City of Fairfax, Virginia

VSMP GENERAL PERMIT for
Small Municipal Separate Storm Sewer Systems
Permit # VAR040064

YEAR 3 ANNUAL REPORT
July 2015 -June 2016

Public Works - Stormwater
10455 Armstrong Street
Room 200
Fairfax, VA 22030

October 1, 2016

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I. BACKGROUND

In accordance with the requirements of Permit Number VAR040064, an annual report is hereby submitted for the City of Fairfax General Permit for Small Municipal Separate Storm Sewer Systems (MS4). A link to the MS4 Program Plan can be found at www.fairfaxva.gov on the Municipal Separate Storm Sewer System (MS4) webpage. A copy of the signed certification (VSMP General Permit Registration Statement) is attached in Appendix A. This Annual Report covers all information required by the permit as described in 9VAC25-890, but is not intended to describe all activities the City performed, programs the City implements, or plans the City has made or is making. In some cases, there are permit requirements that the City has not included in this annual report, but omissions of non-required information should not be taken as an indication that the City is not fulfilling those requirements.

a. City Name	City of Fairfax, Virginia
b. Permit Number	VAR040064
c. Reporting Period	Year 3: July 1, 2015 to June 30, 2016
d. Modifications of Roles and Responsibilities	There are no modifications to the City's roles and responsibilities during this permit term.
e. New outfalls	There have been no new MS4 outfalls added within the City during the third permit year.

II. SELF ASSESSMENT

The following section provides brief summaries of the status of the Permit Year 3 conditions for each of the six minimum control measures. Additional documentation can be found in the referenced appendices. An assessment of requirements for Permit Section I can be found in this report in Section VII.

Table 1 of the SMS4 General Permit lists one "Program Update Requirement" to be completed by 36 months after permit coverage (end of Year 3). The City's demonstration of compliance with this goal and each of the minimum control measures is described in the sections that follow.

Program Update Requirement (from Table 1 of SMS4 General Permit)	Permit Section	Compliance Demonstrated in Annual Report Section
Updated TMDL Action Plans (TMDLS approved before July of 2008) – (Special Conditions for Approved Total Maximum Daily Loads (TMDLs) Other Than Chesapeake Bay)	Section I B	Section II. g.

a. Minimum Control Measure #1 – Public Education and Outreach

The goals of this minimum control measure are to 1) increase the public's knowledge about steps that can be taken to reduce stormwater pollution, 2) increase the public's knowledge of hazards associated with illegal discharges including pertinent legal implications, and 3) implement strategies that target audiences most likely to have significant stormwater impacts.

i. Status of Compliance

BMP	Task	Permit Year Implement/ Complete	Measurable Goal/ Report Item	Comments
1A	Identify at least 3 high priority water quality issues that contribute to the discharge of stormwater	Year 1	Lists of education/ outreach activities for the high priority water quality issues, # of people reached	See Appendices B-1a and B-1b.
1B	Increase public education on reducing stormwater pollution	Year 1	Lists of education/ outreach activities related to stormwater pollution, # of people reached	The *Cityscene* newsletter, NVRC Survey, Sustainability in Fairfax City's Urban Forest Presentation. Links located on City's Website. Also see Appendices B-1a, B-1b, B-1c, and B-1d.

ii. BMP Appropriateness
The identified BMPs and activities associated with this minimum control measure are meeting the goals and are therefore appropriate methods of educating and involving the public.

iii. Progress towards Goal
There were no new update requirements specified for the third year of the permit under this Minimum Control Measure (see Table 1 of General Permit). All updates and requirements completed during the first year were continued during the third year where appropriate. The City continues to promote public education and involvement through both online newsletters and the City's website, www.fairfaxva.gov. Annually, the Only Rain NVRC Survey is conducted. This helps the City understand the public's views to better plan outreach activities, while simultaneously making residents aware of watershed pollution as the survey is conducted. *Cityscene* newsletters, published monthly by the City of Fairfax, contain articles regarding issues such as contractor debris, recycling, and leaf collection. The City's website is also an excellent educational resource. There, pages can be found addressing resident involvement in protecting water resources, energy saving tips for homeowners, as well as stormwater and stream information. MS4 permits submitted since 2009 are also available on the site. The Northern Virginia Clean Water Partners estimated the total public education and outreach program impressions (number of times an advertisement appeared on a computer, television, or mobile device screen) reached over 4.8 Million for the year. Education and outreach activities are documented in Appendices B-1a through B-1d. Appendix B-1a of this report contains the annual summary of activities conducted by the Northern Virginia Clean Water Partners. Appendix B-1b is the City of Fairfax Environmental Sustainability Committee's Annual Report. The annual NVRC Survey results are located in Appendix B-1c, and a presentation on Sustainability in Fairfax City's Urban Forest is available in Appendix B-1d.

b. Minimum Control Measure #2 – Public Involvement/Participation

The goals of this minimum control measure are to increase the public's involvement by the City promoting/sponsoring/etc. a minimum of four local activities annually. These activities are aimed at reducing pollutant loads and improving water quality while providing opportunities for local public participation.

i. Status of Compliance

BMP	Task	Permit Year Implement/ Complete	Measurable Goal/Report Item	Comments
2A	Provide Online Access to the MS4 Program Plan and Annual Reports	Year 1	Date of posted program, confirmation of formats available, verification of web link	http://www.fairfaxva.gov/government/public-works/stormwater-and-floodplain-management/ms4-permit

BMP	Task	Permit Year Implement/ Complete	Measurable Goal/Report Item	Comments
2B	Participate in Four Local Activities	Year 1	List of local activities in which the City has participated	1) City Environmental Sustainability Committee 2) Stream Spring Cleanup 3) Fall Festival 4) Member of the Northern Virginia Clean Water Partners 5) Northern Virginia Rain Barrel Program (flyer in Appendix B-2)

ii. BMP Appropriateness

The identified BMPs and activities associated with this minimum control measure are meeting the goals and are therefore appropriate methods of soliciting public involvement.

iii. Progress towards Goal

There were no new update requirements specified for the third year of the permit under this Minimum Control Measure (see Table 1 of General Permit). All updates and requirements completed during the first year were continued during the third year where appropriate. The City continues to encourage public participation. The City is a member of the Northern Virginia Clean Water Partners to prevent pollution and manage stormwater. The City has an Environmental Sustainability Committee, composed of nine people, that meets the first Wednesday of every month to help the City continue to move in a sustainable direction. A Stream Spring Cleanup, as well as a Fall Festival promoting environmental awareness, are held each year. The City's website outlines different BMPs required of private stormwater facilities as well as a Watershed Management Plan. The City participates in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) and has adopted the Chesapeake Bay ordinance. MS4 permits submitted since 2009 are also available on the City's website. One of the public participation activities, the Rain Barrel Workshop, is explained in Appendix B-2.

c. Minimum Control Measure #3 – Illicit Discharge Detection and Elimination

The goals of this minimum control measure are to locate and map all outfall or point of discharge locations, perform field screenings to determine and eliminate sources of illicit discharges, and to prohibit non-stormwater discharges by ordinance or other legal mechanisms.

i. Status of Compliance

BMP	Task	Permit Year Implement/ Complete	Measurable Goal/Report Item	Comments
3A	Maintain City Storm Sewer System Map	Year 1	Dates of storm sewer map updates and the current map	The City prepares system updates and GIS revisions
3B	Maintain MS4 Outfall Data Information Table	Year 4	Dates of MS4 Outfall Data Information Table updates and current data table	All City maintained outfalls were located during Year 1
3C	Conduct System Screening for Illicit Discharge Detection	Year 1	Total number of outfalls screened, screening results, and detail of any follow-up actions	50 outfalls were screened; pictures of each outfall screened are in Appendix B-3a. Potential illicit discharges were reported to the Fire Dept.; investigation summaries are completed on Spill Report forms, found in Appendix B-3c.
3D	Investigate and Address Illicit Discharges	Implement Revised Procedure in Year 2	Investigation summary of any suspected illicit discharges	An IDDE Field Investigation Form is in Appendix B-3b. In Year 3, Spill Reports were used for follow-up investigations; Spill Reports are located in Appendix B-3c
3E	Notify Downstream MS4 Operators of Any Physical Interconnections	Year 2	List of written notifications to applicable downstream MS4 operators	Notifications were sent to neighboring MS4s. Letters found in Appendix B-3d

ii. BMP Appropriateness

The identified BMPs and activities associated with this minimum control measure are meeting the goals and are therefore appropriate methods of preventing, detecting, and eliminating illicit discharges.

iii. Progress towards Goal

There were no new update requirements specified for the third year of the permit under this Minimum Control Measure (see Table 1 of General Permit). All updates and requirements completed during the first year were continued during the third year where appropriate. A Standard Operating Procedures document for illicit discharge screening procedures and an IDDE review were completed in accordance with the Year 1 requirements.

Citizens are told to report illicit discharges to the City of Fairfax Fire Marshall or the Police Department. Contact information can be found on the City's website on the

"Quick Reference Numbers" page (http://www.fairfaxva.gov/government/city-manager/quick-reference-numbers). A spill or release report is then completed and the problem is addressed. Completed spill reports are found in Appendix B-3c.

All City maintained outfalls were located during Year 1, and semi-annual screening is performed on all outfalls. Downstream MS4 operators have been notified if physical interconnections exist. Notification letters can be found in Appendix B-3d.

d. Minimum Control Measure #4 – Construction Site Stormwater Runoff

This minimum control measure addresses discharges from land disturbing activities by ordinance, published erosion and sediment control standards, site inspections, and other legal measures.

i. Status of Compliance

BMP	Task	Permit Year Implement/ Complete	Measurable Goal/Report Item	Comments
4A	Administer City E&S land disturbing permits	Year 1	# of land disturbing activities, # of acres disturbed, # of permits distributed	27 land disturbing activities, 8.3 acres disturbed. See reports in Appendix B-4b.
4B	City Construction Site Inspection	Year 1	# of E&S inspections and findings	52 E&S inspections were performed. 7 Notice to Comply and 2 Stop Work Orders were issued
4C	Provide Training for City Construction Site Inspection Staff	Year 1	Total # of staff members, # of staff members certified as E&S inspectors	4 staff members/ 4 E&S inspectors
4D	Ensure VSMP Permits are Issued for Projects Meeting State Established Thresholds	Year 1	# of grading permits approved, # of VSMP Permits issued	9 grading permits approved, 12 VSMP Permits issued

ii. BMP Appropriateness

The identified BMPs and activities associated with this minimum control measure are meeting the goals and are therefore appropriate methods of preventing discharge of pollutants in construction site runoff.

iii. Progress towards Goal

The City of Fairfax continues to provide the following forms for construction sites through the Department of Public Works:

- Inspection Reports,
- Warning Letter,
- Notice to Comply,
- Stop work Order,

- Ordinance Summons, and
- Violation Dismissed Notice.

Examples of the above documents can be found in Appendix B-4a. Land Disturbance Permits and BMP agreements are to be approved by the City. An approved grading permit list can be found in Appendix B-4b of this report and a BMP Maintenance agreement can be found in Appendix B-5d.

The City of Fairfax addresses post-construction runoff on new development over one acre, development that disturbs 2,500 square feet or greater, but less than one acre, located in a Chesapeake Bay Preservation Area, and new development with more stringent regulatory size thresholds by utilizing inspections and ordinances located in the City of Fairfax Year 1 Annual Report Appendix C-4 and C-5.

The City of Fairfax addresses required design criteria for stormwater runoff controls in accordance with appropriate water quality and quantity design criteria in Part II of 9VAC25-870, any additional applicable state and local design criteria at project initiation, and any department-approved standards and specifications by utilizing inspections located in the City of Fairfax Year 1 Annual Report Appendix C-4 and the Public Facilities Manual for the City of Fairfax (available online: http://www.fairfaxva.gov/government/public-works/public-facilities-manual).

The City of Fairfax addresses inspection, operation, and maintenance verification of stormwater management facilities not owned by the MS4 operator by requiring the owner to develop a recorded inspection schedule and maintenance agreement allowable under state or local law or other legal mechanism, implementing a schedule designed to inspect all privately owned stormwater management facilities that discharge into the MS4 at least once every five years, enforcing maintenance responsibilities if maintenance is neglected, and utilizing strategies other than maintenance agreements to promote the long-term maintenance of stormwater control measures.

The City of Fairfax addresses inspection, operation, and maintenance verification of stormwater management facilities owned by the MS4 operator by providing for long-term operation and maintenance, conducting annual inspections, conducting maintenance as necessary by utilizing inspections (example form located in Appendix B-5) and ordinances located in the City of Fairfax Year 1 Annual Report Appendix C-4 and C-5.

The City of Fairfax addresses MS4 Program Plan Requirements by updating the MS4 Program Plan to include a list of the applicable legal authorities to ensure compliance with the minimum control measure, written policies and procedures utilized during design of stormwater facilities, written inspection policies and procedures utilized during inspections, written procedures for inspection, compliance, and enforcement to ensure maintenance of private and operator owned stormwater facilities, and the roles and responsibilities of the departments in implementing the minimum control measure.

The City of Fairfax addresses stormwater management facilities that discharge into the MS4 by creating an electronic database to include the facility type, owner, location, including latitude, longitude and the sixth order hydrologic unit code, acres treated,

date brought online, name of any impaired water segments within each HUC, date of the most recent inspection, and whether a maintenance agreement exists.

e. Minimum Control Measure #5 – Post Construction Stormwater Management in New Development and Redevelopment

This minimum control measure addresses post construction stormwater runoff by means of design criteria, inspection and documentation.

i. Status of Compliance

BMP	Task	Permit Year Implement/ Complete	Measurable Goal/Report Item	Comments
5A	Inspect permanent Post-Construction Stormwater Runoff	Year 1	Annual stormwater management facility inspection summary	A sample letter to a BMP owner requiring inspection is in Appendix B-5a. An Inspection Checklist is in Appendix B-5b and an Inspection Report is in Appendix B-5c.
5B	Provide Long-Term Maintenance for Operator Owned Facilities	Year 1	Long-term City maintenance of stormwater management facilities	Maintenance & Monitoring Agreement in Appendix B-5d
5C	Require permanent Management of Post-Construction Runoff	Year 1	Implement and track post-construction stormwater management	Maintenance & Monitoring Agreement in Appendix B-5d
5D	Create and Maintain an Electronic Database of All Permanent Stormwater Management Facility	Year 1	Update the database	17 new facilities came on-line in Year 3. List is in Appendix B-5e.
5E	Maintain City Facility Inspection Database	Year 1	Track and Report findings and results of facility inspections	All 345 BMP facilities were inspected and 97 enforcement actions were taken (required maintenance)
5F	Provide Training for City Inspection Staff	Year 1	Stormwater management facility inspection training agenda and attendance roster	Training plan is in Appendix B-6
5G	Develop Methods to Address Individual Residential Lot Special Criteria	Year 1	Explanation of enforceable methods, List of educational resources	

ii. BMP Appropriateness
The identified BMPs and activities associated with this minimum control measure are meeting the goals and are therefore appropriate methods of protecting water quality from development and redevelopment.

iii. Progress towards Goal
There were no new update requirements specified for the third year of the permit under this Minimum Control Measure (see Table 1 of General Permit). All updates and requirements completed during the first year were continued during the third year where appropriate. Performance measures for FY 2016 can be found on the City's website (http://www.fairfaxva.gov/government/public-works/performance-measures). The City has samples of letters sent to owners regarding annual maintenance as well as example Inspection Reports and Zoning Enforcement forms in Appendix B-5.

The City has developed stormwater management programs through databases, GIS, and Spreadsheets. These are updated on an as needed basis in order to remain current with field conditions.

A list of new facilities can be found in Appendix D-1.

The City continues to educate homeowners on the long-term maintenance of stormwater control measures designed to treat runoff from individual residential lots.

f. Minimum Control Measure #6 – Pollution Prevention/Good Housekeeping for Municipal Operations

This minimum control measure requires the implementation of proper training and standard operating procedures for daily operations tasks to be completed while limiting or eliminating the risk of illicit discharges on municipal facilities.

i. Status of Compliance

BMP	Task	Permit Year Implement/ Complete	Measurable Goal/Report Item	Comments
6A	Develop SWPPP's for all Identified "High Priority" Facilities	Year 4	Identify "High-Priority" Facilities in Year 1, Develop SWPPP by Year 4	SWPPP is in draft form for high priority facility
6B	Implement Turf and Landscape Nutrient Management Plans (NMPs)	Year 2	Identify areas in Year 1, implement in accordance with schedule per Section II B 6 c (40% Year 3)	Of the required 28 acres within the city, 11.83 acres (42%) of the city are covered by NMPs.
6C	Provide Training Plan for City Staff and Contractors	Year 1	Summary of Training Plan, Summary Report of Training Events	The Training plan is in Appendix B-6

BMP	Task	Permit Year Implement/ Complete	Measurable Goal/Report Item	Comments
6D	Develop Written Good Housekeeping and Pollution Prevention Protocols for Daily Municipal operations and Maintenance	Year 2	Written good housekeeping and pollution prevention protocols	These procedures continued to be followed by City staff

ii. BMP Appropriateness

The identified BMPs and activities associated with this minimum control measure are meeting the goals and are therefore appropriate methods of providing for pollution prevention and good housekeeping for the City's operations.

iii. Progress towards Goal

The City of Fairfax addresses operations and maintenance activities by minimizing or preventing pollutant discharge from daily operations, equipment maintenance, pesticides, herbicides, and fertilizers utilizing inspections and regulations located in the City of Fairfax Year 1 Annual Report Appendices C-4, C-6, and D. High priority facilities were identified using GIS records. The only high priority facility identified in the City of Fairfax is the property yard at the public works facility. A GIS map of this property can be in Appendix D of the City of Fairfax Year 1 Annual Report. This facility's SWPPP is currently in draft form.

A GIS analysis was performed to determine all lands owned by the City where nutrients are applied to a contiguous area greater than one acre. A map of these properties can be found in the City of Fairfax Year 1 Annual Report, in Section III of Appendix D. 40% of all identified acres have been covered by draft Turf and Landscape Nutrient Management Plans in accordance with the Year 3 permit requirements.

A Training Plan was created and has been updated to include specific departments and positions who must receive training, as well as a list of example training events. The training plan also includes a section on contractor compliance. Due to recent changes in department staff and responsibilities, the training plan is in need of another update. It is also awaiting approval by City Council. The training plan is attached to this report in Appendix B-6.

The City of Fairfax encourages recycling and waste reduction, and a recycling rate report is completed every year. The city collects refuse and recyclable items from all single family homes once a week at no charge; businesses are required to provide a recycling system for their occupants, employees, and vendors. Leaf pickup is also provided by the City. Literature and regulations regarding recycling procedures can be found on the City's website on the "Refuse & Recycling" page (http://www.fairfaxva.gov/government/public-works/operations-division/refuse-recycling).

g. Additional Year 3 Permit Requirements

Under the general permit (see table 1) the additional requirements for Year 3 include other TMDL Action Plans for applicable TMDLs approved between July 2008 and June 2013 - (Special Conditions for Approved Total Maximum Daily Loads (TMDL) Other Than Chesapeake Bay). TMDL Action Plans for Difficult Run (both *E. coli* and Sediment) and Occoquan River (*E. coli*) can be found in Appendices B-7a-c.

i. Status of Compliance
A TMDL Action Plan was written in Year 2 for the Chesapeake Bay TMDL requirements. Its primary focus was on the Cycle 1 load 5% load reduction. While TMDLs other than the Chesapeake Bay TMDL exist, none required action more stringent or geographically extensive than the Chesapeake Bay TMDL. However, the City has written 3 TMDL Action Plans. These Action Plans can be found in Appendices B-7a-c.

ii. BMP Appropriateness
The TMDL Action Plans associated with this requirement are sufficient to comply with the TMDLs and are therefore appropriate methods of preventing degradation of the water bodies.

iii. Progress towards Goal
TMDL Action Plans have implicit goals of being implemented. Implementation began or will begin on all Action Plans 90 days after submittal unless changes are requested.

III. INFORMATION COLLECTED

George Mason University (GMU) and the City of Fairfax have an agreement for sample collection and analysis. GMU performed sampling at 3 times at each of 4 locations during Year 3. Results of the sample analysis are in Appendix C.

IV. SUMMARY OF YEAR FOUR ACTION PLAN

Storm water activities planned for the next reporting cycle are as follows:

Minimum Control Measure	Year 4 Activity
MCM #1	• Continue implementation of public education and outreach activities
MCM #2	• Continue implementation of public involvement/participation activities
MCM #3	• Continue illicit discharge enforcement
MCM #4	• Enforce annual inspections for privately owned SWM/BMP facilities within the City of Fairfax. • Inspect all City owned BMP/SWM facilities
MCM #5	• Continue implementation of Year 1, 2 and 3 goals
MCM #6	• Perform street sweeping • Perform storm drainage outfall maintenance • Continue storm drain marking program
Outfall Maps	• In accordance with Year 4 requirements listed in Table 1 of the SMS4 permit, the City will complete outfall mapping
SWPPP Implementation	• In accordance with Year 4 requirements listed in Table 1 of the SMS4 permit, the City will finalize and begin implementation of a SWPPP on their Property Yard facility
Additional Operations and Maintenance Activities	• Northfax Storm Drainage (Engineering and Design) • Storm sewer replacement University Drive, Phase I • 300' replacement of failing galvanized storm drainage systems • Storm sewer lining rehabilitation • Neighborhood Drainage Projects- Park Road, Fern Street, and Stonewall Avenue • Burke Station Road storm sewer design • Oak Street Stormwater Improvements (Construction of Phase 1)

V. CHANGES TO CORRECT DEFICIENCIES

The City does not intend to substantially modify or replace any of the Minimum Control Measures, BMPs, or measurable goals shown in this report.

VI. NOTICE OF RELIANCE ON OTHER ENTITIES

The City of Fairfax will not be relying on any other entity to satisfy any permit obligations.

There are no new or terminated signed agreements between City of Fairfax and any third party to implement all or portions of the permit's minimum control measures. The Virginia Department of Transportation (VDOT) operates a stormwater system that may have interconnections with the City of Fairfax's stormwater system. Letters to other entities documenting this possibility are in Appendix B-3d.

VII. APPROVAL STATUS OF PROGRAMS PURSUANT TO SECTION II C

a. Section I B 9 requirements

There have been no updates completed to the MS4 Program Plan. The new information regarding the TMDL WLA was updated in the 2010-2011 permit cycle, and is on-going.

b. Agreements

There are no new or terminated signed agreements between City of Fairfax and any third party to implement all or portions of the permit's minimum control measures.

VIII. TOTAL MAXIMUM DAILY LOAD INFORMATION

Section I of the General SMS4 Permit requires compliance with applicable TMDLs, including the Chesapeake Bay TMDL. TMDLs for streams draining any portion of the City are listed in the table below (except the Chesapeake Bay TMDL). Pursuant to the requirements of I.B., Special conditions for approved TMDLs other than the Chesapeake Bay TMDL, action plans have been developed for non-Chesapeake Bay TMDLs. The action plans for TMDLs approved between 2008 and 2013 were requirements for Year 3 and are included in Appendices B-7a-c. A brief discussion of this requirement is in Section II.g. of this report.

The Chesapeake Bay TMDL requirements include annual reporting requirements after the initial plan development and implementation. In Year 3, the City of Fairfax implemented control measures to reduce total nitrogen, phosphorus, and suspended solids discharges. All control measures are explained further in Section II.B.e. and its associated Appendices.

TMDL Project	Pollutant(s)	EPA Approval Date	SWCB Approval Date	Date on Cover of Final Report	City vs County
Accotink Creek (Lower)	E. Coli	12/18/2008	4/28/2009	September 2008	Refers to City twice (once for City developing restoration project and another for radio announcement). Questionable as to whether this applies to City of Fairfax.

TMDL Project	Pollutant(s)	EPA Approval Date	SWCB Approval Date	Date on Cover of Final Report	City vs County
Accotink Creek Watershed	Fecal Coliform	5/31/2002	6/17/2004	April 2002	"Headwaters of Accotink Creek are in the City of Fairfax, VA and the creek flows for approx. 10.9 miles before it drains into Lake Accotink…"
Potomac River Watershed PCB	PCB	10/31/2007	4/11/2008	September 28, 2007	Refers to City of Fairfax.
Bull Run	Sediment	9/26/2006	6/27/2007	June 2006	Referred to City of Fairfax and gives WLA.
Difficult Run	Sediment	11/07/2008	4/27/2009	August 2008	City referred to as a point source and says is covered by MS4 permits.
Difficult Run	E. coli	11/07/2008	4/28/2009	April 25, 2008	Refers to City in TMDL, but unclear.
Occoquan River Watershed	E. coli	11/15/2006	7/31/2008	August 2006	City has a WLA assigned.
Popes Head Creek	Sediment	9/26/2006	6/27/2007	August 2006	In TMDL, and are "permitted to discharge."

APPENDICES

Appendix A

Certification – VSMP General Permit Registration Statement

City of Fairfax

10455 Armstrong Street
Fairfax, VA 22030
Department of Public Works
(703) 385-7846
(703) 591-5727 (FAX)

Jeffery Selengut
Department of Conservation and Recreation
900 East Main Street, 8th Floor, Pocahontas Building
Richmond, VA 23219-3558

March 27, 2013

Re: VSMP General Permit Registration Statement for MS4 Stormwater Discharges

Dear Mr. Selengut,

Please find the attached VSMP General Permit Registration Statement for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (DRC Form 199-148) and currently implemented Program Plan for the City of Fairfax.

We understand that DCR will bill the City at a later date for the registration fee. Therefore, the applicable fee form (DCR 199-145) is not included with this submittal.

If you have any questions or require additional information, please contact me at 703-385-7810.

Sincerely,

David Summers, Director of Public Works

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

VSMP GENERAL PERMIT REGISTRATION STATEMENT FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS [VAR04]

(Please Type or Print All Information)
(The applicable fee specified in Form DCR 199-145 must additionally be submitted to the address given in that form to obtain coverage)

1. **Regulated Small MS4**

Name: City of Fairfax

Type: [X] City [ ] County [ ] Incorporated Town [ ] Unincorporated Town [ ] College or University
[ ] Local School Board [ ] Military Installation [ ] Transport System [ ] Federal or State Facility [ ] Other

Location (County or City): Fairfax, Virginia

2. **Regulated Small MS4 Operator**

Name: City of Fairfax

Address: 10455 Armstrong Street

City: Fairfax State: VA Zip: 22030

3. **Hydrologic Unit Code(s) as identified in the most recent version of Virginia's 6th Order National Watershed Boundary Dataset currently receiving discharges or that have potential to receive discharges from the regulated small MS4:**

020700100402 PL30 Accotink Creek
020700100401 PL29 Pohick Creek 020700081004 PL22 Difficult Run

4. **Attach a description of the estimated drainage area, in acres, served by the regulated small MS4 discharging to any impaired receiving surface waters listed in the most recent Virginia 305(b)/303(d) Water Quality Assessment Integrated Report, and a description of the land use of each such drainage area.** See Attachment A.

5. **Any TMDL waste loads allocated to the regulated small MS4 (this information may be found at http://www.deq.state.va.us/tmdl/develop.html):** See Attachment A.

6. **The name(s) of any regulated physically interconnected MS4s to which the regulated small MS4 discharges.**

Fairfax County
George Mason University Virginia Department of Transportation

7. **A copy of the MS4 Program Plan that includes:**

a. A list of BMPs that the operator proposes to implement for each of the stormwater minimum control measures and their associated measurable goals pursuant to 4VAC50-60-1240, Section II B; that includes:

i. A list of the existing policies, ordinances, schedules, inspection forms, written procedures, and other documents necessary for BMP implementation; and

ii. The individual, department, division, or unit responsible for implementing the BMP;

b. The objective and expected results of each BMP in meeting the measurable goals of the stormwater minimum control measures;

c. The implementation schedule including any interim milestones for the implementation of a proposed new BMP; and

d. The method that will be utilized to determine the effectiveness of each BMP and the program as a whole.

8. List all existing signed agreements between the operator and any applicable third parties where the operator has entered into an agreement in order to implement minimum control measures or portions of minimum control measures.

The City has an annual contract with George Mason University for stream monitoring.

9. The name, address, telephone number and e-mail address of either the principal executive officer or ranking elected official as defined in 4VAC50-60-370.

Robert Sisson, City Manager
City Hall Room 316,10455 Armstrong Street, Fairfax, VA 22030
703-385-7850 Robert.Sisson@fairfaxva.gov

10. The name, position title, address, telephone number and e-mail address of any duly authorized representative as defined in 4VAC50-60-370.

Christina Alexander, Stormwater Resource Engineer
City Hall, Room 200, 10455 Armstrong Street, Fairfax, VA 22030
703-273-3067 Christina.Alexander@fairfaxva.gov

11. **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."

Print Name: Robert Sisson Title: City Manager

Signature: Date: 3/28/13

For Department of Conservation and Recreation Use Only

Accepted/Not Accepted by: _____ Date: _____

Basin _____ Stream Class _____ Section _____ Special Standards _____

ATTACHMENT A

VSMP GENERAL PERMIT REGISTRATION STATEMENT FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS
For
City of Fairfax

4. Impaired Waters Drainage Area

The majority of the City of Fairfax, Virginia lies within the impaired Accotink Creek Watershed. There are approximately 10 miles of stream channel along Accotink Creek and its tributaries in the City of Fairfax. Approximately 3,600 acres, within the City of Fairfax, discharge to Accotink Creek. Land use within this drainage area is primarily dense urban residential and commercial.

5. TMDL Wasteload Allocations

TMDL ACTION PLANS (TMDLS APPROVED PRIOR TO JULY 2008)

Applicable TMDL Project	Pollutant	SWCB Approval Date	Fairfax City WLA
Accotink Creek Watershed	Fecal Coliform	6/17/2004	N/A
Bull Run	Sediment	6/27/2007	14.2 tons/yr*
Popes Head Creek	Sediment	6/27/2007	22.6 tons/yr*
Potomac River Watershed	PCB	4/11/2008	0.0843 g/yr**

*Allocation shared between City of Fairfax and VDOT Urban Area MS4s.

**Represents a 5% reduction represented by the Margin of Safety which is expected to be achieved by the proposed 93% reduction in atmospheric deposition of PCBs.

TMDL ACTION PLANS (FOR TMDLS APPROVED JULY 2008-JUNE 2013)

Applicable TMDL Project	Pollutant	SWCB Approval Date	Fairfax City WLA
Difficult Run	Sediment	4/27/2009	3,595 tons/yr*
Difficult Run	E. Coli	4/28/2009	9.44E+12 cfu/yr*
Occoquan River Watershed	E. Coli	7/31/2008	1.03E+10 cfu/yr**

*Allocation shared between the City of Fairfax MS4 and Fairfax County, Town of Vienna, Total VDOT, Fairfax County Public Schools, and GW Memorial Parkway MS4s.

**Allocation shared between the City of Fairfax and VDOT Urban Areas MS4.

Virginia Pollution Discharge Elimination System General Permit for Small MS4's

MS4 PLAN
March, 2013

1. **Owner:** City of Fairfax, Virginia

2. **Owner Information**: Address- 10455 Armstrong Street, Fairfax, VA 22030
   City Manager, Robert Sisson
   703-385-7850

3. **Receiving Waters**: The majority of the City of Fairfax, Virginia lies in the Accotink Creek Watershed. Out of the city's total area of 6 square miles, approximately 1 square mile of peripheral areas drains to the adjacent County of Fairfax. Accotink Creek flows from its origin within the City of Fairfax southeast through Fairfax County to its confluence with the Potomac River at Gunston Cove. The city's major stream channel segments include the North and Central forks of Accotink Creek. The South fork of Accotink Creek is known as Daniels Run. There are approximately 10 miles of stream channel along Accotink Creek and its tributaries in the City of Fairfax.

4. **Best Management Practices (BMPs) proposed to meet minimum control measures under 9 VAC 25-750-50 Part IIB.**

   (1) Public education and outreach on storm water impacts

   The City of Fairfax already has in place a public education and outreach program on stormwater impacts. This effort began in 1994 when the City of Fairfax voters approved funds for Stormwater Management Improvements. Since this time, city staff has provided environmental education materials on stream restoration at public meetings and sponsored field walks along city streams. More recently, the city and EPA are working on a pilot program to further refine the City Watershed Management Plan. The city has also updated its website to include information on environmental projects and programs. Proposed future public education and outreach programs include:

   a. Continued development of the citywide watershed plan.
   b. Stream monitoring program performed through contract by George Mason University
   c. Enhanced environmental education information to be distributed though the city's monthly newsletter, website and cable station.
   d. Continuation of the storm drain marker program.
   e. Additional educational materials on proper lawn fertilization techniques.

f. Further education on the importance of proper disposal of pet waste citing the city's existing Pet Waste Ordinance (articles have already appeared in the monthly city newsletter on this issue).
g. Continue to provide information on proper disposal of hazardous waste and recycling information.
h. Resident input for the ongoing stream restoration work.

(2) Public involvement/participation

The City of Fairfax has a long-standing history of involving the public with all capital projects. The public involvement process starts prior to any project being funded. Once project funding is appropriated, city staff holds public meetings to discuss the preliminary planning aspects of the project. The impetuous behind these meetings is to educate the public on the project and to gain public input and participation. Most recently, the city is working with residents and a consultant in preparing stream restoration plans for areas of Accotink Creek.

To ensure that we contact all interested citizens we have started a special mailing list of those citizens that have shown interest in the city's environmental projects. We also advertise all meetings in the city's monthly newsletter, city website and on the city cable channel. This approach ensures that we inform all interested citizens so that they can become involved in our environmental projects. The city will continue to enhance public involvement and participation through the implementation of new programs such as the volunteer stream-monitoring program and the city storm water management plan which are posted on the City's website.

(3) Illicit discharge detection and elimination

The city's GIS inventory of the storm sewer infrastructure provides the location of all city storm drainage structures and includes a connectivity layer showing the connections of all the pipes from the start of the system to the outfall location. This information is being used to further develop and implement the city's plan to detect and eliminate illicit discharges into our MS4. Chapter 110-211 of the city's ordinance currently prohibits the dumping of non-stormwater discharges into the storm system. The city will continue to work to develop a program that includes the following components:

- Procedures for locating priority areas most likely to have illicit discharges.
- Methods to detect and trace the source of illicit discharges.
- Means to remove the source of any illicit discharges.
- Continuation of the storm drain marker program.
- Continued development of the city's program to provide a mechanism for citizens to report illicit discharges. City residents can contact the City of Fairfax Fire Marshal at 703 385 7830 or the Police Department at 703 385 7924 to report illicit discharges and improper dumping.

- Provide outreach materials to businesses and citizens on the hazards associated with illegal dumping and improper disposal of waste.
- Regulation and prohibition of discharges not covered under the VPDES permit.
- Enforcement procedures – the Zoning Administrator enforces chapter 110-211 of the City Code in conjunction with the Fire Marshal and Public Works Department
- Procedures for program evaluation and assessment.

(4) Construction site storm water runoff control

The City of Fairfax will continue to develop, implement and enforce a program to reduce pollutants in any storm water runoff to our system from construction activities that result in a land disturbance of greater than 2,500 square feet in accordance with State and City of Fairfax code requirements for erosion and siltation control programs.

The current City of Fairfax Public Facilities Manual includes a storm water management section. This section contains the items required under this permit that relate to land development. The Public Facilities Manual references and requires all developers to adhere to the guidelines stated in the City of Fairfax Code, the most recent Virginia Erosion and Sediment Control Handbook and the Virginia Stormwater Management Handbook. The City of Fairfax Public Facilities Manual also includes design guidelines to protect natural streams from the harmful effects of increased storm water volumes and velocity resulting from development. The document also provides guidelines to determine the most appropriate BMPs. The Public Facilities Manual was adopted by the City Council in January of 2007. The City of Fairfax has established in-house procedures for:

- Site Plan Review of construction plans that consider potential water quality impacts. The city's Chesapeake Bay Preservation section of the Zoning Code requires that all post-development non-point source pollution runoff loads shall not exceed the predevelopment load based upon average land cover conditions within the city of 45 percent. Pollution loads must be calculated and the BMP selected for the express purpose of controlling nonpoint source pollution. Redevelopment of any site not currently served by water quality best management practices shall achieve at least a ten percent reduction of nonpoint source pollution in runoff compared to the existing runoff load from the site. Post-development runoff from any site to be redeveloped that is currently served by water quality best management practices shall not exceed the existing load of nonpoint source pollution in surface runoff. If existing facilities can be shown to achieve the current standard of nonpoint source pollution control, the site will be considered as being served by water quality BMP's. Structural BMP's must always be maintained in working order, performing at the design levels of service. The applicant's site engineer

shall provide the original structural design and maintenance schedule and verify that the structure is performing at the design level of service.

- Adherence to the Chesapeake Bay Preservation requirements, which establish sanctions to ensure compliance.
- Construction site operators to implement appropriate erosion and sediment control best management practices.
- Construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site that may cause adverse impact to water quality.
- Site inspection and enforcement of erosion and sediment control measures.
- The receipt and consideration of information submitted by the public.

As required, the City of Fairfax continues to develop a program to track regulated land disturbing activities and submit the information for the reporting period, to include the total number of regulated land disturbing activities and total disturbed acreage. The City of Fairfax will also enforce the requirement that construction site operators secure a VPDES construction permit.

(5) Post-construction storm water runoff in new development and redevelopment

The City of Fairfax will continue to develop, implement and enforce a program to address storm water runoff from all new development and redevelopment projects. This program will ensure that controls are in place that will prevent or minimize water quantity and quality impacts as required. Other aspects of the city's program and ordinances include:

- Implementation of strategies which include a combination of structural and/or non-structural BMPs to address post-construction runoff from new and redevelopment projects. Information and guidance is available in the City of Fairfax Public Facilities Manual.
- City requirement for a detention volume equal to the additional runoff volume caused by the land alteration using a design storm of ten years for two hour storm duration with predevelopment levels based on 1974 land conditions.
- City Ordinance requirement that post-development runoff from any site to be redeveloped that is currently served by water quality best management practices shall not exceed the existing load of nonpoint source pollution in surface runoff. If existing facilities can be shown to achieve the current standard of non-point source pollution control, the site will be considered as being served by water quality BMP's.
- Structural Storm Water Management/Best Management Practice (SWM/BMP's) must always be maintained in working order, performing at the design levels of service. The applicant's site engineer shall provide the original structural design and maintenance schedule and verify that the structure is performing at the design level of service.

- City Ordinance requirement that where SWM/BMP's are utilized – require that regular or periodic maintenance be performed to ensure that these facilities continue to function as they were designed, the property owner shall ensure such maintenance by providing the city with a maintenance agreement and surety bond in an amount determined by the zoning administrator. The surety bond shall comply with the requirements of chapter 2; article VI, division 2 of this Code. The agreement and surety shall be subject to the approval of the zoning administrator and the city attorney.
- The city's Public Facilities Manual provides design standards and principles to preserve open space and natural resources, minimize the creation of new impervious areas and limit increases in post-development runoff peak rates, frequency, and volume. The manual also provides guidelines that assist the user in determining the appropriate BMPs.
- The city now requires that owners of all permanent SWM/BMP structures in the City of Fairfax complete annual inspection report and return it to the city. These reports are reviewed by city staff and the SWM/BMP owner is required to make any repairs that are necessary.
- The City has developed a list of SWM and BMP structures which currently number 111 and 56 respectively and have the following information:
    - Type of BMP installed;
    - Mailing address of Owner and location of the SWM/BMP
    - Annual inspection Reports.

  Information on the number of acres treated by each SWM/BMP has been added for new developments.

(6) Pollution prevention/good housekeeping for municipal operations

The City of Fairfax will continue to develop and implement an operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system. The city currently has set guidelines on employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances and storm water system maintenance.

City of Fairfax employees follow the requirements specified in the Virginia Erosion and Sediment Control Handbook and the Virginia Stormwater Management Handbook. Training materials from the EPA, the State of Virginia, and other relevant organizations are used in conjunction with the current city guidelines.

For city funded capital projects, are required to pass through the same site plan review process as followed by a private development. This ensures that all city projects meet the city's own ordinances and guidelines for land development.

Examples of city installed BMPs include an oil/water separator at the city property yard and low impact development type filters in the parking lot at city hall. The new City Hall Annex and the new Police Station have rain gardens and limited curbing to allow water to flow to grassy areas for infiltration. In addition, 2 Filterra units have been installed at City Hall for phosphorus removal.

On-going City of Fairfax Storm Water Management Programs

- Catch Basin Cleaning Program- all basins cleaned once a year. Trouble spots checked after each storm.
- BMP Inspection Program- All public and private BMPs are on an annual inspection cycle.
- Street Sweeping- Main Roads- weekly from March to December.
  Downtown area- weekly all year
  Subdivisions- once during April, June and September
- Stream Restoration Program- provides for the bioengineering restoration of city stream corridors. The City has contracted the engineering consulting firm RK&K, to evaluate and analyze the erosion in the North Folk of Accotink Creek and Daniels Run and recommend stream restoration projects, to reduce erosion and preserve the creek. This work started in January of 2007 and the City is currently in possession of the final report from RK&K and will recommend projects based on the report's findings when funding becomes available.

- City Inspectors are E & S State Certified.

5. Measurable Goals for BMPs

The City of Fairfax will develop, implement and enforce a storm water management program (SWMP) to reduce the discharge of pollutants from the MS4 to the maximum extend practicable, to protect water quality and to satisfy the appropriate water quality requirements of the clean Water Act and the State Water Control Laws. The SWMP will include the six minimum control measures outlined in the VPDES general permit regulations.

The City of Fairfax has a Watershed Management Plan Dated July 2005 which is posted on the City website. This information would then be used to prepare strategies and regulations for the SWMP.

Schedule and Goals for specific BMPs

(1) Public Education and Outreach

Enhancement of Public Education and Outreach Programs- Ongoing

Goals: The City of Fairfax has contracted the services of the George Mason University to monitor city streams and provide reports quarterly on the condition of the city streams. These reports will be posted on the city website to inform the public about the condition of city's streams.

To provide information to citizens on the condition of the city's streams by publishing annual reports of streams water quality conditions so that stream water quality can be tracked and recorded.

The storm drain marker program- On-going

Goals: The goals of this program will be to provide storm drain markers on all city storm drains indicating that no dumping is allowed. Information is also provided to inform citizens that anything dumped into the storm drain system can eventually drain to the Chesapeake Bay. In order to assist with this program and provide an opportunity for public involvement, citizens are continually invited to help with this effort.

Development of City of Fairfax Watershed Plan - Completed

Goals: The City has worked with the EPA on refining future projects related to the City's watershed plan. Projects will be proposed in the FY 13/14 budget.

(2) Public involvement/participation

Development of City of Fairfax of Fairfax Watershed Plan- completed
Goals: Refer to Section (1) above.

(3) Illicit discharge detection and elimination- On-going

Yes, the GIS layer showing the city's storm water infrastructure from inlets to outfalls with connection of pipes and direction of flows has been installed and is operational and available to departments on the city's main computer system. However, the data is current to 2004

Goals: To update the GIS layer of the city's storm water infrastructure with information to keep the system current as new storm water facilities are added to the city's system.

Current and proposed future procedures include:

- Citizen notification process to alert the city Police and Fire Departments to any reported incidents. City website includes direct e-mail access for reporting of violations by citizens. Reports are also taken by phone with access to the police dispatcher for after hour calls reporting illicit discharges.

- The city takes legal action to prosecute violators when they can be identified.
- Future plans to expand the public education program on illicit discharges.

(4) Construction site storm water runoff control –On-going

Goals: The City of Fairfax continues to refine site plan review procedures to consider potential storm water impacts, water quality impacts and erosion and sediment controls. Current review procedures require conformance with the Virginia Storm Water Handbook and the Virginia Erosion and Sediment Control Handbook. Improving the methods of implementation and enforcement of erosion and sediment controls during construction is also on-going. In addition, city site inspectors are certified through the Virginia Erosion and Sediment Control program. The City of Fairfax Public Facilities Manual was adopted by the City Council in 2007. Future editions will include more information on construction site storm water runoff control issues and requirements.

(5) Post-construction storm water runoff in new development and redevelopment– On-going

Goals: The city will continue to review and refine its ordinances to address storm water runoff from new development and redevelopment. The Public Facilities Manual and Storm Water Management Plan documents will include refinements to the city's design standards to preserve open space and natural resources. In addition, these documents will provide enhanced information on strategies to minimize new impervious areas and methods to limit and control increase in post-development runoff peak rates and volume.

(6) Pollution prevention/good housekeeping for municipal operations – On-going

Goals: Current City of Fairfax procedures require city crews to meet Virginia Erosion and Sediment Control regulations pertaining to reducing pollutant runoff from municipal operations into the storm sewer. To ensure compliance with these regulations, the city continues to work to enhance employee training on pollution prevention and good housekeeping techniques into municipal operations.

6. Responsible Persons for Implementing and Coordinating the Program: Peter T. Millard, City Engineer, 703-246-6330 and Christina Alexander, Stormwater Resource Engineer, 703-273-3067

7. Certification- For signed certification; see # 11 on the permit registration application.

Appendix B-1a

MCM #1 – Public Outreach and Education by Northern Virginia Clean Water Partners

Northern Virginia Clean Water Partners 2016 Annual Report

Only Rain Down the Drain

2016 Northern Virginia Clean Water Partners

Fairfax County | Arlington County | Loudoun County | Stafford County | Fairfax Water |City of Alexandria | City of Fairfax |Town of Herndon | City of Falls Church | Town of Leesburg | Town of Vienna | Town of Dumfries | Doody Calls | Northern Virginia Regional Commission | Virginia Coastal Zone Management Program | George Mason University | Fairfax County Public Schools | Northern Virginia Community College | Prince William County Public Schools | Northern Virginia Soil and Water Conservation District

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Report prepared by the Northern Virginia Regional Commission on behalf of the Partners

For more information contact:
Corey Miles
Senior Environmental Planner
703-642-4625
cmiles@novaregion.org

1.0 Regional Stormwater Education Campaign

In 2015, the Northern Virginia Regional Commission continued to support the Northern Virginia Clean Water Partners and their regional stormwater education effort called "Only Rain Down the Drain Campaign". The campaign was initiated in 2003 to enable Northern Virginia jurisdictions to pool outreach funds to achieve common goals regarding stormwater education and outreach and promote consistent messages about stormwater pollution across the Northern Virginia region. The campaign uses the storm drain marker symbol, the blue and green shad, as its logo (Figure 1).

Figure 1. Northern Virginia Clean Water Partners logo symbol

MS4 permittees may fulfill all or part of their public education and outreach and documenting changes in behavior requirements through regional outreach programs involving two or more MS4 localities. The activities conducted as part of this regional campaign satisfies part of the member jurisdiction's Municipal Separate Storm Sewer System (MS4) Phase I and Phase II permit requirements for Minimum Control Measures 1 and 2.

The Clean Water Partners received financial and in-kind contributions from 20 partners in 2016, for a total budget of $101,000. The Partners met two times and had one conference call between January and September 2016 to plan, implement and review campaign activities. Meeting summaries and presentations are provided as Appendix A.

2.0 Public Education Advertisements

The campaign uses a multi-media approach to educate the public on stormwater pollution. Cable television ads, a website (onlyrain.org), print materials, sign-in page takeovers and internet banner ads were used to reach a large audience across the region. On behalf of the partners, NVRC secured the services of Comcast Spotlight to air ads on cable television. Four, 30-second long ad's that feature rubber duckies were selected to illustrate the importance of picking up pet waste, reducing fertilizer application and implementing other general household stormwater pollution reduction measures. The rubber ducky was chosen as a theme for the ads because it has been a long-time symbol of non-point source pollution. One ad was translated into Spanish.

From July 2015 through June 2016, advertisements featuring messages on the importance of picking up pet waste and general household stormwater pollution reduction measures aired on 31 television networks, including four Spanish speaking networks a total of 41,434 times. The networks were selected based upon research that shows they have the highest 'reach' to the target audiences. The complete report from Comcast Spotlight is attached as Appendix B.

Additionally, CSV+ was utilized in conjunction with Xfinity.com. Cox.com and Verizon.net to reach the target audiences. CSV+, a video ad network, provides another opportunity to reach all audiences regardless of Internet Service Provider. Both Spanish language networks and CSV+ do not have data associated with them and were excluded from this analysis.

Table 1. 2016 Multi-media Campaign Summary for Northern Virginia Target Audiences

	Number of Spots Aired	Impressions
31 English Language Television Networks	19,508	16,750,236
Four Spanish Language Networks	21,926	49,512
Digital Ads	N/A	1,381,317
"Only Rain" Website visits	N/A	37,489
Total	**41,434**	**18,218,554**

3.0 High-priority water quality issues and the target audience

Phase II MS4 permit holders are required to conduct outreach and education activities that reach at least 20% of each high priority issue target audience[1]. NVRC held several meetings with the Partners to discuss and determine the high priority water quality issues for the region. Regional water quality impairments were the primary criteria used to determine the issues. The three high priority water quality issues identified by the Partners are bacteria, nutrients, and motor oil/chemical contaminants. These issues became the focus of the education and outreach campaign for 2016.

