

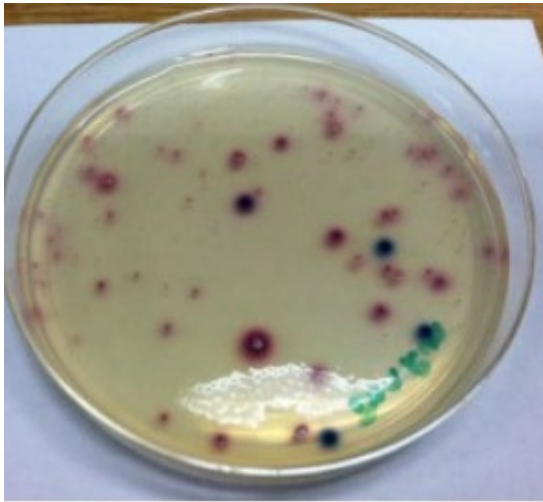
# Arlington County Total Maximum Daily Load Action Plan for *E. coli* Bacteria

*Arlington County Municipal Separate Storm Sewer System (MS4) Permit VA0088579  
(2021-2026 Permit Cycle)*

Original Plan Approved by the Virginia Department of Environmental Quality: July 2016

Updated Plan submitted: November 29, 2022

Revised Updated Plan submitted: October 31, 2023



## Table of Contents

Introduction.....	1
Sources of <i>E.coli</i> Bacteria in the Urban Watershed.....	2
Assessment of County Owned Facilities for Significant Sources of <i>E. coli</i> Bacteria .....	3
Dog Parks.....	3
County Open Space / Natural Lands .....	3
Sanitary Sewer Exfiltration to the Storm Drain System and Surface Waters .....	4
Sanitary Sewer Overflows (SSOs).....	4
Arlington County Water Pollution Control Plant (WPCP) .....	4
Arlington County Trades Center.....	4
Sources of <i>E. coli</i> Bacteria Loading from Private Property and Facilities.....	5
Pet Owners - Private Property .....	5
Illicit Connections and Discharges to the Storm Drain System .....	5
Dumpsters / Commercial “Back of House” Areas .....	5
Animal Care & Service Facilities .....	5
Private Septic Systems .....	5
Strategies for Bacteria Reduction and Control Techniques.....	5
Legal Authorities Applicable to Reducing <i>E. coli</i> Bacteria Loading.....	6
Dog Parks.....	7
Addressing Sanitary Sewer Exfiltration to the MS4 and Surface Waters.....	7
Arlington County Pretreatment Program – FOG Discharge Policy / Ordinance .....	8
Stormwater Management.....	8
Implementation of Stormwater Management Facilities & Retrofit Projects.....	9
Maintenance of Stormwater Management Facilities .....	9
Stormwater Infrastructure Inspection & Maintenance Program .....	10
Street Sweeping .....	10
Arlington County Trades Center SWPPP .....	11
Other High Priority Municipal Facility.....	11
Pollution Prevention Protocols for Street and Parking Lot Maintenance.....	11
Construction Site SWPPP Inspections / Portable Lavatories .....	11
Illicit Discharge Detection and Elimination (IDDE) .....	12
High Risk / Commercial Facility Inspections.....	12
Coordination with Other County Agencies .....	13
Public Education and Outreach .....	13
Arlington County Website.....	13

Social Media and Newsletters.....	13
Northern Virginia Clean Water Partners.....	13
Storm Drain Marking.....	14
Signs .....	14
Public Events / Distribution of Only Rain Pet Waste Pick-up Bag Dispensers.....	15
Pet Waste Postcards .....	15
Fats, Oils, Grease Outreach and Education.....	16
Back-of-House Maintenance for Restaurants.....	18
Bacteria Monitoring Program .....	18
Employee Training.....	18
Schedule of Implementation of Anticipated Actions for 2021-2026 .....	20
Methods for Assessment of Effectiveness .....	22
Analysis of Volunteer In-Stream E. coli Monitoring Program Data.....	22
Analysis of DEQ's Long Term Trend Monitoring Station Data .....	24
Summary.....	24
Appendix A – Summary of Public Comments.....	26

## Introduction

In accordance with its Virginia Stormwater Management Program – Municipal Separate Storm Sewer System (MS4) Permit (VA0088579), Arlington County is required to develop and implement a Local TMDL Action Plan designed to reduce loadings of pollutants of concern to impaired waters for which a TMDL has been approved by the State Water Control Board and U.S. Environmental Protection Agency (EPA).

