staff may take a grab sample of the discharge and use the flow chart method and benchmark concentrations to determine the most likely type of discharge. The flow chart can be found in Appendix E. An illicit discharge screening sheet can be found in Appendix F.

Field Sampling Protocol

1. All preliminary testing is conducted in the field.

2. Determination of parameters tested will be based upon suspected discharge.
3. Make sure testing probes and sample bottles have been properly cleaned and stored.
4. During sampling use all personal protective equipment (PPE) as directed by the material safety data sheet (MSDS). Wash hands after sampling.
5. During sample collection, do not disturb any sediments or benthic growth that may contaminate or skew results.
6. Rinse sample collection device three times with sample water before collecting the sample.
7. Fill sample bottle to top without touching inside of bottle lid or rim.
8. Initiate specific test procedures immediately.
9. Compare sample test results to benchmark concentration levels.
10. Label any waste bottles immediately with all chemicals used for testing and dispose of properly.

If the discharge is determined to be an intermittent discharge, staff may use a caulk dam and/or check the suspect discharge area during varying day and time intervals.

Benchmark Concentrations

Illicit discharges may be from common household or commercial sources or industrial sources. Benchmarks for action are set according to state and federal standards.

1. When testing a suspected illicit discharge, use action levels from Appendix C.
2. Examine surrounding land use in sub-watershed; if industrial sources are present, additionally use industrial benchmarks from Appendix G.
3. If testing results exceed benchmark concentrations then the action level has been reached, staff will then begin tracking the source of the illicit discharge.

Contract Laboratory Services

If the type of discharge cannot be determined, a laboratory sample may be taken from the flow in accordance with the laboratory sampling protocol located in Appendix H. This sample will be sent to the contract lab to help determine the type of discharge.

Illicit Discharge Tracking

Once an illicit discharge is found and has been screened, if the source cannot be determined, staff may use a combination of methods to determine the source of the discharge. These include:

1. Storm drain network investigation
2. Drainage area investigation
3. Dye Testing
4. Video Testing

Storm Drain Network Investigation

When performing storm drain network investigations, staff strategically inspects manholes, inlets, and channels within the storm drain network system to measure chemical or physical indicators to isolate discharges to a specific segment of the network. Once the pipe segment has been identified additional investigations are used to find the specific discharge.

Staff must first decide how to begin the network investigation.

1. Work progressively up the trunk -this method is used in small drainage area investigations.
 - a. Begin with the manhole closest to the outfall and inspect for the illicit discharge.
 - b. Move progressively up the largest diameter pipe flowing to the outfall (the trunk) inspecting for discharges at each manhole or inlet until no discharge is present.
 - c. Isolate the discharge between two drainage structures.
 - d. Begin appropriate investigation.
2. Split the storm drain network-this method is used in large or complex drainage areas.
 - a. Review the map of the storm drain network leading to the suspect outfall.
 - b. Identify the major branches that lead to the largest diameter pipe flowing to the trunk.
 - c. Identify manholes and/or inlets to inspect at the farthest downstream node of each contributing branch and one immediately upstream.
 - d. Working up the network, investigate manholes and/or inlets on each contributing branch and trunk, until the source is narrowed to a specific section of the trunk or contributing branch.
 - e. Once the discharge is narrowed to a specific section of trunk, begin appropriate investigation.
 - f. If narrowed to a contributing branch, move up or split the branch until a specific pipe segment is isolated, and begin appropriate investigation.
3. Move down the storm drain network-this method is used in very large drainage areas with many potential sources of illicit discharge.
 - a. Begin by inspecting manholes and/or inlets at the head of the storm drain network.
 - b. Verify that each upstream branch has no contributing illicit discharges before moving down the pipe to a junction manhole or inlet.
 - c. If a discharge is found, perform appropriate investigation to determine the source of the discharge.
 - d. Verify the discharge has be fixed or removed before moving down the pipe.

Drainage Area Investigations

Drainage area investigations are used when an illicit discharge has distinct indicator characteristics that allow staff to quickly ascertain the specific industrial or commercial source of the discharge. Drainage area investigations are not to be used on suspected sewage discharges.

When performing drainage area investigations:

1. Review current GIS data for the drainage area.
2. Review current permit data for the drainage area.
3. Determine potential discharges within the drainage area.
4. Perform other types of investigations when necessary.

Dye Testing

If the illicit discharge is suspected to be from the sanitary sewer, dye testing may be conducted by introducing non-toxic dye into toilets, sinks, shop drains and other plumbing fixtures. Before beginning testing, staff should:

1. Review storm drain and sewer maps to determine lateral sewer connections and how they can be accessed;
2. Notify property owners and gain access to the property;
 - a. For commercial and industrial properties, staff will carry identification to document their legal authority to enter.
 - b. For residential properties, staff should coordinate with the owner or resident to ensure access to the property.
3. Notify emergency personnel of the days and times dye testing is being performed.
4. Verify all necessary equipment is available for use.

The following guidelines should be used for dye testing:

1. Choose the most appropriate color and type of dye for the facility. When testing multiple fixtures, it is advisable to use two different color dyes and alternate between them.
2. Select the fixtures to test.
 - a. In industrial facilities, check most floor drains.
 - b. For plumbing fixtures, check a representative fixture (i.e. a bathroom sink).
 - c. If working with multiple floors, start at the basement and work up.
 - d. Make sure to flush with plenty of water to ensure the dye moves through the system.
3. Choose the closest sanitary sewer manhole to make observations (typically a sewer lateral). If not possible, choose a downstream manhole.
4. When the dye is introduced, the staff member placing the dye calls the monitoring staff member at the manhole to inform them that the dye has been placed.
5. When the dye is observed, the staff member observing calls the staff member placing the dye to verify that the dye has entered the sanitary sewer system.
6. If dye is not observed (typically within one hour);
 - a. Check storm drains for the presence of dye;
 - b. Check for the presence of a septic system;
 - c. The sewer line may be clogged or leaking.

Video Testing

Video testing may be performed by City maintenance staff in cases where the discharge cannot be determined by other types of investigations or in cases where other testing is not practical (large residential neighborhoods).

Cases of Undetermined Sources

If within six months of beginning an investigation, the source cannot be identified:

1. The City will document all steps of the investigation.
2. If the discharge is intermittent, the City must document a minimum of three separate investigations that were made to attempt to observe flowing discharge.

3. The documentation must include:
 - a. The nature of the violation,
 - b. The date the violation was observed and reported,
 - c. The results of the investigation,
 - d. The follow up to the investigation,
 - e. The resolution of the investigation, and
 - f. The date that the investigation was closed.

Enforcement

All enforcement action relating to illicit discharges into the City's MS4 and waterways will be performed by the Fire Marshal's office.

Determination of Responsibility

The person initiating the discharge shall be responsible for all associated response and materials to remediate the discharge. If a responsible party cannot be immediately located or determined, the owner of the property is responsible for the discharge and costs of associated response and materials..

Abatement of the Discharge

Abatement and remediation of the illicit discharge and all associated damages will be performed by the responsible party. A list of contractors and environmental cleaning companies may be supplied to private property owners.

Time Frame Allowed for abatement or cleanup

The time frame allowed for abatement and remediation of the discharge will be determined by the type of abatement, the equipment and resources needed and the complexity of the incident. Upon completion of remediation of the discharge, the responsible party must submit documentation to the Fire Marshal's office that the discharge has been abated and that any required repairs have been completed. Staff will confirm removal and cleanup of the discharge on site.

General Steps for Enforcement

1. The Fire Marshal will determine if a violation exists and will determine the appropriate level of enforcement of the violation. Enforcement actions may include issuing a notice of violation or other enforcement actions as prescribed by law for the nature of the offense.
2. Educate the responsible party and initiate the appropriate enforcement action.
3. Perform a follow up inspection to confirm corrective actions have been completed properly by the deadline set by the Fire Marshal. The responsible party may complete corrective actions before the deadline and request an earlier follow up inspection.
4. If the discharge or connection has not been repaired after the time frame allowed, the Fire Marshal will determine the next level of enforcement.

Penalties

Penalties upon conviction shall be as set out in Section 27-100 of the Code of Virginia.

27-100. Violation a misdemeanor.

It shall be unlawful for any owner or any other person, firm, or corporation on or after the effective date of any Code provisions, to violate any provisions of the Fire Prevention Code. Any such violation shall be deemed a Class 1 misdemeanor, and any owner, or any

other person, firm, or corporation convicted of such violation shall be punished in accordance with the provisions of 18.2-11.

18.2-11. Punishment for conviction of misdemeanor.

The authorized punishments for conviction of a misdemeanor are:

(a) For Class 1 misdemeanors, confinement in jail for not more than twelve months and a fine of not more than \$2,500, either or both.

Abatement

The City can perform abatement of illicit discharges in the following circumstances:

1. The responsible party fails to perform the required cleanup after being issued a summons or NOV,
2. The responsible party cannot be identified, or
3. The City is the responsible party.

In cases where a summons or NOV has been issued, but the responsible party fails to clean up the site as required, the Court can order the required cleanup of the area.

When deemed necessary by the Fire Marshal, cleanup may be initiated by the fire department or by an authorized individual or firm with approval of the City Manager's Office. Costs associated with such cleanup are borne by the party responsible for the discharge.

In cases where the responsible party is unknown, if deemed necessary by the Fire Marshal, cleanup may be initiated by the fire department or by an authorized individual or firm. If a responsible party is found at a later date, costs associated with such cleanup can then be borne by the party responsible for the discharge.

Documentation

All NOVs and issued summons shall be tracked and logged in the City's database. For each notice the documentation shall specify:

- 1) The nature of the violation,
- 2) The date the violation was observed and reported,
- 3) The results of the investigation,
- 4) The follow up to the investigation,
- 5) The resolution of the investigation, and
- 6) The date that the investigation was closed.

Appendices

Appendix A-Outfall Field Screening

City of Alexandria, Virginia ***Outfall Field Screening***

Section 1: Background Data

Facility ID:		Outfall Location:	
Watershed / HUC:		Local Subwatershed:	
Today's date:		Military Time:	
Screening performed by:		Photo #(s):	
Weather , Temp.(°F):		Time since last precipitation:	Amount:
Local Land Use (Check all that apply):			
<input type="checkbox"/> Ultra-Urban Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space / Park			

Section 2-Outfall Description

LOCATION	MATERIAL	SHAPE	DIMENSION (in)	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____	Diameter: _____	Water: <input type="checkbox"/> No <input type="checkbox"/> Partial <input type="checkbox"/> Fully Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partial <input type="checkbox"/> Fully
<input type="checkbox"/> Open Drainage	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____	Depth: _____ Width: _____ Top: _____ Bottom: _____	
Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, skip to Section 4)			
Flow Description	<input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial			

Section 3-Field Data for Flowing Outfalls

PARAMETER	RESULT	UNIT	EQUIPMENT USED
<input type="checkbox"/> Flow #1	Volume		
	Time to fill		
<input type="checkbox"/> Flow #2	Flow Depth		
	Flow Width		
	Measured length		
	Time of travel		
PARAMETER	RESULT	EQUIPMENT USED	ACTION LEVEL
Temperature			<input type="checkbox"/> Yes <input type="checkbox"/> No
pH			<input type="checkbox"/> Yes <input type="checkbox"/> No
Ammonia			<input type="checkbox"/> Yes <input type="checkbox"/> No
Conductivity			<input type="checkbox"/> Yes <input type="checkbox"/> No

Chlorine			<input type="checkbox"/> Yes <input type="checkbox"/> No
Other:			<input type="checkbox"/> Yes <input type="checkbox"/> No

Section 4: Physical Indicators for Flowing Outfalls Only

Are Physical Indicators Present in the flow? Yes No *(If No, Skip to Section 5)*

PARAMETER	PRESENT	DESCRIPTION	SEVERITY		
Odor	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sewage <input type="checkbox"/> Sour <input type="checkbox"/> Other: <input type="checkbox"/> Sulfide <input type="checkbox"/> Gas	<input type="checkbox"/> 1-Faint	<input type="checkbox"/> 2-Moderate	<input type="checkbox"/> 3-Severe
Color	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> Yellow <input type="checkbox"/> Other:	<input type="checkbox"/> 1-Faint in sample bottle	<input type="checkbox"/> 2-Clearly visible in sample bottle	<input type="checkbox"/> 3-Clearly visible in outfall
Floatables	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sewage (toilet paper, etc.) <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> Suds <input type="checkbox"/> Other	<input type="checkbox"/> 1-Slight-no obvious origin	<input type="checkbox"/> 2-Moderate-indications of origin	<input type="checkbox"/> 3-Obvious-origin clear

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? Yes No *(If No, Skip to Section 6)*

INDICATOR	PRESENT	DESCRIPTION	COMMENTS
Outfall damage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Breakage <input type="checkbox"/> Corrosion <input type="checkbox"/> Cracking/Chipping	
Deposits/Stains	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other:	
Abnormal Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited	
Poor pool quality	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Floatables <input type="checkbox"/> Oil <input type="checkbox"/> Suds <input type="checkbox"/> Algae <input type="checkbox"/> Other:	
Pipe benthic growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Brown <input type="checkbox"/> Green <input type="checkbox"/> Other:	

Section 6: Overall Outfall Illicit Discharge Characterization

Unlikely Potential (2 or more indicators present) Suspect (Indicator with rank 3 severity) Obvious

Section 7: Follow up

Follow-up needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Caulk dam needed and set?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Return for in-depth sample collection?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Laboratory sample needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Recheck for flow at different time interval?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Section 8: Comments

Appendix B-Field Screening Equipment List

- Field Map(s)
- Spray Paint
- Digital Camera
- Cell phone or radio
- Emergency contact list
- Clipboard and pencil or water proof pens
- Field Screening Sheets
- First Aid Kit
- Flash Light
- Surgical Gloves
- Waders and/or Snake proof boots
- Safety Vest
- Insect repellent
- Machete/clippers (where needed)
- Sanitary wipes
- Backpack
- Clear sample bottles
- Test strips
- YSI Meter
- Safety goggles & lab coat
- Kimwipes
- Caulk
- Dipper

If laboratory sample is taken:

- Cooler with ice
- Permanent marker
- Labeling tape
- One liter plastic sampling bottles or bottles provided by laboratory for samples
- Chain of custody sheet

Appendix C-Field Screening Action Levels

Dissolved Oxygen:	< 4.0 mg/L ***
pH:	< 6.0 or > 9.0 ***
Temperature:	Nontidal waters >32°C***
Conductivity	> 400 uS/cm *
Turbidity	>50 NTU*
Ammonia	> 3 mg N/L***
Chlorine	>17 ug/L***
Detergents	> 0.25 mg/L *

* No Federal EPA or State DEQ standard.

*** See 9VAC25-260-50

Appendix D-Sanitary Sewer Overflow Reporting Procedure

TITLE	Sanitary Sewer Overflow Response Plan
PROCEDURE #	TES-Maint-2012-08

SECTION 1: PURPOSE

- 1.1 The purpose of the City of Alexandria Sanitary Sewer Overflow Response Plan (SORP) standard operating procedure is to minimize the impact of sanitary sewer overflows (SSO's) to the public and the environment. The City of Alexandria will ensure that sanitary sewer overflows are responded to in a timely manner to expedite the necessary steps to relieve the overflow. Relieving the sewage blockage and spill containment is the City's highest priority, taking in to consideration public health concerns. This response plan will be the guideline for the standard operating procedures in the event of a sanitary sewer overflow. The response plan will be reviewed periodically to ensure that all corrective measures are being taken and to determine whether periodic staff training (including refresher and/or new employee training) may be warranted.
- 1.2 The plan includes the following elements:
 - a. Section 2: Response to Notification of Spills: The City of Alexandria has adopted service call/overflow response procedures requiring immediate response to minimize or eliminate an overflow.
 - b. Section 3: Initial Spill Response: This section includes standard operating procedures that ensure the notification of first responders during normal business hours and after business hours, spill assessment and volume estimation for notification and reporting purposes.
 - c. Section 4: Service Restoration & Containment: Procedures to ensure containment, termination, maximum recovery and cleanup of spilled sewage.
 - d. Section 5: Notification: Standard practices the City uses to secure the area surrounding a spill, post warning signs as necessary and provide notification to affected City departments/divisions, other impacted agencies and the public.
 - e. Section 6: Recordkeeping and Reporting: Practices, including procedures that link field records to the City's maintenance management system, and procedures for reporting spills, as required, to appropriate regulatory agencies.

SECTION 2: RESPONSE TO NOTIFICATION OF SPILL

- 2.1 The City of Alexandria has adopted service call/emergency response procedures and after-hours processes for calls requiring immediate response to minimize or eliminate an overflow (See Attachments). The City provides (or contracts with an emergency response contractor that provides) all necessary spill response supplies. These supplies are

available for use at any time. The SOP is to aid staff in prompt and responsible SSO response.

- 2.2 When a notification of an SSO is received, it should be clearly communicated who will respond, the estimated time of arrival, and what areas will need to be accessed. The information provided by the caller should be verified before dispatching a field crew. This includes verifying the address and nearest cross street and making sure it is part of the City's conveyance system. If not, provide the caller with the phone number of the responsible agency and follow up by calling the agency and providing the details of the call.

Public Observation

- 2.3 Public observation is the most common way that the City is notified of blockages and spills. Contact information for reporting sewer spills and backups are in the phone book, City website and in many pieces of literature provided by the City. The main telephone number is (703) 746-4488; this line includes an option for 24-hour call response.
- 2.4 When a report of a sewer spill or backup is made during normal business hours, City call center staff receives the call, takes the information from the caller, and completes a Cityworks service request. For emergency sewer backups, spills or blockages, the call center staff verbally communicates (does not leave a voicemail) appropriate information to the Sewers Superintendent or designee along with any information collected from other field reports. The Superintendent then notifies the City's Sewer Inspector and sewer response team, which responds to the incident as soon as possible.

Staff Observation

- 2.5 City staff and contractors perform periodic maintenance work on its sewer system facilities. Any problems noted with the sewer system facilities are reported to the Superintendent who, in turn, responds to emergency situations.

SECTION 3: INITIAL SPILL RESPONSE

- 3.1 All sewer system calls require a response to the reported location of the event in an attempt to minimize or eliminate an overflow. The first responder (Sewer Inspector during normal business hours or City Standby staff during after-hours) must respond to the reporting party or site of the problem and initiate response activities within 60 minutes after initial reporting of the spill to the City. If a responder cannot be at the spill location within 60 minutes after the spill, then the responder must notify the Sewers Superintendent who will dispatch other available staff or emergency contractors.
- 3.2 The first responder should determine appropriate response measures based on the circumstances and information provided by the caller (e.g. weather and traffic conditions, small backup vs. sewage flowing on the ground, etc.). If additional help is needed, contact other employees, contractors, and/or equipment suppliers. Based on available information, the first responder should determine if a combination sewer cleaning truck and/or a spill response vehicle is needed.

3.3 Upon arrival at the site, the first responder should:

- Note arrival time at spill site.
- Verify the existence of a sewer system spill or backup.
- Field verify the address and nearest cross street, making sure it is part of the City's sewer/conveyance system.
- Identify and clearly assess the affected area and extent of spill. If the spill is small (i.e. less than 50 gallons) an eyeball estimate may be made. If the spill appears large (i.e. greater than 50 gallons), staff should work with a Sewer Inspector or Sewer Superintendent to measure the volume. The shape, dimensions, and the depth of the contained wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume. In the event of a significant spill, the City Engineering Department or Office of Environmental Quality may be required to compute the spill volume using the duration or flowrate methods.
 - *To determine the volume of a large spill (i.e. larger than 50 gallons) refer to the following process:*
 - Step 1 Sketch the shape of the contained sewage (see figure above).
 - Step 2 Measure or pace off the dimensions.
 - Step 3 Measure the depth at several locations and select an average.
 - Step 4 Convert the dimensions, including depth, to feet.
 - Step 5 Calculate the area in square feet using the following formulas: Rectangle: Area = length (feet) x width (feet); Circle: Area = diameter (feet) x diameter (feet) x 0.785 or Triangle: Area = base (feet) x height (feet) x 0.5
 - Step 6 Multiply the area (square feet) times the depth (in feet) to obtain the volume in cubic feet.
 - Step 7 Multiply the volume in cubic feet by 7.5 to convert it to gallons.
- Comply with all safety precautions (traffic, confined space, etc).
- Contact caller, if time permits.
- Notify the Sewer Superintendent and Maintenance Division Chief if:
 - The spill appears to be large, in a sensitive area, or there is doubt regarding the extent, impact, or how to proceed; or
 - Additional help is needed for line cleaning or repair, containment, recovery, lab analysis, and/or site cleanup
- Begin completion of the Form 0- SSO Overflow Reporting Form

SECTION 4: SERVICE RESTORATION AND CONTAINMENT

Initial Assessment

- 4.1 Upon arrival at the location of a spill into a house or a building, the first responder should evaluate and determine if the spill was caused by a blockage in the lateral or in a City-owned sewer main, caused either by a backup in the sewer main line or nearby operations and maintenance activities.
- If a blockage is found in a property owner's lateral, it should be clearly communicated that it is not the City's responsibility to work on a private lateral.
 - If a backup in the main line is found to have caused the SSO in a house or building, the first responder should relieve the blockage in the main line and provide the resident with information on claims.

Service Restoration

- 4.2 The first responder should attempt to remove the blockage from the system and restore flow to the area. Using the appropriate cleaning tools, the field crew should set up downstream of the blockage and flush/hydroclean the sewer upstream from a clear manhole. The flows should be observed to ensure that the blockage does not recur downstream.
- 4.3 If the blockage is not relieved within the first few attempts (20 minutes), it is crucial that bypass procedures are followed immediately:
- 4.3.1 Locate the nearest downstream manhole that can accept the additional flow.
- 4.3.2 Set up a 3-inch pump for smaller collection lines, and the 6-inch pump for larger transmission lines, this should be used as a guideline, be advised that larger pumps may be needed. The pump discharge hose should be secured or placed far enough into the manhole that it will not come out during pumping. The pump and pump hose should be protected from traffic by barricades. If additional pumps are needed, they shall be rented from: Flippo Construction Company, 703.370.8778.

Containment & Clean Up

- 4.4 The first responder should attempt to contain as much of the spilled sewage as possible using the following steps:
- Determine the immediate destination of the overflowing sewage
 - Plug storm drains using available equipment and materials to contain the spill, wherever appropriate. If spilled sewage has made contact with the storm drainage system, attempt to contain the spilled sewage by plugging downstream storm drainage facilities
 - Arrange for removal of spilled sewage or debris from storm drainage system through use of vacuum truck and/or bypass pumping

- Contain/direct the spilled sewage using dike/dam or sandbags
- Pump around the blockage/pipe failure/pump station or vacuum flow from upstream of the blockage and dispose of downstream of the blockage to prevent further overflow.

SSOs on Private Properties

4.5 When an SSO occurs inside of a house or building and is due to a City line backup, the first responder should instruct the property owner should be instructed to follow these guidelines:

- Keep all family members and pets away from the affected area.
- Place towels, rags, blankets, etc. between areas that have been affected and areas that have not been affected.
- Do not remove any contaminated items.
- Turn off the HVAC system.
- Move any uncontaminated property away from the overflow area.

The homeowner is responsible for clearing any blockage in the home's plumbing system or private lateral and for any resulting flood damage to the structure. The homeowner is also responsible for damage that happens because a lateral was not properly installed. Spills inside houses or buildings should be cleaned up by a professional cleaning company. Contact information for professional cleaning companies can be found in the "Water Damage Restoration" section of the Yellow Pages.

If the sewage backup is located inside a building or on private property and the backup was caused by a blockage in the public sewer main, the City may be responsible for cleanup and restoration. If this is the case, the City may arrange for a water damage restoration company. Claims by homeowners, if applicable, should be submitted based on information in Section 5.4 of this document.

SSOs on External/Hard Surfaced Areas

4.6 When an SSO occurs in an external location and is due to a City main, staff will make every effort to restore the environment to the condition that existed before the SSO occurred by using the procedures outlined below.

- Collect all signs of sewage solids and sewage-related material either by hand, vacuum or with the use of rakes and brooms and discharge it back into the sanitary sewer system.
- Take reasonable steps to contain and vacuum up the wastewater.
- Disinfect all areas that were contaminated from the overflow using the disinfectant solution of household bleach diluted 10:1 with water. Apply minimal amounts of the disinfectant solution using a hand sprayer. Document the volume and application method of disinfectant that was employed.
- Allow area to dry. Repeat the process if additional cleaning is required.

SSOs on External/Landscaped and Unimproved Natural Vegetation

4.7 When an SSO occurs in an external location such as a natural area and is due to a City main, staff will make every effort to restore the environment to the condition that existed before the SSO occurred by using the procedures outlined below.

- Collect all signs of sewage solids and sewage-related material either by hand, vacuum or with the use of rakes and brooms and discharge it back into the sanitary sewer system.
- Allow the area to dry. Repeat the process if additional cleaning is required.
- Recover any sewage within storm drains, channels, curb, gutters, and culverts.
- Clear surrounding area of paper, solids, and any other signs of a SSO.
- City forces will replace vegetation, sidewalks, asphalt, fencing or any other items that were damaged as a result of the SSO or the crews working to restore service.

Clean Up and Disinfection

4.8 Clean up and disinfection procedures should be implemented to reduce the potential for human health issues and adverse environmental impacts that are associated with an SSO event. The procedures described are for dry weather conditions and should be modified as required for wet weather conditions. Where clean-up is beyond the capabilities of City staff, a cleanup contractor will be used.

SECTION 5: NOTIFICATION

SSOs that do not Reach Public Waters

5.1 For spills that are contained and do not release unrecovered sewage into a storm drain, stream or a surface water body, notification to the public shall be accomplished through the use of signs at the location of the spill. The signs shall be left in place for a term of five business days.

- 5.1.1 City T&ES staff, Maintenance Division Chief (15t) or Sewer Superintendent (2"), shall notify the City Fire Department's Environmental Investigations Unit (EIU) emergency notification email list of all SSOs in order to provide notification to public safety and Office of Environmental Quality staff. All notices to the EIU shall reference the location of the SSO, the date and time discharge was discovered, volume, action being taken, whether it has reached the storm system and/or surface waters, and the appropriate Cityworks service request number.

Spills that Reach Public Waters - City OEQ Requirements

5.2 The Deputy Director of the T&ES Office of Environmental Quality (or designee) shall be notified if an SSO has reached the storm sewer system and/or a surface water. OEQ staff will determine if further investigation of the discharge site and potentially affected areas is required. OEQ will assist in verifying the extent of the contamination in the field. OEQ

will be responsible for reporting to the state as required (see Section 6.3). Information in the required reports will be largely based on Form 0 - SSO Overflow Reporting Form referenced in Section 3.3, Cityworks, and/or discussions with knowledgeable staff.

The City of Alexandria Health Department has the authority to close and re-open water bodies for public water contact. The water bodies affected are determined by the following parameters and best professional judgment:

- The volume of sewage discharged;
- Parameters affecting flow of sewage to the water bodies;
- Direction of current;
- Tides;
- Past experience in the area; and/or
- Any other pertinent information.

Point of Contact

- 5.3 Working with the Office of Communications and Public Information, and the T&ES Public Information Officer, the T&ES Maintenance Division Chief shall be responsible for coordinating public notification, if necessary, for SSOs not reaching waters of the state; and the Deputy Director of T&ES, Office of Environmental Quality (or designee), in coordination with T&ES Maintenance Staff, shall be responsible for public notification, if necessary, for SSOs that may be reasonably expected to reach surface waters.
- 5.4 If the 550 has occurred in a building or residential property and is attributable to a blockage in a City main, the responder or the City Sewer Inspector shall:
- Gather information and fill out a Sewer Backup Summary Report.
 - Notify the Maintenance Division Chief of the incident.
 - Wait for restoration firm to arrive (if required).
 - Forward incident reports and related documents to Maintenance Division Chief.
 - For potential claims, contact the City's office of Risk Management and provide contact information to the resident.

SECTION 6: RECORDKEEPING & REPORTING

Internal SSO Documentation

- 6.1 The first responder will complete a Cityworks work order and a Field Report/Daily Sheet form. The first responder will follow the procedures and complete the Sewer Backup Summary Report if an SSO has occurred in a residence or building. The Maintenance Division Chief will prepare a file for each individual SSO. The file should include the following information:

- Initial service call information with a completed Cityworks service request
- City of Alexandria service request call field report/daily sheet form
- Copies of the City of Alexandria service request and work order forms, which should reference a volume estimate within the notes
- Closed-Circuit Television (CCTV) inspection (this is optional for SSOs that are not blockage related)
- Water quality sampling and test results, if applicable

External SSO Documentation

6.2 The City maintains SSO records for five years from the date of the SSO. All records shall be made available for review upon request. Records shall be retained for all SSOs, including but not limited to the following when applicable:

- Copy of Cityworks service requests and work orders;
- All original recordings for continuous monitoring instrumentation;
- Service call records and complaint logs of calls received by the City;
- SSO calls and SSO records;
- Steps that have been and will be taken to prevent the SSO from recurring and a schedule to implement those steps;
- Work orders, work completed, and any other maintenance records from the previous five years which are associated with responses and investigations of system problems related to SSOs;
- A list and description of complaints from customers or others from the previous five years; and
- Documentation of performance and implementation measures for the previous five years.

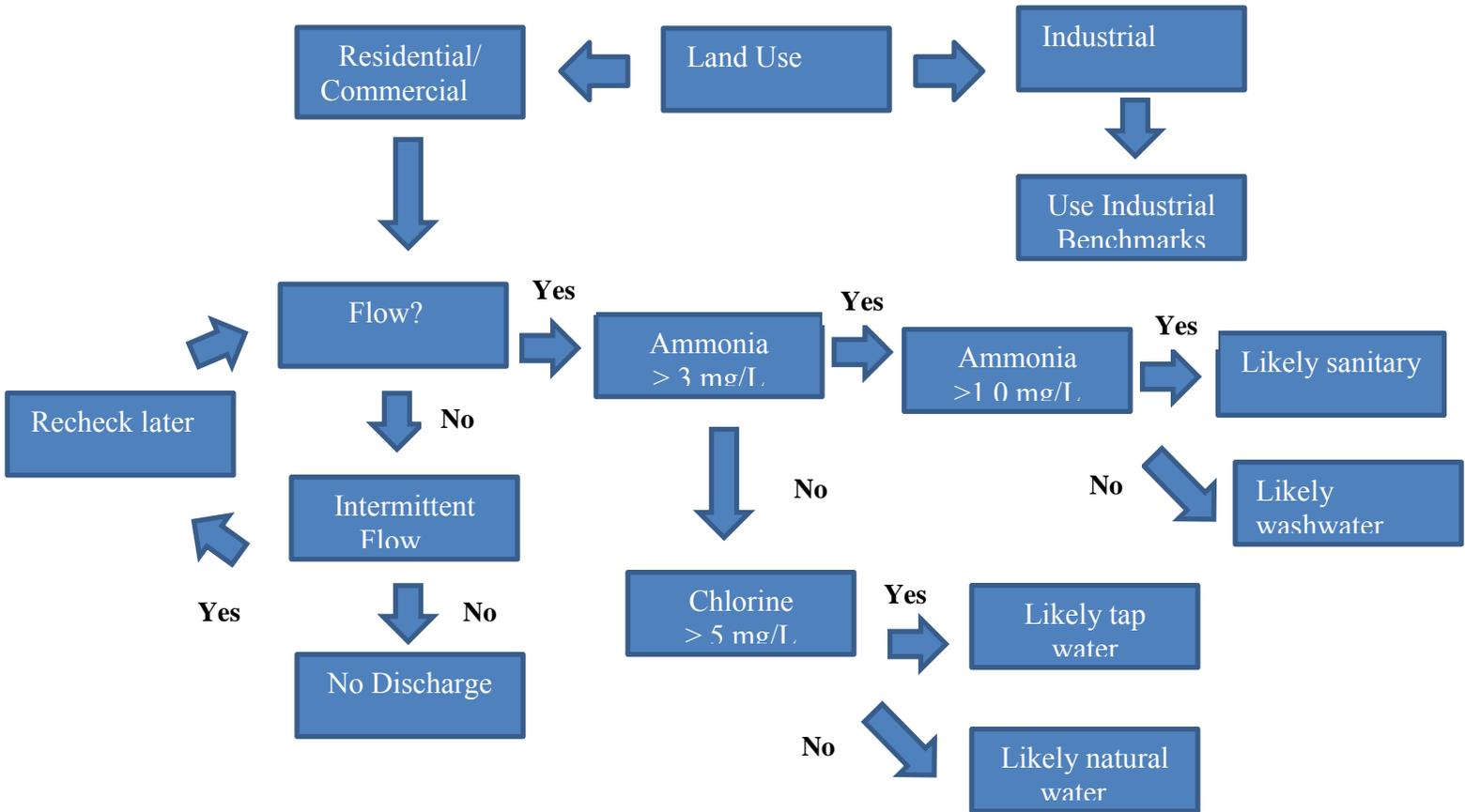
Reports to the State for Unauthorized Discharges

6.3 Discharges of sewage from an SSO that may reasonably be expected to enter surface waters shall be reported to the Virginia Department of Environmental Quality (VDEQ) immediately upon discovery of the discharge, but in no case later than within 24 hours after discovery. OEQ will utilize VDEQ's Pollution Response Program (PREP) online reporting to accomplish the 24 hour reporting. A written report of the unauthorized discharge shall be submitted by OEQ to VDEQ and the Virginia Department of Conservation and Recreation (DCR) within five days of the discovery of the discharge. OEQ will make the 24 hour notice and be responsible for final delivery of the five-day report. The written report shall contain the following, as noted on Form 0:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;

3. The date on which the discharge occurred;
4. The length of time that the discharge continued;
5. The volume of the discharge;
6. If the discharge is continuing, how long it is expected to continue;
7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this permit.

Appendix E-The Flow Chart Method



Appendix F-Illicit Discharge Field Screening Sheet

Illicit Discharge Screening

Closest outfall #: _____ **Date:** _____ **Time:** _____

Time since last rain: Over 72 hours Less than 72 hours

Quantity of last rain: Over 1 inch Less than 1 inch

Inspection Team: _____

Location: _____

Structure Type: Open Channel Manhole Outfall Other: _____

Dominant Land Use: Industrial Commercial Residential Unknown

Was Flow Observed? Yes No

Photo Taken? Yes No **Photo ID#:** _____

Field Screening Parameters

Temp:	Ammonia:	Turbidity:
pH:	Dissolved O²:	Conductivity:
Detergents:	Chlorine:	
Odor: <input type="checkbox"/> None <input type="checkbox"/> Sewage <input type="checkbox"/> Sulfide <input type="checkbox"/> Sour <input type="checkbox"/> Gas <input type="checkbox"/> Other:		
Color: <input type="checkbox"/> Clear <input type="checkbox"/> Green <input type="checkbox"/> Yellow <input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Gray <input type="checkbox"/> Red <input type="checkbox"/> Other:		
Floatables: <input type="checkbox"/> None <input type="checkbox"/> Oily Sheen <input type="checkbox"/> Garbage <input type="checkbox"/> Sewage <input type="checkbox"/> Suds <input type="checkbox"/> Other:		
Outfall Damage: <input type="checkbox"/> None <input type="checkbox"/> Breakage <input type="checkbox"/> Corrosion <input type="checkbox"/> Cracking/Chipping		
Deposits/Stains: <input type="checkbox"/> None <input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other:		
Abnormal Vegetation: <input type="checkbox"/> None <input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited		
Pipe Benthic Growth: <input type="checkbox"/> None <input type="checkbox"/> Brown <input type="checkbox"/> Green <input type="checkbox"/> Other:		
Comments:		

Source of discharge: _____

Responsible Party: _____

Responsible Party Address: _____

Need Enforcement? _____ **Date referred to Fire Marshal:** _____

Appendix G-Industrial Benchmarks

Indicator Parameter	Benchmark Concentration
Ammonia	> 50 mg/L
Color	> 500 units
Conductivity	>2,000 μ S/cm
Hardness	> 2,000 mg/L as CaCO ₃
pH	<5
Turbidity	> 1,000 NTU

Appendix H-Contract Lab Sampling Procedures

Lab Sample Collection

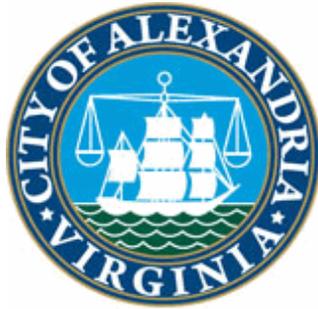
1. Indicator samples are stored in a polyethylene plastic sample bottle that is opaque or clear unless otherwise directed by the contracting laboratory.
2. During sample collection, wear surgical gloves. Wash hands when sampling is complete.
3. Use a dipper or bailer for sample collection; make sure not to disturb any sediments or benthic growth in the pipe or conveyance system as the sample is taken.
4. Rinse all sampling bottles, dippers, and bailers used for sample collection three times with sample water before collecting the sample to be analyzed.
5. Fill sample bottle to top without touching inside of bottle lid or rim.
6. Add any necessary preservatives at the time of sample collection.
7. Label the bottle immediately.
8. Store samples at 4°C (40°F). Keep samples on ice in a cooler if necessary.
9. Return samples to the contracting laboratory within 24 hours, or time required for appropriate sample.
10. Complete the chain of custody as required by the contracting laboratory.

APPENDIX D. DOCUMENTS RELATED TO MCM #4, CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

This appendix contains adopted amendments to the Erosion and Sediment Control Ordinance. It also contains checklists and policies and procedures related to Minimum Control Measure 4, Construction Site Stormwater Runoff, as required in the City's *General Permit for Discharges from Small Municipal Separate Storm Sewer Systems* (General Permit No. VAR040057). These documents are referenced in Section 4.D of the City's MS4 Program Plan.

City of Alexandria

*301 King St., Room 2400
Alexandria, VA 22314*



Docket - Final

Wednesday, June 10, 2015

6:00 PM

Council Chambers

City Council Legislative Meeting

1 Calling the Roll.**2 Closed Meeting.**

[14-4156](#) 6:00 P.M. to 7:00 P.M. - Consideration of Convening a Closed Meeting for Consultation with Legal Counsel for Legal Advice Regarding the Investment of Public Funds Where Bargaining is Involved and to Discuss the Performance and Salaries of Public Officers.

Attachments: [14-4156_exec session motion](#)

3 Moment of Silence and Pledge of Allegiance.**4 Reading and Acting Upon the Minutes of the Following Meetings of City Council:**

[14-4132](#) The Regular Meeting Minutes of May 12, 2015;
The Public Hearing Meeting Minutes of May 16, 2015;
The Special Meeting Minutes of May 20, 2015; and
The Regular Meeting Minutes of May 26, 2015.

Attachments: [14-4132_May 12, 2015 minutes](#)
[14-4132_May 16, 2015 minutes](#)
[14-4132_May 20, 2015 minutes](#)
[14-4132_May 26, 2015 minutes.rtf](#)

PROCLAMATIONS

5 [14-4054](#) Presentation of the Donation of \$80,000 by RunningBrooke for Funding of Improvements to Hume Springs Park and Playground.

6 [14-4131](#) Presentation of a Proclamation Declaring June 19-28, 2015 as Warrior Games Family Appreciation Week in the City of Alexandria.

Attachments: [14-4131 Proclamation](#)

7 [14-4195](#) Presentation of a Proclamation Declaring November 13-22, 2015 as Virginia Cider Week.

Attachments: [14-4195 Proclamation](#)

ORAL REPORTS FROM CITY COUNCIL ON BOARDS, COMMISSIONS AND COMMITTEES

* **Report on Washington Metropolitan Area Transit Authority (Mayor Euille)**

* **Report on Audit Committee (Councilman Wilson and Councilman Smedberg)**

*** Virginia Municipal League Legislative Committee (Councilman Chapman)****REPORTS AND RECOMMENDATIONS OF THE CITY MANAGER (five min.)****CONSENT CALENDAR (8-22)****(Resignations and Uncontested Appointments)**

- 8 [14-4161](#) Receipt of the Following Resignations from Members of Boards, Commissions and Committees:
- (a) Alexandria Redevelopment and Housing Authority
Kara Dinowitz
 - (b) Board of Zoning Appeals
Mark Allen
 - (c) Commission on Aging
Annmarie Pittman
Bernard Kellom, Jr
 - (d) Commission on Persons with Disabilities
Nyrisha Beckman
 - (e) Social Services Advisory Board
Julie Missimore
- Attachments:** [14-4161 Resignations](#)
- 9 [14-4162](#) Uncontested Appointments to Boards, Commissions and Committees:
- (a) Affordable Housing Advisory Committee
1 Builder or Developer of Residential Property
 - (b) Alexandria-Caen Sister City Committee
1 Citizen Member
 - (c) Alexandria Marketing Committee
1 Member with Experience or Expertise in the Following Areas:
Marketing/Communications, Advertising Agency/Public Relations, Media Buyer, Graphic Design/Production, and/or Media Relations/Media Outlet
 - (d) Beauregard Design Advisory Committee
3 Citizen Members

(e) Beautification Commission

1 Citizen Member

(f) Board of Architectural Review - Parker-Gray District

1 Citizen Member

1 Architect Member

(g) Commission on Employment

1 Business Representative From Among Recognized Area Businesses
Including Minority-owned and Small Businesses

(h) Emergency Medical Services Council

1 Operational Medical Director Representative

(i) Local Emergency Planning Committee

1 Representative of Broadcast and Print Media

(j) Real Estate Assessments Review Board

1 Citizen Member

(k) Towing Advisory Board

1 Citizen Member

(l) Visit Alexandria Board of Governors

2 Hotel Owner/Manager, Restaurant Owner/Manager, Trade or
Professional Association Executive, or Retail Owner/Manager
Representative

1 Retail Owner/Manager Representative

(m) Waterfront Commission

1 Citizen Representative From Park Planning District I

Attachments: [14-4162 Uncontested Board Appointments](#)

(Reports and Recommendations of the City Manager)

- 10 [14-3154](#) Consideration of the Monthly Financial Report for the Period Ending
April 30, 2015.
Attachments: [14-3154 Apr 15 Monthly Financial Report](#)
- 11 [14-4084](#) Consideration of the Submission of a Non-Competitive Grant Application
to the Virginia Department of Environmental Quality Litter Prevention
and Recycling Program for Funding of the Adopt-a-Park Litter Control

Program.

Attachments: [14-4084 Attachment 1](#)

[14-4084 Litter grant FY 2016 Attachment 2.docx](#)

[14-4084 Attachment 3](#)

- 12 [14-4088](#) Consideration of the Appointment to the Post-Employment Benefits Trust Board.

(Ordinances for Introduction)

- 13 [14-4120](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend and Reordain Article B (Fire Prevention), Chapter 2 (Fire Protection and Prevention), Title 4 (Public Safety) of the Code of the City of Alexandria, Virginia, 1981, as Amended.

Attachments: [14-4120 Reference Guide](#)

[14-4120 Ordinance](#)

[14-4120 Docket Cover Sheet](#)

- 14 [14-4003](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance Authorizing Amendments to Section 9-13 of the City Code - Towing and Storage of Motor Vehicles.

Attachments: [14-4003 Attachment 1 Ordinance Cover Towing and Storage of Motor Vehicles](#)

[14-4003 Attachment 2 Ordinance.docx.docx](#)

- 15 [14-4025](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend the City Code to Accomplish Changes to the Public Health Advisory Commission's Membership.

Attachments: [14-4025 Public Health Composition Change Cover](#)

[14-4025 Public Health Commission Composition Change ORD](#)

- 16 [14-4032](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend and Reordain Title 5 (Transportation and Environmental Services), Chapter 8 (Parking and Traffic Regulations) of the Code of the City of Alexandria, Virginia, 1981, as Amended.

Attachments: [14-4032 Attachment 1 Ordinance Cover.docx](#)

[14-4032 Attachment 2 Ordinance Parking Meter Revised.docx](#)

- 17 [14-4055](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend and Reordain Chapter 4 (Erosion and Sediment Control) of Title 5 (Transportation and Environmental Services), of the Code of the City of Alexandria, Virginia, 1981, as Amended.

Attachments: [14-4055 Attachment 1 Ordinance Cover Erosion and Sediment Control.docx](#)

[14-4055 Attachment 2 Ordinance Erosion and Sediment Control.docx](#)

- 18 [14-4070](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance Authorizing the Owners of the Property Located at 4825 Maury Lane to Maintain an Encroachment for Pervious Pavers, Fencing and Pillars at that Location.
Attachments: [14-4070 Information sheet](#)
 [14-4070 Ordinance](#)
 [14-4070 Attachment 1](#)
- 19 [14-3668](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance on Changes to the Name and Composition of the Affordable Housing Advisory Committee.
Attachments: [14-3668 Ordinance Cover.docx](#)
 [14-3668 Ordinance](#)
- 20 [14-4113](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend the City Code to Conform with the Virginia Public Procurement Act (VPPA) with Regard to Definitions, Performance and Payment Bonds, Alternate Forms of Security, Competitive Sealed Bidding, Contract Formation and Methods of Source Selection, Public Notice, Contracting for Professional Services by Competitive Negotiations, Competitive Negotiation, Job Order Contracting, and Contract Formation and Methods of Source Selection.
Attachments: [14-4113 Ordinance Cover](#)
 [14-4113 Proposed Ordinance](#)
- 21 [14-3852](#) Introduction and First Reading. Consideration. Passage on First Reading of a Supplemental Appropriation Ordinance for the Support of the City Government for FY 2015.
Attachments: [14-3852 Cover Sheet](#)
 [14-3852 Supp App Ordinance](#)
 [14-3852 Att 3 - June 2015 grant attachment](#)
- 22 [14-3854](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Make Appropriations for the Support of the City Government for Fiscal Year 2016.
Attachments: [14-3854 Atch 1. Appropriation Cover and Ordinance](#)
 [14-3854 Table 1 - 2016 Appropriation Ordinance Final Expenditures by Fund](#)
 [14-3854 Table II - 2016 Sources of Revenue](#)

END OF CONSENT CALENDAR

CONTESTED APPOINTMENTS

- 23 [14-4163](#) Board of Architectural Review - Old and Historic District
2 Citizen Members
Attachments: [14-4163_BAR Old and Historic.docx](#)
- 24 [14-4164](#) Budget and Fiscal Affairs Advisory Committee
2 Citizen Members
Attachments: [14-4164_BFAAC.docx](#)
- 25 [14-4165](#) Community Criminal Justice Board
1 Representative of Local Education to be Nominated by the
Superintendent of Schools
Attachments: [14-4165_Community Criminal Justice Board.docx](#)

REPORTS AND RECOMMENDATIONS OF THE CITY MANAGER FOR DISCUSSION (60 min.)

- 26 [14-3977](#) Consideration of an Amendment to the City Council Approved 2003
Windmill Hill Park Concept Plan to Include a Living Shoreline Design
Concept.
Attachments: [14-3977_Windmill Hill Park Attachment 1.pdf](#)
 [14-3977_Windmill Hill Park Living Shoreline Plan](#)
 [14-3977_CityCouncilPresentation.pdf](#)

ORAL REPORTS AND ORAL PRESENTATIONS BY MEMBERS OF CITY COUNCIL

ORAL REPORT FROM THE CITY MANAGER

- 27 [14-4158](#) Presentation of Report on Crime Reduction and Focus on Quality of Life
with Municipalities in El Salvador.
Attachments: [14-4158_El Salvador Presentation](#)

ORDINANCES AND RESOLUTIONS

- 28 [14-4145](#) Consideration of a Resolution Establishing an Ad Hoc Fort Ward
Management Plan Implementation Monitoring Group. [ROLL-CALL
VOTE]
Attachments: [14-4145_Fort Ward Management Plan Implementation Monitoring Group Resol](#)
- 29 [14-4114](#) Introduction and First Reading. Consideration. Passage on Final Reading
of an Ordinance to Amend the City Code to Amend and Reordain Section
11-11-5 of Article A (General Provisions) and Add Section 11-11-143 of
Article I (Exemptions and Alternate Provisions to the Aquatic Health
Ordinance) of Chapter 11 (Swimming Pools, Spa Pools and Health Clubs)
of Title 11 (Health, Environmental and Sanitary Regulations) of the City

of Alexandria Code. (Lifeguard and Pool Operator Exemption Ordinance.)

Attachments: [14-4114 Ordinance Cover Lifeguards and Operator Exemption Ordinance Cove](#)
[14-4114 Ordinance Lifeguard and Operator Exemption Ordinance](#)
[14-4114 Health Department Memo to Council - Lifeguard Exemption - 2015-05-](#)

OTHER

30 [14-4122](#) Consideration of City Council Schedule.