3.1 Bacteria

Bacteria pollution in stormwater runoff can come from leaking sanitary sewer pipes, livestock agriculture, wildlife (i.e. Canada geese), improper disposal of pet waste, and failed septic systems. Since most of the region is connected to a municipal sanitary sewer, septic systems are not widely used. The region is primarily urban and suburban residential and agriculture is not a major land use. Most sanitary sewer lines undergo regular leak detection and do not contribute a significant load of bacteria to area streams. Due to the large number of pet owners in the region, the Partners chose pet owners as the target audience and the education and outreach messages focused on proper disposal of pet waste.

To reduce bacteria pollution in streams caused by pet waste that is left on the ground, the campaign determined that dog owners are the target audience. The educational message was that "Pet waste left on the ground washes into stormdrains and streams every time it rains. This

[1] 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.

runoff carries bacteria and other organisms from your pet's waste into local streams. Dispose of your pet's waste properly by bagging it and throwing it away." The take home message in the advertisement was simple and reinforcing; "Scoop it, bag it, trash it" (Figure 2).

Figure 2. Messaging to dog owners regarding proper disposal of pet waste

Comcast derived the population of the target audience in the Northern Virginia region using the Scarborough Research syndicated data set for the Washington DC DMA (March 2015- March 2016 survey period). The target audience is respondents who have lifestyle characteristics that include owning a dog. The Scarborough Research data set indicated that the adult population of the target audience across the region is 414,638 individuals. Phase II MS4 permit holders are required to reach at least 20 percent of the target audience in their jurisdiction with education and outreach. In order to reach the 20 percent of the target audience for the entire region, it was necessary to reach at least 86,920 individuals throughout the region with education and outreach.

The goal of reaching 20 percent of the target audience was exceeded across the region.

Table 8. Pet owners reached in each broadcast zone

Lifestyle Characteristics: Own a Dog
Television Impressions in each Broadcast Zone

3.2 Nutrients

Nutrient impairment from stormwater runoff is usually attributed to agriculture or residential fertilizer. MS4 permit holders are required by the Chesapeake Bay TMDL to reduce the nitrogen and phosphorous load contributed to the Bay through stormwater. As the major land use in the region is urban or suburban residential, the Partners chose to target homeowners with education and outreach messages focused on proper lawn care and disposal of yard waste.

Target Audience: Homeowners Who Apply Fertilizer

According to the data from our 2014 annual survey, more than a third of lawn and garden owners fertilize their lawns two or more times per year. The recommended application for most types of lawns in Northern Virginia is once per year in late summer or fall depending upon the results of a soil test. The educational messages were "Fertilize in the Fall if at all", "Mulch clippings for a healthy lawn and community", and "Sweep all clippings and fertilizer off of the pavement". The television and internet ads featured the well-known national symbol of non-point source pollution; the rubber ducky (Figures 4 and 5).

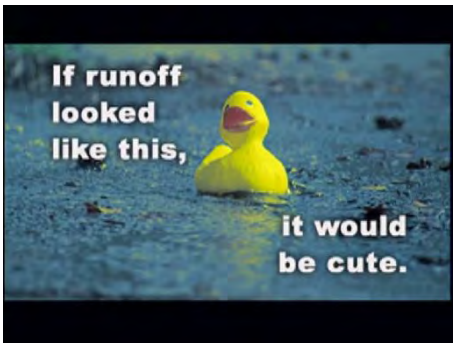

Figure 4. Screenshot of television ad

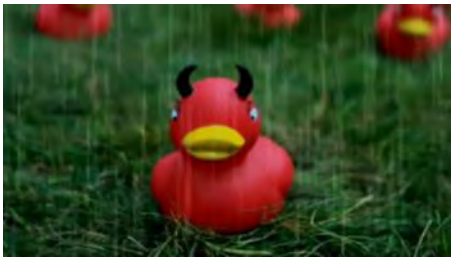
Figure 5. Screenshot of television ad

The survey results suggest that the highest percentages of homeowners who apply fertilizers to their lawn or garden more than the recommended rate are males and females between the ages of 35 and 65.

Comcast derived the population of the target audience in the Northern Virginia region using the Scarborough Research syndicated data set for the Washington DC DMA ((March 2015- March 2016 survey period)). The target audience is respondents who have lifestyle characteristics that include performing their own lawn care. The Scarborough Research data set indicated that the adult population of the target audience across the region is 676,165 individuals. In order to reach the 20 percent of the target audience for the entire region, it was necessary to reach at least 135,233 individuals throughout the region with education and outreach.

To determine how many of the total impressions reached the target audience in individual broadcast zones, the percentage of network viewers in each broadcast zone that have lifestyle characteristics that include performing their own lawn care was tabulated (Table 9).

Table 9. Television impressions of people that perform lawncare at their home

Lifestyle Characteristics: Perform Lawn Care			
Television Impressions in each Broadcast Zone			
Potomac	Alexandria	Fairfax County (Cox & Comcast Cable)	Fairfax Zone (Verizon FiOS)
183,265	**15,420**	**118,120**	**43,752**

The cable television impressions totaled 360,557 and the goal of reaching 20 percent of the target audience was exceeded across the region as well as in individual broadcast zones.

3.3 Motor Oil/Chemical Contaminants

Illicit Discharge or illegal dumping of motor oil, anti-freeze and other chemical contaminants into the stormwater sewer system is also a cause of water impairment in the region. The Partners chose to target home mechanics and contractors with educational messages focused on proper handling of motor oils and hazardous waste.

Target Audience: Contractors and Home Mechanics

Comcast derived a target audience using the Scarborough Research syndicated data set for the Washington DC DMA (March 2014-February 2015 survey period). The target audience is respondents who reported performing their own auto repairs such as oil filter/oil change or coolant/anti-freeze change in the past 12 months. The Scarborough Research data set indicated that the total population of the target audience across the region is 189,232 individuals.

According to Comcast data, the viewers of the networks listed in Table 10 have lifestyle characteristics that include performing their own auto repair. In order to reach 20% of the target audience, it was necessary to reach 37,846 individuals throughout the region with education and outreach. The cable television impressions totaled 422,022 and the goal of reaching 20 percent of the target audience was exceeded with the television ads.

Table 10. Networks with viewers that are more likely to perform their own auto repair

Lifestyle Characteristics: Auto Repair Anti-Freeze/Coolant Or Oil Filter/Oil Change

Television Impressions in each Broadcast Zone			
Potomac	Alexandria	Fairfax County (Cox & Comcast Cable)	Fairfax Zone (Verizon FiOS)
239,588	**16,127**	**118,099**	**48,207**

4.0 Annual Survey

To assist in determining the effectiveness of the campaign at increasing awareness and changing behaviors, after each campaign year, the Partners conduct an online annual survey of 500 Northern Virginia residents. The annual surveys are used to understand current behaviors of Northern Virginia residents as they relate to pet waste management, lawn care, and motor oil disposal. The surveys also determining the effectiveness of the campaign at increasing awareness and changing behaviors related to stormwater pollution from year to year.

The 2015 survey of 500 Northern Virginia residents was conducted online by Amplitude Research. The results are attached as Appendix C. This year, 8 percent of the respondents were Spanish speakers. Results from 2015 indicated that 9 percent of the respondents recalled hearing or seeing advertisements that featured rubber duckies on the internet or on TV about reducing water pollution. Of those who recalled the ads, three percent state they now pick up their pet waste more often, four percent state that they are more careful with motor oil, and 13 percent state they fertilize fewer times per year.

Other findings from the 2015 survey include:

- 15 percent of the respondents recalled hearing or seeing advertisements on the internet or on TV about reducing water pollution.
- Of those who recalled the ads, seven percent state they now pick up their pet waste more often, seven percent state that they are more careful with motor oil, and 18 percent state they fertilize fewer times per year.
- The number of respondents choosing runoff from streets and parking lots as the number one source of pollution has remained steady over the past four years.
- 42 percent of respondents knew they lived in the Potomac River watershed, up from 38 percent in 2011.
- Interestingly, 81 percent of people surveyed reported that they always pick up after their pet, as compared with 30 percent in previous surveys.
- When shown the Only Rain Down the Storm Drain logo, over half of the respondents recognized the logo.
- 86 percent of respondents were familiar with rain barrels, and 66 percent stated they already have a rain barrel or are interested in getting one

- 36 percent of respondents were familiar with rain gardens, with 62 percent already having a rain garden or interested in installing one.
- More than half of the respondents (54%) prefer to receive information from online sources. Newspaper (19%) and television (17%) were the next two preferred information sources.

In addition to capturing responses to questions regarding the effectiveness of the campaign, this year's survey honed in on the current behaviors of Northern Virginia residents as they relate to pet waste management, lawn care, and motor oil disposal. Responses to these questions support the development of future messages and targeted promotion.

The most important reason dog owners are motivated to pick up their pet's waste is because "It's what good neighbors do". The number of respondents choosing "It causes water pollution" as the most important reason to pick up has risen from 13 percent in 2011 to 20 percent in 2014. A third of the lawn and garden owners fertilize their lawns two or more times per year; an equal number never fertilize their lawns. Among those who fertilize once a year, 13 percent fertilize in the spring and only eight percent fertilize in the fall. This suggests that there is room to educate more residents of Northern Virginia that fertilizing in the fall is better for local waterways than fertilizing in the spring.

About half of the respondents reported using an herbicide to treat weeds in their lawn or garden. To better understand behavior related to the application of fertilizer, three new questions about fertilizer were added to the 2013 survey. Among those who fertilize their lawn, 71 percent have never had or were not sure if their soil had been tested for fertility or pH and four-in-ten reported using a slow release N fertilizer. When asked where they get information to decide when and how much fertilizer to apply the top three most commonly selected responses were "Follow directions on the bag" (52%), followed by "Lawn service conducts the applications" (31%), and then "Eyeball it based on size of lawn" (7%).

The majority of respondents take their vehicle to a service station to change their oil (85%) or take used oil to a gas station or hazmat facility for recycling (10%). Only two percent of Northern Virginians reported storing used motor oil in their garage, placing it in the trash or dumping it down the storm drain.

Responses to the survey suggest that public support remains strong for local government programs that improve the quality of water in local and regional streams and rivers and the Chesapeake Bay.

Appendix A
Meeting Summaries and Presentations

Appendix B
Comcast Spotlight Report

Appendix C
Amplitude Research Report

Appendix B-1b

MCM #1 – City of Fairfax Environmental Sustainability Committee's Annual Report

CITY OF FAIRFAX
ENVIRONMENTAL SUSTAINABILITY COMMITTEE

2015 ANNUAL REPORT

Committee Members:

Tim Killian (Chair)
Bruce Knight
Judy Fraser
Jon Buttram
Susan Crate
Adam Basinger
Mark Chandler

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INTRODUCTION

This report summarizes the areas the Environmental Sustainability Committee (ESC) has focused on in the past year, identifies current programs and initiatives as well as unmet challenges that the City faces.

During 2015, the ESC focused on stormwater management, solid waste, recycling, and invasive species as key focus areas. Several of our committee meetings were used as a platform for a speaker series consisting of experts in the area of tree and forest health, stormwater management, and invasive plants. The ESC continued to develop community relationships through its representation on the Zoning Rewrite Advisory Committee and the Solid Waste Management Plan Advisory Committee. The ESC supported Fairfax High School (FHS) environmental programs and the environmental club at Lanier Middle School, Daniels Run Elementary School and Providence Elementary School. The ESC membership went through a transition as four members resigned and two new members were appointed.

COMMITTEE ADMINISTRATION

The nine-member Committee currently has two vacant positions as four members resigned and two new members (Adam Basinger and Mark Chandler) were appointed. In July 2015, Tim Killian was elected by the Committee to serve in the role of ESC Chair. He replaced Judy Fraser who served in that role since the ESC was formed in 2009. In addition, Bruce Knight was elected to serve as Vice-Chair. Stefanie Kupka, the City's Sustainability Coordinator, is the ESC's staff liaison and provides administrative support to the committee. Several citizens informally support and advise the Committee on a regular basis and this number has grown in the last year. In addition, the Committee included a student representative from FHS.

The ESC met with the City Council for a work session in February 2015 to present the 2014 Annual Report. In addition, various Committee members participated in various other City working groups such as the Fairfax Zoning Rewrite Advisory Committee Meeting and the Solid Waste Management Plan Advisory Committee.

OUTREACH AND EDUCATION

As part of its outreach efforts, the Committee sponsored the fifth annual Earth Art Show, supported solid waste survey efforts at Derby-Q, and had an informational booth at the Fall Festival. Further, several ESC meetings were platforms for the *Protecting Our Natural Environment* Speaker Series where Committee members and city residents listened to presentation from experts in the fields of tree and forest health, stormwater management, and invasive plant species.

This year the Earth Art Show included over 75 pieces of artwork from Daniels Run, Providence and Lanier. The Committee awarded prizes to two students from each school, and with the help of Cameron's, a city bakery, and city staff, held a reception in honor of the artists in our schools.

The ESC's Fall Festival participation was a great success due to a well-attended booth. ESC

members and citizen supporters distributed handouts on stormwater and pollution concerns, recycling information, composting, and invasive plant species. The ESC booth featured a recycling game where residents identified wastestreams that could be recycled and those that should be disposed as municipal solid waste. Another activity created and run by the FHS Green Club helped participants learn about invasive plants. In addition, Stormy the Raindrop from Fairfax County's Stormwater Planning Division, worn throughout the day by Green Club and committee members, engaged children and gave away coloring books and other stormwater educational materials.

For the second year in a row, ESC volunteer Frank Linton's observation hive was a noteworthy and popular draw to the booth. Dr. Linton spent the day educating visitors about the importance of pollinators, including bees, to our environment and food crops. The ESC also provided space for the FHS Green Club whose volunteers helped staff our booth. At the Derby-Q Festival and Fall Festival, the ESC supported the staff liaison with collecting solid waste and recycling data from city residents through a survey.

Backyard Composting
Recycling Guide

The ESC encouraged citizens to sign up for the new City Alert email, text and phone service. The Committee also maintains a page on Facebook as a tool for reaching citizens in addition to the official City website.

City Sustainability Coordinator Stefanie Kupka will be developing and launching a web-based Neighborhood and Workplace Sustainability Challenges in cooperation with several cities across the country under an innovative grant award. The challenges will encourage and recognize residents and businesses for being green, healthy and involved in the community. The development of the challenge website and implementation plan is currently in progress.

SCHOOLS

The ESC continued to support the City of Fairfax schools through its liaison with the School Board and its close ties with the Green/ECO Clubs and environmental education efforts in the schools. The ESC supported the schools' educational programs on environmental stewardship, energy efficiencies, technologies and resource protection. As noted earlier, the ESC sponsored the Earth Art show and City students supported the ESC at the Committee's Fall Festival booth.

As a goal to reach out to the next generation of environmentally savvy professionals and leaders, the ESC has included a student liaison from FHS. Also, as a continuation of support to the high school's Advance Placement (AP) Environmental Studies class (Bradley Webster, teacher) the ESC funded a portion of the class project to design and transform one of the school's entrances with rain barrels, composters, native plants and a small garden.

Throughout the year the ESC recognized the City's school's successes with multiple environment-related courses of studies and club activities that met the educational and character building needs of our students. To this end the ESC appreciated our schools' many environmental projects, awards and achievements including; the Virginia Naturally school award, national and regional environment related competitions in urban forestry, watershed conservation, and environmental protection and technologies (placing first, second and fifth in these competitions), and an invitation to the White House as part of an environmental education conference. The school district itself was again recognized as a leader in environmental practices by the Virginia School Boards Association (VSBA) 2015 Green Schools Challenge for all Virginia School Divisions with less than 5000 students. The Green Schools Challenge is a friendly competition designed to encourage implementation of specific environmental policies and practical actions that reduce carbon emissions.

The ESC would like to recognize that Ms. Faiza Alam, a Lanier Middle School science teacher and Lanier students were invited to the White House last August by invitation as part of their Climate Education and Literacy Initiative. The invitation was extended based on Lanier's record of environmental projects and competitions.

Finally, in an effort to provide incentive and a modest level of resources for student initiatives, the ESC provided funding to school efforts and investigated the introduction of small grants.

ENERGY EFFICIENCY

The City teamed up with a non-profit, LEAP-VA to offer homeowners low-cost energy home checkups or audits. In 2016, the City will continue to promote LEAP's energy services to residents. The City will also be teaming up with LEAP and the Northern Virginia Regional Commission (NVRC) to participate in the Solarize NOVA program which will take place March 15 through May 15. The Solarize NOVA program offers bulk purchasing discounts and free solar site assessments to homeowners in select communities in Northern Virginia.

STORMWATER MANAGEMENT

The impact of stormwater on our streams, parks and on city coffers remains of utmost concern. The Committee continued its work to both understand and improve awareness in the City of stormwater issues and programs. The ESC used the Fall Festival as an opportunity to increase awareness about the impact citizens have on stream health through proper disposal of pet waste and use of low impact design methods, such as rain barrels and rain gardens, on their property. The city will be hosting a rain barrel workshop on April 16, 2016.

In May 2015, an ESC member attended a two-day Virginia Department of Environmental Quality (DEQ) stormwater management course. Insights from that course on Stormwater Best Management Practices (BMPs) were shared with committee members during a presentation at regular ESC meeting. Participation in this course significantly increased the knowledge and understanding of the Committee on the available BMPs and other strategies to address stormwater management.

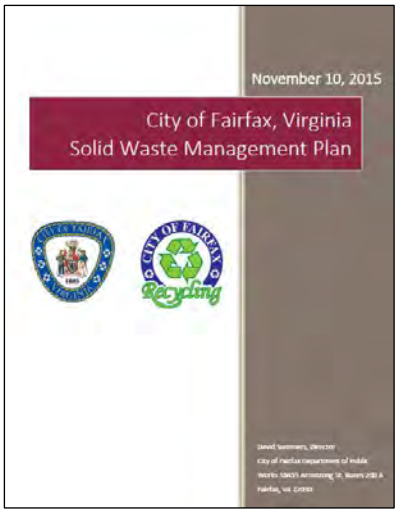
As part of the *Protecting Our Natural Environment* speaker series, Danielle Wynne, from the Fairfax County, Stormwater Planning Division, spoke on the biological health of our streams in May. The scope of her presentation covered the effect of stormwater management on drinking water, biodiversity, green space, recreation/use of water, and property value. We can help out watersheds with structural and non-structural solutions. Fairfax County, uses structural solutions such as stream restoration activities, pond retrofits, and low impact development (rain gardens). Non-structural initiatives include planting of native species.

Developing adequate sources for stormwater funding continues to be a significant challenge for the City. The ESC continued to encourage the City to investigate how other jurisdictions are

funding stormwater management projects and total maximum daily load (TMDL) commitments.

RECYCLING AND SOLID WASTE

In 2015, the City of Fairfax contracted Gershman, Brickner & Bratton, Inc. to develop a new Solid Waste Management Plan (SWMP). This effort was managed by our staff liaison, Stefanie Kupka. This Plan will be used to chart a course for administering solid waste programs and policies for the next twenty years. In Virginia, SWMPs have a 20-year planning horizon, and are updated every 5 years through a prescribed process implemented by the VDEQ. VDEQ receives, reviews, and approves the plan documents, and is also a repository of the information. The SWMP was approved by Mayor and City Council on November 10, 2015 and is currently undergoing VDEQ review.



The ESC played a significant role in the development of the SWMP with two of its members on the Solid Waste Management Plan Advisory Committee. In addition, all members of the ESC had the opportunity to provide comment and input to the Draft SWMP. Further, our support of the SWMP and to the Solid Waste and Recycling Coordinator position identified therein was expressed on the record to Mayor and City Council through email and in person. During the course of the SWMP development process, ESC members and residents had the opportunity to visit and tour the Fairfax County I-66 Transfer Station on West Ox Road.

The City distributed a Solid Waste Services Guide and recycling magnet to all residents living in single family homes and townhomes. The guide featured information on all of the City's residential curbside collection services such as recycling, yard waste, large items, hazardous waste, etc. The City also updated the City's website to revise content and improve layout (www.fairfaxva.gov/recycling). The ESC reviewed and provided feedback on the

magnet, guide and website.

In May 2015, when the ESC became aware of the Prescription Medicine Take Back Day sponsored by the City of Fairfax Police Department, we inquired into the management and fate of the collected pharmaceuticals. Specifically, we had concerns regarding the pharmaceutical waste entering wastewater or direct placement into landfills since many common pharmaceuticals are hazardous waste (e.g., Coumadin or warfarin, insulin, nicotine patches) or contain hazardous constituents. It was confirmed that all collected pharmaceuticals were sent to the Covanta facility in Lorton for incineration. The ESC understands this is currently the accepted and appropriate management method for such waste. The ESC plans to include pharmaceutical waste management in future education and outreach efforts.

OTC, Prescription Medicine Drop-Off Set for May 30

Participate in Medicine Take-Back Day by bringing unwanted prescription and over-the-counter medications to the City of Fairfax Police Station, 3730 Old Lee Highway.

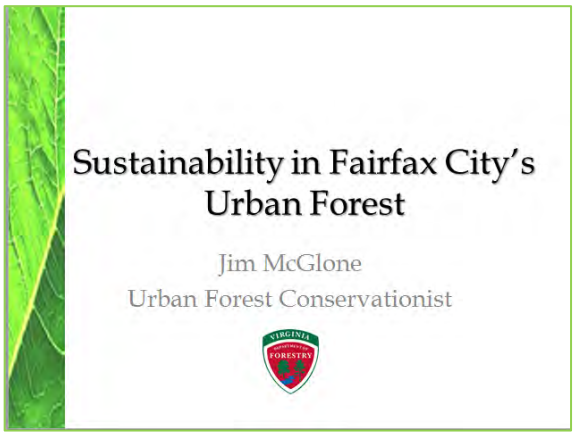
Pills, ointments and liquids in sealed containers will be accepted from 10 a.m. to 2 p.m. May 30 at the police station. Drop-off is anonymous. Information: 703-385-7829.

DEVELOPMENT REVIEW AND COMMENT

The ESC sought and took advantage of the opportunity to review and comment on a proposed redevelopment project in the City. The review process piloted by the committee involved reviewing the Generalized Development Plan (GDP) for the Mantua Professional Center Development Project (The Enclave). The Committee review addressed potential environmental and sustainability issues of the proposed development. Members of the committee met twice to review the GDP, and develop questions and comments for consideration by the city staff, the Mayor and City Council and the developer. Subsequent to the two meetings, committee members conducted further reviews of staff and topical documentation to better address and refine the ESC questions and comments. The committee submitted their comments in September prior to final approval of the developer's plan.

The ESC stands ready to assist in further reviews of future development/redevelopment projects in support of the City's environmental and sustainability goals.

TREES, LAND AND PARK STEWARDSHIP



In March 2015, as part of the *Protecting Our Natural Environment* speaker series, Jim McGlone, Urban Forest Conservationist with the Virginia Department of Forestry, spoke about the many issues that affect urban forests and the benefits from maintaining a health urban forest. Mr. McGlone identified urban forest issues for street trees (e.g., restricted rooting space & compacted soil, equipment damage, road salt, poor architecture, and insects/disease) and park trees (e.g., deer, non-native invasive plants, insects/disease, poor soils, and equipment damage). The use of native trees was identified as being critical to the health of urban forests. The benefits from maintaining health urban forests include: improved air quality, stormwater management, habitats for animals, recycle oxygen, and habitats for people (e.g., lower energy costs, higher property values, stress reduction and better health).

INVASIVE PLANT SPECIES

The issue of invasive plant series was a key area of focus for the ESC in 2015. We had two guest speakers on the subject during the course of the year.

In June 2015, as part of the *Protecting Our Natural Environment* speaker series, Erin Stockschlaeder, an ecologist with the Fairfax County Park Authority, spoke on the benefits of maintaining a health forest and highly diverse forest. Invasive species are harmful to our environment because they result in a loss of biodiversity, impact ecosystem services, affect industry and recreation negatively, and have many undesirable impacts on our parks such as tree death, habitat alteration, and loss of species. They are historically not grown naturally in Fairfax County and out-compete native species. In addition, wildlife (e.g., deer, rabbits) do not eat usually eat them as they are not as nutritious as native plants. Further,

some invasive species change the soil chemistry inhibiting the growth of native plants. Healthy forest can be restored by removing vines from trees, clearing out invasive species by hand, and replanting with natives plant species. Native plants have been growing in Fairfax County historically and are used to competing with other native species. They enhance biodiversity and provide habitat for wildlife.

In September 2015, City resident, Valerie Morgan gave a presentation to the committee on invasive plants in the City. She led the ESC on a tour of the wooded area adjacent to Sherwood Community Center. She identified several common invasive plants and some valuable native plants. She also noted that several trees were endangered due to the presence of English Ivy and other invasive plant species.

PROTECTING OUR NATURAL ENVIRONMENT SPEAKER SERIES

The *Protecting Our Natural Environment* speaker series has been referenced throughout the 2015 Annual Report. The series was undertaken as part of the ESC's outreach and education efforts. The ESC invited the staff, City Council, and the general public through the City Scene, the City alert email system, and word of mouth. The guest speakers provided a wealth of information in short order and gave the ESC and its guests an introduction to the kinds of actions the city can take to protect our natural areas. The speakers were:

- Jim McGlone, Virginia Department of Forestry: *Sustainability in Fairfax City's Urban Forest*
- Danielle Wynne, Fairfax County, Stormwater Planning Division
- Erin Stockschlaeder, Fairfax County Park Authority: *Forest Health and Invasive Plants*

The three speakers provided expertise on trees, streams and plants. We learned that there are many well tested stewardship policies and practices available to the City to improve the functioning of the natural environment even in a highly urbanized setting. We also became aware that the City is behind the curve on appropriate policies and actions that can be pursued at the municipal level.

The ***ESC assessment*** presented below is that the lack of staff time and insufficient funding are the significant hurdles. Further, the ESC concludes that the actions the City takes to meet state and federal mandates are not enough to successfully protect our streams and woods.

- **STAFFING** A relatively small investment in staff time and training can yield large returns.

Staff expertise is critical, and should be accomplished by both in-service education and hiring practices. Some solutions include:

- Well written policies and guidelines can save the City money, both in terms of strategically and wisely using available resources and identifying sources of assistance and funding. Cross departmental staff training in best practices would likely yield great savings over time.
- Volunteers and outside organizations can provide a great deal of free assistance over the long term but a volunteer program will need to be instituted and managed by the City.

- **FUNDING:** In light of the human impacts on urban streams and woods it will be necessary to have ongoing funding to successfully restore and protect our natural areas. Some solutions include:
    - Fairfax County's stormwater service district tax is used for stream care projects (2.5/100 currently with 1/4 penny increase each year going forward for the next five years),
    - State assistance for some of these actions, and
    - Partnering with outside organizations could provide funding and other assistance if there is staff to coordinate with other agencies and organizations.

- **SETTING GOALS:** If the City is going to be a better steward of its natural spaces, we must set goals that go beyond meeting regulatory requirements.
    - Develop an Environmental Strategic Plan that addresses protection, preservation and restoration of our natural areas and tie it into the soon-to-be revised Comprehensive Plan and Citywide policies/guidelines.

The ESC's general observations from the speaker series are as follows:

- Because these issues cross departmental lines there needs to be positive and ongoing interdepartmental coordination.
- Successfully addressing the health and rehabilitation of our natural areas will demand the commitment of permanent staff time. Consultants can be used on an ad hoc basis and volunteers can provide some much needed energy, but these activities require that staff be tasked with these issues in a substantive and permanent manner and develop city policies, performance goals, and periodic public review.
- Partnering and expertise are available to the City on all these issues from State, County and private sources.

CONCLUSION

The Committee members are residents who have volunteered to serve on the ESC in order to help the City improve its environmental sustainability. In its sixth year, the ESC has become better known and more visible throughout the community, but the members see that much greater outreach on issues of the environment and sustainability is needed if the City and its citizens are to become active partners in protecting and supporting our natural resources in the local ecosystem. We look forward to more opportunities to review and comment on proposed development projects in the City. Further, we are excited to support the roll out of the Solid Waste Management Plan upon review and approval by DEQ. As always we will continue to share our insights and raise awareness with regard to stormwater management, solid/recycling, energy efficiency, and other issues and challenges that affect our City's sustainability goals.

The City's sustainability ultimately will rely on proactive leadership and an engaged and informed citizenry. The Committee appreciates input from residents and welcomes all interested parties at ESC meetings. We thank the City Council and Mayor for their continuing support and staff members for their attentiveness to our concerns as we all work together to improve the current and future sustainability of the City and its residents.

2016 WORK PLAN

There are certain key activities inherent in the ESC charter and in consideration of our support to the City's Sustainability Coordinator that will be on our agenda for 2016. These activities involve items that continue to be and will likely always be recurring on our yearly work plan such as support of school environmental programs at all of the City schools, reviewing and commenting on land use and development proposals, and providing recommendations for the General Assembly legislation package (e.g., reduction or elimination of bottled water and plastic shopping bags).

In addition, the ESC expects to be involved in several new activities and initiatives on the City calendar for 2016. The ESC plans to play a role on the Advisory Committee for integrating sustainability into the City Comprehensive Plan. We will support the implementation of the *Workplace and Neighborhood Sustainability Challenges*, *Sustainability Procurement "Playbook"* and *STAR Leading Indicators Pilot Project* grant initiatives. In addition, we plan to support the implementation of Solid Waste Management Plan including the hiring of a Solid Waste and Recycling Coordinator.

In 2016 the ESC plans to address the following environmental and sustainability priorities:

- Increase understanding and awareness of the City's natural resources
- Current and future stormwater management actions and policies
- City adoption and implementation of an invasive plant species management plan
- Identify opportunities to educate citizens on energy, environmental and sustainability issues
- Identify multi-modal transportation opportunities within the City
- Determine impact of VDEQ revised aboveground storage tank regulations on fuel storage tanks in the City
- Support solid waste and recycling program implementation within the City

Appendix B-1c

MCM #1 – 2016 Only Rain NVRC Survey

Northern Virginia Regional Commission

2016 Only Rain NVRC Survey

Summary Report of Findings

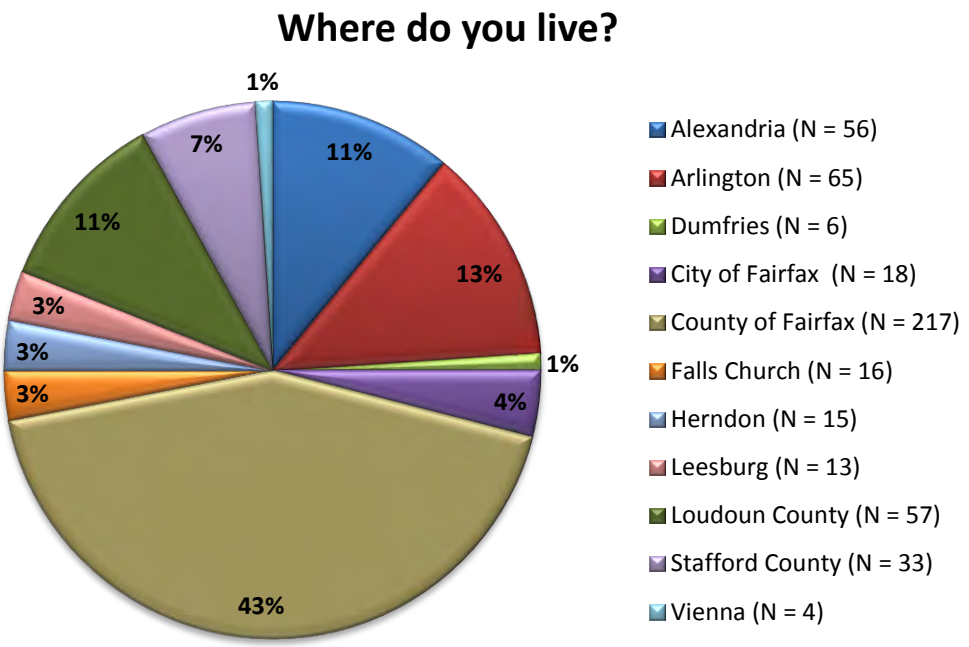
6/15/2016

Amplitude Research, Inc.

Study Methodology & Respondent Characteristics

The Northern Virginia Regional Commission (NVRC) hired Amplitude Research, Inc. to conduct a survey of residents of northern Virginia to measure beliefs and attitudes related to pollution of the Potomac River and Chesapeake Bay.

Amplitude Research administered the study online beginning on May18, 2016. In the end, 500 surveys were completed by web panelists who live in one of the areas of Virginia shown in the chart below. (In the legend, "N =" indicates the number of respondents in each city, county, or town.)

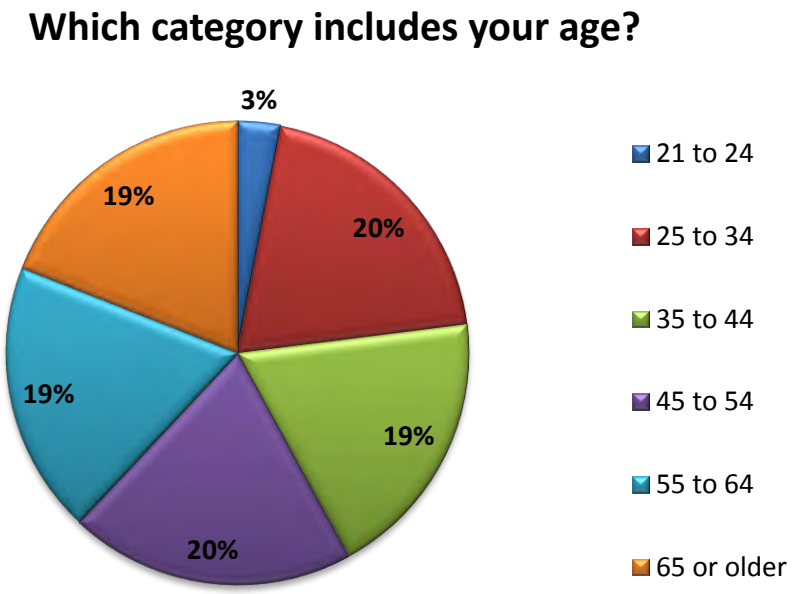


Later in this report, the results for some of the questions are "broken out" by area, in addition to presenting the results for the total sample. However, the specific areas listed above were grouped together into larger areas so that each larger area used for analysis had a reasonable number of respondents.

Residents from Leesburg and Loudoun County were combined into a single category labeled "**Leesburg / Loudoun**," since the town of Leesburg lies within Loudoun County. Another category used for analysis was "**Dumfries / Stafford**," since Dumfries lies just north of Stafford County. Although Dumfries is not located within Stafford County, it is closer to Stafford than to the other counties covered in the survey. (There were too few survey respondents living in Dumfries to examine the results for Dumfries separately.) The City of Fairfax, Falls Church, Herndon, and Vienna were combined with Fairfax County to create the category "**Fairfax Inclusive**," since these cities and towns lie within the Fairfax County area. Although the City of Fairfax and City of Falls Church are distinct areas, their location falls within the larger area circumscribed by Fairfax County.

Alexandria and Arlington each had more than 50 respondents and therefore each of these areas can be examined separately.

The minimum age to participate in the survey was 21. As shown in the chart below, each age group was well represented in the survey. Although a small proportion were age 21 to 24, this category has fewer years than the other categories shown. For analysis purposes later in this report, the categories "21 to 24" and "25 to 34" were combined into the broader category of "21 to 34."



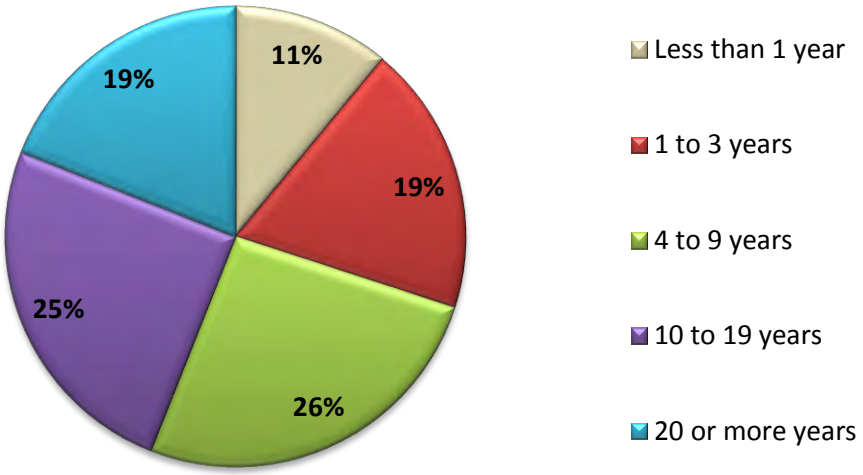
The survey respondents were split between males (48%) and females (52%), while approximately three-fourths (76%) indicated that they own their residence, and 24% reported renting.

The first chart on the next page shows how long respondents have lived in their current residence, and the second chart shows how long they have lived in northern Virginia. On the page after that, results are shown for the type of residence.

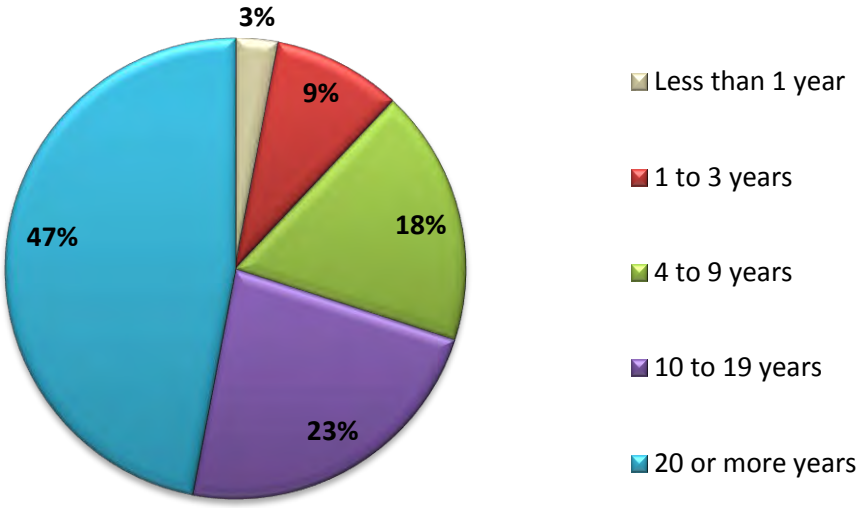
A survey was conducted in each year between 2011 and 2015 that included many of the same or similar questions, targeted the same geographic area, and had a similar demographic mix as in this 2016 study. Later in this report, comparisons between years are shown where appropriate. Initially, the title used for the study was "NVRC Resident Survey." Starting in 2013, the study title was changed to "Only Rain NVRC Survey," since a new question was added about awareness of the "Only Rain" logo.

In 2016, a minimum quota of 8% of the total sample was set for those who are of Hispanic heritage to ensure sufficient representation and to allow analysis of results specifically among Hispanic respondents.

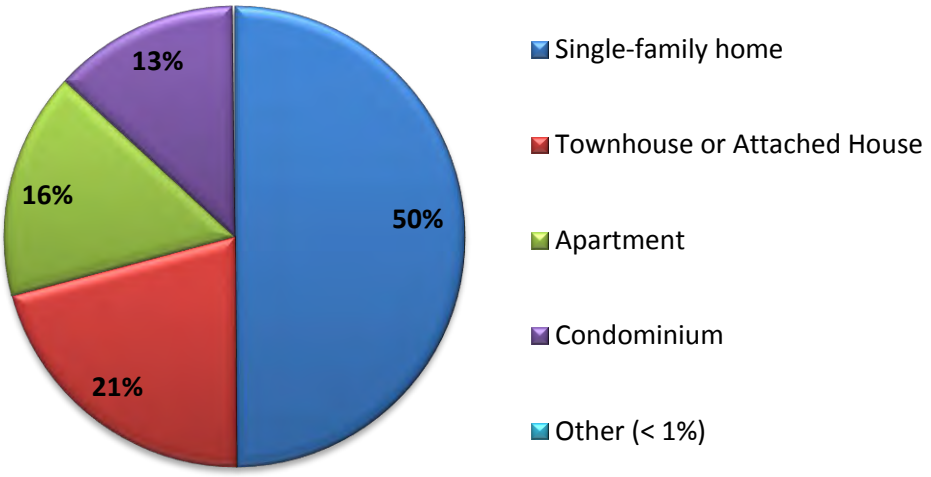
For how many years have you lived in your current residence?



For how many years have you lived in Northern Virginia?



Which of the following best classifies your current residence?



Sampling Variability

While examining the survey findings, it is helpful to keep in mind that the results are based on a sample and are therefore subject to sampling variability, often referred to as "sampling error." The degree of uncertainty for an estimate (e.g., a particular percentage from the survey) arising from sampling variability is represented through the use of a margin of error. A sampling margin of error at the "95% confidence level" can be interpreted as providing a 95% probability that the interval created by the estimate plus and minus the margin of error contains the true value. (The "true" value would be known only if everyone in the target market was surveyed rather than just a sample.) In addition to sampling variability, results may be subject to various sources of non-sampling error (e.g., non-response bias, respondent misinterpretation of question wording, etc.). The degree of non-sampling error is not represented by the sampling margin of error and is usually unknown.

For a "sample size" of 500 survey respondents, the "maximum" margin of sampling error for percentages from the survey is +/- 4.4 percentage points at the 95% confidence level. Here, "maximum" refers to the margin of error being highest for proportions from the survey near 50%, while the margin of error declines as percentages get further from 50%. For example, given the same sample size of 500 respondents, a result from the survey near 10% or 90% would have a margin of sampling error of +/- 2.6 percentage points.

The margin of sampling error increases as the sample size decreases. Thus, when a question is asked of only a subset of the total sample, the associated margin of sampling error is larger than that quoted above. Also, even if a question is asked of all respondents, when examining results for a particular subgroup, the margin of sampling error depends on the number of respondents in that subgroup. For example, the "maximum" margin of sampling error would be +/- 9.8 percentage points at the "95% confidence level" when based on a subgroup of 100 survey respondents. In some parts of this report, results are shown for subgroups that include a fairly small number of respondents, and caution is recommended when thinking about these findings.

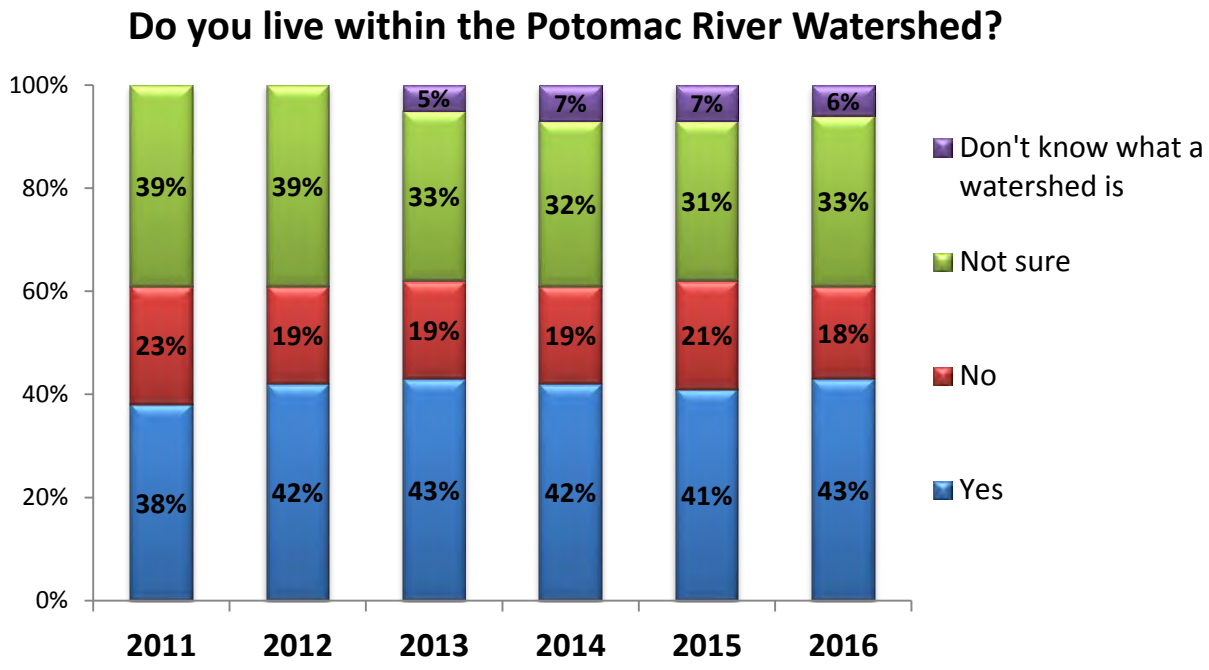
This suggests that results for different subgroups can be considered "similar" when the differences are small (i.e., small enough to be within the range of sampling error).

Results from different years can be considered similar when differences between the years are small. If the difference between two years is referred to as "statistically significant," this essentially means that the difference in the survey results is large enough to be highly confident (i.e., at the "95% confidence level") that there has been a real change. That is, a "statistically significant" difference in the survey results from one year to the next is larger than what would usually be expected from sampling error alone.

In this report, when a result from 2016 is described as "significantly" higher (or lower) than the result from a previous year, this means that the difference between these years is "statistically significant." Also, when one subgroup is described as "more likely" (or "less likely") than another subgroup to answer in a particular way, this is based on a statistically significant difference.

Potomac River Watershed

- Early in the survey, respondents were asked if they lived within the "Potomac River Watershed." As shown in the chart below, slightly more than four-in-ten (43%) in 2016 believed that they did in fact live within the Potomac River Watershed. Similar proportions held this belief in previous years.



- Nearly four-in-ten each year were not sure if they lived within the Potomac River Watershed or did not know what a watershed is. (The response option "I do not know what a watershed is" was first added in the 2013 survey.)

- When breaking the results out by area, as shown in the table below, four-in-ten or more in each area believed that they live in the Potomac River Watershed.

Live Within Potomac River Watershed	**Alexandria**	**Arlington**	**Fairfax Inclusive**	**Leesburg / Loudoun**	**Dumfries / Stafford**
Yes	55%	46%	40%	40%	46%
No	13%	3%	21%	18%	28%
Not sure	30%	45%	32%	36%	23%
Don't know what a watershed is	2%	6%	7%	6%	3%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

- As shown in the next table, those who have lived in northern Virginia for 20 or more years were more likely than others to say they live within the Potomac River Watershed.

Live Within Potomac River Watershed	**Have Lived in Northern Virginia < 4 Years**	**4 to 9 Years**	**10 to 19 Years**	**20 or More Years**
Yes	29%	34%	37%	53%
No	8%	22%	23%	17%
Not sure	51%	32%	37%	27%
Don't know what a watershed is	12%	12%	3%	3%
N = number of respondents	*59*	*92*	*115*	*234*

- Those age 65 or older were more likely than others to believe that they live in the Potomac River Watershed.

Live Within Potomac River Watershed	**Age 21 to 34**	**35 to 44**	**45 to 54**	**55 to 64**	**65 +**
Yes	27%	33%	47%	49%	63%
No	21%	23%	15%	25%	6%
Not sure	42%	40%	30%	24%	27%
Don't know what a watershed is	10%	4%	8%	2%	4%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

- When examining the results by other subgroups, males were more likely than females and homeowners were more likely than renters to believe that they live within the Potomac River Watershed. The proportion of Hispanic respondents holding this belief did not differ significantly from others.

Live Within Potomac River Watershed	**Male**	**Female**	**Homeowners**	**Renters**	**Hispanic Respondents**
Yes	54%	33%	47%	29%	38%
No	16%	20%	19%	16%	24%
Not sure	26%	39%	30%	43%	26%
Don't know what a watershed is	4%	8%	4%	12%	12%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

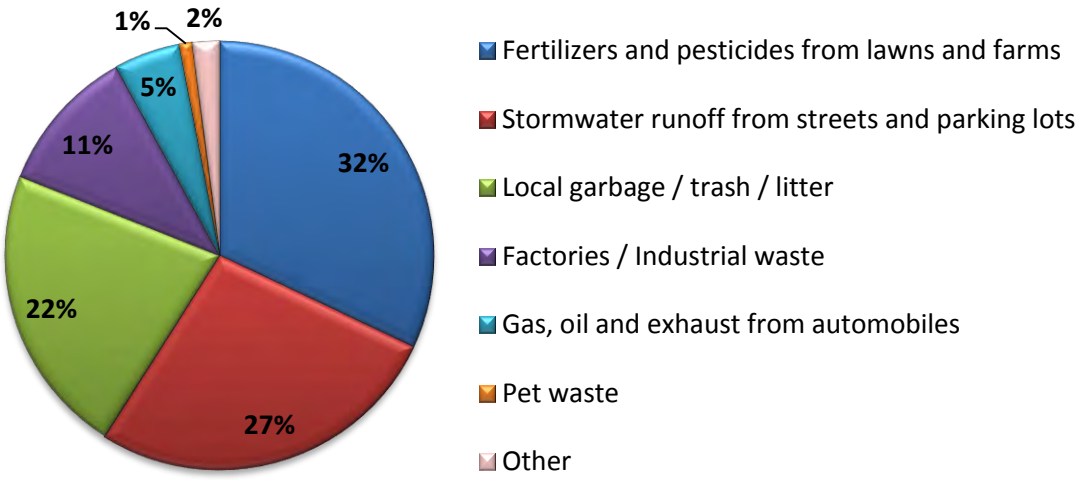
- Those living in an apartment were less likely than others to indicate that they live within the Potomac River Watershed.