Bacteria TMDLs have been established for several waterways that receive stormwater discharges from the County’s MS4. The table below, excerpted from the County’s MS4 Permit (Attachment A), shows the bacteria TMDLs for the several watersheds, EPA approval dates of the TMDL, and waste load allocations (WLA).

Attachment A: Total Maximum Daily Load Reports with Wasteload Allocations to VA0088579 - Arlington County						
TMDL Project	TMDL Pollutant(s)	Final Report	EPA Approval Date	SWCB Approval Date	Wasteload Allocation	Consolidated Wasteload
TMDL Report: Bacteria TMDLs for the Sugarland Run, Mine Run, and Pimmit Run in Arlington, Fairfax, and Loudoun Counties						
Sugarland Run, Mine Run, Pimmit Run	E. Coli	Report is available for review, please see contact information below. <sup>1</sup>	9/26/2013	4/4/2014	2.35E+11cfu/yr	Yes
TMDL Report: Bacteria TMDLs for the Hunting Creek, Cameron Run and Holmes Run Watersheds						
Hunting Creek, Cameron Run, Holmes Run	E. Coli	Report is available for review, please see contact information below. <sup>1</sup>	11/10/2010	8/4/2011	3.68E11 cfu/yr	Yes
TMDL Report: Bacteria TMDL for the Tidal Four Mile Run Watershed						
Tidal Four Mile Run Watershed	E. Coli	Report is available for review, please see contact information below. <sup>1</sup>	6/14/2010	9/30/2010	2.23E13 cfu/yr	Yes
TMDL Report: Fecal Coliform TMDL (Total Maximum Daily Load) Development for Four Mile Run, Virginia						
Four Mile Run Watershed	Fecal Coliform	Report is available for review, please see contact information below. <sup>1</sup>	5/31/2002	6/17/2004	2.04E13 cfu/yr	Yes
<sup>1</sup> All reports are available for review by contacting the Northern Regional Office TMDL Coordinator at the following link: <a href="https://www.deq.virginia.gov/water/water-quality/tmdl-development/approved-tmdls">https://www.deq.virginia.gov/water/water-quality/tmdl-development/approved-tmdls</a>						

The County developed a Bacteria (*E. coli*) TMDL Action Plan during its previous MS4 permit term (2013-2018 plus three years of administrative continuance). That action plan was submitted to the Virginia Department of Environmental Quality (DEQ) on June 22, 2015, and was approved by DEQ on July 5, 2016, following several meetings with DEQ staff.

**Per previous DEQ guidance on approaches for meeting WLAs for pathogenic pollutant TMDLs, this action plan focuses on best management practices (BMP) and strategies that are practicable for reducing bacteria loading from controllable anthropogenic (pet and human) sources. Other sources such as wildlife are not prioritized in this plan.**

Based on previous conversations between Arlington County and the DEQ, this plan is framed in terms of *Escherichia coli* (*E. coli*) bacteria. *E. coli* has superseded fecal coliform bacteria as a pollutant of concern (POC) for impairments and TMDLs by DEQ regulations and practice. Since *E. coli* is a subset of fecal coliform bacteria, actions taken to reduce *E. coli* loading will consequently reduce fecal coliform bacteria loading. In this Plan, the terms ‘bacteria’ and ‘POC’ are used interchangeably with, and intended to be synonymous with, the term *E. coli*.