Attachments: [14-4122 Council Schedule for June 2015](#)
[14-4122 Proposed Council Schedule July 2015 - June 2016](#)

Closed Meeting Continued (if needed)

31 [14-4157](#) Consideration of Convening a Closed Meeting for Consultation with Legal Counsel for Legal Advice Regarding the Investment of Public Funds Where Bargaining is Involved and to Discuss the Performance and Salaries of Public Officers.

Attachments: [14-4157 exec session motion](#)

* * * * *

PUBLIC NOTICE:

The Audit Subcommittee will meet on Monday, June 8, 2015 at 6:00 p.m. in the City Council Work Room at City Hall.

* * * * *

*The Cablecast schedule of Government meetings on Channel 70 can be found here:
<http://apps.alexandriava.gov/Calendar/AltDisplay/VideoList.aspx>*

This docket is subject to change.

* * * * *

Full-text copies of ordinances, resolutions, and agenda items are available in the Office of the City Clerk and Clerk of the Council. Meeting materials are also available on-line at alexandriava.gov/council.

* * * * *

Individuals with disabilities who require assistance or special arrangements to participate in the City Council meeting may call the City Clerk and Clerk of Council's Office at 703-746-4550 (TTY/TDD 838-5056). We request that you provide a 48-hour notice so that the proper arrangements may be made.

City Council meetings are closed-captioned for the hearing impaired.

* * * * *

Attachment 1

Introduction and first reading:
Public hearing:
Second reading and enactment:

INFORMATION ON PROPOSED ORDINANCE

Title

AN ORDINANCE to amend and reordain Chapter 4 (EROSION AND SEDIMENT CONTROL) of Title 5 (TRANSPORTATION AND ENVIRONMENTAL SERVICES), of the Code of the City of Alexandria, Virginia, 1981, as amended.

Summary

In July 2013 the administration of the Virginia Stormwater Management Program and the Erosion and Sediment Control program was transferred from the Virginia Department of Conservation and Recreation (DCR) to the Virginia Department of Environmental Quality (DEQ). This transfer required a renumbering of state law and code. To more closely align the City code with the revised State code, staff is proposing minor editorial revisions to Title 5, Chapter 4 of the Code of Alexandria.

Sponsor

N/A

Staff

Mark Jinks, City Manager
Emily Baker, Acting Deputy City Manager
Yon Lambert, Director, T&ES
William J. Skrabak, Deputy Director, Infrastructure/Environmental Quality, T&ES
Lalit Sharma, Division Chief, Sanitary Sewer/Stormwater Infrastructure, T&ES
Jesse E. Maines, Watershed Management Planner, Sewer/Stormwater Infrastructure, T&ES

Authority

§2.04(c), Alexandria City Charter

Estimated Costs of Implementation

None

Attachments in Addition to Proposed Ordinance and its Attachments (if any)

None

ORDINANCE NO. _____

AN ORDINANCE to amend and reordain Chapter 4 (EROSION AND SEDIMENT CONTROL) of Title 5 (TRANSPORTATION AND ENVIRONMENTAL SERVICES), of the Code of the City of Alexandria, Virginia, 1981, as amended.

THE CITY COUNCIL OF ALEXANDRIA HEREBY ORDAINS:

Section 1. That Chapter 4 of Title 5 of the Code of the City of Alexandria, Virginia, 1981, as amended, be, and the same hereby is, amended and reordained to read as follows:

(New language is underscored; deleted material is ~~stricken~~)

CHAPTER 4 - Erosion and Sediment Control

Sec. 5-4-1 Definitions.

As used in this chapter, and pursuant to 9VAC25-840, the following terms shall have the meanings set forth below, unless the context requires a different meaning:

- (a) "Agreement in lieu of a plan" means a contract between the city and the owner which specifies conservation measures which must be implemented in the construction or modification of a single-family residence; this contract may be executed by the Director in lieu of an erosion and sediment control plan.
- (b) "Alexandria Water Quality Volume" means the volume equal to the first one-half inch of runoff multiplied by the impervious surface of the land development project. This is separate and in addition to the state stormwater management water quality requirement.
- ~~(c)~~ (b) "Applicant shall mean any person submitting an erosion and sediment control plan or an agreement in lieu of a plan for approval or requesting the issuance of a permit, when required, authorizing land-disturbing activities to commence.
- (d) "Certified inspector" means an employee or agent of the city who (i) holds a certificate of competence from the Soil and Water Conservation Board in the area of project inspection or (ii) is enrolled in the Board's training program for project inspection and successfully completes such program within one year after enrollment.
- (e) "Certified plan reviewer" means an employee or agent of a VESCP authority who (i) holds a certificate of competence from the Board in the area of plan review, (ii) is

44 enrolled in the Board's training program for plan review and successfully completes
45 such program within one year after enrollment, or (iii) is licensed as a professional
46 engineer, architect, landscape architect, land surveyor pursuant to Article 1 (§ 54.1-
47 400 et seq.) of Chapter 4 of Title 54.1, or professional soil scientist as defined in §
48 54.1-2200.
49

50 (f) "Certified program administrator" means an employee or agent of a VESCP authority
51 who (i) holds a certificate of competence from the Board in the area of program
52 administration or (ii) is enrolled in the Board's training program for program
53 administration and successfully completes such program within one year after
54 enrollment.
55

56 (~~d~~)(g) "Director" shall mean ~~the~~ the director of transportation and environmental services,
57 his designee or his duly authorized agent.
58

59 (~~e~~)(h) "Erosion and sediment control plan," "conservation plan" or "plan," shall mean a
60 document containing material for the conservation of soil and water resources of an
61 unit or group of units of land. It may include appropriate maps, an appropriate soil
62 and water plan, inventory and management information with needed interpretations,
63 and a record of decisions contributing to conservation treatments. The plan shall
64 contain all major conservation decisions to assure that the entire unit or units of land
65 will be so treated to achieve the conservation objectives.
66

67 (~~e~~)(i) "Erosion impact source area" shall mean an area of land not associated with current
68 land- disturbing activity but subject to persistent erosion resulting in the delivery of
69 sediment onto neighboring properties or into state waters. This definition shall not
70 apply to any lot or parcel of land of 10,000 square feet or less used for residential
71 purposes or to shorelines where the erosion results from wave action or other coastal
72 processes.
73

74 (~~f~~)(j) "Land-disturbing activity" for the purposes of this chapter shall mean any land
75 change which may result in soil erosion from water or wind and the movement of
76 sediments into state waters or onto lands in the commonwealth, including, but not
77 limited to, clearing, grading, excavating, transporting and filling of land.
78

79 (~~g~~)(k) "Natural channel design concepts" means the utilization of engineering analysis
80 and fluvial geomorphic processes to create, rehabilitate, restore, or stabilize an open
81 conveyance system for the purpose of creating or recreating a stream that conveys its
82 bankfull storm event within its banks and allows larger flows to access its bankfull
83 bench and its floodplain.
84

85 ~~(h)~~(l) "Owner" shall mean the owner or owners of the freehold of the premises or of a
86 lesser estate therein, a mortgagee or vendee in possession, an assignee of rents, a
87 receiver, an executor, a trustee, a lessee or another person, firm or corporation in
88 control of a property.

89
90 ~~(i)~~(m) "Peak flow rate" means the maximum instantaneous flow from a given storm
91 condition at a particular location.

92
93 ~~(j)~~(n) "Permittee" shall mean the person to whom the permit authorizing land-disturbing
94 activities is issued or the person who certifies that the approved erosion and sediment
95 control plan will be followed.

96
97 ~~(k)~~(o) "Person" for the purposes of this chapter shall mean any individual, partnership,
98 firm, association, joint venture, public or private corporation, trust, estate,
99 commission, board, public or private institution, utility, cooperative, county, city,
100 town, or other political subdivision of the commonwealth, interstate body, or other
101 legal entity.

102
103 ~~(l)~~(p) "Plan-approving authority" shall mean the department of transportation and
104 environmental services which shall be responsible for determining the adequacy of a
105 plan submitted for land-disturbing activities on ~~an~~ unit or group of units of lands and
106 for approving plans.

107
108 ~~(m)~~(q) "Runoff volume" means the volume of water that runs off the land development
109 project from a prescribed storm event.

110
111 ~~(n)~~(r) "State waters" shall mean all waters on the surface and or wholly or partially
112 underground that is within or bordering the commonwealth or that is within the
113 jurisdiction of the commonwealth.

114
115 ~~(o)~~ "Water Quality Volume" means the volume equal to the first one half inch of runoff
116 multiplied by the impervious surface of the land development project.

117
118 (Intervening sections are unchanged.)

119
120 Sec. 5-4-3.1 Same—erosion impact source area.

121
122 Notwithstanding any contrary provision of this chapter, it shall be unlawful for any
123 property owner to fail, neglect or refuse to implement an erosion and sediment control
124 ~~conservation~~ plan, approved by the director, and within such reasonable time as the
125 director shall specify, for any land designated by the director as an erosion impact source
126 area.

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Sec. 5-4-3.2 Wetlands mitigation banks.

In accordance with the procedure set forth by § 62.1-44.15-51 ~~10.1-563~~(E) of the Code of Virginia which is herein incorporated, any person engaging in the creation and operation of wetland mitigation banks in multiple jurisdictions, which have been approved and are operated in accordance with applicable federal and state guidance, laws, or regulations for the establishment, use, and operation of mitigation banks, pursuant to a permit issued by the Department of Environmental Quality, the Marine Resources Commission, or the U.S. Army Corps of Engineers, may, at the option of that person, file general erosion and sediment control specification for wetland mitigation banks annually with the Virginia Soil and Water Conservation Board (Board) for review and approval consistent with guidelines established by the Board.

(Intervening section is unchanged.)

Sec. 5-4-5 Exceptions.

The provisions of this chapter shall not apply to any construction, reconstruction, repair or alteration of any building or structure when no land is disturbed and no trees, shrubs, grass or vegetation is destroyed or removed, nor to any of the following:

(Intervening sections are unchanged.)

- (1) Shore erosion control projects on tidal waters when the projects are approved by local wetlands boards, the Marine Resources Commission and/or the U.S. Army Corps of Engineers and located on tidal waters and within nonvegetated or vegetated wetlands as defined in Title 28.2 of the Code of Virginia. However, any associated land that is disturbed outside of this exempted area shall remain subject to the article and the regulations adopted pursuant thereto.

(Intervening sections are unchanged.)

Sec. 5-4-6 Permits not to be issued without approved erosion and sedimentation control plan when plan required by chapter.

- (a) No permit shall be issued to construct, erect, or alter any building or structure on any land within the city until a plan has been submitted and approved in accordance with the provisions of this chapter and the applicant has certified in writing that the plan will be followed. The person responsible for carrying out the plan shall provide the name of an individual holding a certificate of competence to the program authority, as provided by § 62.1-44.15:52 ~~10.1-561~~, who will be in charge of and responsible for carrying out the land disturbing activity. However, any plan-approving authority may waive the certificate of competence requirement for an agreement in lieu of a plan for construction of a single family residence. If a violation occurs during the land-

176 disturbing activity, then the person responsible for carrying out the agreement in lieu
177 of a plan shall correct the violation and provide the name of an individual holding a
178 certificate of competence, as provided by § 62.1-44.15:52 ~~40.1-564~~. Failure to
179 provide the name of an individual holding a certificate of competence prior to
180 engaging in land-disturbing activities may result in revocation of the approval of the
181 plan and the person responsible for carrying out the plan shall be subject to the
182 penalties provided in this article.

183
184 (Subsequent section is unchanged.)

185
186
187 Sec. 5-4-7 Minimum criteria; city handbook.

- 188
189 a) The director shall administer and enforce the provisions of this chapter.
190
191 b) This chapter, the erosion and sediment control regulations of the Department of
192 Environmental Quality Conservation and Recreation Division of Soil and Water
193 Conservation (VR 625-02-00) effective March 22, 1995, [9 VAC 25-8404 VAC 50-
194 30-10-et seq.], and the "Virginia Erosion and Sediment Control Handbook, Third
195 Edition, 1992, which are incorporated herein by reference, shall be an integral part of
196 the city's erosion and sediment control program and shall comprise the city's "Erosion
197 and Sediment Control Handbook." The text of these regulations is on file in the office
198 of the director.
199
200 c) In addition to the minimum requirements for controlling erosion and sedimentation
201 for land-disturbing activities which are contained in ~~VR 625-02-00 '4 [4 VAC 50-30-~~
202 409 VAC25-840, the following additional minimum requirements shall apply:
203

204 (Subsequent sections are unchanged.)

205
206 (4) The following additional stormwater management criteria shall apply:

207
208 A stormwater management plan consistent with the requirements of Section
209 13-109(F) in Article XIII of the Alexandria Zoning Ordinance (the
210 Environmental Management Ordinance and the Virginia Stormwater
211 Management Program (VSMP) regulations shall apply. For plans approved
212 on and after July 1, 2014, the flow rate capacity and velocity requirements of
213 this section shall be satisfied by compliance with water quantity requirements
214 in the Stormwater Management Act (§ 62.1-44.15:24 et seq.) and attendant
215 regulations, unless such land-disturbing activities are in accordance with the
216 grandfathering provisions of the VSMP regulations.
217
218

- 219 a. ~~A stormwater management plan shall be developed so that, from the site,~~
220 ~~the postdevelopment peak runoff rate from a two-year and a 10-year~~
221 ~~storm, considered individually, shall not exceed their respective~~
222 ~~predevelopment rates. The predevelopment and postdevelopment peak~~
223 ~~runoff rates must be verified by engineering calculations. Within the Four~~
224 ~~Mile Run Watershed, postdevelopment peak runoff during a 100-year~~
225 ~~frequency storm shall not increase the peak runoff of the Four Mile Run~~
226 ~~Flood Control Channel as required by the city's contract with the United~~
227 ~~States Army Corp of Engineers.~~
- 228 b. ~~b. 1. Concentrated stormwater runoff leaving a development site must be~~
229 ~~discharged directly into an adequate channel. If there is no adequate~~
230 ~~channel one must be constructed to convey stormwater to the nearest~~
231 ~~adequate channel. Newly constructed channels and conduits carrying a~~
232 ~~flow of 1,000 or more cubic feet per second shall be designed for a 100-~~
233 ~~year storm frequency and newly constructed channels and conduits~~
234 ~~carrying a flow of less than 1,000 cubic feet per second shall be designed~~
235 ~~for a 10-year storm frequency.~~
- 236 e. ~~2.~~
- 237 d. ~~An "adequate channel" shall be defined as a natural or man-made channel~~
238 ~~or pipe which is capable of conveying the runoff from a two-year storm or~~
239 ~~a 10-year storm, considered individually, without overtopping its banks or~~
240 ~~eroding after development of the site in question. A receiving channel may~~
241 ~~also be considered adequate at any point where the total contributing~~
242 ~~drainage area is at least 100-times greater than the drainage area of the~~
243 ~~development site in question or, where it can be shown that the peak rate~~
244 ~~of runoff from the site for a two-year and a 10-year storm, considered~~
245 ~~individually, will not be increased after development.~~
- 246 e. ~~3.~~
- 247 f. ~~In accordance with, § 10.1-561 of the Code of Virginia, stream restoration~~
248 ~~and relocation projects that incorporate natural channel design concepts~~
249 ~~are not man-made channels and shall be exempt from any flow rate~~
250 ~~capacity and velocity requirements for natural or man-made channels.~~
- 251 g. ~~4.~~
- 252 h. ~~In accordance with § 10.1-561 of the Code of Virginia, any land-disturbing~~
253 ~~activity that provides for stormwater management intended to address any~~
254 ~~flow rate capacity and velocity requirements for natural or manmade~~
255 ~~channels shall satisfy the flow rate capacity and velocity requirements for~~
256 ~~natural or manmade channels if the practices are designed to (i) detain the~~
257 ~~water quality volume and to release it over 48 hours; (ii) detain and release~~
258 ~~over a 24-hour period the expected rainfall resulting from the one-year,~~
259 ~~24-hour storm; and (iii) reduce the allowable peak flow rate resulting from~~
260 ~~the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal~~

261 to the peak flow rate from the site assuming it was a good forested
262 condition, achieved through multiplication of the forested peak flow rate
263 by a reduction factor that is equal to the runoff volume from the site when
264 it was in a good forested condition divided by the runoff volume from the
265 site in its proposed condition, and shall be exempt from any flow rate
266 capacity and velocity requirements for natural or manmade channels.

267
268 (Subsequent sections are unchanged.)

- 269
- 270 (5) Runoff rate and channel adequacy must be verified with engineering
271 calculations to the satisfaction of the director.
- 272
- 273 (6) All channel improvements or modifications must comply with all applicable
274 laws and regulations.
- 275
- 276 (7) If the applicant chooses an option which includes stormwater detention, the
277 applicant must provide the city with a plan for maintenance of the detention
278 facilities. The plan shall set forth the maintenance requirements of the facility
279 and the party responsible for performing the maintenance. The responsible
280 party may be an individual, organization or the city, whichever has consented
281 to carry out the maintenance. If the designated maintenance responsibility is
282 with an individual or organization other than the city, a maintenance
283 agreement should be executed between the responsible party and the city.
- 284
- 285 ~~(e) The owner or developer may continue to discharge stormwater that has not~~
286 ~~been concentrated (sheet flow) onto lower lying property if:~~
- 287 1. the peak flow rate for a 10-year frequency storm after development does
288 not exceed the predevelopment peak flow rate;
- 289 2. the increase in total volumes of runoff caused by the development will
290 not have an adverse impact on the lower lying property; and
- 291 3. there will be no exacerbation of existing drainage problems on the lower
292 lying or other downhill property.
- 293
- 294 ~~(5)(8) Stabilization of waterways and outlets. All on-site stormwater conveyance~~
295 ~~channels shall be designed and constructed to withstand the expected velocity~~
296 ~~of flow from a 10-year frequency storm without erosion. Stabilization~~
297 ~~adequate to prevent erosion must also be provided at the outlets of all pipes~~
298 ~~and paved channels. Energy dissipators shall be installed as required by the~~
299 ~~director.~~
- 300
- 301 ~~(6)(9) Working in or crossing watercourses. Construction vehicles should be kept~~
302 ~~out of watercourses to the extent possible. Where in-channel work is~~
303 ~~necessary, precautions must be taken to stabilize the work area during~~

304 construction to minimize erosion. The channel (including bed and banks) must
305 always be re-stabilized immediately after in-channel work is completed.

306
307 ~~(7)~~(10) Underground utility lines shall be installed in accordance with the
308 following standard in addition to other applicable criteria: no more than 100
309 feet of trench are to be opened at one time.

310
311 ~~(8)~~(11) Maintenance. All temporary and permanent erosion and sediment control
312 practices must be maintained and repaired as specified in ~~VR 625-02-00 §~~
313 ~~69VAC25-840-60.4 VAC 50-30-60~~.

314
315 ~~(9)~~(12) Submission of an Erosion and Sediment Control Plan to the city is a grant
316 of unlimited right of entry to the property to officials or agents of the city for
317 the purposes of determining adequacy of the proposed plan and inspection of
318 land-disturbing activities for compliance with the approved plan.

319
320 (d) The "Virginia Erosion and Sediment Control Handbook, Third Edition, 1992" and
321 the tree planting and preservation regulations authorized by § 11-410(CC)(1) of
322 the Zoning Ordinance of the City of Alexandria, and known as the city's
323 Landscape Guidelines, shall be used by any applicant making a submittal under
324 this chapter and by the director in his or her review and consideration of the
325 adequacy of landscaping elements included in any erosion and sediment control
326 plan submitted.

327
328 Sec. 5-4-8 Erosion and sediment control plans.

329
330 a) Applications for approved erosion and sediment control plans shall be submitted to
331 and filed with the director as part of the plan of development pursuant to the
332 requirements in Article XIII of the Alexandria Zoning Ordinance, on forms prepared
333 by the city, prior to the time any work subject to this chapter is begun on land. Fees
334 for reviewing erosion and sediment control plans, ~~grading~~ ~~plot~~ plans and performing
335 field inspections for all new structures, exterior alteration, plumbing, electrical, or
336 mechanical building permits where more than 2,500 square feet are disturbed shall be
337 required, the fee to be determined by the ~~D~~director of Transportation and
338 ~~Environmental Services~~. Five copies of an erosion and sediment control plan or
339 ~~grading~~ ~~plot~~ plan must accompany any application, parts of which shall also be on
340 forms prepared by the city. Upon receipt of an application and plans, the director shall
341 consider the plan in light of the provisions of this chapter, and Virginia Erosion and
342 Sediment Control Law and attendant regulations, and promptly approve the plan,
343 disapprove the plan or approve the plan with modifications, noting thereon any
344 changes that will be required. The director shall promptly notify the applicant of his
345 or her decision on a plan. Any approved plan shall be issued, dated, and bear the
346 manual signature of the director ~~of the department of transportation and~~
347 ~~environmental services or his or her deputy~~ or appropriate designee prior to the
348 commencement of land-disturbing activities.

349

350 (Subsequent sections are unchanged.)

351

352

353 Section 2. That this ordinance shall become effective upon the date and at the time of its

354 final passage.

355

356

WILLIAM D. EUILLE

357

Mayor

358

359 Introduction:

360 First Reading:

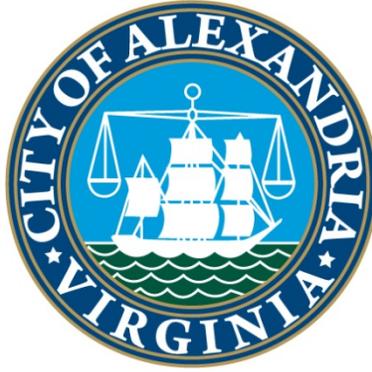
361 Publication:

362 Public Hearing:

363 Second Reading:

364 Final Passage:

365



City of Alexandria, Virginia

**Policies and Procedures for Construction Site Runoff Control
Inspections**

06/05/2014

Eco-CITY  ALEXANDRIA

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Purpose

The purpose of this document is to provide policies and procedures for the inspection of construction sites for stormwater runoff control.

Construction sites will be inspected for compliance with erosion and sedimentation control and for compliance with the site's VSMP permit as applicable.

Legal Authority

Commonwealth of Virginia

Legal Authority to enforce stormwater runoff controls on construction sites is granted to the City by the Code of Virginia. Specifically, authority is granted by the Stormwater Management Act, Title 62.1, Chapter 3.1, Article 2.3 of the Code of Virginia; the Virginia Stormwater Management Program (VSMP) Regulation, Chapter 870 of the Virginia Administrative Code; and by chapter 880 the General VPDES Permit for Discharges of Stormwater From Construction Activities, Chapter 880 of the Virginia Administrative Code.

City of Alexandria

The City of Alexandria Erosion and Sedimentation Control Ordinance is located in Title 5 Chapter 4 of the Alexandria, Virginia code of Ordinances.

The Environmental Management Ordinance, Article XIII of the City of Alexandria Zoning Ordinance contains those provisions of the City Code related to the VSMP permit.

City Procedures for Erosion and Sedimentation Control Inspections

Inspection Schedule

All permitted projects will be inspected as follows:

- A. During or immediately following initial installation of erosion and sediment controls;
- B. At least once in every two week period;
- C. Within 48 hours following any runoff producing storm event; and
- D. At the completion of the project prior to the release of any performance bonds.

Inspection Procedure

City inspections will be performed according to the following procedures:

1. Inspections will be performed to inspect for compliance with the approved erosion and sedimentation control plan. City staff will attempt to inform the construction site operator and/or permittee prior to the inspection.
2. Inspections will be documented on the inspection forms found in appendix 1 of this document.
3. After the inspection has been completed, a hard copy of the documentation will be saved in the inspector's files. Any pictures taken will be saved on the hard drive of the inspector's computer.
4. When a site fails an inspection, the information will be entered into the City's database generating a report for the permittee.
5. For those sites failing inspection, a notice to comply and a copy of the inspection report will be sent to the permittee. This notice can be hand delivered or sent to the permittee by certified mail. The notice to comply will specify the measures needed to bring the site into compliance with the approved erosion and sedimentation control plan and the timeframe allowed for compliance. The notice to comply can be found in Appendix 1 of this document.
6. The time allowed for compliance will be determined by the inspector and will be based on the severity of the violation. No timeframe to comply will exceed 30 days.
7. After the timeframe to complete the required measures has expired, the City inspector will reinspect the site for compliance with the notice to comply.
8. All enforcement action notification will follow the procedures outlined in this document.

Documentation

The inspection records shall include at a minimum:

1. The date of inspection,
2. The result of the inspection,
3. Any deficiencies,
4. The timeframe allowed for compliance with any noted deficiencies.

All records must be kept on file for a minimum of five years.

Enforcement of Erosion and Sedimentation Control Violations

In cases where noncompliance is causing or is imminent danger of causing harmful erosion of lands or sediment deposition in the waters of the commonwealth, drainage system discharging to such waters, or lower lying property or where land disturbing activities have commenced without an approved plan, a stop work order may be issued whether or not the permittee has been issued a notice to comply.

For all other violations, enforcement action for failure to comply with an approved erosion and sedimentation control plan or for performing land disturbing activities without an approved plan will follow these steps:

1. After a notice to comply has been issued, the inspector will reinspect the site for compliance with the notice to comply.
2. If the site fails to meet all of the measures outlined in the notice to comply, the inspector may issue a written stop work order.
3. The permittee will be given a timeframe to complete the measures needed to bring the site into compliance with the notice to comply and the approved sedimentation and erosion control plan. The timeframe allowed will be determined by the inspector and will be based upon the severity of the violation.
4. During the time period the stop work order is active, no construction or other work on the site can take place other than corrective measures.
5. Once the time allowed to bring the site into compliance has expired, the site may be referred to the Director of Transportation and Environmental Services, his or her designee; the City Attorney's Office; or both.
6. The City may then execute a letter of intent to use the performance security for site correction and/or refer the project to the City Attorney's Office to issue a Notice of Violation with associated civil penalties. A letter of intent can be found in appendix 2 of this document. A notice of violation can be found in appendix 3 of this document.
 - a. Letter of Intent. If referred to the Director of Transportation and Environmental Services, the director will send the permittee a letter of intent to utilize the performance bond or cash escrow to apply the corrective measures to the site. The letter will specify a timeframe for compliance. If no action is taken in the time specified, the Director shall have the deficiencies corrected charge to and pay for all related expenses from the performance bond or escrow account. If the cost of correction exceeds the amount of the held security, the Director may collect the difference from the permittee.
 - b. Penalties for noncompliance. Any person who violates these regulations shall be subject to a civil penalty. Each day the violation continues shall constitute a separate offense.
 - i. First time offenders shall be subject to a civil penalty not to exceed five hundred dollars (\$500.00) per day of continuing violation.
 - ii. Each subsequent violation for the same section or provision shall be subject to a civil penalty not to exceed one thousand dollars (\$1000.00) per day of continuing violation.

- iii. No civil penalty arising from the same operative set of facts shall give rise to levying of a civil penalty more than once in any 10 day period or exceeding a total of \$3,000.

City Procedures for VSMP Inspections

Inspection Schedule

All permitted projects will be inspected as follows:

- A. Periodically, and/or
- B. In response to complaints.

Inspection Procedure

City inspections will be performed according to the following procedures:

1. Inspections will be performed to inspect for compliance with the approved erosion and sedimentation control plan. City staff will attempt to inform the construction site operator and/or permittee prior to the inspection.
2. Inspections will be documented on the inspection forms found in appendix 1 of this document.
3. After the inspection has been completed, a hard copy of the documentation will be saved in the inspector's files. Any pictures taken will be saved on the hard drive of the inspector's computer.
4. When a site fails an inspection, the information will be entered into the City's database generating a report for the permittee.
5. For those sites failing inspection, a notice to comply and a copy of the inspection report will be sent to the permittee. This notice can be hand delivered or sent to the permittee by certified mail. The notice to comply will specify the measures needed to bring the site into compliance with the approved VSMP permit and the timeframe allowed for compliance.
6. The time allowed for compliance will be determined by the inspector and will be based on the severity of the violation. No timeframe to comply will exceed 30 days.
7. After the timeframe to complete the required measures has expired, the City inspector will reinspect the site for compliance with the notice to comply.
8. All further enforcement action notification will follow the procedures outlined in this document.

Documentation

The inspection records shall include at a minimum:

1. The date of inspection,
2. The result of the inspection,
3. Any deficiencies,
4. The timeframe allowed for compliance with any noted deficiencies.

All records must be kept on file for a minimum of five years.

Enforcement VSMP Permit Violations

In cases where noncompliance is grossly affecting or presents an imminent and substantial danger of causing harmful erosion of lands or sediment deposition in waters within the watersheds of the Commonwealth or otherwise substantially impacting water quality, the Director of T&ES may issue, without advance notice or hearing, an emergency order directing such person to cease immediately all land-disturbing activities on the site.

For all other violations, enforcement action for failure to comply with an approved VSMP permit or for performing land disturbing activities without an approved permit will follow these steps:

1. After a notice to comply has been issued, the inspector will reinspect the site for compliance with the notice to comply.
2. If the site fails to meet all of the measures outlined in the notice to comply, the inspector may issue a written stop work order. A stop work order can be found in appendix 1 of this document.
3. The permittee will be given a timeframe to complete the measures needed to bring the site into compliance with the notice to comply and the approved VSMP Permit. The timeframe allowed will be determined by the inspector and will be based upon the severity of the violation.
4. During the time period the stop work order is active, no construction or other work on the site can take place other than corrective measures.
5. Once the time allowed to bring the site into compliance has expired, a notice of violation may be issued and the site referred to the City Attorney's Office. A notice of violation can be found in appendix 4 of this document.
6. Any violation of the VSMP Permit or failure to operate without a permit is subject to a civil penalty not to exceed \$32,500 per day per violation with each day of violation as a separate offense. The City Attorney's Office will pursue collection of the civil penalty through prosecution in the appropriate court.

Appendix 1-Inspection Form, Notice to Comply, and Stop Work Order

Transportation and Environmental Services
Infrastructure and Right-of-Way

2900 Business Center Drive
Alexandria, VA 22314
Phone: 703-746-4090

Stormwater Construction Site Inspection Report

Project Name: Location: Date: [Click to enter date](#)
 Inspector's Name: Weather Conditions:
 Time Since Last Precipitation: Precipitation Amount:

STAGE OF CONSTRUCTION

Pre-Construction Conference *Building Construction* *Demolition*
Clearing & Grubbing *Finish Grading* *Bond Release*
Rough Grading *Final Stabilization* *Other* _____

Reason for Inspection: Qualifying Rainfall Event Bi-weekly Inspection Other

Enforcement or Follow-up Action / Inspection Result:

Notice to Comply Stop work Order Re-inspection N/A

Erosion and Sediment Control Measures

Ref. No.	BMP Installed & Operating Properly?			Type of BMP / Activity	Location and Corrective Action Needed	Date to complete corrective action
	Yes	No	N/A			
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temporarily or permanently stabilization of exposed areas		
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stabilization of stockpiles		
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Adequate stabilization from vegetative cover		
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Installation and maintenance of perimeter sediment control		
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stabilization of earthen structures		
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Installation of sediment basins and or sediment traps		
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stabilization of slopes		

8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Installation of proper controls on new disturbed areas		
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Adequate catch basin inlet protection		
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Channel lining/outlet protection for storm water conveyance channels		
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Measures used to minimize impact for in-stream construction		
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Non-erodible material for temporary stream crossings		
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Re-stabilization of in-stream construction		
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Underground utilities being installed in accordance with applicable standards		
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Construction entrance/exit and prevention of offsite tracking		
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dust control to prevent sediment from leaving the site		

Pollution Prevention Measures						
Ref. No.	BMP Implemented and Maintained?			Type of BMP / Activity	Corrective Action Needed	Date to complete corrective action
	Yes	No	N/A			
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Vehicle and equipment fueling, cleaning, storage, and maintenance areas free of spills, leaks, or any other deleterious material		
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Covered dumpster for trash and litter		
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Concrete washout clearly marked and being used		
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sensitive areas (e.g., RPA, streams, mature trees) protected with barriers, flags, or similar		
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Additional control measures to address a TMDL		
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Materials with potential to impact stormwater stored under cover		

Stormwater Management Facility

Ref. No.	SWM Facility Under Construction?			Is Construction Complete?			Type of SWM Facility	Type of work being performed
	Yes	No	N/A	Yes	No	N/A		
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Stormwater Pollution Prevention Plan (SWPPP)			
Yes	No	N/A	SWPPP Check
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the SWPPP onsite?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the SWPPP need to be modified?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has the SWPPP been modified since the last inspection? If so, note the date:

Completion Deadline: [Click to insert date](#)

Verbal / Written Notification given / faxed to:

Please use space below if needed for additional instructions

Appendix 2-Letter of Intent

DATE

Owner Name

Owner Address

RE: Failure to comply with the approved erosion and sedimentation control plan

Site

Certified Mail #

LETTER OF INTENT

Dear NAME:

On DATE, the above reference site was issued a Notice to Comply from the City of Alexandria Office of Construction and Inspection for failure to comply with the site's approved erosion and sedimentation control plan. A stop work order was issued on DATE giving you X number of days to bring the site into compliance with the approved plan. As of today, the site remains out of compliance with the approved plan.

You have X days from the date of this letter to either bring the site into compliance or submit in writing a request for an extension. If the site is not brought into compliance or given an approved extension of time by DATE, the City will utilize your performance bond or cash escrow to apply the necessary corrective measures to the site. If the cost of correction exceeds the amount of the held security, the City may collect the difference from the permittee. Failure to complete corrective measures may also result in the issuance of a Notice of Violation and associated penalties of up to \$1000 per day per violation.

Section 5-4 of the City of Alexandria Code of Ordinances requires applicable development to operate under an approved erosion and sedimentation control plan and to remain in compliance with that plan. Specifically, Sec. 5-4-4 of the City Code states:

- a) It shall be unlawful for any person to construct, erect or alter any building or structure for which an approved erosion and sedimentation control plan is required by this chapter, except in accordance with the approved plan.
- b) It shall be unlawful for any person to clear, grade, excavate, fill, remove topsoil from or change the contour of any land in the city for which an approved erosion and sedimentation control plan is required by this chapter except in accordance with the approved plan.
- c) It shall be unlawful for any person to remove or destroy trees, shrubs, grass, weeds, vegetation, ground cover or other plant life on any land in the city for which an approved erosion and

sedimentation control plan is required by this chapter except in accordance with the approved plan.

The following observations were made during the inspection and require compliance measures:

- Comments
-

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in the Office of Transportation and Environmental Services at 703-746-4065, via email at **EMAIL**, or by fax at 703-519-8354 if you have any questions, need additional information, or to submit the above requested information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Deputy Director, Transportation and Environmental Services

CC: , Inspector,
 , Director, Transportation and Environmental Service
 , Deputy City Attorney

Appendix 3-Erosion and Sedimentation Notice of Violation

DATE

Owner Name

Owner Address

RE: Failure to comply with the approved erosion and sedimentation control plan
Site

NOTICE OF VIOLATION

Dear NAME:

On DATE, the above reference site was issued a Notice to Comply from the City of Alexandria Office of Construction and Inspection for failure to comply with the site's approved erosion and sedimentation control plan. A stop work order was issued on DATE giving you X number of days to bring the site into compliance with the approved plan. As of today, the site remains out of compliance with the approved plan.

Due to failure to respond to multiple notices by the City and/or to bring the site into compliance with the approved sedimentation and erosion control plan, you are hereby served a **NOTICE OF VIOLATION for violation of the City Code of Alexandria Title 5, Chapter 4-Erosion and Sedimentation Control.**

Section 5-4 of the City of Alexandria Code of Ordinances requires applicable development to operate under an approved erosion and sedimentation control plan and to remain in compliance with that plan. Specifically, Sec. 5-4-4 of the City Code states:

- a) It shall be unlawful for any person to construct, erect or alter any building or structure for which an approved erosion and sedimentation control plan is required by this chapter, except in accordance with the approved plan.
- b) It shall be unlawful for any person to clear, grade, excavate, fill, remove topsoil from or change the contour of any land in the city for which an approved erosion and sedimentation control plan is required by this chapter except in accordance with the approved plan.
- c) It shall be unlawful for any person to remove or destroy trees, shrubs, grass, weeds, vegetation, ground cover or other plant life on any land in the city for which an approved erosion and sedimentation control plan is required by this chapter except in accordance with the approved plan.

You will be assessed a civil penalty of \$500 per day per violation beginning DATE until the corrective actions below are completed.

The following items are required to bring your site into compliance:

- Comments

This office will pursue collection of the civil penalty through prosecution in the appropriate court. Additionally, the city may perform the necessary corrections and bill the property owner.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in Transportation and Environmental Services directly at 703-746-4065, via email at [email](#), or by fax at 703-519-8354 if you have any questions about the corrective measures. Please contact me with any questions about the scope and nature of the impending legal proceedings.

Please let me know if you have any questions.

Yours very truly,

Deputy City Attorney

CC: , Inspector
 , Deputy Director of Transportation and Environmental Services
 , Director of Transportation and Environmental Services

Appendix 4-VSMP Notice of Violation

DATE

Owner Name

Owner Address

RE: Failure to comply with the approved erosion and sedimentation control plan
Site

NOTICE OF VIOLATION

Dear NAME:

On DATE, the above reference site was issued a Notice to Comply from the City of Alexandria Office of Construction and Inspection for failure to comply with the site's approved VSMP permit. A stop work order was issued on DATE giving you X number of days to bring the site into compliance with the approved plan. As of today, the site remains out of compliance with the approved plan.

Due to failure to respond to multiple notices by the City and/or to bring the site into compliance with the approved sedimentation and erosion control plan, you are hereby served a **NOTICE OF VIOLATION for violation of the City of Alexandria Zoning Ordinance, Article XIII-Environmental Management.**

Section 13-111 of the Ordinance requires applicable development to operate under an approved VPDES permit, an approved stormwater management plan, an approved erosion and sedimentation control plan and an approved stormwater pollution prevention plan and to remain in compliance with those plans. Specifically, Section 13-126 of the City Code states:

Any person who violates any provision of this article or who fails, neglects, or refuses to comply with any order of the director of T&ES, shall be subject to a civil penalty not to exceed \$32,500.00 for each violation within the discretion of the court. Each day of violation of each requirement shall constitute a separate offense.

(a) Violations for which a penalty may be imposed under this subsection shall include but not be limited to the following:

- i. No state permit registration;
- ii. No SWPPP;
- iii. Incomplete SWPPP;
- iv. SWPPP not available for review;
- v. No approved erosion and sediment control plan;
- vi. Failure to install stormwater BMPs or erosion and sediment controls;
- vii. Stormwater BMPs or erosion and sediment controls improperly installed or maintained;

- viii. Operational deficiencies;
- ix. Failure to conduct required inspections;
- x. Incomplete, improper, or missed inspections; and
- xi. Discharges not in compliance with the requirements of 4FAC50-60-1170 of the general permit.

You will be assessed a civil penalty of \$500 per day per violation beginning **DATE until the corrective actions below are completed.**

The following items are required to bring your site into compliance:

- Comments

This office will pursue collection of the civil penalty through prosecution in the appropriate court. Additionally, the city may perform the necessary corrections and bill the property owner.

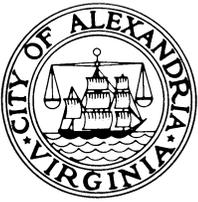
Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in Transportation and Environmental Services directly at 703-746-4065, via email at [email](#), or by fax at 703-519-8354 if you have any questions about the corrective measures. Please contact me with any questions about the scope and nature of the impending legal proceedings.

Please let me know if you have any questions.

Yours very truly,

Deputy City Attorney

CC: , Inspector
 , Deputy Director of Transportation and Environmental Services
 , Director of Transportation and Environmental Services



DEVELOPMENT PRELIMINARY SITE PLAN CHECKLIST

Department of Planning and Zoning, 301 King Street, Room 2100
Alexandria, Virginia 22314 Phone: (703) 746-4666

DSUP/DSP # _____

Project Name (different from project address): _____

Project Address: _____

Applicant's Name: _____

Submission Deadline: Plan submissions received before 3:00 pm will be processed and routed to reviewers the same day. Plan submissions received after 3:00 pm will be processed and routed the next business day. **Submit to the Planning and Zoning Office only to avoid processing delays.**

The following materials are required for a complete development preliminary plan submission:

_____ **Completed and Signed Development Special Use Permit or Development Site Plan Application**

_____ **Completed and Signed Preliminary Plan Checklist (this form)**

_____ **Filing Fee (DSUP and DSP).** For **DSUP:** \$2275 plus \$12/100 gross square feet of building, max \$60,075; **DSP:** \$2400 plus \$12/100 gross square feet of building, max. \$60,200. Other fees may apply.

_____ **Site Plans for Completeness Review of Preliminary Plan (first submission).** For each submission, provide **18** sets (where applicable, at least 1 color set labeled for P&Z) of site plan drawings, folded (if the plan set size is too large to be folded, rolled plans will be accepted). Additional copies may be requested if the application is within a special district.

_____ **Site Plans After Completeness Review (second submission).** Submit **24** full sized (folded). Twelve half-sized sets of the preliminary plan will be requested once the proposal is scheduled for a Planning Commission hearing. Additional copies may be requested if the application is within a special district.

_____ **Electronic Copy.** For **each submission**, provide a CD with PDF files of the entire site plan and other materials (i.e. Transportation Management Plans, Geological Study, etc.). Please submit as few PDF files as possible with clearly defined file names. (ex. Sheet C1 – C10 or Sheet C1 Title Sheet, Sheet C2 Notes, etc.)

_____ **Signature of professional certifying that the submission meets all requirements:**

I, _____ (print name), hereby certify that the drawings and other materials that accompany this checklist have met the requirements of the checklist, and the accompanying electronic copy is an exact duplicate of the hard copy submission.

Signature _____ Date _____

General Process Information:

Preliminary site plans will be reviewed for completeness by City staff. Comments will be returned to the applicant in approximately 3 weeks from submission listing additional information required for the application to be deemed complete.

The applicant must revise the site plan to address all comments of the completeness review and resubmit to Planning and Zoning. This submission must include 24 full-sized folded copies with a letter responding to each of the completeness comments and the specific location of the additions or corrections made to the plan. These plans are routed and reviewed again for completeness. **If they are still not complete the review of them will be suspended and the applicant will be notified of the information that is required.**

When the application is deemed complete, a confirmation letter or e-mail will be sent to the applicant. Within 5 working days of receipt of the confirmation the applicant shall install a notice of the proposed development at the site. When an application is complete, it will receive technical review by City agencies. Three weeks prior to the scheduled hearing date the applicant shall submit a sample materials board and/or color rendering.

FORMAT REQUIREMENTS FOR EACH SHEET:

- _____ Print size of 24" x 36"
- _____ Scale of no less than 1" : 40' with scale identified on each sheet – 1" : 20 or 1" : 30 preferred **Note: 1":25 is not an acceptable scale**
- _____ City approval signature block in same place (lower right corner) on each sheet (see attachment for configuration and size of block)
- _____ North point shown consistently in the same direction on all plan sheets with reference to source of meridian. North arrow pointing down is not acceptable
- _____ Property lines with course and distance for each
- _____ Name, address, signature and registration number of professional(s) preparing the plan on each sheet – all plans to be sealed by the appropriate professional
- _____ Legend of symbols, patterns, and abbreviations used
- _____ Date the plan was prepared/last revised

COVER SHEET:

- _____ Name and address of the developer and of the owner(s) of record
- _____ A narrative description of the project
- _____ Location map with the site shown in relation to the nearest intersection of two or more streets
- _____ Sheet Index
- _____ Key to plan sheets if more than one sheet is needed to show the whole site
- _____ Total area included in the site plan, total area of tax parcel, total existing and proposed impervious area on the tax parcel, and total area that will be disturbed during construction (all expressed in square feet and acres)
- _____ A list of all special use permits, site plan approvals and zoning modifications or waivers being requested
- _____ A list of all existing special use permits, site plans and proffers that apply to all or part of the site
- _____ Building Code analysis

ZONING TABULATIONS (May be included on cover where sufficient space exists)- *For each element, list zoning ordinance requirement and number proposed on preliminary plan:*

***Note: If the proposed development includes multiple lots, the zoning tabulation information must be provided for each individual lot unless all the lots will be consolidated in conjunction with the proposal.**

- _____ Zoning of the site (zoning proffers, if applicable)
- _____ Existing uses on the site
- _____ Proposed uses on the site
- _____ Lot area minimum required by zone district
- _____ Lot area (required and proposed)
- _____ Number of dwelling units (list by number of bedrooms for multifamily)
- _____ Units per acre for residential
- _____ Gross square feet (GSF) of building area*, total and listed by use, (with area devoted to parking included and listed separately)
- _____ Net square feet (NSF) or Floor Area, total and listed by use
- _____ Floor-area-ratios existing and proposed
- _____ Open space (required and proposed)
- _____ Open space total proposed and broken down by ground level space and usable space proposed.
- _____ Average finish grade for each building
- _____ Height of each building above average finish grade
- _____ Building setbacks (required and proposed) for each building

- _____ Frontage with required and proposed listed separately
- _____ Parking spaces (listed by compact, standard, handicapped size and total) required and proposed
- _____ Parking spaces (listed by location of parking i.e. above grade and/or below grade)
- _____ Loading spaces (required and proposed)
- _____ Existing and proposed trip generation

***Note: The gross square footage of a building or buildings on a lot or tract of land (whether “main” or “accessory”) is the sum of all gross horizontal areas under a roof or roofs. These areas shall be measured from the exterior faces of walls and from eaves of all roofs where they extend beyond the wall line, or from the center line of party walls.**

The net square footage OR Floor Area of a building or buildings on a lot or tract of land (whether “main” or “accessory”) is the sum of all gross horizontal areas under a roof or roofs. These areas shall be measured from the exterior faces of walls and from the eaves of all roofs where they extend beyond the wall line or from the centerline of party walls and shall include all space with headroom of seven feet six inches or more, whether or not provided with a finished floor or ceiling. Excluded shall be elevator and stair bulkheads, accessory water tanks, cooling towers and similar construction not susceptible to storage or occupancy. Basements and subbasements shall be excluded from the floor area ratio computations, but for the purpose of computing off street parking requirements that portion of such areas as are occupied by permitted uses shall be subject to the provisions of Article VIII. (special restrictions apply in Eisenhower East and Landmark – Van Dorn)

CONTEXTUAL PLAN:

- _____ Show the proposed project site(s) and adjacent areas affected by the project
 - _____ Proposed project site appropriately labeled
 - _____ Display a minimum of a quarter (1/4) mile in radius of proposed project
 - _____ Existing property lines, buildings, streets, metro, transit stops and routes, and major thoroughfares, if any, appropriately labeled

MAP OF EXISTING SITE CONDITIONS - *Show location, dimensions, size, height, and elevations of:*

- _____ Sidewalks, streets and their names (show full width, curblines and centerlines), alleys, existing easements (include emergency vehicle easements), covenants and reservations
- _____ Show the full right-of-way width of all adjoining streets and include all information for both sides
- _____ Roadway and lane widths and uses (right turn, left turn, etc.)
- _____ Traffic and pedestrian controls including signs, markings and signals
- _____ Existing transit/bus stops with route number identification adjacent to the property
- _____ On-street parking locations and individual spaces when designated
- _____ Driveways, entrances, exits, parking areas; show vehicle parking spaces by type (standard, compact and accessible) and indicate the number in each bay and total count. Dimensions shall exclude any obstructions such as columns or light poles
- _____ Building setbacks, highway setback lines and zone transition lines
- _____ Existing buildings and structures; show footprint and indicate height
- _____ Property lines, including adjoining property lines; show course and distance of each site boundary line
- _____ For adjoining properties, show current zoning and names and addresses of owners (show zoning district boundary lines if multiple districts exist on the site or adjacent parcels)
- _____ Transformers, valves, and other surface features of utility systems
- _____ Storm and sanitary sewer systems, water mains, and other buried utilities; indicate size

- _____ of lines and direction of flow for storm and sanitary lines; identify owner of each system
- _____ Fire hydrants and fire department connections

- _____ Major trees (6" or more in caliper) and shrubs (3' or more in height), located and identified by species, including street trees on public right-of-ways along property frontage. Also, locate and identify trees on adjacent properties with canopies that extend over the site. Identify species, size and locations of trees on opposite sides of fronting streets.
- _____ Recreation areas, swimming pools and bike and walking trails on abutting streets or public access easements
- _____ Watercourses, bodies of water, wetlands and limits of flood plains
- _____ Resource Protection Areas as defined in Article XIII of the Zoning Ordinance
- _____ Lighting on public rights-of-way adjacent to the site
- _____ Significant site features
- _____ Topography shown with 2' contours on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain
- _____ Slopes, terraces and retaining walls, including elevations of level areas and tops and bottoms of walls and exterior stairways and ramps
- _____ Indicate the following on the plan- underground storage tanks; areas located within 1,000 feet of a former sanitary landfill, dump or disposal area; areas with the potential of generating combustible gases.
- _____ Location of buildings listed on the Alexandria List of 100-Year Old Buildings that occur on the site or on adjacent parcels
- _____ A statement indicating whether or not the Site has areas of Marine Clay
- _____ Indicate areas on plan and provide a statement describing any known or expected contamination or brief narrative of due diligence completed (site history) if none is expected

PRELIMINARY SITE PLAN - *Include existing features to be retained and show location, dimension, size, height and elevation of proposed:*

- _____ Boundaries of zoning districts on the site and adjoining sites
- _____ Sidewalks, streets, alleys with widths labeled, and elevations
- _____ Show the full width and centerlines of all adjoining streets
- _____ Existing and modified lane widths and uses (right turn, left turn, etc.)
- _____ Existing and proposed traffic controls including signs, markings and signals
- _____ Sidewalks, bike and walking trails on sites and on abutting streets or public property/easements, with widths of each
- _____ Bicycle parking spaces provided per City Standards
- _____ Bicycle and pedestrian paths per the Transportation Master Plan and 1998 *Bicycle Transportation and Multi-Use Trail Master Plan*, including existing and proposed routes
- _____ Direction of traffic and volumes at all site entrances, exits and intersections
- _____ Sight distance per AASHTO at all driveways and street intersections
- _____ Curb radii at intersections and driveway entrances for public and private streets and alleys, and within parking lots; note AASHTO turning radii
- _____ Existing and proposed on-street parking locations and individual spaces when required
- _____ Driveways, entrances, exits, parking areas; show parking spaces by type (standard, compact and handicap) and indicate the number in each bay and the total count
- _____ Locations of underground parking and indicate the footprint of related subsurface structures
- _____ Garage layouts with columns shown and drive aisle and parking spaces dimensioned. Parking space widths and lengths do not include the column width. The use of "typical" may be used provided it dimensions all types of spaces/aisles and is used in enough places that the review can be performed accurately.