Live Within Potomac River Watershed	**Single-family Home**	**Townhouse**	**Apartment**	**Condo**
Yes	50%	43%	26%	35%
No	18%	17%	17%	22%
Not sure	29%	35%	46%	31%
Don't know what a watershed is	3%	5%	11%	12%
N = number of respondents	*249*	*104*	*81*	*65*

Beliefs About Local Water Pollution

- When asked what they thought was the "Number one" cause of pollution in local streams, the Potomac River, and the Chesapeake Bay, the most frequently selected response option was "Fertilizers and pesticides from lawns and farms." A similar question was asked in past years, but there were several wording changes to the response options in the 2016 survey. (However, "Fertilizers and pesticides from lawns and farms" was still the option selected most often in previous years.)

What do you think is the number one cause of pollution in local streams, the Potomac River, and the Chesapeake Bay?



- The second most often selected cause was "Stormwater runoff from streets and parking lots."

- Tables on the next page (and following pages) show the results broken out by various subgroups of the total sample. For example, those who have lived in northern Virginia for 10 or more years, those age 65 or older, homeowners, males, and non-Hispanics were more likely than others to select fertilizers and pesticides from lawns and farms.

Believed #1 Cause of Local Water Pollution	**Alexandria**	**Arlington**	**Fairfax Inclusive**	**Leesburg / Loudoun**	**Dumfries / Stafford**
Fertilizers and pesticides from lawns and farms	32%	29%	33%	29%	28%
Stormwater runoff from streets and parking lots	27%	32%	29%	21%	21%
Local garbage / trash / litter	14%	19%	22%	26%	28%
Factories / Industrial waste	16%	9%	10%	11%	8%
Gas, oil and exhaust from automobiles	11%	6%	3%	6%	10%
Pet waste	0%	0%	2%	0%	0%
Other	0%	5%	1%	7%	5%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

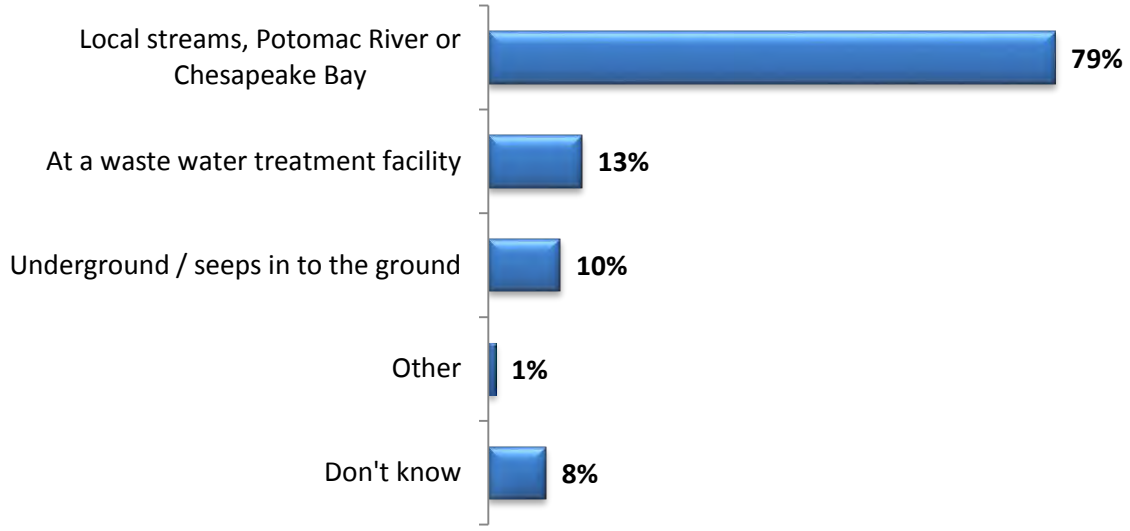
Believed #1 Cause of Local Water Pollution	**Have Lived in Northern Virginia < 4 Years**	**4 to 9 Years**	**10 to 19 Years**	**20 or More Years**
Fertilizers and pesticides from lawns and farms	20%	16%	33%	40%
Stormwater runoff from streets and parking lots	25%	31%	27%	27%
Local garbage / trash / litter	19%	29%	18%	21%
Factories / Industrial waste	24%	12%	13%	5%
Gas, oil and exhaust from automobiles	7%	10%	6%	3%
Pet waste	2%	0%	0%	2%
Other	3%	2%	3%	2%
N = number of respondents	*59*	*92*	*115*	*234*

Believed #1 Cause of Local Water Pollution	**Age 21 to 34**	**35 to 44**	**45 to 54**	**55 to 64**	**65 +**
Fertilizers and pesticides from lawns and farms	18%	20%	36%	34%	52%
Stormwater runoff from streets and parking lots	13%	34%	36%	30%	27%
Local garbage / trash / litter	38%	24%	15%	17%	12%
Factories / Industrial waste	17%	14%	6%	12%	3%
Gas, oil and exhaust from automobiles	12%	6%	4%	3%	0%
Pet waste	2%	0%	1%	2%	0%
Other	0%	2%	2%	2%	6%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

Believed #1 Cause of Local Water Pollution	**Male**	**Female**	**Homeowners**	**Renters**	**Hispanic Respondents**
Fertilizers and pesticides from lawns and farms	37%	27%	35%	22%	16%
Stormwater runoff from streets and parking lots	32%	23%	27%	29%	12%
Local garbage / trash / litter	16%	26%	20%	27%	28%
Factories / Industrial waste	8%	13%	10%	14%	26%
Gas, oil and exhaust from automobiles	3%	8%	5%	6%	14%
Pet waste	0%	2%	1%	0%	0%
Other	4%	1%	2%	2%	4%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

Believed #1 Cause of Local Water Pollution	**Single-family Home**	**Townhouse**	**Apartment**	**Condo**
Fertilizers and pesticides from lawns and farms	37%	28%	21%	29%
Stormwater runoff from streets and parking lots	28%	25%	29%	26%
Local garbage / trash / litter	17%	28%	29%	20%
Factories / Industrial waste	9%	12%	12%	13%
Gas, oil and exhaust from automobiles	6%	3%	7%	6%
Pet waste	1%	0%	0%	3%
Other	2%	4%	2%	3%
N = number of respondents	*249*	*104*	*81*	*65*

"Stormwater" runoff is rain or other water that flows into the street, along the gutter and into the storm drain. To the best of your knowledge, where do you believe storm water eventually ends up?



- "Local streams, Potomac River or Chesapeake Bay" was selected most often as where stormwater is believed to end up. In previous years, this response option was shown as two options with "Local streams" separate, so the 2016 results are not comparable to the past for this question. Results by various subgroups are shown below and on the next page. For example, males and homeowners were more likely than others to select the top response, while those under age 35, those living in the area for less than four years, and those of Hispanic heritage were less likely than others to select this response.

Believed Destination of Stormwater	**Alexandria**	**Arlington**	**Fairfax Inclusive**	**Leesburg / Loudoun**	**Dumfries / Stafford**
Local streams, Potomac River or Chesapeake Bay	86%	75%	78%	73%	90%
Underground / seeps in to the ground	16%	11%	9%	14%	8%
At a waste water treatment facility	7%	14%	13%	14%	15%
Don't know / other	4%	9%	11%	7%	3%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

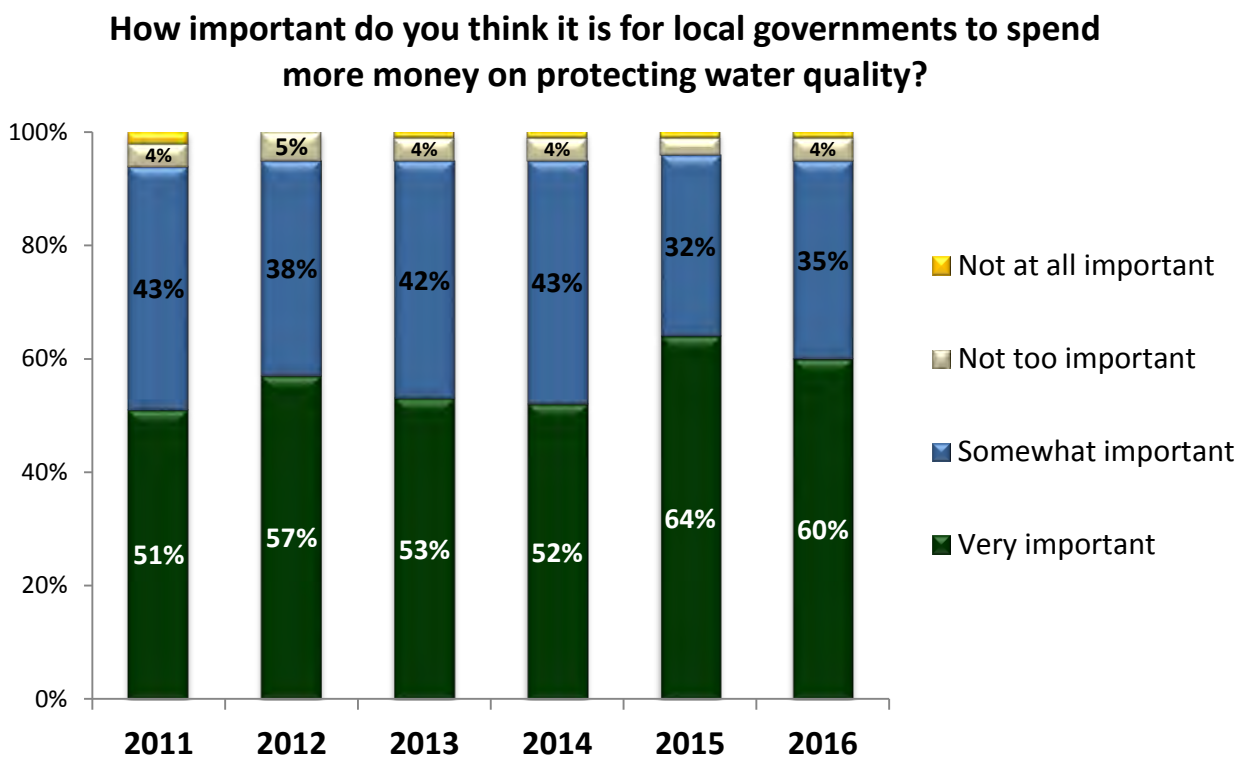
Believed Destination of Stormwater	Have Lived in Northern Virginia < 4 Years	4 to 9 Years	10 to 19 Years	20 or More Years
Local streams, Potomac River or Chesapeake Bay	61%	82%	77%	82%
Underground / seeps in to the ground	12%	14%	10%	9%
At a waste water treatment facility	24%	13%	12%	11%
Don't know / other	15%	7%	10%	8%
N = number of respondents	*59*	*92*	*115*	*234*

Believed Destination of Stormwater	Age 21 to 34	35 to 44	45 to 54	55 to 64	65 +
Local streams, Potomac River or Chesapeake Bay	66%	82%	83%	79%	86%
Underground / seeps in to the ground	18%	10%	10%	11%	2%
At a waste water treatment facility	24%	13%	12%	7%	6%
Don't know / other	11%	9%	9%	10%	6%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

Believed Destination of Stormwater	Male	Female	Homeowners	Renters	Hispanic
Local streams, Potomac River or Chesapeake Bay	83%	75%	82%	69%	64%
Underground / seeps in to the ground	9%	12%	9%	16%	14%
At a waste water treatment facility	11%	15%	9%	24%	32%
Don't know / other	7%	11%	7%	16%	14%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

Believed Destination of Stormwater	**Single-family Home**	**Townhouse**	**Apartment**	**Condo**
Local streams, Potomac River or Chesapeake Bay	80%	84%	65%	83%
Underground / seeps in to the ground	9%	10%	20%	6%
At a waste water treatment facility	10%	13%	26%	8%
Don't know / other	9%	4%	17%	8%
N = number of respondents	*249*	*104*	*81*	*65*

- When asked the question below, the proportion rating "Very important" in 2016 did not differ significantly from 2015, but it was significantly higher than in 2011, 2013, and 2014.



- The majority from each area felt it was "Very important" for local governments to spend more money on protecting water quality.

Importance of Local Water Quality Spending	**Alexandria**	**Arlington**	**Fairfax Inclusive**	**Leesburg / Loudoun**	**Dumfries / Stafford**
Not at all important	0%	1%	1%	0%	2%
Not too important	4%	2%	5%	6%	3%
Somewhat important	34%	40%	35%	36%	28%
Very important	62%	57%	59%	58%	67%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

- In each of the subgroups covered in the tables on the next page, a majority gave a rating of "Very important."

Importance of Local Water Quality Spending	Have Lived in Northern Virginia < 4 Years	4 to 9 Years	10 to 19 Years	20 or More Years
Not at all important	2%	2%	0%	1%
Not too important	5%	4%	4%	4%
Somewhat important	32%	42%	37%	32%
Very important	61%	52%	59%	63%
N = number of respondents	*59*	*92*	*115*	*234*

Importance of Local Water Quality Spending	Age 21 to 34	35 to 44	45 to 54	55 to 64	65 +
Not at all important	2%	1%	0%	2%	1%
Not too important	7%	2%	6%	1%	5%
Somewhat important	40%	43%	27%	34%	30%
Very important	51%	54%	67%	63%	64%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

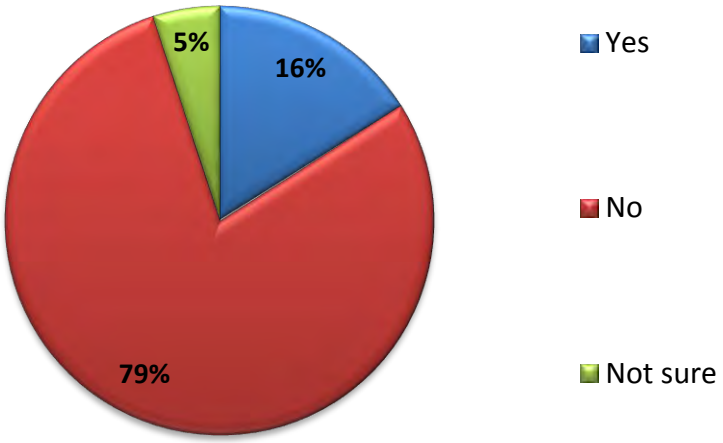
Importance of Local Water Quality Spending	Male	Female	Homeowners	Renters	Hispanic Respondents
Not at all important	2%	0%	1%	1%	2%
Not too important	6%	3%	5%	3%	6%
Somewhat important	30%	40%	36%	32%	20%
Very important	62%	57%	58%	64%	72%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

Importance of Local Water Quality Spending	Single-family Home	Townhouse	Apartment	Condo
Not at all important	1%	0%	1%	1%
Not too important	6%	5%	1%	2%
Somewhat important	30%	44%	32%	43%
Very important	63%	51%	66%	54%
N = number of respondents	*249*	*104*	*81*	*65*

Advertising

- In 2016, a video of an advertisement featuring "rubber duckies" was presented in the survey, and respondents were asked if they had seen it on TV or the Internet. This is the first year that a video was shown. In 2015, without presenting a video, 9% indicated that they had seen ads on TV or the Internet about reducing water pollution and featuring "rubber duckies." In 2016, as shown below, 16% recalled this ad after watching the video.

Please view the video above. Have you seen this ad, or a similar one on TV or the Internet about reducing water pollution?



- The proportion recalling the ad by area ranged from 9% to 20%. However, the differences between areas were not statistically significant. Results by other subgroups are shown on the next page. For example, those under age 35, males, renters, and those of Hispanic heritage were more likely than others to recall the ad.

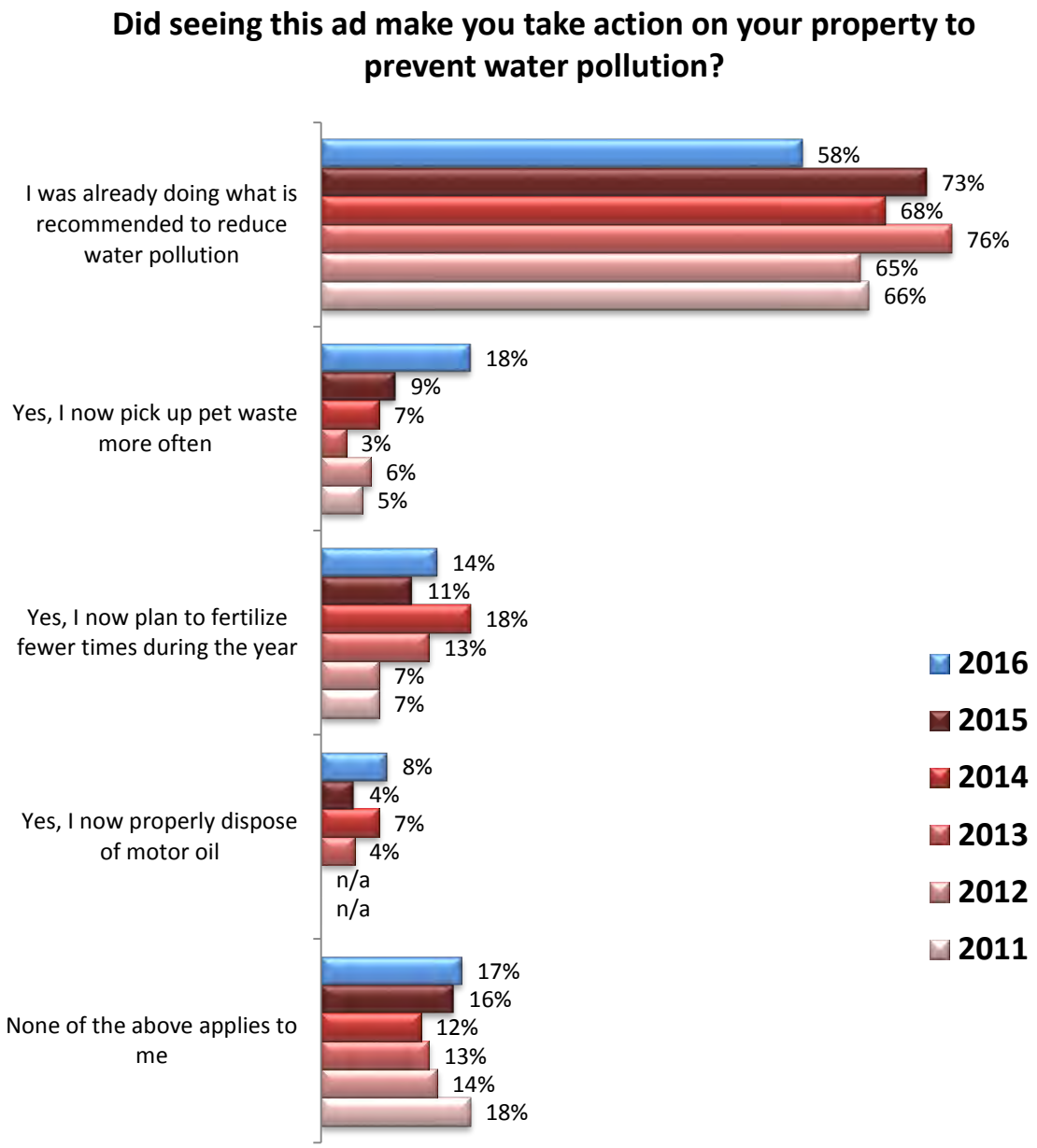
Saw TV / Internet Ads on Reducing Water Pollution	**Alexandria**	**Arlington**	**Fairfax Inclusive**	**Leesburg / Loudoun**	**Dumfries / Stafford**
Yes	20%	9%	16%	14%	18%
No	78%	83%	79%	79%	77%
Not sure	2%	8%	5%	7%	5%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

Saw TV / Internet Ads on Reducing Water Pollution	Have Lived in Northern Virginia < 4 Years	4 to 9 Years	10 to 19 Years	20 or More Years
Yes	14%	22%	17%	13%
No	76%	72%	78%	83%
Not sure	10%	6%	5%	4%
N = number of respondents	*59*	*92*	*115*	*234*

Saw TV / Internet Ads on Reducing Water Pollution	Age 21 to 34	35 to 44	45 to 54	55 to 64	65 +
Yes	25%	12%	17%	10%	12%
No	69%	84%	74%	87%	84%
Not sure	6%	4%	9%	3%	4%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

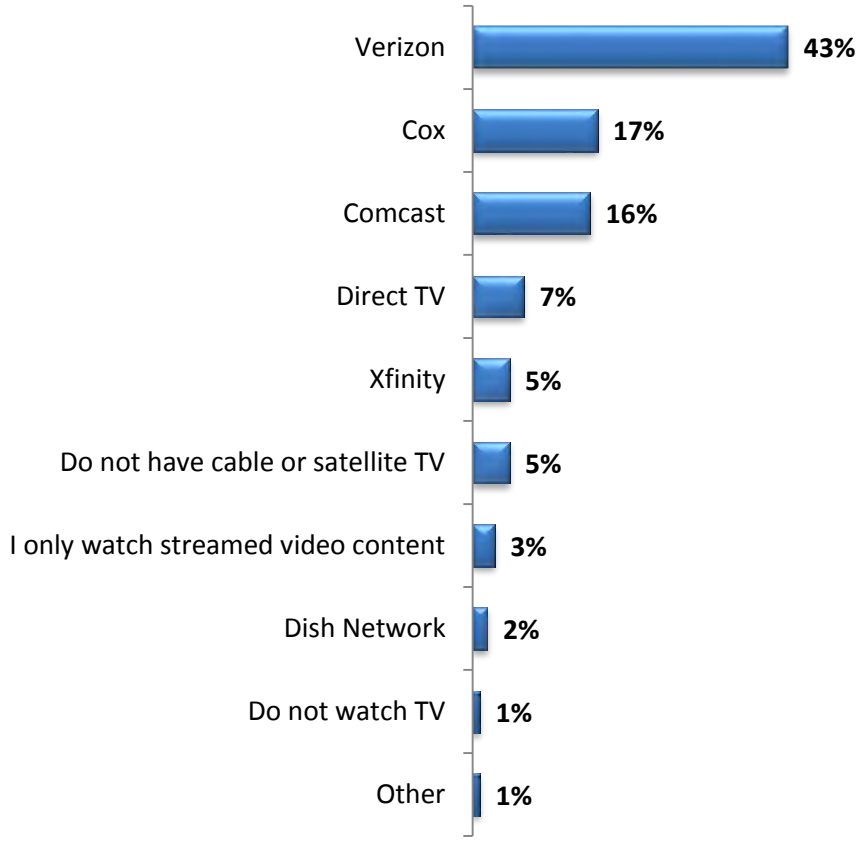
Saw TV / Internet Ads on Reducing Water Pollution	Male	Female	Homeowners	Renters	Hispanic Respondents
Yes	20%	12%	14%	21%	34%
No	75%	82%	81%	74%	60%
Not sure	5%	6%	5%	5%	6%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

Saw TV / Internet Ads on Reducing Water Pollution	Single-family Home	Townhouse	Apartment	Condo
Yes	17%	17%	17%	6%
No	78%	78%	77%	88%
Not sure	5%	5%	6%	6%
N = number of respondents	*249*	*104*	*81*	*65*



- Nearly one-in-five (18%) in 2016 of those who recalled the ad shown in the survey indicated that they now pick up pet waste more often as a result of seeing the ad. This is noticeably higher than in previous years. However, the results from past years are not perfectly comparable to the results from 2016. In previous years, a video was not shown in the survey, and there were slight wording changes in the question about the ad that may have impacted results.

What TV service provider do you use?

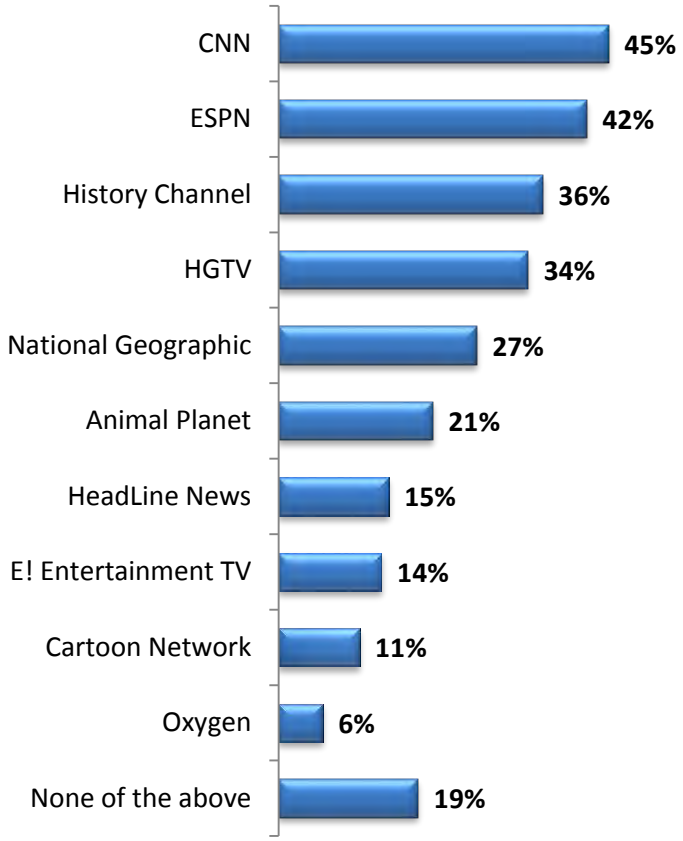


- Verizon was selected most often (by 43%) as their TV service provider.

- Based on a separate analysis (not shown in chart), Verizon had the highest share in four out of five of the areas: 61% in Leesburg / Loudoun, 49% in Fairfax Inclusive, 34% in Arlington, and 33% in Dumfries / Stafford. However, Comcast had the largest share (61%) in Alexandria.

- One reason for adding the question above to the 2016 survey was to determine if recall of the ad differed by TV provider. It turns out that TV recall was similar across providers. When looking at the providers with at least 30 respondents using that provider, the proportion recalling the ad was 17% among Verizon customers, 18% among Cox customers, 16% among Comcast customers, and 14% among Direct TV users.

Which channels have you watched in the past 30 days?



- CNN (45%) was selected most often, followed closely by ESPN (42%), as a channel watched within the past 30 days.

- One reason for adding the question above to the 2016 survey was to determine if recall of the ad differed by channels watched. The two channels that were most strongly associated with recall of the ad were Cartoon Network and Animal Planet. Among those who have watched Cartoon Network within the past 30 days, 38% recalled the ad that was shown in the survey, while 32% of those who have watched Animal Planet recalled the ad.

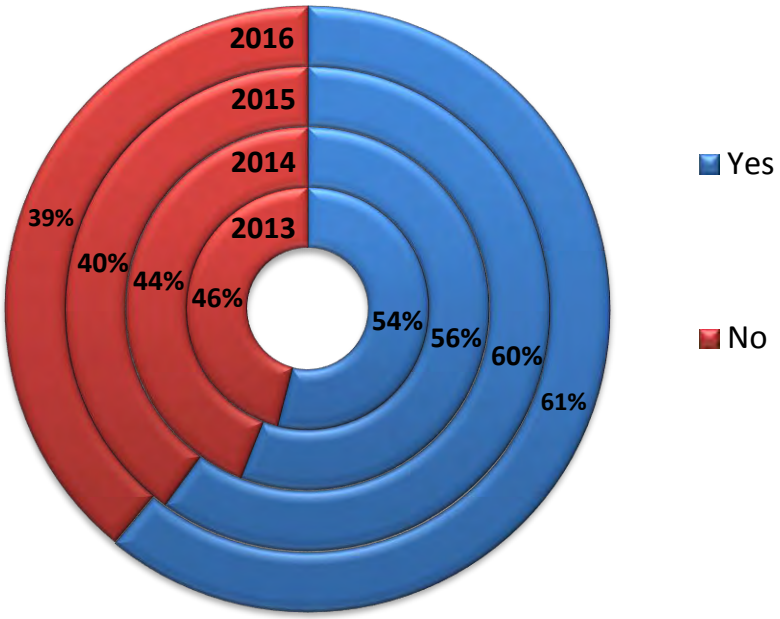
- For several channels, recall of the ad among those who have watched within 30 days was 20% or slightly higher: National Geographic (23% of watchers recalled the ad), CNN (21%), HeadLine News (21%), History Channel (21%), ESPN (20%).

- However, those who watched E!, HGTV, and/or Oxygen were not significantly more likely than others to recall the ad.

- Among those who watched *none* of the channels above, only 4% recalled the ad.

- The logo below was shown to all respondents in 2013, 2014, 2015, and 2016 regardless of whether they had seen advertising or not, and more than half of the total sample recognized the logo. The difference between 61% in 2016 and 54% in 2013 was statistically significant. However, the 2016 result did not differ significantly compared to 2015 and 2014.

Have you ever seen the logo above anywhere?



- Results for the question above in 2016 by subgroup are shown on the next page. Interestingly, awareness was significantly lower in Dumfries / Stafford. This was the case last year as well, and this suggests that there is room for increasing awareness in this area.

Have Seen Logo	Alexandria	Arlington	Fairfax Inclusive	Leesburg / Loudoun	Dumfries / Stafford
Yes	75%	68%	61%	61%	31%
No	25%	32%	39%	39%	69%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

Have Seen Logo	Have Lived in Northern Virginia < 4 Years	4 to 9 Years	10 to 19 Years	20 or More Years
Yes	53%	61%	63%	63%
No	47%	39%	37%	37%
N = number of respondents	*59*	*92*	*115*	*234*

Have Seen Logo	Age 21 to 34	35 to 44	45 to 54	55 to 64	65 +
Yes	62%	61%	71%	62%	50%
No	38%	39%	29%	38%	50%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

Have Seen Logo	Male	Female	Homeowners	Renters	Hispanic Respondents
Yes	60%	62%	62%	60%	58%
No	40%	38%	38%	40%	42%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

Have Seen Logo	Single-family Home	Townhouse	Apartment	Condo
Yes	64%	68%	54%	49%
No	36%	32%	46%	51%
N = number of respondents	*249*	*104*	*81*	*65*

Protecting Clean Water

- In a new question added in 2016, four-in-ten (40%) of the respondents felt they were most prevented from taking action to protect clean water because they didn't know what to do. Nearly four-in-ten (38%) felt nothing prevents them.

- Females, renters, and those age 35 to 44 were more likely than others to select "I don't know what to do." Those age 45 and older, those living in the area 20 or more years, and homeowners were more likely than others to select "Nothing / I do take action to protect clean water."

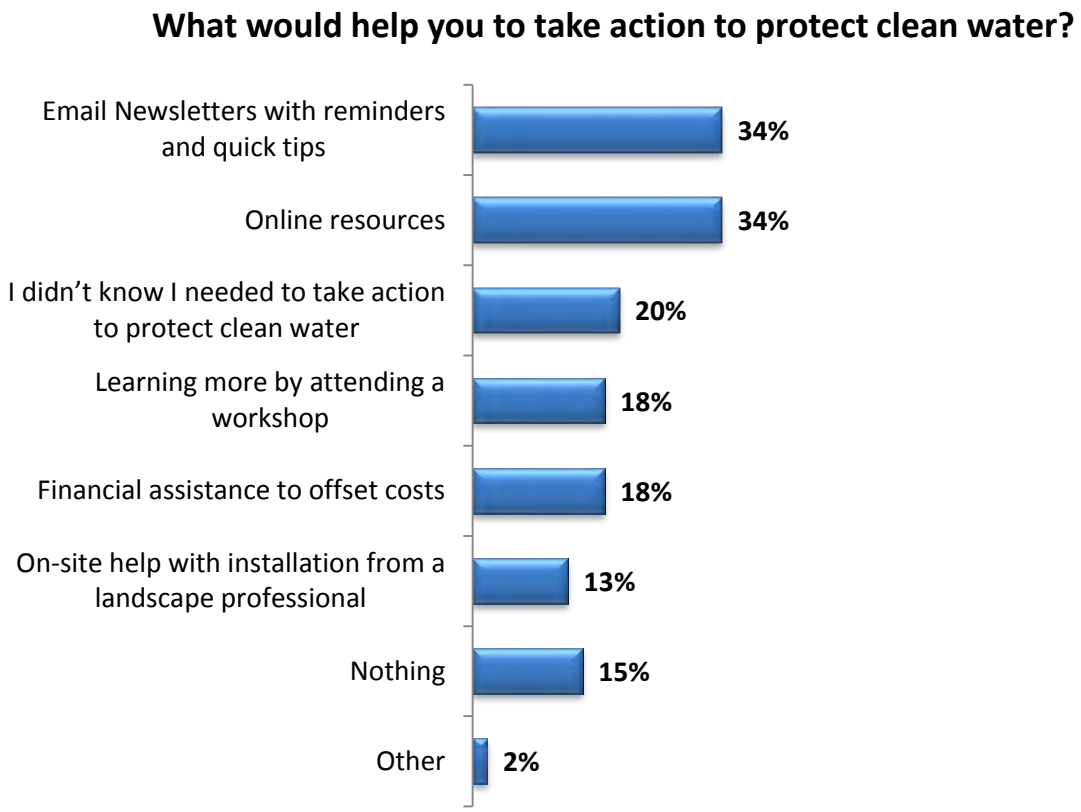
Most Prevents Action	**Alexandria**	**Arlington**	**Fairfax Inclusive**	**Leesburg / Loudoun**	**Dumfries / Stafford**
I don't know what to do	43%	46%	41%	39%	33%
Nothing	37%	41%	38%	37%	31%
I don't have the time	5%	6%	5%	4%	13%
Won't make a difference	2%	5%	6%	7%	5%
It's not important to me	4%	2%	3%	3%	5%
Too expensive	4%	0%	2%	6%	5%
Physical limitations	4%	0%	3%	3%	5%
Other	1%	0%	2%	1%	3%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

Most Prevents Action	Have Lived in Northern Virginia < 4 Years	4 to 9 Years	10 to 19 Years	20 or More Years
I don't know what to do	53%	40%	42%	37%
Nothing	27%	29%	36%	45%
I don't have the time	7%	10%	7%	3%
Won't make a difference	5%	7%	7%	4%
It's not important to me	3%	2%	1%	5%
Too expensive	3%	8%	3%	0%
Physical limitations	2%	3%	2%	3%
Other	0%	1%	2%	3%
N = number of respondents	*59*	*92*	*115*	*234*

Most Prevents Action	Age 21 to 34	35 to 44	45 to 54	55 to 64	65 +
I don't know what to do	43%	57%	41%	33%	30%
Nothing	25%	23%	41%	50%	51%
I don't have the time	10%	10%	3%	6%	1%
Won't make a difference	6%	3%	8%	3%	7%
It's not important to me	4%	2%	2%	4%	3%
Too expensive	6%	2%	2%	2%	0%
Physical limitations	5%	2%	1%	2%	3%
Other	1%	1%	2%	0%	5%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

Most Prevents Action	Male	Female	Homeowners	Renters	Hispanic Respondents
I don't know what to do	32%	48%	38%	50%	38%
Nothing	41%	35%	42%	24%	30%
I don't have the time	5%	6%	4%	10%	14%
Won't make a difference	8%	3%	5%	7%	2%
It's not important to me	5%	2%	4%	2%	2%
Too expensive	3%	3%	2%	3%	6%
Physical limitations	4%	2%	3%	3%	6%
Other	2%	1%	2%	1%	2%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

Most Prevents Action	**Single-family Home**	**Townhouse**	**Apartment**	**Condo**
I don't know what to do	33%	44%	49%	52%
Nothing	44%	36%	27%	31%
I don't have the time	6%	7%	5%	5%
Won't make a difference	5%	2%	10%	6%
It's not important to me	4%	4%	1%	2%
Too expensive	4%	1%	4%	0%
Physical limitations	2%	5%	3%	3%
Other	2%	1%	1%	1%
N = number of respondents	*249*	*104*	*81*	*65*



- In another new question added in 2016, approximately one-third (34%) indicated that email newsletters with reminders and quick tips and/or online resources would help them take action to protect clean water.

- Results by subgroup are shown on the following pages. For example, those who have lived in the area for less than 4 years were more likely than others to select "Learning more by attending a workshop." Those under age 45 were more likely than others to indicate that financial assistance to offset costs would help them take action. Females were more likely than males to select online resources, while males were more likely than females to indicate that nothing would help them take action. Also, those age 65 and older were more likely than others to say nothing would help them take action. When looking at the results by area, those living in Alexandria were less likely than others to indicate that they didn't know that they needed to take action to protect clean water.

Help Take Action	Alexandria	Arlington	Fairfax Inclusive	Leesburg / Loudoun	Dumfries / Stafford
Email Newsletters with reminders and quick tips	46%	34%	31%	37%	31%
Online resources	36%	38%	31%	33%	41%
I didn't know I needed to take action to protect clean water	5%	26%	22%	17%	26%
Learning more by attending a workshop	23%	14%	19%	16%	18%
Financial assistance to offset costs	20%	22%	16%	19%	21%
On-site help with installation from a landscape professional	16%	12%	12%	13%	18%
Other	9%	0%	2%	3%	0%
Nothing	7%	17%	17%	14%	15%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

Help Take Action	Have Lived in Northern Virginia < 4 Years	4 to 9 Years	10 to 19 Years	20 or More Years
Email Newsletters with reminders and quick tips	37%	35%	31%	34%
Online resources	42%	32%	34%	32%
I didn't know I needed to take action to protect clean water	20%	21%	21%	20%
Learning more by attending a workshop	32%	20%	15%	16%
Financial assistance to offset costs	25%	23%	14%	15%
On-site help with installation from a landscape professional	19%	14%	16%	10%
Other	3%	3%	3%	2%
Nothing	10%	16%	10%	19%
N = number of respondents	*59*	*92*	*115*	*234*

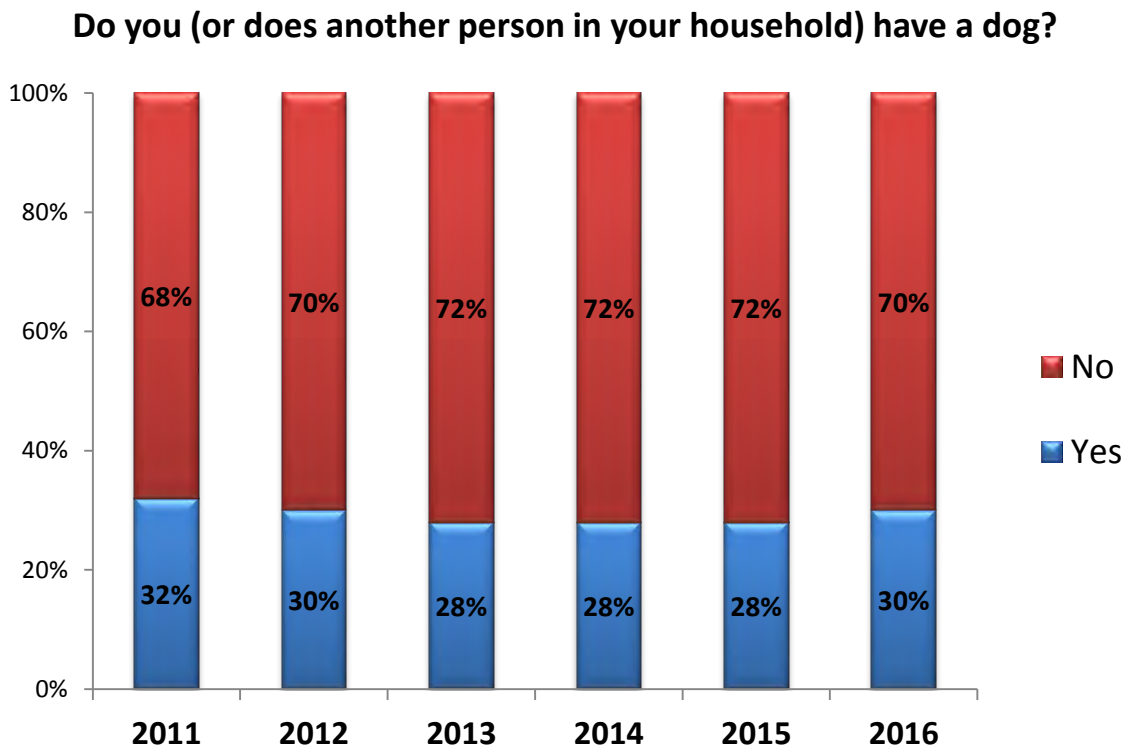
Help Take Action	Age 21 to 34	35 to 44	45 to 54	55 to 64	65 +
Email Newsletters with reminders and quick tips	33%	34%	37%	36%	29%
Online resources	37%	38%	31%	39%	22%
I didn't know I needed to take action to protect clean water	27%	23%	21%	14%	15%
Learning more by attending a workshop	26%	17%	17%	17%	13%
Financial assistance to offset costs	28%	27%	14%	12%	6%
On-site help with installation from a landscape professional	19%	16%	14%	9%	6%
Other	2%	1%	5%	0%	4%
Nothing	10%	6%	10%	18%	34%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

Help Take Action	Male	Female	Homeowners	Renters	Hispanic Respondents
Email Newsletters with reminders and quick tips	32%	35%	34%	35%	32%
Online resources	27%	40%	31%	40%	26%
I didn't know I needed to take action to protect clean water	18%	22%	20%	23%	20%
Learning more by attending a workshop	16%	20%	17%	23%	26%
Financial assistance to offset costs	16%	19%	16%	21%	16%
On-site help with installation from a landscape professional	12%	14%	13%	14%	16%
Other	3%	2%	3%	2%	8%
Nothing	21%	10%	16%	12%	12%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

Help Take Action	**Single-family Home**	**Townhouse**	**Apartment**	**Condo**
Email Newsletters with reminders and quick tips	30%	41%	40%	31%
Online resources	32%	33%	44%	29%
I didn't know I needed to take action to protect clean water	19%	25%	21%	17%
Learning more by attending a workshop	17%	19%	20%	22%
Financial assistance to offset costs	17%	20%	21%	12%
On-site help with installation from a landscape professional	14%	13%	16%	3%
Other	2%	3%	2%	3%
Nothing	17%	11%	10%	22%
N = number of respondents	*249*	*104*	*81*	*65*

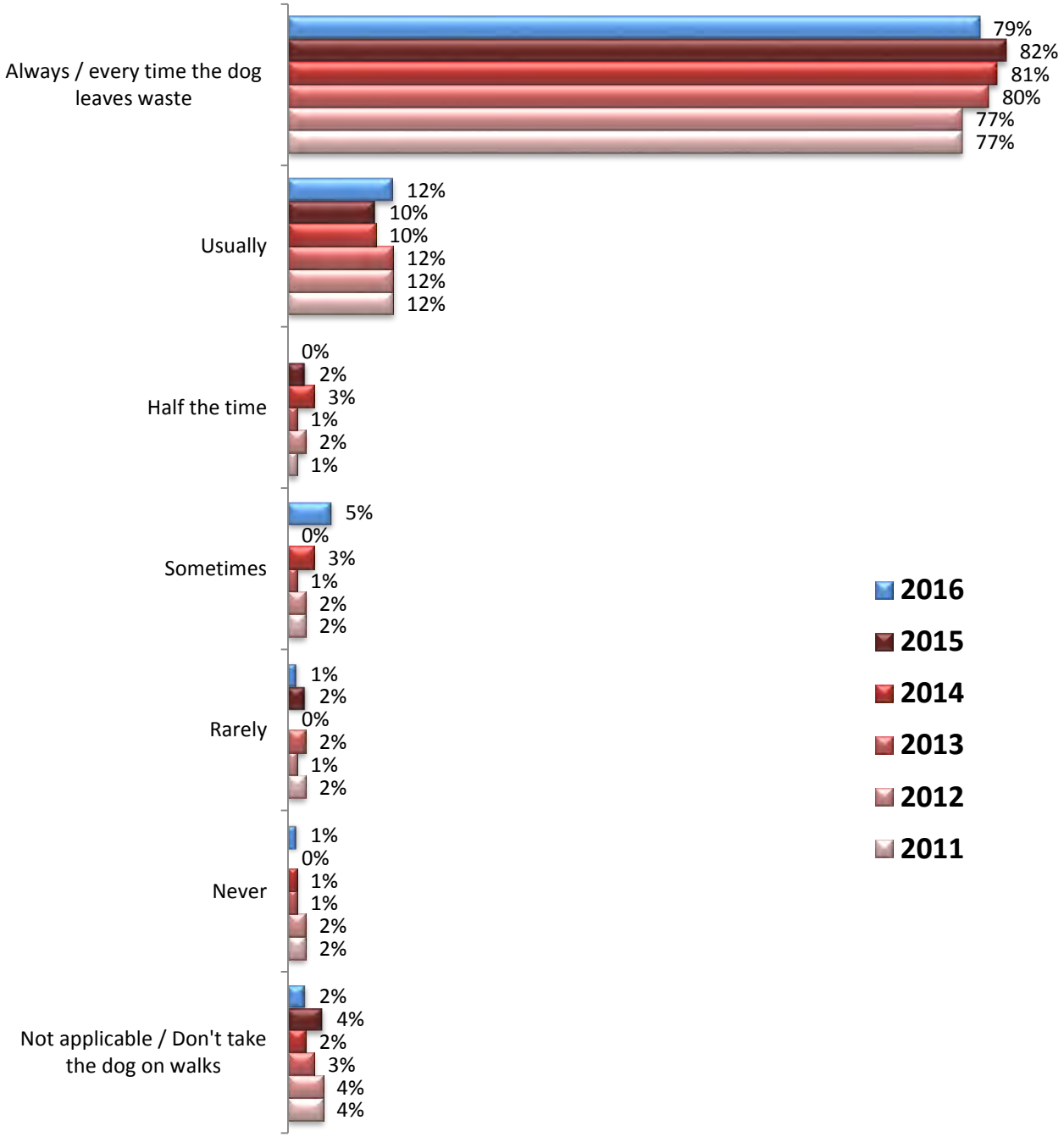
Behavior Among Dog Owners

- More than one-fourth each year indicated that they have a dog (or someone else in their household has a dog).



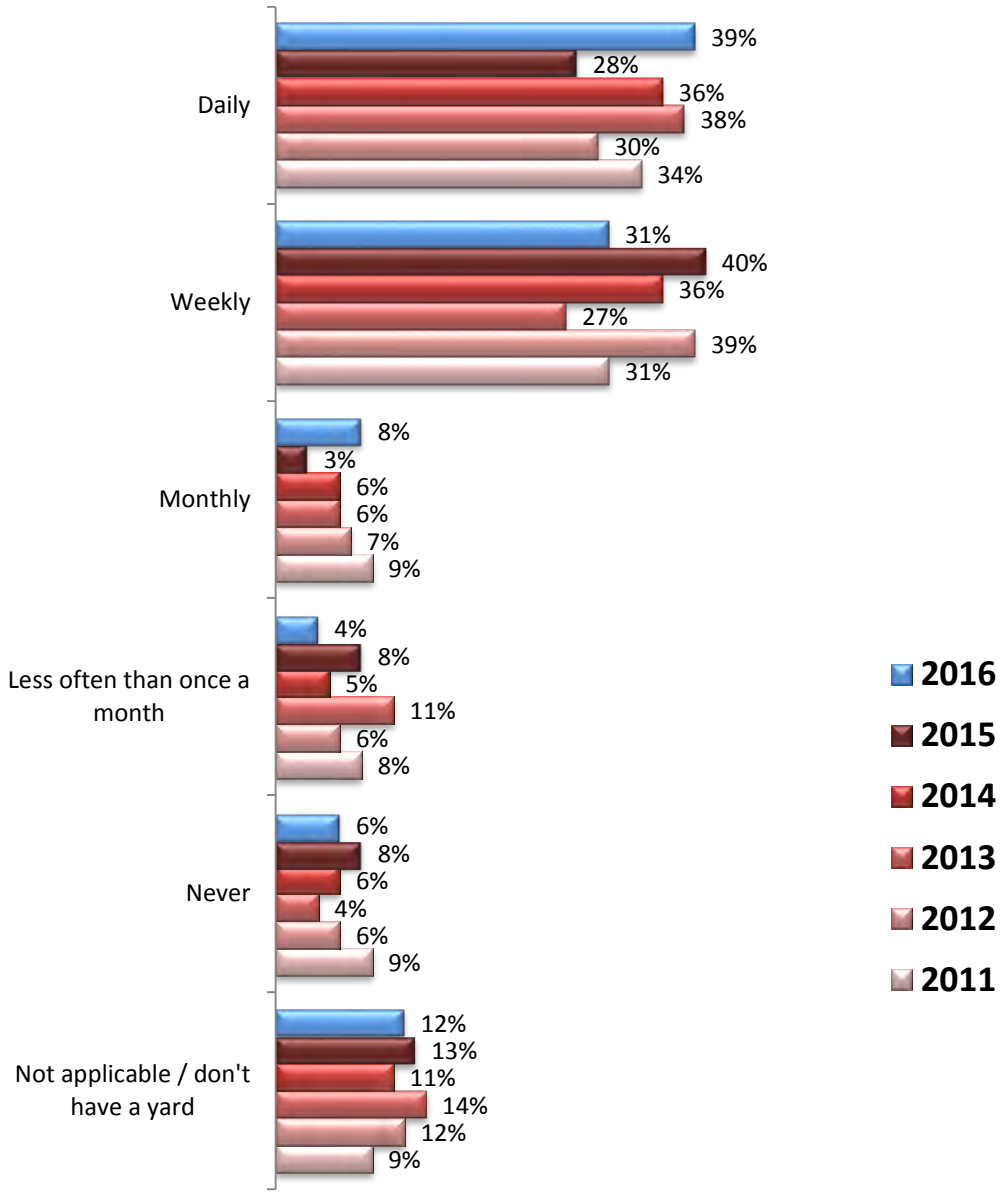
- On the following pages, results are shown for questions about how often dog owners pick up after their dogs and what motivates them to do so.