This updated Bacteria TMDL Action Plan has been developed in accordance with the requirements set forth in Part 1.E.2 of the 2<sup>nd</sup> Phase MS4 Permit (2021-2026). **As with the previous Action Plan, the County will continue to take a comprehensive and conservative approach by implementing best management practices and strategies to reduce *E. coli* bacteria loading County-wide, extending efforts beyond its regulated MS4 service**

**area subject to the applicable point source WLA.**<sup>1</sup> This includes implementing practices to reduce bacteria loading to Pimmit Run. The Bacteria TMDL for Tributaries to the Potomac River: Sugarland Run, Mine Run, and Pimmit Run was approved by the Environmental Protection Agency (EPA) on September 26, 2013, and the State Water Control Board (SWCB) on April 4, 2014.

This Plan is a component of the County's on-going long-term comprehensive, and multi-pollutant watershed management effort that will continue to be implemented over multiple MS4 permit cycles in parallel with the implementation of the Chesapeake Bay TMDL Action Plan and PCB TMDL Action Plan. This plan will be incorporated via reference in the County's MS4 Program Plan per section 1.E.2.g. The Program Plan will provide the date of the most recent action plan and where the plan can be reviewed online.

In accordance with part 1.E.2.f, the public was provided the opportunity to comment on the initial draft plan for a minimum of fifteen days to meet the local TMDL action plan requirements. The plan was available to review on the County's website ("Bacteria & PCB TMDL Actions Plans") starting in late October 2022. Online public comment forms were made available from November 1 through November 15, 2022. Various media / outreach mechanisms were used to notify the public. A summary of public comments is provided in Appendix A.

A summary of annual implementation actions will be included in the County's MS4 Permit Annual Reports per Part I.E.2.h.1 of the permit.

### **Sources of *E. coli* Bacteria in the Urban Watershed**

The primary sources of *E. coli* bacteria loading to urban surface waters include the following:

- Waste from wildlife (including pigeons, waterfowl, starlings, rats, mice, foxes, raccoons, deer, groundhogs) – wildlife often concentrates in stream corridors, which are typically the largest areas of open space in urban areas
- Pet / domestic animal waste (including dog, cat, rabbit, chicken, horse) that is not picked up and/or disposed of properly
- Leaking and/or poorly maintained waste receptacles
- Sanitary sewer overflows associated with backups or damaged infrastructure
- Exfiltration from older sanitary mains and private laterals
- Cross-connections of sanitary lines to the storm system
- Illicit dumping or disposal of sanitary waste to the storm drain system
- Poorly maintained portable lavatories

In addition to these sources, *E. coli* bacteria can continue to live and be delivered to surface waters via stormwater runoff as a result of re-growth inside storm drain infrastructure and accumulation on sediment and debris in streets and parking lots. Furthermore, bacteria living in benthic sediment in streams can be re-suspended into the water column during storm events.

From 1998 – 2000, Dr. George Simmons of Virginia Tech performed an extensive Bacteria Source Tracking (BST) study of the entire Four Mile Run watershed, including the tidal drainage area. The study used genetic fingerprinting methods to identify sources of *E. coli* bacteria. Of the samples identified, wildlife was shown as

---

<sup>1</sup> The County intends to track progress in at least a qualitative manner for this expanded TMDL Action Plan implementation approach. Such tracking is intended to facilitate appropriate crediting to the County at a future time toward implementation obligations associated with this TMDL (credit for practices addressing unregulated lands or credit through a trading mechanism) or other future TMDLs for this POC related to other water body segments.

the predominant source of bacteria in the watershed. Approximately 25% of the samples identified indicated pets and/or humans as contributing sources. Additional BST sampling was conducted from January 2006 – December 2006 at the DEQ monitoring station 1A.FOU000.19 to support the development of the bacteria TMDL for the tidal portion of the Four Mile Run watershed. The results were consistent with the earlier BST study.

The following sections in this action plan correspond with reporting information outlined in DEQ issued guidance documents and required reporting elements specified section 1.E.2.c and d of the MS4 permit.

**Assessment of County Owned Facilities for Significant Sources of *E. coli* Bacteria**

The following County-owned and operated facilities have been evaluated and identified as potential significant sources of *E. coli* bacteria loading to the MS4 and surface waters. These facilities are not covered under a separate VPDES industrial stormwater general permit.