- _____ Vehicle turning movements for any parking lot or garage, entrances and drive aisles, accessible spaces with AASHTO standard vehicle
- _____ Vehicle turning movements for loading zones with the largest vehicle that will access the site
- _____ Slope of entrance ramp
- _____ Locations of building entrances and exits
- _____ Building setbacks, highway setback lines, zone transition lines and vision clearances
- _____ Provide sections demonstrating compliance with the Section 6-403
- _____ Show any transition zone setback, if applicable
- _____ Easements, covenants and reservations including emergency vehicle easements (EVE) (existing and proposed)
- _____ Property lines; show course and distance of each site boundary line
- _____ Yard dimensions for setback requirements
- _____ Buildings and structures, including optional decks and other projections such as canopies, bay projections, roof overhangs; or maximum building envelope (where approved as envelope) showing outside dimensions, including height, and first floor elevations
- _____ Stoops, steps and staircases (with elevations)
- _____ Distances between buildings and adjoining property lines
- _____ Storage space for solid waste and recyclable material containers with trash truck turning movements and pick up locations
- _____ Storm and sanitary sewer systems, including lateral lines, water mains and service lines, with size, direction of flow and owners indicated in plan view for both existing and proposed
- _____ Gas mains and service lines; with size of line and owner of line indicated
- _____ Fire hydrants, water mains and service lines; with size of line and owner of line indicated
- _____ Electric, telephone, cable and all other utilities on the property; identify owners
- _____ Transformers, switchboxes, cable boxes, poles, telephone pedestals, and other surface features of utility systems and elevations
- _____ Existing and proposed light poles and fixtures on-site and on adjoining rights-of-way
- _____ Existing and proposed bus stop(s) and bus stop amenities
- _____ Recreation areas, swimming pools. (Discharge from swimming pools shall be shown connected to the sanitary sewer in plan view.)
- _____ Watercourses, bodies of water, wetlands and limits of flood plains
- _____ Resource Protection Areas as defined in Article XIII of the Zoning Ordinance and developable area
- _____ Significant site features
- _____ Limits of Disturbance
- _____ Proposed grading shown with 2' contours on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain
- _____ Slopes, terraces and retaining walls, including elevations of level areas and tops and bottoms of walls and exterior stairways and ramps

LANDSCAPE PLAN - *(Proposed landscape plan must comply with the " City of Alexandria Landscape Guidelines, 2007" published by the Department of Recreation, Parks and Cultural Activities, City of Alexandria)*
http://alexandriava.gov/uploadedFiles/recreation/info/040907_land_guidelines.pdf

- _____ Buildings, and other structures and all building entrances
- _____ Streets, driveways, sidewalks, trails, intersections and all paved areas
- _____ Utilities and utility easements, existing and proposed
- _____ Locations of off-site and on-site lighting, including street lighting
- _____ Existing vegetation to be removed; include locations, size and species of all trees 6" or greater in caliper
- _____ Street trees and natural vegetation to be retained; include locations, approximate

- _____ driplines, size and species of all trees 6" or greater in caliper
- _____ Details of protection structures to be used for existing trees to be preserved
- _____ Proposed street tree species, locations, and planting details
- _____ Indicate the distances between street trees

- _____ Location and dimensions of areas to be landscaped (including within public right-of-ways), specifying the location, names, caliper, and size of proposed individual trees, shrubs, and ground cover plants (indicate initial and final height for trees and shrubs, initial width for shrubs, and initial spread for groundcover plants)
- _____ Tabulation of required, existing and proposed crown coverage (**Do not include street trees.**)
- _____ Show existing and proposed trails, roadways and sidewalks
- _____ Plans shall be sealed by a Certified/Registered Landscape Architect.

OPEN SPACE PLAN:

- _____ Open space areas graphically showing the square footage and type (ground level or rooftop)

LIGHTING PLAN/SIGNAGE PLAN:

- _____ Building and structures
- _____ Location of all existing and proposed lights, including street lights and building lights.
- _____ Type of fixture
- _____ Show the locations and height of proposed signs and provide information needed to assess compliance with the sign ordinance and applicable special guidelines.

GIS - DIMENSION PLAN - *Include existing features to be retained and show location, dimension, size, height and elevation of:*

- _____ Sidewalks, streets, alleys, driveways and parking lots; (edge of pavement or top of curb)
- _____ Show the full right-of-way width and centerlines of all adjoining streets
- _____ Buildings and structures, showing outside dimensions, including height
- _____ Property lines
- _____ Stoops, steps and staircases
- _____ Locations of building entrances; identification of primary building entrance, secondary entrances and any mock entrances if applicable
- _____ 3 x y coordinate pairs in state plane coordinates (NAD 83) conforming to 50 scale (1:600/1"=50') National Map Accuracy Standards.

***Note: The Dimension Plan is used to update the City of Alexandria's Geographic Information System and therefore should contain only the information specified above. Additionally, Alexandria GIS does not meet the threshold for accuracy, as listed for the coordinate data above and is therefore not suitable as source for obtaining this coordinate information.**

ELEVATIONS AND SECTIONS:

- _____ Scaled architectural elevations of each building face, with materials labeled
- _____ Scaled elevations showing landscaping plan or screening treatment along public rights-of-way
- _____ Scaled sections through buildings
- _____ Scaled sections showing grade changes in relationship to buildings and/or retaining walls
- _____ Scaled sections showing average finished grade line and scaled heights, including penthouses
- _____ A detailed graphic showing floor area analysis indicating areas that have been deducted for purposes of the FAR calculation. If the FAR deductions exceed 20% of the overall building's square footage, written justification shall be submitted.

_____ Scaled floor plans

ENVIRONMENTAL QUALITY AND QUANTITY PLAN - Plans for collecting and depositing stormwater, including approximate pipe sizes, structures and BMPs:

- _____ Pre- and post-development, 2 and 10 year stormwater computations
- _____ Drainage area map delineating area contributing stormwater onto the project
- _____ Narrative describing how the project will comply with the stormwater quantity and quality requirement of Article XIII of the Zoning Ordinance
- _____ Water quality worksheet A or B and Worksheet C
- _____ Drainage area map with scale and north arrow indicating the area draining to the selected water quality BMPs
- _____ City standard water quality BMP data blocks (2)
- _____ Preliminary calculations of sanitary flow generated from the site
- _____ Narrative describing how the project will comply with the requirements of Memo to Industry 02-07 titled *New Sanitary Sewer Connection and Adequate Outfall Analysis*

When subdivision of land is involved, include a PRELIMINARY SUBDIVISION PLAT - (Refer to Section 11-1700 of the Alexandria Zoning Ordinance for additional requirements.)

- _____ Plat size shall not exceed 24" x 36"
- _____ Scale no less than 100' to 1"
- _____ Subdivision name
- _____ Name, address of owner of record and the applicant
- _____ Name, address, certificate number and seal of the surveyor or engineer
- _____ Gross area in acres and total number of buildings, lots or sites involved
- _____ Date, scale and north point with reference to source of meridian
- _____ Zoning of the property
- _____ A form or space, not less than two and one-quarter by three and one-half inches, on which approval by the commission may be shown
- _____ Lot lines with the dimensions of the length and width of the lots
- _____ In the case of resubdivisions, all lot lines or lot numbers that are proposed to go out of existence by reason of the resubdivision shall be shown by dotted lines and numbers
- _____ Location of the property immediately adjoining the proposed subdivision and the names and addresses of all its owners
- _____ Location and width of all proposed streets, alleys and public areas and their dimensions
- _____ Points of connection with the city sewer system
- _____ Location of all easements, reservations, and highway setbacks, as established by section 7-1006 of the zoning ordinance
- _____ The width and name of adjacent existing streets, alleys, easements, public utilities, and railroads shown graphically
- _____ Limits of floodplains and resource protection areas
- _____ The location of metal monuments not less than one inch in diameter and 24 inches in length shown thus: O, and located in the ground at each intersection of streets and alleys with plat boundary lines, and at all points on street, alley, and boundary lines where there is a corner, change in direction, or curvature.
- _____ Any deed restrictions shall be recorded with this plat, if applicable.
- _____ A surveyor's or engineer's seal and certificate of survey in the following form, which may be modified to accommodate title information:

"I hereby certify that I have carefully surveyed the property delineated by this plat, and that it is correct to the best of my knowledge and belief; that this is a subdivision of part (or all) of the land conveyed by

_____ to _____ by deed dated _____ and recorded among the land records of _____ in Deed Book _____ at page _____ and is within those boundaries; and that all required monuments have been installed where indicated; except those that will be installed at a later date but before completion of the project.

“Certified Surveyor or Engineer”

_____ A curve table shall be placed on the final plat containing the following for all curvilinear boundaries and street centerlines; delta, radius, arc, tangent, chord and chord bearing. All distances shall be shown to the nearest one-hundredth of a foot; angles or bearings to the nearest ten seconds.

ADDITIONAL STUDIES – IF REQUIRED

WATER QUALITY ASSESSMENT (in case of RPA encroachment)

_____ See Article XIII of the Zoning Ordinance for specific requirements

ARCHAEOLOGICAL ASSESSMENT

- _____ Documentary Study and initial Archaeological Evaluation completed and submitted by Alexandria Archaeology
- _____ Appropriate archaeology comments on all site plan sheets involving ground disturbance
- _____ Locations and themes for historical interpretive elements and markers on plan, if applicable.

BUILDING MASSING STUDY

_____ A physical model showing the mass and scale of the proposed buildings relative to surrounding buildings. This should be a scaled three-dimensional representation of the proposed building mass (including building articulation) in the context of surrounding buildings. Digital models and/or photomontage may be substituted for physical models if deemed acceptable by the Director of Planning & Zoning.

TRANSPORTATION IMPACT STUDY

_____ Submit all Transportation Studies or Memo.

AFFORDABLE HOUSING PLAN

_____ A statement of intended voluntary contribution to the City’s Housing Trust Fund or, in the case of a residential project, a voluntary Affordable Housing plan that specifies the number of affordable on-site units, by unit type, or a statement explaining why the developer is unable to include the on-site units, along with the developer’s proposed voluntary contribution to the Housing Trust Fund

_____ It is the City's policy that a voluntary contribution for affordable housing be made on all new development. The payment should be paid to the City prior to issuance of certificate of occupancy in the case of commercial development or rental housing, and paid at sale to end user in the case of for-sale housing. In lieu of this contribution, a developer may submit an Affordable Housing Plan to the Office of Housing proposing another means of meeting the affordable housing requirement.

<http://alexandriava.gov/housing/info/default.aspx?id=6628>

Design Guidelines/Updated information

Guidelines Link -<http://alexandriava.gov/planning/info/default.aspx?id=14676>

_____ If located along Mount Vernon Avenue, information required by the *Mount Vernon*

- _____ *Avenue Design Guidelines*, including information necessary to assess compliance with the guidelines.
- _____ If located within the Old Town North area, information required by the *Old Town North Design Guidelines*, including information necessary to assess compliance with the guidelines.
- _____ If located within the Old and Historic Alexandria District, information required by the *Alexandria Historic District Design Guidelines*.
- _____ If located within the Parker Gray Historic District, information required by the *Alexandria Historic District Design Guidelines*.
- _____ If involving a site which occupied by a building on the list *Buildings over 100 Years Old Outside the Historic Districts*, information required by the *Alexandria Historic District Design Guidelines*.
- _____ If located along Washington Street, information required by the *Washington Street Standards*, the *Washington Street Guidelines*, the *Old Town North Urban Design Guidelines* and the *Alexandria Historic District Design Guidelines*.
- _____ If located within the Carlyle CDD, information required by the *Carlyle Design Guidelines* and the *Carlyle Streetscape Design Guidelines*.
- _____ If located within the Potomac Yard/Potomac Greens Small Area, information required by the *Potomac Yard Urban Design Guidelines*.
- _____ Link to Transportation and Environmental Services – Memos to the Industry Link - <http://alexandriava.gov/tes/info/default.aspx?id=3522>
- _____ Four Mile Run Design Guidelines

ADDITIONAL APPLICATIONS WHICH MAY BE REQUIRED FOR CERTAIN DEVELOPMENT PROPOSALS

Generally, all applications related to the same development proposal are required to be processed concurrently. There is a separate fee for each of these applications. See current fee schedule. Check those which are submitted with this application.

- _____ **Master Plan and/or Rezoning.** Required when the proposal requires different zoning or a change to the City's Master Plan. See sections 11-800 and 11-900 of the Zoning Ordinance.
- _____ **Transportation Management Plan Special Use Permit.** Required for any project containing 50,000 sq.ft. or more of commercial space, 40,000 sq.ft. or more of retail space, 150,000 sq.ft. or more of industrial space or 250 or more residential units. See section 11-700 of the Zoning Ordinance.
- _____ **Vacation.** Required when a portion of the public right-of-way is proposed to be acquired and utilized in the development.
- _____ **Encroachment.** Required when portions of the building (including stoops, steps, awnings, etc.) or planters, etc. project into the public right-of-way.
- _____ **Coordinated Development District (CDD) Concept Plan.** Required on tracts zoned CDD, in order to proceed with development under the CDD zoning. See section 5-600 of the Zoning Ordinance.
- _____ SUP for parking reductions and signs
- _____ **Board of Architectural Review Approvals.** Required when the project is within one of the City's two historic districts. See chapter 10 of the Zoning Ordinance. ***Note this requires separate application and approval process**

Revised:
7/26/2013 – RAL
12/9/2013 – JXB



FINAL DEVELOPMENT SPECIAL USE PERMIT (DSUP) AND DEVELOPMENT SITE PLAN (DSP) CHECKLIST

Department of Planning and Zoning
Development Division, City Hall
301 King Street, Room 2100
Alexandria, Virginia 22314
Phone: (703) 838-4666

Project Name: _____

Project Location (Address): _____

Tax Map References: _____

Applicant Name: _____

Applicant Address: _____

Applicant E-mail Address: _____

The following materials are required for a complete Final Site Plan (DSUP/DSP) submission:

_____ **Completed Final Site Plan Application Form**

_____ **Completed and Signed Final Site Plan Checklist**

_____ **Filing Fee.** The final site plan fee is \$2,000 plus \$8.00/100 gross square feet of building, maximum \$20,000 (Note: incomplete resubmissions: first free, 2nd and subsequent \$1,000) plus final subdivision fee, if applicable.

Payment Rc'd:	_____ / _____ / _____
	date amt initials
Payment Verified	_____ / _____ / _____
	date amt initials

_____ **Completed and signed ESI checklist**

_____ **ESI fee for Transportation & Environmental Services Review**, if applicable

Check here to specify non-ESI member, with no ESI review required

_____ **Response Letter.** A response letter must be provided with the initial final site plan submission which provides a response to **EACH** recommendation, code requirement, and finding contained in the Preliminary DSP or DSUP staff report, and for subsequent final submissions, which responds to **EACH** staff comment on the prior final review. Responses must include a reference to the plan sheet where change has been made. The Response Letter must also include a detailed description of and justification for any changes made to the plan which are not a result of a specific approval condition or staff comment.

Final DSUP and DSP Checklist:

_____ **Final Site Plans.** Eighteen sets of Final Site Plan drawings (rolled) shall be provided. (Lesser numbers may be required after the first submission; check with the Development Team Leader. The last submission will require three sets of prints, one set of mylars, and an electronic file of the site plan in .dxf format.) **NOTE: When second and subsequent final site plans are submitted all sets shall be marked in red where the changes to the plans have been made in response to review comments.**

All Final Site Plans and application materials shall be submitted to the Department of Planning and Zoning at the above address. Plans will not be distributed for review to other departments until a complete submission, with all items, is filed. Submission of any materials to departments other than Planning & Zoning may result in a processing delay, as review dates are determined by routing from Planning & Zoning.

I certify that I am responsible for the preparation of the final site plans being submitted and that the plans are consistent with all prior approvals granted by the City except as may be called out in the Response Letter accompanying this final site plan submission. I further certify that I have filled out the attached check list and confirmed that all required information has been provided.

Signature of Engineer/Architect/Surveyor

Date of Submission

Final DSUP and DSP Checklist:

FINAL SITE PLAN DRAWINGS SUBMISSION FORMAT/REQUIREMENTS:

Note: The following sheets and information are required for every submission. Additional sheets and information should be provided where necessary to demonstrate compliance with City requirements or conditions of approval.

REQUIREMENTS FOR EACH SHEET

- ___ Print size shall not exceed 24" x 36" and all sheets shall be the same size
- ___ Scale no less than 40' to 1" (20' or 30' to 1" preferred), with scale identified on each sheet
- ___ City approval signature block in same place (lower right corner) on each sheet (see attachment for configuration and size of block)
- ___ Date, scale and north point with reference to source of meridian
- ___ Name, address, signature and registration number of professional preparing the plan on each sheet
- ___ Date the plan was prepared on each sheet

COVER SHEET

- ___ Name and address of the developer and of the owner(s) of record
- ___ A narrative description of the proposed development
- ___ Location map with the site shown in relation to the nearest intersection of two or more streets
- ___ Index to plan sheets
- ___ Key to plan sheets if more than one sheet is needed to show the whole site
- ___ Total area included in the site plan, total area of tax parcel, total existing and proposed impervious area on the tax parcel, and total area that will be disturbed during construction (all expressed in square feet and acres)
- ___ A list of all special use permits and zoning modifications or waivers **approved** with the preliminary plan
- ___ Notes
 - ___ Noise
 - ___ ESA Statement (amend accordingly)
 - ___ Wells
 - ___ Contaminated Lands
 - ___ E&S
- ___ Table of all symbols and abbreviations utilized in the plan set.

ZONING TABULATIONS (May be provided on cover where sufficient space exists)

For each element, list zoning ordinance requirement, number approved on preliminary plan and number proposed on final plan, if different.

****Note:** If the proposed development includes multiple lots, the zoning tabulation information must be provided for each individual lot unless all the lots will be consolidated in conjunction with the proposal.**

- ___ Zoning of the site
 - ___ Existing uses on the site
 - ___ Proposed uses for the site
 - ___ Lot area (and minimum lot area under zoning, if applicable)
- Final DSUP and DSP Checklist:

- _____ Number of dwelling units (list by number of bedrooms for multifamily)
- _____ Units per acre for residential
- _____ Gross square feet (GSF) of building area*, total and listed by use (with parking listed separately)
- _____ Net square feet (NSF) of floor area, total and listed by use
- _____ Floor-area-ratio (existing if applicable, and proposed listed separately and combined)
- _____ Open space, with ground level open space listed separately from other open space
- _____ Average finished grade of each building
- _____ Height of each building
- _____ Yards; required and proposed listed separately
- _____ Frontage; required and proposed listed separately
- _____ Parking spaces (listed by compact, standard, and handicapped sizes and total)
- _____ Loading spaces
- _____ Existing and proposed trip generation

***Note: The gross square footage of a building or buildings on a lot or tract of land (whether “main” or “accessory”) is the sum of all gross horizontal areas under a roof or roofs. These areas shall be measured from the exterior faces of walls and from eaves of all roofs where they extend beyond the wall line, or from the center line of party walls. Parking garages, other than garages attached to, or on the same lot with, individual residences and designated for use by a single household, are excluded from the gross square footage calculation.**

DSP/DSUP CONDITIONS WITH PLANNING COMMISSION & CITY COUNCIL ACTIONS

(Place this information on a separate sheet of the submission following the cover sheet)

- _____ Copy of the approved DSUP/DSP conditions, with action, from the staff report for the project
- _____ Copy of the City Department Comments containing Code Requirements from the staff report.

EXISTING CONDITIONS PLAN

- _____ Same sheet as required in preliminary site plan (with corrections, if any required by approval)

FINAL SITE PLAN

Include existing features to be retained and show location, dimension, size, height and elevation of:

- _____ Boundaries of zoning districts on the site
- _____ Sidewalks, streets, alleys with widths labeled, and elevations
- _____ Show the full right-of-way width and centerlines of all adjoining streets
- _____ Existing and modified lane widths and uses (right turn, left turn, etc.)
- _____ Traffic controls including signs, markings and signals on a separate sheet if necessary (see Traffic Signal Plan, below)
- _____ Maintenance of traffic plan
- _____ Existing and proposed on-street parking locations and individual spaces when required
- _____ Direction of traffic and volumes at all site entrances, exits and intersections
- _____ Sight distance per AASHTO at all driveways and street intersections; horizontal and vertical
- _____ Easements, covenants and reservations including emergency vehicle easements (EVE)
- _____ Building restriction lines, highway setback lines, zone transition lines, vision clearances
- _____ Property lines; show course and distance of each site boundary line
- _____ Dimensions of front, side and rear yards
- _____ Buildings and structures, including optional decks and other projections such as canopies, roof overhangs; or maximum building envelope (where approved as envelope) showing outside dimensions, including height, and first floor elevations

Final DSUP and DSP Checklist:

- _____ Stoops, steps and staircases
- _____ Locations of building entrances and exits
- _____ Sump pump and roof drain outfalls
- _____ Locations of underground parking and the extent of related subsurface structures
- _____ Dimensions of all on-site parking spaces indicating type (standard, compact or handicapped)
- _____ Storm and sanitary sewer systems, including lateral lines, water mains and service lines, with size and owner of line indicated; indicate direction of flow; profiles; calculations for storm and sanitary
- _____ Gas mains and service lines; with size of line and owner of line indicated
- _____ Fire hydrants, water mains and service lines; with size of line and owner of line indicated
- _____ Electric, telephone, cable and all other utilities on the property; identify owners
- _____ Transformers, switchboxes, cable boxes, telephone pedestals, and other surface features of utility systems
- _____ Light poles and fixtures on-site and on adjoining rights-of-way
- _____ Driveways, entrances, exits, parking areas; show parking spaces by type (standard, compact and handicap) and indicate the number in each bay and the total count
- _____ Curb radii at intersections and driveway entrances for public and private streets and alleys, and within parking lots
- _____ Sidewalks, bike and walking trails on sites and on abutting streets or public property/easements
- _____ Recreation areas, swimming pools
- _____ Watercourses, bodies of water, wetlands and limits of flood plains
- _____ Resource Protection Areas as defined in Article XIII of the Zoning Ordinance
- _____ Soil boring data and test reports for sites containing marine clay or fill, and when the Director of Transportation and Environmental Services requires
- _____ Significant geological features
- _____ Proposed grading shown with 2' contours on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain
- _____ Slopes, terraces and retaining walls, including elevations of level areas and tops and bottoms of walls and exterior stairways and ramps
- _____ Indicate elevations at the base of all utility structures other than individual poles, such as fire hydrants and transformers
- _____ Provide rim elevation and invert elevations of all piping at manholes
- _____ Elevations of streets and alleys
- _____ Total area that will be disturbed during construction (expressed in square feet, acres, and delineated accordingly)
- _____ Roadway alignment data

LANDSCAPE PLAN

(See "Landscape Guidelines" published by the Department of Planning and Zoning, City of Alexandria.)

- _____ Buildings, streets, driveways, paved areas and other structures
- _____ Utilities and Utility easements
- _____ Locations of off and on site lighting including street lighting
- _____ Street trees and natural vegetation to be retained; include locations, size and species.
- _____ Proposed tree protection locations and details
- _____ Proposed trees and landscaping, including within public right-of-ways
- _____ Location and dimensions of areas to be landscaped (including within public right-of-ways), specifying the location, names, species, caliper, and size of proposed individual trees, shrubs, and ground cover plants (indicate initial height for trees and shrubs, initial width for shrubs,

Final DSUP and DSP Checklist:

and initial spread for groundcover plants)

- _____ Tabulation of required, existing and proposed crown coverage
- _____ Tree and shrub planting details
- _____ Landscape planters on underground parking
- _____ Total area that will be disturbed during construction (expressed in square feet, acres, and delineated accordingly)
- _____ The following notes:
 - _____ All materials' specifications shall be in accordance with the industry standard for grading plant material-The American Standard for Nursery Stock (ANSI Z60.1).
 - _____ Maintenance of all trees and landscape materials shall conform to accepted industry standards set forth by the Landscape Contractors Association, American Society of Landscape Architects, the International Society of Arboriculture, and the American National Standards Institute.

LIGHTING PLAN

- _____ Buildings and structures
- _____ Location of all existing and proposed lights, including street lights and building lights.
- _____ Type of fixture
- _____ Mounting height
- _____ Strength of fixture in lumens or watts
- _____ Manufacturers' specifications for fixtures
- _____ Photometric calculations (point lighting plan) accounting for proposed street trees

EROSION AND SEDIMENT CONTROL PLANS

- _____ Erosion and Sediment (E&S) Control Plan Sheets showing:
 - _____ Two-phase plan for sediment and erosion control
 - _____ Narrative phasing plan including demolition and sequence of construction activities
 - _____ All appropriate details of erosion and sediment control measures (must meet Virginia Erosion and Sedimentation Control Handbook (VESCH) standards)
 - _____ Sources of water for construction entrance washdown
 - _____ Grading for drains and traps for construction entrance runoff
 - _____ Phase1 drainage area map indicating existing conditions drainage area, runoff coefficients and peak discharges for 2- and 10-year storms
 - _____ Phase 2 drainage area map indicating drainage areas to selected BMPs, runoff coefficients and peak discharges for 2- and 10-year storms
 - _____ Show and list appropriate control measures defined for each drainage area
 - _____ Total area that will be disturbed during construction (expressed in square feet, acres, and delineated accordingly)
 - _____ Identify areas having different ground covering materials (i.e. concrete, asphalt, gravel, turf, crushed stone, etc.)
 - _____ Delineate any wetlands or Resource Protection Areas (RPA)
 - _____ Legend for line types (must be in accordance with VESCH)
 - _____ Grading for sediment traps and basins
 - _____ Tabulate drainage area, wet volume, dry volume, and clean-out volume for traps and basins with respective elevations
 - _____ Temporary and permanent seeding mixtures
 - _____ Erosion and Sediment Control Narrative to include:

Final DSUP and DSP Checklist:

- _____ Adjacent properties
- _____ Critical areas
- _____ Soils description
- _____ BMP strategies
- _____ Maintenance practices to be employed
- _____ Phasing
- _____ Standard notes
- _____ Stockpiling procedures
- _____ Contaminated soils
- _____ Calculations for:
 - _____ Traps
 - _____ Basins
 - _____ Dewatering structures
 - _____ Culvert protection
 - _____ Culvert sizing
- _____ Block for Certified Responsible Land Disturber
- _____ References to any needed VPDES permit and indication that a copy will be filed with the City
- _____ References to any needed POTW permit and indication that a copy will be filed with the City
- _____ Geotechnical information

STORMWATER MANAGEMENT/BMP SHEETS

(See Article XIII of the Zoning Ordinance for guidance on water quality calculations)

- _____ Water Quality Impact Assessment
 - _____ Location and description of RPA components
 - _____ Location and nature of RPA encroachment
 - _____ Type and location of proposed BMP, with supporting calculations
- In addition, where a MAJOR assessment is required:
 - _____ Hydrogeological element
 - _____ Landscape plan supplement
 - _____ Ecological impact analysis
- _____ Stormwater Management Sheets
 - _____ Outfalls located and determined to be adequate for proposed discharge
 - _____ Pre and post development calculations
 - _____ Drainage divides off-site identified and delineated
 - _____ Drainage divides on-site identified and delineated
 - _____ Show flow routing to detention
 - _____ Calculate HGL and depict on profiles showing 2 feet of freeboard
 - _____ Computation and display of inlet flow
 - _____ Show full flow calculations
 - _____ Demonstrate that velocities are no less than 2 FPS and no more than 20 FPS
 - _____ Use N-values $>36"=0.015$ & $\leq 36" 0.013$
 - _____ Show erosive velocity at outfalls
 - _____ BMP Sheets
 - _____ Water Quality Volume (WQV) computation (in cubic feet and acre-feet)
 - _____ Drainage area map with scale and north arrow indicating the area draining to the

Final DSUP and DSP Checklist:

- _____ selected water quality BMPs
- _____ Water Quality Worksheets A or B and C
- _____ City standard water quality BMP data blocks (2)
- _____ BMP detail including WQV default elevation
- _____ Surface appurtenance casting detail
- _____ Signage detail for surface BMP
- _____ Standard BMP notes
- _____ Waiver approval letters

SIGNING AND MARKING PLANS

- _____ Street layout, including curb lines or edge of pavement, sidewalks, handicap ramp locations
- _____ Existing pavement markings, noting markings to be eradicated
- _____ Proposed new pavement markings, including pattern, width and color
- _____ Dimensions of proposed lane widths, and parking lanes and spaces
- _____ Pavement marking materials specifications, including type and thickness
- _____ Existing signs to be retained, removed or relocated
- _____ Proposed new traffic signs, including locations, MUTCD sign codes where applicable, and special legends
- _____ Sign schedule including sign code, size, legend, sheeting and sign blank specifications, special installation requirements

TRAFFIC SIGNAL PLAN

- _____ Intersection layout showing poles, mast arms, signal head, detector and controller locations and specifications
- _____ Intersection lane use and markings
- _____ Vehicular and pedestrian signal head configurations
- _____ Signal phasing and sequence charts and initial timing plans
- _____ Location of power connection
- _____ Cable and conduit layout, sizes and specifications
- _____ Wiring size and specifications
- _____ Interconnect details
- _____ Specifications for poles, mast arms and pole foundations; pole foundation designs sealed by registered engineer

FIRE SAFETY PLAN

(See 'Water and Fire Requirements For Site Plans and New Construction' prepared and published by the City of Alexandria Fire/EMS Department.)

- _____ Building foot prints, driveways, parking areas.
- _____ Building entrances and exits
- _____ Use group classification and type of construction (defined by USBC).
- _____ Existing and proposed water main location and size
- _____ Existing and proposed fire hydrant locations
- _____ Available water pressure and flow capability, static pressure, residual pressure, flow in GPM
- _____ Fire flow calculations in accordance with city standards that are prepared by a licensed engineer that determine the require fire flow for the project. Verification that the existing and/or proposed infrastructure is capable of providing the required fire flow shall be provided..
- _____ Type of fire suppression or detection system to be provided (e.g. sprinklers, standpipes, smoke

Final DSUP and DSP Checklist:

or heat detectors).

- _____ Location and size of underground fire lines
- _____ Location of fire department siamese connection (typically, street front of building)
- _____ Height of building in feet and stories
- _____ Identification of fire walls, tenant separations, etc.
- _____ Topographical map relating grade and elevation to fire department connections.
- _____ Location of all Emergency Vehicle Easements and of EVE signs outlining the EVE
- _____ Emergency vehicle turnaround space for drive aisles in excess of 100 feet.
- _____ Fire ladder truck access to the front and rear of all buildings in excess of 50 feet in height.

DIMENSION PLAN

(The Dimension Plan is to be submitted with the first and second submission as a separate sheet. A paper copy of the dimension plan is to be submitted at the time of the mylar submission.)

Include existing features to be retained and show location, dimension, size, height and elevation of:

- _____ Sidewalks, streets, alleys, driveways and parking lots; (edge of pavement or top of curb)
- _____ Show the full right-of-way width and centerlines of all adjoining streets
- _____ Buildings and structures, showing outside dimensions, including height
- _____ Property lines
- _____ Stoops, steps and staircases
- _____ Locations of building entrances; identification of primary building entrance if applicable
- _____ 3 x,y coordinate pairs in state plane coordinates (NAD 83) conforming to 50 scale (1:600/1"=50') National Map Accuracy Standards.
- _____ Fire Hydrants

Note: The Dimension Plan is used to update the City of Alexandria's Geographic Information System and therefore should contain only the information specified above. Additionally, Alexandria GIS does not meet the threshold for accuracy, as listed for the coordinate data above and is therefore not suitable as source for obtaining this coordinate information.

DETAILS

(Details may be incorporated into relevant sheets if sufficient space is available.)

- _____ Fences and walls, retaining walls
- _____ Street typical sections
- _____ Pavement sections
- _____ Curbs
- _____ Driveway aprons
- _____ Handicap ramps
- _____ Location and dimension of all handicapped parking spaces
- _____ Sidewalks and plaza sections/details
- _____ Signs
- _____ Trash receptacles
- _____ Two benchmarks

Final DSUP and DSP Checklist:

THE FOLLOWING SHEETS ARE NOT REQUIRED TO BE PROVIDED IN EVERY SET. INSTEAD, 3 COPIES OF EACH SHEET MAY BE PROVIDED SEPARATELY.

OPEN SPACE EXHIBIT

(The purpose of this sheet is to demonstrate to staff which areas were counted toward open space.)

- _____ parcels
- _____ streets, alleys, driveways, all other areas of paving
- _____ buildings and entrances
- _____ areas counted as open space, shaded and dimensioned with areas counted as usable open space identified
- _____ tabulations of areas counted as open space and usable open space

ARCHITECTURAL ELEVATIONS

- _____ Elevations of each building face, to scale and with dimensions
- _____ Label all building materials

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Revised 5/13/05kmj

1/14/05kmj

9/29/03kmj

8/18/04kmj

4/27/06 kmj

Final DSUP and DSP Checklist:

GRADING PLAN CHECK LIST SUBMISSION REQUIREMENTS:

Per City of Alexandria Code Section 8-1-22 (d)

Note: The following sheets and information are required for every submission. Additional sheets and information should be provided where necessary to demonstrate compliance with City requirements or conditions of approval. Provide 11 copies of the plan and \$500 fee at first submission.

The Check List shall be completed and submitted with first submission of the plans. Failure to comply may result in the plan being deemed incomplete and unacceptable for review.

Property Address: _____

Owner/Applicant: _____

Owner/Applicant Contact Phone # and Email: _____

Engineer: _____

Engineer Phone # and Email: _____

REQUIREMENTS FOR EACH SHEET

- _____ Print size shall be 24" x 36" and all sheets shall be the same size
- _____ Scale no less than 30' to 1" with scale identified on each sheet
- _____ City grading plan approval signature block in same place (lower right corner) on each sheet
- _____ Date, scale and north arrow with reference to source of meridian
- _____ Name, address, signature and registration number of professional preparing the plan on each sheet (original signature required for mylar submission)
- _____ Date the plan was prepared on each sheet/ Date of latest revision
- _____ Name, address and phone number of the developer/builder and/or the owner(s) of record
- _____ Location map with the site shown in relation to the nearest intersection of two or more streets
- _____ Table of standard symbols per common engineering practice and abbreviations utilized in the plan set.

ADDITIONAL REQUIREMENTS

- _____ A narrative description of the proposed development
- _____ Index to plan sheets
- _____ Total area included in the site plan, total area of tax parcel, total existing and proposed impervious area on the tax parcel, and total area that will be disturbed during construction (all expressed in square feet and acres). The disturbed area will be calculated as described in Memorandum to the Industry on Grading Plan Requirements and Waiver Provisions
- _____ If applicable, a list of all special use permits, variances, certificate of appropriateness, special exception, waivers, etc., **approved** for the Grading Plan (i.e. Curb cut approval)

- _____ Copy of Curb cut approval (if proposed) shown on plan
- _____ City Standard Notes to include: *(amend as applicable- available from Site Plan Coordinator)*
 - Existing Conditions Survey Notes
 - City Standard General Notes
 - Environmental Site Assessment Statement
 - Stormwater Management Notes
 - Utility Works Notes
 - Sequence of Construction Notes
 - Demolition Notes
 - Construction Notes
 - Archaeology Notes
 - Rodent Abatement Note
 - Site Specific Notes

GRADING PLAN

Show location, dimensions, size, height and elevation of the following along with the existing features to be retained:

- _____ Sidewalks, streets, alleys with widths labeled, and elevations
- _____ Building restriction lines, vision clearances (on corner lots)
- _____ Property lines; show course and distance of each site boundary line
- _____ Dimensions of front, side and rear yards
- _____ Buildings and structures, including optional decks and other projections such as canopies, roof overhangs
- _____ Stoops, steps and staircases
- _____ Locations of building entrances and exits
- _____ Sump pump and roof drain outfalls [*Note: Flow from downspouts, foundation drains, and sump pumps shall be discharged as per the requirements of Memorandum to Industry on Downspouts, Foundation Drains, and Sump Pumps, Dated June 18, 2004 available on the City web site.*]
- _____ Existing and proposed storm and sanitary sewer systems, including lateral lines in plan and profile.
- _____ Existing and proposed gas mains and service lines in plan view
- _____ Light poles and fixtures on-site and on adjoining rights-of-way
- _____ Driveways, entrances, exits, parking areas; show parking spaces by type (standard, compact and handicap) and indicate the number in each bay and the total count
- _____ Sidewalks, bike and walking trails on site and on abutting streets or public property/easements
- _____ If applicable, recreation areas, swimming pools, etc.
- _____ Watercourses, bodies of water, wetlands and limits of flood plains
- _____ Depict any Resource Protection Areas as defined in Article XIII of the Zoning Ordinance and delineate their appropriate buffer width

- _____ To any wetland or RPA add a note stating that “RPA buffer shall be vegetated with native riparian species and remain undisturbed. RPA is limited to water dependent facilities or redevelopment.”
- _____ Significant geological features
- _____ Proposed grading shown with 2' contours on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain. The Director of Transportation and Environmental Services (T&ES), at his discretion, may ask to show the contours at a lesser interval than 2', if required, to understand the pattern of micro drainage from the site and/or the adjacent properties.
- _____ Two benchmarks
- _____ Slopes, terraces and retaining walls, including elevations of level areas and tops and bottoms of walls and exterior stairways and ramps
- _____ Indicate elevations at the base of all utility structures other than individual poles, such as fire hydrants and transformers
- _____ Provide rim elevation and invert elevations of all piping at manholes
- _____ Elevations of streets and alleys

ZONING REQUIREMENTS (Provided on cover sheet)

For each element, list zoning ordinance requirement, number approved on preliminary plan and number proposed on final plan, if different.

- _____ Zoning of the site
- _____ Existing use on the site
- _____ Proposed use for the site
- _____ Existing and required lot area
- _____ Depict building restriction line
- _____ Gross square feet (GSF) of existing and new building area (attach P&Z floor area calculations sheet)
- _____ Net square feet (NSF) of existing and new building area (attach P&Z floor area calculations sheet)
- _____ Floor-area-ratio (existing and proposed)
- _____ Open space (existing and proposed)
- _____ Average finished grade of structure for existing and new construction
- _____ Height of structure from existing and average finished grade
- _____ Yards (front, side and rear) required and proposed
- _____ Parking space(s), if applicable listed by total number, size of space and type (compact, standard, and handicapped)
- _____ % of crown coverage existing and proposed (based on P&Z Landscape Guidelines)

****Note: ** If the proposed development includes multiple lots, the zoning tabulation information must be provided for each individual lot unless all the lots will be consolidated in conjunction with the proposal.**

EROSION AND SEDIMENT CONTROL PLANS (When required)

- _____ Delineate the total area that will be disturbed during construction and show it on the plan. Calculate the total disturbed area as described in the Memorandum to the Industry on Grading Plan Requirements and Waiver Provisions in square feet and acres and show it on the plan. If the total disturbed area is more than 2,500 square feet then the proposed improvements shall be designed to complete the requirements of Article XIII of the Zoning Ordinance of the City of Alexandria.
- _____ Narrative phasing plan including demolition and sequence of construction activities
- _____ All appropriate details of erosion and sediment control measures [must meet Virginia Erosion and Sedimentation Control Handbook (VESCH) standards]
- _____ Sources of water for construction entrance wash down
- _____ Grading for drains and traps for construction entrance runoff
- _____ Show and list appropriate control measures defined for each drainage area
- _____ Identify areas having different ground covering materials (i.e. concrete, asphalt, gravel, turf, crushed stone, etc.)
- _____ Delineate any wetlands or Resource Protection Areas (RPA)
- _____ Legend for line types (must be in accordance with VESCH)
- _____ Temporary and permanent seeding mixtures
- _____ Erosion and Sediment Control Narrative to include:
 - Project Description
 - Existing Conditions
 - Critical Areas
 - Adjacent Areas
 - Off-site Areas
 - Erosion and Sediment Control Measures
 - Permanent Stabilization
 - Contaminated Soils
 - Stormwater Runoff Considerations
 - Asphalt Drive Note
 - Tree Note
 - Erosion Control Program
 - Sediment Control Practices
- _____ BMP strategies (projects with 2,500 SF of disturbed area including construction staging and storage.)
- _____ BMP Narrative
- _____ Delineation and description of areas with contaminated soils
- _____ Erosion & Sediment Control Notes (*amend as applicable- available from Site Plan Coordinator*)

STORMWATER MANAGEMENT/BMP SHEETS (When Required)

(See Article XIII of the Zoning Ordinance for guidance on water quality calculations)

- _____ Location and description of RPA components
- _____ Location and nature of RPA encroachment
- _____ Water Quality Impact Assessment, if applicable
- _____ Type and location of proposed BMP, with supporting calculations
- _____ Pre and post development runoff calculations
- _____ Stormwater Narrative
- _____ Stormwater Outfall Narrative
- _____ Drainage divides off-site/on-site identified and delineated
- _____ Water Quality Volume (WQV) computation (in cubic feet and acre-feet)
- _____ Water Quality Worksheets A or B and C
- _____ City standard water quality BMP data blocks (2) (Project Description and Miscellaneous Blocks)
- _____ Signage detail for surface BMP
- _____ Water Quality Improvement Fund request, if applicable, can either be included on the First Final plan with original submitted separately to the Division of Environmental Quality, Department of T&ES for approval. Once the request is approved then both the request and approval letters must be included on the plan of subsequent submissions and/or Mylar.
- _____ BMP and associated structure details
- _____ BMP Sign details

EXISTING AND PROPOSED VEGETATION (When Required)

- _____ Notes for Preservation & Protection of Existing Vegetation *(amend as applicable- available from Site Plan Coordinator)*
- _____ Notes for Proposed Planting *(amend as applicable- available from Site Plan Coordinator)*

**ATTACHMENT 1
City of Alexandria**

Stormwater Pollution Prevention Plan Elements Chart	
<i>Element</i>	Sheet Number
Stormwater Management Plan (See Section 13-114)	
Type and location of stormwater discharges	
Information on features discharged into	
Pre-development and Post-development drainage areas	
Name, address, telephone number and email of owner	
Tax reference number and parcel number of property	
Narrative describing current condition and final site conditions	
BMP – Type, geographic coordinates, acres treated and surface water into which it will discharge	
Hydrologic and Hydraulic computations	
Documentation and calculations verifying compliance with quality and quantity requirements	
Map of site with topography that includes:	
a. All contributing drainage areas	
b. Existing streams, ponds, culverts, ditches, wetlands, other water bodies and floodplains	
c. Soil types, forest cover or other vegetative areas	
d. Current conditions including existing structures, roads, known utilities, and easements	
e. Adjoining parcel information	
f. Limits of clearing and grading	
g. Proposed drainage patterns	
h. Proposed conditions – buildings, roads/parking, utilities, BMPs	
i. Proposed land use with tabulation of the % surface area adapted to each use	
Pollution Prevention Plan – Standard Notes (See Section 13-116)	
Include BMP to prohibit the following discharges	
a. Wastewater from washout of concrete	
b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials	
c. Fuels, oils, or other pollutants used in vehicle and equipment O&M	
d. Soaps or solvent used in vehicle and equipment washing	
Discharges from dewatering activities, including dewatering of trenches or excavations (prohibited unless managed by appropriate controls)	
Minimize the exposure of construction and landscape materials and wastes, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials onsite to precipitation and to stormwater	
Erosion and Sediment Control Plans (provide sheet range)	
Registration Statement – General VPDES Permit for Discharges from Construction Activities	
Description of any additional control measures necessary to address TMDL (provide sheet range if applicable)	

APPENDIX E. DOCUMENTS RELATED TO MCM #5, POST-CONSTRUCTION STORMWATER MANAGEMENT

This appendix contains policies and procedures for long term, post-construction BMP operation and maintenance. It contains inspection schedules and guidelines; forms; pre- and post-inspection notification letters; and enforcement letters. Distinctions are made between publically- and privately-owned BMPs as required in section II.B.5 of the City's *General Permit for Discharges from Small Municipal Separate Storm Sewer Systems* (General Permit No. VAR040057).

ARTICLE XIII. - ENVIRONMENTAL MANAGEMENT

FOOTNOTE(S):

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Editor's note— Ord. No. 4865, § 1, adopted March 15, 2014, repealed Art. XIII and enacted a new article as set out herein. The former Art. XIII, §§ 13-100—13-120, pertained to similar subject matter and derived from Ord. No. 4443, § 1, adopted April 22, 2006.

Sec. 13-100. - General findings.

The Chesapeake Bay is one of the most productive estuaries in the world, providing substantial economic and social benefits to the people of the Commonwealth of Virginia. Healthy state and local economies are integrally related to and dependent upon the health of the Chesapeake Bay. The general welfare of the people of the Commonwealth depends upon the health of the Bay.

The waters of the Chesapeake Bay and its tributaries, including the Potomac River and Alexandria's local streams, have been degraded significantly by point source and nonpoint source pollution, which threatens public health and safety and the general welfare.

13-101 - Purpose.

- (A) It is the policy of the City of Alexandria, Virginia to protect the quality of water in the Chesapeake Bay and its tributaries and, to that end, to require all land uses and land development in the city to:
 - (1) Safeguard the waters of the commonwealth from pollution;
 - (2) Prevent any increase in pollution of state waters;
 - (3) Reduce existing pollution of state waters; and
 - (4) Promote water resource conservation.
- (B) To fulfill this policy, this Article XIII is adopted to minimize potential pollution from stormwater runoff, minimize potential erosion and sedimentation, reduce the introduction of harmful nutrients and toxins into state waters, maximize rainwater infiltration while protecting groundwater, and ensure the long-term performance of the measures employed to accomplish the statutory purpose.
- (C) The provisions of this chapter shall be deemed severable, and the invalidity or unenforceability of any individual provision or section hereof shall not affect the validity and enforceability of the remaining provisions of the chapter.

13-102 - Authority.

This Article XIII is issued under the authority of Section 62.1-44.15:73 of the Code of Virginia (the Chesapeake Bay Preservation Act), 62.1-44.15:24 et seq. of the Code of Virginia (the Virginia Stormwater Management Act) and attendant regulations as adopted by the Virginia State Water Control Board. Code of Virginia Section 62.1-44.15:27 specifically requires the City to adopt a Virginia Stormwater Management Program. Authority to protect water quality is also provided by Section 15.2-2283 of the Code of Virginia.