When taking your dog(s) for a walk, how often do you pick up after your dog(s)?

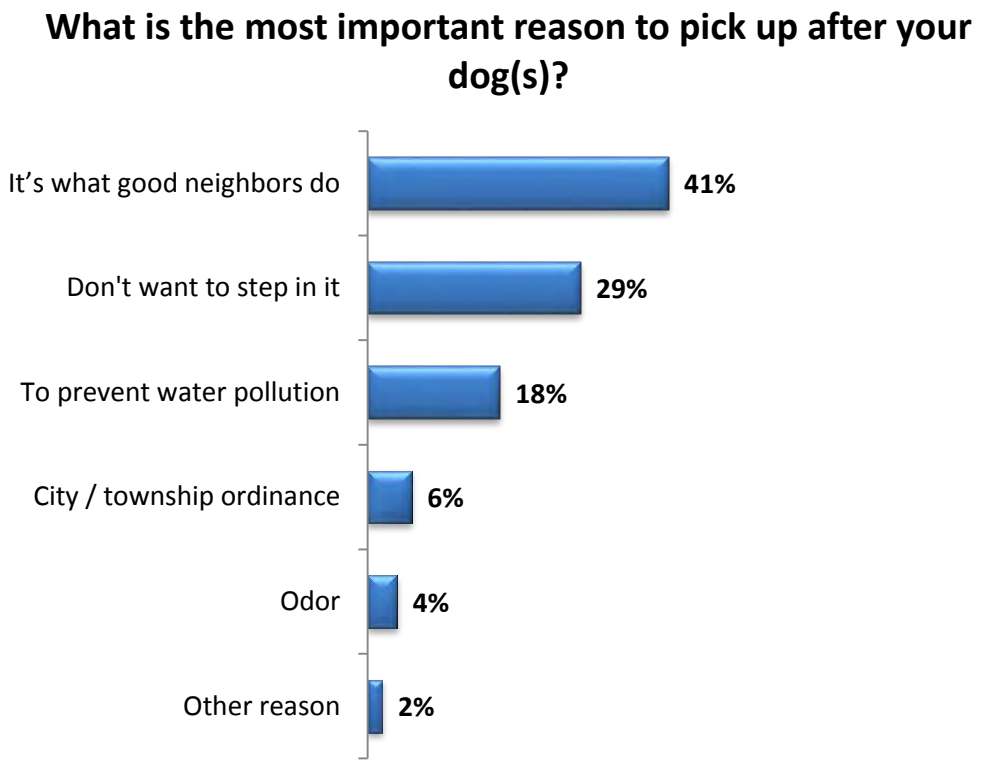


- Nearly eight-in-ten (79%) in 2016 indicated that they *always* pick up after their dog(s) when taking the dog(s) for a walk.

How often do you (or does someone else from your household) remove dog waste from your yard?

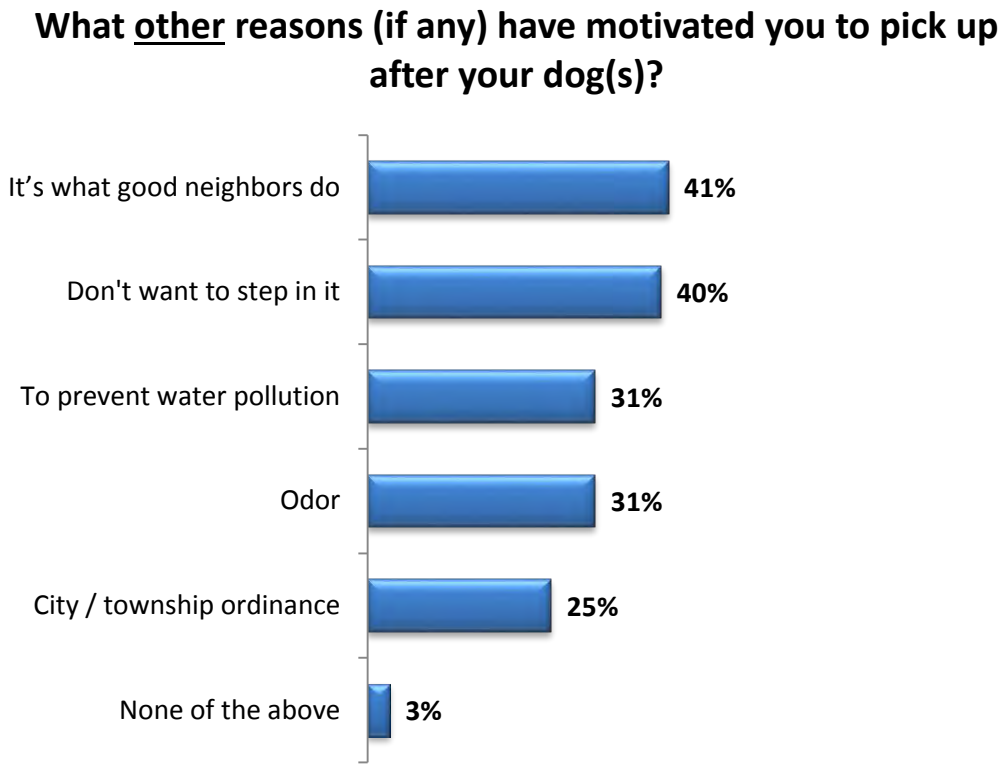


- In their own yard, the majority removed pet waste daily or weekly.
- There was some fluctuation from year to year in the proportions reporting daily and weekly removal of dog waste from their yard, but recall that this question was asked only of dog owners, and the sample size of dog owners is lower than the total sample size, while the margin of error is higher for a lower sample size.

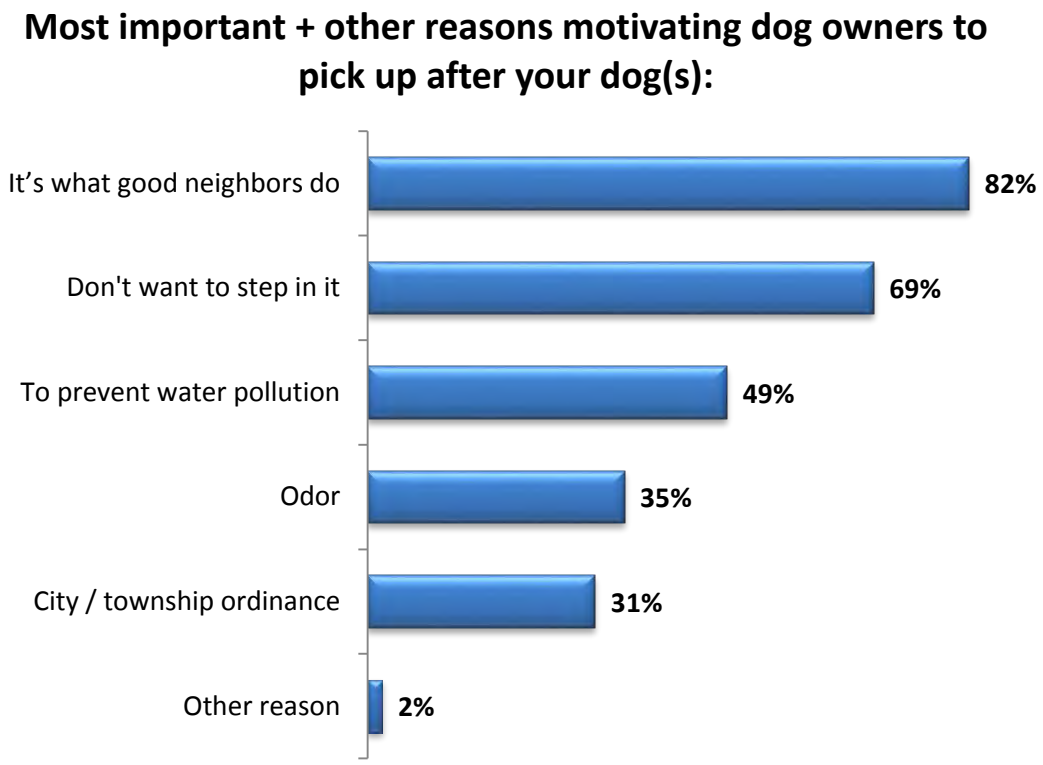


- When asked about the "Most important reason" for picking up after their dog(s), four-in-ten (41%) selected "It's what good neighbors do." Although a similar question was asked in previous years, comparisons to the past would not be valid due to changes to the response options in the 2016 survey.

- Nearly one-in-five (18%) selected "To prevent water pollution" as the most important reason for picking up after their dog.



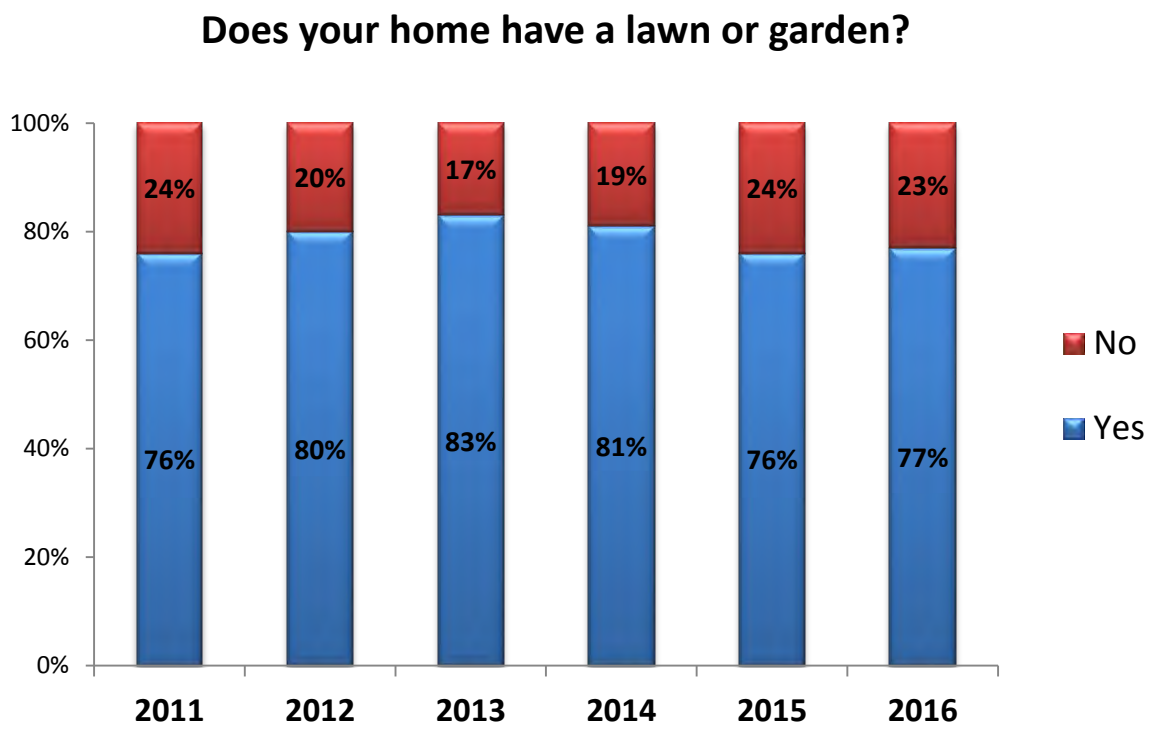
- In addition to the *most* important reason for picking up after their dog(s) as shown on the previous page, respondents were also asked to select any other reasons that motivate them. As shown in the chart above, an additional 31% selected "To prevent water pollution" as a motivation. When combining results in the chart above with the chart on the previous page, a total of 49% were motivated to pick up after their dog(s) in order "To prevent water pollution," as shown on the next page.



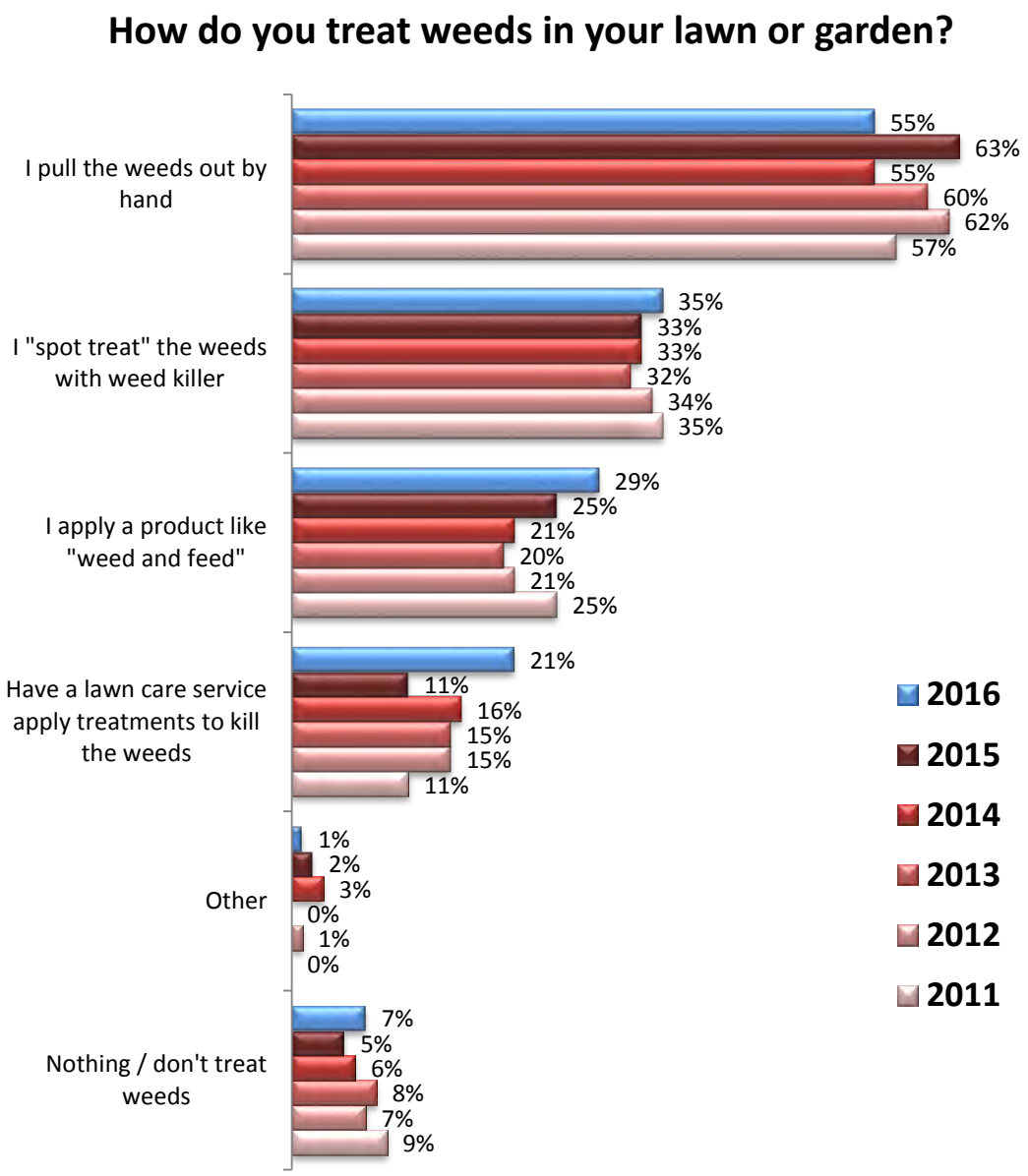
- While it is encouraging to see that nearly half (49%) were motivated to pick up after their dog by wanting to prevent water pollution, this also means that approximately half were not thinking about water pollution in this context.

Behavior Related to Lawns & Gardens

- More than three-fourths of the survey respondents each year indicated that their current home has a lawn or garden.

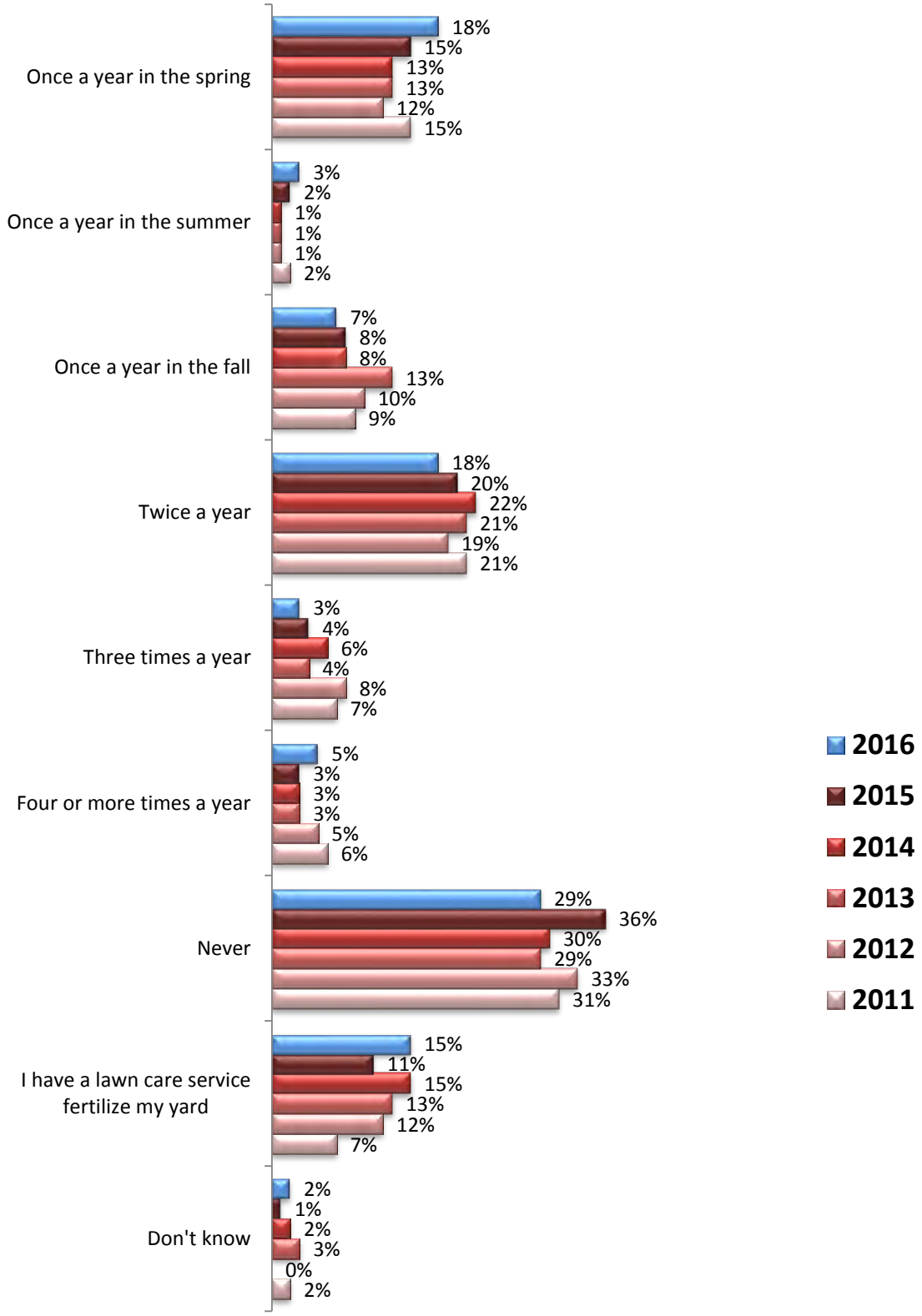


- In a separate question, of the respondents who have a lawn or garden, more than two-thirds (70%) in 2016 identified themselves as the primary person taking care of the lawn or garden. Several questions about lawns and gardens were then asked only of these respondents (i.e., primary person in the household who takes care of the lawn or garden).

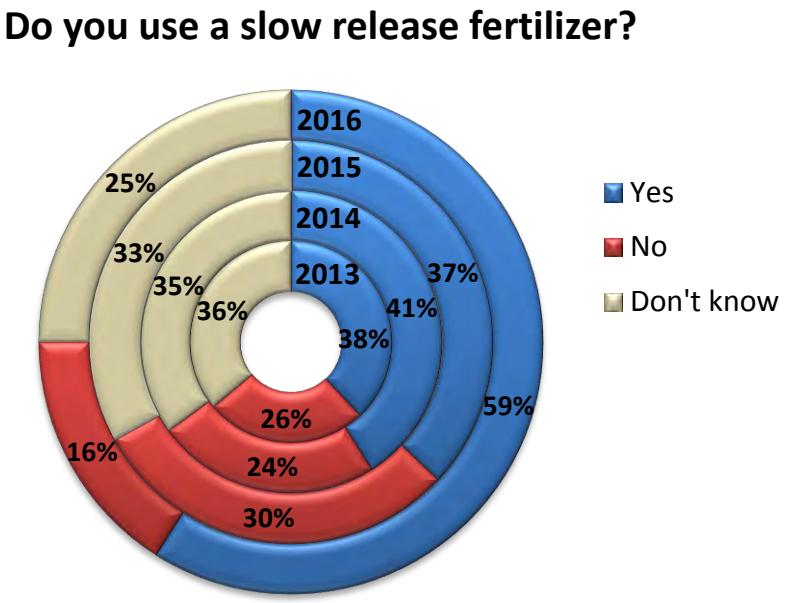


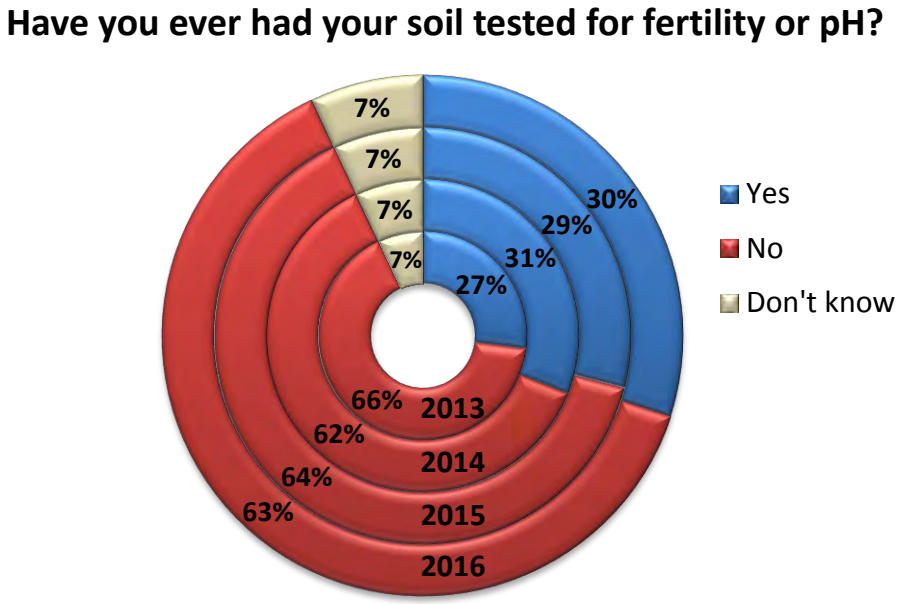
- When dealing with weeds, more than half (55%) reported pulling them out by hand.
- However, it was possible to report more than one way of dealing with weeds. Slightly more than one-third (35%) in 2016 reported using "spot treatments," and more one-fourth (29%) reported that they apply "weed and feed." Also, some (21%) have a lawn service apply weed killer.
- On the next page, a chart shows how often norther Virginia residents fertilize their lawn.

Which of the following best describes how often you fertilize your lawn?



- The next two questions were first asked in the 2013 survey. These results are based only on those who fertilize their lawn (or have a lawn service fertilize their lawn) at least once a year. However, in the previous years, the wording for the first question referred to "slow release N fertilizer." In 2016, the "N" was removed, and this may have impacted the results.





Behavior Related to Changing Vehicle Oil

- When asked about changing the oil in their car or truck, eight-in-ten or more each year reported that they use an oil change service, while 13% in 2016 reported taking old motor oil to a gas station or hazmat facility for recycling. A small number of respondents selected other response options. Because the number selecting some response options was very small, the results are shown in the tables below, with the frequency (number of respondents selecting each response) and the percentage.

2016: When you need to change the oil in your car or truck, what do you do with the old motor oil?

	Frequency	*Percent*
I don't change the oil myself / I take it to a garage / oil change service	399	79.8%
Take the old motor oil to a gas station or hazmat facility for recycling	65	13.0%
Store it in my garage	9	1.8%
Put it in the trash	8	1.6%
Other	2	0.4%
Don't own a car or truck	17	3.4%
Total	500	100.0%

2015: When you need to change the oil in your car or truck, what do you do with the old motor oil?

	Frequency	*Percent*
I don't change the oil myself / I take it to a garage / oil change service	426	85.2%
Take the old motor oil to a gas station or hazmat facility for recycling	54	10.8%
Store it in my garage	4	0.8%
Put it in the trash	3	0.6%
Don't own a car or truck	13	2.6%
Total	500	100.0%

2014: When you need to change the oil in your car or truck, what do you do with the old motor oil?

	Frequency	*Percent*
I don't change the oil myself / I take it to a garage / oil change service	426	85.2%
Take the old motor oil to a gas station or hazmat facility for recycling	50	10.0%
Put it in the trash	5	1.0%
Store it in my garage	4	0.8%
Other	1	0.2%
Don't own a car or truck	14	2.8%
Total	500	100.0%

2013: When you need to change the oil in your car or truck, what do you do with the old motor oil?

	Frequency	*Percent*
I don't change the oil myself / I take it to a garage / oil change service	427	85.4%
Take the old motor oil to a gas station or hazmat facility for recycling	57	11.4%
Put it in the trash	3	0.6%
Dump it in the gutter or down the storm sewer	2	0.4%
Store it in my garage	1	0.2%
Don't own a car or truck	10	2.0%
Total	500	100.0%

2012: When you need to change the oil in your car or truck, what do you do with the old motor oil?

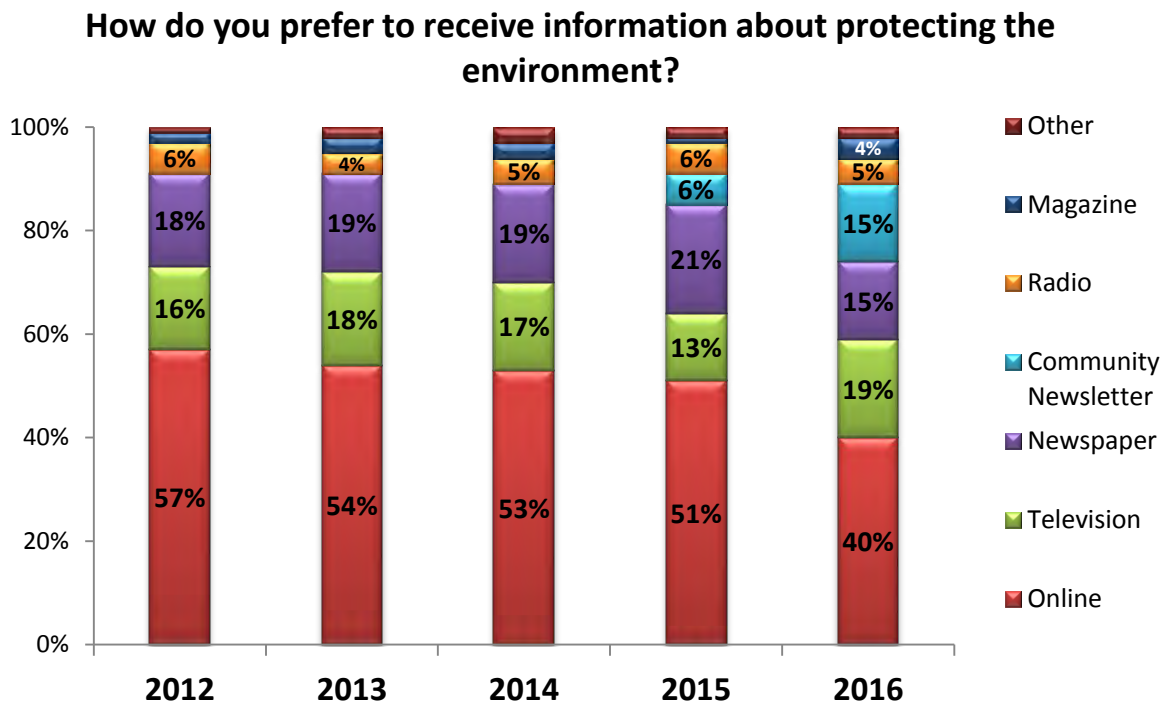
	Frequency	*Percent*
I don't change the oil myself / I take it to a garage / oil change service	426	85.2%
Take the old motor oil to a gas station or hazmat facility for recycling	49	9.8%
Store it in my garage	3	0.6%
Put it in the trash	2	0.4%
Other	2	0.4%
Don't own a car or truck	18	3.6%
Total	500	100.0%

2011: When you need to change the oil in your car or truck, what do you do with the old motor oil?

	Frequency	*Percent*
I don't change the oil myself / I take it to a garage / oil change service	413	82.6%
Take the old motor oil to a gas station or hazmat facility for recycling	60	12.0%
Put it in the trash	2	0.4%
Other	2	0.4%
Don't own a car or truck	23	4.6%
Total	500	100.0%

Preference for Receiving Information

- The wording for the question below was changed in the 2016 survey. In previous years, the question was, "How do you prefer to receive information?" without a reference to protecting the environment. ("Community Newsletter" was first added as an option in 2015.)



- In each of the areas included in the survey, more preferred to receive information online than preferred to receive information from other particular sources, as shown below. This was true for other subgroups as well, except for those age 65 or older.

Preference for Receiving Information	**Alexandria**	**Arlington**	**Fairfax Inclusive**	**Leesburg / Loudoun**	**Dumfries / Stafford**
Online	44%	48%	39%	39%	38%
Television	21%	8%	22%	17%	15%
Newspaper	11%	20%	15%	12%	18%
Community Newsletter	18%	6%	16%	23%	10%
Radio	2%	6%	4%	4%	8%
Magazine	2%	6%	3%	4%	8%
Other	2%	6%	1%	1%	3%
N = number of respondents	*56*	*65*	*270*	*70*	*39*

Preference for Receiving Information	Have Lived in Northern Virginia < 4 Years	4 to 9 Years	10 to 19 Years	20 or More Years
Online	53%	51%	42%	32%
Television	12%	12%	14%	26%
Newspaper	9%	13%	10%	20%
Community Newsletter	17%	12%	22%	13%
Radio	3%	8%	4%	4%
Magazine	3%	3%	5%	4%
Other	3%	1%	3%	1%
N = number of respondents	*59*	*92*	*115*	*234*

Preference for Receiving Information	Age 21 to 34	35 to 44	45 to 54	55 to 64	65 +
Online	46%	55%	40%	35%	26%
Television	16%	14%	14%	28%	24%
Newspaper	10%	5%	14%	15%	31%
Community Newsletter	11%	16%	23%	14%	13%
Radio	9%	5%	3%	4%	1%
Magazine	5%	4%	4%	2%	4%
Other	3%	1%	2%	2%	1%
N = number of respondents	*115*	*94*	*103*	*94*	*94*

Preference for Receiving Information	Male	Female	Homeowners	Renters	Hispanic Respondents
Online	43%	38%	38%	49%	44%
Television	18%	20%	18%	22%	22%
Newspaper	20%	10%	17%	7%	6%
Community Newsletter	10%	20%	17%	10%	10%
Radio	2%	7%	4%	6%	8%
Magazine	5%	3%	4%	3%	6%
Other	2%	2%	2%	3%	4%
N = number of respondents	*240*	*260*	*379*	*121*	*50*

Preference for Receiving Information	**Single-family Home**	**Townhouse**	**Apartment**	**Condo**
Online	36%	43%	50%	41%
Television	18%	19%	22%	15%
Newspaper	20%	6%	7%	20%
Community Newsletter	15%	22%	7%	17%
Radio	4%	6%	6%	3%
Magazine	5%	3%	4%	2%
Other	2%	1%	4%	2%
N = number of respondents	*249*	*104*	*81*	*65*

Appendix: Questionnaire

2016 Only Rain NVRC Survey

INTRODUCTION:
Welcome, and thank you for participating in this important research survey.

S1. Are you:

- o Male
- o Female

S2. Which of the following categories includes your age?

- o Under 18 **[END SURVEY]**
- o 18 to 20 **[END SURVEY]**
- o 21 to 24
- o 25 to 34
- o 35 to 44
- o 45 to 54
- o 55 to 64
- o 65 to 74
- o 75 or older

S3. Do you own or rent your home?

- o I own my home
- o I rent my home
- o Neither **[END SURVEY]**

S4. Do you live in the state of Virginia?

- o Yes
- o No **[END SURVEY]**

S5. Which of the following best describes where you live (county or city or town)?

- o Alexandria
- o Arlington
- o Dumfries
- o City of Fairfax
- o Fairfax County
- o Falls Church
- o Herndon
- o Leesburg
- o Loudoun County
- o Stafford County
- o Vienna
- o None of the above **[END SURVEY]**

S6. Which of the following describes your ethnicity? (Please select all that apply)

- ☐ African American / Black
- ☐ American Indian / Alaska Native
- ☐ Asian
- ☐ Hispanic / Latino
- ☐ Native Hawaiian / Pacific Islander
- ☐ White / Caucasian
- ☐ Other

Q1. Which of the following best classifies your current residence?

- o Single-family home
- o Townhouse or attached house
- o Apartment
- o Condominium
- o Mobile home or manufactured home
- o Cooperative
- o Other

Q2. For how many years have you lived in your current residence?

- o Less than 1 year
- o 1 to 3 years
- o 4 to 9 years
- o 10 to 19 years
- o 20 or more years

Q3. For how many years have you lived in Northern Virginia?

- o Less than 1 year
- o 1 to 3 years
- o 4 to 9 years
- o 10 to 19 years
- o 20 or more years

Q4. Do you live within the Potomac River Watershed?

- o Yes
- o No
- o Not Sure
- o I do not know what a “watershed” is

Q5. What do you think is the number one cause of pollution in local streams, the Potomac River, and the Chesapeake Bay? (Please select only one)

- o Factories / Industrial waste
- o Fertilizers and pesticides from lawns and farms
- o Local Garbage / trash / litter
- o Gas, oil and exhaust from automobiles
- o Pet waste
- o Stormwater runoff from streets and parking lots
- o Other: _____

Q6. "Stormwater" runoff is rain or other water that flows into the street, along the gutter and into the storm drain. To the best of your knowledge, where do you believe storm water eventually ends up?

- □ At a waste water treatment facility
- □ Local streams, Potomac River or Chesapeake Bay
- □ Underground / seeps in to the ground
- □ Don't know
- □ Other:_____

Q7. Do you (or does another person in your household) have a dog?

- o Yes **[CONTINUE WITH Q8]**
- o No **[SKIP TO Q11]**

Q8. When taking your dog(s) for a walk, how often do you (or someone else from your household) pick up waste after your dog(s)?

- o Always / every time the dog leaves waste
- o Usually
- o Sometimes
- o Rarely
- o Never
- o Not applicable / I don't take the dog(s) on walks

Q9. How often do you (or does someone else from your household) remove dog waste from your yard?

- o Daily
- o Weekly
- o Monthly
- o Less often than once a month
- o Never
- o Not applicable / don't have a yard

[SKIP OVER Q10a/b IF NEVER OR NOT APPLICABLE IN BOTH Q8 AND Q9]
Q10a. What is the most important reason to pick up after your dog(s)? (Please select only one)

- o City / township ordinance
- o Don't want to step in it
- o To prevent water pollution
- o It's what good neighbors do
- o Odor
- o Other reason
- o None / no reason to **[SKIP TO Q11]**

Q10b. What other reasons (if any) have motivated you to pick up after your dog(s)? [PROGRAMMING NOTE: DON'T SHOW WHAT WAS SELECTED IN Q10a]

- □ City / township ordinance
- □ Don't want to step in it
- □ To prevent water pollution
- □ It's what good neighbors do
- □ Odor
- □ None of the above

Q11. Does your home have a lawn or garden?

- o Yes **[CONTINUE WITH Q12]**
- o No **[SKIP TO Q17]**

Q12. Are you the primary person who takes care of the lawn or garden?

- o Yes **[CONTINUE WITH Q13]**
- o No **[SKIP TO Q17]**

Q13. How do you treat weeds in your lawn or garden? (Select all that apply)

- □ I apply a product like "weed and feed" that contains weed treatment and fertilizer
- □ I "spot treat" the weeds with weed killer
- □ I pull the weeds out by hand
- □ I have a lawn care service apply treatments to kill the weeds
- □ Other
- □ Nothing / I don't treat weeds / leave the weeds alone

Q14. Which of the following best describes how often you fertilize your lawn?

- o Once a year in the spring
- o Once a year in the summer
- o Once a year in the fall
- o Twice a year
- o Three times a year
- o Four or more times a year
- o Never **[SKIP TO Q16]**
- o I have a lawn care service fertilize my yard
- o Don't know

Q15. Do you use a slow release fertilizer in your lawn or garden?

- o Yes
- o No
- o I don't know

Q16. Have you ever had your soil tested for fertility or pH?

- o Yes
- o No
- o I don't know

Q17. What most prevents you from taking action to protect clean water?

- o It's not important to me
- o I don't have the time
- o Too expensive
- o My actions won't make a difference
- o I don't know what to do
- o I have physical limitations
- o Nothing / I do take action to protect clean water
- o Other: _____

Q18. What would help you to take action to protect clean water? (Select all that apply)

- ☐ On-site help with installation from a landscape professional
- ☐ Learning more by attending a workshop
- ☐ Online resources
- ☐ Financial assistance to offset costs
- ☐ Email Newsletters with reminders and quick tips
- ☐ I didn't know I needed to take action to protect clean water
- ☐ Nothing
- ☐ Other: _____

Q19. When you need to change the oil in your car or truck, what do you do with the old motor oil?

- o I don't change the oil myself / I take it to a garage / oil change service
- o Take the old motor oil to a gas station or hazmat facility for recycling
- o Store it in my garage
- o Put it in the trash
- o Dump it in the gutter or down the storm sewer
- o Dump it down the sink
- o I don't own a car or truck
- o Other

Q20. How important do you think it is for local governments to spend more money on protecting water quality?

- o Not at all important
- o Not too important
- o Somewhat important
- o Very important

---------- Page Break ----------

Q21. What TV service provider do you use?

- o Comcast
- o Cox
- o Direct TV
- o Dish Network
- o Verizon
- o Xfinity
- o Do not have cable or satellite TV
- o Do not watch TV
- o I only watch streamed Video Content (ex. Netflix, Hulu, YouTube, Chromecast, etc.)
- o Other

Q22. Which of these channels have you watched in the past 30 days? (Select all that apply)

- ☐ Animal Planet
- ☐ Cartoon Network
- ☐ CNN
- ☐ E! Entertainment TV
- ☐ ESPN
- ☐ HeadLine News
- ☐ History Channel
- ☐ HGTV
- ☐ National Geographic
- ☐ Oxygen
- ☐ None of the above

---------- Page Break ----------

Q23. Please view the video above. Have you seen this ad, or a similar one on TV or the Internet about reducing water pollution?

- o Yes **[CONTINUE WITH Q24]**
- o No **[SKIP TO Q25]**
- o Not sure **[SKIP TO Q25]**

Q24. Did seeing this ad make you take action on your property to prevent water pollution? (Select all that apply)

- □ Yes, I now pick up pet waste more often
- □ Yes, I now plan to fertilize fewer times during the year
- □ Yes I now properly dispose of motor oil
- □ I was already doing what is recommend to reduce water pollution
- □ None of the above applies to me

Q25. Have you seen the logo above anywhere? (Show Only Rain logo)

- o Yes
- o No

Q26. How do you prefer to receive information about protecting the environment? (Please select only one)

- o Magazine
- o Newspaper
- o Community newsletter
- o Online
- o Radio
- o Television
- o Other: _____

Appendix B-1d

MCM #1 –Sustainability in Fairfax City's Urban Forest Presentation

Sustainability in Fairfax City's Urban Forest

Jim McGlone
Urban Forest Conservationist

VIRGINIA DEPARTMENT OF FORESTRY

Past Sustainability Efforts

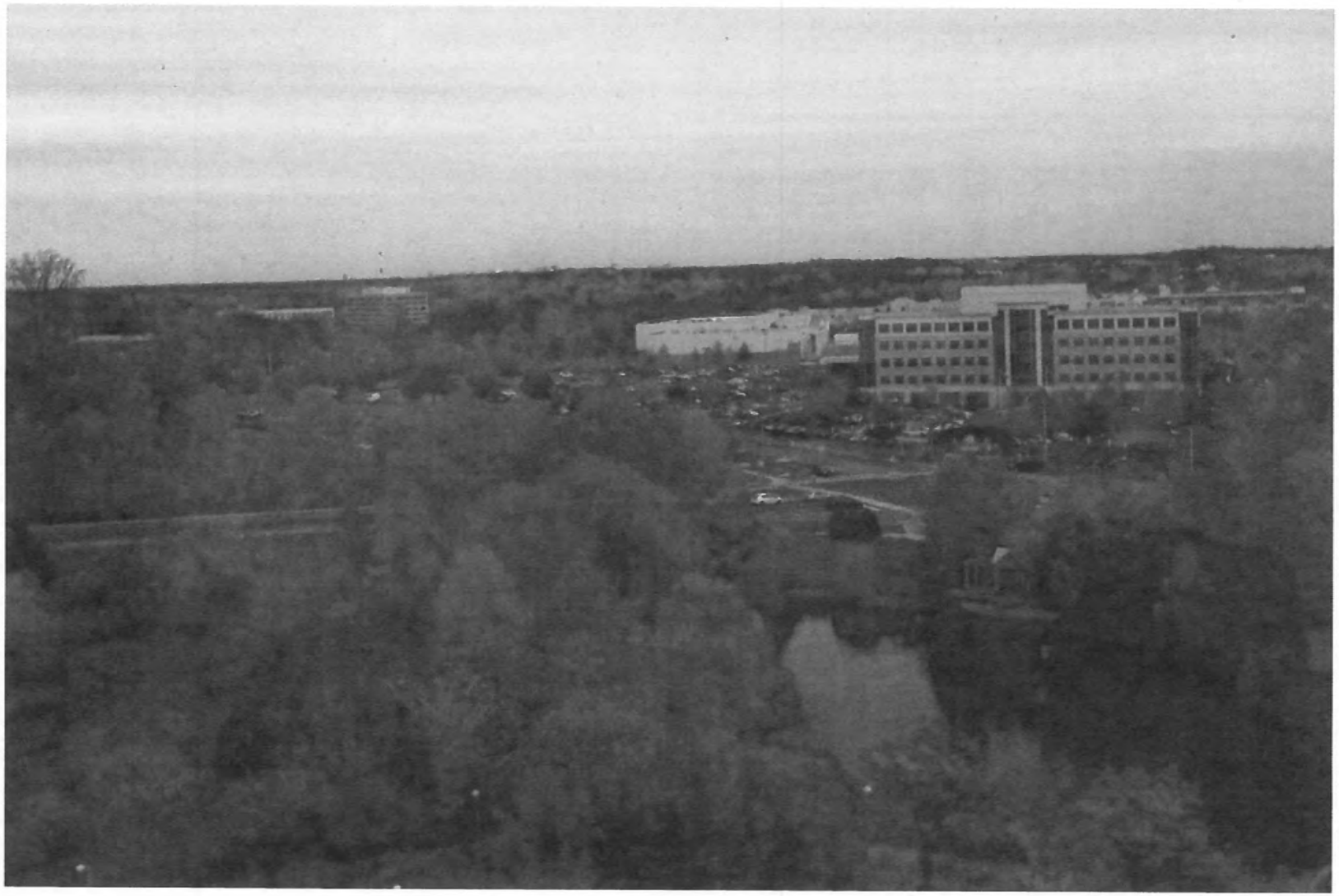
- Early 70s – Sewage
  - Solution: hook into regional system
- 90s and 00s – Storm water
  - Solution: Stream Restoration

URBAN FORESTS

Urban Forest

- Urban – man made; forest – nature
- Urban – adjective modifying the noun forest
- Forest a system consisting of:
  - Living –plants, animals, bacteria, fungi
  - Non-living – minerals, water, air, light
  - Interactions between and among
- An urban forest is a forest dominated by people and their constructs

The Urban Forest

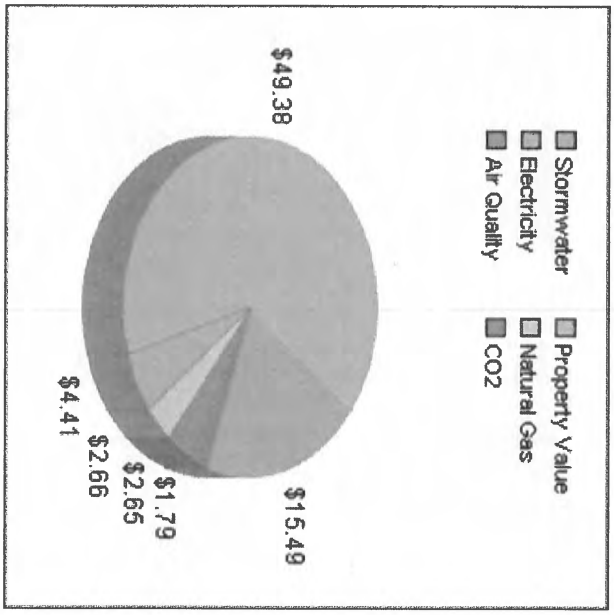


Ecosystem Sustainability Benefits

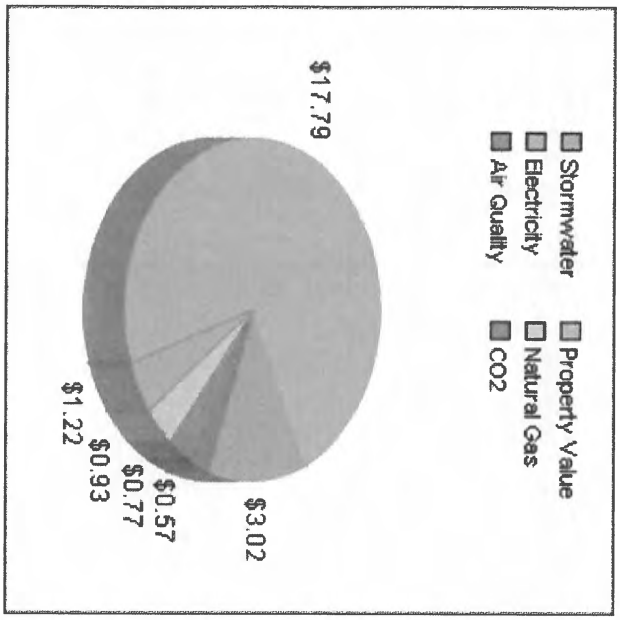
- Improve Air Quality
- Manage stormwater
- Store Carbon
- Provide habitat for animals
- Recycle oxygen

Sustainability Benefits Cont.