***Dog Parks***

Arlington County Department of Parks and Recreation (DPR) manages ten [Dog Parks](#) throughout the County

<b>Dog Park</b>	<b>Address</b>	<b>Watershed</b>
Benjamin Banneker Park	1680 N Sycamore St	Four Mile Run Upper Mainstem
Fort Barnard Dog Park	2101 S Pollard St	Four Mile Run Middle Mainstem
Fort Ethan Allan Dog Park	3829 N Stafford St	Gulf Branch
Glencarlyn Dog Park	301 S Harrison St	Four Mile Run and Upper Long Branch
James Hunter Dog Park	1230 N Hartford St	Spout Run
Shirlington Dog Park	2710 S Oakland St	Four Mile Run Middle Mainstem
Towers Dog Park	801 S Scott St	Lower Long Branch
Utah Dog Park	3191 S Utah St	Four Mile Run Middle Mainstem
Virginia Highlands Park	1600 S Hayes St	Roaches Run
Gateway Park	1300 Langston Blvd	Rosslyn / Potomac

Dog parks are very popular and in high demand in Arlington County. Hundreds of dogs frequent these areas weekly. While the majority of dog owners pick up after their pet, there are instances when waste is not picked up. Pet waste that is left on the ground at and adjacent to these areas can be a significant source of bacteria loading given the high concentration of dogs and associated waste production.

***County Open Space / Natural Lands***

The County’s Department of Parks and Recreation manages 924 acres of parkland throughout the County. Of that, 248 acres are designated as “natural lands”. NOVA Parks manages 135 acres in Arlington County. The majority of open space and natural land is situated along stream corridors. Open space and trails (over 50 miles of multi-use and paved trails) located throughout the County are heavily used by dog owners and their pets. It is estimated that there are approximately 7,000 licensed dogs (older than six months old) in the County. Pet waste that is left on the ground can be a source of bacteria loading.

Wildlife, including deer, fox, raccoon, squirrels, and birds tend to be concentrated in the limited open / natural spaces in urban watersheds, especially stream corridors, and are another potential source of bacteria loading.

### ***Sanitary Sewer Exfiltration to the Storm Drain System and Surface Waters***

Throughout the County, sanitary sewer infrastructure (publicly and privately owned) conveys wastewater flow from buildings to wastewater treatment plants. The County owns and maintains over 465 miles of sanitary lines, thirteen lift stations throughout the County, and a major wastewater treatment plant (Water Pollution Control Plant – WPCP). The WPCP and associated collection system has an individual VDPES permit (discussed below). Discharges associated with exfiltration and leaks from older or damaged sanitary lines to the storm drain system or surface waters is a potential source of bacteria loading.

### ***Sanitary Sewer Overflows (SSOs)***

Overflows from sanitary sewer infrastructure (manholes) can occur from blockages in the system, damaged and/or offset pipes, or capacity exceedances during significant storm events. Tree roots that get into pipes can snag and accrue debris (paper, wipes, rags) resulting in blockages and subsequent overflows. Grease buildup or accumulation of items (wipes, rags, gloves, personal hygiene products) that should not be disposed of into the sanitary sewer system can also cause blockages and overflows. Discharges of sewage can also result from broken lines. Sanitary lines, especially those not encased, that have become exposed in open channels due to erosion are at high risk of breaks during storm events. Sanitary infrastructure can also be compromised during construction activity resulting in discharges of sewage to the MS4 and surface waters.

### ***Arlington County Water Pollution Control Plant (WPCP)***

Located in south Arlington, the WPCP is a 40 million gallon per day (MGD) capacity advanced wastewater treatment facility that treats 23 million gallons of wastewater each day from residences and businesses, with nearly 20 percent of the plant's flow coming from neighboring localities such as Alexandria, Fairfax and the City of Falls Church. The WPCP discharges highly treated and disinfected effluent directly to the tidal section of Four Mile Run, which is subject to bacteria and other effluent limitations established by the VDPES Permit. Although the WPCP effluent may include small bacteria loads as allowed by the permit, the County operates the WPCP such to achieve effluent quality for bacteria that is typically far better than instream conditions and applicable standards and permit limits, such that the WPCP has a net beneficial impact on instream conditions for bacteria.