13-103 - Definitions.

The following words and terms used in this Article XIII have the following meanings, unless the context clearly indicates otherwise.

- (A) *Administrator*. The person responsible for the administration of this Article XIII, which in the city shall be the director of T&ES or his/her designee.
- (B) *Alexandria water quality volume default*. The volume equal to the first 0.5 inch of runoff multiplied by the total impervious area of the site as defined herein.
- (C) *Applicant*. A person who has submitted, or plans to submit, a plan of development or an exception request to the city or a person seeking approval from the city for any activity that is regulated under this article.
- (D) *Best management practice (BMP)*. Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface water and groundwater systems from the impacts of land-disturbing activities.
- (E) *Buffer area*. An area of natural or established vegetation managed to protect other components of a resource protection area and state waters from significant degradation due to land disturbances. To effectively perform this function, the buffer area will achieve a 75 percent reduction of sediments and a 40 percent reduction of nutrients. A 100-foot wide buffer area shall be considered to meet this standard.
- (F) *Chesapeake Bay Preservation Act land-disturbing activity*. A land-disturbing activity including clearing, grading, or excavation that results in a land disturbance equal or greater than 2,500 square feet and less than one acre in all areas of the city designated as subject to the regulations adopted pursuant to the Chesapeake Bay Preservation Act, Code of Virginia, § 62.1-44.15:67 et seq.
- (G) *Clean Water Act* or *CWA* means the federal Clean Water Act (33 U.S.C § 1251 et seq.), formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, and Public Law 97-117, or any subsequent revisions thereto.
- (H) *Common plan of development or sale*. A contiguous area where separate and distinct construction activities may be taking place at different times on different schedules.
- (I) *Control measure*. Any best management practice or stormwater management facility, or other method used to minimize the discharge of pollutants to state waters.
- (J) *Department (DEQ)*. The Virginia Department of Environmental Quality.
- (K) *Development*. Land disturbance and the resulting landform associated with the construction or substantial alteration of residential, commercial, industrial, institutional, recreational, transportation, or utility facilities or structures or the clearing of land for non-agricultural or non-silvicultural purposes.
- (L) *Director of T&ES/Director of P&Z*. Director of T&ES means the director of transportation and environmental services of the City of Alexandria. Director of P&Z means the director of planning and zoning of the City of Alexandria.
- (M) *Floodway*. All lands as defined in subsection 6-303(K) of this ordinance.
- (N) *General permit*. The state permit titled General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities found in 9VAC25-880 et seq.) of the Virginia Stormwater Management Regulations authorizing a category of discharges under the federal Clean Water Act and the Virginia Stormwater Management Act within a geographical area of the Commonwealth of Virginia.

- (O) *Highly erodible soils.* Soils (excluding vegetation) with an erodibility index (EI) from sheet and rill erosion equal to or greater than eight. The erodibility index for any soil is defined as the product of the formula $RKLS/T$, where K is the soil susceptibility to water erosion in the surface layer; R is the rainfall and runoff; LS is the combined effects of slope length and steepness; and T is the soil loss tolerance.
- (P) *Highly permeable soils.* Soils with a given potential to transmit water through the soil profile. Highly permeable soils are identified as any soil having a permeability equal to or greater than six inches of water movement per hour in any part of the soil profile to a depth of 72 inches (permeability groups "rapid" and "very rapid"), as found in the "National Soil Survey Handbook" of November 1996 in the "Field Office Technical Guide" of the U.S. Dept. of Agriculture Natural Resources Conversation Service.
- (Q) *Impervious cover.* A surface composed of any material that significantly impedes or prevents natural infiltration of water into the soil. Impervious surfaces include, but are not limited to: roofs, buildings, streets, parking areas, and any concrete, asphalt, or compacted gravel surface.
- (R) *Intermittent stream.* Any natural or engineered channel (measured from top of bank) with flowing water during certain times of the year, when groundwater provides for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow. Acceptable methodologies for establishing the presence of an intermittent stream will be provided by the director of T&ES pursuant to subsection 13-104(C).
- (S) *Isolated wetlands of minimal ecological value.* Those wetlands, as defined in 9VAC25-210-10, that:
- (i) Do not have a surface water connection to other state waters;
 - (ii) Are less than one-tenth of an acre in size;
 - (iii) Are not located in a Federal Emergency Management Agency designated 100-year floodplain;
 - (iv) Are not identified by the Virginia Natural Heritage Program as a rare or state significant natural community;
 - (v) Are not forested; and
 - (vi) Do not contain listed federal or state threatened or endangered species.
- (T) *Land disturbance or land-disturbing activity.* A manmade change to the land surface that potentially changes its runoff characteristics, including clearing, grading, filling, or excavation.
- (U) *Layout.* A conceptual drawing sufficient to provide for the specified stormwater management facilities required at the time of approval.
- (V) *Minor modification.* An amendment to an existing general permit before its expiration not requiring extensive review and evaluation including, but not limited to, changes in EPA promulgated test protocols, increasing monitoring frequency requirements, changes in sampling locations, and changes to compliance dates within the overall compliance schedules. A minor general permit modification or amendment does not substantially alter general permit conditions, substantially increase or decrease the amount of surface water impacts, increase the size of the operation, or reduce the capacity of the facility to protect human health or the environment.
- (W) *Natural channel.* A nontidal waterway that is part of the natural topography and is generally characterized as being irregular in cross section with a meandering course.
- (X) *Nonpoint source pollution.* Contamination from diffuse sources that is not regulated as point source pollution under Section 402 of the Clean Water Act.
- (Y) *Nontidal wetlands.* Those wetlands, other than tidal wetlands, that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under

normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined by the U.S. Environmental Protection Agency pursuant to Section 404 of the Federal Clean Water Act, in 33 CFR 328.3b.

- (Z) *Operator*. The owner or operator of any facility or activity subject to regulation under this Article XIII.
- (AA) *Permittee*. The person to whom a state permit is issued, including any owner or operator whose construction site is covered under a state construction general permit.
- (BB) *Person*. Any individual, corporation, partnership, association, municipality, commission, or political subdivision, of a state, governmental body, including federal, state, or local entity as applicable, any interstate body or any other legal entity.
- (CC) *Pre-development*. The land use that exists at the time that plans for the development are submitted to the city. Where phased development or plan approval occurs (preliminary grading, roads and utilities, etc.), the land use at the time the first item is submitted shall establish pre-development conditions.
- (DD) *Post-development*. Conditions that reasonably may be expected or anticipated to exist after completion of the development activity on a specific site or tract of land.
- (EE) *Public road*. For the purpose of this Article XIII, public road means a publicly owned road designed and constructed in accordance with water quality protection criteria at least as stringent as requirements applicable to the Virginia Department of Transportation, including regulations promulgated pursuant to (i) the Erosion and Sediment Control Law (Section 64.1-44.15:51 et seq. of the Code of Virginia) and (ii) the Virginia Stormwater Management Act (Section 64.1-44.15:24 et seq. of the Code of Virginia). This definition includes those roads where the Virginia Department of Transportation exercises direct supervision over the design or construction activities, or both, and cases where roads are constructed or maintained, or both, by the City of Alexandria.
- (FF) *Redevelopment*. The process of developing land that is or has been previously developed.
- (GG) *Regulations*. The Virginia Stormwater Management Program (VSMP) Permit Regulations, 9VAC-25-870, as amended.
- (HH) *Restored stormwater conveyance system*. A stormwater conveyance system that has been designed and constructed using natural channel design concepts. Restored stormwater conveyance systems include the main channel and the flood-prone area adjacent to the main channel.
- (II) *Resource management area (RMA)*. A Chesapeake Bay Preservation Area overlay designation as further defined in section 13-105(C).
- (JJ) *Resource protection area (RPA)*. A Chesapeake Bay Preservation Area overlay designation as further defined in section 13-105(B).
- (KK) *Shoreline*. Land contiguous to a body of water.
- (LL) *Site*. The land or water area where any facility or land-disturbing activity is physically located or conducted, including adjacent land used or preserved in connection with the facility or land-disturbing activity. Areas channelward of mean low water in tidal Virginia shall not be considered part of a site. The following shall be used for determining water quality and water quantity requirements in sections 13-109(E) and (F): For projects disturbing less than 50 percent of the tax parcel, (or if multiple parcels are involved, the land subject to the application), the disturbed area shall constitute the site; for projects disturbing greater than or equal to 50 percent of the tax parcel (or if multiple parcels are involved, the land subject to the application), the entire tax parcel shall constitute the site.
- (MM) *State*. The Commonwealth of Virginia.

- (NN) *State permit*. An approval to conduct a land-disturbing activity issued by the Virginia State Water Control Board in the form of a state stormwater individual permit or coverage issued under a state general permit or an approval issued by the Virginia State Water Control Board for stormwater discharges from an MS4. Under these state permits, the state imposes and enforces requirements pursuant to the federal Clean Water Act, the Virginia Stormwater Management Act, and their attendant regulations.
- (OO) *State Water Control Law*. Chapter 3.1 (62.1-44.2 et seq.) of Title 62.1 of the Code of Virginia.
- (PP) *State waters*. All waters on the surface or in the ground, wholly or partially within or bordering the commonwealth or within its jurisdiction, including wetlands.
- (QQ) *Stormwater*. Precipitation that is discharged across the land surface or through conveyances to one or more waterways and that may include stormwater runoff, snow melt runoff, and surface runoff and drainage.
- (RR) *Stormwater management facility*. A device that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release or the velocity of flow.
- (SS) *Stormwater management plan*. A document or documents containing material describing methods for complying with the requirements of section 13-114 of this article.
- (TT) *Stormwater pollution prevention plan (SWPPP)*. A document that is prepared in accordance with section 13-113 of this article and good engineering practices and that identifies potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges from the construction site, and otherwise meet the requirements of this article. In addition the document shall identify and require the implementation of control measures, and shall include, but not be limited to the inclusion of, or the incorporation by reference of, an approved erosion and sediment control plan, and a pollution prevention plan.
- (UU) *Subdivision*. Means the same as defined in section 2-197.2 of the Alexandria Zoning Ordinance.
- (VV) *Substantial alteration*. Expansion or modification of a building or development that would result in land disturbance exceeding an area of 2,500 square feet in the resource management area only.
- (WW) *Tidal shore*. Land contiguous to a tidal body of water between the mean low water level and the mean high water level.
- (XX) *Tidal wetlands*. Vegetated and nonvegetated wetlands as defined in Section 28.2-1300 of the Code of Virginia.
- (YY) *Top of Bank*. To the extent applicable, top of bank shall be determined on prevailing professional standards and the best professional judgment of the director.
- (ZZ) *Total maximum daily load (TMDL)*. The sum of the individual wasteload allocations for point sources, load allocations for nonpoint sources, natural background loading, and a margin of safety. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. The TMDL process provides for point versus nonpoint source trade-offs.
- (AAA) *Use*. Any activity on the land other than development, including, but not limited to agriculture, horticulture, and silviculture.
- (BBB) *Virginia Stormwater Management Act*. Article 2.3 (§ 62.1-44.15:24 et seq.) of Chapter 3.1 of Title 62.1 of the Code of Virginia.
- (CCC) *Virginia Stormwater BMP Clearinghouse website*. A website that contains detailed design standards and specifications for control measures that may be used in Virginia to comply with the requirements of the Virginia Stormwater Management Act and regulations.
- (DDD) *Virginia Stormwater Management Program (VSMP)*. A program approved by the Virginia State Water Control Board that has been established by a locality to manage the quality and

quantity of runoff resulting from land-disturbing activities and shall include such items as local ordinances, rules, permits, requirements, annual standards and specifications, policies and guidelines, technical materials, and requirements for plan review, inspection and enforcement, where authorized in this article, and evaluation consistent with the requirements of this article and associated regulations.

- (EEE) *VSMP authority.* An authority approved by the Virginia State Water Control Board to operate a VSMP. For the purposes of this article, the city is the VSMP authority.
- (FFF) *VSMP authority permit.* An approval to conduct a land-disturbing activity issued by the city for the initiation of a land-disturbing activity after evidence of general permit coverage has been provided where applicable. In the City of Alexandria a VSMP authority permit is not a separate permit. Rather, the issuance of a building, land use, or other land development permit is contingent on a proposed land-disturbing activity meeting all VSMP authority permit requirements in 9VAC-25-870 and the requirements of this article.
- (GGG) *Water body with perennial flow.* A body of water that flows in a natural or engineered channel year-round during a year of normal precipitation. This includes, but is not limited to streams, estuaries, and tidal embayments and may include drainage ditches or channels constructed in wetlands or from former natural drainage ways that convey perennial flow. Lakes and ponds, through which a perennial stream flows, are a part of the perennial stream. Generally, the water table is located above the streambed for most of the year and groundwater is the primary source for stream flow. The width of the perennial stream extends from top-of-bank to top-of-bank of the channel or to the limits of the normal water level for a pond or lake when there is no definable top-of-bank. Acceptable methodologies for establishing the presence of a water body with perennial flow will be provided by the director of T&ES pursuant to subsection 13-104(C).
- (HHH) *Water-dependent facility.* A development of land that cannot exist outside of the resource protection area and must be located on the shoreline by reason of the intrinsic nature of its operation. These facilities include, but are not limited to:
- (i) Ports;
 - (ii) The intake and outfall structures of power plants, water treatment plants, sewage treatment plants, and storm sewers;
 - (iii) Marinas and other boat docking facilities;
 - (iv) Beaches and other public water-oriented recreation areas; and
 - (v) Fisheries or other marine resources facilities.
- (III) *Watershed.* The total drainage area contributing runoff to a single point.
- (JJJ) *Wetlands.* Tidal and nontidal wetlands.

13-104 - Administration.

- (A) *Responsibility for administration.* The director of T&ES, or his/her designee, is charged with responsibility for the administration of this Article XIII.
- (B) *Duties and authority.* In the administration of this Article XIII the duties and authority of the director of T&ES shall include, without limitation:
- (1) Receiving applications for plan of development approval;
 - (2) Reviewing applications to determine if they contain all information required and necessary for a determination of their merit;
 - (3) Reviewing applications to determine their compliance with the provisions and intent of this Article XIII and their merit;

- (4) Docketing items for hearing before the planning commission and conferring with the city manager to schedule public hearings before the city council as necessary on applications;
 - (5) Preparing a staff report for each application;
 - (6) Interpreting the provisions of this Article XIII to ensure that its intent is carried out.
- (C) *Rules, regulations, and procedures.* The director of T&ES shall promulgate rules, regulations, and procedures for the administration and enforcement of this Article XIII and shall promulgate rules, regulations, and procedures for the processing of applications that ensure full review, comment, and recommendations on each application by the department of transportation and environmental services. The city manager shall promulgate rules and procedures for review by other departments of applications, where such review is determined to be necessary or desirable and such procedures may include the establishment of a development review committee composed of departments of the city whose expertise is necessary or desirable in the review of applications. All such rules, regulations, and procedures shall be transmitted to the city council at the time of issuance.
- (D) *Establishment of fees.* The director of T&ES shall by general rule approved by city council establish a schedule of fees required for each application under this Article XIII to be paid at the time an application is submitted. The schedule of fees shall include those authorized by 9VAC25-870-700 et seq. The schedule of fees is set per approved council docket.
- (E) *Responsibility for enforcement.* The director of T&ES shall have the authority and the responsibility of section 11-200 and section 13-126 to ensure that all buildings and structures and the use of all land complies with the provisions of this Article XIII.
- (F) The director of T&ES shall review, approve, disapprove, or approve with modifications or conditions or both the following elements of the plan of development:
- (1) The environmental site assessment, required pursuant to section 13-112
 - (2) The stormwater management plan, required pursuant to section 13-114 and approved in accordance with section 13-115
 - (3) The erosion and sediment control plan required pursuant to section 5-4-1.
 - (4) The water quality impact assessment, if required, pursuant to section 13-117
 - (5) Compliance of the plan of development with section 13-106 through section 13-110
- (G) The director of T&ES shall have the authority and the responsibility to enforce the requirement that a permittee must develop, implement, and keep at the site for inspection a stormwater pollution prevention plan that meets the requirements set forth in section 13-113 and a pollution prevention plan that meets the requirements set forth in section 13-116
- (H) Review and decision on applications for exceptions shall be as provided in section 13-119
- (I) Review and decision on applications for modifications to noncomplying land uses and structures shall be as provided in section 13-122
- (J) Review and decision on applications for exemptions shall be as provided in section 13-123
- (K) Review and decision on the remaining elements of the plan of development shall be as provided in the regulations of this ordinance and the City Code applicable to each such element.

13-105 - Designation of Chesapeake Bay Preservation Area Overlay District.

- (A) All land within the corporate limits of the city is designated as a Chesapeake Bay Preservation Area (CBPA). The CBPA is divided into resource protection areas and resource management areas. The regulations set forth in this Article XIII shall apply as an overlay district, and shall supersede any zoning, land use, or land development regulation of the City Code that is inconsistent with the provisions of this Article XIII.

- (B) Resource protection areas (RPAs) consist of sensitive land that has either an intrinsic water quality value due to the ecological and biological processes such land performs or that is sensitive to uses or activities such that the use results in significant degradation to the quality of state waters. In their natural condition, these lands provide for the removal, reduction, or assimilation of nonpoint source pollution entering the bay and its tributaries. An area of land that includes any one of the following land types shall be considered to be within the RPA:
- (1) Tidal wetlands;
 - (2) Tidal shores;
 - (3) Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow;
 - (4) A buffer area of 100 feet (measured from top of bank) located adjacent to and landward of the components listed in subsections (1) through (3) above and along both sides of any water body with perennial flow. The full buffer area shall be designated as the landward component of the RPA notwithstanding the presence of permitted uses, encroachments, and vegetation clearing in compliance with this Article XIII.
- (C) Resource management areas (RMAs) include land that, if improperly used or developed, has a potential for causing significant water quality degradation or for diminishing the functional value of the RPA. Therefore, all lands in the city, not included in the RPA, shall constitute the RMA since all such land drains through natural or manmade conveyances to the Potomac River and Chesapeake Bay.

13-106 - Establishment of CBPA boundaries.

- (A) Chesapeake Bay Preservation Area boundaries are established by text, as provided in section 13-105. The city shall publish and update in a manner established by the director of T&ES pursuant to section 13-104(C) a general map depicting the location of identified CBPA features. However, in all cases it is the burden of the applicant to identify CBPA features and to delineate the appropriate RPA boundaries in accordance with the development review process required pursuant to section 13-111, or if no development review process is required, then through the environmental site assessment pursuant to section 13-112
- (B) Any property owner wishing to change the depiction of an RPA feature on the general map may conduct an environmental site assessment in section 13-112 and submit it to the director of T&ES. The director of T&ES may accept, modify, or reject the RPA delineation based on the evidence presented by the property owner and in consideration of all other available information.
- (C) In the event that a site-specific RPA boundary delineation is contested by an applicant or property owner, the applicant or property owner may request a meeting with the director of T&ES to review the decision. Requests for the meeting shall be made no more than 30 calendar days after notification of a modification or rejection of a proposed RPA delineation. The director of T&ES will preside over the meeting of the involved parties and reconsider the decision. The meeting participants will be notified by the director of T&ES within 30 calendar days after the meeting of the result of the reconsideration.

13-107 - Development, redevelopment, and uses permitted in RPAs.

The following criteria shall apply in RPAs unless the development, redevelopment, use, or land-disturbing activity is exempted under section 13-123 or granted an exception pursuant to section 13-119. All development, redevelopment, and uses within the RPA must comply with the performance criteria provided in section 13-109

- (A) The following are permitted within the RPA provided they do not require development, redevelopment, structures, grading, fill, draining, or dredging:
 - (1) Conservation or preservation of soil, water, vegetation, fish, shellfish, and other wildlife;
 - (2) Passive recreational activities, including but not limited to fishing, bird watching, hiking, boating, horseback riding, swimming, and canoeing; and
 - (3) Educational activities and scientific research.
- (B) The following are permitted within the RPA if approved by the director of T&ES. A water quality impact assessment may be required by the director of T&ES in accordance with section 13-117 if the project is located within an environmentally sensitive area, or is of sufficient scale to affect water quality.
 - (1) Repair and maintenance of existing piers, walkways, observation decks, wildlife management shelters, boathouses, and other similar water-related structures provided that there is no increase in structure footprint and that any required excavating and filling results in a land-disturbing activity of 2,500 square feet or less;
 - (2) Boardwalks, trails, and pathways;
 - (3) Historic preservation and archeological activities; and
 - (4) Repair and maintenance of existing flood control and stormwater management facilities.
- (C) The following, if permitted in the underlying zone, are allowed within the RPA if approved by the director of T&ES and provided that a water quality impact assessment is performed and accepted by the director of T&ES as complete in accordance with section 13-117
 - (1) A new or expanded water-dependent facility may be allowed provided that the following criteria are met:
 - (a) It does not conflict with the city master plan;
 - (b) Any non-water-dependent component is located outside of the RPA; and
 - (c) Access to the water-dependent facility is provided with the minimum disturbance necessary, and where practical, a single point of access is provided.
 - (2) Redevelopment may be allowed provided that the following criteria are met:
 - (a) There is no increase in impervious surface cover;
 - (b) There is no further encroachment within the RPA; and
 - (c) The proposed redevelopment is consistent with the city master plan.
 - (3) Public flood control and stormwater management facilities that drain or treat water from multiple development projects or from a significant portion of a watershed, may be allowed provided that:
 - (a) The director of T&ES has conclusively established that the location of the facility within the RPA is the optimum location;
 - (b) The size of the facility is the minimum necessary for flood control or stormwater quality treatment, or both;
 - (c) All applicable permits for construction in state or federal waters must be obtained from the appropriate state and federal agencies, such as the Army Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission; and
 - (d) The facility is consistent with a city stormwater management program approved by the Virginia State Water Control Board.

- (4) Stream restoration projects and shoreline erosion control and stabilization projects, including the removal of trees and woody vegetation, employment of necessary restoration, control, and stabilization techniques, and establishment of appropriate vegetation, may be allowed in accordance with the best available technical advice and applicable permit conditions or requirements if approved by the city arborist.
- (D) In order to maintain the functional value of the RPA buffer area, existing vegetation may be removed if approved by the director of T&ES and only to provide for reasonable sight lines, access paths, general woodlot management, and best management practices to prevent upland erosion and concentrated flows of stormwater, as follows:
- (1) Trees may be pruned or removed as necessary to provide for sight lines and vistas, provided that where removed, they shall be replaced with other vegetation that is equally effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff. Replacement vegetation shall require the approval of the director of T&ES, in consultation with the department of recreation, parks, and cultural activities and the department of planning and zoning.
 - (2) Any path shall be constructed and surfaced so as to effectively control erosion.
 - (3) Dead, diseased, or dying trees or shrubbery and noxious weeds (such as Johnson grass, kudzu, and multiflora rose) may be removed and thinning of trees may be conducted. The director of T&ES may approve a long term management plan for a specific RPA that complies with professionally recognized management practices.
- (E) The following encroachments, if permitted in the underlying zone, are allowed to the RPA buffer area if approved by the director of T&ES and provided that a water quality impact assessment is performed and accepted by the director of T&ES as complete in accordance with section 13-117
- (1) When the application of the buffer area would result in the loss of a buildable area on a lot or parcel recorded prior to October 1, 1989, encroachments into the buffer area may be approved by the director of T&ES in accordance with the following criteria:
 - (a) Encroachments into the buffer area shall be the minimum necessary to achieve a reasonable buildable area for a principal structure and necessary utilities;
 - (b) Where practicable, a vegetated area that will maximize water quality protection, mitigate the effects of the buffer encroachment, and is equal to the area of encroachment into the buffer area shall be established elsewhere on the lot; and
 - (c) The encroachment may not extend into the seaward 50 feet of the buffer area.
 - (2) When the application of the buffer area would result in the loss of buildable area on a lot or parcel recorded between October 1, 1989 and March 1, 2002, encroachments into the buffer area may be approved by the director of T&ES in accordance with the following criteria:
 - (a) The lot or parcel was created as a result of a legal process conducted in conformity with the city's subdivision regulations;
 - (b) Any conditions or mitigation measures imposed through previously approved exceptions must be met;
 - (c) If a stormwater BMP was previously required, the BMP shall be evaluated to determine if it continues to function effectively, and, if necessary, the BMP shall be reestablished or repaired and maintained as required; and
 - (d) The criteria in (1) above of this section shall be met.

13-108 - Development and uses permitted in RMAs.

Development, redevelopment, and uses authorized by the underlying zone are permitted in the RMA provided such activity is carried out in accordance with all applicable criteria in this Article XIII. The director of T&ES may, due to the unique characteristics of a site or the intensity of the proposed development, redevelopment, or use require a water quality impact assessment as provided in subsections 13-117(C) and (D).

13-109 - General performance requirements for CBPAs.

The director of T&ES shall approve development, redevelopment, uses, or land-disturbing activities in the CBPA only if it is found that the activity is in compliance with this Article XIII and that the applicant has demonstrated, by a preponderance of the evidence, that the proposed development, redevelopment, use, or land-disturbing activity meets or exceeds the following standards.

- (A) No more land shall be disturbed than is necessary to provide for the proposed use, development, or redevelopment.
- (B) Indigenous vegetation shall be preserved to the maximum extent practicable consistent with the use, development, or redevelopment proposed.
- (C) Development or redevelopment shall minimize impervious cover consistent with the proposed use or development.
- (D) The proposed development or redevelopment shall comply with section 5-4-1 et seq. of the City Code (erosion and sediment control).
- (E) All development, redevelopment, and uses disturbing greater than 2,500 square feet shall meet the following storm water quality management performance requirements. For purposes of this section, the following shall be used to define the site area for determining water quality requirements: for projects disturbing less than 50 percent of the tax parcel (or if multiple parcels are involved, the land subject to the application), the disturbed area shall be used as the site area; for projects disturbing greater than or equal to 50 percent of the tax parcel (or if multiple parcels are involved, the land subject to the application), the entire tax parcel shall be used as the site area.
 - (1) The entire water quality volume from the site shall be treated. When the development, redevelopment, or use constitutes disturbing only a small portion of a tax map parcel greater than five acres in size, the director of T&ES may establish criteria for allowing the parcel to be divided into sub-basins.
 - (2) Single-family residences separately built and disturbing less than one acre and not part of a larger common plan of development or sale, including additions or modifications to existing single-family detached residential structures are exempt from subsections (4) and (5) below. The Alexandria water quality volume default requirement in subsection (6) still applies.
 - (3) In order to protect the quality of state waters located within the City of Alexandria and to control the discharge of stormwater pollutants from regulated activities, the following minimum design criteria and statewide standards for stormwater management, per 9VAC25-870-63 shall be applied.
 - (4) New development. The total phosphorus load of new development projects shall not exceed 0.41 pounds per acre per year, as calculated pursuant to this section.
 - (5) Development of prior developed lands:
 - (a) For land-disturbing activities disturbing greater than or equal to one acre that results in no net increase in impervious cover from the pre-development condition, the total

phosphorus load shall be reduced at least 20 percent below the pre-development total phosphorus load.

- (b) For regulated land-disturbing activities disturbing less than one acre that results in no net increase in impervious cover from the pre-development condition, the total phosphorus load shall be reduced at least ten percent below the predevelopment total phosphorus load.
 - (c) For land-disturbing activities that result in a net increase in impervious cover over the pre-development conditions, the design criteria for new development shall be applied to the increased impervious area. Depending on the area of disturbance, the criteria of subsections (a) or (b) above shall be applied to the remainder of the site.
 - (d) In lieu of subsection (c), the total phosphorus load of a linear development project as defined in 9VAC25-870-10 occurring on prior developed lands shall be reduced 20 percent below the predevelopment total phosphorus load.
 - (e) The total phosphorus load shall not be required to be reduced below the applicable standard for new development unless standards applied by other parts of this article require a more stringent standard.
- (6) For new development and development on prior developed lands in subsections (4) and (5) above, the entire Alexandria water quality volume default from the site shall be treated, or the requirements must be met consistent with section 13-110
 - (7) Compliance with subsections (4) and (5) above shall be determined using the runoff reduction method and through the use of stormwater BMPs established in 9VAC25-870-65 or found at the Virginia BMP Clearinghouse website, except as may be limited in accordance with policies established by the director of T&ES in accordance with subsection 13-104(C).
 - (8) Compliance with subsections (4) and (5) may be achieved by the applicant in accordance with off-site compliance options in 9VAC25-870-69 under the following circumstances:
 - (a) Less than five acres of land will be disturbed;
 - (b) The post-construction phosphorus control requirement is less than ten pounds per year; or
 - (c) At least 75 percent of the required phosphorus nutrient reductions are achieved on-site. If at least 75 percent of the required phosphorus nutrient reductions cannot be met on-site, and the operator can demonstrate to the satisfaction of the director of T&ES that (i) alternative site designs have been considered that may accommodate on-site best management practices, (ii) on-site best management practices have been considered in alternative site designs to the maximum extent practicable, (iii) appropriate on-site best management practices will be implemented, and (iv) full compliance with post-development nonpoint nutrient runoff compliance requirements cannot practicably be met on-site, then the required phosphorus nutrient reductions may be achieved, in whole or in part, through the use of off-site compliance options.
 - (9) When the requirements of subsections (4) and (5) have otherwise been met, the requirement to treat the entire Alexandria water quality volume default in subsection (6) may be achieved in accordance with alternative stormwater management equivalency options presented in section 13-110
 - (10) Notwithstanding those exemptions granted under section 13-123, all such land-disturbing activities shall be subject to the design storm and hydrologic methods set out in 9VAC25-870-72, linear development controls in 9VAC25-870-76, and criteria associated with stormwater impoundment structures in 9VAC25-870-85.
 - (11) Notwithstanding the above requirements, any site with (a) an intermittent stream contained within an existing natural channel, or (b) a non-tidal wetland that does not meet the criteria

for designation as a resource protection area in section 13-105(B), must meet the following additional water quality performance criteria:

- (a) Measures must be taken to protect these features from direct stormwater runoff from impervious surfaces and to preserve their water quality functions.
 - (b) A 50-foot wide vegetated area preserved where present, or established where not present, on the outward edge of these features shall be considered a sufficient BMP to meet this standard if the vegetated area is designed to prevent erosion and scouring.
 - (c) The BMP requirement in (b) above may alternatively be met through the use of a smaller vegetated area in combination with equivalent on-site stormwater treatment and/or equivalent off-site options presented in section 13-110 if approved by the director of T&ES.
 - (d) Development, redevelopment, uses, and land-disturbing activities allowed in the vegetated area shall be the same as those allowed in RPAs as described in section 13-107. Delineation of the vegetated area shall be accomplished in the manner prescribed in section 13-106
 - (e) The director of T&ES may waive the requirements of (b) above if the non-tidal wetland is demonstrated to the director of T&ES's satisfaction that it qualifies as an isolated wetland of minimal ecological value defined in section 13-103(K).
- (F) All development and redevelopment shall meet the following channel protection and flood protection requirements. Compliance with this section satisfies the stormwater management requirements of section 5-4-7(c)(4) of the City Code (erosion and sediment control):
- (1) Channel protection. Concentrated stormwater flow shall be released into a stormwater conveyance system and shall meet the criteria of this section, where applicable, from the point of discharge to a point within the limits of analysis in subsection (d).
 - (a) *Manmade stormwater conveyance systems.* When stormwater from a development is discharged to a manmade stormwater conveyance system, following the land-disturbing activity, either:
 - (i) The manmade stormwater conveyance shall convey the post-development peak flow rate from the two-year 24-hour storm event without causing erosion of the system. Detention of stormwater or downstream improvements may be incorporated into the land-disturbing activity to meet this criterion, at the discretion of the director; or
 - (ii) The peak discharge requirements for concentrated stormwater flow to natural stormwater conveyance systems in subsection (c) shall be met.
 - (b) *Restored stormwater conveyance systems.* When stormwater from a development is discharged to a restored stormwater conveyance system that has been restored using natural design concepts, following the land-disturbing activity, either:
 - (i) The development shall be consistent, in combination with other stormwater runoff, with the design parameters of the restored stormwater conveyance system that is functioning in accordance with the design objectives; or
 - (ii) The peak discharge requirements for concentrated stormwater flow to natural stormwater conveyance systems in subsection (c) shall be met.
 - (c) *Natural stormwater conveyance systems.* When stormwater from a development is discharged to a natural stormwater conveyance system the maximum peak flow rate from the one-year 24-hour storm following the land-disturbing activity shall be calculated either:
 - (i) In accordance with the following methodology:

$$Q_{\text{Developed}} \leq \text{I.F.} \cdot (Q_{\text{Pre-developed}} \cdot \text{RV}_{\text{Pre-developed}}) / \text{RV}_{\text{Developed}}$$

Under no condition shall $Q_{\text{Developed}}$ be greater than $Q_{\text{Pre-developed}}$ nor shall $Q_{\text{Developed}}$ be required to be less than that calculated in the equation $(Q_{\text{Forest}} \cdot \text{RV}_{\text{Forest}}) / \text{RV}_{\text{Developed}}$; where

I.F. (Improvement Factor) equals 0.8 for sites > 1 acre or 0.9 for sites ≤ 1 acre.

$Q_{\text{Developed}}$ = The allowable peak flow rate of runoff from the developed site.

$\text{RV}_{\text{Developed}}$ = The volume of runoff from the site in the developed condition.

$Q_{\text{Pre-developed}}$ = The peak flow rate of runoff from the site in the pre-developed condition.

$\text{RV}_{\text{Pre-developed}}$ = The volume of runoff from the site in pre-developed condition.

Q_{Forest} = The peak flow rate of runoff from the site in a forested condition.

$\text{RV}_{\text{Forest}}$ = The volume of runoff from the site in a forested condition.

- (d) *Limits of analysis.* Unless subsection (c) is utilized to show compliance with the channel protection criteria, stormwater conveyance systems shall be analyzed for compliance with channel protection criteria to a point where either:
- (i) Based on land area, the site's contributing drainage area is less than or equal to 1.0 percent of the total watershed area; or
 - (ii) Based on peak flow rate, the site's peak flow rate from the one-year 24-hour storm is less than or equal to 1.0 percent of the existing peak flow rate for the one-year 24-hour storm event prior to implementation of any stormwater quantity control measures.
- (2) Flood protection. Concentrated stormwater flow shall be released into a stormwater conveyance system and shall meet one of the following criteria as demonstrated by the use of acceptable hydrologic and hydraulic methodologies:
- (a) Concentrated stormwater flow to stormwater conveyance systems that currently do not experience localized flooding during the ten-year 24-hour storm event:
 - (i) The point of discharge releases stormwater into a stormwater conveyance system that, following the land-disturbing activity, confines the post-development peak flow rate from the ten-year 24-hour storm event within the stormwater conveyance system; and
 - (ii) Unless waived under (iv), the post-development peak flow rate for the ten-year 24-hour storm event shall be less than the predevelopment peak flow rate from the ten-year 24-hour storm event.
 - (iii) Detention of stormwater or downstream improvements may be incorporated into the approved land-disturbing activity to meet (i) and (ii), at the discretion of the director of T&ES.
 - (iv) A waiver of the detention requirements and/or the downstream stormwater limits of analysis in subsection (2)(c) may be granted by the director based on factors including but not limited to the project's location in the watershed.
 - (b) Concentrated stormwater flow to stormwater conveyance systems that currently experience localized flooding during the ten-year 24-hour storm event: The point of discharge either:
 - (i) Confines the post-development peak flow rate from the ten-year 24-hour storm event within the stormwater conveyance system to avoid the localized flooding.

Additional detention of stormwater or downstream improvements may be incorporated into the approved land-disturbing activity to meet this criterion, at the discretion of the director; or

- (ii) Releases a post-development peak flow rate for the ten-year 24-hour storm event that is less than the pre-development peak flow rate from the ten-year 24-hour storm event.
 - (iii) A waiver of the detention requirement may be granted by the director of T&ES based on factors including but not limited to the amount of stormwater runoff generated, the severity of flooding issues in the watershed and/or the lack of adequacy of the existing conveyance system.
- (c) Limits of analysis. Stormwater conveyance systems shall be analyzed for compliance with flood protection criteria to a point where:
- (i) The site's contributing drainage area is less than or equal to 1.0 percent of the total watershed area draining to a point of analysis in the downstream stormwater conveyance system;
 - (ii) Based on peak flow rate, the site's peak flow rate from the ten-year 24-hour storm even is less than or equal to 1.0 percent to the existing peak flow rate from the ten-year 24-hour storm event prior to the implementation of any stormwater quantity control measures; or,
 - (iii) The stormwater conveyance system enters a mapped floodplain or other flood-prone area adopted in accordance with section 6-300 et seq. of the City Code.
- (d) Alternative limits of analysis. If section 13-109(F)(2)(a)(i) and (ii) or 109(F)(2)(b)(ii) are utilized to comply with the flood protection criteria the downstream limit of analysis shall extend to:
- (i) A point that is at least 150 feet downstream of a point where the receiving pipe or channel is joined by another that has a drainage area that is at least 90 percent of the size of the first drainage area at the point of confluence; or
 - (ii) A point that is at least 150 feet downstream of a point where the drainage area is 360 acres or greater.
- (3) Increased volumes of sheet flow resulting from pervious or disconnected impervious areas, or from physical spreading of concentrated flow through level spreaders, must be identified and evaluated for potential impacts on down-gradient properties or resources. Increased volumes of sheet flow that will cause or contribute to erosion, sedimentation, or flooding of down gradient properties or resources shall be diverted to a stormwater management facility or a stormwater conveyance system that conveys the runoff without causing down-gradient erosion, sedimentation, or flooding. If all runoff from the site is sheet flow and the conditions of this subsection are met, no further water quantity controls are required.
- (4) For the purposes of computing pre-development runoff, all pervious lands on the site shall be assumed to be in good hydrologic condition in accordance with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) standards, regardless of conditions existing at the time of computation. Pre-development runoff calculations utilizing other hydrologic conditions may be utilized provided that it is demonstrated to and approved by the director of T&ES that actual site conditions warrant such considerations.
- (5) Pre-development and post-development runoff characteristics and site hydrology shall be verified by site inspections, topographic surveys, available soil mapping or studies, and calculations consistent with good engineering practices. Guidance provided in the Virginia Stormwater Management Handbook and by the Virginia Stormwater BMP Clearinghouse shall be considered appropriate practices.

- (6) The director of T&ES may waive these requirements provided in subsection (2) in cases where stormwater detention would conflict with the city's flood management programs. The waiver may be granted based on factors including, but not limited to, the project's location in the watershed and/or off-site improvement to upgrade the downstream conveyance systems.
 - (7) Post-development concentrated surface waters shall not be discharged on adjoining property, unless an easement expressly authorizing such discharge has been granted by the owner of the affected land.
- (G) It shall be the responsibility of the owner of any stormwater quality or quantity management facility established to meet the requirements of (E) and (F) above to provide adequate maintenance for proper functioning of the system. The following requirements apply to all existing and future facilities constructed in the city:
- (1) The owner shall enter into a stormwater BMP maintenance agreement (agreement) with the city that provides all necessary provisions to ensure compliance with this article, to include access for inspections. The agreement shall require the provision of long-term maintenance of stormwater BMPs and provide for inspections. Facility-specific inspection frequency and maintenance requirements shall be set by city policy and procedures. The BMP maintenance agreement shall be set forth in an instrument recorded in the city land records. The stormwater BMP maintenance agreement form will be provided by the director of T&ES in accordance with section 13-104(C).
 - (2) The owner shall prepare and submit inspection and maintenance reports to the city in accordance with city policies and procedures for the specific facility. Inspection and maintenance reports shall be signed by the owner of the facility or an individual acting on the owner's behalf, a registered professional, or a person who holds an appropriate certificate of competence from the board. Such certification shall state that the facility is being adequately maintained as designed.
 - (3) The owner shall provide the city with access to the facility to perform quality assurance inspections and follow up inspections to ensure adequate maintenance has been conducted a minimum of once every five years, or on a more frequent basis at the discretion of the director. If inadequate maintenance is observed by the city, the owner will be notified and an adequate period specified for corrective action. If the corrective action is not performed within the specified time, the city may perform the necessary corrections and bill the property owner. In cases of repeated instances of failure to perform required maintenance, sanctions may be imposed as provided in section 13-126

13-110 - Alexandria water quality improvement fund and alternative stormwater management equivalency options.

- (A) The director of T&ES, in consultation with the director of planning and zoning and the director of recreation, parks, and cultural activities, as appropriate, shall establish equivalent stormwater management options that may be used to meet the requirements of section 13-109(E)(6) and section 13-109(E)(11)(c). Options shall include the following:
 - (1) Specific on-site and off-site improvements that have been determined by the director of T&ES to achieve a pollutant removal equal to or greater than what would have been achieved had a traditional BMP been required; and
 - (2) Monetary contributions to the Alexandria water quality improvement fund provided for in subsection (C) below.
- (B) Improvements may include, but not necessarily be limited to, stream restoration, stream daylighting, removal of existing RPA encroachments, RPA enhancement, street cleaning, combined sewer system separation, and permanent preservation of open space areas beyond the city's baseline open space preservation requirements.

- (C) Monetary contributions to the Alexandria water quality improvement fund shall be calculated by the director of T&ES based on estimates of the cost of actually installing and maintaining on-site BMPs through their life cycle. These costs will be updated on a periodic basis by the director of T&ES as required.
- (D) In determining whether to allow equivalent stormwater options, as well as the appropriate combination of on-site and off-site controls, the director of T&ES shall take into consideration the following:
 - (1) Whether there is an opportunity to control impervious surface cover that comes into routine contact with vehicles, including but not limited to parking areas, streets and roadways except for public roads exempt under section 13-109; loading docks; equipment, material, and waste storage areas; and vehicle fueling, washing, storage, maintenance, and repair areas;
 - (2) Whether other environmental and public benefits such as site design, open space, tree preservation, and landscaping can be achieved;
 - (3) Whether on-site stormwater detention would conflict with the city's flood management programs;
 - (4) Whether site-specific constraints would make on-site treatment difficult or impractical, especially when the site consists of a single-family residence separately built and not part of a subdivision;
 - (5) Whether there are opportunities readily available for off-site improvements within the general vicinity of the site that will provide greater water quality benefits than on-site improvements;
 - (6) Whether there are opportunities to control specific pollutants of concern identified within the watershed or subwatershed, including but not limited to those identified by the department of environmental quality in its most recent 303(d) Total Maximum Daily Load (TMDL) Priority List;
 - (7) Whether there are opportunities to implement the Water Quality Management Supplement to the city master plan and the city's Virginia Stormwater Management Permit (VSMP) for its municipally owned separate storm sewer system discharges as issued by the Department of Environmental Quality; and
 - (8) Whether the cost of implementing available off-site improvements is reasonably equivalent to that of a monetary contribution;
 - (9) Single family residential development projects that are exempt from the water quality requirements of section 13-123(A) are considered eligible to contribute to the Alexandria water quality improvement fund in section 13-110(A)(2) to meet the Alexandria water quality volume default requirement in section 13-107(E)(3) with no further consideration of items (1) through (8) above.
- (E) Final approval of equivalency options used for a particular site shall be made at the sole discretion of the director of T&ES.
- (F) The city hereby establishes a dedicated fund known as the Alexandria water quality improvement fund to be used in conjunction with this Article XIII, the water quality management supplement to the city master plan, and the city's municipal separate storm sewer system (MS4) general permit issued by the Virginia Department of Environmental Quality. The purpose of the fund is to reduce nonpoint source pollution and improve stream quality and habitat through appropriate activities including, but not limited to: new BMPs, retrofit of existing BMPs, riparian enhancements, stream bank stabilization and/or restoration, public education and outreach, demonstration projects, water quality monitoring and analysis, and other activities to meet TMDL requirements.

- (A) Any development, redevelopment, or use exceeding 2,500 square feet of land disturbance within the CBPA shall be subject to the development review process outlined in subsection (C) below prior to any clearing of the site, or the issuance of any building, land use, or land development permit. However, any land-disturbing activity less than one acre within the CBPA shall not be required to complete a registration statement for coverage under the general permit, but shall be subject to all aspects of the development review process, to include the water quality and quantity criteria in subsections 13-109(E) and (F). Further, any detached single-family home construction within or outside of a common plan of development or sale that is not otherwise exempt shall not be required to complete a registration statement, but shall adhere to all other requirements of the general permit and all applicable requirements of this article.
- (B) Notwithstanding subsection (A) above, all development, redevelopment, or use in the RPA, or in the vegetated area established under subsection 13-109(E)(11), regardless of the amount of land disturbance, shall be subject to the review criteria established in section 13-107 prior to any clearing of the site or the issuance of any building, land use, or land development permit.
- (C) The development review process application shall consist of the plans and studies identified below, such application forms as the director of T&ES shall require and the appropriate fees, which together shall constitute the plan of development. The plans and studies identified in this section may be coordinated or combined with other required submission materials, as deemed appropriate by the director of T&ES. The plan of development shall contain the following elements:
 - (1) A site plan in accordance with the provisions of section 11-400 of this ordinance or other applicable law and, if applicable, a subdivision plat in accordance with the provisions of Chapter 5, Title 7 of the City Code;
 - (2) An environmental site assessment as detailed in section 13-112
 - (3) A landscape plan in accordance with the provisions of section 113-117(D)(3) of this ordinance certified by qualified design professionals practicing within their areas of competence;
 - (4) A stormwater management plan as detailed in section 13-114 and approved in accordance with section 13-115
 - (5) An erosion and sediment control plan in accordance with the provisions of Chapter 4, Title 5 of the City Code;
 - (6) Completion of the stormwater pollution prevention plan checklist referring to standard plan language included in the final plan; and
 - (7) For all land disturbance, development, or redevelopment within an RPA, or within an environmentally sensitive area as determined by the director of T&ES pursuant to section 13-117(C) or section 13-117(D), or for an exception under section 13-119, a water quality impact assessment as detailed in section 13-117
- (D) No development, redevelopment, uses, or land disturbing activities may commence until the director of T&ES has approved the final site plan and a state construction general permit has been issued based on approval of a complete and accurate registration statement signed and submitted by the operator, if such registration statement is required. The following shall be required for final site plan approval:
 - (1) Evidence that a general VPDES permit for discharges of stormwater from construction activities has been issued, if such general permit is required;
 - (2) Approval by the director of T&ES of all requirements as outlined in subsection (C) above;
 - (3) Payment of all applicable fees in accordance with section 113-104(D);
 - (4) Demonstration to the satisfaction of the director of T&ES, through the review of the final site plan application and attendant materials and supporting documentation, that all land

clearing, construction, disturbance, land development, and drainage will be done in accordance with this Article XIII.

- (5) Review of a signed standard maintenance and monitoring agreement for the long term maintenance of stormwater BMPs, and proof of recordation per section 13-109(G).
- (E) As a condition of final plan approval, any development, redevelopment, or land-disturbing activity of one acre or greater must develop prior to the land-disturbing activity, implement, and keep at the site for inspection a stormwater pollution prevention plan that meets the requirements set forth in section 13-113, which includes a pollution prevention plan that meets the requirements set forth in section 13-116

13-112 - Environmental site assessment.

- (A) The environmental site assessment shall clearly delineate the individual components of the RPA as well as the total geographic extent of the RPA as defined in section 13-105(B) through a methodology approved by the director of T&ES under the authority of section 13-104(C).
- (B) The environmental site assessment shall also clearly describe, map, or explain the following:
 - (1) Intermittent streams contained within a natural channel through a methodology approved by the director of T&ES under the authority of section 13-104(C).
 - (2) Highly erodible and highly permeable soils if available from existing public documents or documents available to the applicant;
 - (3) Steep slopes greater than 15 percent in grade;
 - (4) Known areas of contamination;
 - (5) Springs, seeps, and related features; and
 - (6) A listing of all wetlands permits required by law (evidence that such permits have been obtained shall be presented to the director of T&ES before permits will be issued to allow commencement of grading or other on-site activity).
- (C) Wetlands delineations shall be performed consistent with current procedures promulgated by the U.S. Army Corps of Engineers and the Environmental Protection Agency.
- (D) Site-specific evaluations or delineations of RPA boundaries shall be certified by a professional engineer, land surveyor, landscape architect, soil scientist, or wetland delineator certified or licensed to practice in the Commonwealth of Virginia.
- (E) In the event that no part of the site plan area contains any elements described in subsection (A) or (B) above, the applicant and the party responsible for the evaluation may, in lieu of providing an environmental site assessment plan, so certify the finding, in writing and under oath, to the director of T&ES. Any permit issued in reliance upon such a certification where said certification is factually inaccurate or incorrect shall be void ab initio. Such invalidity shall be in addition to any other penalties which may be imposed upon the makers of such certification.
- (F) The environmental site assessment shall be drawn at the same scale as the preliminary site plan or subdivision plat, and shall be certified as complete and accurate by a professional engineer or a certified land surveyor. This requirement may be waived by the director of T&ES when the proposed use or development would result in less than 5,000 square feet of disturbed area.