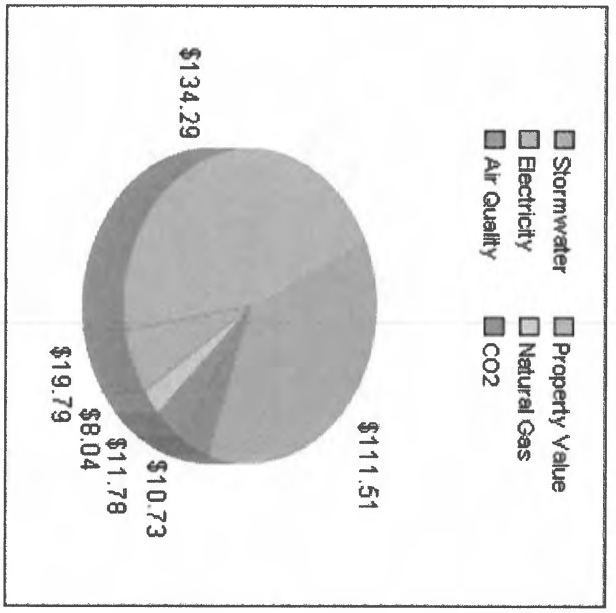
- Provide habitat for people
  - Lower energy costs through shading and ambient cooling
  - Higher property values, lower vacancy rates, better employee retention, lower crime rates
  - Stress reduction, better health, reduced ADHD, improved immune system functioning, reduces the incidence and severity of anxiety and depression
  - Less direct input – fertilizer, fuel, water, time
  - Support IPM



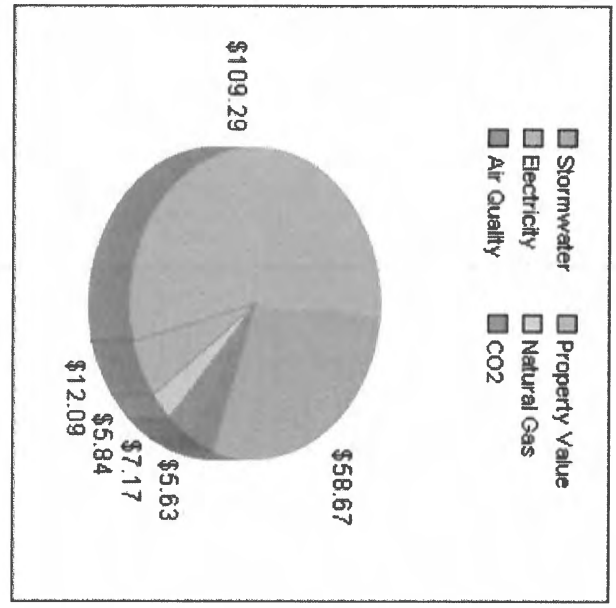
10 inch $76/year



5 inch $24/year



30 inch $296/year



20 inch $199/year

Red Maple in a single family home setting.
Using National Tree Benefit Calculator
http://www.treebenefits.com/calculator/

Urban Forest Issues

Street Trees

- Restricted rooting space & compacted soil
- Equipment damage
- Drought
- Road salt
- Poor architecture
- Insects/disease

Park Trees

- Deer
- Non-Native invasive plants
- Insects/disease
- Poor soils
- Equipment damage

STREET TREES

Right Tree in Right Place

Site considerations

- Function
- Growing conditions
  - Soil
    - Volume
    - Nutrients
    - Compaction
  - Water availability
  - Heat
- Surrounding area
  - Hardscape near roots
  - Crown space

Tree considerations

- Ultimate size
- Rooting habits
- Crown shape
- Debris
  - Fruit
  - Flowers
- Adaptations
  - Salt tolerance
  - Low oxygen

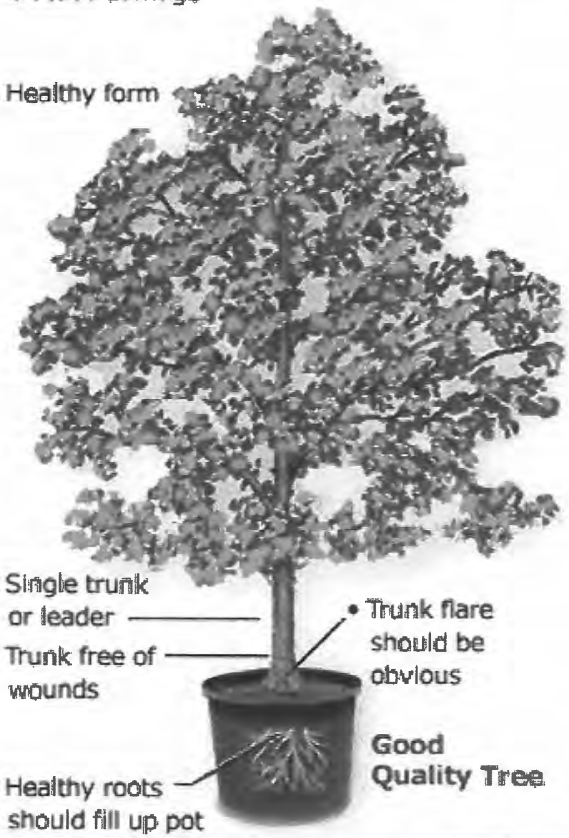
Select a Good Quality Tree at the Nursery

A High Quality Tree Has:

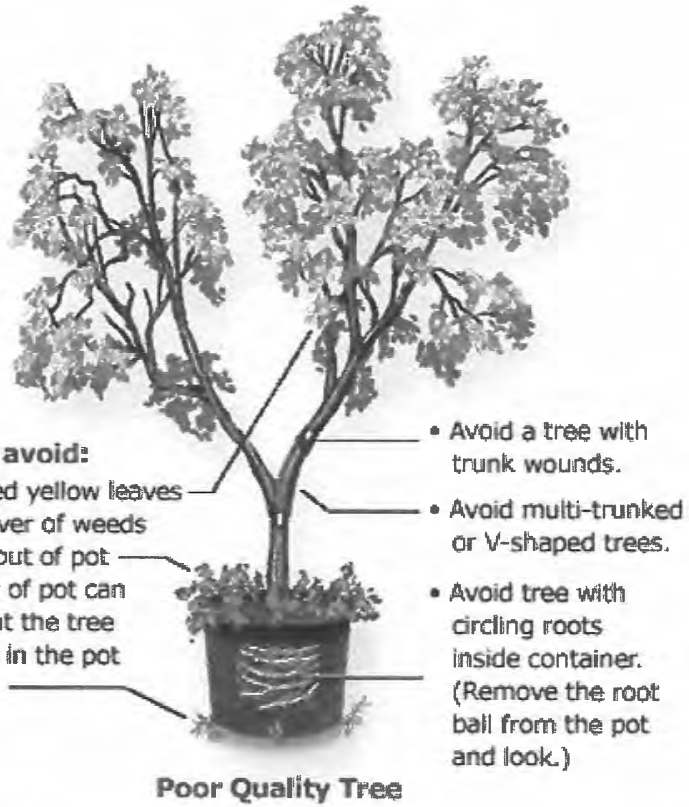
- Enough sound roots to support healthy growth.
- A single, central trunk or leader
- A trunk free of mechanical wounds and wounds from incorrect pruning.
- A strong form with well-spaced, firmly attached branches.
- Leaves with good color and no obvious insect or disease damage

A Low Quality Tree Has:

- Crushed or circling roots in a small root ball or small container.
- A trunk with wounds from mechanical impacts or incorrect pruning.
- A weak form in which multiple stems squeeze against each other or branches squeeze against the trunk.



Good Quality Tree

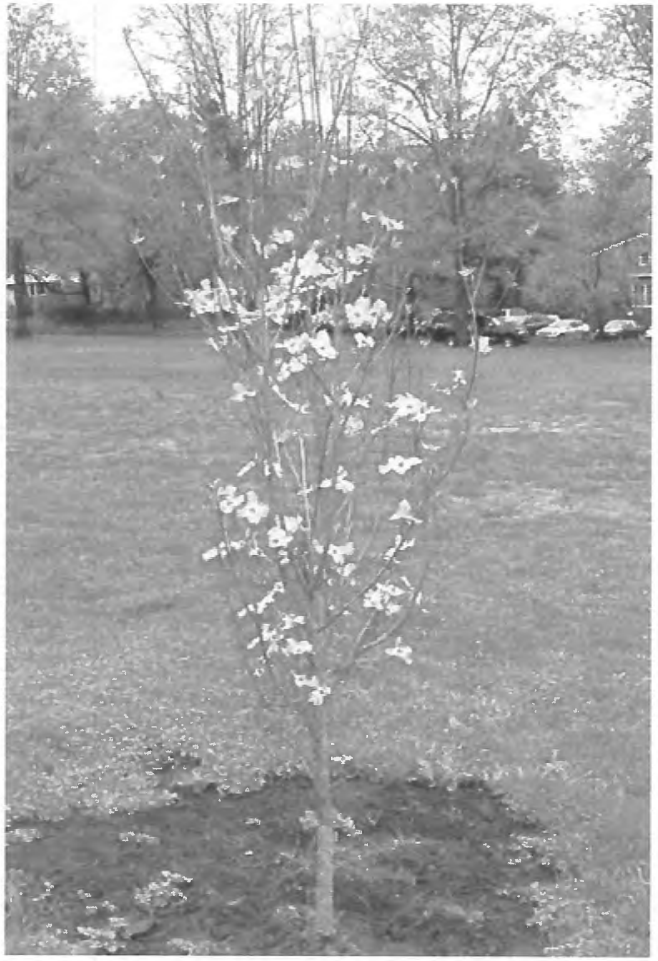


Poor Quality Tree

Illustration Copyright © Robert O'Brien

New Tree Maintenance

- Supplemental watering for 1 year per inch caliper
- Structural pruning
- Mulching
- Nutrient/pest management as needed



Older Tree Maintenance

- Pruning
- Mulching
- Nutrient/pest management as needed
- Risk assessment
- Mitigation as needed

Mulching

PARK TREES

Deer & Invasive Plants

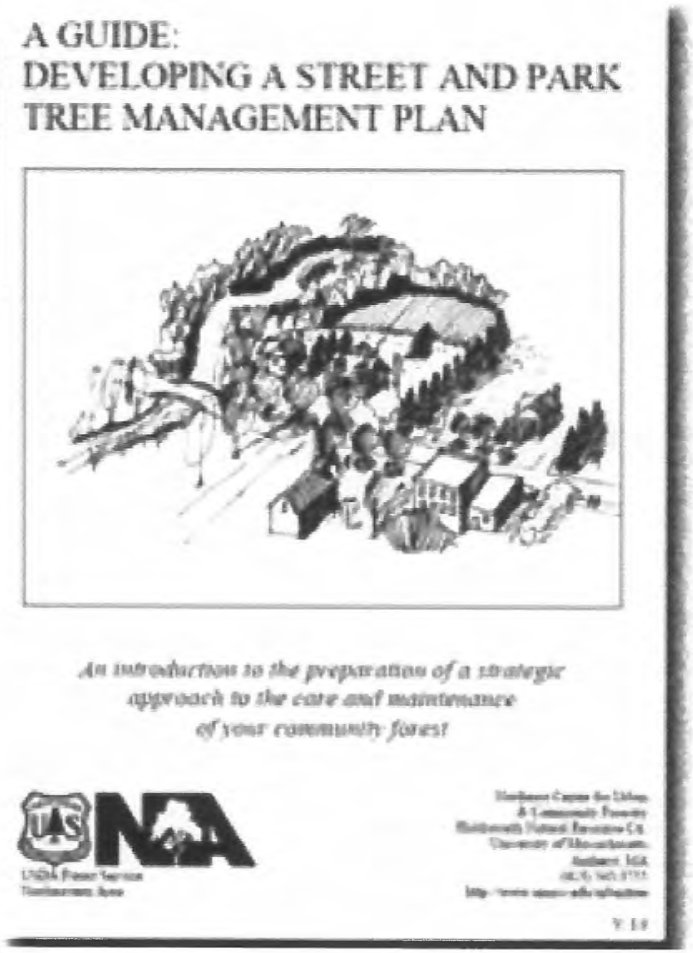
Native Trees

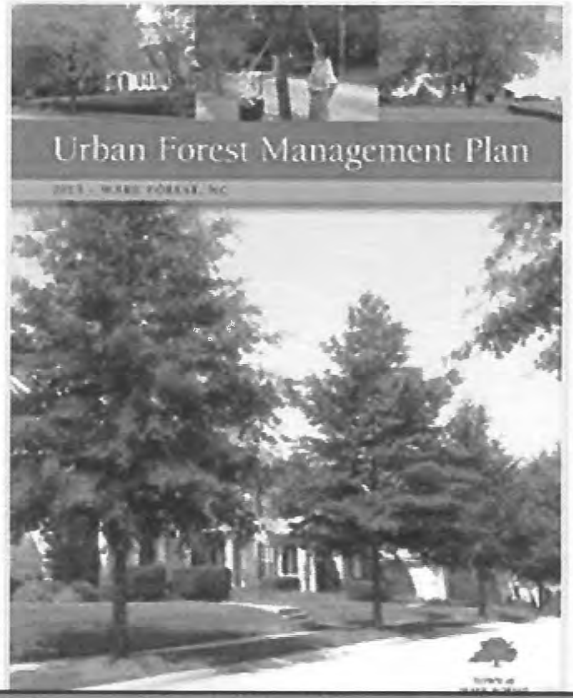
- Primary benefit is to wildlife
- May affect human habitat benefits
- Air and water benefits don't depend on origin
- Use native trees in parks and non-invasive trees in streets

URBAN FOREST MANAGEMENT

Have a Plan

Planning the Urban Forest:


A GUIDE:
DEVELOPING A STREET AND PARK TREE MANAGEMENT PLAN
An introduction to the preparation of a strategic approach to the care and maintenance of your community forest


Urban Forest Management Plan

URBAN
FORESTRY
SOUTH

Strategic Plan Elements

A. Vision/Goals/Mission – Where You Want To Be

B. Initial Assessment – Where You Are

   A. Street trees/parks

   B. Ordinances

   C. Tree resources

      A. Personnel

      B. Equipment

C. Actions – How to get from B to A

Tactical Plan

- Define and prioritize work
- Budget
- Training
- Data maintenance
- Evaluation of progress

Emergency Management Plan

i-Tree Applications

Applications

i-Tree Eco

i-Tree Streets

i-Tree Hydro (beta)

i-Tree Vue

i-Tree Design

i-Tree Canopy

System Requirements

i-Tree Urban Forest Assessment Applications

The 2014 version of i-Tree offers several urban forest assessment applications including i-Tree Eco, i-Tree Streets and i-Tree Vue. i-Tree Design and i-Tree Canopy are accessible online assessment tools.

Based on years of US Forest Service research and development, these innovative applications provide urban forest managers and advocates with tools to quantify ecosystem services and benefit values of community trees at multiple scales. The ability to articulate the significance of community trees in terms of pollution mitigation, storm water run-off reduction, carbon sequestration and storage and more has allowed i-Tree users to improve tree management, plan strategically, increase community awareness, engage decision makers and build new partnerships.

Click on the "Learn more" links to further explore the i-Tree Applications or see the new Guide to Assessing Urban Forests.

i-Tree Eco

i-Tree Eco provides a broad picture of the entire urban forest. It is designed to use field data from complete inventories or randomly located plots throughout a community along with local hourly air pollution and meteorological data to quantify urban forest structure, environmental effects, and values to communities

http://dendro.cnre.vt.edu/DENDROLOGY/doctor/doctor.cfm

Dendrology at Virginia Tech

Virginia Department Of Fo... | Intranet DOF | eVA | ftp.dof.state.va.us | USDA Forest Service | Virginia Department of Fo... | Commonwealth of Virginia | DCR | DGIF | DHRM | Web Slice Gallery

VirginiaTech
Invent the Future

Department of
Forest Resources and Environmental Conservation

Class | Fact Sheets | Features | Tools

vTree

- ID Keys
- vTree App
- WPINA DVD
- Street Tree Selector
- Campus Trees
- Links
- Quiz
- Doctor Dendro

Dr. Dendro will enter
any of your tree-relat
questions.

lowers in
rn Idaho

**Dr. Dendro (on right) with former graduate stude
Butnor (left, now with USDA Forest Service) and
Gough (center, now a Professor at Virginia Com
University).**

Ask Dr. Dendro a question.
For tree identification questions please feel free to attach digital photos. Be sure and indicate what region of the country the plant is from, whether it is wild or in a yard, and any other information you noticed about the plant.

For whatever reason, repeated studies have shown that urban trees improve the quality of life in a built environment. Improved quality of life means more tax revenue, fewer services and happier people, all of which leads to re-election.

Trees can be a great benefit to a municipality, but there is a cost to maintaining the urban forest. If the forest is not maintained it will become a bane rather than a boon.

Appendix B-2

MCM #2 – Rain Barrel Workshop Flyer

SAVE THE DATE!

Rain Barrel Workshops

Build Your Own Rain Barrel ($55)

March 5: Mason District, Falls Church

April 2: Arlington County

April 16: Green Acres Center, Fairfax

May 7: City of Alexandria

May 14: Walker Nature Center, Reston

June 18: Arlington County

Rain Barrel Sale ($65)

April 29-30: Packard Center, Annandale @ Native Seedling Sale

June 4: Falls Church Property Yard, 7100 Gordons Road

Registration (required) opens in February 2016

www.fairfaxcounty.gov/nvswcd/rainbarrels.htm

Or search: Northern Virginia Rain Barrels

The Northern Virginia Rain Barrel Program is a regional partnership between: Northern Virginia Soil and Water Conservation District, Cities of Falls Church, Alexandria and Fairfax, Reston Association, Arlington County and Arlingtonians for a Clean Environment. Thanks for your support!

Rain Barrel Workshop

Ages: All ages welcome

Saturday, April 16, 10:00am-12:00pm

Location: Cafeteria at Green Acres Center

Fee: $55 per rain barrel

At this workshop, you will build your own rain barrel to take home as well as learn about the care and maintenance of your new rain barrel. This workshop is sponsored by the Northern Virginia Soil and Water Conservation District. For more information, call 703-385-7816

Spaces are limited so register early! Registration will close three days before the event date or when the workshop is full, whichever comes first.

Register at: http://www.arlingtonenvironment.org/be-green/live-green/barrel/

Appendix B-3a

MCM #3 – Pictures of Outfalls Screened in Year 3

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SOCCER
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Appendix B-3b

MCM #3 – IDDE Field Investigation Form

POTENTIAL ILLICIT DISCHARGE FIELD SHEET

Section 1: Background Data

Description / Location of Suspected Illicit Discharge:

Date of Observation: _____/_____/_____ | Time (Military):

Name(s) of Observer(s):

Has it rained in the last 72 hours? ☐ Yes ☐ No

Land Use in Drainage Area (Check all that apply):

☐ Industrial
☐ Ultra-Urban Residential
☐ Suburban Residential
☐ Commercial
☐ Institutional
☐ Open Space
☐ Woods

Other: _____ Known Industry: _____

Estimate the Flow Rate (cfs)_____

☐ Drip ☐ Flow < 1 CFS
☐ Steady Drip ☐ Flow > 1 CFS
☐ Stream

Section 2: Discharge Structure Description

LOCATION	MATERIAL	SHAPE	NUMBER	DIMENSIONS
☐ Closed Pipe	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Elliptical ☐ Box ☐ Other: _____	Number of Pipes _____	Circular Pipe Diameter: _____ (in.) Elliptical or Box Pipe Width (in.): _____ Height (in.): _____
☐ Open Drainage (Channel)	☐ Concrete ☐ Earthen ☐ Rip-Rap ☐ Other: _____	☐ Trapezoidal ☐ Parabolic ☐ Other: _____		Depth: _____ ft. Top Width: _____ ft. Bottom Width: _____ft.
Flow Description	☐ Trickle ☐ Moderate ☐ Substantial ☐ None			
Structure Condition	☐ Good ☐ Minor Damage (e.g. chipping, erosion) ☐ Needs Repair (not functioning properly) ☐ Buried			

POTENTIAL ILLICIT DISCHARGE FIELD SHEET

Section 3: Physical Indicators for Outfalls

INDICATOR	CHECK IF PRESENT	DESCRIPTION	COMMENTS
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Sulfide ☐ Petroleum/gas ☐ Chlorine ☐ Other: _____	
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other: _____	
Turbidity	☐	☐ Cloudy ☐ Opaque ☐ Other:_____	
Floating Objects (Does Not Include Trash)	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (Oil Sheen) ☐ Other:_____	
Deposits / Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Bleached Soil ☐ Other:_____	
Vegetation	☐	☐ Excessive growth ☐ Inhibited growth ☐ Other:_____	
Damage to Outfall Structures	☐	☐ Concrete cracking ☐ Concrete spalling ☐ Peeling paint ☐ Metal corrosion Other:_____	

Section 4: Source of Discharge

Source of Illicit Discharge (if known):_____

Comments:_____

Appendix B-3c

MCM #3 – Hazardous Material Spill Reports

CITY OF FAIRFAX FIRE DEPARTMENT
OFFICE OF THE FIRE MARSHAL
SPILL OR RELEASE REPORT
FOR HAZARDOUS MATERIAL INCIDENT

Date of Event: 4/14/2016 **Date of Report:** 4/18/2016

Time of Event: UNKNOWN **Location of Incident:** **Accotink Creek at Hallman St**

F.D. Incident Number: N/A **Companies Responding:** None

Investigation Number: FM2016106001

Type of Incident: Haz Mat

Product released: Unknown Milky white substance **Amount:** UNK

What happened to cause the release or spill: UNK

Responsible Party: UNK

How many injuries occurred during this event if any: 0 Civilians, 0 Fire Fighters.

What area was affected by this event? Accotink Creek

What corrective action has been initiated? None

Were facility procedures violated? UNKNOWN

Was a Fire Code Notice of Violation Issued: No **Section:**

Photos taken: Yes **Evidence Taken:** No

Weather Conditions: CLEAR , 31-64°F, 28-89% RH

Status: NFI **Final Action:** Closed Report

What other agencies have been notified: None

F.D. Units on scene: None

Amount expended: $ 0.0 **Amount Recovered:** $ 0.0

Total property loss: $ 0.0

Notified to investigate a "milky white" substance in the creek. Nothing found upon investigation. A similar undocumented event has occurred in this area before. Photo taken of current status. Normal stagnant water film. Spoke with complainant and advised to call FMO if future event occurs.

This report filed by: Lt. David Whitacre

Signature of Investigator: Lt. David Whitacre **Date:** 4/18/16

Report reviewed by: CAPT [illegible] **Date:** 4/18/16

CITY OF FAIRFAX FIRE DEPARTMENT
OFFICE OF THE FIRE MARSHAL
SPILL OR RELEASE REPORT
FOR HAZARDOUS MATERIAL INCIDENT

Date of Event: 1/20/2016 **Date of Report:** 1/20/2016

Time of Event: 0854 **Location of Incident:** 3801 Jermantown Rd

F.D. Incident Number: N/A **Companies Responding:** HM440, HMSU440

Investigation Number: FM2016020001 PD# 2016-1070

Type of Incident: Haz Mat

Product released: Automatic Trans Fluid **Amount:** <6 OZ

What happened to cause the release or spill: Undetermined

Responsible Party: Unknown

How many injuries occurred during this event if any: 0 Civilians, 0 Fire Fighters.

What area was affected by this event? Stairwell #4

What corrective action has been initiated? Cleaned up by staff

Were facility procedures violated? N

Was a Fire Code Notice of Violation Issued: N **Section:**

Photos taken: Y **Evidence Taken:** N

Weather Conditions: Clear, 19 °F

Status: Closed **Final Action:** Closed

What other agencies have been notified: City PD

F.D. Units on scene: HM440, HMSU440

Amount expended: $ 0.0 **Amount Recovered:** $ 0.0

Total property loss: $ 0.0

This report filed by: Lt. David Whitacre

Signature of Investigator: Lt. David Whitacre **Date:** 1/20/16

Report reviewed by: CAPT [illegible] **Date:** 1/20/16

CITY OF FAIRFAX FIRE DEPARTMENT
OFFICE OF THE FIRE MARSHAL
SPILL OR RELEASE REPORT
FOR HAZARDOUS MATERIAL INCIDENT

Date of Event: 7/6/2015 **Date of Report:** 7/6/2015

Time of Event: 0945 **Location of Incident:** 3513 Burrows Ave

F.D. Incident Number: N/A **Companies Responding:** FM442 City PD

Investigation Number: PD201511551

Type of Incident: Haz Mat

Product released: Used Motor Oil **Amount:** < 2 gallons

What happened to cause the release or spill: Vehicle struck a brick wall, leaked fluids into storm run off area

Responsible Party: **Joseph V. Grosso Jr 11/16/1970**
10712 Norman Ave
Fairfax Va 22030

How many injuries occurred during this event if any: 1 Civilians, 0 Fire Fighters.

What area was affected by this event? Storm water drainage area. Isolated to a 20'x 1' Area

What corrective action has been initiated? Atlas contacted for clean-up

Were facility procedures violated? No

Was a Fire Code Notice of Violation Issued: N **Section:**

Photos taken: Y **Evidence Taken:** N

Weather Conditions: Mostly Cloudy, 75 °F

Status: **Closed** **Final Action:** Closed

What other agencies have been notified: **City PD Atlas Environmental**

F.D. Units on scene: FM 42

Amount expended: $0 **Amount Recovered:** $0

Total property loss: $

This report filed by: Lt. David Whitacre

Signature of Investigator: _____ **Date:** 7/6/15

Report reviewed by: CAPT _____ **Date:** 7/15/15

Appendix B-3d

MCM #3 – Notices to Potential Interconnected Stormwater Systems

City of Fairfax

10455 Armstrong Street
Fairfax, VA 22030
Department of Public Works
(703) 273-33067
(703) 591-5727 (FAX)

Virginia Department of Transportation
Mr. Roy T. Mills
Location and Design Division
State Stormwater Program Planner
(804) 786-9013

October 2015

Subject: MS4 Permit; Notice of Potential Physically Interconnected Stormwater Systems

Dear Mr. Mills,

The City of Fairfax is a Phase II small MS4 located in Fairfax County, VA. The City of Fairfax is covered under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems. (Registration VAR040064)

The purpose of this letter is to notify you of the potential interconnected stormwater systems operated by VDOT, and the City of Fairfax. Under the MS4 Permit requirements, the City of Fairfax is required to notify all downstream regulated MS4 stormwater systems that are physically interconnected. At this time the City of Fairfax has not identified any points where the City discharges into any VDOT regulated stormwater systems, therefore this is just a notification and no action on your part is required.

If you have any questions or need any additional information please feel free to contact me.

Sincerely,

Christina Alexander
Stormwater Resource Engineer
(703)273-3067
Christina.Alexander@fairfaxva.gov

City of Fairfax

10455 Armstrong Street
Fairfax, VA 22030
Department of Public Works
(703) 273-33067
(703) 591-5727 (FAX)

County of Fairfax
Stormwater Planning Division
12000 Government Center Pkwy.
Fairfax, VA 22035

October 2015

Subject: MS4 Permit; Notice of Potential Physically Interconnected Stormwater Systems

Dear MS4 Permit Manager,

The City of Fairfax is a Phase II small MS4 located in Fairfax County, VA. The City of Fairfax is covered under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems.

The purpose of this letter is to notify you of the potential interconnected stormwater systems operated by Fairfax County, and the City of Fairfax. Under the MS4 Permit requirements, the City of Fairfax is required to notify all regulated MS4 stormwater systems that are physically interconnected. At this time the City of Fairfax has not identified any points where the City discharges into any Fairfax County regulated stormwater systems, therefore this is just a notification and no action on your part is required.

If you have any questions or need any additional information please feel free to contact me.

Sincerely,

Christina Alexander
Stormwater Resource Engineer
(703)273-3067
Christina.Alexander@fairfaxva.gov

City of Fairfax

10455 Armstrong Street
Fairfax, VA 22030
Department of Public Works
(703) 273-33067
(703) 591-5727 (FAX)

George Mason University
Facilities Planning Division
4400 University Dr.
Fairfax, VA 22032
(703) 993-2520

October 2015

Subject: MS4 Permit; Notice of Potential Physically Interconnected Stormwater Systems

Dear MS4 Permit Manager,

The City of Fairfax is a Phase II small MS4 located in Fairfax County, VA. The City of Fairfax is covered under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems.

The purpose of this letter is to notify you of the potential interconnected stormwater systems operated by George Mason University, and the City of Fairfax. Under the MS4 Permit requirements, the City of Fairfax is required to notify all downstream MS4 stormwater systems that are physically interconnected. At this time the City of Fairfax has not identified any points where the City discharges into any George Mason University regulated stormwater systems, therefore this is just a notification and no action on your part is required.

If you have any questions or need any additional information please feel free to contact me.

Sincerely,

Christina Alexander
Stormwater Resource Engineer
(703)273-3067
Christina.Alexander@fairfaxva.gov

Appendix B-4a

MCM #4 – VSMP Inspection Report, Warning Letter, Notice to Comply, Stop Work Order, Ordinance Summons, and Violation Dismissed Notice

Filing No: SW14XXXX

City of Fairfax
Department of Public Works

10455 Armstrong St, Room 200
Fairfax, VA 22030
703 273 6073

Date Issued:
07/01/14

VSMP INSPECTION REPORT

To:

An inspection of the site at **Location/Address** on **07/01/14** revealed the presence of the following violation(s):

The following corrections are required:

Notice is hereby given that the violations stated above shall be corrected on or before **07/01/14** at **9:00 AM**. The site will be reinspected at that time.

Failure to address the above violation(s) will result in a Warning Letter, Notice to Comply and/or Stop Work Order being issued. Please contact this department if there are any questions.

VSMP Inspector _____ Satoshi Eto

VSMP Administrator _____ Christina Alexander

A copy of this notice will be posted at the site and/or emailed to the Operator, AND a copy sent by Certified Mail.
White: Permit Holder/Addressee Yellow: Inspector Pink: File

Filing No: SW14XXXX

City of Fairfax
Department of Public Works

10455 Armstrong St
Fairfax, VA 22030
703 273 6073

Date Issued:
07/01/14

VSMP WARNING LETTER

To:

An inspection of the site at **Location/Address** on **07/01/14** revealed the presence of the following violation(s):
A VSMP Inspection Report was sent on 07/01/14.

The following corrections are required:

Notice is hereby given that the violations stated above shall be corrected on or before **07/01/14** at **9:00 AM**. The site will be reinspected at that time.

Failure to comply with this notice will result in a Notice to Comply or Stop Work Order, or other legal enforcement action by the City of Fairfax to implement the appropriate corrections. Please contact this department if there are any questions.

VSMP Inspector _____ Satoshi Eto

VSMP Administrator _____ Christina Alexander

A copy of this notice will be posted at the site and/or emailed to the Operator, AND a copy sent by Certified Mail.
White: Permit Holder/Addressee Yellow: Inspector Pink: File

Filing No: SW14XXXX

City of Fairfax
Department of Public Works

10455 Armstrong St
Fairfax, VA 22030
703 273 6073

Date Issued:
07/01/14

VSMP NOTICE TO COMPLY

To:

An inspection of the site at **Location/Address** on **07/01/14** revealed the presence of the following violation(s):
A VSMP Inspection Report / Warning Letter was sent on 07/01/14.

The following corrections are required:

Notice is hereby given that the violations stated above shall be corrected on or before **07/01/14** at **9:00 AM**. The site will be reinspected at that time.

Failure to comply with this notice will result in a Stop Work Order and/or other legal enforcement action by the City of Fairfax to implement the appropriate corrections. Please contact this department if there are any questions.

VSMP Inspector _____ Satoshi Eto

VSMP Administrator _____ Christina Alexander

A copy of this notice will be posted at the site and/or emailed to the Operator, AND a copy sent by Certified Mail.
White: Permit Holder/Addressee Yellow: Inspector Pink: File

Filing No: SW14XXXX

City of Fairfax
Department of Public Works

10455 Armstrong St
Fairfax, VA 22030
703 273 6073

Date Issued:
07/01/14

VSMP STOP WORK ORDER

To:

An inspection of the site at **Location/Address** on **07/01/14** revealed the presence of the following violation(s).
A VSMP Inspection Report / Warning Letter / Notice to Comply was sent on 07/1/14

You are hereby ordered to stop all land-disturbing activities on the above referenced project until the specified corrective measures have been taken. If work is not begun to correct this violation by **07/01/14**, further legal action will be taken. Upon completion of the corrective action, the order shall be immediately lifted. Continuing land disturbing activities in disregard of this Order shall constitute a violation of City Code Sec 110-291(e).

The following corrections are required:

Please contact this department if there are any questions.

VSMP Inspector _____ Satoshi Eto

VSMP Administrator _____ Christina Alexander

A copy of this notice will be posted at the site and/or emailed to the Operator, AND a copy sent by Certified Mail.
White: Permit Holder/Addressee Yellow: Inspector Pink: File

Filing No: SW14XXXX

City of Fairfax

Date Issued:
07/01/14

VSMP ORDINANCE SUMMONS

To:

You are charged with violating City Code as follows:

Location of Violation: **Location/Address**
Description of Violation:

Violation of:

- ☐ City Code Sec 110-287(a)1 – Failure to obtain VSMP Permit prior to engaging in land disturbing activity. - $2500 / violation / day
- ☐ City Code Sec 110-287(d)1 – VSMP permit non-compliance - $2500 / violation / day
  Description:
- ☐ City Code Sec 110-291(d) – Continued land disturbing activity in disregard of Stop Work Order issued by Administrator. - $2500/ violation / day
- ☐ City Code Sec 110-294(a) – Illicit discharges - $1000 / violation / day

Penalty:

Cumulative Penalty: violation dates & types

You are required to respond by 07/01/14 in one of the following ways:

1. **To Pay Penalty and Waive Your Right to a Hearing:**
   - Check the "Admit Violation" or "No Contest" box below; checking either of these boxes and signing this ticket is a waiver of trial, is an admission of liability, and has the same force and effect as a court judgment, but is not a criminal conviction for any purpose.
   - Correct the violation and certify that the violation has been corrected by signing below;
   - Make check payable to City of Fairfax. Print filing number noted above on the check. Payment may be made by mail or in person, at; Treasurer's Office, City Hall, 10455 Armstrong Street, Room 208, Fairfax, VA 22030.
2. **To stand trial for the violation(s) shown on this summons:**
   - Check the "Contest in Court" box below and mail this completed notice to the Dept of Public Works, City Hall, 10455 Armstrong St, Fairfax, VA 22030.

FAILURE TO RESPOND AS NOTED ABOVE WILL RESULT IN THE ISSUANCE OF A SUMMONS TO APPEAR IN COURT

COMPLETE AND SIGN: ☐ Admit ☐ No Contest ☐ Contest in Court

Name:_____

I hereby certify under penalty of law, that I have answered as indicated above,
and have corrected the violation that I have admitted to or for which I have pleaded no contest.

Signature:_____ Date:_____

Certificate of Service

I personally observed the violation noted and state that I am an employee of the Department of Public Works, that a true copy of this ticket was ☐mailed to the last known address of the respondent or the respondent's agent and/or ☐posted at the site of the infraction, and know this ticket to be true to the best of my knowledge.

Signature:_____ Date:_____

Director of Public Works_____ Date:_____

A copy of this notice will be posted at the site and/or emailed to the Operator, AND a copy sent by Certified Mail.
White: Permit Holder/Addressee Yellow: Inspector Pink: File

Filing No: SW14XXXX

City of Fairfax
Department of Public Works
10455 Armstrong St
Fairfax, VA 22030
703 385 7828

Date Issued:
07/01/14

Violation Dismissed

To:

A reinspection of the site at **Location/Address** on **07/01/14** revealed that the following violation(s) have been corrected to the satisfaction of the Office of Site Inspections.

Your cooperation in this matter is appreciated and Public Works will continue to monitor this site to ensure compliance with VSMP requirements.

VSMP Inspector _____ Satoshi Eto

VSMP Administrator _____ Christina Alexander

A copy of this notice will be posted at the site and/or emailed to the Operator, AND a copy sent by Certified Mail.
White: Permit Holder/Addressee Yellow: Inspector Pink: File

Appendix B-4b

MCM #4 – List of Approved Grading Permits

Year 3 Approved Grading Permits

Project Number	Project Type	Action	Description LIne 1	Apply Date	Project Address	Owner Name	Applicant Name
15110003	PERMIT-G	APP 3/16	MAJOR/NEW SFD/ .24 ACRES	11/2/2015	10100 DWIGHT AVE	CORBIN, THOMAS L & NORMA LEE	CORBIN, THOMAS L & NORMA LEE
16010099	PERMIT-G	APP 01/16	MAJOR/NEW SFD/0.19 ACRES	1/29/2016	4100 ADDISON RD	CONNER THOMAS CLIFFORD	CONNER THOMAS CLIFFORD
16030013	PERMIT-G	APP 5/16	MAJOR/NEW SUBDIVISION/1.25 ACRES	3/2/2016	10400 STRATFORD AVE	SHERWOOD, STACY C & GERALDINE E	SHERWOOD, STACY C & GERALDINE E
16040092	PERMIT-G	APP 4/16	MAJOR/REDEVELOPMENT/6.11 ACRES	4/15/2016	10742 MAIN ST -10764	OAK KNOLLS REALTY CORP	OAK KNOLLS REALTY CORP
15110091	PERMIT-G	APP 12/15	MINOR/ADDITION & DECK/1700SF	11/18/2015	10322 WOOD RD	SAVAGE, WILLIAM H & JOYCE M	SAVAGE, WILLIAM H & JOYCE M
15110086	PERMIT-G	APP 12/15	MINOR/ADDITION/1020SF	11/17/2015	10604 MAPLE ST	NIKOUEI, SORROOSH	NIKOUEI, SORROOSH
15110055	PERMIT-G	APP 11/15	MINOR/ADDITION/218SF	11/12/2015	3810 ESTEL RD	NASREEN BEGUM	NASREEN BEGUM
16080064	PERMIT-G	APP 8/16	MINOR/ADDITION/2294 SF	8/16/2016	3617 CHAIN BRIDGE RD	DUONG, TAM TUE	DUONG, TAM TUE
16010053	PERMIT-G	APP 2/16	MINOR/ADDITION/2370SF	1/15/2016	10719 OAK PL	HALL, LELAND & STACY	HALL, STACY
15100081	PERMIT-G	APP 10/15	MINOR/ADDITION/2463SF	10/16/2015	3500 CHAIN BRIDGE RD	WILLIAMS, SIDNEY H III & CAROL C.	WILLIAMS, SIDNEY H III & CAROL C.
16050056	PERMIT-G	APPROVED	MINOR/ADDITION/360 SF	5/12/2016	4102 POPLAR ST	TRAHEY, KRISTIN	TRAHEY, KRISTIN
16030055	PERMIT-G	APP 3/16	MINOR/ADDITION/860SF	3/11/2016	3720 FARR AVE	WATERS, JAMES C JR & TERESA S	WATERS, JAMES C JR & TERESA S
15100017	PERMIT-G	APP 10/15	MINOR/ADDITON & DECK/ 1500 SF (FOOTERS ONLY)	10/5/2015	3228 SHERMAN ST	GIBBONS, SCOTT M & JULIE T.	GIBBONS, SCOTT M & JULIE T.
16040083	PERMIT-G	APP 4/16	MINOR/DETACHED GARAGE/800 SF	4/13/2016	10805 ORCHARD ST	ABRAHAMS, CHRIS	ABRAHAMS, CHRIS
15100020	PERMIT-G	APP 10/15	MINOR/DRIVEWAY EXPANSION/210SF	10/6/2015	3603 MCLEAN AVE	ELHAJJ, NADER	ELHAJJ, NADER
15100102	PERMIT-G	APPROVED	MINOR/FILL DITCH/	10/19/2015	3811 HAYNSWORTH PL	DAVID SONTHEIMER	DAVID SONTHEIMER
15100059	PERMIT-G	APP 10/15	MINOR/FOOTERS FOR PORCH/320SF	10/13/2015	3801 THAYER CT	WALKINSHAW, LOUIS OWENBETHLEHEM BAP	WALKINSHAW, LOUIS OWENBETHLEHEM BAP
16060077	PERMIT-G	APP 6/16	MINOR/GARAGE/ 2000 SF	6/21/2016	10225 ANTIETAM AVE	GLAZE, PATRICK & NOELLE	GLAZE, PATRICK & NOELLE
16080004	PERMIT-G	APP 8/16	MINOR/GARAGE/1040 SF	8/2/2016	10811 ORCHARD ST	SCOTT, JAMIE C & DENINE M	SCOTT, JAMIE C & DENINE M
15100005	PERMIT-G	APP 11/15	MINOR/GARAGE/1217SF	10/1/2015	4028 POPLAR ST	HORTON, JOHN D	HORTON, JOHN D
15110058	PERMIT-G	APP 11/15	MINOR/GARAGE/672SF	11/13/2015	3720 WARWICK CIR	LISTER, LONNIE A & LAURA M	LISTER, LONNIE A & LAURA M
16050112	PERMIT-G	APPROVED	MINOR/GARAGE/952SF	5/27/2016	3900 TEDRICH BLVD	KING, ALLISON EARL JR &JANICE K	KING, ALLISON EARL JR &JANICE K
16060085	PERMIT-G	APP 6/16	MINOR/PATIO/136 SF	6/23/2016	4312 JOHNSON CT	RICHMOND AMERICAN HOMES	RICHMOND AMERICAN HOMES
16060050	PERMIT-G	APP 6/16	MINOR/PATIO/480 SF	6/16/2016	3602 MERCEDES WAY	CHRISTOPHER AT AVERY PARK LLC	CHRISTOPHER AT AVERY PARK LLC
16060017	PERMIT-G	APP 6/16	MINOR/PATIO/525 SF	6/7/2016	10832 LINDA ST	CHRISTOPHER AT AVERY PARK LLC	CHRISTOPHER AT AVERY PARK LLC
16040073	PERMIT-G	APP 4/16	MINOR/SITE REMEDIATION/1500SF	4/12/2016	10480 FAIRFAX BLVD	EXXON CORP (THE)	EXXON CORP (THE)
15100082	PERMIT-G	APP 11/15	MINOR/SUNROOM/260SF	10/16/2015	3625 HERITAGE LA	AKHTAR, MOHAMMAD & KHALIDA	AKHTAR, MOHAMMAD & KHALIDA

Appendix B-5a

MCM #5 – Letter to BMP Owner

SAMPLE SWM/BMP LETTER

City of Fairfax

10455 Armstrong Street
***Fairfax, Virginia* 22030-3630**

Date

Addresss

Re: Stormwater Management/Best Management Practice
(Also referred to as SWM/BMP)

Dear Sir:

This letter is sent to advise you that the City may pursue enforcement action against the owner of the property located at ADDRESS, for failure to properly maintain the on-site Stormwater Management/Best Management Practice (SWM/BMP) system.

Virginia Administrative Code Sections 4VAC50-60-150 and 9 VAC 10-20-120 require annual inspection and certification that SWM/BMP facilities are properly maintained. Inspectors with the city's Department of Public Works are available to meet with property-owners or their representatives to make recommendations to ensure proper SWM/BMP function and reporting to satisfy the State Code requirements. Inasmuch as your facility is on private property, the City cannot perform the inspection for you, but can provide guidance and answer questions. For more information on inspection requirements please see the city's webpage at http://www.fairfaxva.gov/Environment/StormWaterMgmt.asp.

Enclosed is a copy of the SWM/BMP inspection report, found on the city website listed above, that needs to be filled out but a qualified inspector. Additionally attached, for your information, is a list of qualified inspectors used in the past. Failure to send in your inspection report within 30 days of receiving this letter, will result in a Notice of Violation (Notice) issuance to the site. Notice of Violation fines begin at $200 and may increase to $500. Typically, it is less costly to obtain the inspection than to pay any accrued penalty fine amounts.

SAMPLE SWM/BMP LETTER

If you have any questions about the rules for inspections or any additional questions please contact me at 703.273.3067 or Christina.Alexander@fairfaxva.gov .

Respectfully,

Christina Alexander
Stormwater Resource Engineer, Public Works

Attachments
Enclosure

Cc: Peter Millard
David Summers
Michelle Coleman

Appendix B-5b

MCM #5 – BMP Inspection Checklist

BMP ID: _____	DATE: ___/_____/___	ASSESSED BY:

SITE NAME: _____

ADDRESS: _____

SECTION 1- BACKGROUND INFORMATION (GIS)

BMP TYPE :

- ☐ Dry Detention Pond
- ☐ Extended Detention Pond
- ☐ Wet Pond
- ☐ Filter (specify: _____)
- ☐ Infiltration (specify:_____)
- ☐ Check if structure is underground
- ☐ Dry Swale
- ☐ Wet Swale
- ☐ Grass Channel
- ☐ Dry Well
- ☐ Permeable Pavement
- ☐ Bioretention
- ☐ Wetland
- ☐ Level Spreader
- ☐ WQ Inlet
- ☐ Proprietary Device
- ☐ Other _____

YEAR CONSTRUCTED: _____

OWNERSHIP

☐ Public ☐ Private ☐ Unknown

SECTION 2- FIELD VISIT

Rain in last 48 hrs? ☐ Yes ☐ No

Evidence of high water table (e.g., excessive soil saturation)? ☐ Yes ☐ No

OUTLET CHARACTERISTICS

PRIMARY OUTLET STRUCTURE:	☐ N/A – infiltration w/ no outlet ☐ Pipe ☐ Riser ☐ Weir ☐ Large Storm Overflow ☐ Open channel ☐ Large Storm By-pass ☐ Other: _____
OUTLET FEATURES:	☐ N/A ☐ Trash Rack ☐ Pond Drain ☐ Inverted outlet pipe ☐ Hooded outlet ☐ Anti-vortex device ☐ Perforated pipe ☐ Gravel Diaphragm ☐ Micropool outlet ☐ Multiple outlet levels *Outlet includes restrictor?* ☐ Yes ☐ No
OUTLET STRUCTURE CONDITIONS:	Erosion at Outlet: ☐None ☐Slight ☐Moderate ☐Severe Outlet Clogging: ☐None ☐Slight ☐Moderate ☐Severe Structural Problems: ☐None ☐Slight ☐Moderate ☐Severe
CONDITIONS AT OUTFALL:	☐ Stream ☐ Closed storm sewer ☐ Surface channel ☐ Road ditch ☐ Other: _____ ☐Unknown

Active Erosion:	☐None ☐Slight ☐Moderate ☐Severe	Odor:	☐None ☐Slight ☐Moderate ☐Severe
Trash:	☐None ☐Slight ☐Moderate ☐Severe	Algae:	☐None ☐Slight ☐Moderate ☐Severe
Sedimentation:	☐None ☐Slight ☐Moderate ☐Severe	Other WQ Problems:	☐None ☐Slight ☐Moderate ☐Severe

Emergency Spillway Type: ☐ Channel ☐ Riser Overflow ☐ Weir ☐ Other: _____

SOIL OR FILTER MEDIA

TYPE OF FILTER/INFILTRATION MEDIA: (check all that apply)

☐ Soil mix _____(in) ☐ Sand _____(in) ☐ Gravel _____(in) ☐ Large Stone _____(in)

☐ Organic material _____(in) ☐ Other_____ ☐ N/A ☐ Unknown

Avg. depth of sediment build-up on surface?_____(in)

SOIL MEDIA SAMPLE: *Note – Complete during site investigation, if applicable*

Dominant Soil Type ☐ Clay ☐ Loam ☐ Sand ☐ Sand/Loam

Is the soil homogenous? ☐ Yes ☐ No

Comments:

VEGETATION

GENERAL OBSERVATIONS:

- ☐ Landscaped
- ☐ Aquatic Bench
- ☐ Invasive Species
- ☐ Plant Diversity

TYPE OF GROUND COVER (% of Surface Area in Plan View up to low Outlet)**:**

Note – All percentages should sum up to 100 %.