Overflows or releases of untreated or partially treated wastewater from the WPCP as a result of equipment malfunction, however, can be sources of bacteria loading.

### ***Arlington County Trades Center***

The Arlington County Trades Center is located at the intersection of South Arlington Mill Road and South Taylor Street in the southeastern portion of the County. It has been identified as a High Priority Municipal Facility given the scope and nature of the operations conducted at the complex. The Trades Center is the staging site for the County's municipal operations including vehicle and equipment repair, maintenance, cleaning, fueling; material and equipment storage; and earth products recycling and storage. The Trades Center plays an important role in ensuring necessary daily services and operations are carried out throughout the County. The facility covers approximately 39 acres and includes eight separate operation areas.

Of the eight facilities, the Department of Environmental Services (DES) Solid Waste Bureau (SWB) facility has the most potential to be a source of bacteria loading – albeit not a significant source. DES SWB manages the County's residential refuse collection and recycling programs and the Earth Products Recycling Yard (EPRY). A number of materials are stored and processed at the EPRY. Leaves and brush are processed into mulch that is provided to residents, County staff and contractors. Several trucks are staged on site including, leaf vacuum trucks, garbage trucks, street sweepers, trucks for brush pickup, and dump trucks. Material collected by the County's street sweepers is temporarily stored at the EPRY, prior to being taken to a waste storage facility.

Potential bacteria sources at this facility include leaks from refuse collection trucks and street sweepers, runoff containing leachate from stockpiled materials such as mulch, yard debris, soil, and street sweeper debris.

There are a number of dumpsters and smaller waste receptacles located throughout the Trades Center. Leaks from these containers could be a potential bacteria source.

### **Sources of *E. coli* Bacteria Loading from Private Property and Facilities**

The following private sources have been identified as potential significant sources of *E. coli* bacteria loading to the MS4 and surface waters. They have been included in this Action Plan recognizing that bacteria loading from these sources may be more significant than from County owned and operated sources. Management practices and strategies to address these sources are included in the following section.

#### ***Pet Owners - Private Property***

There are a significant number of pet owners in the County. Uncollected pet waste left on the ground on private property can be a significant source of *E. coli* bacteria loading. In addition to dogs, domestic pet cats that are allowed to be outdoors are also source of bacteria. Waste from feral cats is another source.

#### ***Illicit Connections and Discharges to the Storm Drain System***

Cross connections occur when private sanitary lines are connected to private or public storm lines. These illicit connections can be a significant source of bacteria. Illicit discharges such as dumping or illegal disposal of waste into the MS4 can also be a source of bacteria loading.

#### ***Dumpsters / Commercial “Back of House” Areas***

There are hundreds of restaurants and grocery stores throughout the County. Many of these establishments have dumpsters, trash compactors, recycling containers, and used cooking grease containers situated outside, typically behind the building. Poorly maintained and/or leaking waste receptacles are attractive to pests, such as mice, rats, crows, and raccoons, which leads to increased populations in these areas and concentrated levels of wildlife waste left on the ground. Outdoor washing activities (rinsing floor mats, food containers, and garbage cans outside) and disposal of wash water (dumping mop buckets), grease, food scraps onto the ground also attracts pests.

#### ***Animal Care & Service Facilities***

There are a number of private businesses that provide services for animals, including veterinary care, grooming, lodging, pet day care, obedience courses, and animal shelters. Areas around these establishments receive high level of traffic from pets. Pet waste left on the ground in these “concentrated” areas could be a significant source of bacteria loading.

#### ***Private Septic Systems***

There are currently 34 private septic systems (32 conventional and two alternative systems) in Arlington County. The majority of these systems are situated on properties located in the Potomac Palisades on the north side of the county. Septic systems that are not routinely maintained have the potential to release contents and contribute to bacteria loading to surface waters.

### **Strategies for Bacteria Reduction and Control Techniques**

The following section outlines the management strategies and practices the County is implementing to reduce bacteria loading from significant sources to the County’s MS4 and surface waters.