13-113 - Stormwater pollution prevention plan.

- (A) The stormwater pollution prevention plan (SWPPP) shall include the content specified in 9VAC25-870-54, which includes but is not limited to, an approved erosion and sediment control plan, an approved stormwater management plan, a pollution prevention plan for regulated land-disturbing activities, and a description of any additional control measures necessary to address a TMDL. The SWPPP must also comply with the requirements and general information set forth

in 9VAC25-880-70 Section II of the general VPDES permit for discharges of stormwater from construction activities (construction general permit).

- (B) The SWPPP shall be amended by the operator whenever there is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to state waters that is not addressed in the existing SWPPP.
- (C) The SWPPP must be maintained by the operator at a central location on-site. If an on-site location is not available, notice of the SWPPP's location must be posted near the main entrance at the construction site. Operators shall make the SWPPP available for public review in accordance with Section II of the general permit, either electronically or in hard copy.

13-114 - Stormwater management plan.

- (A) The stormwater management plan must apply the stormwater technical requirements of section 13-109 to the entire site. Individual lots in a new residential, commercial, or industrial development or sale, including those developed under subsequent owners, shall not be considered separate land-disturbing activities. Instead, the common plan, as a whole, shall be considered to be a single land disturbing activity. The plan shall consider all sources of surface runoff and all sources of subsurface and groundwater flows converted to surface runoff. The plan shall contain maps, charts, graphs, tables, photographs, narrative descriptions, explanations, calculations, and citations to supporting references as appropriate to communicate the information required by this Article XIII. At a minimum, the stormwater management plan must contain the following:
 - (1) Information on the type and location of stormwater discharges; information on the features to which stormwater is being discharged including surface waters, and the pre-development and post-development drainage areas;
 - (2) Contact information including the name, address, and telephone number of the owner and the tax reference and parcel number of the property or properties affected;
 - (3) A narrative that includes a description of current site conditions and final site conditions;
 - (4) A general description of the proposed stormwater management facilities and a maintenance agreement and inspection schedule in accordance with section 13-109(G) to ensure that the facilities will be operated and maintained after construction is complete;
 - (5) Information on the proposed stormwater management facilities, including:
 - (a) The type of facilities;
 - (b) Location, including geographic coordinates;
 - (c) Acres treated; and
 - (d) The surface waters into which the facility will discharge.
 - (6) Hydrologic and hydraulic computations, including runoff characteristics.
 - (7) Documentation and calculations verifying compliance with the water quality and water quantity requirements of section 13-109
 - (8) A map or maps of the site that depicts the topography of the site and includes:
 - (a) All contributing drainage areas;
 - (b) Existing streams, ponds, culverts, ditches, wetlands, other water bodies, and floodplains;
 - (c) Soil types, relevant geological formations, forest cover, and other vegetative areas;
 - (d) Current land use including existing structures, roads, and locations of known utilities and easements;

- (e) Sufficient information on adjoining parcels to assess the impacts of stormwater from the site on these parcels;
 - (f) The limits of clearing and grading, and the proposed drainage patterns on the site;
 - (g) Proposed buildings, roads, parking areas, utilities, and stormwater management facilities; and
 - (h) Proposed land use with tabulation of the percentage of surface area to be adapted to various uses, including but not limited to planned locations of utilities, roads, and easements.
- (B) If an operator intends to meet the water quality requirements set forth in section 13-109(E) through the use of off-site credits in accordance with section 13-109(E)(8), then a letter of availability from the off-site provider must be included. Approved off-site options must achieve the necessary reductions prior to the commencement of the applicant's land-disturbing activity except as otherwise allowed by Section 62.1-44.15:35 of the Code of Virginia.
 - (C) If the operator intends to utilize the alternative stormwater management equivalency options in section 13-110 to meet the Alexandria water quality volume default in section 13-109(E)(6) or the additional water quality performance criteria of section 13-109(E)(8), then the operator must submit a narrative and any required calculations.
 - (D) Site specific facilities for phased projects shall be designed for the ultimate development of the contributing project watershed based on zoning, comprehensive plans, local public facility master plans, or other similar planning documents.
 - (E) Elements of stormwater management plans that include activities regulated under Chapter 4 of Title 54.1 of the Code of Virginia be appropriately sealed and signed by professional registered in the Commonwealth of Virginia and performed in accordance with procedures, consistent with good engineering practice, established by the director of T&ES pursuant to section 13-104(C).
 - (F) All stormwater designs that require analysis of pressure hydraulic systems and/or inclusion and design of flow control structures must be sealed by a professional engineer registered in the Commonwealth of Virginia.
 - (G) An as-built drawing for permanent stormwater management facilities shall be submitted to the director of T&ES in accordance with section 13-114. The as-built drawing shall be appropriately sealed and signed by a professional registered in the Commonwealth of Virginia certifying that the stormwater facilities have been constructed in accordance with the approved plan.
 - (H) The plan shall establish a long-term schedule for inspection and maintenance of stormwater management facilities that includes all maintenance requirements and persons responsible for performing maintenance. If the designated maintenance responsibility is with a party other than the City of Alexandria, then a maintenance agreement shall be executed between the responsible party and the city in accordance with section 13-109(G).

13-115 - Stormwater management plan review.

- (A) The director of T&ES shall review stormwater management plans and shall approve or disapprove a stormwater management plan in accordance with the following:
 - (1) The director of T&ES shall determine the completeness of the plan in accordance with section 13-114 and shall notify the applicant, in writing, of such determination within 15 calendar days of receipt. If the plan is deemed incomplete, the above written notification shall contain the reasons the plan is deemed incomplete.
 - (2) The director of T&ES shall have an additional 60 calendar days from the date of the communication of completeness to review the plan, except that if a determination of completeness is not made and communicated within 15 days, then the plan shall be deemed complete and the director of T&ES shall have 60 calendar days from the date of submission to review the plan.

- (3) The director of T&ES shall review any plan that has been previously disapproved within 45 calendar days of the date of re-submission.
 - (4) During the review period, the plan shall be approved or disapproved and the decision communicated in writing to the person responsible for the land-disturbing activity or the designated agent. If the plan is not approved, the reasons for not approving the plan shall be provided in writing. Approval or denial shall be based on the plan's compliance with the requirements of this article.
 - (5) If a plan meeting all requirements of this article is submitted and no action is taken within the time frame provided in this subsection, the plan will be deemed approved.
- (B) Approved stormwater management plans may be modified as follows:
- (1) Modifications to an approved stormwater management plan shall be allowed only after review and written approval by the director of T&ES. The director of T&ES shall have 60 calendar days to respond in writing either approving or disapproving such request.
 - (2) The director of T&ES may require that an approved stormwater management plan be amended, within a time prescribed by the director of T&ES, to address any deficiencies noted during inspection.
- (C) The director of T&ES shall require the submission of an as-built drawing for permanent stormwater facilities. The director of T&ES may elect not to require as-built drawings for stormwater management facilities for which recorded maintenance agreements are not required.

13-116 - Pollution prevention plan.

- (A) The pollution prevention plan is required by 9VAC25-870-56 and shall be developed, implemented, and updated as necessary, and must detail the design, installation, implementation, and maintenance of effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented, and maintained to:
- (1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
 - (2) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater; and
 - (3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.
- (B) The pollution prevention plan shall include effective best management practices to prohibit the following discharges:
- (1) Wastewater from washout of concrete, unless managed by an appropriate control;
 - (2) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;
 - (3) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
 - (4) Soaps or solvents used in vehicle and equipment washing.
- (C) Discharges from dewatering activities, including discharges from dewatering of trenches or excavations, are prohibited unless managed by appropriate controls.

13-117 - Water quality impact assessment.

- (A) The purpose of the water quality impact assessment is to:
- (1) Identify the impacts of a proposed use, development, or redevelopment on water quality and lands within an RPA;
 - (2) Ensure that, where a use, development, or redevelopment does take place within an RPA, it will be located on those portions of the site and in a manner that will be least disruptive to the natural functions of the RPA;
 - (3) Identify the impacts of a proposed use, development, or redevelopment within an RMA where the director of T&ES has determined that the proximity to an RPA, the environmentally sensitive characteristics of the site, or the proposed scale and intensity has the potential to affect water quality;
 - (4) Specify mitigation that will address water quality protection under the foregoing circumstances or under an exception under section 13-116
- (B) A water quality impact assessment is required for any proposed development or redevelopment in the RPA, except that at the discretion of the director of T&ES a water quality impact assessment may not be required if the activity is addressed under section 13-107(A), section 13-107(B), or section 13-107(D). There are two types of water quality impact assessments: water quality minor impact assessments and water quality major impact assessments.
- (C) A water quality minor impact assessment is required for development or redevelopment within RPAs or under an exception which involves 5,000 or less square feet of land disturbance; or for any development or redevelopment within the RMA that involves 5,000 or less square feet of land disturbance adjacent to an RPA, if required by the director of T&ES due to the presence or proximity of wetlands, potential for harmful discharge of contaminants from the property, or slopes greater than 15 percent which are proposed to be disturbed. A minor assessment must demonstrate that the undisturbed buffer area, enhanced vegetative plantings, and any required BMPs will result in the removal of no less than 75 percent of sediments and 40 percent of nutrients from post-development stormwater runoff and that will retard runoff, prevent erosion, and filter nonpoint source pollution the equivalent of the full undisturbed buffer area. Such an assessment shall include a site plan that shows the following:
- (1) Location and description of the existing characteristics and conditions of the components of the RPA as identified in section 13-105(B) and delineated in the environmental site assessment required by section 13-112
 - (2) Location and nature of the proposed encroachment into the buffer area, including: type of paving material; areas of clearing or grading; location of any structures, drives, or other impervious cover; and sewage disposal systems or reserve drainfield sites;
 - (3) Type and location of enhanced vegetation and/or proposed BMPs to mitigate the proposed encroachment;
 - (4) Location of existing vegetation on-site, including the number and types of trees and other vegetation to be removed in the buffer to accommodate the encroachment or modification; and
 - (5) Revegetation plan that supplements the existing buffer vegetation in a manner that provides for pollutant removal, erosion, and runoff control. The revegetation plan will incorporate native vegetation to the extent practicable.
- (D) A water quality major impact assessment is required for development or redevelopment within RPAs or under an exception that involves more than 5,000 square feet of land disturbance; or for any development or redevelopment within the RMA which involves more than 5,000 square feet of land disturbance adjacent to an RPA, if required by the director of T&ES due to the presence or proximity of wetlands, potential for harmful discharge of contaminants from the property, or slopes greater than 15 percent which are proposed to be disturbed. The following elements shall be included in a water quality major impact assessment:

- (1) All of the information required in a water quality minor impact assessment as specified in subsection (C) above;
- (2) A hydrogeological element that:
 - (a) Describes the existing topography, soils, hydrology, and geology of the site;
 - (b) Describes the impacts of the proposed development or redevelopment on topography, soils, hydrology, and geology on the site;
 - (c) Indicates the following:
 - (i) Disturbance or reduction of wetlands and justification for such action;
 - (ii) Disruption or reductions in the supply of water to wetlands, streams, lakes, rivers, or other water bodies;
 - (iii) Disruptions to existing hydrology, including wetland and stream circulation patterns;
 - (iv) Source location and description of proposed fill material (may, at applicant's risk, be provided when the U.S. Army Corps of Engineers permit application is submitted);
 - (v) Location of dredge materials and location of dumping area for such materials (may, at applicant's risk, be provided when the U.S. Army Corps of Engineers permit application is submitted);
 - (vi) Locations of and impacts on adjacent shellfish beds, submerged aquatic vegetation, and fish spawning areas (may, at applicant's risk, be provided when the U.S. Army Corps of Engineers permit application is submitted);
 - (vii) The estimated pre- and post-development pollutant loads in runoff as delineated in the stormwater management plan required by section 13-113
 - (viii) Estimation of percent increase in impervious surface on the site and identification of the type(s) of surfacing materials to be used;
 - (ix) Percent of the site to be cleared for the project;
 - (x) Anticipated duration and phasing schedule of the construction period; and
 - (xi) Listing of all requisite permits from all applicable agencies necessary to develop the project;
 - (d) Describes the proposed mitigation measures for the potential hydrogeological impacts. Potential mitigation measures include:
 - (i) Proposed erosion and sediment control measures, which may include minimizing the extent of the cleared area, perimeter controls, reduction of runoff velocities, measures to stabilize disturbed areas, schedule and personnel for site inspection;
 - (ii) Proposed stormwater management system;
 - (iii) Creation of wetlands to replace those lost; and
 - (iv) Minimizing cut and fill.
- (3) A supplement to the landscape plan that:
 - (a) Identifies and delineates the location of all significant plant material, including all trees on site six inches or greater diameter breast height. Where there are groups of trees, stands shall be outlined.
 - (b) Describes the impacts the development or use will have on the existing vegetation. Information should include:

- (i) General limits of clearing based on all anticipated improvements, including buildings, drives, and utilities;
 - (ii) Clear delineation of all trees which will be removed; and
 - (iii) Description of plant species to be disturbed or removed.
- (c) Describes the potential measures for mitigation. Possible mitigation measures include:
 - (i) Replanting schedule for trees and other significant vegetation removed for construction, including a list of possible plants and trees to be used;
 - (ii) Demonstration that the proposed plan will preserve to the greatest extent possible any significant trees and vegetation on the site and will provide maximum erosion and overland flow benefits from such vegetation;
 - (iii) Demonstration that indigenous plants are to be used to the greatest extent possible; and
 - (iv) Identification of the natural processes and ecological relationships inherent at the site, and an assessment of the impact of the proposed use and development of the land, including mitigating measures proposed in the water quality impact assessment, on these processes and relationships.
- (E) A water quality minor impact assessment shall be certified as complete and accurate by a professional engineer or a certified land surveyor. The additional elements required in a water quality major impact assessment shall be certified as complete and accurate by a professional engineer and by a qualified environmental scientist.
- (F) For any water quality impact assessment to proceed, the director of T&ES must first approve it for completeness and compliance with this Article XIII. Upon receipt of any water quality major impact assessment application, the director of T&ES may determine if review by the department is warranted and may request the department to review the assessment and respond with written comments. Any comments by the department will be incorporated into the final review by the director of T&ES provided that such comments are provided by the department within 90 days of the request.
 - (1) For a water quality minor impact assessment, the director of T&ES shall base this finding on the following criteria:
 - (a) The necessity of the proposed encroachment and the ability to place improvements elsewhere on the site to avoid disturbance of the buffer area;
 - (b) Impervious surface is minimized;
 - (c) Proposed BMPs, where required achieve the requisite reductions in pollutant loadings;
 - (d) The development, as proposed, meets the purpose and intent of these regulations;
 - (e) The cumulative impact of the proposed development when considered in relation to other development within the RPA in the vicinity, both existing and proposed, will not result in a significant degradation of water quality.
 - (2) For a water quality major impact assessment, the director of T&ES shall base this finding on the following criteria:
 - (a) Within any RPA, the proposed development is water-dependent or constitutes redevelopment;
 - (b) The disturbance of wetlands shall comply with state and federal regulations;
 - (c) The development will not result in significant disruption of the hydrology of the site;

- (d) The development will not result in significant degradation of water quality that could adversely affect aquatic vegetation or life;
- (e) The development will not result in unnecessary destruction of plant material on site;
- (f) Proposed erosion and sediment control measures are adequate to achieve the required reductions in runoff, and prevent off-site transport of sediment during and after construction;
- (g) Proposed stormwater management measures are adequate to control the stormwater runoff to achieve the required standard for pollutant control; and
- (h) Proposed revegetation of disturbed areas will provide adequate erosion and sediment control benefits, as determined by the director of T&ES.

13-118 - Final plans.

- (A) Final site plans and subdivision plats subject to this Article XIII for all lands within the CBPA shall include the following additional information:
 - (1) A copy showing issuance of all wetlands permits required by law; and
 - (2) A BMP inspection schedule and maintenance agreement between the city and applicant as deemed necessary and appropriate by the director of T&ES to ensure proper maintenance of best management practices in order to assure their continued performance.
- (B) The following installation and bonding requirements shall be met.
 - (1) Where buffer areas, landscaping, stormwater management facilities or other specifications of an approved plan are required, no certificate of occupancy shall be issued until the installation of required plant materials or facilities is completed, in accordance with the approved site plan.
 - (2) When the occupancy of a structure is desired prior to the completion of the required landscaping, stormwater management facilities, or other specifications of an approved plan, a certificate of occupancy may be issued only if the applicant provides to the city a surety bond or equivalent satisfactory to the director of T&ES in amount equal to the remaining plant materials, related materials, and installation costs of the required landscaping or facilities and/or maintenance costs for any required stormwater management facilities during the construction period.
 - (3) Unless otherwise approved by the director of T&ES for a phased project, all required landscaping shall be installed and approved by the first planting season following issuance of a certificate of occupancy or the surety bond may be forfeited to the city.
 - (4) Unless otherwise approved by the director of T&ES for a phased project, all required stormwater management facilities or other specifications shall be installed and approved within 18 months of project commencement. Should the applicant fail, after proper notice, to initiate, complete or maintain appropriate actions required by the approved plan, the surety bond may be forfeited to the city. The city may collect from the applicant the amount by which the reasonable cost of required actions exceeds the amount of surety held.
 - (5) After all required actions of the approved site plan have been completed, the applicant must submit a written request for a final inspection. If the requirements of the approved plan have been completed to the satisfaction of the director of T&ES, such unexpended or unobligated portion of the surety bond held shall be refunded to the applicant or terminated within 60 days following the receipt of the applicant's request for final inspection. The director of T&ES may require a certificate of substantial completion from a professional engineer or licensed surveyor before making a final inspection.

13-119 - Exceptions.

- (A) Unless otherwise provided in this Article XIII, a request for an exception to the requirements of this Article XIII shall be made pursuant to this section in writing to the director of T&ES. The request shall identify the impacts of the proposed exception on water quality and on lands within the RMA and RPA through the performance of a water quality impact assessment that complies with the provisions of section 13-117 to the extent applicable.
- (B) For exceptions to the provisions of sections 13-109 and 13-124 other than those detailed in section 13-107, the director of T&ES shall review the request for an exception and the water quality impact assessment and may grant the exception with such conditions and safeguards as deemed necessary to further the purpose and intent of this Article XIII if the director of T&ES finds that the applicant has demonstrated by a preponderance of the evidence that:
 - (1) Granting the exception will not confer upon the applicant any special privileges that are denied to other property owners in the CBPA overlay district;
 - (2) The exception is not based upon conditions or circumstances that are self-created or self-imposed, nor does the exception arise from conditions or circumstances either permitted or noncomplying that are related to adjacent parcels;
 - (3) The exception is the minimum necessary to afford relief;
 - (4) The exception will be consistent with the purpose and intent of the overlay district, and not injurious to water quality, the neighborhood or otherwise detrimental to the public welfare;
 - (5) Reasonable and appropriate conditions are imposed, as warranted, to prevent the allowed activity from causing degradation of water quality.
- (C) Economic hardship alone is not sufficient reason to grant an exception from the requirements of this Article XIII.
- (D) Under no circumstances shall the city allow an exception to the requirement that a qualified land-disturbing activity obtain the required construction general permit or other state permits.
- (E) Under no circumstances shall the city allow the use of a BMP not found on the Virginia Stormwater BMP Clearinghouse website, or as applicable for projects subject to 9VAC25-870 Part II.C. Notwithstanding, this shall not preclude the director of T&ES from placing reasonable limitations on a BMP on the Virginia Stormwater BMP Clearinghouse website.
- (F) Exceptions to the requirements for phosphorus reductions required under section 13-109(E)(4) and (5) will not be allowed unless off-site options available through 9VAC25-870-69 have been considered and found not available.
- (G) Exceptions to section 13-107 shall be heard and determined by the planning commission after hearing and notice pursuant to section 11-300. The schedule for reviewing the exception shall be made by the director of T&ES and the director of planning and zoning. The schedule shall provide, in a manner approved by the city manager, reasonable opportunity for review and action by the environmental policy commission prior to any formal action by the planning commission so that any recommendation of support, denial, or modification can be considered as part of the planning commission's deliberations.
- (H) A record of all exceptions granted shall be maintained by the director of T&ES.
- (I) Any person aggrieved by a decision of the director of T&ES or planning commission under this section may appeal as provided in section 13-120

13-120 - Appeals.

- (A) Any person aggrieved by a final case decision of the director of T&ES in the administration, interpretation or enforcement of this Article XIII or on any application hereunder may appeal such decision to the planning commission, by filing a notice of appeal, in writing, stating the grounds of appeal, with the secretary of the planning commission within 14 days of the issuance of such decision; provided, that any person aggrieved, who had no actual knowledge of the

issuance of such decision, may file an appeal within 14 days of the last day on which notice provided in section 11-300 or section 11-408 of this ordinance is given for any element of the plan of development. A notice of appeal shall be accompanied by a filing fee of \$100.00.

- (B) The planning commission shall conduct a public hearing on any appeal filed pursuant to section 13-120(A), notice for which shall be provided in accordance with the applicable provisions of section 11-300 of this ordinance. Following the conclusion of the hearing, the planning commission may affirm, reverse or modify the decision of the director of T&ES, or vacate the decision and remand the matter to the director of T&ES for further consideration.
- (C) Any person aggrieved by a decision of the planning commission issued pursuant to section 13-119(D) or section 13-120(B), or the city manager, may appeal the decision to the city council, by filing a notice of appeal, in writing, stating the grounds of appeal, with the city clerk within 14 days of the issuance of the decision.
- (D) The city council shall conduct a public hearing on any appeal filed pursuant to subsection (C), notice for which shall be provided in accordance with the applicable provisions of section 11-300 of this ordinance. Following the conclusion of the hearing, the council may affirm, reverse or modify the decision of the commission, or vacate the decision and remand the matter to the planning commission or the director of T&ES for further consideration.
- (E) Notwithstanding the provisions of subsections (A) through (D) above, an applicant or any aggrieved party who elects to appeal shall appeal the director of T&ES's decision of approval or disapproval of a stormwater management plan application by filing a notice of appeal with the director of T&ES within 30 days after service of such decision. The filing of such notice, and proceedings thereafter, shall be governed by Part 2A of the Rules of the Supreme Court of Virginia, and judicial review shall be had in the Circuit Court of the City of Alexandria on the record previously established, and shall otherwise be in accordance with the Administrative Process Act, Virginia Code Sections 9-6.14:1 et seq.

13-121 - Hearings.

- (A) Any applicant, permittee, or person subject to this article aggrieved by any action of the city taken without a formal hearing, or by inaction of the city, may demand in writing a formal hearing by the planning commission, provided a petition requesting such hearing is filed with the director of T&ES within 30 days after notice of such action is given by the director of T&ES.
- (B) The hearings held under this section shall be conducted by the planning commission at a regular or special meeting of the planning commission or by at least one member of the planning commission designated by the planning commission to conduct such hearings on behalf of the planning commission at any other time and place authorized by the planning commission.
- (C) A verbatim record of the proceedings of such hearing shall be taken and filed with the planning commission. Depositions may be taken and read as in actions at law.
- (D) The planning commission or its designated member, as the case may be, shall have power to issue subpoenas and subpoenas duces tecum, and at the request of any party shall issue such subpoenas. The failure of a witness without legal excuse to appear or testify or to produce documents shall be acted upon by the city whose action may include the procurement of an order of enforcement from the circuit court. Witnesses who are subpoenaed shall receive the same fees and reimbursements for mileage as in civil actions.

13-122 - Noncomplying land uses and structures.

- (A) Any land use or structure lawfully existing on January 28, 1992, or any land use or structure that exists at the time of any amendment to this Article XIII that does not comply as a result of the amendment, shall be deemed noncomplying.

- (B) Any proposed land use or structure for which an applicant has a an approved preliminary site plan, building permit, subdivision plan, plot plan, or special use permit on or before February 23, 2004 that would not comply under proposed amendments to Article XIII pursuant to the December 10, 2001 amendments to 9VAC10-20-10 et seq. may be constructed in accordance with the provisions of this Article XIII in effect at the time of submittal, except that the proposed land use or structure shall comply with any new requirements to the maximum extent practicable. Upon completion, the land use or structure shall be deemed noncomplying.
- (C) Any application for a proposed land use or structure that is not exempt pursuant to (A) or (B) above shall comply with amendments to Article XIII adopted pursuant to the December 10, 2001 amendments to 9VAC10-20-10 et seq.
- (D) Nothing in this Article XIII shall prevent the reconstruction of noncomplying structures destroyed by any casualty unless the reconstruction is otherwise restricted by this ordinance or other portions of the City Code. Such reconstruction shall occur within two years after the destruction or damage and there shall be no increase in the amount of impervious area and no further encroachment in the RPA, to the extent possible by sound engineering practices.
- (E) Any noncomplying land use or structure may continue and be maintained, including renovation, remodeling, and other cosmetic alterations provided that the activity does not result in land disturbance and that there is no net increase in nonpoint source pollutant load.
- (F) A request to enlarge or expand a principal noncomplying structure within an RPA buffer area may be approved by the director of T&ES through an administrative process provided that:
 - (a) The principal structure remains intact and the modification is compatible in bulk and scale to those in the surrounding neighborhood area, as determined by the director of planning and zoning. If these criteria are not met, the modification shall be subject to the exception request process requirements of section 13-119
 - (b) There will be no increase in nonpoint source pollution load.
 - (c) Any development or land disturbance exceeding and area of 2,500 square feet complies with section 5-4-1 et seq. of the City Code (erosion and sediment control).
 - (d) The director of T&ES finds that the request is consistent with the criteria provided in section 13-116(B).
- (G) A request to construct or modify a non-attached noncomplying accessory structure, or a request to modify or expand a noncomplying land use (e.g., a parking area, boat storage area, active recreation fields, etc.), shall only be approved through the exceptions process outlined in section 13-119

13-123 - Exemptions.

- (A) The following uses, which may involve structures, fill, flooding, draining, dredging, or excavating, shall be exempted from section 13-107, to the extent specifically enumerated in these regulations and not prohibited by any other provision of the City Code or applicable law and subject to the director of T&ES review and approval of design and construction plans for compliance with this Article XIII:
 - (1) Construction, installation, operation and maintenance of electric, natural gas, fiber-optic, and telephone lines, railroads and public roads constructed by VDOT or by or for the City of Alexandria in accordance with VDOT standards (built separately from development projects regulated under section 13-106), and their appurtenant structures. The exemption of public roads is further conditioned on the alignments being designed to prevent or otherwise minimize the encroachment in the RPA buffer and to minimize adverse effects on water quality.
 - (2) Construction, installation, and maintenance of water, sewer, natural gas, underground telecommunications and cable television lines owned or permitted by the City of Alexandria

or a service authority shall be exempt from the requirements of section 13-107 provided that:

- (a) To the degree possible, the location of such utilities and facilities shall be outside RPAs;
 - (b) No more land shall be disturbed than is necessary to provide for the proposed utility installation; and
 - (c) All such construction, installation, and maintenance of such utilities and facilities shall be in compliance with all applicable state and federal requirements and permits, and designed and conducted in a manner that protects water quality.
- (B) Notwithstanding any other provisions of this article, the following uses, which may involve structures, fill, flooding, draining, dredging, or excavating, shall be exempt from this article:
- (1) Land-disturbing activities less than 2,500 square feet not part of a larger common plan of development or sale, except as may be required in section 13-107 for CPBA;
 - (2) Land disturbances associated with permitted surface or deep mining operations and projects, or oil and gas operations and projects conducted under the provisions of Title 45.1 of the Code of Virginia;
 - (3) Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original construction of a project. The paving of existing road with a compacted or impervious surface and re-establishment of existing ditches and shoulders is deemed routine maintenance if performed in accordance with this subsection;
 - (4) Conducting land-disturbing activities in response to a public emergency where the related work requires immediate authorization to avoid imminent endangerment to human health or the environment. In such situations, the director of T&ES shall be advised of the disturbance within seven days of commencing the land-disturbing activity and compliance with this Article XIII shall be required within 30 days of commencing the land-disturbing activity;
 - (5) Land clearing for agricultural or silvicultural purposes, and related activities, in accordance with Section 62.1-44.15:34.C.2 of the Code of Virginia; and
 - (6) Activities under a state or federal reclamation program to return an abandoned property to an agricultural or open land use.
- (C) Discharges to a sanitary sewer or a combined sewer shall be exempt from section 13-113 (stormwater pollution prevention plan), section 13-116 (pollution prevention plan), and the requirement to obtain a VSMP construction general permit unless otherwise required by City Code or state or federal law . All other applicable portions of this article shall continue to apply.
- (D) Single-family residences separately built and disturbing less than one acre and not part of a larger common plan of development or sale, including additions or modifications to existing single-family detached residential structures are exempt from the water quality requirements of sections 109(E)(3) and (E)(4) except the Alexandria water quality volume default requirement in section 13-109(E)(5) still applies.

13-124 - Time limits on applicability of design criteria and grandfathering.

- (A) The time limits on applicability of design criteria shall apply provided:
- (1) Land-disturbing activities that obtain an initial state permit or commence land disturbance prior to July 1, 2014 shall be conducted in accordance with the technical criteria in 9VAC-25-870-93 through 9VAC25-870-99. Such projects shall remain subject to these technical criteria for two additional state construction general permit cycles. After such time, portions of the project not under construction shall become subject to any new technical criteria adopted by the board.

- (2) Land-disturbing activities that obtain an initial state construction general permit on or after July 1, 2014 shall be conducted in accordance with the technical criteria in sections 13-109(E) and (F), except for as provided in subsection (B) below, and shall remain subject to this technical criteria for two additional state permit cycles. After such time, portions of the project not under construction shall become subject to any new technical criteria adopted by the board.
 - (3) Nothing in this section shall preclude an operator from constructing to a more stringent standard at his/her discretion.
- (B) Grandfathering provisions established in 9VAC25-870-48 shall apply to this article as applicable. Any land-disturbing activity shall be considered grandfathered by the VSMP authority and shall be subject to the technical criteria of 9VAC25-870-93 through 9VAC25-870-99, provided:
- (1) A proffered or conditional zoning plan, zoning with a plan of development, preliminary or final subdivision plat, preliminary or final site plan, or any document determined by the locality to be equivalent thereto (i) was approved by the locality prior to July 1, 2012, (ii) provided a layout as defined in 9VAC25-870-10, (iii) will comply with the technical criteria of 9VAC25-870-93 through 99, (iv) has not been subsequently modified or amended in a manner resulting in an increase in the amount of phosphorus leaving each point of discharge, and such that there is no increase in the volume or rate of runoff;
 - (2) A state permit has not been issued prior to July 1, 2014; and
 - (3) Land disturbance did not commence prior to July 1, 2014.
- (C) Locality, state and federal projects shall be considered grandfathered and shall be subject to the technical criteria in 9VAC25-870-93 through 9VAC25-870-99 provided:
- (1) There has been an obligation of locality, state or federal funding, in whole or in part, prior to July 1, 2012, or the department has approved a stormwater management plan prior to July 1, 2012;
 - (2) A state permit has not been issued prior to July 1, 2014; and
 - (3) Land disturbance did not commence prior to July 1, 2014.
- (D) Land-disturbing activities grandfathered under subsections (A) and (B) of this section shall remain subject to 9VAC25-870-93 through 99 technical criteria for one additional state permit cycle. After such time, portions of the project not under construction shall become subject to any new technical criteria adopted by the board.
- (E) In cases where governmental bonding or public debt financing has been issued for a project prior to July 1, 2012, such project shall be subject to the technical criteria of 9VAC25-870-93 through 99.
- (F) Nothing in this section shall preclude an operator from constructing to a more stringent standard at his discretion.
- (G) However, these applicable land-disturbing activities are also subject to more stringent City criteria effective prior to July 1, 2014. This includes the definition of "site," treating the entire Alexandria water quality volume in section 13-109(E), the pre/post-development peak flow rate requirement for the ten-year 24-hour storm event in section 13-109(F)(2), the requirements in section 13-109(F)(3), and the requirements in section 13-109(F)(7).

13-125 - Monitoring and inspections.

- (A) The director of T&ES shall inspect the land-disturbing activity during construction for compliance with this Article XIII, including but not limited to compliance with the approved erosion and sediment control plan, compliance with the approved stormwater management plan,

development, updating, and implementation of the pollution prevention plan, and development and implementation of any additional control measures necessary to address a TMDL.

- (B) The director of T&ES may, at reasonable times and under reasonable circumstances, enter any establishment or upon any property, public or private, for the purpose of obtaining information or conducting surveys or investigations necessary in the enforcement of the provisions of this Article XIII.
- (C) In accordance with a performance bond with surety, cash escrow, letter of credit, any combination thereof, or such other legal arrangement or instrument, the director of T&ES may also enter any establishment or upon any property, public or private, for the purpose of initiating or maintaining appropriate actions that are required by the permit conditions associated with a land-disturbing activity when a permittee, after proper notice, has failed to take acceptable action within a time specified.
- (D) Pursuant to Section 62.1-44.15:40 of the Code of Virginia, the director of T&ES may require every permit applicant or permittee, or any such person subject to the requirements of this Article XIII to furnish when requested such application materials, plans, specifications, and other pertinent information as may be necessary to determine the effect of the discharge on the quality of state waters, or such other information as may be necessary to accomplish the purpose of this Article XIII.
- (E) Post-construction inspections of stormwater management facilities required by the provisions of this Article XIII shall be conducted by the director of T&ES pursuant to section 13-109(G).

13-126 - Penalties.

- (A) Under the authority of 9VAC25-870-116 the director of T&ES shall have the following authority to enforce provisions of this Article XIII required or authorized under Section 62.1-44.15:24 et seq. of the Code of Virginia (the Virginia Stormwater Management Act) and its attendant regulations:
 - (1) If the director determines that there is a failure to comply with the VSMP authority permit conditions or determines there is an unauthorized discharge, notice shall be served upon the permittee or person responsible for carrying out the permit conditions by any of the following: verbal warnings and inspection reports, notices of corrective action, consent special orders, and notices to comply. Written notices shall be served by registered or certified mail to the address specified in the permit application or by delivery at the site of the development activities to the agent or employee supervising such activities.
 - (a) The notice shall specify the measures needed to comply with the permit conditions and shall specify the time within which such measures shall be completed. Upon failure to comply within the time specified, a stop work order may be issued in accordance with subsection (b) or the permit may be revoked by the director of T&ES.
 - (b) If a permittee fails to comply with a notice issued in accordance with this section within the time specified, the director of T&ES may issue an order requiring the owner, permittee, person responsible for carrying out an approved plan, or the person conducting the land-disturbing activities without an approved plan or required permit to cease all land-disturbing activities until the violation of the permit has ceased, or an approved plan and required permits are obtained, and specified corrective measures have been completed.

Such orders shall be issued in accordance with local procedures. Such orders shall become effective upon service on the person by certified mail, return receipt requested, sent to his address specified in the land records of the locality, or by personal delivery by an agent of the director of T&ES. However, if the director of T&ES finds that any such violation is grossly affecting or presents an imminent and substantial danger of causing harmful erosion of lands or sediment deposition in waters within the watersheds of the Commonwealth or otherwise substantially

impacting water quality, it may issue, without advance notice or hearing, an emergency order directing such person to cease immediately all land-disturbing activities on the site and shall provide an opportunity for a hearing, after reasonable notice as to the time and place thereof, to such person, to affirm, modify, amend, or cancel such emergency order. If a person who has been issued an order is not complying with the terms thereof, the director of T&ES may institute a proceeding for an injunction, mandamus, or other appropriate remedy in accordance with subsection (3) below.

- (2) In addition to any other remedy provided by this article, if the director of T&ES or his designee determines that there is a failure to comply with the provisions of this article, they may initiate such informal and/or formal administrative enforcement procedures in a manner that is consistent with local public facilities/engineering manuals and/or specific policy.
- (3) Any person violating or failing, neglecting, or refusing to obey any rule, regulation, ordinance, order, approved standard or specification, or any permit condition issued by the director of T&ES may be compelled in a proceeding instituted in the appropriate local court by the locality to obey same and to comply therewith by injunction, mandamus or other appropriate remedy.
- (4) Any person who violates any provision of this article or who fails, neglects, or refuses to comply with any order of the director of T&ES, shall be subject to a civil penalty not to exceed \$32,500.00 for each violation within the discretion of the court. Each day of violation of each requirement shall constitute a separate offense.
 - (a) Violations for which a penalty may be imposed under this subsection shall include but not be limited to the following:
 - (i) No state permit registration;
 - (ii) No SWPPP;
 - (iii) Incomplete SWPPP;
 - (iv) SWPPP not available for review;
 - (v) No approved erosion and sediment control plan;
 - (vi) Failure to install stormwater BMPs or erosion and sediment controls;
 - (vii) Stormwater BMPs or erosion and sediment controls improperly installed or maintained;
 - (viii) Operational deficiencies;
 - (ix) Failure to conduct required inspections;
 - (x) Incomplete, improper, or missed inspections; and
 - (xi) Discharges not in compliance with the requirements of 4FAC50-60-1170 of the general permit.
 - (b) The director of T&ES may issue a summons for collection of the civil penalty and the action may be prosecuted in the appropriate court.
 - (c) In imposing a civil penalty pursuant to this subsection, the court may consider the degree of harm caused by the violation and also the economic benefit to the violator from noncompliance.
 - (d) Any civil penalties assessed by a court as a result of a summons issued by the city shall be paid into the treasury of the city and specifically placed into the Alexandria water quality improvement fund established in section 13-110 and used for the purpose of minimizing, preventing, managing, or mitigating pollution of the waters of

the city and abating environmental pollution therein in such manner as the court may, by order, direct.

- (5) Notwithstanding any other civil or equitable remedy provided by this section or by law, any person who willfully or negligently violates any provision of this article, any order of the director of T&ES, any condition of a permit, or any order of a court shall, be guilty of a misdemeanor punishable by confinement in jail for not more than 12 months or a fine of not less than \$2,500.00 nor more than \$32,500.00, or both.
- (B) Under the authority of Section 62.1-44.15:74 of the Code of Virginia the director of T&ES shall have the following authority to enforce provisions of this Article XIII required or authorized under Section 62.1-44.15:73 of the Code of Virginia (the Chesapeake Bay Preservation Act) and its attendant regulations:
- (1) Any person who: (i) violates any provision of this ordinance or (ii) violates or fails, neglects, or refuses to obey any final notice, order, rule, regulation, or variance or permit condition authorized under this ordinance shall, upon such finding by an appropriate circuit court, be assessed a civil penalty not to exceed \$5,000.00 for each day of violation. Such civil penalties may, at the discretion of the court assessing them, be directed to be paid into the Alexandria water quality improvement fund for the purpose of abating environmental damage to or restoring Chesapeake Bay Preservation Areas therein, in such a manner as the court may direct by order, except that where the violator is the city itself or its agent, the court shall direct the penalty to be paid into the state treasury.
 - (2) With the consent of any person who: (i) violates any provision of this ordinance related to the protection of water quality in Chesapeake Bay Preservation Areas or (ii) violates or fails, neglects, or refuses to obey any notice, order, rule, regulation, or variance or permit condition authorized under this ordinance, the city may provide for the issuance of an order against such person for the one-time payment of civil charges for each violation in specific sums, not to exceed \$10,000.00 for each violation. Such civil charges shall be paid into the city water quality improvement fund for the purpose of abating environmental damage to or restoring Chesapeake Bay Preservation Areas therein, except that where the violator is the city itself or its agent, the civil charges shall be paid into the state treasury. Civil charges shall be in lieu of any appropriate civil penalty that could be imposed under subsection (A) above. Civil charges may be in addition to the cost of any restoration required or ordered by the city.
- (C) In addition to subsections (A) and (B) above, the director of T&ES shall have the enforcement provisions available in section 11-200 of this ordinance.

(Ord. No. 4865, § 1, 3-15-14; Ord. No. 4903, § 1, 10-18-14)



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

December 22, 2014

(804) 698-4000
1-800-592-5482

Rashad M. Young, City Manager
City of Alexandria
301 King Street, Room 3500
Alexandria, Virginia 22314

Dear Mr. Young:

In accordance with §62.1-44.15:27 G of the Virginia Stormwater Management Act (Act), Department of Environmental Quality (DEQ) has completed the review of the City of Alexandria's final Virginia Stormwater Management Program (VSMP) application package submitted on November 4, 2014. Based on this review, DEQ has determined that the City of Alexandria's VSMP is consistent with the Act, the VSMP regulation and the General VPDES Permit for Discharges of Stormwater from Construction Activities.

In light of this determination, DEQ approves the City of Alexandria's VSMP and the City is authorized to operate a VSMP as of July 1, 2014. Please note that this approval is based on the content of the application package. Any changes made to the documents in the package after the approval date, including changes to the adopted ordinance, may necessitate DEQ evaluation as part of its compliance review of your approved VSMP.

Thank you for your cooperation in developing a VSMP. We look forward to continuing to assist the City with the implementation of its VSMP.

Sincerely,

A handwritten signature in black ink that reads 'David K. Paylor'.

David K. Paylor

cc: Melanie Davenport, Director, Water Division
Frederick Cunningham, Director, Office of Water Permits
Joan Salvati, Manager, Local Government Stormwater Programs



City of Alexandria, Virginia

**Policies and Procedures for Post-Construction BMP
Inspection and Maintenance**

06/05/2014

Eco-CITY  ALEXANDRIA

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Purpose

The purpose of this document is to provide policies and procedures for the long term maintenance of Stormwater Best Management Practices (BMPs).

Municipally owned and operated BMPs will be maintained according to the BMP maintenance schedule and guidelines. Annual Inspections will be performed for all municipally owned and operated BMPs.

Privately owned BMPs must be maintained by the owner. Municipal staff will inspect all privately owned BMP facilities other than those that treat stormwater from an individual residential lot at least once every five years.

Municipal Stormwater BMP Inspections and Maintenance

Maintenance Schedule and Guidelines

Municipal BMPs will be maintained according to the BMP maintenance schedule and guideline specific to each BMP found in Appendix 1 of this document.

Inspections

Inspections will be performed on an annual basis and documented on the inspection forms found in Appendix 2 of this document.

After completion, the results of each inspection and any associated pictures will be entered into the City's database.

Follow up

For any BMPs requiring maintenance, the required maintenance tasks must be addressed as soon as possible.

Any work performed, inspections, and inspection pictures will be documented in the City's database.

Private Stormwater BMP Maintenance Regulations

City of Alexandria, Virginia

Stormwater BMP Maintenance Regulations

Effective: July 1, 2014

Authority

The following regulations for stormwater Best Management Practice (BMP) maintenance have been adopted as permitted by the Zoning Ordinance of the City of Alexandria section 13-104(C).

These regulations supplement the Zoning ordinance of the City of Alexandria relating to the regulation of stormwater BMP maintenance.

BMP Regulations

It is the responsibility of the owner of any stormwater BMP facility as described in the Environmental Management Ordinance to provide adequate maintenance and proper functioning of the system. All BMPs must operate in good working condition and in accordance with the approved design and specifications. Maintenance shall be performed in accordance with the requirements set forth in:

1. The BMP maintenance agreement and;
2. The BMP maintenance schedule and guideline, or in cases where no BMP maintenance schedule and guideline is recorded, in accordance with the maintenance requirements as set forth in the original design.

Inspections and Maintenance Records

The owner of any BMP shall keep on file all inspection and maintenance records for the facility. The records shall include at a minimum:

1. The date of inspection or maintenance,
2. The result of the inspection,
3. The type of maintenance performed, if required, and,
4. The signature of the owner of the facility or the individual acting on the owner's behalf.

All records must be kept on file for a minimum of five years and be available for submission to the City upon request.

City Inspections

Inspections by the City may be conducted or established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in BMPs; and evaluating the condition of BMPs.

Notification of Enforcement Action

If inadequate maintenance is observed by the City, the City shall notify, in writing, the property owner or other person violating these regulations. The notification shall indicate the nature of the violation, contain the address or other description of the site upon which the violation is occurring, order the necessary action to correct the violation, and give a deadline for correcting the violation. Notification will follow the procedure below:

1. The first Letter of Notification shall require the owner to contact the City with a maintenance plan within 30 days and shall allow 90 days for the owner to perform the required BMP maintenance actions.
2. If an adequate response is not received within 30 days following the Letter of Notification, a Letter of Corrective Action will be issued requiring the owner to contact the City with a maintenance plan and to perform the required BMP maintenance within 60 days.
3. If an adequate response is not received within 30 days following the Letter of Corrective Action, a Notice of Noncompliance will be issued requiring the owner to contact the City with a maintenance plan and to perform the required BMP maintenance within 30 days.
4. If an adequate response is not received within 30 days following the Notice of Noncompliance, a Notice of Violation with associated civil penalties will be issued by the City Attorney's Office.

Extension of time

A person who receives an enforcement letter, or the owner of the land on which the violation occurs, may submit to the Director or T&ES or his or her designee a written request for an extension of time for correction of the violation. On determining that the request includes enough information to show that the violation cannot be corrected within the specified time limit for reasons beyond the control of the person requesting the extension, the City may extend the time limit as is reasonably necessary to allow timely correction of the violation.

Penalties for noncompliance

Any person who violates these regulations shall be subject to a civil penalty. Each day the violation continues shall constitute a separate offense.

1. First time offenders shall be subject to a civil penalty not to exceed five hundred (\$500.00) per day of continuing violation.
2. Repeat violators shall be subject to a civil penalty not to exceed one thousand dollars (\$1000.00) per day of continuing violation.

The City Attorney's Office will pursue collection of the civil penalty through prosecution in the appropriate court. Additionally, the city may perform the necessary corrections and bill the property owner.

City Procedures for Inspections of Private Stormwater BMPs

All privately owned stormwater BMPs not serving single family residential properties will be inspected a minimum of once every five years.

City inspections will be performed according to the following procedures:

1. Prior to inspection, a preinspection notification letter will be sent to the property owner and/or contact on file for each BMP. A copy of the preinspection notification letter can be found in appendix 3 of this document.
2. Inspections will be documented on the inspection forms found in appendix 2 of this document.
3. After the inspection has been completed, documentation of the inspection, including any pictures will be documented in the City's database. A hard copy of all inspections will also be kept in the hard copy file for each BMP.
4. After inspection, a post inspection letter will be sent to the property owner and/or contact on file for each BMP with the results of the inspection. If required, the letter will state any maintenance items needed to bring the BMP into compliance with its maintenance requirements. Post-inspection notification letters can be found in appendix 4 of this document.
5. All enforcement action notification will follow the procedures outlined in the City's Stormwater BMP Maintenance Regulations. All enforcement action letters can be found in appendix 5 of this document.

Documentation

All inspection forms, pre- and post- inspection letters, and enforcement letters will be documented in the City's database. A hard copy of all inspections and all letters sent will be kept on file with the City for a minimum of 5 years.

Single Family Residential BMP Inspections and Maintenance

It is the responsibility of the owner of any stormwater BMP facility that treats stormwater from an individual residential lot to provide adequate maintenance and proper functioning of the system. All BMPs must operate in good working condition and in accordance with the approved design and specifications.

Inspections and Maintenance Records

The owner of any BMP shall keep on file all inspection and maintenance records for the facility. The records shall include at a minimum:

1. The date of inspection or maintenance,
2. The result of the inspection,
3. The type of maintenance performed, if required, and,
4. The signature of the owner of the facility or the individual acting on the owner's behalf.

All records must be kept on file for a minimum of five years and be available for submission to the City upon request.

City Outreach and Inspections

As an alternative to required maintenance agreements, the City will perform homeowner outreach targeted to the maintenance of single family residential BMPs. City Staff will mail out annual fact sheets and/or maintenance reminders targeted to the owner of each BMP.

Inspections by the City may be conducted or established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in BMPs; and evaluating the condition of BMPs.

Appendix 1-BMP Maintenance Schedule and Guidelines

Bioretention Area Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of bioretention areas requires that the following tasks be undertaken in the first year following installation:

- Initial inspections. For the first 6 months following construction, the bioretention area should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.
- Spot reseeding. Inspect for bare or eroding areas in the contributing drainage area or around the bioretention area, and make sure they are immediately stabilized with grass cover.
- Watering. Watering is needed once a week during the first 2 months, and then as needed during first growing season (April-October), depending on rainfall.
- Remove and replace dead plants.