_____Trees	_____Grasses/Perennials	_____ Ponded water	_____ Other: _____
_____ Managed Turf	_____ Bare Soil	_____Shrubs	_____ N/A
_____ Gravel/stone	_____ Mulch	_____ Emergent wetland	

Depth of mulch, if present: ☐ Hardwood _____(in) ☐ Pine Straw _____ (in) ☐ Other_____ (in)

Rate degree of shading of BMP Surface Area by trees: ☐ Well Shaded ☐ Some Shading ☐ No Shading ☐ N/A

INLET CHARACTERISTICS

INLET #1:
Diameter/Width: _____(in)

TYPE OF INLET: ☐ Open Channel ☐ Closed Pipe ☐ Sheet Flow ☐ Curb Cut ☐ Other: _____

Elevation difference between bottom of inlet and BMP surface: _____ (in)

INLET SUBMERSION:
☐ Complete
☐ Partial
☐ None

INLET CONDITIONS:

Inlet Erosion	☐None	☐Slight	☐Moderate	☐Severe
Inlet Clogging	☐None	☐Slight	☐Moderate	☐Severe
Structural Problems	☐None	☐Slight	☐Moderate	☐Severe

Comments:

INLET #2:
Diameter/Width: _____(in)

TYPE OF INLET: ☐ Open Channel ☐ Closed Pipe ☐ Sheet Flow ☐ Curb Cut ☐ Other: _____

Elevation difference between bottom of inlet and BMP surface: _____ (in)

INLET SUBMERSION:
☐ Complete
☐ Partial
☐ None

INLET CONDITIONS:

Inlet Erosion	☐None	☐Slight	☐Moderate	☐Severe
Inlet Clogging	☐None	☐Slight	☐Moderate	☐Severe
Structural Problems	☐None	☐Slight	☐Moderate	☐Severe

Comments:

INLET #3:
Diameter/Width: _____(in)

TYPE OF INLET: ☐ Open Channel ☐ Closed Pipe ☐ Sheet Flow ☐ Curb Cut ☐ Other: _____

Elevation difference between bottom of inlet and BMP surface: _____ (in)

INLET SUBMERSION:
☐ Complete
☐ Partial
☐ None

INLET CONDITIONS:

Inlet Erosion	☐None	☐Slight	☐Moderate	☐Severe
Inlet Clogging	☐None	☐Slight	☐Moderate	☐Severe
Structural Problems	☐None	☐Slight	☐Moderate	☐Severe

Comments:

INLET #4:
Diameter/Width: _____(in)

TYPE OF INLET: ☐ Open Channel ☐ Closed Pipe ☐ Sheet Flow ☐ Curb Cut ☐ Other: _____

Elevation difference between bottom of inlet and BMP surface: _____ (in)

INLET SUBMERSION:
☐ Complete
☐ Partial
☐ None

INLET CONDITIONS:

Inlet Erosion	☐None	☐Slight	☐Moderate	☐Severe
Inlet Clogging	☐None	☐Slight	☐Moderate	☐Severe
Structural Problems	☐None	☐Slight	☐Moderate	☐Severe

Comments:

PRETREATMENT

TYPE OF PRETREATMENT *(check all that apply)*
☐ None
☐ Sediment Forebay (_____ ft^3)
☐ Grass Channel
☐ Riprap Channel or Apron
☐ Grass Filter Strip
☐ Plunge Pool?
☐ Stone Diaphragm
☐ Other: _____

PRETREATMENT FUNCTION ☐ By design ☐ Incidental
Is pretreatment functioning? ☐ Yes ☐ No
Is sediment removal necessary? ☐ Yes ☐ No
Signs of pretreatment bypass? ☐ Yes ☐ No
Signs of flow of sediment from pretreatment to BMP? ☐ Yes ☐ No
Severity: ☐ Slight ☐Moderate ☐Severe

GENERAL DESIGN

BMP FEATURES (check all that apply)
☐ Maintenance Access
☐ Fence
☐ Multi-cell
☐ Micropool
☐ Impermeable Liner
☐ Underdrain
☐ Clean Out
☐ Observation Well
Is water present in observation well?
☐ Yes ☐ No Depth: _____ ft
☐ Pond Drain
☐ Other:_____

CONVEYANCE THROUGH BMP
☐ No Defined Channel
☐ Low Flow Channel
☐ Concrete ☐ Eroded ☐ Earthen ☐ Other _____

Is BMP designed with a Permanent Pool? ☐ Yes ☐ No

PERFORMANCE

GENERAL PROBLEMS: (check all that apply)

- ☐ Maintenance Needed
- ☐ Water Bypass of Inlet
- ☐ Water Bypass of Outlet
- ☐ Incorrect Flow Paths
- ☐ Short-circuiting of treatment mechanism
- ☐ No or ineffective treatment
- ☐ Ineffective pretreatment
- ☐ Others _____ __
- ☐ Erosion at Embankments
- ☐ Erosion within Facility
- ☐ Deposition within Facility
- ☐ Inappropriate Ponding of Water
- ☐ Clogged Pond Drain/Underdrain
- ☐ Clogged Media
- ☐ Inappropriate media material
- ☐ Inappropriate underlying soil (infiltration)
- ☐ Permanent Pools not stable
- ☐ Inadequate vegetation
- ☐ Dead or Diseased Vegetation
- ☐ Too many invasive plants
- ☐ Trees on Embankment
- ☐ Failing structural components
- ☐ Safety issue (Note:_____)

WATER QUALITY IN FACILITY: ☐N/A

Algae	☐None	☐Slight	☐Moderate	☐Severe
Odor	☐None	☐Slight	☐Moderate	☐Severe
Turbidity	☐None	☐Slight	☐Moderate	☐Severe
Color	☐Normal	☐Abnormal: _____		

EVIDENCE OF:

- ☐ Geese
- ☐ Animal Burrows
- ☐ Mosquitoes
- ☐ BMP Alteration

PROBLEM		1=NONE	2 - FEW	3 – SEVERAL	4-SEVERE
TRASH		No evidence of trash	A few pieces of trash throughout BMP	Trash accumulation near inlet/outlet	Lots of trash in BMP or BMP used for storage
BMP BANK EROSION		No noticeable erosion	Slight erosion < 5% of bank affected	Moderate erosion ~15% of bank affected	Banks severely eroded, >25% of bank affected
SEDIMENT DEPOSITION		No sediment deposition	Areas of minor sediment deposition	Areas of some deposition, may be severe near inlet/outlets	Lots of deposition resulting in pond bottom clogging
SURFACE SLOPE		0-1% BMP surface slope	1-3% BMP surface slope or steeper slopes with check dams,	3-5% BMP surface slope with no check dams,	>5% surface slope;
SIDE SLOPES		BMP side slopes 3:1 or flatter	BMP side slopes 2:1	Steep BMP side slopes	Risk of side slope failure
STRUCTURAL		No evidence of structural damage	Minor problems (e.g., bank slump, eroded channels)	Moderate structural problems –failure pending	Structural failures (e.g., bank failure, blowout)
VISIBILITY		High visibility, near high-traffic areas	Some visibility, near traffic areas	Limited visibility, near low traffic areas	No visibility, behind buildings or fences
ACCESSIBILITY		Maintained access area for vehicles	Access area designated, but not maintained	Access for vehicles not designated	Access for vehicles not possible
VEG COVER		No mowing in/around BMP	Mowing along BMP edges but areas of no mow in BMP bottom	Mowed turf vegetation	BMP bottom has large areas of bare soil
		Dense plant cover (>75%)	Plant cover, 50-75%	Some plant cover, 25-50%	Sparse vegetative cover (<25%),
VEG HEALTH	TREES	Healthy and established	Slightly stressed	Stressed	Dead
	GROUND COVER	Healthy and established	Slightly stressed	Stressed	Dead
	SHRUBS	Healthy and established	Slightly stressed	Stressed	Dead
	EMERGENT WETLAND	Healthy and established	Slightly stressed	Stressed	Dead

OVERALL PERFORMANCE SCORE (circle one number)

Excellent design and function, no general problems with performance	BMP is well designed, but is undersized or has a few performance problems	BMP is adequately designed, several problems with performance are noted	Poor BMP design, severe performance problems or failure
10 9	8 7	6 5	4 3 2 1

FIELD NOTES

GOOD OR INTERESTING FEATURES:

PHOTO #'S:

POOR OR PROBLEMATIC FEATURES:

PHOTO #'S:

SECTION 3 – DESIGN PLAN VERIFICATION

PLAN AVAILABLE: ☐ As-built ☐ Other: _____

Do field observations match design plans/as-builts? Describe any differences.

Soil type in facility	☐ N/A	☐ Yes	☐ No	If no, describe:
Pretreatment type and size	☐ N/A	☐ Yes	☐ No	If no, describe:
Signage	☐ N/A	☐ Yes	☐ No	If no, describe:
Low-flow channel	☐ N/A	☐ Yes	☐ No	If no, describe:
Dimensions/volume	☐ N/A	☐ Yes	☐ No	If no, describe:
Inlet type, #, and sizing	☐ N/A	☐ Yes	☐ No	If no, describe:
Outlet type, #, and sizing	☐ N/A	☐ Yes	☐ No	If no, describe:
Vegetation composition	☐ N/A	☐ Yes	☐ No	If no, describe:
Other features	☐ N/A	☐ Yes	☐ No	If no, describe:

Appendix B-5c

MCM #5 – BMP Inspection Report

SWM/BMP
INSPECTION REPORT

FOR CITY USE ONLY

LOCATION OF SWM/BMP:	ACCEPTED ( ) MAINTENANCE ( ) QUESTIONS ( ) REPAIRS ( )
ADDRESS OF SWM/BMP :	DATE: ___/___/____ REVIEWED BY: _____ TITLE: _____
OWNER OR MANAGEMENT CO.:	**PHONE # :**
ADDRESS:	
INSPECTION COMPANY :	**PHONE # :**
ADDRESS :	
INSPECTOR NAME (print) :	**PHONE # :**
INSPECTOR SIGNATURE :	**DATE # :**

TYPE OF BMP

Bio-detention ( )	Dry Pond ( )	Wet Pond ( )	Infiltration Trench ( )	Underground Detention ( )
Storm Ceptor ( )	Sand Filters ( )	Green Roof ( )	Filterra ( )	Vegetated Swale ( )

Other, describe :

Inspection Checklist

Structural Integrity:	Yes	No	N/A
Does the facility show any signs of settling, cracking, bulging, misalignment, or any other structural deterioration?			
Do embankment, emergency spillways, side slope, or inlet/outlet structure show signs of excessive erosion or slumping?			
Is the inlet and outlet pipe damaged or otherwise not functioning properly?			
Do impoundment and inlet areas show erosion, low spots, or lack of stabilization?			
Are trees or saplings present on the embankment?			
Are animal burrows present?			
Are contributing areas unstabilized with evidence of erosion?			
Do grass areas require mowing and /or are clippings building up?			
Working Conditions			
Are cartridge filters, sand filters, filterra boxes, and other filters clogged?			
Provide date of last filter replacement. (/ /)			
Is water quality orifice, weir, grate, trash rack completely clear of debris and completely open?			
Does the depth of sediment or other factors suggest a loss of storage volume?			
Is there standing water in inappropriate areas, such as on filters or cartridges after a dry period?			
Is there an accumulation of floating debris and/or trash?			
Other Inspection Items			
Is there evidence of encroachments or improper use of impoundment areas?			
Do the fence gate or other safety device need repair?			
Is there excessive algae growth or has one type of vegetation taken over the facility?			
Is there evidence of oil, grease, or other automotive fluids entering and clogging the facility?			
In rain gardens, is there evidence of soil erosion, does mulch cover the entire area, is specified number and types of plants still in place, or is there evidence of disease or plant stress from adequate or too much watering?			
Is there evidence of fish kill?			

Appendix B-5d

MCM #5 – BMP Maintenance and Monitoring Agreement

BMP AGREEMENT# (to be filled in by staff): _____

CITY OF FAIRFAX
STANDARD BEST MANAGEMENT PRACTICES (BMP) FACILITIES MAINTENANCE AND MONITORING AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20 _____, by and between _____, its successors and assigns, hereinafter called (the "Landowner"), and the City of Fairfax, Virginia, a Virginia municipal corporation (the "City");

WITNESSETH:

WHEREAS, the Landowner is the owner of record certain real property located within the City, and described as:

_____

Tax map, block, and lot number

as acquired by deed recorded in the land records of the County of Fairfax, Virginia in Deed Book _____ at Page _____, (the "Property").

WHEREAS, Landowner is proceeding to build on and develop the Property and;

WHEREAS, Erosion and Sediment Control Plan/ Plan of Development/Site Plan/Subdivision Plan (describe fully)_____, (the "Plan"), which is expressly made a part hereof by reference, as approved or to be approved by the City, provides for detention or on-site treatment of stormwater within the confines of the Property and;

WHEREAS, Erosion and Sediment Control Plan/Plan of Development/Site Plan/Subdivision Plan identifies the type of structural best management practices facility or facilities as:

1)_____
2)_____ 4)_____
3)_____ 5)_____

as defined by the Virginia Stormwater Management Handbook and;

WHEREAS, Erosion and Sediment Control Plan/Plan of Development/Site Plan/Subdivision Plan identifies the geographic location (HUC), hydrologic unit code of each facility as:

1)_____(HUC as established in 4 VAC 50-60-10) _____(USGS HUC)
2)_____(HUC as established in 4 VAC 50-60-10) _____(USGS HUC)
3)_____(HUC as established in 4 VAC 50-60-10) _____(USGS HUC)
4)_____(HUC as established in 4 VAC 50-60-10) _____(USGS HUC)
5)_____(HUC as established in 4 VAC 50-60-10) _____(USGS HUC)

WHEREAS, Erosion and Sediment Control Plan/Plan of Development/Site Plan/Subdivision Plan identifies the impaired surface water that the best management practices facility is discharging into as:

1)_____
2)_____
3)_____
4)_____
5)_____

WHEREAS, Erosion and Sediment Control Plan/Plan of Development/Site Plan/Subdivision Plan identifies the number of acres treated by each facility as:

1)	Total:_____	Pollutant Removal:	TN: _____
	Pervious:_____		TP: _____
	Impervious:_____		TSS: _____
2)	Total:_____		TN: _____
	Pervious:_____		TP: _____
	Impervious:_____		TSS: _____

3) Total:_____ TN: _____
Pervious:_____ TP: _____
Impervious:_____ TSS: _____

4) Total:_____ TN: _____
Pervious:_____ TP: _____
Impervious:_____ TSS: _____

5) Total:_____ TN: _____
Pervious:_____ TP: _____
Impervious:_____ TSS: _____
and;

WHEREAS, Landowner acknowledges that the City Zoning Ordinance requires that on-site Best Management Practices, facilities, (the "Facilities"), be properly constructed and maintained, inspected on the property and;

WHEREAS, the City requires that the Facilities as shown on the Plan be constructed and adequately maintained by the Landowner.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. The Facilities shall be constructed by the Landowner, in accordance with the plans and specifications as identified in the Plan.
2. Landowner shall maintain the Facilities in good working condition, in a manner to be acceptable to the City, so that the Facilities perform as designed.
3. Landowner, hereby grant permission to the City, its authorized agents and employees, to enter upon the Property and to inspect the Facilities whenever the City deems it to be necessary. The purpose of the inspection shall be to assure safe and proper functioning of the Facilities, berms, outlet structures, pond areas, etc. When deficiencies are noted, the City shall give the Landowner, copies of the inspection report with its findings and evaluations within 30 days.
4. Landowner will submit inspection reports and perform maintenance in accordance with the maintenance schedule for the Facilities including sediment removal as outlined on the approved plans and the following specific requirements:
    a. Maintenance of the aforementioned facility or facilities shall conform to the maintenance requirements contained in Chapter 9 of the 2013 Stormwater Management Handbook, published by the Virginia Department of Environmental Quality and the Virginia Stormwater BMP Clearinghouse Website, available at http://www.vwrrc.vt.edu/swc/
    b. Inspection of Facilities shall be performed every **12** months by a qualified professional licensed to perform said work in the State of Virginia; an inspection report shall be submitted to the City Stormwater Program Specialist.
5. In the event the City, pursuant to this Agreement, enters upon the Property and takes whatever steps it deems necessary to maintain said Facilities and in performance of said work for labor, use of equipment, supplies, materials and the like on account of the Landowner's failure to perform such work, the Landowner shall reimburse the City, upon demand, within 30 days of receipt thereof for all costs incurred by the City hereunder. 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. If not paid within such 30-day period, the City shall have a lien against the Property to the extent permitted by law, in the amount of such costs, plus interest at the highest rate permitted by law.
6. Landowner shall indemnify and hold harmless the City, its officers, 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 of or maintenance of the Facilities by the Landowner. In the event a claim is asserted against the City, the City

shall promptly notify the Landowner, and the Landowner shall defend, at its own expense, any suit based on such claim. If any judgment or claim against the City shall be allowed, the Landowner shall pay all of the City's costs and expenses in connection therewith, including attorneys' fees.

7. Landowner hereby grants permission to the City, its authorized agents and employees, and the Northern Virginia Planning District Commission, its authorized agents, employees and consultants, to enter upon the property, and to install, operate and maintain equipment to monitor the flow rate and pollutant content of the input flow, the effluent, and at intermediate points in the BMP.
8. This Agreement shall be recorded among the land records of the County of Fairfax, 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) (Seal)

By: _____
Name (type or print)

Attest:_____
Secretary

WITNESS THE FOLLOWING SIGNATURE AND SEAL:

STATE OF _____County/City/Town of _____to-wit:

I, the undersigned, A Notary Public in and for the State and County, City or Town aforesaid, do hereby certify that this day personally appeared before me in the State and County, City or Town aforesaid:

_____,
(Name) (Title)

whose name(s) is(are) signed to the foregoing and hereunto annexed agreement bearing the _____day of _____, 2_____, and acknowledged the same before me.

Given under my hand this _____day of _____,2_____.

Notary Registration Number#: _____

My Commission expires: _____day of _____,2_____.

_____
(Notary Public Signature)

CITY OF FAIRFAX

By: _____
Stormwater Resource Engineer

By: _____
City Attorney – Approved as to Form

By: _____
City Manager

Attest:_____
City Clerk

WITNESS THE FOLLOWING SIGNATURE AND SEAL:

COMMONWEALTH OF VIRGINA
CITY OF FAIRFAX to-wit:

The foregoing instrument was acknowledged before me this:

_____day of _____,2_____.by_____, as City Manager, on behalf of the City of Fairfax, Virginia.

My Commission expires: _____day of _____,2_____.

Notary Registration Number#: _____

_____
(Notary Public Signature)

Appendix B-5e

MCM #5 – List of BMPs Implemented in Year 3

City of Fairfax, VA: List of BMPs Implemented in Year 3

DEQ's Urban BMP Reporting

Address	BMP Implemented
10535 Cedar Ave	Permeable Pavement
3508 Perry Street	Infiltration Trench
Lowes - 4080 Jermantown Rd	Filterra
Lowes - 4080 Jermantown Rd	Contech Jellyfish
Old Towne Square - 10386 Main St	Permeable Pavement (1)
Old Towne Square - 10386 Main St	Permeable Pavement (2)
The Lamb Center - 3160 Campbell Drive	Permeable Pavement
3503 Burrows Ave	Amended Soils(1)
3503 Burrows Ave	Amended Soils(2)
3503 Burrows Ave	Planter (Urban Bioretention) (1)
3503 Burrows Ave	Planter (Urban Bioretention) (2)
3503 Burrows Ave	Planter (Urban Bioretention) (3)
3503 Burrows Ave	Planter (Urban Bioretention) (4)
3503 Burrows Ave	Planter (Urban Bioretention) (5)
Layton Hall Redevelopment, Phase 1 - 10320 Layton Hall Dr	Amended Soils (1)
Layton Hall Redevelopment, Phase 1 - 10320 Layton Hall Dr	Amended Soils (2)
Patient First - 10100 Fairfax Blvd	Contech Stormfilter

Appendix B-6

MCM #6 – City of Fairfax Draft Training Plan

1.0 Introduction

The purpose of this Training Plan is to identify the training requirements and to provide a schedule and approach for compliance with these requirements under the City of Fairfax municipal separate storm sewer system (MS4) management program The Department of Public Works - Stormwater is responsible for implementing the MS4 for the City of Fairfax.

1.1 Goals

The Virginia General Permit for Discharges of Stormwater from Small MS4s (General Permit), published at 9 VAC 25-890 et al, has specific requirements for training of City of Fairfax staff and contractors acting on behalf of the City of Fairfax. The General Permit was revised in 2013 and the updated version became effective on July 1, 2013. The City of Fairfax obtained coverage under the 2013 General Permit as General Permit Number VAR040064.

The 2013 General Permit regulations, including the definitions of terms used under this regulatory program, can be found at the Virginia Pollutant Discharge Elimination System Program (VPDES) Permit Regulations: http://lis.virginia.gov/cgi-bin/legp604.exe?000+reg+9VAC25-890-40

As required in Section II, Part B.6 of the General Permit, this plan was designed with consideration of the following goals:

- To develop and provide training for staff and ensure contractors are appropriately trained, so both groups that are involved in operations and maintenance activities are enabled to minimize or prevent pollutant discharge from: 1) daily operations such as road, street, and parking lot maintenance; 2) equipment maintenance; and 3) the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers;
- Development of a Training Plan meeting the training requirements provided in Section II, Part B.6.d of the General Permit.

1.2 Objectives

This Training Plan outlines a process for training City of Fairfax staff and requires contractors to support the City's objective of achieving improved water quality through reduced pollutant volumes making their way into water bodies via the City's MS4. Implementation of the actions described in this document should help the City achieve this objective of improving the quality of the waters within the City of Fairfax. This plan will be updated annually and will reflect changes that result from evaluation of the effectiveness of the Training Plan that is outlined in Section 3.5 of this plan.

The Training Plan complies with the General Permit requirements to:

- Utilize written procedures developed under other General Permit requirements as a component of the City of Fairfax's overall employee training; and
- Identify and document:
  - The positions/employees that need training;
  - The type(s) of training; and
  - The frequency of training.

2.0 MS4 Management Program

Polluted stormwater runoff is commonly transported through MS4s, from which it is often discharged, untreated, into local water bodies. The Commonwealth of Virginia requires operators of MS4s to obtain a permit for their MS4 discharges and develop a stormwater management program. The permit establishes six "minimum control measures" (MCMs) to prevent stormwater pollution in the MS4; they are:

1. Public education and outreach;
2. Public participation/involvement;
3. Illicit discharge detection and elimination (IDDE);
4. Construction site stormwater runoff control;
5. Post-construction stormwater management in new development and re-development on prior developed lands; and,
6. Pollution prevention/good housekeeping for municipal operations.

Among the requirements associated with the sixth MCM listed above, the City of Fairfax must prepare and implement a Training Plan. The City functions and associated training that are covered by this plan are detailed in the remaining sections of this document.

3.0 Permit-Mandated Training

The City of Fairfax's staff training requirements for compliance with its MS4 permit include language about specific personnel functions and type of training.

The text below provides the requirements from the General Permit.

1. The City of Fairfax shall provide biennial (every other year) training to applicable field personnel in the recognition and reporting of illicit discharges.

2. The City of Fairfax shall provide biennial training to applicable employees in good housekeeping and pollution prevention practices that are to be employed during road, street, and parking lot maintenance.
3. The City of Fairfax shall provide biennial training to applicable employees in good housekeeping and pollution prevention practices that are to be employed in and around maintenance and public works facilities.
4. The City of Fairfax shall ensure that employees, and require that contractors, who apply pesticides and herbicides are properly trained or certified in accordance with the Virginia Pesticide Control Act (§ 3.2-3900 et seq. of the Code of Virginia).
5. The City of Fairfax shall ensure that employees and contractors serving as plan reviewers, inspectors, program administrators, and construction site operators obtain the appropriate certifications as required under the Virginia Erosion and Sediment Control Law and its attendant regulations.
6. The City of Fairfax shall ensure that applicable employees obtain the appropriate certifications as required under the Virginia Erosion and Sediment Control Law and its attendant regulations.
7. The City of Fairfax shall provide biennial training to applicable employees in good housekeeping and pollution prevention practices that are to be employed in and around recreational facilities.
8. The appropriate emergency response employees shall have training in spill responses.

3.1 Affected Staff

The City of Fairfax positions/functions that fall within the areas described in the General Permit requiring training are located in the Departments of Public Works (PW); Departments of Public Works – Operations (DPWO); Parks and Recreation (PR); and Fire Department/Emergency Response Teams (ER). These organizations and the respective applicable training topics are shown in **Table 1**. Specific positions or functions within the different departments are shown in **Table 2**.

Table 1: Required Department Training

City Department	Illicit Discharge Recognition (ID)	Good House-keeping and Pollution Prevention (GHPP)	Certified and /Or Trained, VA Pesticide Control Act (PCA)	Certified Under VA ESC Law (ESC)	Certified SWM Plan Reviewer/ Inspector (SWM)	Spill Response (SR)
Public Works – (PW)				X	X	
Public Works – Operations (DPWO)	X	X	X			
Parks & Recreation (PR)	X	X	X			
Fire Department/ Emergency Response Teams (ER)	X					X

Table 2: Positions Requiring Stormwater Management-Specific Training

POSITION	TRAINING TYPES
Department of Public Works	
Program Manager	ESC, SWM-INSP
Assistant Program Managers	ESC, SWM-INSP
Field Technicians/Program Specialists	ESC, SWM-INSP
Department of Public Works - Operations	
Public Works Stormwater Maint. Supervisor	ID, GHPP, PCA
Public Works staff	ID, GHPP
Parks and Recreation	
Maintenance Staff	ID, GHPP, PCA
Maintenance Supervisors	ID, GHPP, PCA
Fire Department/ Emergency Response Teams	
Career Staff	ID,SR
Volunteer Staff	ID,SR
Contractor Support Staff	varies

Specifically, staff working in the positions listed in **Table 2** above must receive training appropriate to their responsibilities related to stormwater pollution and the reduction or elimination of pollutants entering waters of the City of Fairfax, Virginia. Training must be provided at least biennially. However, to simplify scheduling and to ensure training is current for all affected staff, the City of Fairfax will make training opportunities available on an as needed basis. Turnover in staff and changes in positions occur frequently enough that training needs may need to be evaluated on an annual basis.

3.2 Training Topics

Training may be a combination of in-house, commercially available and/or coordinated course offerings with other MS4-locality training events. The six types of training and the City of Fairfax staff and/or contractors that are subject to the training are explained below. The status of the training provided to the appropriate personnel is also included. Training events that are continuously conducted, and those that are available to staff and contractors via the internet are summarized in **Table 3**. The 2013 General Permit requires that the City implement and document stormwater management training. In addition to the targeted courses listed below, Virginia's Department of Environmental Quality offers a selection of training courses. Information about these is provided at http://www.deq.virginia.gov/ ConnectWithDEQ/TrainingCertification.aspx. A partnership, called The Chesapeake Stormwater Network, also provides a selection of pertinent training courses, at http://chesapeakestormwater.net/ and they have other offerings that are provided at http://chesapeakestormwater.net/training-library/.

3.2.1 Illicit Discharge Recognition (ID)

Illicit discharge recognition training is required for selected staff within the DPWO, PR, and ER organizations. Annual review of training needs will be conducted to ensure that all staff is engaging the appropriate training events on no less than a biennial basis. Example opportunities for future training are shown in **Table 3** below.

3.2.2 Good Housekeeping and Pollution Prevention (GHPP)

Good housekeeping and pollution prevention training is required for selected staff within DPWO and PR organizations. Annual review of training needs will be conducted to ensure that all staff is engaging the appropriate training events on no less than a biennial basis. Example opportunities for future training are shown in **Table 3** below.

3.2.3 Certified and/or Trained Under the Virginia Pesticide Control Act (PCA)

Training is required for all applicators. For DPWO staff, this includes only the Public Works Supervisors. For PR staff this includes Maintenance staff and their supervisors doing applications at parks within the City of Fairfax. This function is carried out by a combination of the City of Fairfax employees and contractors for PR. All applicators have their current

certifications and will be required to keep certifications current. Example opportunities for future training are shown in **Table 3** below.

3.2.4 Certified, VA Erosion and Sediment Control Law (ESC)

Training is required for PW staff, including the Program Manager, Assistant Program Managers, and Field Technicians/Program Specialists. All PW staff selected to be certified have their current certifications and will be required to keep them current. Example opportunities for future training, to ensure certifications are maintained, are shown in **Table 3** below.

3.2.5 Stormwater Management (SWM)

Stormwater Management Inspector training is required for PW staff, including the Program Manager, Assistant Program Managers, and Field Technicians/Program Specialists. All appropriate PW staff have their current certifications and will be required to keep them current.

Example opportunities for future training, to ensure certifications are maintained, are shown in **Table 3** below.

A commercial vendor of training packages tailored to compliance with MS4 permits has developed a series of training modules. Information on these options is provided at http://stormwaterone.com/virginia-stormwater-management and is not necessarily recommended, but is included here as one of a number of options for City compliance.

3.2.6 Spill Response (SR)

Training is required for Fire Department and Emergency Response Team staff. The Fire Department is a combination career and volunteer system that operates under the City of Fairfax Fire Department and the Fairfax Volunteer Fire Department Inc.

Table 3: Example Course Offerings Available to City of Fairfax Staff and Contractors

Training Type	Example Course Selection / Opportunities
Illicit Discharge Identification	Illicit Discharge Detection & Elimination (webinars available from U.S.EPA) Developing Your IDDE Program (IDDE 101) Conducting Illicit Discharge Detection and Elimination Investigations (IDDE 201) Illicit Discharge Detection and Elimination IDDE 301 - Finding and Fixing Illicit Discharges and Connections
Good Housekeeping and Pollution Prevention	Pollution Prevention/Good Housekeeping (webinars available from U.S.EPA) Killing Two Birds with One Stone: Building a Local Program to Maintain Your Stormwater Practices and Prevent Pollution from Municipal Operations EPA's Stormwater Pollution Prevention Webinar Series: Road Salt Pollution Prevention Strategies Stormwater 101: The Basics
Certified and/or Trained, VA Pesticide Control Act	Pesticides (webinar available from U.S.EPA) U.S. EPA Webcast on Pesticide General Permit (PGP) Requirements for Notice of Intent
Certified, VA Erosion and Sediment Control Law	Erosion & Sediment Control: Basic, Inspector, and Plan Reviewer Courses: http://www.deq.virginia.gov/ConnectWithDEQ/TrainingCertification/ESCTraining.aspx
Certified SWM Inspector	Virginia Stormwater Management Program: Inspector Courses: http://www.deq.virginia.gov/ConnectWithDEQ/TrainingCertification/SWMTraining.aspx
Certified SWM Plan Reviewer	Virginia Stormwater Management Program: Plan Reviwer Courses: http://www.deq.virginia.gov/ConnectWithDEQ/TrainingCertification/SWMTraining.aspx

Spill Response	• 8 hours of HazMat Awareness training for volunteer First Responder, EMT, Advanced EMT, and Paramedic members within Fairfax City Fire, Rescue, and Emergency Management; • 40 hours of Hazardous Materials Operations training for career and volunteer Firefighters, Technicians, Lieutenants, Captains, Battalion Chiefs, Deputy Chiefs, Assistant Chiefs and Chief of Department within Fairfax City Fire, Rescue, and Emergency Management; • 80 hours of Hazardous Materials Technician training for career firefighter, Technicians, Lieutenants, Capt. and Battalion Chiefs of Fairfax City Fire, Rescue, and Emergency Management personnel assigned to the hazardous materials station; and • 40 hours of Environmental Crimes enforcement training for career law enforcement members of the Fairfax City Fire Marshal's office.

3.3 Ensuring Contractor Compliance

While the majority of personnel affected by the stormwater management training requirements are employed directly by the City of Fairfax, there are cases where contracted individuals are performing jobs that are subject to stormwater training. The City of Fairfax's procurement office will be notified of the roles and responsibilities shown in **Table 2** of this plan so that they can add language to contracts that speaks to the training required by the General Permit. At a minimum, the Scope of Work for contracted inspectors will require they have the proper training stormwater training for the work being performed.

Appropriate staff will be provided a copy of this plan and their participation in assisting the City with compliance with the training requirements for contracted personnel will be sought.

3.4 Training Frequency and Compliance

As noted previously, training is required on a biennial basis. The City of Fairfax will ensure that this standard is met via a policy of reviewing staff and contractor status not less than annually with triggers for review being:

- upon hiring;
- staff transfers into new/different positions; and

In accordance with the General Permit, the City of Fairfax will keep documentation of each applicable training event for a period of three years. Records will include the date and location, if applicable, of the training; the names of the employees taking the training; and the objective of the training event.

Ideally, the City of Fairfax will include the training needed for compliance with the MS4

requirements within a larger, automated personnel training tracking system. In the absence of such a tracking system, **Table 4** illustrates a spreadsheet format that can be used by the Department of Public Works to track compliance and trigger planning to fulfill training needs.

Table 4: Sample Training History and Schedule for Fairfax City Personnel

Employee or Contractor Name	Department Name	Position Name	Training Category Requirement	Date Completed	Next Training Date Deadline
Joe Smith	PR	Maintenance Tech	Illicit discharge	17-Feb-13	01-Jan-15
			Good housekeeping and pollution prevention	31-Mar-14	01-Feb-16
			Pesticide Control Act	7-May-14	maintain certification
Sue Jones	PW	Engineering Assistant	Illicit discharge	17-Feb-13	01-Jan-15
			Good housekeeping and pollution prevention	none	31-Jul-14
			Pesticide Control Act	20-Jan-14	maintain certification

3.5 Evaluation of Training Plan Effectiveness

Each year PW will review the training accomplished within the identified departments that are subject to stormwater management training requirements. At that time, the staff population requiring training will be compared to actual training received. Additionally, the universe of those included in the plan will be evaluated to confirm that appropriate staff is included in the training planning. Any shortfalls or changes that are identified will be documented and added to this Training Plan.

Appendix B-7a

Difficult Run *E. coli* TMDL Action Plan

Difficult Run

Bacteria TMDL Action Plan

PERMIT NUMBER VAR040064

Submitted to DEQ:

October 2016

CITY OF FAIRFAX, VIRGINIA - DIFFICULT RUN E.COLI TMDL ACTION PLAN

INTRODUCTION

The City of Fairfax has prepared this Difficult Run E.Coli (bacteria) TMDL Action Plan to address the Special Condition for approved local TMDLs (Section I.B) in the City's MS4 Permit. The City's approach for preparation of this Action Plan is based on the requirements listed in the MS4 General Permit and DEQ's Draft Local TMDL Action Plan Guidance Document that was released on 4/9/2015. Each of the sections in this Action Plan will address one or more of the required action plan content items as listed on page 4 of DEQ's Draft Local TMDL Action Plan Guidance Document.

TMDL BACKGROUND INFORMATION

1. ***The name(s) of the Final TMDL report(s);***
2. ***The pollutant(s) causing the impairment(s);***
3. ***The WLA(s) assigned to the MS4 as aggregate or individual WLAs.***
   [This section of the Action Plan directly addresses Section I.B of the MS4 Permit and DEQ Guidance Document Action Plan Content Items1-3]

The City of Fairfax was assigned an aggregated Waste Load Allocation (WLA) under the approved TMDL report entitled *Bacteria TMDL for the Difficult Run Watershed, dated April 25, 2008*. The impaired segment of Difficult Run (Segment ID: VAN-A11R-01) begins at the confluence of Captain Hickory Run with Difficult Run and extends 2.93 miles downstream to its confluence with the Potomac River. The watershed is located in (HUC) 02070008 and is within Fairfax County. The segment is listed as impaired on Virginia's Section 303(d) Total Maximum Daily Load Priority List and Report because of violations of the state's water quality standards for E.coli and fecal coliform bacteria. At the time of the initial listing of the Difficult Run segment, the Virginia Bacteria Water Quality Standard was expressed in fecal coliform bacteria; however, the bacteria water quality standard has been changed is now expressed in E.coli. Therefore, the TMDL is expressed in E.coli by converting modeled daily fecal coliform concentrations to daily E. coli concentrations using the following regression based instream translator equation:

$$\text{E.coli conc. (cfu/100 mL)} = 2^{-0.0172} \times [\text{fecal coliform conc. (cfu/100mL)}]^{0.91905}$$

Analyses of physical, chemical, biological, and observational data indicate that potential key sources of fecal coliform in the stream segment included run-off from point source discharges, residential waste, and wildlife sources. A TMDL was therefore developed for bacteria to address the impairments in Difficult Run. The City of Fairfax (VAR040064), Fairfax County (VA0088587), and Town of Vienna (VAR040066) MS4s were assigned an aggregated WLA in the Final TMDL report as follows:

- Difficult Run TMDL Bacteria WLA (E.coli) = 9.65E+10 (cfu./day)
- Difficult Run TMDL Bacteria WLA (E.coli) = 9.86E+12 (cfu./year)

The City's MS4 Boundary, 0.18 square mile contributing drainage area to Difficult Run and the location of the impaired reach in comparison to the City limits is shown in Figure 1. The remainder of this Action Plan will focus on addressing the City's plan for complying with the aggregated WLA assigned to the City under this TMDL.

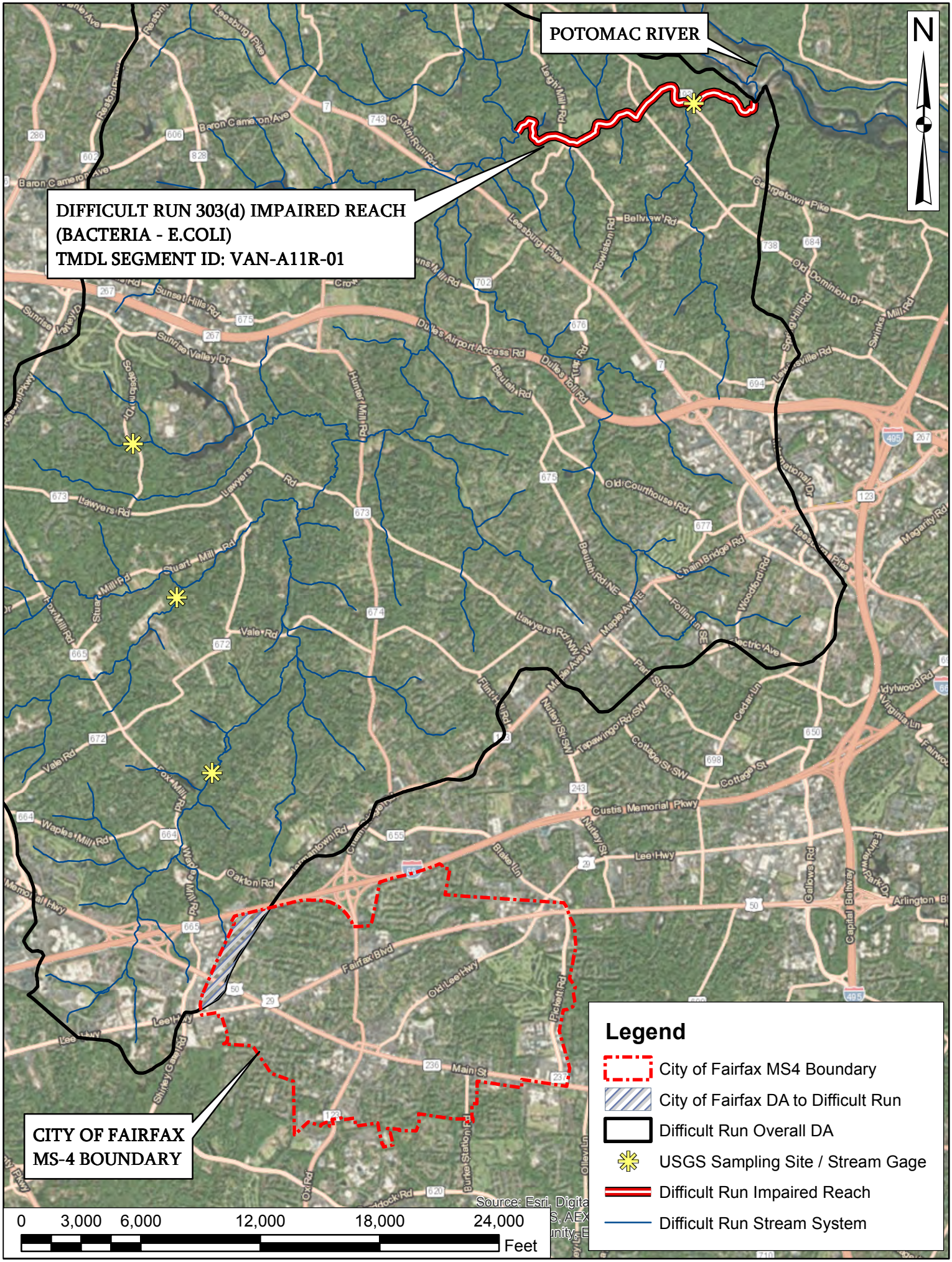

FIGURE 1: CITY OF FAIRFAX CONTRIBUTING DRAINAGE AREA (DA) TO DIFFICULT RUN

SIGNIFICANT SOURCES OF POC(S)

4. ***Significant sources of POC(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit. A significant source of pollutant(s) 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.***
   [This section of the Action Plan directly addresses Section I.B.2.d of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 4]

An initial Geographic Information System (GIS) based evaluation was performed to locate all City-owned/operated properties in the Difficult Run watershed. Utilizing the best available GIS shapefile data including parcel boundaries and current/historical activity descriptions, One (1) City-owned/operated property was identified in the Difficult Run watershed. The results of the initial evaluation are documented in Table 1, and the property's respective location within the City is shown in Figure 2.

Table 1. City-owned/operated properties in the Difficult Run Watershed.

GIS ID*	Name	Facility Type	Area (Ac)
1	Kutner Park	Park	10.5
** See Figure 2 for corresponding identifier*			

Once the City-owned/operated property was identified, a desktop based Pollutant of Concern (POC) source evaluation was performed utilizing the parcel's land use type, acreage, presence or absence of MS4 outfall(s), current activity description, and site proximity to Difficult Run. The site met the metrics listed above, as well as displayed features visible in the City's aerial imagery that would identify the site as having the potential for an expected pollutant loading greater than the average pollutant loading for the land use identified in the TMDL. Forested areas were weighted higher in this analysis due to the increased presence of wildlife habitats, as were parks, due to recreational field attributes (portable sanitation facilities).

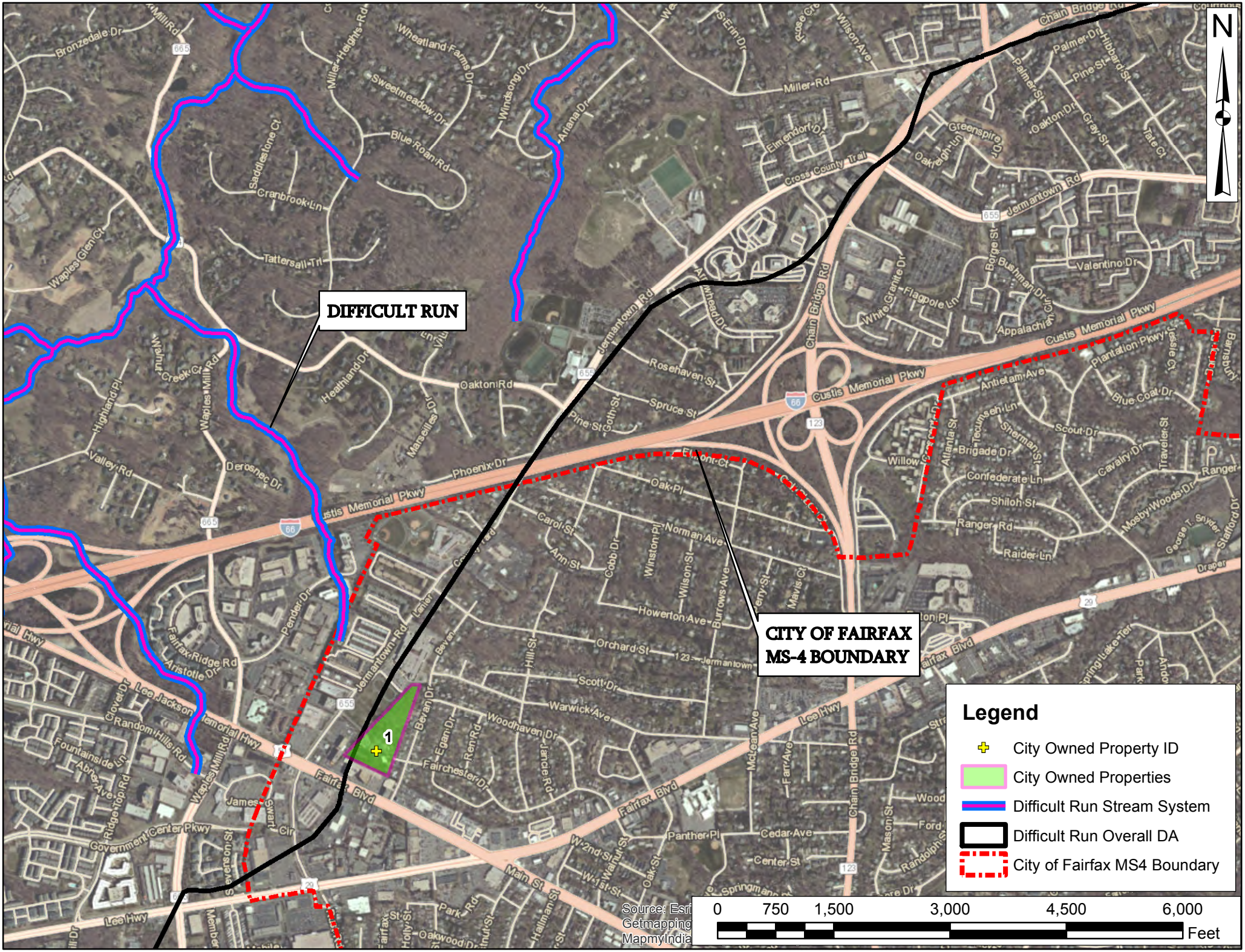

FIGURE 2: CITY OF FAIRFAX MS4 OWNED/OPERATED FACILITIES IN THE DIFFICULT RUN WATERSHED

After the initial desktop analysis was completed, an on-site field reconnaissance was performed to review and assess the on-the-ground conditions for Kutner Park. The site visit was performed to evaluate for potential pollutant of concern (POC) generating activities, as well as drainage patterns, stormwater pollution potential (exposure to precipitation), wild life presence and habitat, and locations of outfalls. The desktop analysis, coupled with the findings from the on-site field reconnaissance, determined that the City-owned/operated property exhibits site features, operations, and pollutant related indicators that could categorize it as "having the potential for an expected pollutant loading greater than the average pollutant loading for the land use identified in the TMDL". A description of the City-owned/operated facility is as follows:

Kutner Park

Kutner Park (Figure 3) features a wooded pedestrian hiking trail around the park's perimeter. The wooded area itself contributes to above-average amounts of bacterial loading due to the presence of a wildlife habitat (Figure 4), whereas the walking trail provides a location for residents to walk dogs and subsequently dispose/not dispose of dog waste (Figure 5) which can also increase the potential bacterial loading on-site. The southern end of the park features a picnic pavilion, grill area, playground equipment, soccer field, tennis court, and volleyball court. There is no on-site plumbing, and because of this, portable sanitation facilities (Figure 6) are available for public use for park visitors. The site features mentioned above classify the site as having a higher propensity for an increased bacterial loading.

Figure 3. Kutner Park

Figure 4. Kutner Park Vernal Pool and Wildlife Habitat.

Figure 5. Kutner Park dog waste station along walking trail.

Figure 6. On-site portable sanitation facilities.

Action Plan elements to address significant sources of POC loadings from facilities of concern owned or operated by the MS4 operator

The following subsection outlines the City's proposed means and methods for addressing existing and future significant sources of POC loadings from the facility identified in the subsequent section site analysis.

Kutner Park

To address the potential for significant sources of bacterial loading from Kutner Park, the City plans to implement the following means and methods:

- The City will continue to promote, and maintain, the dog waste disposal stations along the park trail. The City will also add brochure holders to each waste station that contain public education / outreach materials related to the water quality impacts of dog waste.
- The City will address the following items pertaining to all on-site portable sanitation facilities:
    - All facilities will be moved to a level ground surface;
    - All facilities will, wherever possible, be located upon natural ground and not within 5 feet of an impervious surface;
    - All facilities will be anchored down to prevent them from tipping over; and
    - Any damaged facilities will be repaired or replaced immediately.

Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to address the potential for significant sources of POC loadings from facilities of concern owned or operated by the City. Furthermore, the City plans to continue their current pollution prevention activities at all City properties, as well as incorporate additional pollution prevention activities to address Minimum Control Measure (MCM) 6 of their MS4 Program Plan.

EXISTING OR NEW BEST MANAGEMENT PRACTICES

5. Existing or new management practices, control techniques, and system design and engineering methods , that have been or will be implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA. [This section of the Action Plan directly addresses Section I.B.2.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 5]

Recognizing that bacteria pollutant discharges from the City's MS4 need to be controlled to the maximum extent practicable in order to protect the water quality in Difficult Run, City leaders and staff have incorporated several Best Management Practices (BMPs) into their MS4 Program Plan (revised in 2013), and their subsequent Annual Report(s), that specifically target bacteria and focus on source control. The following is a list of thirty three (33) BMPs that meet the Minimum Control Measures (MCMs) set forth in the City's MS4 Program Plan, and are further developed in their MS-4 Annual Reports, that specifically address the reduction of bacterial pollutant loads for the City's

MS4 *(Note: BMPs with an asterisk in their identifier (i.e. 2B*) are from the City's 2015 Annual Report):*

- *BMP 1.1. Stream Monitoring* - The City, in conjunction with George Mason University (GMU), will perform stream monitoring, to include bacteria sampling, to assess stream water quality. The City will publish an annual report related to the findings.
- *BMP 1.2. Storm Drain Marker Program* - The City will continue to use markers on existing storm drain inlets and place markers on new storm drain inlets. Marker reads "Drains to the Chesapeake Bay, No Dumping".
- *BMP 1.3. City of Fairfax Watershed Management Plan* - The City will post their Watershed Management Plan, and any updates, to their website to allow public access to watershed management information.
- *BMP 1.5. Additional Public Education Material* - The City will publish a quarterly newsletter to deliver stormwater program messages and distribute stormwater related information to citizens.
- *BMP 1.6. Additional Public Education Material* - The City will promote the "Follow the Rubber Ducky" initiative on their website to illustrate the effects of stormwater conveyance and pollution to the public.
- *BMP 2.3. Public Education utilizing the City's Stormwater Website* - The City will routinely update its webpage to inform residents on activities regarding the City's Stormwater Program, environmental protection, watershed management, and proper waste disposal.
- *BMP 2.4. (2B*) Public Outreach and Activities* - The City will participate in local public outreach activities including (1) the City Environmental Sustainability Committee; (2) The Spring Cleanup Event; (3)The Fall Festival Event; and,(4) Continue to be a member of the Northern Virginia Clean Water Partners.
- *BMP 3.1. Storm Sewer System Map* - The City will continue to update and revise their Storm Sewer Outfall Map, located on the City's website, as needed. The City utilizes a Capital Improvement Program (CIP) that includes system updates and GIS based revisions.
- *BMP 3.2. Storm sewer line and structure maintenance* - The City will maintain their storm sewers and associated structures in order to provide uninhibited flow through the City drainage system.
- *BMP 3.3. Illicit Discharge Detection and Elimination (IDDE)* - The City will conduct semi-annual system screening on their outfalls for the presence of illicit discharges. The City will utilize their storm sewer GIS layers to help track the total number of outfalls screened and screening results. The City will keep details of any follow up actions.
- *BMP 3.4. Illicit Discharge Detection and Elimination Enforcement Procedure* - The City will use legal authority to issue summons and prosecute violators for negligence and/or failure to properly report spills.
- *BMP 3.5. Spill Reporting to DEQ and DCR* - The City will ensure that the responsible party(s) reports spills that reach state waters to the Department of Environmental Quality Response Program (PREP).