As noted in the introduction, reduction strategies will focus on *E. coli* bacteria loading from controllable, anthropogenic human and pet sources. For domestic pets, the primary source control and reduction strategy is public education and outreach. For anthropogenic sources, the primary source control strategies include infrastructure and facility inspection and maintenance, pollution prevention, good housekeeping, and identification and elimination of illicit cross-connections.

Per the requirements of its permit, the County will implement a minimum of six strategies for bacteria reduction listed in Table 4 in section 1.E.2.d.1. The selected strategies from this table will be specified along with additional efforts the County is taking to reduce bacteria loading.

**Legal Authorities Applicable to Reducing *E. coli* Bacteria Loading**

The following sections of [Arlington County Code](#) provide directives that are applicable to reducing bacteria loading to the storm drain system, and subsequently, surface waters to the maximum extent practicable.

County Code	Provisions
Chapter 2: Animals and Fowl	<p>§2-5.A Prohibits dogs from running at large in the County</p> <p>§2-5.B Requires dog owners to remove dog waste from any property other than the dog owner’s property and between the edges or curbs of public streets.</p>
Chapter 10: Garbage, Refuse, and Weeds	<p>§10-6.B.1.a.5. Plastic bags need to be securely tied with the contents wrapped to prevent tearing or puncturing of the bag. Requires waste containers to be emptied frequently enough to prevents their contents from overflowing.</p> <p>§10-6.B.1.d. Requires refuse containers to be kept serviceable and sanitary condition. (Serviceable meaning – watertight, lid, no holes, cracks.)</p> <p>§10.6.D.3 Requires animal feces to be securely sealed or wrapped in plastic or paper bags before being placed in a trash cart of household container.</p> <p>§10-24. Prohibits littering</p>
Chapter 26: Utilities	§26-7.C Prohibits the discharge of unauthorized non-stormwater discharges to the storm drain system or surface waters
Chapter 57: Erosion and Sediment Control	Requires erosion and sediment controls to prevent or minimize transport of sediment off site
Chapter 60: Stormwater Management	Requires construction controls and post construction stormwater management to reduce runoff and pollutants

- Selected strategies from MS4 Permit section 1.E.2.d.1 Table 4:**
- *Adopt and enforce pet waste ordinances or policies, or [leash laws](#) or policies.*
  - *Implement and enforce urban trash management practices.*

## **Dog Parks**

Dog parks are a benefit to the community for a variety of reasons and can be considered a strategy for controlling pet waste. The dog park environment encourages park users to pick up after their pets. Information posted on fences, kiosks, and/or bulletin boards at the parks further encourages patrons to pick up after their pet.

Patrons of dog parks must comply with [Dog Park Rules and Regulations](#), which include obeying pet waste pickup laws. The County provides pet waste pick-up bag dispensers and waste receptacles for patrons of CCAs. The County regularly services the waste receptacles through its refuse collection program to prevent overflowing containers. Based on field surveys conducted by County staff, many people rely on these dispensers and utilize them when provided.

The majority of dog parks have a Dog Park Sponsor Group. The sponsor groups agree to be responsible for the maintenance and operation tasks outlined in the [Dog Park Sponsor Agreement](#) with the County. Each group maintains a liaison that works with the County on maintenance or other issues. Sponsor groups also assist with outreach efforts about responsible facility use and picking up pet waste. Information is disseminated via newsletters, websites, list serves, and social media. Many of the sponsor groups conduct regular “clean-ups” of the parks to ensure these facilities are kept clean. The County reserves the right to close any dog park if rules are not being followed.

Additional information about education and outreach focusing on picking up pet waste and proper disposal is provided later in this plan.

### **Selected strategies from MS4 Permit section 1.E.2.d.1 Table 4:**

- *Provide signage to pick up dog waste, providing pet waste bags and disposal containers.*
- *Adopt and enforce pet waste ordinances or policies, or leash laws or policies.*
- *Maintain dog parks by removing disposed of pet waste bags and cleaning up other sources of bacteria.*

## **Addressing Sanitary Sewer Exfiltration to the MS4 and Surface Waters**

The County continues to implement its comprehensive [sanitary sewer maintenance](#) program to ensure that the sanitary sewer system continues to operate effectively and efficiently and reduce the potential for blockages and leaks. The County’s [Sanitary Sewer System Master Plan](#) evaluates the system’s facilities, practices, and policies, and identifies maintenance and improvement programs and projects to renew aging infrastructure and provide a safeguard for the future of the system.