Routine Maintenance Guidelines

Bioretention areas must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for and remove excess sediment	Annually
Mow grass filter strips and bioretention turf cover	At least four times per year
Weed and rake mulch	Twice during the growing season
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remulch to maintain a three inch layer	Annually
Prune trees and shrubs	Annually
Inspect for clogging or ponding water in the filter bed	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed
Remove sediment in pretreatment cells and inflows	Every 2-3 years
Replace the mulch layer	Every 3 years

Constructed Wetlands Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of constructed wetland areas requires that the following tasks be undertaken in the first year:

- Initial Inspections. During the first 6 months following construction, the site should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.
- Spot Reseeding. Inspect for bare or eroding areas in the contributing drainage area or around the wetland buffer, and make sure they are immediately stabilized with grass cover.
- Watering. Trees planted in the buffer and on wetland islands and peninsulas need watering during the first growing season. In general, consider watering every three days for first month, and then weekly during the first growing season (April - October), depending on rainfall.
- Reinforcement Plantings. Remove and replace any dead or dying plantings.

Routine Maintenance Guidelines

Constructed wetlands must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Forebay inspection and cleanout	Annually-remove sediment when forebay reaches 50% capacity or every 5 years
Inspect the orifice and repair any clogging	Annually
Inspect and exercise all mechanical devices	Annually
Inspect for and repair any structural damage and leaks	Annually
Inspect inlets and outlets and repair any clogging and damage	Annually
Remove woody vegetation on or near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge if necessary
Harvest overgrown vegetation to guide wetland maturation	As needed
Replace displaced rip rap	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Dry Swale Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Swales must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Remove any invasive vegetation or weeds	As needed
Mow grass to a height of 4"-9"	As needed to maintain correct height
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Replace any dead or dying plantings	Annually
Remove accumulated sand or sediment	Annually
Inspect check dams and repair any erosion or blockage	Annually
Inspect underdrains and repair any clogging or damage	Annually
Inspect inflow and outlets and repair any clogging or damage	Annually

Dry Detention Basin Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of dry detention basins requires that the following tasks be undertaken in the first year following installation:

- Immediately after the dry extended detention basin is established, the vegetation will be watered twice weekly if needed until the plants become established (commonly six weeks).
- No portion of the dry extended detention pond will be fertilized after the first initial fertilization to establish the vegetation.
- The vegetation in and around the basin will be maintained at a height of approximately six inches.

Routine Maintenance Guidelines

Dry detention basins must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove debris and trash	As needed
Outlet/inlet inspection and cleanout	Annually
Bank mowing and inspection/stabilization of eroded areas	As needed to maintain 4"-9" height
Forebay inspection and cleanout	Annually -remove sediment every 7 years or when sediment volume exceeds 50% of storage volume
Check pond depth	Annually-remove sediment as needed
Remove woody vegetation along embankment	Annually
Inspect for and repair structural damage	Annually
Inspect, exercise, and repair all mechanical devices	Annually
Repair broken pipes	As needed
Replace riprap that has been choked with sediment	As needed

Extended Detention (ED) Pond Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

ED Ponds are prone clogging at the ED low-flow orifice. Ideally, the orifice should be inspected at least twice a year after initial construction.

Routine Maintenance Guidelines

ED Ponds must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Mow area around facility	Twice per year at a minimum
Forebay inspection and cleanout	Annually-remove sediment when 50% capacity reached or every 7 years
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect the orifice and repair any clogging or damage	Annually
Inspect and exercise all mechanical devices	Annually
Inspect for and repair any structural damage and leaks	Annually
Inspect inlets and outlets and repair any clogging or damage	Annually
Remove woody vegetation on or near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge if necessary
Replace displaced rip rap	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Grass Channel Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Grass channels must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Mow grass to height of 4"-9"	As need to maintain correct height
Remove excess sediment accumulation	Annually
Inspect for and repair any clogging	Annually
Inspect check dams and repair any erosion or blockages	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed

Infiltration Practice Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Infiltration practices must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check for and repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Mow grass to a height of 4"-9"	As needed to maintain correct height
Inspect for and remove excess sediment	Quarterly
Inspect facility for clogging and repair	Semi-annually
Remove woody vegetation from facility	Semi-annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect for and repair any structural damage	Annually
Inspect for and repair any clogged outlets or inlets	Annually
Replace clogged pea gravel, topsoil, and filter fabric	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Permeable Pavement Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Permeable pavement must be inspected to ensure that it operates in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for and remove excess sediment	Annually
Inspect facility for clogging and repair any clogging and improper drainage	Annually
Inspect for and repair any structural damage	Annually
Inspect for repair any clogged or damaged inlets and outlets	Annually

Proprietary BMP Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Proprietary systems must be maintained in good working condition and in accordance with the approved design and specifications. All proprietary systems should be inspected and maintained according to the manufacturer's recommendations.

A copy of the manufacturer's recommended inspection and maintenance schedule must be attached to this document.

Rainwater Harvesting Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Rainwater harvesting systems must be inspected to ensure they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

All rainwater harvesting system components should be inspected by the responsible party twice per year. A comprehensive inspection by a qualified third party inspector should occur every third year.

Routine Maintenance Tasks	Frequency
Remove leaves and debris from gutters and downspouts	Semi-annually
Remove any algae growth	Semi-annually
Inspect and clean prescreening devices and first flush diverters	Quarterly
Inspect and clean storage tank lids	Annually
Inspect for and repair any clogging	Annually
Inspect and repair mosquito screens	Annually
Inspect tank and remove sediment build up	Every 3 years
Clear overhanging vegetation and trees over roof	Every 3 years
Check integrity of backflow preventer	Every 3 years
Inspect structural integrity of tank, pump, pipe, and electrical system and repair any damage	Every 3 years
Replace damaged or defective system components	As needed

Rooftop Disconnection BMP Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Rooftop disconnections must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for downspout disconnection	Annually
Inspect for and remove any sediment accumulation	Annually
Check that pervious areas receiving flow have not been disturbed or converted	Annually

Sand Filter Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Proper functioning of the sand filter requires that the following tasks be undertaken in the first year:

- Initial Inspections. During the first 6 months following construction, the site should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.

Routine Maintenance Guidelines

Sand filters must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	Annually, or more often if needed
Inspect sedimentation chamber or forebay, cleanout when sediment accumulation exceeds design level	Annually
Inspect for standing water or ponding for more than 48 hours after a storm	Annually
Inspect and exercise all mechanical devices and repair if needed	Annually
Inspect for and repair any structural damage and leaks	Annually
For filters that hold water, check for water at normal pool	Annually
Inspect for and repair any clogging	Annually
Cleanout wet sedimentation chambers	Every 2-3 years or when over ½ full
Remove sediments from dry sedimentation chamber	Every 2-3 years

Sheet Flow to Vegetated Filter Areas and Conserved Open Space Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

These practices must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Mow grass filter strips to prevent woody growth	Semi-annually
Inspect for and remove sediment accumulation	Annually
Inspect level spreader for diffuse flow and repair any channeling	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed

Soil Compost Amendment Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

In order to ensure the success of soil compost amendments, the following tasks must be undertaken in the first year following soil restoration:

- Initial inspections. For the first six months following the incorporation of soil amendments, the site should be inspected at least once after each storm event that exceeds 1/2-inch of rainfall.
- Spot Reseeding. Check for bare or eroding areas in the contributing drainage area or around the soil restoration area and make sure they are immediately stabilized with grass cover.
- Fertilization. Depending on the amended soils test, a one-time, spot fertilization may be needed in the fall after the first growing season to increase plant vigor.
- Watering. Water once every three days for the first month, and then weekly during the first year (April-October), depending on rainfall.

Routine Maintenance Guidelines

Soil compost amendments must be maintained in good working condition and in accordance with the approved design and specifications. There are no major on-going maintenance needs associated with compost amendments.

Urban Bioretention Area Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of bioretention areas requires that the following tasks be undertaken in the first year following installation:

- Initial inspections. For the first 6 months following construction, the bioretention area should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.
- Spot reseeding. Inspect for bare or eroding areas in the contributing drainage area or around the bioretention area, and make sure they are immediately stabilized with grass cover.
- Watering. Watering is needed once a week during the first 2 months, and then as needed during first growing season (April-October), depending on rainfall.
- Remove and replace dead plants.

Routine Maintenance Guidelines

Bioretention areas must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for and remove excess sediment	Annually
Weed mulch	Twice during the growing season
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remulch to maintain a three inch layer	Annually
Prune trees and shrubs	Annually
Inspect for clogging or ponding water in the filter bed	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed
Replace the mulch layer	Every 3 years

Vegetated Roof Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of vegetated roofs require that the following tasks be undertaken during the first year following construction:

- Initial inspections. The roof should be inspected monthly during the vegetation establishment period, and then every six months thereafter to assess the state of vegetative cover and to look for leaks, drainage problems and other functional or structural concerns

Routine Maintenance Guidelines

Vegetated roofs must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

The use of herbicides, insecticides, fungicides, and fertilizers should be avoided, since their presence could hasten degradation of the waterproof membrane. Also, power-washing and other exterior maintenance operations should be avoided so that cleaning agents and other chemicals do not harm the vegetated roof plant communities.

Routine Maintenance Tasks	Frequency
Remove trash and debris	Semi-annually
Inspect waterproof membrane for leaks or cracks and repair any damage	Semi-annually
Remove invasive plants	Semi-annually
Inspect and remove overgrowth and debris from roof drains, scuppers and gutters	Semi-annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Semi-annually
Replace any dead or dying plants	Semi-annually
Remove excess debris, fallen leaves, and overgrowth	Semi-annually
Check and repair areas of erosion	Semi-annually
Water to promote plant growth and survival	As needed

Wet Pond Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of wet ponds requires that the following tasks be undertaken during the first year following construction.

- Initial inspections. For the first six months following construction, the site should be inspected at least twice after storm events that exceed a 1/2-inch of rainfall.
- Aquatic Benches. Remove and replace dead or dying plants.
- Spot Reseeding. Inspect for eroding areas in the contributing drainage area or around the pond buffer, and make sure they are immediately stabilized with grass cover.
- Watering. Trees planted in the pond buffer need to be watered during the first growing season. In general, consider watering every 3 days for first month, and then weekly during the remainder of the first growing season (April - October), depending on rainfall.

Routine Maintenance Guidelines

Wet Ponds must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Mow area around facility	Twice per year at a minimum
Forebay inspection and cleanout	Annually-remove sediment when forebay reaches 50% capacity or every 7 years
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect and repair any clogging or damage to the orifice	Annually
Inspect and exercise all mechanical devices	Annually
Inspect for and repair structural damage and leaks	Annually
Inspect and repair any damaged or clogged inlets and outlets	Annually
Remove woody vegetation on or near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge if necessary
Replace displaced rip rap	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Wet Swale Maintenance Schedule and Guidelines

This document must be recorded as an addendum to the stormwater management/ BMP facilities operation and maintenance agreement

Routine Maintenance Guidelines

Swales must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Remove any invasive vegetation	As needed
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Replace any dead or dying plantings	Annually
Remove accumulated sand or sediment	Annually
Inspect for and repair any eroded or blocked check dams	Annually
Inspect for and remove any clogging at inflow and outlets	Annually



Appendix 2-Inspection Forms

City of Alexandria, Virginia BMP Inspection-Bioretenion

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment	
No excessive trash or debris	
No evidence of erosion	
Adequate vegetation	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
Inflow is not blocked by vegetation	
Side slopes	
No evidence of erosion	
No excessive sediment	
No evidence of nuisance animals	
Vegetation	

Plant composition consistent with approved plans	
No invasive species	
No dead or dying plants	
75-90% cover (mulch/ turf)	
Mulch 2"-3" deep	
Grass is more than 6"-10"	
Filter media	
Compacted or inconsistent with plan design	
Mulch more than 3 years old or in poor condition	
Evidence of oil, grease, chemicals or fertilizer	
Excessive trash, debris, or sediment	
No evidence of erosion	
No evidence of clogging	
Underdrain	
Water is being conveyed	
Standing water is present	
Planters (if applicable)	
Water does not drain within 3-4 hours	
No structural deficiencies	
Outlet	
No excessive trash, debris, or obstructions	
No excessive sediment	
No evidence of erosion	
No obstructions	
Grates are in good condition	
Observation well present and capped	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Constructed Wetlands

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment	
No excessive trash or debris	
No evidence of erosion	
Forebay less than 50% filled	
No evidence of clogging	
Adequate vegetation	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
No woody growth	
No evidence of nuisance animals	
Vegetation	
Plant composition consistent with approved plans	
No invasive species	
Practice is overgrown and	

not developing into wetland	
Planted trees are healthy	
No dead or dying plants	
Wetland cells and pools	
No excessive trash or debris	
Excessive sediment accumulation	
No evidence of nuisance animals	
No excessive sediment	
Adequately maintaining permanent pool	
Open water overgrown	
Riser and principal spillway	
No evidence of structural damage	
Valves are operational	
No seepage into conduit	
No evidence of clogging	
Trash rack is clear of debris	
No obstruction of orifice	
No excessive sediment	
Dam/Embankment	
No cracking, bulging, or sliding	
No soft spots, seepage, or sink holes	
No evidence of nuisance animals	
No woody vegetation	
No evidence of erosion	
Emergency Spillway	
No woody growth	
No excessive trash, debris, or sediment	
No evidence of erosion	
No soft spots, seepage, or sink holes	
No riprap failure	
No evidence of obstruction	
Outlet	
No woody growth	
No excessive trash, debris,	

or obstructions	
No excessive sediment	
No evidence of erosion	
No rip rap failure	
Pipe in good condition	
Endwall/headwall in good condition	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Dry Swale

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment	
No excessive trash or debris	
No evidence of erosion	
No evidence of clogging	
Adequate vegetation	
Inlet /swale sides and base	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
Check dams	
Proper function of dam	
No accumulation of trash/debris behind dam	
Vegetation	
Plant composition consistent with approved	

plans	
No invasive species	
No dead or dying plants	
Grass height is 4"-9"	
Underdrain	
Water is being conveyed	
Standing water is present	
Outlet	
No excessive trash, debris, or obstructions	
No excessive sediment	
No evidence of erosion	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Extended Detention Pond

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment	
No excessive trash or debris	
No evidence of erosion	
Forebay less than 50% filled	
No evidence of clogging	
Adequate vegetation	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
No woody growth	
No evidence of nuisance animals	
Vegetation	
Plant composition consistent with approved plans	
No invasive species	
No overgrown grass around	

facility	
No dead or dying plants	
Permanent pool/Side slopes	
No excessive trash or debris	
No evidence of erosion	
No evidence of nuisance animals	
No excessive sediment	
Adequately maintaining permanent pool	
Riser and principal spillway	
No evidence of structural damage	
Valves are operational	
No seepage into conduit	
No evidence of clogging	
Trash rack is clear of debris	
No obstruction of orifice	
No excessive sediment	
Dam/Embankment	
No cracking, bulging, or sliding	
No soft spots, seepage, or sink holes	
No evidence of nuisance animals	
No woody vegetation	
Emergency Spillway	
No woody growth	
No excessive trash, debris, or sediment	
No evidence of erosion	
No soft spots, seepage, or sink holes	
No riprap failure	
No evidence of obstruction	
Outlet	
No woody growth	
No excessive trash, debris, or obstructions	
No excessive sediment	
No evidence of erosion	

No rip rap failure	
Pipe in good condition	
Endwall/headwall in good condition	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments on pond	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Grass Channel

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment	
No excessive trash or debris	
No evidence of erosion	
No evidence of clogging	
Adequate vegetation	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
Check dams	
Proper function of dam	
No accumulation of trash/debris behind dam	
Vegetation	
Plant composition consistent with approved	

plans	
No invasive species	
No dead or dying plants	
Grass height is not 4"-9"	
No evidence of erosion	
Side slopes	
No evidence of erosion	
Channel Bottom	
No excessive trash or debris	
No evidence of soil compaction	
No evidence of erosion	
Outlet	
No excessive trash, debris, or obstructions	
No excessive sediment	
No evidence of erosion	
Outlet is stable	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments	



City of Alexandria, Virginia
BMP Inspection-Hydrodynamic

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Debris clean out	
No excessive trash or debris	
No evidence of clogging	
Structural components	
No evidence of deterioration	
Grates in good condition	
No evidence of spalling or cracking	
Sediment deposition	
Inlets/outlets clear of sediment	
Sediment below manufacturer's limit	
Overall	
No evidence of flow bypass	
No noticeable odors	
Adequate facility access	

Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Infiltration Practice

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment	
No excessive trash or debris	
No evidence of erosion	
No evidence of clogging	
Adequate vegetation	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
Inflow is not blocked by vegetation	
Embankment/Side slopes	
No evidence of erosion	
No excessive sediment	
No evidence of nuisance animals	
Vegetation	
Plant composition consistent with approved	

plans	
No trees in the facility	
Grass is more than 4"-9" in height	
Facility drainage	
Compacted or inconsistent with plan design	
Excessive trash and debris	
No drawdown 3 days after a ½ inch storm.	
Excessive trash, debris, or sediment	
No evidence of erosion	
No evidence of clogging	
Structural	
No evidence of spalling or cracking	
Grates are in good condition	
No evidence of structural deterioration	
Outlet	
No excessive trash, debris, or obstructions	
No excessive sediment	
No evidence of erosion	
No obstructions	
Grates are in good condition	
Observation well present and capped	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Permeable Pavement

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment/Inlets	
No excessive trash or debris	
No evidence of erosion	
No evidence of clogging	
Pavement Surface	
No excessive trash or debris	
No evidence of erosion	
No loose material stored on pavement surface	
No excessive sediment	
Pavement is stained, clogged or ponded	
Structural Integrity	
No slumping, cracking, spalling or broken pavers	
Observation wells	
Present and capped	
Outlet	
No excessive trash, debris, or obstructions	
No excessive sediment	

No evidence of erosion	
Pipe in good condition	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Rainwater Harvesting

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Overall	
No evidence of leaking	
No evidence of structural damage	
Electric system is functioning	
Sediment accumulation is less than 5% of design volume	
No excessive overhanging trees/vegetation	
Captured roof area	
No excessive trash or debris	
Gutter system	
No evidence of clogging	
Runoff reaching the system	
No algae growth	
No excessive sediment	
No mosquitos in system	
Screens and filters	
No excessive debris or sediment	
Pump	
Pump is operational	

Prescreening/first flush	
No excessive trash, debris, or obstructions	
Overflow pipe	
No excessive erosion	
Pipe in good condition	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Rooftop Disconnection

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Piping, gutters, and drains	
Downspouts remain disconnected	
No excessive trash or debris	
Runoff is entering pervious area	
Downstream treatment	
Treatment practice in place	
No ponding at point of disconnection	
No evidence of erosion	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Sand Filter

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
Oil and grease entry minimized	
Sedimentation Chambers	
Excessive sediment and debris	
Water chambers not more than ½ full of sediment	
Filter media	
No evidence of clogging	
Water retention	
Water holding chambers at normal pool	
No evidence of leakage	
Structural components	

No evidence of deterioration	
Grates and manholes in good condition	
No evidence of spalling or cracking	
Outlet/ Spillway	
No structural deterioration	
No excessive trash, debris, or sediment	
No evidence of erosion	
No evidence of obstruction	
Pump	
Conduits appear to be intact	
No excessive trash, debris, or obstructions	
Panel box is marked	
No evidence of failure	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	
No noticeable odors	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Sheet flow to vegetated areas

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
Channel	
No evidence of erosion	
No accumulation of trash/debris at top of filter area	
Vegetation	
Plant composition consistent with approved plans	
No invasive species	
No dead or dying plants	
Gravel diaphragm	
In place and functioning	
Level spreader	
No excessive trash or debris	
No evidence concentrated flow	

No evidence of erosion	
Outlet	
No excessive trash, debris, or obstructions	
No excessive sediment	
No evidence of erosion	
Outlet is stable	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Soil Compost Amendments

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Overall	
No evidence of erosion	
No evidence of excessive fertilizer/chemical use	
No excessive trash or debris	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Proprietary Filter Device

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Debris clean out	
No excessive trash or debris	
No evidence of clogging	
Structural components	
No evidence of deterioration	
Grates in good condition	
No evidence of spalling or cracking	
Sediment deposition	
Filtration chamber clear of sediment	
Water chambers not more than ½ full of sediment	
Water retention (if required)	
Water holding chambers at normal level	

No evidence of leakage	
Pump (if required)	
Wiring diagram available	
Panel box marked	
No evidence of failure	
Overall	
No evidence of flow bypass	
No noticeable odors	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Vegetated Roof

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Vegetation	
Plant composition consistent with approved plans	
No dead or dying plants	
Plants are choking on excess vegetation	
No invasive vegetation	
No overgrown grass	
No drought conditions	
No pest infestations	
No excessive trash or debris	
Structural components	
Waterproof membrane is not leaking or cracked	
Drainage layer and inlet	
No evidence of clogging	
Inlet is in good condition	
Soil substrate	
No evidence of erosion	
No evidence of clogging	
Overall	
No excessive erosion	
Mosquito proliferation	

No evidence of damage/vandalism	
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Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Wet Pond

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment	
No excessive trash or debris	
No evidence of erosion	
Forebay less than 50% filled	
No evidence of clogging	
Adequate vegetation	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
No woody growth	
No evidence of nuisance animals	
Vegetation	
Plant composition consistent with approved plans	
No invasive species	
No overgrown grass around	

facility	
No dead or dying plants	
Permanent pool/Side slopes	
No excessive trash or debris	
No evidence of erosion	
No evidence of nuisance animals	
No excessive sediment	
Adequately maintaining permanent pool	
Riser and principal spillway	
No evidence of structural damage	
Valves are operational	
No seepage into conduit	
No evidence of clogging	
Trash rack is clear of debris	
No obstruction of orifice	
No excessive sediment	
Dam/Embankment	
No cracking, bulging, or sliding	
No soft spots, seepage, or sink holes	
No evidence of nuisance animals	
No woody vegetation	
No evidence of erosion	
Emergency Spillway	
No woody growth	
No excessive trash, debris, or sediment	
No evidence of erosion	
No soft spots, seepage, or sink holes	
No riprap failure	
No evidence of obstruction	
Outlet	
No woody growth	
No excessive trash, debris, or obstructions	
No excessive sediment	

No evidence of erosion	
No rip rap failure	
Pipe in good condition	
Endwall/headwall in good condition	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments on pond	

Inspection Comments



City of Alexandria, Virginia
BMP Inspection-Wet Swale

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Result
Contributing Drainage Area	
Adequate vegetation	
No excessive trash or debris	
No evidence of erosion	
Pre-treatment	
No excessive trash or debris	
No evidence of erosion	
No evidence of clogging	
Adequate vegetation	
Inlet	
Inlet is stable	
No excessive trash, debris, or sediment	
No evidence of erosion	
Check dams	
Proper function of dam	
No accumulation of trash/debris behind dam	
Vegetation	
Plant composition consistent with approved	

plans	
No invasive species	
No dead or dying plants	
Outlet	
No excessive trash, debris, or obstructions	
No excessive sediment	
No evidence of erosion	
Overall	
Adequate facility access	
Mosquito proliferation	
No encroachments	

Inspection Comments

Appendix 3-Pre-Inspection Notification Letter



City of Alexandria, Virginia
Department of Transportation & Environmental Services
Infrastructure and Environmental Quality
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«OWNER_ADDRESS»

«Owner_City», «Owner_State» «Owner_Zip»

RE: STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITY INSPECTION

«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

(Project #«BMP_ID» – «BMP_Type_Full»)

Dear Facility Owner:

As part of the City's stormwater program, staff will be visiting the above-referenced project to inspect the stormwater Best Management Practice (BMP) facility within the next few weeks. This inspection ensures proper maintenance activities are being performed and that the BMP is functioning according to design. The City performs maintenance inspections of stormwater BMPs to meet regulatory requirements as well as practice good environmental stewardship. It is the responsibility of the owner to ensure proper maintenance and functioning of the BMP that serves their property.

Examples of stormwater BMPs include ponds, bioretention areas, sand filters, hydrodynamic devices, and vegetated buffer strips, to name a few. These BMPs improve the quality of stormwater runoff from a developed site by reducing pollutants such as sediment, oil, litter, and excess nutrients that enter our local streams and waterways, such as Four Mile Run, Cameron Run, Holmes Run, the Potomac River and Chesapeake Bay.

As required by the Virginia Stormwater Management Act and Chesapeake Bay Preservation Act, the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) establishes the City's stormwater management program and sets forth the owner's inspection and maintenance requirements and the City's quality assurance inspections. Additionally, under the Virginia Stormwater Management Program permit regulations (9VAC25-870), the Virginia Department of Environmental Quality (DEQ) requires the City to control pollution to the maximum extent practicable and to ensure that BMPs are being maintained and function properly.

City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by their owners. This is also outlined in the BMP maintenance agreement executed between the site developer/owner and the City to ensure proper functioning and regular maintenance for the life of the facility. This agreement is on file in our office and conveys to successive landowners with the property deed.

City staff will inspect the above referenced facility in the next few weeks. If you would like to be present for the inspection, it can be scheduled when you can be onsite to discuss any issues and answer any questions you may have about the facility. Please contact me by phone at 703-746-4071 or by email to schedule the inspection or to discuss this further.

A post-inspection letter will be sent following the inspection. In instances where inadequate maintenance is observed or the facility is malfunctioning, this letter will list maintenance requirements and will specify a period of time to correct the deficiencies. Documentation of maintenance must be provided to this office and will be kept on file. **Failure to complete required maintenance activities may result in a notice of violation and assessment of civil penalties.**

Our records show that you are the owner – or may act on behalf of the owner – of the facility. However, if you are not the appropriate contact for the facility, please let me know or forward this letter to the appropriate person or organization.

Your time and cooperation are greatly appreciated and working together will help to achieve our goal of protecting our streams, the Potomac River, and the Chesapeake Bay. Please feel free to contact me if you have any questions or need any additional information. Please reference the project # located at the top of this letter in your correspondence.

Sincerely,

Water Quality Compliance Specialist
City of Alexandria, VA

Appendix 4-Post-Inspection Letters

Post inspection Letter-No maintenance required



City of Alexandria, Virginia

Department of Transportation & Environmental Services
Infrastructure and Environmental Quality
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: POST INSPECTION – STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITIES

«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

(Project #«BMP_ID» – «BMP_Type_Full» & BMP)

Dear Facilities Owner:

The City performed an inspection of the above-referenced stormwater Best Management Practice (BMP) facility on **DATE**. This letter is sent to inform you of the inspection findings and any required maintenance activities that must be performed.

As part of the City's stormwater program, staff inspects stormwater Best Management Practice (BMP) facilities to ensure proper maintenance activities are being performed and that the BMP is functioning according to design. The City performs maintenance inspections of stormwater BMPs to meet regulatory requirements as well as practice good environmental stewardship. It is the responsibility of the owner to ensure proper maintenance and functioning of the BMP that serves their property..

As required by the Virginia Stormwater Management Act and Chesapeake Bay Preservation Act, the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) establishes the City's stormwater management program and sets forth the owner's inspection and maintenance requirements and the City's quality assurance inspections. Additionally, under the Virginia Stormwater Management Program permit regulations (9VAC25-870), the Virginia Department of Environmental Quality (DEQ) requires the City to control pollution to the maximum extent practicable and to ensure that BMPs are being maintained and function properly.

City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by their owners. This is also outlined in the BMP maintenance agreement executed between the site developer/owner and the City to ensure proper functioning and regular maintenance for the life of the

facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

The following observations were made during the inspection:

Plan number and Name

- Comments

No action is necessary at this time. Please continue routine inspection and maintenance of the facility to ensure it functions as designed.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact me directly at 703-746-4071, via email, or via fax at 703-519-8354 if you have any questions, need additional information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Water Quality Compliance Specialist

Post-Inspection Letter-Maintenance Required



City of Alexandria, Virginia

Department of Transportation & Environmental Services
Infrastructure and Environmental Quality
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: POST INSPECTION – STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITIES

«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

(Project #«BMP_ID» – «BMP_Type_Full» & BMP)

Dear Facilities Owner:

The City performed an inspection of the above-referenced stormwater Best Management Practice (BMP) facility on **DATE**. This letter is sent to inform you of the inspection findings and required maintenance activities that must be performed. Documentation of maintenance must be received by this office within the timeframe provided below to avoid a notice of violation for noncompliance.

Section 13-109 of the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) requires the City of Alexandria to perform maintenance inspections of stormwater BMPs and ensure their proper function. Additionally, under Virginia Stormwater Management Program permit regulations (9VAC 25-870), the Virginia Department of Environmental Quality (DEQ) requires the City to ensure adequate long-term operation and maintenance of these BMPs by requiring the owner to develop a recorded inspection and maintenance schedule.

City ordinance {13-109(G)} states that all stormwater BMPs must be adequately maintained by the property owners. This is also outlined in the BMP maintenance agreement executed between the owner (or site developer) and the City to ensure proper functioning and regular maintenance for the life of the facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

The following observations were made during the inspection and require maintenance:

Plan number and Name

- Comments

Immediate maintenance is required to restore proper functioning of the facility. Please perform maintenance of the facility and provide the below requested information.

Provide the following:

- Within **30 days** from the date of this letter provide a written plan identifying applicable maintenance / corrective actions that will be taken. The plan may be submitted by mail, email, or fax.
- Perform maintenance / corrective actions within **90 days** of the date of this letter. Provide documentation of the work performed to this office. Documentation may be submitted by mail, email, or fax.

Please reference the Project # in your correspondence as listed at the beginning of this letter.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact me directly at 703-746-4071, via email or via fax at 703-519-8354 if you have any questions, need additional information, or to submit the above requested information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Water Quality Compliance Specialist

Appendix 5-Enforcement Letters

Notice of corrective action required



City of Alexandria, Virginia
Department of Transportation & Environmental Services
Infrastructure and Environmental Quality
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITY MAINTENANCE
«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

Certified Mail #

NOTICE OF CORRECTIVE ACTION REQUIRED

Dear Facility Owner:

On **DATE**, a certified letter from the City of Alexandria was sent notifying you that the stormwater Best Management Practice (BMP) on the above-referenced property required maintenance and was out of compliance with the City's Environmental Management ordinance. The prior notification letter required you to contact the city within 30 days with a plan for maintenance and to perform all required maintenance within 90 days. As of today, the City has not received an adequate response to this letter.

Documentation of maintenance must be received by this office within the timeframe provided below to avoid a notice of violation for noncompliance and the associated penalty fees.

Section 13-109 of the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) requires the City of Alexandria to perform maintenance inspections of stormwater BMPs and ensure their proper function. Additionally, under Virginia Stormwater Management Program permit regulations (9VAC 25-870), the Virginia Department of Environmental Quality (DEQ) requires the City to ensure adequate long-term operation and maintenance of these BMPs by requiring the owner to develop a recorded inspection and maintenance schedule.

City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by the property owners. This is also outlined in the BMP maintenance agreement executed between the owner (or site developer) and the City to ensure proper functioning and regular maintenance for the life of the

facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

The following observations were made during the inspection and require maintenance:

Plan name and Number

- Comments

Immediate maintenance is required to restore proper functioning of the facility. Perform maintenance of the facility and provide the below requested information.

Provide the following:

- Within **30 days** from the date of this letter provide a written plan identifying applicable maintenance / corrective actions that will be taken. The plan may be submitted by mail, email, or fax.
- Perform maintenance / corrective actions within **60 days** of the date of this letter. Provide documentation of the work performed to this office. Documentation may be submitted by mail, email, or fax.

Please reference the Project # in your correspondence as listed at the beginning of this letter.

Failure to provide the required information and/or perform the required BMP maintenance in the timeframe allowed may result in a notice of violation which carries penalties of up to \$32,500 per day per violation until the required maintenance has been completed.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact me directly at 703-746-4071, via email, or via fax at 703-519-8354 if you have any questions, need additional information, or to submit the above requested information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Water Quality Compliance Specialist

Notice of noncompliance



City of Alexandria, Virginia

Department of Transportation & Environmental Services
Infrastructure and Environmental Quality
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITY MAINTENANCE

«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

Certified Mail #

NOTICE OF NONCOMPLIANCE

Dear Facility Owner:

On **DATE**, a certified letter from the City of Alexandria was sent notifying you that the stormwater Best Management Practice (BMP) on the above-referenced property required maintenance and was out of compliance with the City's Environmental Management Ordinance. A second notice of corrective action was sent on **DATE**. The prior notification letter required you to contact the city within 30 days with a plan for maintenance and to perform all required maintenance within 60 days. As of today, the City has not received an adequate response to this letter.

You have 30 days from the date of this letter to either repair the BMPs or submit in writing a request for an extension. Failure to repair the BMPs or submit in writing for an extension shall result in the issuance of a NOTICE OF VIOLATION. Each notice of violation for failure to maintain a stormwater BMP may result in the assessment of a civil penalty of up to \$32,500 per day per violation until corrective action is completed.

Section 13-109 of the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) requires the City of Alexandria to perform maintenance inspections of stormwater BMPs and ensure their proper function. Additionally, under Virginia Stormwater Management Program permit regulations (9VAC 25-870), the Department of Environmental Quality (DEQ) requires the City to ensure adequate long-term operation and maintenance of these BMPs by requiring the owner to develop a recorded inspection and maintenance schedule.

City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by the property owners. This is also outlined in the BMP maintenance agreement executed between the owner (or site developer) and the City to ensure proper functioning and regular maintenance for the life of the facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

The following observations were made during the inspection and require maintenance:

Plan Number and Name

- Comments

Immediate maintenance is required to restore proper functioning of the facility.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in the Office of Environmental Quality directly at 703-746-4071, via email, or by fax at 703-519-8354 if you have any questions, need additional information, or to submit the above requested information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Division Chief
TES/Infrastructure and Environmental Quality

CC: , Water Quality Compliance Specialist
 , Stormwater Section Lead
 , Deputy Director of Transportation and Environmental Services
 , Director of Transportation and Environmental Services
 , Deputy City Attorney

Notice of Violation

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITY MAINTENANCE
«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

NOTICE OF VIOLATION

Dear Facility Owner:

On **DATE**, a certified letter from the City of Alexandria was sent notifying you that the stormwater Best Management Practice (BMP) on the above-referenced property required maintenance and was out of compliance with the City's Environmental Management ordinance. A second notice of corrective action was sent on **DATE**. A final notice of noncompliance was sent on **DATE**.

Due to failure to respond to multiple notices by the City and/or to repair the above-reference BMP, you are hereby served a **NOTICE OF VIOLATION for failure to maintain a BMP and violation of the City's Environmental Management Ordinance**. City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by their owners. This is also set forth in the BMP maintenance agreement executed between the site developer and the City to ensure proper functioning and regular maintenance for the life of the facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

You will be assessed a civil penalty of \$500 per day per violation beginning **DATE until the corrective actions below are completed.**

The following maintenance items are required to bring your BMP into compliance:

Plan Number and Name

- Comments

This office will pursue collection of the civil penalty through prosecution in the appropriate court. Additionally, the city may perform the necessary corrections and bill the property owner.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in Infrastructure and Environmental Quality directly at 703-746-4071, via email at **email**, or by fax at 703-519-8354 if you have any questions about the BMP corrective measures. Please contact me with any questions about the scope and nature of the impending legal proceedings.

Please let me know if you have any questions.

Yours very truly,

Deputy City Attorney

CC: , Water Quality Compliance Specialist
 , Stormwater Section Lead
 , Deputy Director of Transportation and Environmental Services
 , Director of Transportation and Environmental Services



STANDARD MAINTENANCE AND MONITORING AGREEMENT STORMWATER BMP FACILITIES MAINTENANCE / MONITORING AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20____, by and between, _____ hereinafter called the "Landowner", and the City of Alexandria, Virginia (the "City");

WITNESSTH:

WHEREAS, the Landowner is the owner of certain real property described as tax map # _____, block # _____, parcels # _____ as acquired by deed in the land records of the City of Alexandria, Virginia, Deed book _____ Page # _____ (Instrument # _____,) hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to build on and develop the property; and

WHEREAS, _____, hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the City, provides for detention on-site treatment of stormwater within the confines of the property; and

WHEREAS, the City and the Landowner, its successors and assigns agree that the health, safety and welfare of the residents of the City of Alexandria, Virginia, require that on-site stormwater management/Best Management Practices (BMP) facilities be constructed and maintained on the property; and

WHEREAS, the City requires that on-site stormwater management/BMP facilities as shown on the Plan be constructed and adequately maintained by the Landowner, its successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management/BMP facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications identified in the plans.

2. The Landowner, its successors and assigns, shall maintain the stormwater management/BMP facilities in good working conditions, acceptable to the City, so that they are performing their design functions.

3. The Landowner, its successors and assigns, hereby grant permission to the City, its authorized agents and employees, to enter upon the property and to inspect the stormwater management/BMP facilities whenever the City deems necessary. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire

facility including, berms, inlet and outlet structures, vegetation, infiltration media, pond areas, access roads, etc. When deficiencies are noted, the City shall notify the Landowner, its successors and assigns, and provide information the inspection findings and evaluations.

4. In the event the Landowner, its successors and assigns, fail to maintain the stormwater management/BMP facilities in good working condition acceptable to the City, the City may enter upon the Property and take whatever steps it deems necessary to maintain said stormwater management/BMP facilities and to charge the costs of the repairs to the Landowner, its successors and assigns. This provision shall not be construed to allow the City of Alexandria to erect any structure of a permanent nature on the land of the Landowner, outside of an easement belonging to the City. It is expressly understood and agreed that the City is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.

5. The Landowner, its successors and assigns, will perform maintenance in accordance with the maintenance schedule for the stormwater management/BMP facilities including sediment removal as outlined on the approved plans and the following specific requirements:

Maintenance of the following Best Management Practice(s):

shall conform to the approved plan's maintenance requirements, requirements contained in Chapter 2 of the Alexandria Supplement to the Northern Virginia BMP Handbook, the Northern Virginia Regional Commission guidebook Maintaining Stormwater Systems: A Guidebook for Private Owners and Operator in Northern Virginia, and/or specific maintenance requirements established by the manufacturer as approved by the Director of Transportation and Environmental Services (T&ES) prior to the release of the Final Site Plan. Specific manufacturer maintenance requirements for the BMP will be submitted to the City of Alexandria, T&ES.

6. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials and the like on account of the Landowner's or its successors' and assigns' failure to perform such work, the Landowner, its successors and assigns, shall reimburse the City, upon demand, within 30 days of receipt thereof for all costs incurred by the City hereunder. If not paid within such 30-day period, the City shall have a lien against the property in the amount of such costs, plus interest at the Judgment Rate, and may enforce it in the same manner a lien for real property taxes may be enforced.

7. The Landowner, its successors and assigns, shall indemnify and hold harmless the City and its agents and employees for any and all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the City for the construction, presence, existence or maintenance of the stormwater management/BMP facilities by the Landowner, its successors and assigns.

8. In the event a claim is asserted against the City, its agents or employees, the City shall promptly notify the Landowners, their successors and assigns, and they shall defend, at their own expense, any suit based on such claim. If any judgment or claim against the City, its agents or employees shall be allowed, the Landowner, its successors and assigns shall pay all costs and expenses in connection therewith.

9. The Landowner, its successors and assigns, hereby grants permission to the city, its authorized agents, employees, guests, and consultants to enter upon the property to install, operate and maintain equipment to monitor the flow characteristics and pollutant content of the influent and effluent, and at intermediate points in the facility. The Landowner further agrees to design and construct the facility to provide access for monitoring as outlined in Chapter 2 of the Alexandria Supplement to the Northern Virginia BMP Handbook and/or in the manufacturer manual for the BMP.

10. The Landowner, its successors and assigns, hereby grants permission to the City, its authorized agents, employees and guests to enter upon the property whenever the City deems necessary, with a ten day advance notice, to conduct tours of the stormwater management/BMP facilities. The purpose of such tours is to expand the base of knowledge in the stormwater management/BMP field amongst planners, engineers, scientists and other interested parties.

11. This Agreement shall be recorded among the land records of the City of Alexandria, Virginia, and shall constitute a covenant running with the land/or equitable servitude, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and other successors in interest.

WITNESS the following signatures and seals:

Landowner Signature

Print or Type Name

Title

ATTEST:

COMMONWEALTH OF _____

CITY OF _____

I, _____, a Notary Public in and for the City and Commonwealth aforesaid, whose commission expires on the ____ day of _____, 20__, do hereby certify that _____, whose name(s) is/are signed to the foregoing Agreement bearing date of the _____ day of _____, 20__, has acknowledged the same before me in my said City and State.

GIVEN UNDER MY HAND THIS _____ day of _____, 20__.

NOTARY PUBLIC

WITNESS the following signatures and seals.

Director, Department of T&ES or Designee

Print or Type Name

ATTEST:

COMMONWEALTH OF _____
CITY OF _____

I, _____, a Notary Public in the City of Alexandria and for the Commonwealth of Virginia, whose commission expires on the ____ day of _____, 20__, do hereby certify that _____, representative for the City of Alexandria, whose name is signed to the foregoing Agreement bearing the date of the ____ day of _____, 20__, has acknowledged the same before me in the City and Commonwealth aforesaid.

GIVEN UNDER MY HAND THIS ____ day of _____, 20__.

NOTARY PUBLIC



**INSTRUCTIONS FOR PREPARING:
STANDARD MAINTENANCE AND MONITORING AGREEMENT
STORMWATER BMP FACILITIES MAINTENANCE / MONITORING
AGREEMENT**

The following instructions are provided to help the applicant properly complete steps associated with this agreement.

- Day, date and Landowner are self-explanatory and must be provided
- Description of property should be provided in full, in the spaces provided
- **Project Name**
- **Project Number** as assigned by the City of Alexandria
- Specify the **Number**, and then the **Specific Type** of stormwater quality BMP facility. If different BMPs are employed for the same project, provide type and number of each being constructed.
- Execute and notarize the document in the spaces provided.
- T&ES staff will also execute and notarize the document.

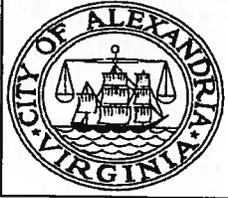
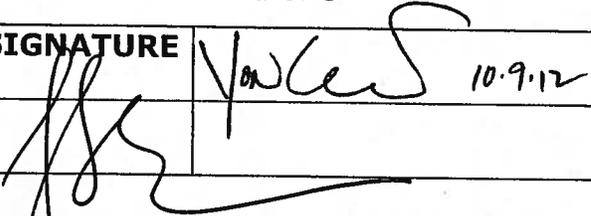
*This document must be executed and recorded with the Land Records Division of the Alexandria Circuit Court. **The applicant must submit proof (i.e. Receipt) that this agreement has been recorded prior to release of site plan.***

The following shall be completed by the applicant prior to release of the Performance Bond (if applicable)

- The applicant must submit a written certification by a Registered Engineer or Licensed Surveyor that the BMP(s) have been constructed and installed as designed and in accordance with the Final Site Plan.
- Submit a certification by a qualified professional, to the satisfaction of the Director of T&ES, that any existing stormwater management facilities and associated conveyance systems adjacent to the project were not adversely affected by construction operations and that they are functioning.
- A copy of the BMP Operation and Maintenance Manual shall be submitted to the Division of Environmental Quality via written or digital media. A copy of the executed maintenance service contract made with a qualified private contractor shall be included in the Manual.

APPENDIX F. DOCUMENTS RELATED TO MCM#6, POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

This appendix contains written procedures for daily operations, or Standing Operating Procedures (SOPs) for Daily Operations. These outline procedures for pollution prevention and good housekeeping, as required by Section II.B.6.a&f of the City's MS4 General Permit.

	TITLE		Sanitary Sewer Overflow Response Plan	
	Procedure #		TES-Maint-2012-08	
	Revision	JFD	Date	20-September-2012
	Page	1 of 8		
ORIGINATOR Name / Title	Yon Lambert / Deputy Director, Operations	SIGNATURE		
APPROVED BY Name / Title	Richard J. Baier / Director, T&ES			

SECTION 1: PURPOSE

- 1.1 The purpose of the City of Alexandria Sanitary Sewer Overflow Response Plan (SORP) standard operating procedure is to minimize the impact of sanitary sewer overflows (SSO's) to the public and the environment. The City of Alexandria will ensure that sanitary sewer overflows are responded to in a timely manner to expedite the necessary steps to relieve the overflow. Relieving the sewage blockage and spill containment is the City's highest priority, taking in to consideration public health concerns. This response plan will be the guideline for the standard operating procedures in the event of a sanitary sewer overflow. The response plan will be reviewed periodically to ensure that all corrective measures are being taken and to determine whether periodic staff training (including refresher and/or new employee training) may be warranted.
- 1.2 The plan includes the following elements:
 - a. Section 2: Response to Notification of Spills: The City of Alexandria has adopted service call/overflow response procedures requiring immediate response to minimize or eliminate an overflow.
 - b. Section 3: Initial Spill Response: This section includes standard operating procedures that ensure the notification of first responders during normal business hours and after business hours, spill assessment and volume estimation for notification and reporting purposes.
 - c. Section 4: Service Restoration & Containment: Procedures to ensure containment, termination, maximum recovery and cleanup of spilled sewage.
 - d. Section 5: Notification: Standard practices the City uses to secure the area surrounding a spill, post warning signs as necessary and provide notification to affected City departments/divisions, other impacted agencies and the public.
 - e. Section 6: Recordkeeping and Reporting: Practices, including procedures that link field records to the City's maintenance management system, and procedures for reporting spills, as required, to appropriate regulatory agencies.

SECTION 2: RESPONSE TO NOTIFICATION OF SPILL

- 2.1 The City of Alexandria has adopted service call/emergency response procedures and after-hours processes for calls requiring immediate response to minimize or eliminate an overflow (See Attachments). The City provides (or contracts with an emergency response contractor that provides) all necessary spill response supplies. These supplies are available for use at any time. The SOP is to aid staff in prompt and responsible SSO response.

TITLE	Sanitary Sewer Overflow Response Plan	Procedure #	TES-Maint-2012-08
		Page 2 of 8	

2.2 When a notification of an SSO is received, it should be clearly communicated who will respond, the estimated time of arrival, and what areas will need to be accessed. The information provided by the caller should be verified before dispatching a field crew. This includes verifying the address and nearest cross street and making sure it is part of the City's conveyance system. If not, provide the caller with the phone number of the responsible agency and follow up by calling the agency and providing the details of the call.

Public Observation

2.3 Public observation is the most common way that the City is notified of blockages and spills. Contact information for reporting sewer spills and backups are in the phone book, City website and in many pieces of literature provided by the City. The main telephone number is (703) 746-4488; this line includes an option for 24-hour call response.

2.4 When a report of a sewer spill or backup is made during normal business hours, City call center staff receives the call, takes the information from the caller, and completes a Cityworks service request. For emergency sewer backups, spills or blockages, the call center staff verbally communicates (does not leave a voicemail) appropriate information to the Sewers Superintendent or designee along with any information collected from other field reports. The Superintendent then notifies the City's Sewer Inspector and sewer response team, which responds to the incident as soon as possible.

Staff Observation

2.5 City staff and contractors perform periodic maintenance work on its sewer system facilities. Any problems noted with the sewer system facilities are reported to the Superintendent who, in turn, responds to emergency situations.

SECTION 3: INITIAL SPILL RESPONSE

3.1 All sewer system calls require a response to the reported location of the event in an attempt to minimize or eliminate an overflow. The first responder (Sewer Inspector during normal business hours or City Standby staff during after-hours) must respond to the reporting party or site of the problem and initiate response activities within 60 minutes after initial reporting of the spill to the City. If a responder cannot be at the spill location within 60 minutes after the spill, then the responder must notify the Sewers Superintendent who will dispatch other available staff or emergency contractors.

3.2 The first responder should determine appropriate response measures based on the circumstances and information provided by the caller (e.g. weather and traffic conditions, small backup vs. sewage flowing on the ground, etc.). If additional help is needed, contact other employees, contractors, and/or equipment suppliers. Based on available information, the first responder should determine if a combination sewer cleaning truck and/or a spill response vehicle is needed.