- *BMP 3.6. Spill Investigation from small MS-4 operated properties* - The City will investigate spills and potential illicit discharges from small MS-4 operated facilities, in order to determine the cause and enforce corrective action to prevent future occurrences.
- *BMP 3.7. Prevention of hazardous / illicit substances into the storm sewer system* - The City will continue to provide residents a hazardous waste disposal facility to prevent hazardous/illicit/bacteria producing materials from reaching the storm sewer system.
- *BMP 3.8 Sanitary Sewer Overflows* - The City will continue, as part of its utilities program, to implement techniques to prevent sanitary sewer overflows.
- *BMP 3.9 Sanitary Sewer Improvements* - The City will maintain their sanitary sewers and associated structures to provide uninhibited flow, as well as prevent sanitary sewer leaks and overflows throughout the sanitary sewer system.
- *BMP 5.1. Public Facilities Manual* - The City will continue to provide information to developers through the Public Facilities Manual (PFM) regarding Stormwater and Best Management Practice (BMP) design requirements. The PFM will be updated as required to address changes in design standards.
- *BMP 5.2 Stormwater Management Ordinance* - The City will continue to follow and update their Stormwater Management Ordinance to meet the provisions set forth in the State Stormwater Requirements and Chesapeake Bay Program Requirements.
- *BMP 5.3. Best Management Practice (BMP) and Stormwater Management (SWM) Facility Maintenance* - The City will continue to require all publicly and privately owned BMPs and SWM Facilities to be maintained to function as designed. The City will continue to require SWM maintenance plans to be provided on each approved site plan along with an executed stormwater maintenance agreement.
- *BMP 5.4. Stormwater management maintenance and inspection* - The City will maintain a Post-Development Stormwater Management facility inspection program and will perform annual inspections on these facilities.
- *BMP 5.5 Stormwater Management (SWM) Facility and Best Management Practice (BMP) Tracking* - The City will track all known permanent SWM and BMP facilities discharging into their regulated MS-4 area. The City will track the following information: (1) Type of structural SWM Facility installed as defined in the VA Stormwater BMP Clearinghouse; (2) Geographic Location (HUC); (3) The impaired surface water that the SWM is discharging in to; (4) The number of acres treated.
- *BMP 5.6. Best Management Practice (BMP) and Stormwater Management (SWM) Facility Enforcement Procedures* - The City will provide BMPs and SWM facility owners' violation notices when their facilities are not functioning as designed. The City will take enforcement action if the items outlined in the violation notice are not addressed within the City's required time frame.
- *BMP 5.7. Stormwater Program Enhancements* - The City will continue to enhance stormwater programs to reduce the impacts resulting from new and re-development. The City will continue to encourage the use of new and innovative stormwater strategies such as Low Impact Development (LID) and Environmental Site Design (ESD) through the site plan process

- *BMP 5.8. Stormwater Program Enhancements - Employee Training* -The City will continue to provide Stormwater Management Facility inspection training for the City's inspection staff.
- *BMP 5.9. Stormwater Infrastructure Evaluation and Assessment* - The City will evaluate, collect data, and inspect 30,000 feet of storm pipe throughout the MS4 to ensure all infrastructure is functioning as designed.
- *BMP 6.1. Leaf Collection* - The City will continue to provide special curbside leaf collection services in November and December to prevent decaying leaves from getting into streams, causing blockages, and producing nutrients.
- *BMP 6.2. Yard Waste Collection* - The City will continue to provide regular yard waste collection services to collect yard waste before it can be transported by stormwater runoff to the City's streams.
- *BMP 6.3. - Pollution Prevention Information Posted on City website and flyers distributed to City residents* - The City will maintain a Refuse and Recycling website with the most recent version of the City's Solid Waste Management Plan. The website will also provide information to the public on proper solid waste disposal techniques and recycling practices.
- *BMP 6.6. Employee Education and Training on Pollution Prevention and Good Housekeeping* - The City will continue their employee Pollution Prevention and Good Housekeeping procedures training programs.
- *BMP 6.8. (6A*) - Stormwater Pollution Prevention Plans* - The City will develop Stormwater Pollution Prevention Plans (SWPPPs) for all City properties identified as "High Priority Facilities".
- *BMP 6.9. (6B*) - Implement Turf and Landscape Nutrient Management Plans* - The City will identify all areas that need Nutrient Management Plans (NMPs) and implement the plans in accordance with the schedule set forth in Section II.B.6.c of the Stormwater General Permit.
- *BMP 6.10. (6D*) - Written Good Housekeeping and Pollution Prevention Protocols for Daily Municipal Operations and Maintenance* -The City will develop written good housekeeping measures and pollution prevention standard operating procedures to be incorporated into daily operational activities.
- *Other BMPs - Street Sweeping* - The City will continue to implement and maintain its Street Sweeping Program.

More detailed descriptions for each BMP can be found in the City's MS4 Annual Reports which are available for download at http://www.fairfaxva.gov/government/public-works/stormwater-and-floodplain-management/ms4-permit. The City plans to continue implementation of these BMPs to address the bacteria WLA listed in the aforementioned TMDL. Based on the results of the City's Action Plan assessment methodology (as described in Section 9 of this Action Plan), an adaptive iterative approach will be used to enhance/replace these BMPs to achieve the most effective plan for reducing the discharge of bacteria from the City's MS4 and to meet the assigned TMDL WLA.

LEGAL AUTHORITIES

6. Legal authorities such as ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements applicable to reducing the POCs identified in each respective TMDL.
[This section of the Action Plan directly addresses Section I.B.2.a of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 6]

Along with specific BMPs implemented to address bacteria and focus on source control, the City's political leadership has included several provisions to the City's Code in order to facilitate a reduction in these pollutant discharges. These provisions include:

- Instituting legal ramifications for dog owners that fail to remove dog excrement from public right-of-ways and all properties other than the dog owners under Chapter 6 Article 3 - Section 6-61.(b)
- Prohibiting the ownership of wild, exotic, or vicious animals under Chapter 6 Article 5 - All Sections
- Prohibiting the accumulation of solid waste on vacant lots, private roadways, and other lands within the City under Chapter 38 Article 3 - Section 38-38
- Instituting a creek and channel usage, improvement, and preservation provision to improve natural drainage systems within the City in accordance with 9VAC25-870-66 under Section 110-286 of the City's Stormwater Ordinance

The City has reviewed its MS4 Program Plan and ordinances to evaluate its ability to comply with the Special Condition for approved (other than the Chesapeake Bay TMDL) TMDLs (Section I.B) in the MS4 Permit. Based on this review, it is our opinion that the City of Fairfax does not require any new or modified legal authorities or policies to meet the requirements of this special condition. The following is a list of the City's relevant existing legal authorities and policies:

- City of Fairfax's Code of Ordinance
- City of Fairfax's Stormwater Ordinance - (Chapter 110 Article 2 - Division 11 of the County Code)
- City of Fairfax's MS4 Program Plan
- City of Fairfax's Public Facilities Manual (PFM)

However, the City may choose to coordinate with other adjacent MS4s (Fairfax County and the Town of Vienna) and explore the idea of establishing memoranda of understanding (MOU) to clarify MS4 service boundary lines and inter-jurisdictional responsibilities for POC loads and subsequent required POC load reductions in the future.

ENHANCEMENTS TO PUBLIC EDUCATION, OUTREACH, AND EMPLOYEE TRAINING

7. ***Enhancements to public education, outreach, and employee training programs to also promote methods to eliminate and reduce discharges of the POC(s) for which a WLA has been assigned.***
   [This section of the Action Plan directly addresses Section I.B.2.c of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 7]

Enhancements to Public Education and Outreach Program

The City continues to implement a public education and outreach program as part of its MS4 Program Plan. The City's Stormwater and Floodplain Management webpage (Webpage) (http://www.fairfaxva.gov/government/public-works/environment) is the primary public education and outreach tool utilized for reaching the program's targeted audiences and providing for distribution of educational materials to convey the appropriate messages. The City's webpage has three general sub-section hyperlinks that each contain educational information related to reducing bacterial loading in the Difficult Run Creek watershed. The three hyperlinks, and corresponding public education and outreach materials available at those hyperlinks, are as follows:

- ***Stormwater and Floodplain Management Hyperlink***
  - Northern Virginia Clean Water Partners "Only Rain Down the Storm Drain" initiative, as well as corresponding website;
  - The City's MS4 Homepage - with the City's Annual Reports and Outfall Map available for download;
  - The City's Watershed Management Plan
  - The Chesapeake Bay Ordinance and information regarding the Resource Protection Area (RPA) requirements within the City limits; and
  - Information on the City's BMP and Stormwater Management Inspection Program
- ***Protecting Water Resources Hyperlink***
  - Contact information for citizens to report illicit discharges;
  - Educational information, including hyperlinks to Federal, State, and Local Stormwater initiatives, on what citizens can do to report and prevent illicit discharges; and
  - Educational information, including hyperlinks to Federal, State, and Local Stormwater initiatives, on what children can do to protect our water resources

- ***Virginia Stormwater Management Program (VSMP) Hyperlink***
  - Access to the City's Stormwater Ordinance, as well as any revisions;
  - VSMP related forms, applications, fee forms, and checklists; and
  - The City of Fairfax's VSMP Responsibility Flow Chart

As can be seen from this list, the City has utilized their webpage to compile several different publications and hyperlinks to directly address the pollutant of concern (bacteria) for which a WLA

has been assigned to the City. The City plans to add more public education and outreach materials to their website annually. Furthermore, the City plans on developing and adding a fourth hyperlink to their webpage entitled "Public Education and Outreach Materials". The hyperlink will provide a separate tab which compiles all existing City publications that directly address the pollutant of concern, as well as add the following materials:

- Environmental Protection Agency (EPA) Outreach Materials (In English and Spanish) - "After the Storm Brochure", "Make Your Home the Solution to Stormwater Pollution" Brochure, and Children's Stormwater Stickers
- PDF links to recent City of Fairfax (Cityscene) Newsletters
- PDF links to the City of Fairfax's Environmental Sustainability Committee Annual Reports
- Outreach materials from the Northern Virginia Clean Water Partners
- Postings regarding City events pertaining to Stormwater Outreach (i.e. "Make your own Rain Barrel" workshop dates)

Along with a fluid Public Education and Outreach hyperlink, all new available publications posted to the hyperlink will also be distributed at future public events. Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to enhance the City's Public Education and Outreach Program.

Enhancements to Employee Training Program

Per MCM 6 of the City's MS4 Program Plan, the City has set guidelines on employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet vehicle and building maintenance, new construction and land disturbance, and stormwater system maintenance. The following is a list of current City employee training activities that specifically address the pollutant of concern (bacteria) for which a WLA has been assigned to the City:

- City Inspectors, Plan Reviewers, and Program Administrators are required to obtain proper certification as necessary under the Virginia Erosion and Sediment Control Law;
- All pertinent staff are required to obtain the Virginia Department of Environmental Quality (DEQ) Stormwater Certifications;
- All pertinent staff utilize training material from the EPA, State of Virginia, and other relevant organizations in conjunction with current City training materials.

Along with the existing City Employee Training Program, the City plans to develop in-house training modules for requisite City staff on Municipal Pollution Prevention Practices and Illicit Discharge Detection and Elimination. Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to enhance the City's Employee Training Program.

BMP/MILESTONES IMPLEMENTATION SCHEDULE

8. A schedule of interim milestones and implementation of the items in 5, 6, and 7. [This section of the Action Plan directly addresses Section I.B.1.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Items 8]

As permitted in Section I.B.1 of the MS4 General Permit and referred to in DEQ's Draft Local TMDL Action Plan Guidance Document, the City is proposing to implement this Action Plan in multiple stages over multiple permit cycles using an adaptive iterative approach. This approach will allow the City to gather the necessary data and information to determine the most effective BMPs/management strategies for controlling POC loads along with identifying targeted areas for their implementation to meet the TMDL WLA for bacteria. The following schedule is proposed for implementation of the BMPs and milestone activities included in this Action Plan for the current permit cycle ending on June 30, 2018:

BMP/Milestone Activity	Schedule
Submission of Local TMDL Action Plan to DEQ	October 1, 2016
BMP 1.1. Stream Monitoring	Annually
BMP 1.2. Storm Drain Marker Program	Annually
BMP 1.3. City of Fairfax Watershed Management Plan	Annually
BMP 1.5. Additional Public Education Material - Quarterly Newsletter	Quarterly
BMP 1.6. Additional Public Education Material - Follow the Rubber Duck	Monthly
BMP 2.3. Public Education utilizing the City's Stormwater Website	As-Needed
BMP 2.4. (2B*) Public Outreach and Community Activities	Annually
BMP 3.1. Storm Sewer System Map	As-Needed
BMP 3.2. Storm sewer line and structure maintenance	Annually
BMP 3.3. Illicit Discharge Detection and Elimination (IDDE)	On-Going
BMP 3.4. IDDE Enforcement and Procedures	As-Needed
BMP 3.5. Spill Reporting to DEQ and DCR	As-Required
BMP 3.6. Spill Investigation from small MS-4 Operated Properties	As-Needed
BMP 3.7. Prevention of Illicit substances into storm sewer system	Annually
BMP 3.8. Sanitary Sewer Overflow Prevention	Annually
BMP 3.9. Sanitary Sewer Improvements	Annually
BMP 5.1. Public Facility Manual (PFM) Updates	As-Required
BMP 5.2. Stormwater Management Ordinance	As-Required
BMP 5.3. BMP and SWM Facility Maintenance Program	Annually
BMP 5.4. BMP and SWM Facility Inspections	Annually
BMP 5.5. SWM Facility Tracking	Annually
BMP 5.6. BMP and SWM Facility Enforcement Procedures	As-Needed
BMP 5.7. Stormwater Program Enhancements - LID and ESD Practices	As-Needed
BMP 5.8. Stormwater Program Enhancements - Employee Training	Annually
BMP 5.9. Stormwater Infrastructure Evaluation and Assessment	Annually
BMP 6.1. Leaf Collection	On-Going
BMP 6.2. Yard Waste Collection	On-Going
BMP 6.3. Pollution Prevention Information posted to City Website	On-Going

BMP 6.6. Employee Education on Pollution Prevention / Good Housekeeping	Annually
BMP 6.8. (6A*) Stormwater Pollution Prevention Plans (SWPPPs)	June 30, 2017
BMP 6.9. (6B*) Implement Turf and Landscape Nutrient Management Plans	Annually
BMP 6.10. (6D*) Standard Operating Procedures	June 30, 2015
- Other BMPs. Street Sweeping	Annually
- Develop and Implement Dog Waste Impacts Brochure for Kutner Park	Dec 30, 2016
- Implement Portable Sanitation Facility BMPs (All Sites)	Dec 30, 2016
Develop the "Public Education and Outreach Materials" City Website link	June 30, 2017
Develop in-house Employee Stormwater Pollution Prevention training	Dec 30, 2016
Prepare WQ Monitoring Program for POC Reductions Assessment	Dec 30, 2016
Purchase WQ Monitoring Equipment & Conduct Training	Feb 1, 2017
Commence WQ Monitoring Program	April 1, 2017
Prepare WQ Monitoring Reports	Annually
Prepare Estimate of "End Date" for Compliance with WLA	March 30, 2018
Identify BMPs to be Implemented during Next Permit Cycle (2018-2023)	March 30, 2018

METHODS TO ASSESS TMDL ACTION PLAN

9. Methods to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs.
[This section of the Action Plan directly addresses Section I.B.2.e of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 9]

In order to assess the effectiveness of the City's Difficult Run Bacteria TMDL Action Plan, the City plans to prepare a Water Quality (WQ) Monitoring Program, in conjunction with the on-going City Water Quality Monitoring being performed by George Mason University (GMU), which will be initiated during this permit cycle. The City envisions collecting water quality samples (E.Coli) twice a year from representative MS4 outfalls that discharge to the headwaters of the impaired reach of Difficult Run. The City will utilize the water quality data collected under the monitoring program to: Identify potential sources of discharge of the POC; target locations within the MS4 permit area for implementation of BMPs; and ultimately to assess the overall effectiveness of the Action Plan in reducing the discharge of the POC from the City's MS4.

In accordance with the schedule provided in Section 8 of this Action Plan, the WQ Monitoring Program will be fully developed by December 30, 2016 and documentation of the program details will be submitted to DEQ with the City's subsequent Annual Report which will be due on October 1, 2017. After commencement of the WQ Monitoring Program and appropriate amounts of sampling data become available, the City will analyze the data to determine if any adjustments are necessary to the Action Plan with regards to the BMPs/management strategies for controlling POC loads. This analysis may include utilization of a stormwater runoff/pollutant loading model such as Purdue University's Long Term Hydrologic Impact Analysis (L-THIA) for estimation of the POC loads coming from the City's MS4. At the end of each MS4 permit reporting period, the City will also prepare annual WQ monitoring reports to be included with the City's MS4 Annual Report.

MEASURABLE GOALS AND METRICS TO TRACK COMPLIANCE

10. Measurable goals and the metrics that the permittee and Department will use to track those goals (and the milestones required by the permit). Evaluation metrics other than monitoring may be used to determine compliance with the TMDL(s).
[This section of the Action Plan directly addresses Section I.B.1.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 10]

The City intends to demonstrate its progress on implementation of this Action Plan by tracking, monitoring, and reporting on BMP/milestone activity progress in its MS4 Program Annual Report that is submitted to DEQ on October 1st of each permit year. In the Annual Report, the City will provide updates on the status of each of the BMP/milestone activities listed under Section 8 of this Action Plan to include compliance with the proposed schedule. In accordance with the adaptive iterative approach adopted by the City, referenced in this Action Plan, the City may modify/replace BMPs, as necessary, to achieve the most effective plan for reducing the discharge of bacteria from the City's MS4 and meeting the assigned TMDL WLA.

Appendix B-7b

Difficult Run Sediment TMDL Action Plan

Difficult Run

Sediment TMDL Action Plan

PERMIT NUMBER VAR040064

Submitted to DEQ:

October 2016

CITY OF FAIRFAX, VIRGINIA - DIFFICULT RUN SEDIMENT TMDL ACTION PLAN

INTRODUCTION

The City of Fairfax has prepared this Difficult Run Benthic (Sediment) TMDL Action Plan to address the Special Condition for approved local TMDLs (Section I.B) in the City's MS4 Permit. The City's approach for preparation of this Action Plan is based on the requirements listed in the MS4 General Permit and DEQ's Draft Local TMDL Action Plan Guidance Document that was released on 4/9/2015. Each of the sections in this Action Plan will address one or more of the required action plan content items as listed on page 4 of DEQ's Draft Local TMDL Action Plan Guidance Document.

TMDL BACKGROUND INFORMATION

1. ***The name(s) of the Final TMDL report(s);***
2. ***The pollutant(s) causing the impairment(s);***
3. ***The WLA(s) assigned to the MS4 as aggregate or individual WLAs.***
   [This section of the Action Plan directly addresses Section I.B of the MS4 Permit and DEQ Guidance Document Action Plan Content Items1-3]

The City of Fairfax was assigned an aggregated Waste Load Allocation (WLA) under the approved TMDL report entitled *Benthic TMDL Development for Difficult Run, Virginia, dated April 2008*. The impaired segment of Difficult Run (Segment ID: VAN-A11R-01) begins at the confluence of Captain Hickory Run with Difficult Run and extends 2.93 miles downstream to its confluence with the Potomac River. The watershed is located in (HUC) 02070008 and is within Fairfax County. The segment is listed as impaired on Virginia's Section 303(d) Total Maximum Daily Load Priority List and Report due to water quality violations of the general standard (listed as a benthic impairment). Analyses of physical, chemical, biological, and observational data indicate that sediment, due to higher runoff flows, has been identified as the most probable cause of the benthic impairments in the stream segment. A TMDL was therefore developed for sediment to address the benthic impairments in Difficult Run. The City of Fairfax (VAR040064), Fairfax County (VA0088587), Fairfax County Public Schools (VAR040104), Town of Vienna (VAR040066), the Virginia Department of Transportation (VDOT) Urban Area (VAR040062), and the George Washington Memorial Parkway (VAR040111) MS4s were assigned an aggregated WLA in the Final TMDL report as follows:

- Difficult Run TMDL Sediment WLA = 3,663.2 Tons/Year or 7,326,400 lbs./year

The City's MS4 Boundary, 0.18 square mile contributing drainage area to Difficult Run, and the location of the impaired reach in comparison to the City limits is shown in Figure 1. The remainder of this Action Plan will focus on addressing the City's plan for complying with the aggregated WLA assigned to the City under this TMDL.

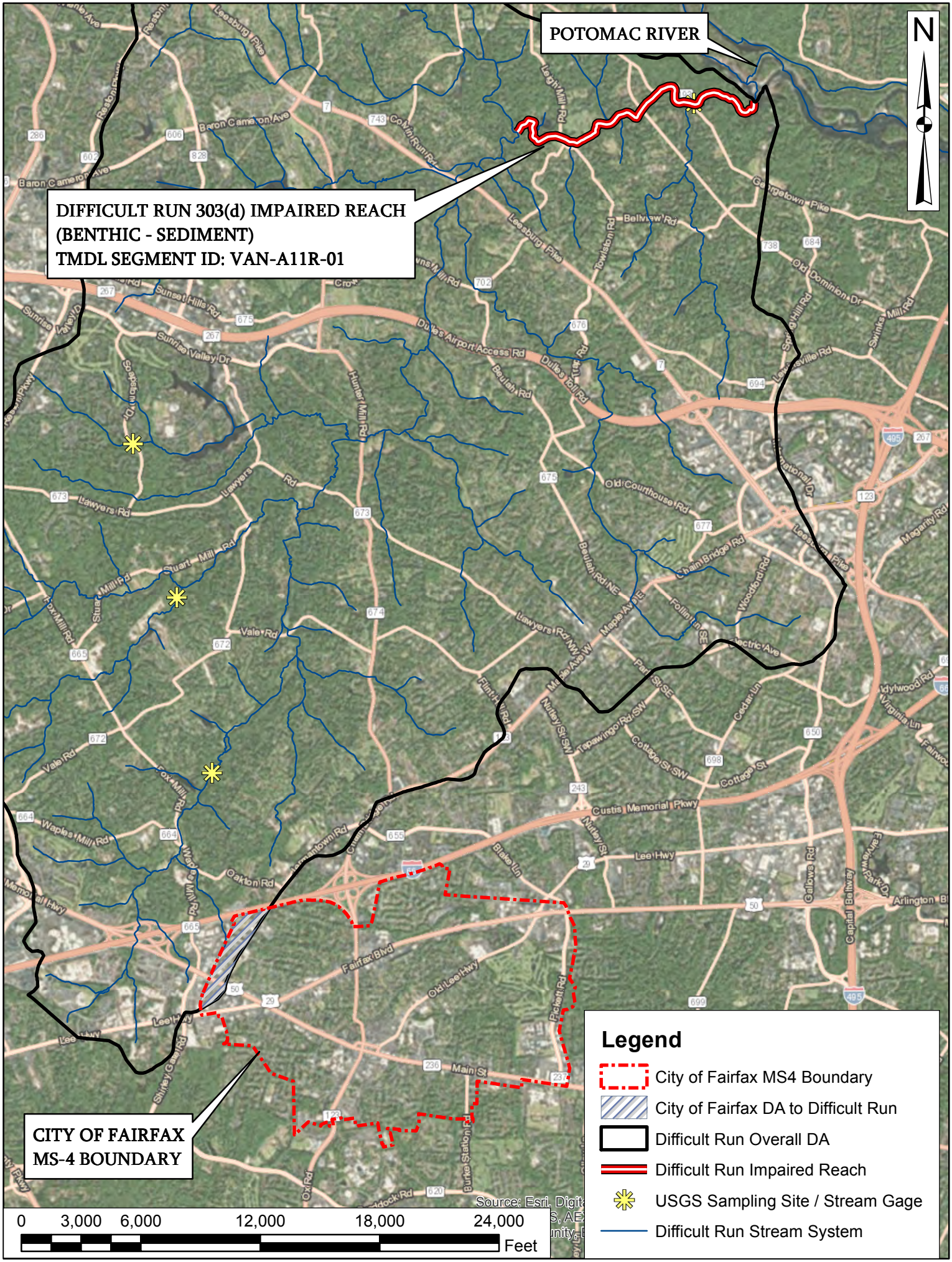

FIGURE 1: CITY OF FAIRFAX CONTRIBUTING DRAINAGE AREA (DA) TO DIFFICULT RUN

SIGNIFICANT SOURCES OF POC(S)

4. ***Significant sources of POC(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit. A significant source of pollutant(s) 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.***
   [This section of the Action Plan directly addresses Section I.B.2.d of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 4]

An initial Geographic Information System (GIS) based evaluation was performed to locate all City-owned/operated properties in the Difficult Run watershed. Utilizing the best available GIS shapefile data including parcel boundaries and current/historical activity descriptions, One (1) City-owned/operated property was identified in the Difficult Run watershed. The results of the initial evaluation are documented in Table 1, and the property's respective location within the City is shown in Figure 2.

Table 1. City-owned/operated properties in the Difficult Run Watershed.

GIS ID*	Name	Facility Type	Area (Ac)
1	Kutner Park	Park	10.5

Once the City-owned/operated property was identified, a desktop based Pollutant of Concern (POC) source evaluation was performed utilizing the parcel's land use type, acreage, presence or absence of MS4 outfall(s), current activity description, and site proximity to Difficult Run. The site met the metrics listed above, as well as displayed features visible in the City's aerial imagery that would identify the site as having the potential for an expected pollutant loading greater than the average pollutant loading for the land use identified in the TMDL. Large parks with on-site operational activities were weighted higher in this analysis due to the increased occurrence of material (i.e. aggregate) application and stockpiling, as well as nutrient application practices. Kutner Park was classified as having the potential for an expected pollutant loading greater than the average pollutant loading for the land use identified in the TMDL.

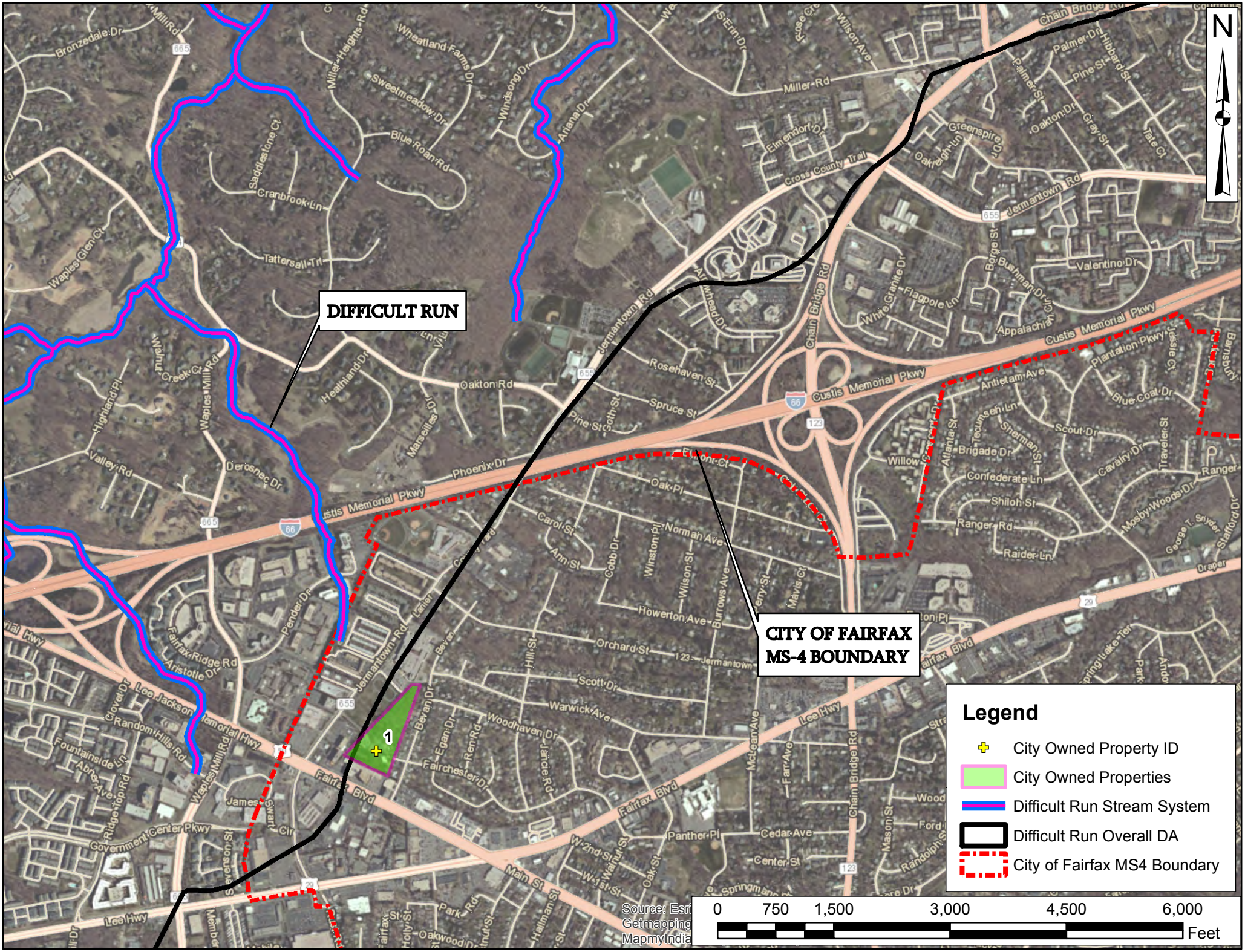

FIGURE 2: CITY OF FAIRFAX MS4 OWNED/OPERATED FACILITIES IN THE DIFFICULT RUN WATERSHED

After the initial desktop analysis was completed, an on-site field reconnaissance was performed to review and assess the on-the-ground conditions for Kutner Park. The site visit was performed to evaluate for potential pollutant of concern (POC) generating activities, as well as drainage patterns, stormwater pollution potential (exposure to precipitation), material storage locations, and locations of outfalls. The desktop analysis, coupled with the findings from the on-site field reconnaissance, determined that Kutner Park exhibits site features, operations, and pollutant related indicators that could categorize it as "having the potential for an expected pollutant loading greater than the average pollutant loading for the land use identified in the TMDL". A description of the City-owned/operated facility is as follows:

Kutner Park

The majority of Kutner Park (Figure 3) drains to Accotink Creek, with a small portion of the park draining to an unnamed tributary of Difficult Run. The park features a crushed gravel pedestrian hiking trail (Figure 4) around the park's perimeter. The southern end of the park features a picnic pavilion, grill area, playground equipment, soccer field (Figure 5), tennis court, volleyball court, and community garden (Figure 6). The playground, fields, trail, and gardens are comprised of gravel, dirt, sand and other aggregates that may runoff during storm events and cause enhanced sediment loading. Required maintenance activities associated with the field, trail, and gardens can also increase the potential for sediment loading. The site features mentioned above classify the site as having a higher propensity for an increased sediment loading.

Figure 3. Kutner Park

Figure 4. Kutner Park hiking trail.

Figure 5. Kutner Park Recreational Fields.

Figure 6. Kutner Park Community Gardens.

Action Plan elements to address significant sources of POC loadings from facilities of concern owned or operated by the MS4 operator

The following subsection outlines the City's proposed means and methods for addressing existing and future significant sources of POC loadings from the facility identified in the preceding section site analysis.

Kutner Park

To address the potential for significant sources of sediment loading from Kutner Park, the City plans to implement the following means and methods:

- The City will install permanent covers on all on-site material and aggregate storage bays to abate surface flow run-on
- The City will stabilize and revegetate all denuded areas on-site.
- The City will continue to utilize good housekeeping measures when performing all trail, garden, and recreational field maintenance activities

Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to address the potential for significant sources of POC loadings from facilities of concern owned or operated by the City. Furthermore, the City plans to continue their current pollution prevention activities at all City properties, as well as incorporate additional pollution prevention activities to address Minimum Control Measure (MCM) 6 of their MS4 Program Plan.

EXISTING OR NEW BEST MANAGEMENT PRACTICES

5. ***Existing or new management practices, control techniques, and system design and engineering methods , that have been or will be implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA. [This section of the Action Plan directly addresses Section I.B.2.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 5]***

Recognizing that sediment pollutant discharges from the City's MS4 need to be controlled to the maximum extent practicable in order to protect the water quality in Difficult Run, City leaders and staff have incorporated several Best Management Practices (BMPs) into their MS4 Program Plan (revised in 2013), and their subsequent Annual Report(s), that specifically target sediment and focus on source control. The following is a list of thirty five (35) BMPs that meet the Minimum Control Measures (MCMs) set forth in the City's MS4 Program Plan, and are further developed in their MS-4 Annual Reports, that specifically address the reduction of sediment pollutant loads for the City's MS4 *(Note: BMPs with an asterisk in their identifier (i.e. 2B*) are from the City's 2015 Annual Report):*

- *BMP 1.1. Stream Monitoring* - The City, in conjunction with George Mason University (GMU), will perform stream monitoring to assess stream water quality. The City will publish an annual report related to the findings.
- *BMP 1.2. Storm Drain Marker Program* - The City will continue to use markers on existing storm drain inlets and place markers on new storm drain inlets. Marker reads "Drains to the Chesapeake Bay, No Dumping".
- *BMP 1.3. City of Fairfax Watershed Management Plan* - The City will post their Watershed Management Plan, and any updates, to their website to allow public access to watershed management information.
- *BMP 1.5. Additional Public Education Material* - The City will publish a quarterly newsletter to deliver stormwater program messages and distribute stormwater related information to citizens.
- *BMP 1.6. Additional Public Education Material* - The City will promote the "Follow the Rubber Ducky" demonstration on their website to illustrate the effects of stormwater conveyance and pollution to the public.
- *BMP 2.3. Public Education utilizing the City's Stormwater Website* - The City will routinely update its webpage to inform residents on activities regarding the City's Stormwater Program, environmental protection, watershed management, and proper waste disposal.
- *BMP 2.4. (2B*) Public Outreach and Activities* - The City will participate in local public outreach activities including (1) the City Environmental Sustainability Committee; (2) The Spring Cleanup Event; (3)The Fall Festival Event; and,(4) Continue to be a member of the Northern Virginia Clean Water Partners.
- *BMP 3.1. Storm Sewer System Map* - The City will continue to update and revise their Storm Sewer Outfall Map, located on the City's website, as needed. The City utilizes a Capital Improvement Plan (CIP) that entails system updates and GIS based revisions.
- *BMP 3.2. Storm sewer line and structure maintenance* - The City will maintain their storm sewers and associated structures in order to provide uninhibited flow through the City drainage system.
- *BMP 3.3. Illicit Discharge Detection and Elimination (IDDE)* - The City will conduct semi-annual system screening on their outfalls for the presence of illicit discharges. The City will utilize their storm sewer GIS layers to help track the total number of outfalls screened and screening results. The City will keep details of any follow up actions.
- *BMP 3.4. Illicit Discharge Detection and Elimination Enforcement Procedure* - The City will use legal authority to issue summons and prosecute violators for negligence and/or failure to properly report spills.
- *BMP 3.5. Spill Reporting to DEQ and DCR* - The City will ensure that the responsible party(s) reports spills that reach state waters to the Department of Environmental Quality Response Program (PREP).
- *BMP 3.6. Spill Investigation from small MS-4 operated properties* - The City will investigate spills and potential illicit discharges from small MS-4 operated facilities, in

order to determine the cause and enforce corrective action to prevent future occurrences.

- *BMP 3.7. Prevention of hazardous / illicit substances into the storm sewer system* - The City will continue to provide residents a hazardous waste disposal facility to prevent hazardous/illicit materials from reaching the storm sewer system.
- *BMP 4.1. City of Fairfax Erosion and Sediment Control Ordinance No. 2006-17 of the City Code -* The City will provide site plan review and on-site Erosion and Sediment (E&S) Control inspections.
- *BMP 4.2. VSMP Permits* - The City will continue to require construction site owners and operators to obtain a VSMP permit from the State for construction activities resulting in a land disturbance greater than one acre. The City will also continue to require an owner and/or operator to obtain a City specific VSMP Permit for construction activities greater than 2500 square feet, and less than one acre.
- *BMP 4.3. E & SC Staff Training* - The City will require Inspectors, Plan Reviewers, and Program Administrators to obtain the appropriate certifications as required under the Virginia Stormwater Management Program, and Erosion and Sediment Control Law.
- *BMP 4.4 Land Disturbing Activity Reporting -* The City will track the number of land disturbing plans and acres disturbed and develop corresponding quarterly reports summarizing these activities.
- *BMP 5.1. Public Facilities Manual* - The City will continue to provide information to developers through the Public Facilities Manual (PFM) regarding Stormwater and Best Management Practice (BMP) design requirements. The PFM will be updated as required to address changes in design standards.
- *BMP 5.2 Stormwater Management Ordinance* - The City will continue to follow and update their Stormwater Management Ordinance to meet the provisions set forth in the State Stormwater Requirements and Chesapeake Bay Program Requirements.
- *BMP 5.3. Best Management Practice (BMP) and Stormwater Management (SWM) Facility Maintenance* - The City will continue to require all public and privately owned BMPs and SWM Facilities to be maintained to function as it was designed. The City will continue to require SWM maintenance plans to be provided on each approved site plan along with an executed stormwater maintenance agreement.
- *BMP 5.4. Stormwater management maintenance and inspection* - The City will maintain a Post-Development Stormwater Management facility inspection program and will perform annual inspections on these facilities.
- *BMP 5.5 Stormwater Management (SWM) Facility and Best Management Practice (BMP) Tracking* - The City will track all known permanent SWM and BMP facilities discharging into their regulated MS-4 area. The City will track the following information: (1) Type of structural SWM Facility installed as defined in the VA Stormwater BMP Clearinghouse; (2) Geographic Location (HUC); (3) The impaired surface water that the SWM facility is discharging into; (4) The number of acres treated.
- *BMP 5.6. Best Management Practice (BMP) and Stormwater Management (SWM) Facility Enforcement Procedures* - The City will provide BMPs and SWM facility owners with violation notices when their facilities are not functioning as designed. The

City will take enforcement action if the items outlined in the violation notice are not addressed within the City's required time frame.

- *BMP 5.7. Stormwater Program Enhancements* - The City will continue to enhance stormwater programs to reduce the impacts resulting from new and re-development projects. The City will continue to encourage the use of new and innovative stormwater strategies such as Low Impact Development (LID) and Environmental Site Design (ESD) through the site plan process
- *BMP 5.8. Stormwater Program Enhancements - Employee Training* -The City will continue to provide Stormwater Management Facility inspection training for the City's inspection staff.
- *BMP 5.9. Stormwater Infrastructure Evaluation and Assessment* - The City will evaluate, collect data, and inspect 30,000 feet of storm pipe throughout the MS4 to ensure all infrastructure is functioning as designed.
- *BMP 6.1. Leaf Collection* - The City will continue to provide special curbside leaf collection services in November and December to prevent decaying leaves from getting into streams, causing blockages, and releasing nutrients.
- *BMP 6.2. Yard Waste Collection* - The City will continue to provide regular yard waste collection services to collect yard waste before it can be transported by stormwater runoff to the City's streams.
- *BMP 6.3. - Pollution Prevention Information Posted on City website and flyers distributed to City residents* - The City will maintain a Refuse and Recycling website with the most recent version of the City's Solid Waste Management Plan. The website will also provide information to the public on proper solid waste disposal techniques and recycling practices.
- *BMP 6.6. Employee Education and Training on Pollution Prevention and Good Housekeeping* - The City will continue their employee Pollution Prevention and Good Housekeeping procedures training programs
- *BMP 6.7. (6A*) - Stormwater Pollution Prevention Plans* - The City will develop Stormwater Pollution Prevention Plans (SWPPPs) for all City properties identified as "High Priority Facilities".
- *BMP 6.8. (6B*) - Implement Turf and Landscape Nutrient Management Plans* - The City will identify all areas that need Nutrient Management Plans (NMPs) and implement the plans in accordance with the schedule set forth in Section II.B.6.c of the Stormwater General Permit.
- *BMP 6.9. (6D*) - Written Good Housekeeping and Pollution Prevention Protocols for Daily Municipal Operations and Maintenance* -The City will develop written good housekeeping measures and pollution prevention standard operating procedures to be incorporated into daily operational activities.
- *Other BMPs - Street Sweeping* - The City will continue its Street Sweeping Program.

More detailed descriptions for each BMP can be found in the City's MS4 Annual Reports which are available for download at http://www.fairfaxva.gov/government/public-works/stormwater-and-floodplain-management/ms4-permit. The City plans to continue implementation of these BMPs to address the sediment WLA listed in the aforementioned TMDL. Based on the results of the City's

Action Plan assessment methodology (as described in Section 9 of this Action Plan), an adaptive iterative approach will be used to enhance/replace these BMPs to achieve the most effective plan for reducing the discharge of sediment from the City's MS4 and to meet the assigned TMDL WLA.

LEGAL AUTHORITIES

6. ***Legal authorities such as ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements applicable to reducing the POCs identified in each respective TMDL.***
   [This section of the Action Plan directly addresses Section I.B.2.a of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 6]

Along with specific BMPs implemented to address sediment and focus on source control, the City's political leadership has included several provisions to the City's Code in order to facilitate a reduction in these pollutant discharges. These provisions include:

- Instituting legal ramifications regarding lack of maintenance and upkeep on all of the privately owned Stormwater Management Facilities and Best Management Practices within the City.
- Enforcing the Chesapeake Bay Preservation Act (CBPA) land disturbing activity requirements which include submission of a land disturbance application package for land disturbing activities greater than 2500 ft^2 and less than 1 acre. Furthermore, the City also requires land disturbing application packages for single family home development.
- Prohibiting the accumulation of solid waste on vacant lots, private roadways, and other lands within the City under Chapter 38 Article 3 - Section 38-38
- Instituting a creek and channel usage, improvement, and preservation provision to improve natural drainage systems within the City in accordance with 9VAC25-870-66 under Section 110-286 of the City's Stormwater Ordinance

The City has reviewed its MS4 Program Plan and ordinances to evaluate its ability to comply with the Special Condition for approved (other than the Chesapeake Bay TMDL) TMDLs (Section I.B) in the MS4 Permit. Based on this review, it is our opinion that the City of Fairfax does not require any new or modified legal authorities or policies to meet the requirements of this special condition. The following is a list of the City's relevant existing legal authorities and policies:

- City of Fairfax's Code of Ordinance
- City of Fairfax's Stormwater Ordinance - (Chapter 110 Article 2 - Division 11 of the County Code)
- City of Fairfax's MS4 Program Plan
- City of Fairfax's Public Facilities Manual (PFM)

However, the City may choose to coordinate with other adjacent MS4s (Fairfax County, Fairfax County Public Schools, Town of Vienna, VDOT, and the George Washington Memorial Parkway)

and explore the idea of establishing memoranda of understanding (MOU) to clarify MS4 service boundary lines and inter-jurisdictional responsibilities for POC loads and subsequent required POC load reductions in the future.

ENHANCEMENTS TO PUBLIC EDUCATION, OUTREACH, AND EMPLOYEE TRAINING

7. ***Enhancements to public education, outreach, and employee training programs to also promote methods to eliminate and reduce discharges of the POC(s) for which a WLA has been assigned.***
   [This section of the Action Plan directly addresses Section I.B.2.c of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 7]

Enhancements to Public Education and Outreach Program

The City continues to implement a public education and outreach program as part of its MS4 Program Plan. The City's Stormwater and Floodplain Management webpage (Webpage) (http://www.fairfaxva.gov/government/public-works/environment) is the primary public education and outreach tool utilized for reaching the program's targeted audiences and providing for distribution of educational materials to convey the appropriate messages. The City's webpage has three general sub-section hyperlinks that each contain educational information related to reducing sediment loading in the Difficult Run watershed. The three hyperlinks, and corresponding public education and outreach materials available at those hyperlinks, are as follows:

- ***Stormwater and Floodplain Management Hyperlink***
  - Northern Virginia Clean Water Partners "Only Rain Down the Storm Drain" initiative, as well as corresponding website;
  - The City's MS4 Homepage - with the City's Annual Reports and Outfall Map available for download;
  - The City's Watershed Management Plan;
  - The Chesapeake Bay Ordinance and information regarding the Resource Protection Area (RPA) requirements within the City limits; and
  - Information on the City's BMP and Stormwater Management Inspection Program

- ***Protecting Water Resources Hyperlink***
  - Contact information for citizens to report illicit discharges;
  - Educational information, including hyperlinks to Federal, State, and Local Stormwater initiatives, on what citizens can do to report and prevent illicit discharges; and
  - Educational information, including hyperlinks to Federal, State, and Local Stormwater initiatives, on what children can do to protect our water resources

- ***Virginia Stormwater Management Program (VSMP) Hyperlink***
    - Access to the City's Stormwater Ordinance, as well as any revisions;
    - VSMP related forms, applications, fee forms, and checklists; and
    - The City of Fairfax's VSMP Responsibility Flow Chart

As can be seen from this list, the City has utilized their webpage to compile several different publications and hyperlinks to directly address the pollutant of concern (sediment) for which a WLA has been assigned to the City. The City plans to add more public education and outreach materials to their website annually. Furthermore, the City plans on developing and adding a fourth hyperlink to their webpage entitled "Public Education and Outreach Materials". The hyperlink will provide a separate tab which compiles all existing City publications that directly address the pollutant of concern, as well as add the following materials:

- Environmental Protection Agency (EPA) Outreach Materials (In English and Spanish) - After the Storm Brochure, "Make Your Home the Solution to Stormwater Pollution Brochure, and Children's Stormwater Stickers"
- PDF links to recent City of Fairfax (Cityscene) Newsletters
- PDF links to the City of Fairfax's Environmental Sustainability Committee Annual Reports
- Outreach materials from the Northern Virginia Clean Water Partners
- Postings regarding City events pertaining to Stormwater Outreach (i.e. "Make your own Rain Barrel" workshop dates)

Along with a fluid Public Education and Outreach hyperlink, all new available publications posted to the hyperlink will also be distributed at future public events. Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to enhance the City's Public Education and Outreach Program.

Enhancements to Employee Training Program

Per MCM 6 of the City's MS4 Program Plan, the City has set guidelines on employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet vehicle and building maintenance, new construction and land disturbance, and stormwater system maintenance. The following is a list of current City employee training activities that specifically address the pollutant of concern (sediment) for which a WLA has been assigned to the City:

- City Inspectors, Plan Reviewers, and Program Administrators are required to obtain proper certification as necessary under the Virginia Erosion and Sediment Control Law;
- All pertinent staff are required to obtain the Virginia Department of Environmental Quality (DEQ) Stormwater Certifications;
- All pertinent staff utilize training material from the EPA, State of Virginia, and other relevant organizations in conjunction with current City training materials.

Along with the existing City Employee Training Program, the City plans to develop in-house training modules for requisite City staff on Municipal Pollution Prevention Practices and Illicit Discharge Detection and Elimination. Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to enhance the City's Employee Training Program.