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- 3.3 Upon arrival at the site, the first responder should:
- Note arrival time at spill site.
 - Verify the existence of a sewer system spill or backup.
 - Field verify the address and nearest cross street, making sure it is part of the City's sewer/conveyance system.
 - Identify and clearly assess the affected area and extent of spill. If the spill is small (i.e. less than 50 gallons) an eyeball estimate may be made. If the spill appears large (i.e. greater than 50 gallons), staff should work with a Sewer Inspector or Sewer Superintendent to measure the volume. The shape, dimensions, and the depth of the contained wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume. In the event of a significant spill, the City Engineering Department or Office of Environmental Quality may be required to compute the spill volume using the duration or flowrate methods.
 - *To determine the volume of a large spill (i.e. larger than 50 gallons) refer to the following process:*
 - Step 1 Sketch the shape of the contained sewage (see figure above).
 - Step 2 Measure or pace off the dimensions.
 - Step 3 Measure the depth at several locations and select an average.
 - Step 4 Convert the dimensions, including depth, to feet.
 - Step 5 Calculate the area in square feet using the following formulas: Rectangle: Area = length (feet) x width (feet); Circle: Area = diameter (feet) x diameter (feet) x 0.785 or Triangle: Area = base (feet) x height (feet) x 0.5
 - Step 6 Multiply the area (square feet) times the depth (in feet) to obtain the volume in cubic feet.
 - Step 7 Multiply the volume in cubic feet by 7.5 to convert it to gallons.
 - Comply with all safety precautions (traffic, confined space, etc).
 - Contact caller, if time permits.
 - Notify the Sewer Superintendent and Maintenance Division Chief if:
 - The spill appears to be large, in a sensitive area, or there is doubt regarding the extent, impact, or how to proceed; or
 - Additional help is needed for line cleaning or repair, containment, recovery, lab analysis, and/or site cleanup
 - Begin completion of the Form O- SSO Overflow Reporting Form

SECTION 4: SERVICE RESTORATION AND CONTAINMENT

Initial Assessment

- 4.1 Upon arrival at the location of a spill into a house or a building, the first responder should evaluate and determine if the spill was caused by a blockage in the lateral or in a City-owned sewer main, caused either by a backup in the sewer main line or nearby operations and maintenance activities.
- If a blockage is found in a property owner's lateral, it should be clearly communicated that it is not the City's responsibility to work on a private lateral.

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- If a backup in the main line is found to have caused the SSO in a house or building, the first responder should relieve the blockage in the main line and provide the resident with information on claims.

Service Restoration

4.2 The first responder should attempt to remove the blockage from the system and restore flow to the area. Using the appropriate cleaning tools, the field crew should set up downstream of the blockage and flush/hydroclean the sewer upstream from a clear manhole. The flows should be observed to ensure that the blockage does not recur downstream.

4.3 If the blockage is not relieved within the first few attempts (20 minutes), it is crucial that bypass procedures are followed immediately:

4.3.1 Locate the nearest downstream manhole that can accept the additional flow.

4.3.2 Set up a 3-inch pump for smaller collection lines, and the 6-inch pump for larger transmission lines, this should be used as a guideline, be advised that larger pumps may be needed. The pump discharge hose should be secured or placed far enough into the manhole that it will not come out during pumping. The pump and pump hose should be protected from traffic by barricades. If additional pumps are needed, they shall be rented from:

Flippro Construction Company, 703-370-8778

Containment & Clean Up

4.4 The first responder should attempt to contain as much of the spilled sewage as possible using the following steps:

- Determine the immediate destination of the overflowing sewage
- Plug storm drains using available equipment and materials to contain the spill, wherever appropriate. If spilled sewage has made contact with the storm drainage system, attempt to contain the spilled sewage by plugging downstream storm drainage facilities
 - Arrange for removal of spilled sewage or debris from storm drainage system through use of vacuum truck and/or bypass pumping
- Contain/direct the spilled sewage using dike/dam or sandbags
- Pump around the blockage/pipe failure/pump station or vacuum flow from upstream of the blockage and dispose of downstream of the blockage to prevent further overflow.

SSOs on Private Properties

4.5 When an SSO occurs inside of a house or building and is due to a City line backup, the first responder should instruct the property owner should be instructed to follow these guidelines:

- Keep all family members and pets away from the affected area.
- Place towels, rags, blankets, etc. between areas that have been affected and areas that have not been affected.
- Do not remove any contaminated items.
- Turn off the HVAC system.

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- Move any uncontaminated property away from the overflow area.

The homeowner is responsible for clearing any blockage in the home's plumbing system or private lateral and for any resulting flood damage to the structure. The homeowner is also responsible for damage that happens because a lateral was not properly installed. Spills inside houses or buildings should be cleaned up by a professional cleaning company. Contact information for professional cleaning companies can be found in the "Water Damage Restoration" section of the Yellow Pages.

If the sewage backup is located inside a building or on private property and the backup was caused by a blockage in the public sewer main, the City may be responsible for cleanup and restoration. If this is the case, the City may arrange for a water damage restoration company. Claims by homeowners, if applicable, should be submitted based on information in Section 5.4 of this document.

SSOs on External/Hard Surfaced Areas

- 4.6 When an SSO occurs in an external location and is due to a City main, staff will make every effort to restore the environment to the condition that existed before the SSO occurred by using the procedures outlined below.
- Collect all signs of sewage solids and sewage-related material either by hand, vacuum or with the use of rakes and brooms and discharge it back into the sanitary sewer system.
 - Take reasonable steps to contain and vacuum up the wastewater.
 - Disinfect all areas that were contaminated from the overflow using the disinfectant solution of household bleach diluted 10:1 with water. Apply minimal amounts of the disinfectant solution using a hand sprayer. Document the volume and application method of disinfectant that was employed.
 - Allow area to dry. Repeat the process if additional cleaning is required.

SSOs on External/Landscaped and Unimproved Natural Vegetation

- 4.7 When an SSO occurs in an external location such as a natural area and is due to a City main, staff will make every effort to restore the environment to the condition that existed before the SSO occurred by using the procedures outlined below
- Collect all signs of sewage solids and sewage-related material either by hand, vacuum or with the use of rakes and brooms and discharge it back into the sanitary sewer system.
 - Allow the area to dry. Repeat the process if additional cleaning is required.
 - Recover any sewage within storm drains, channels, curb, gutters, and culverts.
 - Clear surrounding area of paper, solids, and any other signs of a SSO.
 - City forces will replace vegetation, sidewalks, asphalt, fencing or any other items that were damaged as a result of the SSO or the crews working to restore service.

Clean Up and Disinfection

- 4.8 Clean up and disinfection procedures should be implemented to reduce the potential for human health issues and adverse environmental impacts that are associated with an SSO event. The procedures described are for dry weather conditions and should be

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modified as required for wet weather conditions. Where clean-up is beyond the capabilities of City staff, a cleanup contractor will be used.

SECTION 5: NOTIFICATION

SSOs that do not Reach Public Waters

5.1 For spills that are contained and do not release unrecovered sewage into a storm drain, stream or a surface water body, notification to the public shall be accomplished through the use of signs at the location of the spill. The signs shall be left in place for a term of five business days.

5.1.1 City T&ES staff, Maintenance Division Chief (1st) or Sewer Superintendent (2nd), shall notify the City Fire Department’s Environmental Investigations Unit (EIU) emergency notification email list of all SSOs in order to provide notification to public safety and Office of Environmental Quality staff. All notices to the EIU shall reference the location of the SSO, the date and time discharge was discovered, volume, action being taken, whether it has reached the storm system and/or surface waters, and the appropriate Cityworks service request number.

Spills that Reach Public Waters – City OEQ Requirements

5.2 The Deputy Director of the T&ES Office of Environmental Quality (or designee) shall be notified if an SSO has reached the storm sewer system and/or a surface water. OEQ staff will determine if further investigation of the discharge site and potentially affected areas is required. OEQ will assist in verifying the extent of the contamination in the field. OEQ will be responsible for reporting to the state as required (see Section 6.3). Information in the required reports will be largely based on Form O - SSO Overflow Reporting Form referenced in Section 3.3, Cityworks, and/or discussions with knowledgeable staff.

The City of Alexandria Health Department has the authority to close and re-open water bodies for public water contact. The water bodies affected are determined by the following parameters and best professional judgment:

- The volume of sewage discharged;
- Parameters affecting flow of sewage to the water bodies;
- Direction of current;
- Tides;
- Past experience in the area; and/or
- Any other pertinent information.

Point of Contact

5.3 Working with the Office of Communications and Public Information, and the T&ES Public Information Officer, the T&ES Maintenance Division Chief shall be responsible for coordinating public notification, if necessary, for SSOs not reaching waters of the state; and the Deputy Director of T&ES, Office of Environmental Quality (or designee), in coordination with T&ES Maintenance Staff, shall be responsible for public notification, if necessary, for SSOs that may be reasonably expected to reach surface waters.

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- 5.4 If the SSO has occurred in a building or residential property and is attributable to a blockage in a City main, the responder or the City Sewer Inspector shall:
- Gather information and fill out a Sewer Backup Summary Report.
 - Notify the Maintenance Division Chief of the incident.
 - Wait for restoration firm to arrive (if required).
 - Forward incident reports and related documents to Maintenance Division Chief.
 - For potential claims, contact the City's office of Risk Management and provide contact information to the resident.

SECTION 6: RECORDKEEPING & REPORTING

Internal SSO Documentation

- 6.1 The first responder will complete a Cityworks work order and a Field Report/Daily Sheet form. The first responder will follow the procedures and complete the Sewer Backup Summary Report if an SSO has occurred in a residence or building.

The Maintenance Division Chief will prepare a file for each individual SSO. The file should include the following information:

- Initial service call information with a completed Cityworks service request
- City of Alexandria service request call field report/daily sheet form
- Copies of the City of Alexandria service request and work order forms, which should reference a volume estimate within the notes
- Closed-Circuit Television (CCTV) inspection (this is optional for SSOs that are not blockage related)
- Water quality sampling and test results, if applicable

External SSO Documentation

- 6.2 The City maintains SSO records for five years from the date of the SSO. All records shall be made available for review upon request. Records shall be retained for all SSOs, including but not limited to the following when applicable:
- Copy of Cityworks service requests and work orders;
 - All original recordings for continuous monitoring instrumentation;
 - Service call records and complaint logs of calls received by the City;
 - SSO calls and SSO records;
 - Steps that have been and will be taken to prevent the SSO from recurring and a schedule to implement those steps;
 - Work orders, work completed, and any other maintenance records from the previous five years which are associated with responses and investigations of system problems related to SSOs;
 - A list and description of complaints from customers or others from the previous five years; and
 - Documentation of performance and implementation measures for the previous five years.

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Reports to the State for Unauthorized Discharges

6.3 Discharges of sewage from an SSO that may reasonably be expected to enter surface waters shall be reported to the Virginia Department of Environmental Quality (VDEQ) immediately upon discovery of the discharge, but in no case later than within 24 hours after discovery. OEQ will utilize VDEQ's Pollution Response Program (PREP) online reporting to accomplish the 24 hour reporting. A written report of the unauthorized discharge shall be submitted by OEQ to VDEQ and the Virginia Department of Conservation and Recreation (DCR) within five days of the discovery of the discharge. OEQ will make the 24 hour notice and be responsible for final delivery of the five-day report. The written report shall contain the following, as noted on Form O:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;
3. The date on which the discharge occurred;
4. The length of time that the discharge continued;
5. The volume of the discharge;
6. If the discharge is continuing, how long it is expected to continue;
7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this permit.

SECTION 7: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

FORM O

SSO Overflow Reporting Form

City of Alexandria, Virginia
Department of Transportation & Environmental Services

1. Date and time staff became aware that a SSO occurred:
2. Location:

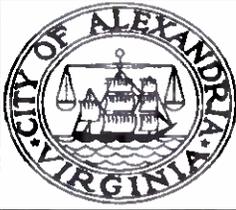
3. Date and Time Operations Staff reported to T&ES, ENG and DEQ:
4. Name of Person Making Report Under No. 3:
5. Date and Time Staff Reported Overflow to City Health Department:
6. Name of Person Making Report Under No. 5:
7. Estimated Date/Time Overflow Started:
8. Estimated Date/Time Overflow Ended:
9. Estimated Volume (gallons) of SSO:

Corrective Action Taken: Please describe:

10. Was SSO Monitored Until It Was Eliminated (Yes / No):

If No.10 is No, Explain:

Name and Title of Person(s) Making Report:

	TITLE	Brick Sidewalk Maintenance	
	Procedure #	TES-2013-04	
	Revision		Date
	Page	1 of 5	
ORIGINATOR Name / Title	Jeff DuVal / Division Chief, Maintenance	SIGNATURE	 6/9/2014
APPROVED BY Name / Title	Yon Lambert / Deputy Director, T&ES Operations		 6.9.14

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Maintenance Division provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Maintenance Division coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for Maintenance Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Brick Sidewalk Maintenance Team serves to repair and maintain brick sidewalk infrastructure in the City of Alexandria public Right of Way (ROW).

- Provides immediate Traffic Control to ensure roadway and pedestrian safety
- Conducts assessments and inspections of brick sidewalk infrastructure
- Determines and implements appropriate response
- Repairs and maintains brick sidewalk infrastructure

1.2 The Brick Sidewalk Maintenance Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Brick Maintenance.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Brick Sidewalk Maintenance Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory equipment, have been listed.
- d. Section 5: Brick Sidewalk Maintenance Operation: Captures the efforts with standard procedure for responding to brick sidewalk maintenance.

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- e. Section 6: Brick Sidewalk Maintenance Reporting: Contains information required in creating/closing a Cityworks Work Order upon completion of repairs.
- f. Section 7: Reference Materials
- g. Section 8: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Brick Sidewalk Maintenance Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in brick repair and maintenance; maintain written and computerized records of repairs. The Assistant Superintendent is responsible for inspection of completed work and closing working orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

4.1 Brick Sidewalk Maintenance Team equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

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- **Traffic Control Devices:**
 - Minimum of six (6) Orange Cones
 - Minimum of two (2) Flashlights
 - Flags
 - Sidewalk Close Signs

- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Utility Truck
 - Gravel
 - Stone Dust
 - Brick or Pavers
 - Leveling Tool
 - Rubber Mallet

SECTION 5: BRICK MAINTENANCE OPERATION

5.1 Brick Sidewalk Maintenance requests are processed during normal business hours and assemble out of 2900 Business Center Driver (BCD). When a Brick Sidewalk request is processed, the following is expected:

- Supervisor is responsible for operating the Utility Truck
- Operator/Support is responsible for operating the Crew Cab (or other vehicle as needed)
- Perform pre-trip equipment check
- The Team must report safely to the work location
- Upon arrival to the work location, team must create safe work zone
- Establish signs displaying that the sidewalk is closed so that sidewalk is not damaged by pedestrians or bicyclists travelling on sidewalk
- To begin laying the walkway
 - Level the ground appropriately for the walkway
 - While the walkway should be level, the ground should slope gently outward from the brick walkway to act as a runoff for rain and snow
 - Layer 4 inches of gravel inside the walkway bed and tamp it down. Be sure that the gravel is spread evenly
 - Fill the brick walkway bed with approximately 1 inch of masonry sand. This will act as a binding agent for the bricks once watered and allowed to dry
 - Tamp and level the stone dust. Check the walkway every few feet with a level to be certain that the proper height and curve is being maintained

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- Begin laying the bricks
 - Lay the bricks in the proper pattern over the masonry sand. Use a rubber mallet to tamp each brick down after it has been placed
 - Cover the bricks with another layer of masonry sand after laying all of your bricks or pavers
 - Sweep the masonry sand into all the cracks and in between each brick. Be sure to sweep stone dust along the brick edges with a soft broom
- Seal and secure the bricks with the masonry sand by watering the brick walkway thoroughly. The masonry sand will become hard upon drying and hold the bricks in place
 - Once sidewalk is completed, establish signs to prevent pedestrians from using sidewalk until masonry sand has been given adequate time to dry
 - When sidewalk has dried, remove signage and return sidewalk to operational status

SECTION 6: BRICK SIDEWALK MAINTENANCE TEAM REPORTING

Brick Sidewalk Maintenance Team Report

6.1 Once the Brick Sidewalk Maintenance Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Equipment/Vehicle
- Materials Used
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Attach Before and After Pictures (if applicable)
- Save all changes
- Close work order

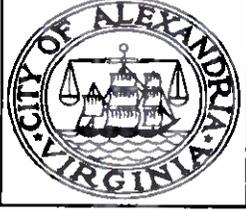
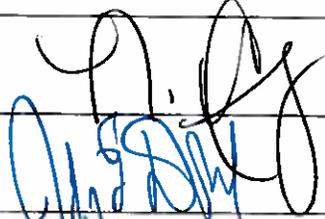
SECTION 7: REFERENCE

- City Website – Memo to Industry Standard for Brick Pavers (<http://alexandriava.gov/tes/info/default.aspx?id=3522>)
- Safety and Personal Protective Equipment Specifications (<S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE>)

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SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE		Brine System and Application: Pollution Prevention Measures	
	Procedure #		TES-2013-11	
	Revision		Date	
	Page		1 of 2	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services		SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations		6.26.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond during weather events, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Snow Pretreatment Operator Team serves in pretreatment of roadways when conditions warrant application in response to an impending snow event in the City of Alexandria. Pretreatment helps to minimize the formation of snow and ice in order to keep roadways clear and safe for motorist and pedestrian travel. This task is completed by:

SECTION 2: EQUIPMENT LIST

2.1 Pretreatment equipment is identified below:

- **Personal Protective Equipment (PPE): Refer to PPE Matrix**
 - Safety Vest
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear (ANSI Z87 with side shields)
 - Protective Hearing Equipment (HPD with minimum 20 dB NRR)
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

TITLE	Brine System and Application: Pollution Prevention Measures	Procedure #	TES-2013-11
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- **Tools**
 - Snow Zone Maps
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Radio
- **Vehicles**
 - Utility Vehicle (F-450 with snowplow and spreader)
- **Deicing Materials**
 - Brine
 - Sand

SECTION 3: PRETREATMENT PROCEDURE

3.1 Pretreating important roadways prior to an impending snow event that warrants application is vital to snow removal operations. Pretreatment minimizes the accumulation of hard snow, but more importantly, minimizes the bond between the snow and the roadway, assisting in plowing efforts. Additionally, pretreatment helps to minimize refreezing of slush on road surfaces.

Procedures for applying deicing materials are as follows:
(PROCEDURES WILL BE FULLY DEVELOPED AT A LATER TIME)

SECTION 4: POLLUTION PREVENTION MEASURES

4.1 Pollution prevention procedures must be followed to minimize or prevent impacts to the Municipal Separate Storm Sewer System (MS4) from pretreatment operations. Deicing agents must not contain urea or other forms of nitrogen or phosphorus to parking lots, roadways, sidewalks, or other paved surfaces.

Sand/Aggregate Storage and Loading

- Ensure that sand/aggregate is stored under the designated shelter
- When loading, take care to not overload
- Sweep the area frequently to prevent buildup and runoff of material

Brine Storage and Loading

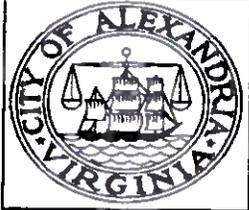
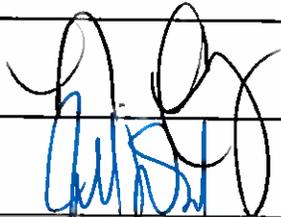
- Store brine in designated containers, with secure covers/lids
- Ensure that plumbing and delivery equipment are not leaking and in proper working order
- Ensure emergency shutoff in working order
- Ensure inlet protection is readily available to block off inlet in case of accidental release
- Use the lowest concentration that remains effective

Application

- Use designated amounts on roadway surfaces

Equipment Cleanup

- Recover wash water generated from equipment cleaning

	TITLE		Bus Shelter and Bike Rack Installation and Maintenance	
	Procedure #		TES-PWS-2015-28	
	Revision		Date	
	Page		1 of 4	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services		SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations		6.30.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

1.2 The Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE) and Tools, all of which are mandatory have been listed.
- d. Section 5: Operation: Captures the efforts with standard procedure for responding to bus shelter and bike rack installation and maintenance.
- e. Section 6: Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

TITLE	Bus Shelter and Bike Rack Installation and Maintenance	Procedure #	TES-PWS-2015-28
		Page 2 of 4	

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Bus Shelter and Bike Rack Installation and Maintenance roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in repair and maintenance; maintains written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Maps (Sewer and City)
 - Pick

TITLE	Bus Shelter and Bike Rack Installation and Maintenance	Procedure #	TES-PWS-2015-28
		Page 3 of 4	

- o Shovel
- o Broom
- o Utility Contacts
- o Emergency Fire and Police Contacts
- o City Risk Management Handouts

SECTION 5: OPERATION

4.1 The Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a ticket is processed, the following is expected: (PROCEDURES WILL BE FULLY DEVELOPED AT A LATER TIME)

- Prevent disturbance of, or introduction of, polluted runoff to storm drain system. Use temporary sediment control measures, such as a silt fence or sock, as necessary.
- Stabilize any exposed ground, dirt, or soil.
- Use only the amount of repair material needed.
- Pick up litter and debris around the site prior to any repair activities.
- Avoid tracking mud and dust from work activities. Clean any tracked mud or dust using dry methods, such as sweeping.

SECTION 6: TEAM REPORTING

Team Report

5.1 Once the Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

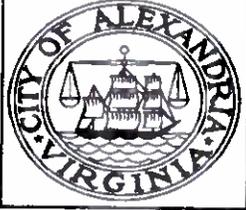
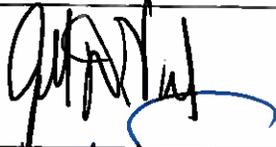
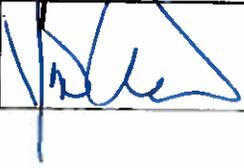
SECTION 7: REFERENCE

7.1 Safety and Personal Protective Equipment Specifications ([S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE](#))

TITLE	Bus Shelter and Bike Rack Installation and Maintenance	Procedure #	TES-PWS-2015-28
		Page 4 of 4	

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE	Concrete Sidewalk Maintenance	
	Procedure #	TES-2013-09	
	Revision	Date	
	Page	1 of 6	
ORIGINATOR Name / Title	Jeff DuVal / Division Chief, Public Works Services	SIGNATURE	
APPROVED BY Name / Title	Yon Lambert / Deputy Director, T&ES Operations		

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for Public Works Services Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Concrete Sidewalk Maintenance Team serves to repair and maintain concrete sidewalk infrastructure in the City of Alexandria public Right of Way (ROW).

- Provides immediate Traffic Control to ensure roadway and pedestrian safety
- Conducts assessments and inspections of concrete sidewalk infrastructure
- Determines and implements appropriate response
- Repairs and maintains concrete sidewalk infrastructure

1.2 The Concrete Sidewalk Maintenance Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Concrete Maintenance.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to the Concrete Maintenance Team.

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
		Page 2 of 6	

- c. Section 4: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory maintenance crew equipment, have been listed.
- d. Section 5: Concrete Sidewalk Installation Operation: Captures the efforts with standard procedure for responding to concrete sidewalk maintenance.
- e. Section 6: Concrete Sidewalk Installation Reporting: Contains information required in creating/closing a Cityworks Work Order upon completion of repairs.
- f. Section 7: Reference Material
- g. Section 8: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Concrete Sidewalk Maintenance Team roles and responsibilities have been identified below:

- **Assistant Superintendent** is responsible for inspecting completed work, and updating and closing work orders in Cityworks.
- **Supervisor** is responsible for processing the maintenance ticket and verifying accurate information through Cityworks; reviews work of staff engaged in concrete sidewalk repair; maintains written and computerized records of repairs.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinating with Supervisor to establish maintenance and repair goals; performing field observations to ensure compliance with departmental policies, practices, and City ordinances.
- **Concrete Inspector** is responsible for identifying large area sidewalk projects; coordinating with the Superintendent to establish high volume requests areas; and monitoring contractor repair and costs to ensure compliance with departmental policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Concrete Sidewalk Installation Team Equipment list has been identified below:

- **Personal Protective Equipment (PPE): Refer to PPE Matrix**
 - Safety Vest

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
		Page 3 of 6	

- Hard Hats
- Government Issued Work Boots
- Gloves
- Protective Eyewear
- Protective Hearing Equipment
- Hand Sanitizer
- **Identification and Security**
 - Complete Uniform
 - Government Issue Identification (ID) Badge
- **Traffic Control Devices:**
 - Minimum of six (6) Orange Cones
 - Minimum of two (2) Flashlights
 - Flags
 - Sidewalk Repair Signs
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Air Compressor
 - Jackhammer
 - Wheelbarrow
 - Utility Truck
 - Concrete truck

SECTION 5: CONCRETE SIDEWALK INSTALLATION OPERATION

4.1 Concrete Sidewalk Installation tickets are processed during normal business hours. Concrete Sidewalk Installation teams assemble out of 2900 Business Center Drive (BCD). When a Concrete Sidewalk Installation ticket is processed:

- **Preparation**
 - Work crew will arrive to the work site safely and immediately establish a safe work zone.
 - Establish signs stating that the sidewalk is closed and establish proper roadway signs to create buffer if needed
 - Store dry and wet materials under cover, away from drainage areas.
 - If existing sidewalk is being replaced.
 - Remove any damaged concrete that may need to be replaced
 - Use jackhammers or backhoe to break concrete into small chunks
 - Use wheelbarrows and tools to remove the broken chunks of concrete into a dump truck or other vehicle
 - Prepare and compact sub-base.

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
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- Dig the sub-base to the proper depth for the entire length of the sidewalk that is to be replaced
 - Pour the sub-base material evenly across the section of sidewalk to be replaced
 - Using a compacting tool, compact the section of sub-base so that it is level for the length of the sidewalk
 - Using a leveling tool, check that the sub-base maintains the standard depth for each section of sidewalk
 - Set forms and place any reinforcing steel that may be required.
 - Set the forms along the edges of the sidewalk with no gaps between the form and the sub-base so that the concrete mix maintains the same height and does not flow out under either side
 - Measure to determine how much concrete will be needed.
 - Include formula for determining how much concrete is needed and what measurements must be taken. The typical formula would be: length x width x depth divided by 27. This will equal the cubic yards needed for measure and repair.
 - Locate or construct approved concrete washout facility.
- Installation Process
 - Install inlet protection as needed.
 - Inlet protection will be needed if the sidewalk will be installed directly on top of storm water inlets
 - Moisten sub-base just prior to placing new concrete. This helps keep the soil from wicking the moisture out of the concrete into the ground.
 - Place new concrete in forms.
 - Pour concrete to the center of the form at a slow rate, so that the concrete is able to spread across the form properly and is not at risk of overflowing
 - Scrape off surface.
 - Scrape off excess concrete into the adjacent form, as to not waste excess concrete and to keep the sidewalk level
 - Level the surface to remove any obstructions before the concrete settles and will make repairs more costly and time consuming
 - Let concrete obtain its initial set.
 - Apply appropriate surface finish.
 - Remove forms when concrete will not slump.
 - This is typically about 24 hours after pour, but will be longer if weather is excessively humid, less if it is very hot and dry
- Site Cleanup
 - Sweep cement and concrete dust from grinding activities and load into a truck with a dump bed. Sweep all dirt and debris from the street and gutter and load it into utility vehicle.
 - Transport all waste and debris from job site to an appropriate waste disposal facility (aggregate yard) identified by the Superintendent.

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
		Page 5 of 6	

- Once work area is cleared of all tools, debris and excess materials, open the sidewalk for pedestrian traffic.
- Return to Business Center Drive and complete work order form.
- Equipment Specific Cleaning
 - Perform washout of concrete trucks and equipment in designated areas only. Clear out any excess concrete mix from vehicle and make vehicle ready for next shift.

SECTION 6: CONCRETE SIDEWALK MAINTENANCE TEAM REPORTING

Concrete Sidewalk Maintenance Team Report

6.1 Once the Concrete Sidewalk Maintenance Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Equipment/Vehicle
- Materials Used
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Attach Before and After Pictures (if applicable)
- Save all changes
- Close work order

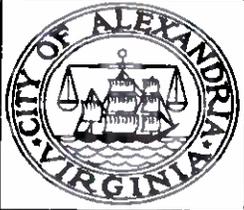
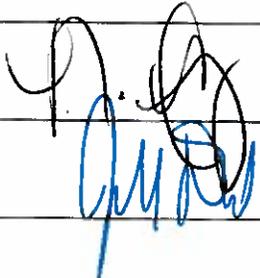
SECTION 7: REFERENCE

- Safety and Personal Protective Equipment Specifications (<S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE>)

REV Level	Purpose of Change	Changes	Date of Previous Revision
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TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
		Page 6 of 6	

Initial	New	None	NA

	TITLE		Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance	
	Procedure #		TES-PWS-2015-27	
	Revision		Date	
	Page	1 of 4		
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE		
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6-30-15		

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

1.2 The Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE) and Tools, all of which are mandatory have been listed.
- d. Section 5: Operation: Captures the efforts with standard procedure for responding to crack sealing, strip patching, paving/patching construction maintenance, and concrete inspection/construction maintenance.

TITLE	Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance	Procedure #	TES-PWS-2015-27
		Page 2 of 4	

- e. Section 6: Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in repair and maintenance; maintains written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer

TITLE	Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance	Procedure #	TES-PWS-2015-27
		Page 3 of 4	

- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts

SECTION 5: OPERATION

4.1 The Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a ticket is processed, the following is expected: (PROCEDURES WILL BE FULLY DEVELOPED AT A LATER TIME)

- Prevent disturbance of, or introduction of, polluted runoff to storm drain system. Use temporary sediment control measures, such as a silt fence or sock, as necessary.
- Stabilize any exposed ground, dirt, or soil.
- Use only the amount of repair material needed.
- Pick up litter and debris around the site prior to any repair activities.
- Avoid tracking mud and dust from work activities. Clean any tracked mud or dust using dry methods, such as sweeping.

SECTION 6: TEAM REPORTING

Team Report

5.1 Once the Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)

TITLE	Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance	Procedure #	TES-PWS-2015-27
		Page 4 of 4	

- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

SECTION 7: REFERENCE

7.1 Safety and Personal Protective Equipment Specifications ([S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE](#))

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE		Dewatering	
	Procedure #		TES-PWS-2015-26	
	Revision		Date	
	Page		1 of 4	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE		
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6.26.15		

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

1.2 The Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE) and Tools, all of which are mandatory have been listed.
- d. Section 5: Operation: Captures the efforts with standard procedure for responding to dewatering.
- e. Section 6: Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

TITLE	Dewatering	Procedure #	TES-PWS-2015-26
		Page 2 of 4	

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Dewatering Operations roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in repair and maintenance; maintains written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts

TITLE	Dewatering	Procedure #	TES-PWS-2015-26
		Page 3 of 4	

- Emergency Fire and Police Contacts
- City Risk Management Handouts

SECTION 5: OPERATION

4.1 The Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a ticket is processed, the following is expected:

- All dewatering discharges into the storm drain system should be filtered or treated to ensure there is no sediment or other contaminants. To remove sediment from dewatering discharges, either filter the discharge or use a settling container.
- Some dewatering operations may require a separate VPDES permit. If so, follow all procedures, requirements, and recommendations in the permit.
- If the project has a stormwater pollution prevention plan (SWPPP), follow all procedures, requirements, and recommendations in the plan.
- Monitor and analyze dewatering discharges daily for appropriate pH and turbidity.
- Use temporary sediment control measures, such as a silt sock, around storm drains located near dewatering activities.

SECTION 6: TEAM REPORTING

Team Report

5.1 Once the Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

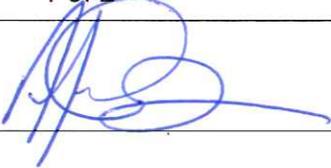
SECTION 7: REFERENCE

7.1 Safety and Personal Protective Equipment Specifications ([S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE](#))

TITLE	Dewatering	Procedure #	TES-PWS-2015-26
		Page 4 of 4	

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)			
	TITLE	Fleet and Vehicle Maintenance		
	Purpose	Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015
	Page	1 of 2		
SOP Administrator: Name / Title	Alfred Coleman / Deputy Director, Administration	SIGNATURE		
Location of SOP:	3550 Wheeler Avenue, Alexandria, VA			

I. Purpose

The Fleet Services Division within the Department of General Services is responsible for maintaining the City's vehicles, specialty, and major construction equipment. The City has approximately 900 units in its fleet, which includes police cruisers, pickup trucks, sedans, SUVs, dump trucks, hybrid fuel vehicles, construction equipment, refuse trucks, and street sweepers. Fleet Services performs maintenance and repairs on these City-owned units at the fleet maintenance facility located at 3550 Wheeler Avenue. This SOP provides pollution prevention and good housekeeping written procedures for daily activities related to Fleet and Vehicle Maintenance to address the applicable Municipal Separate Storm Sewer System (MS4) General Permit requirement in Section II B. 6 a.

II. Roles and Responsibilities

The Fleet Services Division Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

III. Process

- Conduct maintenance work indoors to the greatest extent possible.
- When maintenance work is conducted outdoors, use an impervious surface and protect storm drains from spills and leaks.
- Clean up any spills or leaks promptly using dry methods, such as adsorbent pads or sweeping.
- Do not clean any vehicles or equipment, including lawn care equipment, near a storm drain. Use designated wash racks that drain to sanitary sewers to wash vehicles and equipment.
- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Use drip pans for vehicles that are stored outside.
- Do not leave drip pans outside during rain. Properly dispose of any liquid that collects in drip pans. Do not dispose of liquid in storm drains.
- Never leave vehicles/equipment unattended while fueling.

TITLE	Fleet and Vehicle Maintenance SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 2	

IV. Training and Documentation

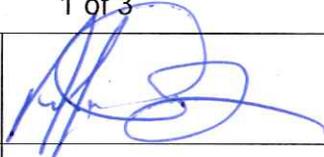
- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Documentation**
 - Maintain a record of all employees trained and training topics.
 - Maintain documentation of maintenance and inspection activity.

V. References

- Pollution Prevention/Good Housekeeping for Municipal Operations: Standard Operating Procedures for Erie County Department of Environment and Planning Division of Environmental Compliance Services
(<\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\StwtrPPGH SOP.pdf>)
- Fleet and Vehicle Maintenance Standard Operating Procedure for City of Boulder, Colorado
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\fleetvehicle_maint_sops.pdf)
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program
(<\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf>)

VI. Record of Changes

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

	Standard Operating Procedures (SOP)			
	TITLE	Fleet and Vehicle Washing		
	Purpose	Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015
	Page	1 of 3		
SOP Administrator: Name / Title	Alfred Coleman / Deputy Director, Administration	SIGNATURE		
Location of SOP:	3550 Wheeler Avenue, Alexandria, VA			

I. Purpose

The Fleet Services Division within the Department of General Services is responsible for maintaining the City's vehicles, specialty, and major construction equipment. The City has approximately 900 units in its fleet, which includes police cruisers, pickup trucks, vans, sedans, dump trucks, hybrid fuel vehicles, construction equipment, refuse trucks, and street sweepers. Fleet Services performs maintenance and repairs on these City-owned units at the fleet maintenance facility located at 3550 Wheeler Avenue. This SOP provides stormwater pollution prevention procedures relating to fleet and vehicle washing. The City's Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) prohibits the discharge of vehicle and equipment wash water to the storm sewer system. In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

II. Roles and Responsibilities

The Fleet Services Division Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

III. Process

- Wash water is prohibited from entering the storm sewer system.
- Do not clean or wash vehicles or equipment, including lawn care equipment, near a storm drain. If washing vehicles outdoors, use designated wash racks that drain to sanitary sewers to wash vehicles and equipment or use a system that contains wash water and properly dispose of it.
- Minimize soap and water use when washing vehicles.
- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned using brooms on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Keep vehicles and other equipment clean, and do not allow a build-up of oil or grease.

Vehicles and equipment may be cleaned using one of the following methods that prevent wash water from entering the storm sewer system:

TITLE	Fleet and Vehicle Washing SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 3	

- **Washrack**
 - When using the dedicated washrack at 133 Quaker Lane, ensure that the grate inlet at the washrack is draining to the sanitary sewer by engaging the valve that switches from the storm sewer to the sanitary sewer.
 - When done using the washrack, ensure the valve to the sanitary sewer has been disengaged and that the drain is now draining to the storm sewer.
- **Contain / Capture Wash Water**
 - When using a system that contains all wash water, such as blocking storm drains or using a wash kit, absorbent boom, or berm, collect and dispose of all wash water in the sanitary sewer.
 - Follow the manufacturers' directions for all proprietary systems and kits that capture wash water ("Read the Label").
 - Do not dispose of any wash water in the storm sewer or on grassed areas.
 - Clean wash equipment on grassed surfaces or in areas that drain directly to the sanitary sewer.
- **Car Wash Vendor**
 - Wash City-owned vehicles at the commercial car wash facility under contract with the City.

IV. Training and Documentation

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Documentation**
 - Maintain a record of all employees trained and training topics.

V. References

- Standard Operating Procedures for Weber County Storm Water Coalition (<\\Tes01\DeptFiles\Tes\envq\lty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Weber County.pdf>)
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program (<\\Tes01\DeptFiles\Tes\envq\lty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf>)
- Vehicle Wash Compliance for City of Alexandria Fire Department (<\\Tes01\DeptFiles\Tes\envq\lty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Fire Dept\GO 13-030 Vehicle Wash Compliance 8-7-13.pdf>)

TITLE	Fleet and Vehicle Washing SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

- Vehicle Wash Compliance Certification Form for Prohibition of Municipal Vehicle Washwater Discharge to Storm Drain System, City of Alexandria
 (\\Tes01\DeptFiles\Tes\env\q\lty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Vehicle Wash Compliance Certification Form Final 07.01.2013.docx)

VI. Record of Changes

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

Alexandria Fire Department



General Order	
Subject:	Stormwater Pollution Prevention
Approved:	Dwayne Bonnette, Assistant Chief
	GO # 15-003
	Date: 6/30/2015

1.0 BACKGROUND

- 1.1 Discharges into waterways from storm sewer systems are regulated under the Virginia Stormwater Management Act, the Virginia Stormwater Management Program (VSMP), and the Clean Water Act. The Virginia Department of Environmental Quality (VDEQ) issues and regulates these discharges throughout the State by issuing Municipal Separate Storm Sewer System (MS4) permits to local and municipal jurisdictions with compliance requirements. Failure of local and municipal governments to comply with the terms of their permits will result in fines from VDEQ and/or the Environmental Protection Agency (EPA).
- 1.2 The provisions of the MS4 permit require local and municipal governments to develop, maintain and enforce a program that includes six control areas, including detection and elimination of illicit discharges; controlling construction stormwater runoff; post-construction stormwater management; and pollution prevention and good housekeeping policies for government processes and employees.
- 1.3 The City's permit explicitly requires the city to "Prevent the discharge of municipal vehicle wash water into the Municipal Separate Storm Sewer System (MS4) by July 2013." Vehicle wash discharge contains metals and asbestos from brake dust, grease and oils from the vehicle, and other pollutants that become attached to the vehicle from road grime. Stormwater filter systems that have been installed at some Fire Department facilities only filter sediment, they do not filter oils, metals, and other pollutants from the water.

2.0 PURPOSE

- 2.1 This policy establishes pollution prevention and good housekeeping practices to support the City's compliance of the MS4 permit.

3.0 APPLICABILITY

- 3.1 This policy applies to all Fire Department employees.

4.0 DEFINITIONS

- 4.1 **Vehicle Wash:** any fixed or mobile facility where the manual, automatic, or self-service exterior washing of vehicles is conducted. It includes, but is not limited to, automobiles, trucks, motor homes, buses, motorcycles, ambulances, fire trucks, tractor trailers, and other devices that convey passengers or goods on streets or highways (9VAC25-194-10)
- 4.2 **Heavy Duty Vehicle:** larger apparatus, such as engines, trucks, rescue squads, medic units, and other large specialty vehicles.
- 4.3 **Light Duty Vehicle:** cars, pickup trucks, and sport utility vehicles.
- 4.4 **Nonpoint Source Pollution:** pollution caused by rainfall, snowmelt, and other water sources that carry natural and man-made pollutants. These pollutants include: oils, grease, toxic chemicals and metals, soap and cleaning chemicals, fertilizers, insecticides, pesticides, sediment, etc.
- 4.5 **Vehicle Wash Containment System:** A deployable system that is placed around a vehicle to collect all vehicle wash water. The wash water is collected and disposed of through the sanitary sewer system.
- 4.6 **Sanitary Sewer System:** Any drain that discharges into the sewer system that is used to dispose of sewage.

5.0 POLICY

- 5.1** During non-emergency operations, all personnel will take necessary measures to prevent Nonpoint Source Pollution runoff from entering the storm water system.
- 5.2** Heavy Duty Vehicles will be rinsed or washed inside a fire station's apparatus bay with a floor drain that discharges to the sanitary sewer system. If the fire station does not have a floor drain that discharges to the sanitary sewer, or the drain is inoperative, a Vehicle Wash Containment System will be deployed to contain and properly dispose of the vehicle wash water.
- 5.3** Light Duty Vehicles will utilize the current City contracted car wash vendor.
- 5.4** Fuel dispensing stations will be provided with spill containment supplies and emergency pump shut-offs. All spills will be treated immediately. The hazardous materials team will be called for any spill greater than the local resources are capable of handling.
- 5.5** Vehicles and equipment must be attended during active fueling.

6.0 RESPONSIBILITIES

- 6.1** All personnel are responsible for ensuring their non-emergency work does not result in Nonpoint Source Pollution.
- 6.2** Station Managers are responsible for establishing specific housekeeping and vehicle wash procedures for their facility.

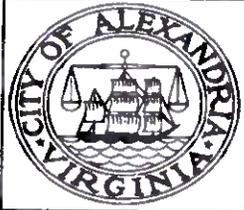
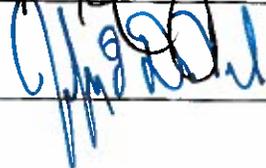
7.0 PROCEDURE

- 7.1** Vehicle maintenance and repair will be conducted indoors to the greatest extent possible.
- 7.2** When vehicle maintenance or repair is performed outdoors, use an impervious surface and protect storm drains from spills and leaks. Vehicle maintenance and repair will not be performed during a rain event.

- 7.3** Clean up spills and leaks promptly using dry methods, such as absorbent pads, loose absorbent and sweeping.
- 7.4** Do not wash equipment, including lawn care equipment, on any impervious surface that leads to the storm drain system.
- 7.5** Remove grass from lawn care equipment using dry methods, such as a broom, preferably while on grassed surfaces.
- 7.6** Use oil drip pans underneath the motor area of Heavy Apparatus Vehicles that are stored indoors and outdoors. Properly dispose of all liquids, oils, and grease collected in drip pans. The pans shall be cleaned in a manner that prevents Nonpoint Source Pollution.
- 7.7** Vehicles washed at fire stations will only be washed using biodegradable soap.
- 7.8** Vehicles washed using a Vehicle Wash Containment System must deploy the system prior to use of any water or soap products. Any wash water collected must be disposed of through the Sanitary Sewer System.

8.0 CANCELLATIONS

- 8.1** This policy cancels Standard Operating Procedure #13-030, Vehicle Wash Compliance issued on August 8, 2013.

	TITLE	Hydrant Inspection and Maintenance	
	Procedure #	TES-PWS-2013-12	
	Revision		Date
	Page	1 of 3	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6.26.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

1.2 The Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE) and Tools, all of which are mandatory have been listed.
- d. Section 5: Operation: Captures the efforts with standard procedure for responding to hydrant inspection and maintenance.
- e. Section 6: Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

ITILE	Hydrant Inspection and Maintenance	Procedure #	TES-PWS-2013-12
		Page 2 of 3	

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Hydrant Inspection and Maintenance roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in repair and maintenance; maintains written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts

ITILE	Hydrant Inspection and Maintenance	Procedure #	TES-PWS-2013-12
		Page 3 of 3	

SECTION 5: HYDRANT OPERATION AND INSPECTION

4.1 The Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a ticket is processed, the following is expected: (PROCEDURES WILL BE FULLY DEVELOPED AT A LATER TIME)

- Pick up litter and debris around the site prior to any inspection and maintenance activities.
- Use temporary sediment control measures, such as a silt sock, around storm drains located near hydrant inspection and maintenance activities.

SECTION 6: TEAM REPORTING

Team Report

5.1 Once the Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

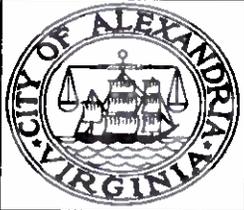
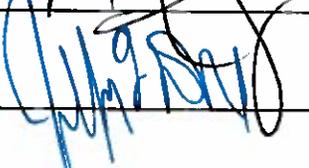
- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

SECTION 7: REFERENCE

7.1 Safety and Personal Protective Equipment Specifications ([S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE](#))

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE		Jet Truck Operations	
	Procedure #		TES-PWS-2013-06	
	Revision		Date	
	Page		1 of 4	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE		
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6.26.15		

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond during weather events, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Jet Truck Crew serves to clean sewer infrastructure that is owned by the City of Alexandria.

- Provides immediate Traffic Control to ensure roadway and pedestrian safety
- Determines and implements appropriate response
- Cleans and clears sewer infrastructure

1.2 The Jet Truck Crew operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory Jet Truck equipment have been listed.
- c. Section 4: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to the Jet Truck Team.
- d. Section 5: Jet Truck Operation: Captures the response efforts with standard procedure for each ticket response.
- e. Section 6: Jet Truck Reporting: Contains information to report to Cityworks after response to tickets.
- f. Section 7: Reference Materials
- g. Section 8: Document Changes

TITLE	Jet Truck Operations	Procedure #	TES-PWS-2013-06
		Page 2 of 4	

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Jet Truck Crew roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing maintenance ticket and verifying accurate information from Cityworks, as well as operating the Jet Truck.
- **Operator/Support** is responsible for assisting with Traffic Control Devices and other equipment.

SECTION 3: EQUIPMENT LIST

3.1 Jet Truck Cleaning Team equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Complete Uniform
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Government Issue Identification (ID) Badge
 - Hand Sanitizer
- **Traffic Control Devices:**
 - Minimum of six (6) Orange Cones
 - Minimum of two (2) Flashlights
 - Flags
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Jet Truck
 - Manhole Tool
 - 4328 CCTV (if needed)

SECTION 4: SERVICE REQUEST PROCESS

4.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

4.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

4.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and

TITLE	Jet Truck Operations	Procedure #	TES-PWS-2013-06
		Page 3 of 4	

reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 5: JET TRUCK OPERATION

5.1 The Jet Truck Operation Team is responsible for meeting during normal working hours at 2900 Business Center Drive (BCD) and cleaning assigned sewer infrastructure in the City of Alexandria. When the Jet Truck Cleaning Team processes a sewer maintenance ticket, the following is expected:

- Supervisor is responsible for operating the Jet Truck
- Operator/Support is responsible for operating the Crew Cab (or other vehicle as needed)
- Perform pre-trip equipment check
 - Check quantity of water in tank, fill if necessary.
 - Start truck and extend the hose reel in order to open hood
 - Finish under the hood components of pre-trip check
- The Team must report safely to the work location
- Upon arrival on location, set truck close to manhole and have laborer guide truck into final position. Team must then create safe work zone.
 - Create work zone with cones
 - Open manhole lid and check the direction of water flow
 - Send the nozzle up-stream
 - When cleaning storm sewers, place a bladder downstream to collect water, sediment, and debris. This ensures that excess sediment is not released into the receiving water.
- Prepare by
 - Attaching the correct nozzle to the hose, then adjust hose reel over manhole
 - Lower hose into hole and set footage counter on the hose reel when hose enters pipe
 - Slide tiger tail into hole to prevent chaffing
- Begin pumping by
 - Switching the rodder pump on
 - Switching the engine RPM on
 - Adjusting the engine RPM to achieve 1,000 psi
 - Send the Support to next manhole to watch for the hose
 - Operator of truck must know when hose enters manhole
 - Document footage
- Finish by
 - Reel in hose while maintaining pressure of 1000 psi
 - Watching the water at bottom of manhole for debris
 - When hose nozzle is almost back at the start manhole, reduce RPM and shut off rodder pump switch
 - Remove tiger tail and rest of hose
 - If cutter is needed to cut roots, utilize 4328 CCTV to place cutter exactly on the root
 - Use dry methods, such as sweeping, to clean up any sediment around the work site.
- Upon return to BCD

TITLE	Jet Truck Operations	Procedure #	TES-PWS-2013-06
		Page 4 of 4	

- Check water level at end of shift, tank must be topped off for stand-by crew
- Clean filters if scheduled, replace if needed
- Store Jet Truck inside 133 Quaker Lane building if temperature is close to freezing (overnight temperature is expected to be below 40 degrees Fahrenheit)

SECTION 6: JET TRUCK CLEANING TEAM REPORTING

Jet Truck Cleaning Team Report

6.1 Once the Jet Truck Cleaning Team returns to 2900 Business Center Drive, the Team supervisor must report the details of the response on the Jet Truck Cleaning Form. The Team supervisor will then record the details into Cityworks.