BMP/MILESTONES IMPLEMENTATION SCHEDULE

8. A schedule of interim milestones and implementation of the items in 5, 6, and 7. [This section of the Action Plan directly addresses Section I.B.1.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Items 8]

As permitted in Section I.B.1 of the MS4 General Permit and referred to in DEQ's Draft Local TMDL Action Plan Guidance Document, the City is proposing to implement this Action Plan in multiple stages over multiple permit cycles using an adaptive iterative approach. This approach will allow the City to gather the necessary data and information to determine the most effective BMPs/management strategies for controlling POC loads along with identifying targeted areas for their implementation to meet the TMDL WLA for sediment. The following schedule is proposed for implementation of the BMPs and milestone activities included in this Action Plan for the current permit cycle ending on June 30, 2018:

BMP/Milestone Activity	Schedule
Submission of Local TMDL Action Plan to DEQ	October 1, 2016
BMP 1.1. Stream Monitoring	Annually
BMP 1.2. Storm Drain Marker Program	Annually
BMP 1.3. City of Fairfax Watershed Management Plan	Annually
BMP 1.5. Additional Public Education Material - Quarterly Newsletter	Quarterly
BMP 1.6. Additional Public Education Material - Follow the Rubber Duck	Monthly
BMP 2.3. Public Education utilizing the City's Stormwater Website	As-Needed
BMP 2.4. (2B*) Public Outreach and Community Activities	Annually
BMP 3.1. Storm Sewer System Map	As-Needed
BMP 3.2. Storm sewer line and structure maintenance	Annually
BMP 3.3. Illicit Discharge Detection and Elimination (IDDE)	On-Going
BMP 3.4. IDDE Enforcement and Procedures	As-Needed
BMP 3.5. Spill Reporting to DEQ and DCR	As-Required
BMP 3.6. Spill Investigation from small MS-4 Operated Properties	As-Needed
BMP 3.7. Prevention of Illicit substances into storm sewer system	Annually
BMP 4.1. City of Fairfax Erosion and Sediment Control (E&SC) Ordinance	Annually
BMP 4.2. VSMP Permits	On-Going
BMP 4.3. Staff E&SC Training	On-Going
BMP 4.4 Land Disturbing Activity Reporting	Annually
BMP 5.1. Public Facility Manual (PFM) Updates	As-Required
BMP 5.2. Stormwater Management Ordinance	As-Required
BMP 5.3. BMP and SWM Facility Maintenance Program	Annually

BMP 5.4. BMP and SWM Facility Inspections	Annually
BMP 5.5. SWM Facility Tracking	Annually
BMP 5.6. BMP and SWM Facility Enforcement Procedures	As-Needed
BMP 5.7. Stormwater Program Enhancements - LID and ESD Practices	As-Needed
BMP 5.8. Stormwater Program Enhancements - Employee Training	Annually
BMP 5.9. Stormwater Infrastructure Evaluation and Assessment	Annually
BMP 6.1. Leaf Collection	On-Going
BMP 6.2. Yard Waste Collection	On-Going
BMP 6.3. Pollution Prevention Information posted to City Website	On-Going
BMP 6.6. Employee Education on Pollution Prevention / Good Housekeeping	Annually
BMP 6.7. (6A*) Stormwater Pollution Prevention Plans (SWPPPs)	June 30, 2017
BMP 6.8. (6B*) Implement Turf and Landscape Nutrient Management Plans	Annually
BMP 6.9. (6D*) Standard Operating Procedures	June 30, 2015
- Other BMPs. Street Sweeping	Annually
- Installation of permanent covers on all material/aggregate storage bays	June 30, 2018
- Stabilize and revegetate all denuded areas on-site	Annually
Develop the "Public Education and Outreach Materials" City Website link	June 30, 2017
Develop in-house Employee Stormwater Pollution Prevention training	Dec 30, 2016
Prepare WQ Monitoring Program for POC Reductions Assessment	Dec 30, 2016
Purchase WQ Monitoring Equipment & Conduct Training	Feb 1, 2017
Commence WQ Monitoring Program	April 1, 2017
Prepare WQ Monitoring Reports	Annually
Prepare Estimate of "End Date" for Compliance with WLA	March 30, 2018
Identify BMPs to be Implemented during Next Permit Cycle (2018-2023)	March 30, 2018

METHODS TO ASSESS TMDL ACTION PLAN

9. Methods to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs.
[This section of the Action Plan directly addresses Section I.B.2.e of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 9]

In order to assess the effectiveness of the City's Difficult Run Sediment TMDL Action Plan, the City plans to prepare a Water Quality (WQ) Monitoring Program, in conjunction with the on-going City Water Quality Monitoring being performed by George Mason University (GMU), which will be initiated during this permit cycle. The City envisions collecting water quality samples (TSS) twice a year from representative MS4 outfalls that discharge to tributary streams to the impaired reach of Difficult Run. The City will utilize the water quality data collected under the monitoring program to: Identify potential sources of discharge of the POC; target locations within the MS4 permit area for implementation of BMPs; and ultimately to assess the overall effectiveness of the Action Plan in reducing the discharge of the POC from the City's MS4.

In accordance with the schedule provided in Section 8 of this Action Plan, the WQ Monitoring Program will be fully developed by December 30, 2016 and documentation of the program details will be submitted to DEQ with the City's subsequent Annual Report which will be due on October 1,

2017. After commencement of the WQ Monitoring Program and appropriate amounts of sampling data become available, the City will analyze the data to determine if any adjustments are necessary to the Action Plan with regards to the BMPs/management strategies for controlling POC loads. This analysis may include utilization of a stormwater runoff/pollutant loading model such as Purdue University's Long Term Hydrologic Impact Analysis (L-THIA) for estimation of the POC loads coming from the City's MS4. At the end of each MS4 permit reporting period, the City will also prepare annual WQ monitoring reports to be included with the City's MS4 Annual Report.

MEASURABLE GOALS AND METRICS TO TRACK COMPLIANCE

10. Measurable goals and the metrics that the permittee and Department will use to track those goals (and the milestones required by the permit). Evaluation metrics other than monitoring may be used to determine compliance with the TMDL(s).
[This section of the Action Plan directly addresses Section I.B.1.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 10]

The City intends to demonstrate its progress on implementation of this Action Plan by tracking, monitoring, and reporting on BMP/milestone activity progress in its MS4 Program Annual Report that is submitted to DEQ on October 1st of each permit year. In the Annual Report, the City will provide updates on the status of each of the BMP/milestone activities listed under Section 8 of this Action Plan to include compliance with the proposed schedule. In accordance with the adaptive iterative approach adopted by the City, referenced in this Action Plan, the City may modify/replace BMPs, as necessary, to achieve the most effective plan for reducing the discharge of sediment from the City's MS4 and meeting the assigned TMDL WLA.

Appendix B-7c

Occoquan River *E. coli* TMDL Action Plan

Occoquan River Watershed

(Popes Head Creek)

Bacteria TMDL Action Plan

PERMIT NUMBER VAR040064

Submitted to DEQ:

October 2016

CITY OF FAIRFAX, VIRGINIA OCCOQUAN RIVER WATERSHED E.COLI TMDL ACTION PLAN

INTRODUCTION

The City of Fairfax has prepared this Occoquan River Watershed E.Coli (bacteria) TMDL Action Plan to address the Special Condition for approved local TMDLs (Section I.B) in the City's MS4 Permit. The City's approach for preparation of this Action Plan is based on the requirements listed in the MS4 General Permit and DEQ's Draft Local TMDL Action Plan Guidance Document that was released on 4/9/2015. Each of the sections in this Action Plan will address one or more of the required action plan content items as listed on page 4 of DEQ's Draft Local TMDL Action Plan Guidance Document.

TMDL BACKGROUND INFORMATION

1. ***The name(s) of the Final TMDL report(s);***
2. ***The pollutant(s) causing the impairment(s);***
3. ***The WLA(s) assigned to the MS4 as aggregate or individual WLAs.***
   [This section of the Action Plan directly addresses Section I.B of the MS4 Permit and DEQ Guidance Document Action Plan Content Items1-3]

The City of Fairfax was assigned an aggregated Waste Load Allocation (WLA) under the approved TMDL report entitled *Bacteria TMDLs for Popes Head Creek, Broad Run, Kettle Run, South Run, Little Bull Run, Bull Run and the Occoquan River, Virginia dated August 2006*. The City of Fairfax's south western limits drain to the headwaters of Popes Head Creek. Popes Head Creek flows south to its junction with Bull Run, which then joins with the Occoquan River. Because of this, the City is partially within the Occoquan River Watershed and is subject to the aforementioned bacteria TMDL for Popes Head Creek.

The impaired segment of Popes Head Creek (Segment ID: VAN-A23R-02) begins at the confluence of Piney Branch and Popes Head Creek and extends 4.9 miles downstream to the confluence with Bull Run. The segment is listed as impaired on Virginia's Section 303(d) Total Maximum Daily Load Priority List and Report because of violations of the state's water quality standards for fecal coliform bacteria. At the time of the initial listing of the Popes Head Creek segment, the Virginia Bacteria Water Quality Standard was expressed in fecal coliform bacteria; however, the bacteria water quality standard has been changed is now expressed in E.coli. Therefore, the TMDL is expressed in E.coli by converting modeled daily fecal coliform concentrations to daily E. coli concentrations using the following regression based instream translator equation:

$$E.coli\ conc.\ (cfu/100\ mL) = 2^{-0.0172} \times [fecal\ coliform\ conc.\ (cfu/100mL)]^{0.91905}$$

Analyses of physical, chemical, biological, and observational data indicate that potential key sources of fecal coliform in the stream segment included run-off from point source discharges, residential waste, and wildlife sources. A TMDL was therefore developed for bacteria to address the impairments in Popes Head Creek. The City of Fairfax (VAR040064) and Virginia Department of Transportation Urban Area (VAR040062) MS4s were assigned an aggregated WLA in the Final TMDL report as follows:

- Popes Head Creek TMDL Bacteria WLA (E.coli) = 1.03E+10 (cfu./year)

The City's MS4 Boundary, 0.54 square mile contributing drainage area to Popes Head Creek, location of the impaired reach in comparison to the City, and location of the City limits in comparison to the Occoquan River is shown in Figure 1. The remainder of this Action Plan will focus on addressing the City's plan for complying with the aggregated WLA assigned to the City under this TMDL.

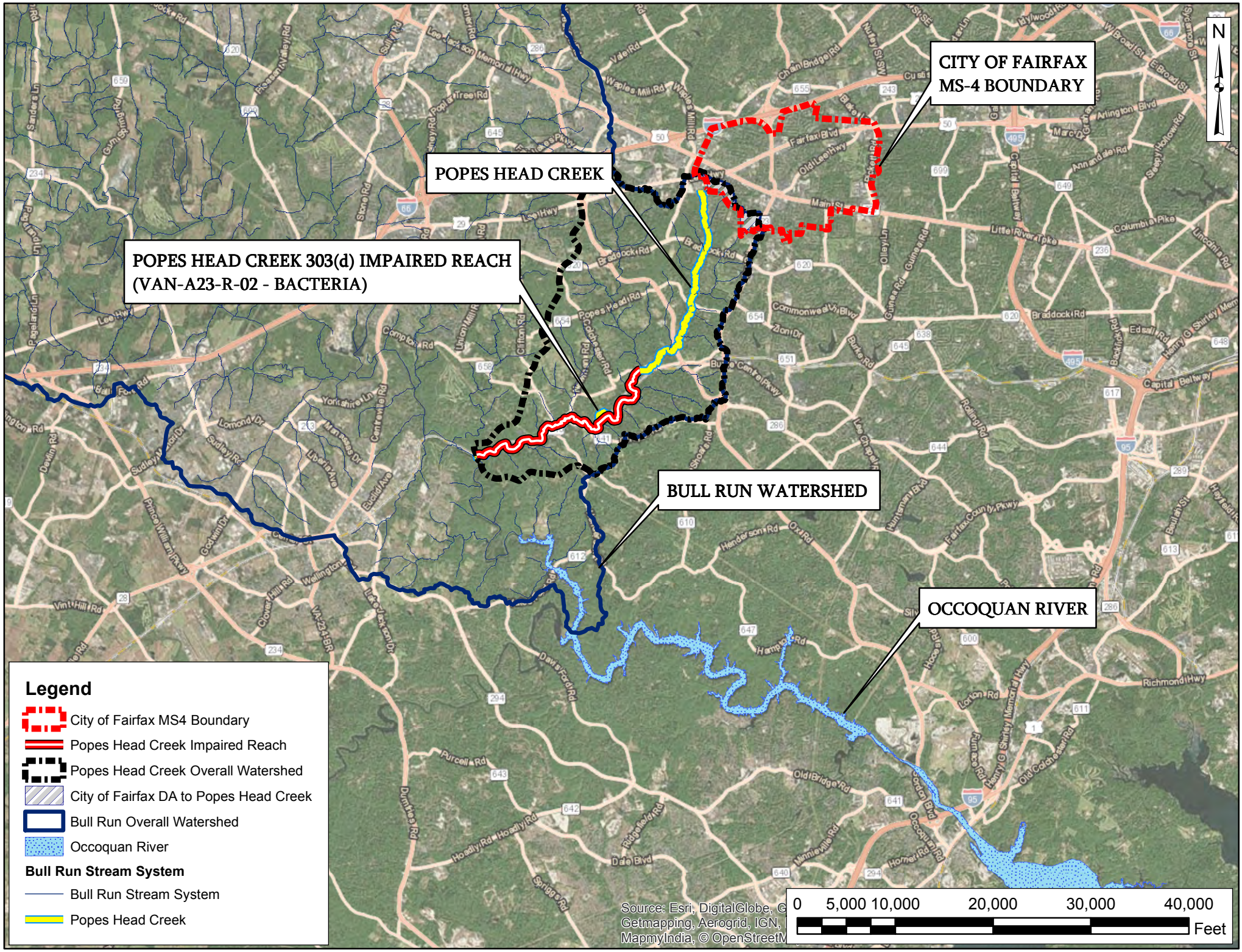

FIGURE 1: CITY OF FAIRFAX CONTRIBUTING DRAINAGE AREA (DA) TO POPES HEAD CREEK (OCCOQUAN RIVER WATERSHED)

SIGNIFICANT SOURCES OF POC(S)

4. ***Significant sources of POC(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit. A significant source of pollutant(s) 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.***
   [This section of the Action Plan directly addresses Section I.B.2.d of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 4]

An initial Geographic Information System (GIS) based evaluation was performed to locate all City-owned/operated properties in the Popes Head Creek watershed. Utilizing the best available GIS shapefile data including parcel boundaries and current/historical activity descriptions, Two (2) City-owned/operated properties were identified in the Popes Head Creek watershed. The results of the initial evaluation are documented in Table 1, and each property's respective location within the City is shown in Figure 2.

Table 1. City-owned/operated properties in the Popes Head Creek Watershed.

GIS ID*	Name	Facility Type	Area (Ac)
1	Jester Property	Park	2.0
2	Providence Park	Park	20.0
**** See Figure 2 for corresponding GIS ID***			

Once the City-owned/operated properties were identified, a desktop based Pollutant of Concern (POC) source evaluation was performed utilizing each parcel's land use type, acreage, presence or absence of MS4 outfall(s), current activity descriptions, and site proximity to Popes Head Creek. One (1) site met the metrics listed above, as well as displayed features visible in the City's aerial imagery that would indicate the increased potential for higher bacterial loadings. Forested areas with surface water features were weighted higher in this analysis due to the increased presence of wildlife and waterfowl habitats. Providence Park was identified as the only site having the potential for an expected pollutant loading greater than the average pollutant loading for the land use identified in the TMDL.

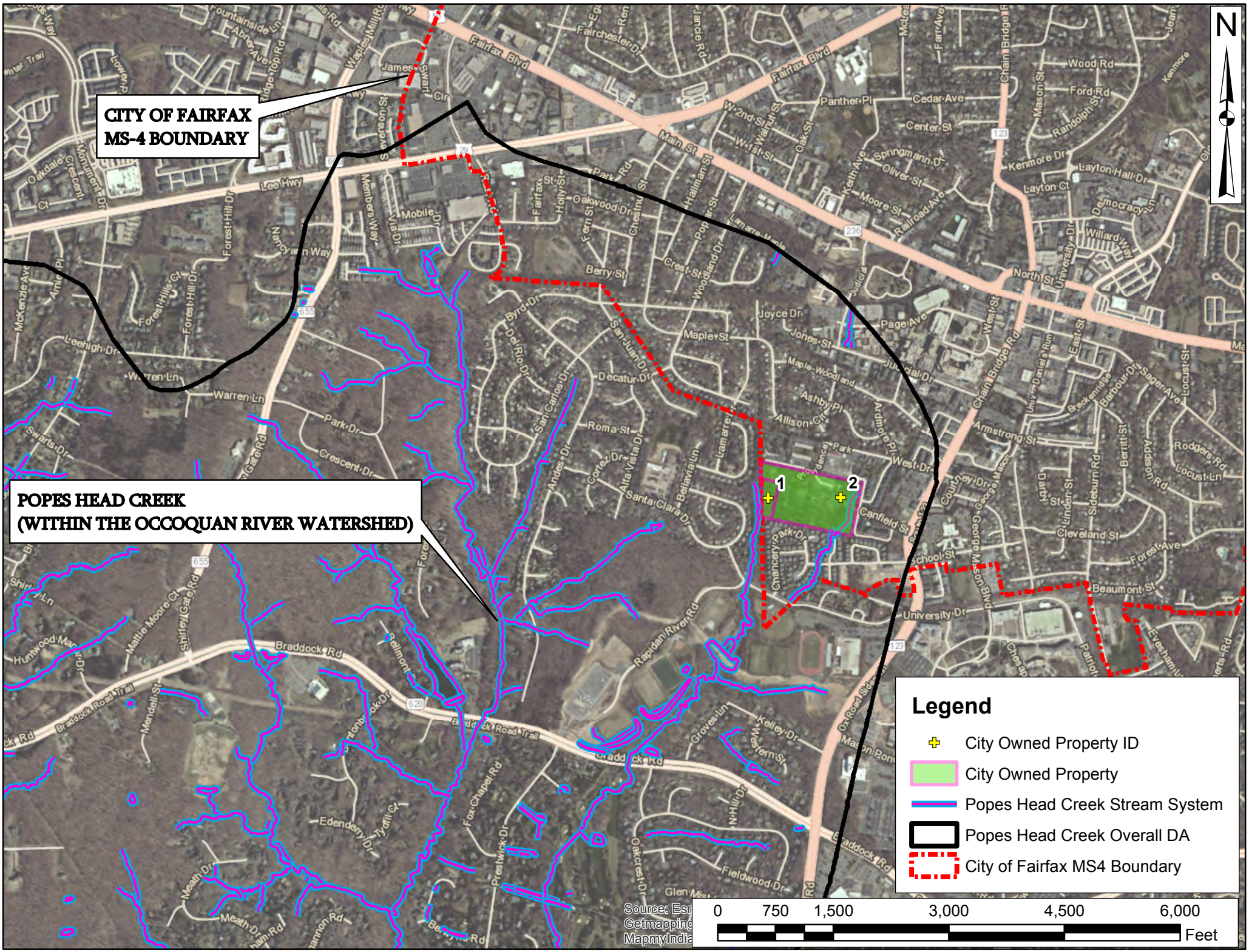

FIGURE 2: CITY OF FAIRFAX MS4 OWNED/OPERATED FACILITIES IN THE POPES HEAD CREEK WATERSHED (OCCOQUAN RIVER WATERSHED)

After the initial desktop analysis was completed, an on-site field reconnaissance was performed to review and assess the on-the-ground conditions for Providence Park. A site visit was performed to evaluate for potential pollutant of concern (POC) generating activities, as well as drainage patterns, stormwater pollution potential (exposure to precipitation), wild life presence and habitat, and locations of outfalls. The desktop analysis, coupled with the findings from the on-site field reconnaissance determined that the park exhibits site features, operations, and pollutant related indicators that could categorize them as "having the potential for an expected pollutant loading greater than the average pollutant loading for the land use identified in the TMDL". A description of the City-owned/operated facilities is as follows:

Providence Park

The 20 acre Providence Park Site (Figure 3) features multiple recreational fields, a playground, walking trail, tennis courts, small community center, large parking lot, and several intermittent stream channels which act as the headwaters of Popes Head Creek. The park is partially wooded, and the wooded area itself potentially contributes to above-average amounts of bacterial loading due to the possible presence of a wildlife habitat. The on-site walking trail provides a location for residents to walk dogs and subsequently dispose/not dispose of dog waste, which can also increase the potential bacterial loading on-site. There is no on-site plumbing, and because of this, portable sanitation facilities (Figure 4) are available for public use for park visitors. The site features mentioned above classify the site as having a higher propensity for an increased bacterial loading.

Figure 3. Providence Park Site Limits

Figure 4. On-site portable sanitation facilities.

Action Plan elements to address significant sources of POC loadings from facilities of concern owned or operated by the MS4 operator

The following subsection outlines the City's proposed means and methods for addressing existing and future significant sources of POC loadings from the facility identified in the subsequent section site analysis.

Providence Park

To address the potential for significant sources of bacterial loading from Providence Park, the City plans to implement the following means and methods:

- The City will continue to promote, and maintain, all dog waste disposal stations along the park trail. The City will also add brochure holders to each waste station that contain public education / outreach materials related to the water quality impacts of dog waste.
- The City will address the following items pertaining to all on-site portable sanitation facilities:
    - All facilities will be moved to a level ground surface;
    - All facilities will, wherever possible, be located upon natural ground and not within 5 feet of an impervious surface;
    - All facilities will be anchored down to prevent them from tipping over; and
    - Any damaged facilities will be repaired or replaced immediately.

Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to address the potential for significant sources of POC loadings from facilities of concern owned or operated by the City. Furthermore, the City plans to continue their current pollution prevention activities at all City properties, as well as incorporate additional pollution prevention activities to address Minimum Control Measure (MCM) 6 of their MS4 Program Plan.

EXISTING OR NEW BEST MANAGEMENT PRACTICES

5. Existing or new management practices, control techniques, and system design and engineering methods , that have been or will be implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA. [This section of the Action Plan directly addresses Section I.B.2.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 5]

Recognizing that bacteria pollutant discharges from the City's MS4 need to be controlled to the maximum extent practicable in order to protect the water quality in Popes Head Creek, City leaders and staff have incorporated several Best Management Practices (BMPs) into their MS4 Program Plan (revised in 2013), and their subsequent Annual Report(s), that specifically target bacteria and focus on source control. The following is a list of thirty three (33) BMPs that meet the Minimum Control Measures (MCMs) set forth in the City's MS4 Program Plan, and further developed in their MS-4 Annual Reports, that specifically address the reduction of bacterial pollutant loads for the City's MS4 *(Note: BMPs with an asterisk in their identifier (i.e. 2B*) are from the City's 2015 Annual Report):*

- *BMP 1.1. Stream Monitoring* - The City, in conjunction with George Mason University (GMU), will perform stream monitoring, to include bacteria sampling, to assess stream water quality. The City will publish an annual report related to the findings.
- *BMP 1.2. Storm Drain Marker Program* - The City will continue to use markers on existing storm drain inlets and place markers on new storm drain inlets. Marker reads "Drains to the Chesapeake Bay, No Dumping".
- *BMP 1.3. City of Fairfax Watershed Management Plan* - The City will post their Watershed Management Plan, and any updates, to their website to allow public access to watershed management information.
- *BMP 1.5. Additional Public Education Material* - The City will publish a quarterly newsletter to deliver stormwater program messages and distribute stormwater related information to citizens.
- *BMP 1.6. Additional Public Education Material* - The City will promote the "Follow the Rubber Ducky" initiative on their website to illustrate the effects of stormwater conveyance and pollution to the public.
- *BMP 2.3. Public Education utilizing the City's Stormwater Website* - The City will routinely update its webpage to inform residents on activities regarding the City's Stormwater Program, environmental protection, watershed management, and proper waste disposal.

- *BMP 2.4. (2B*) Public Outreach and Activities* - The City will participate in local public outreach activities including (1) the City Environmental Sustainability Committee; (2) The Spring Cleanup Event; (3)The Fall Festival Event; and,(4) Continue to be a member of the Northern Virginia Clean Water Partners.
- *BMP 3.1. Storm Sewer System Map* - The City will continue to update and revise their Storm Sewer Outfall Map, located on the City's website, as needed. The City utilizes a Capital Improvement Program (CIP) that includes system updates and GIS based revisions.
- *BMP 3.2. Storm sewer line and structure maintenance* - The City will maintain their storm sewers and associated structures in order to provide uninhibited flow through the City drainage system.
- *BMP 3.3. Illicit Discharge Detection and Elimination (IDDE)* - The City will conduct semi-annual system screening on their outfalls for the presence of illicit discharges. The City will utilize their storm sewer GIS layers to help track the total number of outfalls screened and screening results. The City will keep details of any follow up actions.
- *BMP 3.4. Illicit Discharge Detection and Elimination Enforcement Procedure* - The City will use legal authority to issue summons and prosecute violators for negligence and/or failure to properly report spills.
- *BMP 3.5. Spill Reporting to DEQ and DCR* - The City will ensure that the responsible party(s) reports spills that reach state waters to the Department of Environmental Quality Response Program (PREP).
- *BMP 3.6. Spill Investigation from small MS-4 operated properties* - The City will investigate spills and potential illicit discharges from small MS-4 operated facilities, in order to determine the cause and enforce corrective action to prevent future occurrences.
- *BMP 3.7. Prevention of hazardous / illicit substances into the storm sewer system* - The City will continue to provide residents a hazardous waste disposal facility to prevent hazardous/illicit/bacteria producing materials from reaching the storm sewer system.
- *BMP 3.8 Sanitary Sewer Overflows* - The City will continue, as part of its utilities program, to implement techniques to prevent sanitary sewer overflows.
- *BMP 3.9 Sanitary Sewer Improvements* - The City will maintain their sanitary sewers and associated structures to provide uninhibited flow, as well as prevent sanitary sewer leaks and overflows throughout the sanitary sewer system.
- *BMP 5.1. Public Facilities Manual* - The City will continue to provide information to developers through the Public Facilities Manual (PFM) regarding Stormwater and Best Management Practice (BMP) design requirements. The PFM will be updated as required to address changes in design standards.
- *BMP 5.2 Stormwater Management Ordinance* - The City will continue to follow and update their Stormwater Management Ordinance to meet the provisions set forth in the State Stormwater Requirements and Chesapeake Bay Program Requirements.
- *BMP 5.3. Best Management Practice (BMP) and Stormwater Management (SWM) Facility Maintenance* - The City will continue to require all publicly and privately owned

BMPs and SWM Facilities to be maintained to function as designed. The City will continue to require SWM maintenance plans to be provided on each approved site plan along with an executed stormwater maintenance agreement.

- *BMP 5.4. Stormwater management maintenance and inspection* - The City will maintain a Post-Development Stormwater Management facility inspection program and will perform annual inspections on these facilities.
- *BMP 5.5 Stormwater Management (SWM) Facility and Best Management Practice (BMP) Tracking* - The City will track all known permanent SWM and BMP facilities discharging into their regulated MS-4 area. The City will track the following information: (1) Type of structural SWM Facility installed as defined in the VA Stormwater BMP Clearinghouse; (2) Geographic Location (HUC); (3) The impaired surface water that the SWM is discharging in to; (4) The number of acres treated.
- *BMP 5.6. Best Management Practice (BMP) and Stormwater Management (SWM) Facility Enforcement Procedures* - The City will provide BMPs and SWM facility owners' violation notices when their facilities are not functioning as designed. The City will take enforcement action if the items outlined in the violation notice are not addressed within the City's required time frame.
- *BMP 5.7. Stormwater Program Enhancements* - The City will continue to enhance stormwater programs to reduce the impacts resulting from new and re-development. The City will continue to encourage the use of new and innovative stormwater strategies such as Low Impact Development (LID) and Environmental Site Design (ESD) through the site plan process
- *BMP 5.8. Stormwater Program Enhancements - Employee Training* -The City will continue to provide Stormwater Management Facility inspection training for the City's inspection staff.
- *BMP 5.9. Stormwater Infrastructure Evaluation and Assessment* - The City will evaluate, collect data, and inspect 30,000 feet of storm pipe throughout the MS4 to ensure all infrastructure is functioning as designed.
- *BMP 6.1. Leaf Collection* - The City will continue to provide special curbside leaf collection services in November and December to prevent decaying leaves from getting into streams, causing blockages, and producing nutrients.
- *BMP 6.2. Yard Waste Collection* - The City will continue to provide regular yard waste collection services to collect yard waste before it can be transported by stormwater runoff to the City's streams.
- *BMP 6.3. - Pollution Prevention Information Posted on City website and flyers distributed to City residents* - The City will maintain a Refuse and Recycling website with the most recent version of the City's Solid Waste Management Plan. The website will also provide information to the public on proper solid waste disposal techniques and recycling practices.
- *BMP 6.6. Employee Education and Training on Pollution Prevention and Good Housekeeping* - The City will continue their employee Pollution Prevention and Good Housekeeping procedures training programs.

- *BMP 6.8. (6A*) - Stormwater Pollution Prevention Plans* - The City will develop Stormwater Pollution Prevention Plans (SWPPPs) for all City properties identified as "High Priority Facilities".
- *BMP 6.9. (6B*) - Implement Turf and Landscape Nutrient Management Plans* - The City will identify all areas that need Nutrient Management Plans (NMPs) and implement the plans in accordance with the schedule set forth in Section II.B.6.c of the Stormwater General Permit.
- *BMP 6.10. (6D*) - Written Good Housekeeping and Pollution Prevention Protocols for Daily Municipal Operations and Maintenance* -The City will develop written good housekeeping measures and pollution prevention standard operating procedures to be incorporated into daily operational activities.
- *Other BMPs - Street Sweeping* - The City will continue to implement and maintain its Street Sweeping Program.

More detailed descriptions for each BMP can be found in the City's MS4 Annual Reports which are available for download at http://www.fairfaxva.gov/government/public-works/stormwater-and-floodplain-management/ms4-permit. The City plans to continue implementation of these BMPs to address the bacteria WLA listed in the aforementioned TMDL. Based on the results of the City's Action Plan assessment methodology (as described in Section 9 of this Action Plan), an adaptive iterative approach will be used to enhance/replace these BMPs to achieve the most effective plan for reducing the discharge of bacteria from the City's MS4 and to meet the assigned TMDL WLA.

LEGAL AUTHORITIES

6. Legal authorities such as ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements applicable to reducing the POCs identified in each respective TMDL.
[This section of the Action Plan directly addresses Section I.B.2.a of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 6]

Along with specific BMPs implemented to address bacteria and focus on source control, the City's political leadership has included several provisions to the City's Code in order to facilitate a reduction in these pollutant discharges. These provisions include:

- Instituting legal ramifications for dog owners that fail to remove dog excrement from public right-of-ways and all properties other than the dog owners under Chapter 6 Article 3 - Section 6-61.(b)
- Prohibiting the ownership of wild, exotic, or vicious animals under Chapter 6 Article 5 - All Sections
- Prohibiting the accumulation of solid waste on vacant lots, private roadways, and other lands within the City under Chapter 38 Article 3 - Section 38-38
- Instituting a creek and channel usage, improvement, and preservation provision to improve natural drainage systems within the City in accordance with 9VAC25-870-66 under Section 110-286 of the City's Stormwater Ordinance

The City has reviewed its MS4 Program Plan and ordinances to evaluate its ability to comply with the Special Condition for approved (other than the Chesapeake Bay TMDL) TMDLs (Section I.B) in the MS4 Permit. Based on this review, it is our opinion that the City of Fairfax does not require any new or modified legal authorities or policies to meet the requirements of this special condition. The following is a list of the City's relevant existing legal authorities and policies:

- City of Fairfax's Code of Ordinance
- City of Fairfax's Stormwater Ordinance - (Chapter 110 Article 2 - Division 11 of the County Code)
- City of Fairfax's MS4 Program Plan
- City of Fairfax's Public Facilities Manual (PFM)

However, the City may choose to coordinate with the adjacent MS4 (VDOT) and explore the idea of establishing memoranda of understanding (MOU) to clarify MS4 service boundary lines and inter-jurisdictional responsibilities for POC loads and subsequent required POC load reductions in the future.

ENHANCEMENTS TO PUBLIC EDUCATION, OUTREACH, AND EMPLOYEE TRAINING

7. ***Enhancements to public education, outreach, and employee training programs to also promote methods to eliminate and reduce discharges of the POC(s) for which a WLA has been assigned.***
   [This section of the Action Plan directly addresses Section I.B.2.c of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 7]

Enhancements to Public Education and Outreach Program

The City continues to implement a public education and outreach program as part of its MS4 Program Plan. The City's Stormwater and Floodplain Management webpage (Webpage) (http://www.fairfaxva.gov/government/public-works/environment) is the primary public education and outreach tool utilized for reaching the program's targeted audiences and providing for distribution of educational materials to convey the appropriate messages. The City's webpage has three general sub-section hyperlinks that each contains educational information related to reducing bacterial loading in the Popes Head Creek watershed. The three hyperlinks, and corresponding public education and outreach materials available at those hyperlinks, are as follows:

- ***Stormwater and Floodplain Management Hyperlink***
  - Northern Virginia Clean Water Partners "Only Rain Down the Storm Drain" initiative, as well as corresponding website;
  - The City's MS4 Homepage - with the City's Annual Reports and Outfall Map available for download;
  - The City's Watershed Management Plan;

- ***Stormwater and Floodplain Management Hyperlink (Continued)***
    - The Chesapeake Bay Ordinance and information regarding the Resource Protection Area (RPA) requirements within the City limits; and
    - Information of the City's BMP and Stormwater Management Inspection Program

- ***Protecting Water Resources Hyperlink***
    - Contact information for citizens to report illicit discharges;
    - Educational information, including hyperlinks to Federal, State, and Local Stormwater initiatives, on what citizens can do to report and prevent illicit discharges; and
    - Educational information, including hyperlinks to Federal, State, and Local Stormwater initiatives, on what children can do to protect our water resources

- ***Virginia Stormwater Management Program (VSMP) Hyperlink***
    - Access to the City's Stormwater Ordinance, as well as any revisions;
    - VSMP related forms, applications, fee forms, and checklists; and
    - The City of Fairfax's VSMP Responsibility Flow Chart

As can be seen from this list, the City has utilized their webpage to compile several different publications and hyperlinks to directly address the pollutant of concern (bacteria) for which a WLA has been assigned to the City. The City plans to add more public education and outreach materials to their website annually. Furthermore, the City plans on developing and adding a fourth hyperlink to their webpage entitled "Public Education and Outreach Materials". The hyperlink will provide a separate tab which compiles all existing City publications that directly address the pollutant of concern, as well as add the following materials:

- Environmental Protection Agency (EPA) Outreach Materials (In English and Spanish) - "After the Storm Brochure", "Make Your Home the Solution to Stormwater Pollution" Brochure, and Children's Stormwater Stickers
- PDF links to recent City of Fairfax (Cityscene) Newsletters
- PDF links to the City of Fairfax's Environmental Sustainability Committee Annual Reports
- Outreach materials from the Northern Virginia Clean Water Partners
- Postings regarding City events pertaining to Stormwater Outreach (i.e. "Make your own Rain Barrel" workshop dates)

Along with a fluid Public Education and Outreach hyperlink, all new available publications posted to the hyperlink will also be distributed at future public events. Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to enhance the City's Public Education and Outreach Program.

Enhancements to Employee Training Program

Per MCM 6 of the City's MS4 Program Plan, the City has set guidelines on employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet vehicle and building maintenance, new construction and land disturbance, and stormwater system maintenance. The following is a list of current City employee training activities that specifically address the pollutant of concern (bacteria) for which a WLA has been assigned to the City:

- City Inspectors, Plan Reviewers, and Program Administrators are required to obtain proper certification as necessary under the Virginia Erosion and Sediment Control Law;
- All pertinent staff are required to obtain the Virginia Department of Environmental Quality (DEQ) Stormwater Certifications;
- All pertinent staff utilize training material from the EPA, State of Virginia, and other relevant organizations in conjunction with current City training materials.

Along with the existing City Employee Training Program, the City plans to develop in-house training modules for requisite City staff on Municipal Pollution Prevention Practices and Illicit Discharge Detection and Elimination. Section 8 of this Action Plan outlines the milestone dates for implementation of the means and methods proposed to enhance the City's Employee Training Program.

BMP/MILESTONES IMPLEMENTATION SCHEDULE

8. A schedule of interim milestones and implementation of the items in 5, 6, and 7. [This section of the Action Plan directly addresses Section I.B.1.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Items 8]

As permitted in Section I.B.1 of the MS4 General Permit and referred to in DEQ's Draft Local TMDL Action Plan Guidance Document, the City is proposing to implement this Action Plan in multiple stages over multiple permit cycles using an adaptive iterative approach. This approach will allow the City to gather the necessary data and information to determine the most effective BMPs/management strategies for controlling POC loads along with identifying targeted areas for their implementation to meet the TMDL WLA for bacteria. The following schedule is proposed for implementation of the BMPs and milestone activities included in this Action Plan for the current permit cycle ending on June 30, 2018:

BMP/Milestone Activity	Schedule
Submission of Local TMDL Action Plan to DEQ	October 1, 2016
BMP 1.1. Stream Monitoring	Annually
BMP 1.2. Storm Drain Marker Program	Annually
BMP 1.3. City of Fairfax Watershed Management Plan	Annually

BMP 1.5.	Additional Public Education Material - Quarterly Newsletter	Quarterly
BMP 1.6.	Additional Public Education Material - Follow the Rubber Duck	Monthly
BMP 2.3.	Public Education utilizing the City's Stormwater Website	As-Needed
BMP 2.4.	(2B*) Public Outreach and Community Activities	Annually
BMP 3.1.	Storm Sewer System Map	As-Needed
BMP 3.2.	Storm sewer line and structure maintenance	Annually
BMP 3.3.	Illicit Discharge Detection and Elimination (IDDE)	On-Going
BMP 3.4.	IDDE Enforcement and Procedures	As-Needed
BMP 3.5.	Spill Reporting to DEQ and DCR	As-Required
BMP 3.6.	Spill Investigation from small MS-4 Operated Properties	As-Needed
BMP 3.7.	Prevention of Illicit substances into storm sewer system	Annually
BMP 3.8.	Sanitary Sewer Overflow Prevention	Annually
BMP 3.9.	Sanitary Sewer Improvements	Annually
BMP 5.1.	Public Facility Manual (PFM) Updates	As-Required
BMP 5.2.	Stormwater Management Ordinance	As-Required
BMP 5.3.	BMP and SWM Facility Maintenance Program	Annually
BMP 5.4.	BMP and SWM Facility Inspections	Annually
BMP 5.5.	SWM Facility Tracking	Annually
BMP 5.6.	BMP and SWM Facility Enforcement Procedures	As-Needed
BMP 5.7.	Stormwater Program Enhancements - LID and ESD Practices	As-Needed
BMP 5.8.	Stormwater Program Enhancements - Employee Training	Annually
BMP 5.9.	Stormwater Infrastructure Evaluation and Assessment	Annually
BMP 6.1.	Leaf Collection	On-Going
BMP 6.2.	Yard Waste Collection	On-Going
BMP 6.3.	Pollution Prevention Information posted to City Website	On-Going
BMP 6.6.	Employee Education on Pollution Prevention / Good Housekeeping	Annually
BMP 6.8.	(6A*) Stormwater Pollution Prevention Plans (SWPPPs)	June 30, 2017
BMP 6.9.	(6B*) Implement Turf and Landscape Nutrient Management Plans	Annually
BMP 6.10.	(6D*) Standard Operating Procedures	June 30, 2015
Develop and Implement Dog Waste Impacts Brochure		Dec 30, 2016
Implement Portable Sanitation Facility BMPs		Dec 30, 2016
Develop the "Public Education and Outreach Materials" City Website link		June 30, 2017
Develop in-house Employee Stormwater Pollution Prevention training		Dec 30, 2016
Prepare WQ Monitoring Program for POC Reductions Assessment		Dec 30, 2016
Purchase WQ Monitoring Equipment & Conduct Training		Feb 1, 2017
Commence WQ Monitoring Program		April 1, 2017
Prepare WQ Monitoring Reports		Annually
Prepare Estimate of "End Date" for Compliance with WLA		March 30, 2018
Identify BMPs to be Implemented during Next Permit Cycle (2018-2023)		March 30, 2018

METHODS TO ASSESS TMDL ACTION PLAN

9. Methods to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs.
[This section of the Action Plan directly addresses Section I.B.2.e of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 9]

In order to assess the effectiveness of the City's Occoquan River Watershed Bacteria TMDL Action Plan, the City plans to prepare a Water Quality (WQ) Monitoring Program, in conjunction with the on-going City Water Quality Monitoring being performed by George Mason University (GMU), which will be initiated during this permit cycle. The City envisions collecting water quality samples (E.Coli) twice a year from representative MS4 outfalls that discharge to the impaired reach of Popes Head Creek, which is part of the Occoquan River Watershed. The City will utilize the water quality data collected under the monitoring program to: Identify potential sources of discharge of the POC; target locations within the MS4 permit area for implementation of BMPs; and ultimately to assess the overall effectiveness of the Action Plan in reducing the discharge of the POC from the City's MS4.

In accordance with the schedule provided in Section 8 of this Action Plan, the WQ Monitoring Program will be fully developed by December 30, 2016 and documentation of the program details will be submitted to DEQ with the City's subsequent Annual Report which will be due on October 1, 2017. After commencement of the WQ Monitoring Program and appropriate amounts of sampling data become available, the City will analyze the data to determine if any adjustments are necessary to the Action Plan with regards to the BMPs/management strategies for controlling POC loads. This analysis may include utilization of a stormwater runoff/pollutant loading model such as Purdue University's Long Term Hydrologic Impact Analysis (L-THIA) for estimation of the POC loads coming from the City's MS4. At the end of each MS4 permit reporting period, the City will also prepare annual WQ monitoring reports to be included with the City's MS4 Annual Report.

MEASURABLE GOALS AND METRICS TO TRACK COMPLIANCE

10. Measurable goals and the metrics that the permittee and Department will use to track those goals (and the milestones required by the permit). Evaluation metrics other than monitoring may be used to determine compliance with the TMDL(s).
[This section of the Action Plan directly addresses Section I.B.1.b of the MS4 Permit and DEQ Guidance Document Action Plan Content Item 10]

The City intends to demonstrate its progress on implementation of this Action Plan by tracking, monitoring, and reporting on BMP/milestone activity progress in its MS4 Program Annual Report that is submitted to DEQ on October 1st of each permit year. In the Annual Report, the City will provide updates on the status of each of the BMP/milestone activities listed under Section 8 of this Action Plan to include compliance with the proposed schedule. In accordance with the adaptive iterative approach adopted by the City, referenced in this Action Plan, the City may modify/replace

BMPs, as necessary, to achieve the most effective plan for reducing the discharge of bacteria from the City's MS4 and meeting the assigned TMDL WLA.

Appendix C

Water Quality Monitoring Reports

Fairfax City Water Quality Monitoring: **Report**
conducted by Potomac Environmental Research and Education Center
George Mason University
Note: Samples were collected on 4/4/2016

Parameter	**Station A**	**Station B**	**Station C**	**Station D**
Time	8:58	9:10	9:31	9:43
Temperature (oC)	9.69	9.83	10.29	10.47
Specific Conductance (umho/cm)	380	544	470	549
Dissolved Oxygen (mg/L)	11.34	11.13	10.27	10.13
Dissolved Oxygen (% saturation)	99.4	98.0	91.7	90.9
pH	7.63	7.82	7.49	7.34
Turbidity (NTU)	0.6	0.6	1.4	1.8
Nitrate + nitrite (mg/L as N)	0.45	0.77	1.34	0.96
Total phosphorus (mg/L as P)	0.012	0.017	0.015	0.018
Total suspended solids (mg/L)	4.0	3.8	5.5	5.5
Volatile suspended solids (mg/L)	1.7	1.5	2.1	1.8
Escherichia coli (#/100 mL)	45	59	75	112
Latitude	38.853075	38.860637	38.861766	38.861645
Longitude	77.279314	77.292603	77.277595	77.269913

Station Locations:
Station A: Daniels Run at St Andrews Dr.
Station B: Middle Fork Accotink Cr off Spring Lake Terr
Station C: Accotink Cr just above Old Lee Hwy
Station D: Accotink Cr just below Pickett Rd

Methods

Parameter	**Description**	**Reference**
Temperature (oC)	YSI DataSonde 6600 V2 4	EPA 170.1
Specific Conductance (umho/cm)	YSI DataSonde 6600 V2 4	EPA 120.1
Dissolved Oxygen (mg/L)	YSI DataSonde 6600 V2 4	EPA 360.1
Dissolved Oxygen (% saturation)	YSI DataSonde 6600 V2 4	EPA 360.1
pH	YSI DataSonde 6600 V2 4	EPA 150.2
Turbidity (NTU)	YSI DataSonde 6600 V2 4	
Nitrate + nitrite (mg/L as N)	Cd reduction using AQ2	EPA 353.3
Total phosphorus (mg/L as P)	Persulfate digestion AQ2	EPA 365.2 as modified by Wetzel and Likens
Total suspended solids (mg/L)	Gravimetric with Whatman 984AH filters	EPA 160.1 dried to 80oC
Escherichia coli (#/100 mL)	Membrane Filter/Simultaneouse Detection	EPA 1604

Fairfax City Water Quality Monitoring: **Report**
conducted by Potomac Environmental Research and Education Center
George Mason University
Note: Samples were collected on 1/13/2016

Parameter	**Station A**	**Station B**	**Station C**	**Station D**
Time	9:45 AM	10:01 AM	10:17 AM	10:32 AM
Temperature (oC)	0.67	0.68	1.53	1.70
Specific Conductance (umho/cm)	188	423	437	375
Dissolved Oxygen (mg/L)	13.84	13.37	12.88	12.82
Dissolved Oxygen (% saturation)	96.5	93.2	92.1	92.1
pH	7.28	7.68	7.84	7.79
Turbidity (NTU)	2.6	1.4	3.0	4.4
Nitrate + nitrite (mg/L as N)	0.75	1.49	1.54	1.27
Total phosphorus (mg/L as P)	0.024	0.014	0.016	0.020
Total suspended solids (mg/L)	3.4	4.3	4.6	4.8
Volatile suspended solids (mg/L)	1.5	2.1	1.9	2.0
Escherichia coli (#/100 mL)	783	167	340	383
Latitude	38.853075	38.860637	38.861766	38.861645
Longitude	77.279314	77.292603	77.277595	77.269913

Station Locations:
Station A: Daniels Run at St Andrews Dr.
Station B: Middle Fork Accotink Cr off Spring Lake Terr
Station C: Accotink Cr just above Old Lee Hwy
Station D: Accotink Cr just below Pickett Rd

Methods

Parameter	**Description**	**Reference**
Temperature (oC)	YSI DataSonde 6600 V2 4	EPA 170.1
Specific Conductance (umho/cm)	YSI DataSonde 6600 V2 4	EPA 120.1
Dissolved Oxygen (mg/L)	YSI DataSonde 6600 V2 4	EPA 360.1
Dissolved Oxygen (% saturation)	YSI DataSonde 6600 V2 4	EPA 360.1
pH	YSI DataSonde 6600 V2 4	EPA 150.2
Turbidity (NTU)	YSI DataSonde 6600 V2 4	
Nitrate + nitrite (mg/L as N)	Cd reduction using AQ2	EPA 353.3
Total phosphorus (mg/L as P)	Persulfate digestion AQ2	EPA 365.2 as modified by Wetzel and Likens
Total suspended solids (mg/L)	Gravimetric with Whatman 984AH filters	EPA 160.1 dried to 80oC
Escherichia coli (#/100 mL)	Membrane Filter/Simultaneouse Detection	EPA 1604

Fairfax City Water Quality Monitoring: **Report**
conducted by Potomac Environmental Research and Education Center
George Mason University
Note: Samples were collected on 10/20/2015

Parameter	**Station A**	**Station B**	**Station C**	**Station D**
Time	9:33 AM	9:19 AM	9:03 AM	8:57 AM
Temperature (oC)	8.40	8.57	9.03	9.03
Specific Conductance (umho/cm)	236	469	487	483
Dissolved Oxygen (mg/L)	12.46	11.01	10.31	10.17
Dissolved Oxygen (% saturation)	106.2	94.4	89.5	88.2
pH	8.08	7.98	7.60	7.38
Turbidity (NTU)	1.8	3.8	1.2	1.3
Nitrate + nitrite (mg/L as N)	0.63	1.24	1.30	1.09
Total phosphorus (mg/L as P)	0.018	0.026	0.014	0.014
Total suspended solids (mg/L)	3.5	2.1	6.2	5.8
Volatile suspended solids (mg/L)	2.4	1.2	2.1	2.1
Escherichia coli (#/100 mL)	36	270	1187	363
Latitude	38.853075	38.860637	38.861766	38.861645
Longitude	77.279314	77.292603	77.277595	77.269913

Station Locations:
Station A: Daniels Run at St Andrews Dr.
Station B: Middle Fork Accotink Cr off Spring Lake Terr
Station C: Accotink Cr just above Old Lee Hwy
Station D: Accotink Cr just below Pickett Rd

Methods

Parameter	**Description**	**Reference**
Temperature (oC)	Hydrolab DataSonde DS5	EPA 170.1
Specific Conductance (umho/cm)	Hydrolab DataSonde DS5	EPA 120.1
Dissolved Oxygen (mg/L)	Hydrolab DataSonde DS5	EPA 360.1
Dissolved Oxygen (% saturation)	Hydrolab DataSonde DS5	EPA 360.1
pH	Hydrolab DataSonde DS5	EPA 150.2
Turbidity (NTU)	Hydrolab DataSonde DS5	
Nitrate + nitrite (mg/L as N)	Cd reduction using Hach Nitraver 5/AQ2	EPA 353.3
Total phosphorus (mg/L as P)	Persulfate digestion/Ascorbic Acid/AQ2	EPA 365.2 as modified by Wetzel and Likens
Total suspended solids (mg/L)	Gravimetric with Whatman 984AH filters	EPA 160.1 dried to 80oC
Escherichia coli (#/100 mL)	Membrane Filter/Simultaneouse Detection	EPA 1604