Items to be completed on Jet Truck Cleaning Report:

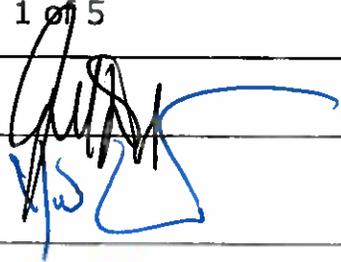
- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Equipment/ Vehicle
- Materials Used
- Assessment
- Responsibility
- Description (indicate materials used)
- Measurement (indicate amount of materials used)
- Comments (may be used to indicate additional information for reporting)
- Attach Before and After Pictures (if applicable)

SECTION 7: REFERENCE

- Safety and Personal Protective Equipment Specifications ([S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE](#))

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE	Pothole Patch Maintenance	
	Procedure #	TES-2013-05	
	Revision		Date
	Page	1 of 5	
ORIGINATOR Name / Title	Jeff DuVal / Division Chief, Maintenance	SIGNATURE	
APPROVED BY Name / Title	Yon Lambert / Deputy Director, T&ES Operations		

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Maintenance Division provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Maintenance Division coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for Maintenance Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Pothole Patch Repair Team serves to repair potholes in roadways that have been determined to pose a safety risk to motorists and pedestrians, or that compromise the integrity of roadway infrastructure in the City of Alexandria public Right of Way (ROW).

- Provides immediate Traffic Control to ensure roadway and pedestrian safety
- Determines and implements appropriate response
- Repairs / fills in pothole in roadway

1.2 The Pothole Patching Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Pothole Patching Maintenance Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory pothole patching equipment have been listed.
- d. Section 5: Pothole Repair Operation: Captures the efforts with standard procedure for responding to pothole patching maintenance.

TITLE	Pothole Patch Maintenance [DRAFT]	Procedure #	TES-2013-05
		Page 2 of 5	

- e. Section 6: Pothole Repair Maintenance Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

- 2.1 Pothole Repair Operations roles and responsibilities have been identified below:
- **Supervisor** is responsible processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in pothole patch repair and maintenance; maintain written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
 - **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

- 3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.
- 3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.
- 3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

- 3.1 Pothole Repair Team Equipment list has been identified below:
- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
 - **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

TITLE	Pothole Patch Maintenance [DRAFT]	Procedure #	TES-2013-05
		Page 3 of 5	

- **Traffic Control Devices:**
 - Minimum of six (6) Orange Cones
 - Directional Signs
 - Minimum of two (2) Flashlights
 - Information signs
 - Arrow boards
 - Flags

- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - UPM / Cold Patch Mix
 - Tamping tool
 - Buzz saw
 - Jackhammer
 - Air compressor

SECTION 5: POTHOLE REPAIR OPERATION

4.1 The Pothole Repair Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a Pothole Repair ticket is processed, the following is expected:

- Operator/Support is responsible for operating the Crew Cab (or other vehicle as needed)
- Immediately set up Traffic Control Devices
- Assess the location
- Determine and implement appropriate response by following Pothole and Pavement Rating System. The Pothole and Pavement Rating System is used to determine whether a pothole patch is necessary, as well as which method of repair to use, if a repair is required. Potholes and pavement defects are classified by the Superintendent, who uses the following factors to determine repair priority: size, depth, location in the street, potential for damage to vehicles and injuries to residents. Work order priority levels can be modified in Cityworks to track response efforts.
 - Priority 1 poses a significant and imminent threat to vehicular and pedestrian traffic, including personal safety and damage to property. This level of repair requires a minimum of 5 business days, weather permitting.
 - Priority 2 poses a moderate threat to vehicular and pedestrian traffic, including personal safety and damage to property. This level of repair requires a minimum of 7-10 business days, weather permitting.

TITLE	Pothole Patch Maintenance [DRAFT]	Procedure #	TES-2013-05
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- Priority 3 poses a minimal threat to vehicular and pedestrian traffic, including personal safety and damage to property. This level of repair requires a minimum of 7-10 business days, weather permitting.
- The Supervisor will determine the appropriate Technique to use to patch potholes
 - Cold Mix Patching Technique (Non-summer months / cold weather)
 - Clean the pothole of any loose debris and standing water
 - Install cold mix to pothole and tamp material into pothole so it is even with the existing surface of the road.
 - If using Aquaphalt Material, place material in hole and level with a rake or shovel. Ensure that the material stands above the existing surface to allow for compaction. If the depth of the area to be patched is greater than 2.5 inches, place material in two layers. Soak material evenly with water; 1 quart of water per container is recommended. Excess water will not damage the material. Compact to a smooth finish with a hand-tamper or roller.



- Hot Mix Patching Technique (Summer months)
 - Saw cut the pothole with saw or square cut the pothole with a jackhammer if the street is in good or fair condition. Cutting and squaring potholes is only done on an as needed basis. If the street is in poor condition remove loose debris, apply tack to pothole and fill with hot mix and tamp material into pothole so it is even with the existing surface of the road.
 - Spray hole with tack oil
 - Place hot mix in pothole in 2-3 inch layers
 - Compact hot mix material into hole with tamping device until material is level with road surface
- Clean work site of loose debris and return to operational status

TITLE	Pothole Patch Maintenance [DRAFT]	Procedure #	TES-2013-05
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SECTION 6: POTHOLE PATCH REPAIR TEAM REPORTING

Pothole Patch Repair Team Report

5.1 Once the Pothole Patch Repair Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

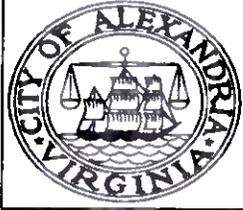
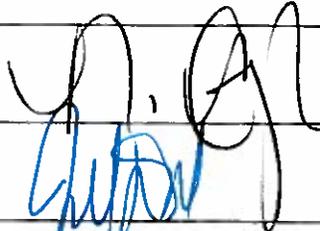
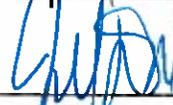
- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

SECTION 7: REFERENCE

7.1 Personal Protective Equipment Specifications and Vendors
(S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE	Snow Operations CDL/Non-CDL Operators	
	Procedure #	TES-2013-11	
	Revision		Date
	Page	1 of 7	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6.30.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services (PWS) Division provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Snow Response Operator Team serves in snow response efforts in the City of Alexandria to keep roadways clear and safe for motorist and pedestrian travel. This task is completed by:

- Coordinating efforts with partnering agencies and forecasters in order to calculate a successful snow response effort
- Responding when a snow emergency is put into effect
- Pretreat city streets with brine when conditions warrant application
- Maintain vehicles in a safe operating capacity for the duration of a snow event
- Apply Deicing and Snow Treatment material to roads during a snow event
- Clear Snow Emergency Routes and Zones identified by the City

1.2 The Snow Response Operator Team includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of the Snow Response Operator Team during a snow event.
- b. Section 3: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory equipment, have been listed.

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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- c. Section 4: Snow Response Operator Team Operation: Captures the efforts with standard procedure for responding during a snow event.
- d. Section 5: Snow Response Operator Team Plow Procedures: Encompasses procedures for effective snow plow operation.
- e. Section 6: Snow Response Operator Team Report: Contains information to be reported at the end of a snow shift.
- f. Section 7: Reference Materials
- g. Section 8: Document Changes

1.3 The Brine System and Application for Pretreatment of Roadways with will be covered under a separate SOP. (Note that deicing agents must not contain urea or other forms of nitrogen or phosphorus.)

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Snow Response Operator Team roles and responsibilities have been identified below:

- **CDL Driver** is responsible for safely driving vehicles that require a valid Commercial Driver's License.
- **Operator** is responsible for clearing road and applying deicing and snow treatment material using small utility based vehicles such as Ford F-450 utility body trucks.

SECTION 3: EQUIPMENT LIST

3.1 Snow Response Operator Team equipment list has been identified below:

- **Personal Protective Equipment (PPE): Refer to PPE Matrix**
 - Safety Vest
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear (ANSI Z87 with side shields)
 - Protective Hearing Equipment (HPD with minimum 20 dB NRR)
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Snow Zone Maps
 - Pick
 - Shovel
 - Broom
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Radio
 - Salt/Deicing Material
- **Vehicles**
 - 10-wheel dump truck

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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- 6-wheel dump truck
- Utility Vehicle (F-450 with snowplow and spreader)
- Loader

SECTION 4: SNOW RESPONSE OPERATOR TEAM OPERATION

4.1 Snow Response Team Laborer responses occur when forecasters believe that there is a sufficient probability of a snow emergency occurring, regardless of time or day of week.

When a Snow Event is activated, the following is expected:

- The Team must report safely to the muster room
- Upon arrival, the Team will receive
 - Weather briefing
 - Equipment assignment
 - Special instructions as needed
- Team Member will inspect vehicles
 - CDL drivers are to complete a CDL vehicle inspection form
 - Non-CDL drivers are to complete Vehicle Check Sheet, then assist CDL drivers with CDL vehicle inspection if needed
 - Wash or clean out frozen loads from conveyor belts or salt spreaders
- Before leaving yard
 - Enter data for the starting mileage and hour meter for each vehicle
 - Check vehicle for operational condition, to include lights, fuel and leaks; and use drip pans for leaking equipment or vehicles
 - Give white copy of vehicle check sheet to Supervisor
 - Conduct radio check with Supervisor
 - Attach any relevant documents to clipboard so they do not become a distraction during the snow shift
- Radio procedures
 - Perform Radio Check with Supervisor upon leaving
 - Snow Command will provide weather updates on the hour or more frequently if needed
 - Call in only two (2) routes at a time to reduce the confusion with Snow Command
 - Be sure to report to Snow Command at least once an hour. Failure to do so will be reported to the Supervisor or Office Assistant for follow-up
 - Keep radio channels clear of irrelevant discussions. The possibility may arise where drivers encounter an emergency situation and radio channels need to be kept clear in the event that this happens
 - If you encounter an emergency, announce over radio "I have an emergency." When this is heard over the radio, all other operators must cease communications so the Operator with an emergency can speak clearly with Command.
- Safety procedures while on roadways

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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- Follow proper winter driving techniques: Drive slow, keep a safe distance between vehicles, avoid situations where you may have to use large driver inputs (i.e. sudden braking or hard turns)
- Be aware of where the snow you plow is going, as to avoid damage to people and property
- Always exercise caution
- If you need to use the phone, pull over to the side and use the proper radio code (10/7 or 10/8)
- **NO TEXTING WHILE DRIVING.** If you are involved in an accident while texting or using the phone, you can be held liable
- If you become stuck
 - Remain calm and declare to Command that you have an emergency
 - Describe to your Supervisor what your situation is
 - Turn your vehicle lights off and put your 4-way flashers on
 - Do not dig the tires in and try to get out, this will make the situation worse
 - Keep the plow down in order to help prevent vehicle from tipping
- If you encounter a stranded motorist
 - Check if they need assistance. If they do, inform command.
 - Command will be able to dispatch the proper help to the motorist.
 - Do not attempt to get the vehicle unstuck, and do not allow the motorist to ride in your vehicle with you
- At the end of the shift
 - Clear out truck cabin for next operator
 - Inform Supervisor of any equipment problems / concerns
 - Retrieve and complete Salt Usage check sheet from Supervisor to track all salt loaded during shift

SECTION 5: SNOW RESPONSE PLOW PROCEDURE

5.1 During a Snow Event, safe and effective removal of snow is vital in snow operations. Below is a detailed outline of procedures for snow removal.

Procedures for clearing streets are as follows:

- When plowing city streets, single lane and multi-lane
 - Begin clearing the center first and work your way towards the curb
 - Be cautious of parked cars and other objects obstructing the roadway even on snow emergency routes
 - Be cautious of where the snow you are plowing is going and that it does not endanger anyone or cause damage and injury
- Roads with medians and turn lanes
 - Begin in center, feel for the curb then back away slightly
 - Follow the median
 - Plow the turn lane on your first pass. If there is a backup truck, have the backup plow address the turn lanes
 - Lay extra salt in the turn lane
- Roads with 'suicide lanes' or optional-left turn lanes

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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- As a standard, begin in the outside and work your way out while plowing
- Lay extra salt in the center lanes
- Be mindful that you are in a turn lane, oncoming traffic might not understand what you are doing and attempt to turn in front of you
- Multi-lane road with head wall
 - Start plowing from the head wall to the Berm
 - Keep in mind of the similarity of plowing from the center of the road first
 - If this is not executed properly, snow might create a ramp which would allow a vehicle sliding to jump over the wall and into oncoming traffic
- Intersections
 - Start with a center lane
 - Be cautious of medians
 - Lay extra salt before and after intersection
- Hills
 - Proceed with caution, these are areas with very low traction
 - Gear the transmission down
 - Apply salt heavily
 - Call Supervisor if help is needed
- Curves
 - Pay close attention to speed
 - Be aware of the berm and overhanging tree limbs
 - If you cannot see around the corner, drive as if there is a car in the other lane and proceed with caution
- Heavy traffic roads
 - Be sure to put salt down before rush hour so the heavy flow of traffic can spread the salt application across the roadway
 - Be cautious of sudden stops
 - Keep your plow down at all times, even when heading back to depot
- Obstructions
 - Examples of common obstructions can be mailboxes, telephone poles, and other equipment that is typically found close to the road
 - Make note of pedestrian islands and others obstructions close to the roadway when you are making dry runs so that you will become familiar with the locations during an active snow event
 - If you damage public or private property, record the address and give this information to your supervisor
- Bridges
 - Know the clearance for your truck, including the light bar on the top of the truck
 - When plowing on bridges that have no traffic below, angle the plow toward the berm. Feel for the curb to contact with the side of the plow, then back away slightly
 - When plowing on bridges that have traffic below, do not angle the plow towards the berm. Straight blade the snow off the bridge deck.

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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Once the bridge deck is complete, angle your blade back towards the berm and continue plowing.

- **Night Plowing**
 - Because of the lower temperatures, the salt will not be as effective as it would be during the day. However, you must keep applying salt so as the temperatures warms during the day it will begin to melt the snow.
 - Use this opportunity to access areas that would otherwise be congested with traffic during the day
- **Snow Glare**
 - When plowing during the day, lower your visors to help deflect sun light
 - Keep windshield clean and wiper fluid reservoir full
 - Wear sun glasses if needed
- **Ice**
 - In icy conditions, or when you suspect that black ice is present:
 - Do not slam on brakes
 - Do not make sudden changes in speed or direction
 - Ease off the accelerator and steer into the direction that you are skidding. This will help to keep the vehicle stable when attempting to regain traction
 - Ice storms can be especially hazardous. They have the capability of downing power lines and branches
 - If a low power line or branch falls on your truck, contact the Snow Command immediately for action steps
- **Low Visibility**
 - Keep your light on low beams. If you turn your high beams on, it is possible that you will temporarily blind other drivers
 - Reduce your speed to increase your reaction time
- **Piling and Storage of Snow**
 - Avoid plowing, pushing, blowing or storing excess snow and street debris in front of storm drain inlets
 - Do not dispose of snow in wetlands, storm water BMPs, ditches with open water, or on top of storm drains
 - Store snow on gravel or grass where snow can melt and infiltrate
- **Salt / Deicing Materials**
 - Applied following plowing operations during prolonged snow events.
 - Take precaution to avoid overloading the application equipment and vehicles.

SECTION 6: SNOW RESPONSE OPERATOR TEAM REPORT

6.1 Once the Snow Response Operator Team returns to 2900 Business Center Drive upon completion of assigned tasks, the details of their shift and salt usage check must be reported. The details of their shift will be entered into Cityworks upon the return to BCD.

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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Items to be completed on Snow Emergency Operator Report Form:

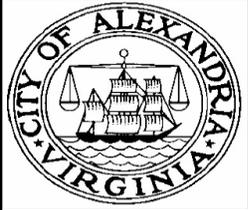
- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Equipment/Vehicle
- Materials Used
- Measurement (indicate amount of materials used)
- Comments (may be used to indicate additional information for reporting)

SECTION 7: REFERENCE

- Safety and Personal Protective Equipment Specifications ([S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE](#))
- Master Snow Plow ([S:\maint\FILES\SNOW REMOVAL](#))

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)			
	TITLE	Bulk Material Storage		
	Purpose	Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015
	Page	1 of 3		
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City’s numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails, open spaces areas)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City’s walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City’s Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on the proper storage procedures for bulk materials.

1.2 The Bulk Material Storage SOP includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Bulk Material Storage.

TITLE	Bulk Material Storage SOP	Purpose	Stormwater Pollution Prevention
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- b. Section 3: Bulk Material Storage: Identifies the appropriate process for Sand, Salt, Dirt, or Gravel, and Liquid Storage.
- c. Section 4: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- d. Section 5: Reference Materials
- e. Section 6: Record of Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Bulk Material Storage Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: BULK MATERIAL STORAGE

- **Sand, Salt, Dirt, or Gravel**
 - Store piles under a roof, inside a building, or covered with a tarp.
 - Store piles on a flat, impervious surface.
 - Contain stormwater run-on and runoff with barriers or berms.
 - Clean-up "track out" using dry cleaning methods, such as brooms.
 - Never dispose of wash water from sand/salt trucks into storm drains.
- **Liquid**
 - Provide secondary containment for all above-ground storage tanks (ASTs). Secondary containment can include double-walled tanks, or impervious containment outside of the tank that can contain the entire contents of the largest tank plus an additional 4 inches of rainfall.
 - Properly dispose of liquid that is drained from secondary containment for ASTs.
 - Have a spill kit available in case of a spill, leak, or accidental discharge. Immediately clean all spills, leaks, or accidental discharges.

SECTION 4: TRAINING AND DOCUMENTATION

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
 - Employees who handle bulk materials should be trained on the safest way to store the materials.
- **Record Keeping and Documentation**
 - Maintain a record of all employees trained and training topics.
 - Maintain an inventory of bulk materials storage amounts and locations.

SECTION 5: REFERENCES

- Operation and Maintenance Plan for Port of Skagit, Washington
[\(\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for](\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for)

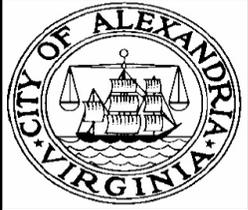
TITLE	Bulk Material Storage SOP	Purpose	Stormwater Pollution Prevention
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[Daily Operations\Resources\PortofSkagitOPERATIONmMAINTENANCEplanupdated.pdf](#))

- Guidelines and Standard Operating Procedures: Illicit Discharge Detention and Elimination and Pollution Prevention/Good Housekeeping for Stormwater Phase II Communities in New Hampshire ([\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\NH IDDE SOP.pdf](#))

SECTION 6: RECORD OF DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

	Standard Operating Procedures (SOP)		
	TITLE		Equipment Maintenance
	Purpose		Stormwater Pollution Prevention
	Revision	Initial	Date June 4, 2015
	Page		1 of 3
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE	
Location of SOP:	2900 Business Center Drive, Alexandria, VA		

I. Purpose

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City's numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City's walkways and overpasses.

This SOP provides pollution prevention and good housekeeping written procedures for daily activities related to Fleet and Vehicle Maintenance to address the applicable Municipal Separate Storm Sewer System (MS4) General Permit requirement in Section II B. 6 a.

II. Roles and Responsibilities

The Equipment Maintenance Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

III. Process

- Conduct maintenance work indoors to the greatest extent possible.
- When maintenance work is conducted outdoors, use an impervious surface and protect storm drains from spills and leaks.
- Clean up any spills or leaks promptly using dry methods, such as adsorbent pads or sweeping.
- Do not clean any vehicles or equipment, including lawn care equipment, near a storm drain. Use designated wash racks that drain to sanitary sewers to wash vehicles and equipment.

TITLE	Equipment Maintenance SOP	Purpose	Stormwater Pollution Prevention
			Page 2 of 3

- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Use drip pans for vehicles that are stored outside.
- Do not leave drip pans outside during rain. Properly dispose of any liquid that collects in drip pans. Do not dispose of liquid in storm drains.
- Never leave vehicles/equipment unattended while fueling.

IV. Training and Documentation

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Documentation**
 - Maintain a record of all employees trained and training topics.
 - Maintain documentation of maintenance and inspection activity.

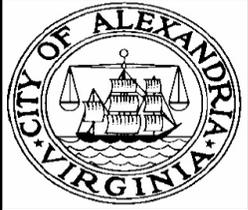
V. References

- Pollution Prevention/Good Housekeeping for Municipal Operations: Standard Operating Procedures for Erie County Department of Environment and Planning Division of Environmental Compliance Services
[\(\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\StwtrPPGH_SOP.pdf\)](\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\StwtrPPGH_SOP.pdf)
- Fleet and Vehicle Maintenance Standard Operating Procedure for City of Boulder, Colorado
[\(\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\fleetvehicle_maint_sops.pdf\)](\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\fleetvehicle_maint_sops.pdf)
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program
[\(\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf\)](\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf)

TITLE	Equipment Maintenance SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

VI. Record of Changes

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

	Standard Operating Procedures (SOP)			
	TITLE	Fleet and Vehicle Washing		
	Purpose	Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015
	Page	1 of 3		
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

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Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City’s walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City’s Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on the proper washing procedures for fleet and vehicle washing.

1.2 The Fleet and Vehicle Washing SOP includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Fleet and Vehicle Washing.

TITLE	Fleet and Vehicle Washing SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 3	

- b. Section 3: Fleet and Vehicle Washing: Identifies the appropriate process for fleet and vehicle washing.
- c. Section 4: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- d. Section 5: Reference Materials
- e. Section 6: Record of Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 The Fleet and Vehicle Washing Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: FLEET AND VEHICLE WASHING

- Wash water is prohibited from entering the storm sewer system.
- Do not clean or wash vehicles or equipment, including lawn care equipment, near a storm drain. If washing vehicles outdoors, use designated wash racks that drain to sanitary sewers to wash vehicles and equipment or use a system that contains wash water and properly dispose of it.
- Minimize soap and water use when washing vehicles.
- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned using brooms on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Keep vehicles and other equipment clean, and do not allow a build-up of oil or grease.

Vehicles and equipment may be cleaned used one of the following methods that prevent wash water from entering the storm sewer system:

- **Washrack**
 - When using the dedicated washrack at 133 Quaker Lane, ensure that the grate inlet at the washrack is draining to the sanitary sewer by engaging valve that switches from the storm sewer to the sanitary sewer.
 - When done using the washrack, ensure the valve to the sanitary sewer has been disengaged and that the drain is now draining to the storm sewer.
- **Contain / Capture Wash Water**
 - When using a system that contains all wash water, such as blocking storm drains or using a wash kit, adsorbent boom, or berm, collect and dispose of all wash water in the sanitary sewer.
 - Follow the manufacturers' directions for all proprietary systems and kits that capture wash water ("Read the Label").
 - Do not dispose of any wash water in the storm sewer or on grassed areas.

TITLE	Fleet and Vehicle Washing SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

- Clean wash equipment on grassed surfaces or in areas that drain directly to the sanitary sewer.
- **Car Wash Vendor**
 - Wash vehicles at the commercial car wash facility under contract with the City.

SECTION 4: TRAINING AND DOCUMENTATION

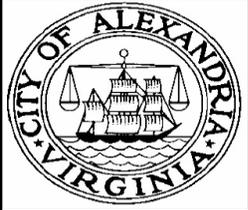
- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Record Keeping and Documentation**
 - Maintain a record of all employees trained and training topics.
 - Maintain an inventory of fleet vehicles.

SECTION 5: REFERENCES

- Standard Operating Procedures for Weber County Storm Water Coalition (<\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Weber County.pdf>)
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program (<\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf>)
- Vehicle Wash Compliance for City of Alexandria Fire Department (<\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Fire Dept\GO 13-030 Vehicle Wash Compliance 8-7-13.pdf>)
Vehicle Wash Compliance Certification Form for Prohibition of Municipal Vehicle Washwater Discharge to Storm Drain System, City of Alexandria (<\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Vehicle Wash Compliance Certification Form Final 07.01.2013.docx>)

SECTION 6: RECORD OF DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)			
	TITLE	Garbage Storage		
	Purpose	Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015
	Page	1 of 3		
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City’s numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City’s walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City’s Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on the proper storage procedures for garbage.

1.2 The Bulk Material Storage SOP includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Garbage Storage.

TITLE	Garbage Storage SOP	Purpose	Stormwater Pollution Prevention
			Page 2 of 3

- b. Section 3: Garbage Storage: Identifies the appropriate process for Garbage Storage.
- c. Section 4: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- d. Section 5: Reference Materials
- e. Section 6: Record of Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Garbage Storage Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: GARBAGE STORAGE

- Cover dumpsters located outside.
- Place dumpsters and trash cans on a flat, impervious surface that does not drain directly to a storm drain.
- Locate dumpsters and trash cans in convenient, easily observable areas.
- Regularly inspect trash cans and dumpsters for leaks. Repair immediately if any are found.
- Never dispose of wash water from dumpsters or trash cans into storm drains.
- Do not put hazardous materials or oils in dumpsters or trash cans.

SECTION 4: TRAINING AND DOCUMENTATION

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Record Keeping and Documentation**
 - Maintain a record of all employees trained and training topics.

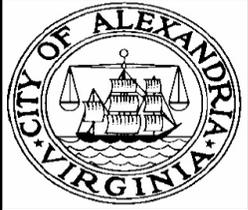
SECTION 5: REFERENCES

- Operation and Maintenance Plan for Port of Skagit, Washington
(<\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\PortofSkagitOPERATIONmAINTEANCEplanupdated.pdf>)
- Guidelines and Standard Operating Procedures: Illicit Discharge Detention and Elimination and Pollution Prevention/Good Housekeeping for Stormwater Phase II Communities in New Hampshire
(<\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\NH IDDE SOP.pdf>)

TITLE	Garbage Storage SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

SECTION 6: RECORD OF DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)			
	TITLE	Pesticide, Herbicide, and Fertilizer Application		
	Purpose	Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015
	Page	1 of 4		
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City’s numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City’s walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City’s Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on the proper handling, mixing, application, clean-up, and storage procedures for pesticides, herbicides, and fertilizers (landscape chemicals).

1.2 The Pesticide, Herbicide, and Fertilizer Application SOP include the following elements:

TITLE	Pesticide, Herbicide, and Fertilizer Application SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 4	

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Pesticide, Herbicide, and Fertilizer Application.
- b. Section 3: Preparation: Identifies the appropriate preparation for Pesticide, Herbicide, and Fertilizer Application.
- c. Section 4: Equipment List: Includes a list of mandatory equipment that is needed for Personal Protective Equipment (PPE), Identification and Security, and Tools.
- d. Section 5: Process: Identifies the appropriate process for Pesticide, Herbicide, and Fertilizer Application.
- e. Section 6: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- f. Section 7: Reference Materials
- g. Section 8: Record of Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Pesticide, Herbicide, and Fertilizer Application Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: PREPARATION

- Always follow the manufacturers' recommendations for use of pesticide, herbicide, and fertilizer ("Read the Label").
- Fertilizer applications must be based on recommendations in the Nutrient Management Plan if applicable, and/or Virginia Nutrient Management Standards and Criteria (latest) to avoid economic costs and environmental impacts associated with excess fertilizer use.
- Use herbicides and pesticides only if there is an actual pest problem.
- Do not apply pesticides, herbicides, or fertilizers if rain is expected within a 24-hour period.
- Only apply pesticides, herbicides, or fertilizers if wind speeds are low (less than 5 mph).
- Have a spill kit available in case of a spill.

SECTION 4: EQUIPMENT LIST

4.1 equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Government Issued Work Boots
 - Rubber gloves
 - Protective Eyewear
 - Hand Sanitizer
- **Identification and Security**
 - Government Issue Identification (ID) Badge
- **Tools**

TITLE	Pesticide, Herbicide, and Fertilizer Application SOP	Purpose	Stormwater Pollution Prevention
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- ANSI approved sprayers
- Plastic pallets and pails for secondary containment
- Spill kit
- Absorbent pads
- Broom
- Dust pan
- Manufacturers' instructions for use and disposal of materials
- MSDS sheets for all chemicals
- Emergency Fire and Police Contacts
- City Risk Management Handouts

SECTION 5: PROCESS

When pesticide, herbicide, and/or fertilizer are applied the following is expected:

- **Mixing**
 - Always follow the manufacturers' recommendations for mixing of pesticide, herbicide, and fertilizer ("Read the Label").
 - Do not mix, prepare, transfer, or pour landscape chemicals outdoors or near or in storm drains. Use a protected area with impervious secondary containment, preferably indoors, to mix, prepare, transfer, and pour landscape chemicals.
- **Application**
 - Always follow the manufacturers' recommendations for application of pesticide, herbicide, and fertilizer ("Read the Label").
 - Only apply the recommended amounts of the landscape chemicals.
 - Do not overspray the landscape chemicals onto an impervious surface, such as a sidewalk or driveway.
 - Do not apply landscape chemicals to frozen ground.
 - Do not overwater areas recently treated with landscape chemicals to minimize the amount of runoff into storm drains.
- **Clean-Up**
 - Always follow the manufacturers' recommendations for clean-up and disposal of pesticide, herbicide, and fertilizer ("Read the Label").
 - Clean up any spills or leaks promptly using dry methods, such as sweeping.
 - Triple rinse pesticide and herbicide containers and use the rinse water as product or as dilution for the next batch.
 - Recycle or dispose of all spent or excess landscape chemicals properly and promptly.
 - Dispose of any excess, unused, expired, or waste pesticide, herbicide, and/or fertilizer as hazardous waste.
 - Keep application equipment clean; do not allow a buildup of chemicals.
 -
- **Storage**
 - Always follow the manufacturers' recommendations for storage of pesticide, herbicide, and fertilizer ("Read the Label").

TITLE	Pesticide, Herbicide, and Fertilizer Application SOP	Purpose	Stormwater Pollution Prevention
		Page 4 of 4	

- All pesticide and herbicide storage should be kept to a minimum. Any pesticides that are stored should be stored in secured area, preferably indoors so that spills and leaks will not contact soils.
- All containers must be clearly and correctly labeled.

SECTION 6: TRAINING AND DOCUMENTATION

- **Training**

- The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- Employees who handle pesticides should be trained on the safest way to mix, apply, store, and handle the chemicals.

- **Record Keeping and Documentation**

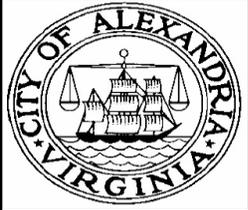
- Maintain a record of all employees trained and training topics.
- Maintain an inventory of pesticide, herbicide, and/or fertilizer application activities.
- Maintain an inventory of pesticide, herbicide, and/or fertilizer expiration dates.

SECTION 7: REFERENCES

- Fertilizer, Herbicide, and Pesticide Application Standard Operating Procedure for City of Westminster, Colorado
[\(\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\fertilizer application Westminster.pdf\)](http://Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\fertilizer application Westminster.pdf)
- Fertilizer, Herbicide, and Pesticide Application Standard Operating Procedure for City of Boulder, Colorado
[\(\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\01638 BoulderColoradoChemical.pdf\)](http://Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\01638 BoulderColoradoChemical.pdf)
- Chemical Application Pesticides, Herbicides, Fertilizers (Parks and Recreation) Standard Operating Procedure for Sandy City, Utah
[\(\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Storm Water 2011.pdf\)](http://Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Storm Water 2011.pdf)

SECTION 8: RECORD OF DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)			
	TITLE	Snow Operations		
	Purpose	Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015
	Page	1 of 3		
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City’s numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City’s walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City’s Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on pollution prevention and good housekeeping procedures associated with snow removal.

1.2 The Snow Operations SOP includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each team member during snow operations.

TITLE	Snow Operations SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 3	

- b. Section 3: Snow Operations: Identifies the appropriate process for pollution prevention and good housekeeping for snow operations.
- c. Section 4: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- d. Section 5: Reference Materials
- e. Section 6: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Snow Response Operator Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: SNOW OPERATIONS

- Inspect vehicles and equipment
 - Check vehicle for operational condition, to include lights, fuel and leaks; and use drip pans for leaking equipment or vehicles
- Piling and Storage of Snow
 - Avoid plowing, pushing, blowing or storing excess snow and street debris in front of storm drain inlets
 - Do not dispose of snow in wetlands, stormwater BMPs, ditches with open water, or on top of storm drains
 - Store snow on gravel or grass where snow can melt and infiltrate
- Salt / Deicing Materials
 - Take precaution to avoid overloading the application equipment and vehicles

SECTION 4: TRAINING AND DOCUMENTATION

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Record Keeping and Documentation**
 - Maintain a record of all employees trained and training topics.

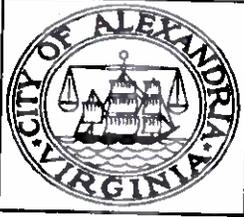
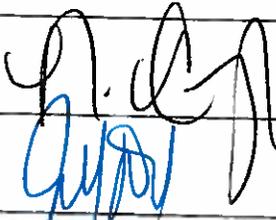
SECTION 7: REFERENCE

- Safety and Personal Protective Equipment Specifications (<S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE>)
- Master Snow Plow (<S:\maint\FILES\SNOW REMOVAL>)

TITLE	Snow Operations SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE	Vehicle and Equipment Washing (Resource Recovery)	
	Procedure #	TES-RR-2015-22	
	Revision		Date
	Page	1 of 5	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6.30.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Resource Recovery (RR) Division is responsible for refuse and recycling collection, street sweeping, and curbside recycling programs. The Resource Recovery (RR) Division provides comprehensive, cost-effective solid waste management to residents and businesses in an environmentally sound manner, while incorporating state-of-the-art methods and technology, and educating the public on responsible resource management. The RR Division coordinates with other City agencies and other divisions within T&ES to respond during weather events and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the RR Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operating procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The purpose of this procedure is to provide operational best management practices (BMPs) to control pollutant discharges by promoting a conscious effort when washing City vehicles and equipment to reduce the amount of sediment, antifreeze, heavy metals, oil and other materials that may runoff from the wash rack. Uncontrolled washing activities have a potential to produce a high concentration of pollutants in runoff wash water to the storm water system. These procedures are critical steps that must be included in every vehicle washing activity at the 133 South Quaker Lane wash rack.

1.2 Vehicle and Equipment Washing include the following elements:

- a. Section 2: Equipment List: Personal Protective Equipment (PPE) and mandatory equipment have been listed.
- b. Section 4: Refuse Container Management Process: Captures the efforts and description with standard procedure for vehicle and equipment washing.
- c. Section 5: Pollution Prevention
- d. Section 6: Training and Documentation
- e. Section 7: Reference Materials
- f. Section 8: Document Changes

TITLE	Vehicle and Equipment Washing (Refuse Recovery)	Procedure#	TES-2015-22
		Page 2 of 5	

SECTION 3: EQUIPMENT LIST

3.1 The Vehicle and Equipment Washing equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Work Boots
 - Protective Eyewear (ANSI Z87 with side shields)
- **Vehicle Washing Equipment:**
 - Biodegradable/ Phosphate free Detergents
 - Pump Sprayer
 - Vehicle Wash Brush
 - Automotive Degreaser
 - City Vehicle Wash Rack
- **Identification and Security:**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

SECTION 4: VEHICLE AND EQUIPMENT WASHING PROCESS

4.1 State and Federal regulations require local ordinances to prohibit unauthorized discharges to the storm drainage system and local water ways. One of the most common "prohibited discharges" is wastewater from commercial vehicle washing. The City of Alexandria takes every precautionary measure to ensure no runoff enters the storm drainage systems.

4.2 All vehicles and equipment must be washed in a designated area, located in the rear of 133 S. Quaker Lane. Vehicle washing is conducted twice a month on bi-weekly Mondays (weather permitting). To begin the process, the Superintendent of the Public Works Services (PWS) Sewer Section, must be notified in order to change the sewer drain from *storm* to *sanitary* prior to vehicle washing.

- **Vehicle/Equipment Prewash**
 - Using the pre-wash degreasing agent, starting with the lower portion working upwards, mist the degreaser onto the vehicle. Allow the product to dwell on the vehicle (usually 30 seconds – 5 minutes) as it works to break up and loosen any contaminants from the vehicle.
 - Choose a wash media (sponge or mitt) to use and soak it in clean water for a few seconds. Working in small areas, wipe the area you are degreasing with the wash media, using as little pressure as possible. Be sure to repeat these steps until each area of the vehicle has been agitated with the wash media and water.
- **Interior Trim**
 - Empty vehicle of all debris, trash and recyclables and take out any floor mats and lay them aside.

TITLE	Vehicle and Equipment Washing (Refuse Recovery)	Procedure#	TES-2015-22
		Page 3 of 5	

- Vacuum the floorboards, under the seats, around the pedals, the upholstery, rear deck, and top of the dashboard. Be sure to use any brush attachments and crevice tools available to get between and beside seats.
- Spray vinyl cleaner onto a cloth and wipe methodically over the vinyl surfaces in the vehicle and buff the surfaces with a clean, soft cloth.
- Spray window cleaner on a cloth or paper towel and methodically clean the windows.
- Traditional Power Wash Cleaning
 - Pour roughly an ounce (or as directed on the bottle) of shampoo into the pump sprayer. Spray the bucket with water to generate some lather and suds.
 - Take the vehicle wash brush, starting from the top of your vehicle, gently guide your brush across a section of the vehicle, using little to no added pressure. Be sure to repeat these steps until your entire vehicle has been washed.
 - All vehicles are to be air dried after wash. After wash is complete, the sewer drain must then be switched back to storm from sanitary.
- Cleaning Truck Hopper
 - Lock Out/Tag Out – *Lockout* is the isolation of energy from any system (a machine, equipment, or process) which physically locks the system in a safe mode. *Tagout* is a labelling process that is always used when lockout is required. The process of tagging out a system involves attaching or using an indicator that includes information on why the lockout is needed.
 - At this time the hopper is now ready to be cleaned. Follow the steps for *Vehicle/Equipment Prewash* followed by steps for *Traditional Power Wash Cleaning*.
- Wash Rack Clean-up
 - Once all vehicles have been washed thoroughly, all debris must be removed and the area is then power washed to remove all sediments.

SECTION 5: POLLUTION PREVENTION MEASURES

5.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

- Wash water is prohibited from entering the storm sewer system.
- Do not clean or wash vehicles or equipment, including lawn care equipment, near a storm drain. If washing vehicles outdoors, use designated wash racks that drain to sanitary sewers to wash vehicles and equipment or use a system that contains wash water and properly dispose of it.
- Use biodegradable, phosphate free soap when washing vehicles.
- Minimize soap and water use when washing vehicles.

TITLE	Vehicle and Equipment Washing (Refuse Recovery)	Procedure#	TES-2015-22
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- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned using brooms on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Keep vehicles and other equipment clean, and do not allow a build-up of oil or grease.

5.2 Vehicles and equipment may be cleaned using one of the following methods that prevent wash water from entering the storm sewer system:

- **Washrack**
 - When using the dedicated washrack at 133 Quaker Lane, ensure that the grate inlet at the washrack is draining to the sanitary sewer by engaging valve that switches from the storm sewer to the sanitary sewer.
 - When done using the washrack, ensure the valve to the sanitary sewer has been disengaged and that the drain is now draining to the storm sewer.
- **Contain / Capture Wash Water**
 - When using a system that contains all wash water, such as blocking storm drains or using a wash kit, adsorbent boom, or berm, collect and dispose of all wash water in the sanitary sewer.
 - Follow the manufacturers' directions for all proprietary systems and kits that capture wash water ("Read the Label").
 - Do not dispose of any wash water in the storm sewer or on grassed areas.
 - Clean wash equipment on grassed surfaces or in areas that drain directly to the sanitary sewer.
- **Car Wash Vendor**
 - Wash vehicles at the commercial car wash facility under contract with the City.

SECTION 6: TRAINING AND DOCUMENTATION

Training

- The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.

Documentation

- Maintain a record of all employees trained and training topics.

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SECTION 6: REFERENCE

- Standard Operating Procedures for Weber County Storm Water Coalition ([\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Weber County.pdf](#))
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program ([\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf](#))
- Vehicle Wash Compliance for City of Alexandria Fire Department ([\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Fire Dept\GO 13-030 Vehicle Wash Compliance 8-7-13.pdf](#))
- Vehicle Wash Compliance Certification Form for Prohibition of Municipal Vehicle Washwater Discharge to Storm Drain System, City of Alexandria ([\\Tes01\DeptFiles\Tes\envqly\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Vehicle Wash Compliance Certification Form Final 07.01.2013.docx](#))
- Safety and Personal Protective Equipment Specifications ([S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE](#))

SECTION 7: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA



Environmental
Sustainability
Management
System

City of Alexandria - RPCA

Verification	Originator	Revised	Approved	Issued
Initials Date	RHS 04/4/2014	RHS 03/12/2015	Core Team 03/13/2015	RPCA 03/16/2015

RPCA Standard Operating Procedures (SOP) for Invasive Species Control and Herbicide Use in the City of Alexandria

Description

This work shall consist of activities to control or eradicate invasive vegetation within a given project area. All project areas and work sites must be pre-approved by RPCA, Natural Resources Division.

Control areas typically include upland forested areas, woodland edges, tidal wetlands, emergent fringe wetlands, rip-rap side slopes, trails, medians, right-of-ways, and other sites. These efforts include the application of approved herbicides and may include hand extraction in combination with the herbicide application throughout the duration of the contract.

All work shall be performed in accordance with this specification, specific plans, and as directed by Natural Resources Division. Invasive vegetation control shall only include those species designated by Natural Resources Division.

Materials

All herbicides shall be EPA registered chemicals, including those that are approved for use in or adjacent to waterways where applicable, to control and prevent re-growth of undesirable vegetation. All herbicides proposed for use require prior approval by Natural Resources Division. Contractors shall select herbicides appropriate to the species being managed and shall submit the selection(s) to Natural Resources Division for written approval prior to the use of such chemicals. Manufacturer's specification sheets (labels) for herbicide, wetting agent, basal oil, and dyes shall also be submitted to Natural Resources Division. Also, a colorant shall be added to the herbicide in order to easily identify plants that have been treated.

In addition, where foliar application of a glyphosate herbicide is indicated, we require that Roundup or other glyphosate products formulated with reportedly environmentally damaging surfactants not be used,

but rather a 53.8% non-surfactant glyphosate herbicide (in the form of its isopropylamine salt), such as Rodeo, AquaNeat, Accord Concentrate, Foresters Non Selective, or comparable product, that is mixed with an environmentally safe surfactant such as Agri-Dex.

Procedures

Herbicide application is strictly regulated, and the Contractor must ensure that all regulations are followed. Application equipment, personal protective equipment, and application rates of the herbicide shall be in conformance with manufacturer's recommendations as shown on the product label and in accordance with federal and state pesticide application laws.

In addition, all tanks, backpack sprayers, hand sprayers, and containers holding herbicides shall have the contents visibly and legibly written and displayed on the container (product or trade name and active ingredients and percent).

- 1) **Pre-Application Meeting:** A pre-application meeting shall be scheduled prior to commencement of invasive plant control operations. Meeting shall include Natural Resource Division staff.
- 2) **Qualifications of Herbicide Operator:** The Contractor shall submit qualifications of key personnel who will be performing and/or supervising work on site, including a copy of the herbicide applicator's license. Only certified pesticide technicians and applicators are authorized to apply herbicides on City lands (except those in training under the direct supervision of certified applicators on-site).
- 3) **Notification:** The Contractor shall notify Natural Resources Division at least 48 hours prior to all herbicide applications.
- 4) **Flagging:** The areas planned for treatment shall be clearly flagged in the field and reviewed by Natural Resources Division Staff prior to commencement of treatment activities. The Contractor shall be prepared to discuss invasive species control and native plant preservation methodologies during this field review.
- 5) **Timing of Herbicide Application:** Herbicide applications shall only be applied during appropriate periods of the growing season, typically between May and October, or as approved by Natural Resources Division. Herbicide application shall only be conducted during appropriate weather conditions as indicated on the product label. The herbicide shall not be applied when it is raining or if rain is forecasted within 24 hours of the planned application. The wind speed cannot be greater than 10 mph at the time of application.
- 6) **Application Method:** Herbicide application shall be selective low volume treatments with a backpack sprayer, truck mounted spray rig with low volume pump and spray gun, squirt bottle, injection gun, paint brush, or other methods, as approved by Natural Resources Division. Broadcast

high volume applications will not be permitted, except in certain, pre-approved situations. The herbicide shall be applied with approved spraying apparatus directly to the target plant. Extreme caution shall be used when spraying adjacent to off-target, non-invasive vegetation or directly adjacent to any waterways/wetlands. Overspray of herbicide onto non-target plants shall be avoided to the greatest extent possible. The Contractor shall be responsible for any act of negligence in applying and handling of the herbicide on the project.

Operating motorized vehicles along any natural area trails, except for rare emergency situations, is prohibited, unless pre-approved by Natural Resources Division. This is highly damaging to fragile soils, vegetation, and wildlife, and creates an active disturbance mechanism for the spread of non-native invasive species.

Digging woody plants from wooded and riparian sites is not allowed, except in special, pre-approved cases, because it creates soil disturbance and causes an increase of non-native invasive species, damages native vegetation, de-stabilizes slopes and stream banks, and causes erosion. Instead, it is advised to saw down the targeted vegetation and immediately treat the fresh cut with the appropriate herbicide.

- 7) **Pre-Application Invasive Plant Eradication:** The Contractor shall conduct a field walk of the project area to identify the location and density of the invasive plant species to be managed. Once the Contractor has identified these areas and approved the locations and methods to be used, he will manage the invasive plants as here described.
- 8) **Upland slopes with dense stands of invasive plants:** Reduce growth layers and damage leaves with a string trimmer to improve herbicide uptake. Thoroughly wet all leaves with approved herbicides. Cut large stems or trunks and apply approved herbicides to cut surfaces immediately (within seconds) using a spray bottle or paint brush.
- 9) **Wetland fringe areas and upland slopes with individual plants or small patches of invasive plants:** Utilize spot treatment methods while being sure to minimize over spray onto surrounding desirable plants. Cut large stems and apply approved herbicides to cut surfaces immediately using a spray bottle or paint brush.
- 10) **Post-Application Invasive Plant Eradication:** Some contracts are negotiated to have the Contractor responsible for post-application management of invasive plants for a designated period of time after the completion of first-phase applications.
- 11) **Upland slopes:** Identify and flag individual plants and areas dominated by invasive plants. Spot treat individual invasive plants while being sure to minimize over spray onto surrounding desirable plants. Cut large stems and apply approved herbicides to cut surfaces immediately using a spray bottle or paint brush.

- 12) **Created wetland vegetation fringe along the stream:** Identify and flag individual plants and areas dominated by invasive plants. Spot treat individual invasive plants while being sure to minimize over spray onto surrounding desirable plants.
- 13) **Herbicide Handling:** The Contractor shall store, transport, and handle the herbicide in accordance with the manufacturer's recommendations. Materials shall be stored in the original container at a secured location. Any spills or leaks must be cleaned up immediately.
- 14) **Site Cleanup:** During the execution of invasive vegetation control measures, all areas shall be kept neat and clean and free of trash and debris. Final cleanup shall be the responsibility of the Contractor and shall consist of the removal of all trash and materials incidental to the project to an approved off-site disposal location.
- 15) **Replacement of Native Plants Damaged:** The Contractor shall be responsible for replacing (or suitable in-kind restitution) of any native plant material that is killed or damaged through any act of negligence by the Contractor in applying and handling of the herbicide on the project.
- 16) **Final Inspection:** The Contractor shall be responsible for correcting all deficiencies within seven (7) calendar days of inspection. Natural Resources Division and the Contractor shall perform a final inspection and any corrective actions at the close-out of the contract.

Measurement and Payment

The Invasive Species Control will be measured and paid for at the contract unit price of square yards of surface area of herbicide applied. Hand extraction prior to or following herbicide application will be considered part of the contract unit. Any additional work required to ensure invasive vegetation control during the duration of the contract, including hand pulling, will be measured on a per square yard basis. This work will only be undertaken as approved or directed by RPCA/Natural Resources Division, and price and payment will constitute full compensation for furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work.