The County maintains over 465 miles of public sanitary sewer lines in order to maintain the integrity of the system. Part of the inspection and maintenance program includes sanitary sewer pipe relining and replacement. Cured-in-place pipe (CIPP) is a trenchless rehabilitation process used to repair existing pipes. Sanitary relining is part of the County’s Capital Improvement Plan (CIP). The CIP currently provides funding to reline approximately 1.5 percent of the public sanitary sewer system annually, or about seven miles of pipe. Close to 60% of the County’s sanitary sewer system has been relined since the program began. Relining and replacement significantly reduces sanitary sewer exfiltration as well as overflows or leaks to the MS4 and surface waters.

Per the requirements of the MS4 permit, the County will inspect a minimum of 400,000 linear feet of sanitary sewer lines during the current permit cycle. The County’s uses TV inspection to check the system. Remote control carriage-mounted video cameras, launched from inspection trucks, are inserted into a sewer manhole and dispatched through a section of a sanitary sewer pipe. A video recording is generated, which can be

analyzed to identify cracks, dislodged pipe joints, locations of house lateral connections, flow conditions, and any other sewer characteristics.

The County is in the process of updating its Sanitary Sewer Master Plan. Approximately 35 monitoring locations were selected to measure flow in the sanitary sewer system. Data from rain gauges near the monitoring sites will help to determine peaking factors to use in design processes. While there is ultimately still the potential for a storm that will exceed the capacity of the sanitary sewer system, the focus is to analyze these data to determine if there are areas in the system that need improvement to minimize the occurrence of potential overflows.

**Selected strategy from MS4 Permit section 1.E.2.d.1 Table 4:**

- *identify leaking sanitary sewer lines infiltrating to the MS4 and implement repairs.*

***Arlington County Pretreatment Program – FOG Discharge Policy / Ordinance***

Arlington County’s Water Pollution Control Plant manages the County’s Pretreatment Program. As part of this program, a [Fats, Oils, and Grease \(FOG\) Discharge Policy](#) as well as an updated County ordinance ([26.1 Wastewater Pretreatment](#)) have been established to aid in preventing the introduction and accumulation of FOG into the County’s sanitary sewer system that may cause or contribute to sanitary sewer blockages, obstructions, and sanitary sewer overflows. The Pretreatment Program ensures that applicable food serving establishments (FSE) are permitted and have appropriately sized grease interceptors. Permitted facilities are required to inspect and maintain these devices. Cleaning schedules are based on the size of grease inceptor that is required for the facility. County staff also conduct inspection of these facilities and review required self-monitoring reports provided by the facility.

Certain sections of the sanitary sewer system have been designated as grease “hot spots,” due to the density of FSEs connected to those segments of the sanitary sewer system. The County tracks sections of the sanitary sewer system that are subject to FOG buildups and have caused sanitary sewer overflows (SSOs) in the past. These areas have been identified as needing more frequent cleaning. In order to reduce maintenance frequency of “hot spots,” County pretreatment staff will closely monitor the FOG management practices of the contributing FSEs to ensure proper interceptor sizing and/or cleaning/maintenance frequencies are occurring.

***Stormwater Management***

As described in the County’s [MS4 Program Plan](#) and [Chesapeake Bay TMDL Action Plan](#), the County has a comprehensive water quality improvement program. This program includes regulation of development activity under Chapter 60 of the Arlington County Code as well as retrofits on existing developed land as part of the implementation of the County’s adopted Stormwater Master Plan.

The Chesapeake Bay TMDL Action Plan documents significant nutrient and sediment reductions as a result of stormwater management facilities installed with development projects since the 2006 accounting baseline established by DEQ. These reductions are cross-referenced for this Action Plan. It is expected that these reductions will continue to occur with future development activity because most of this activity in Arlington is redevelopment, and the County ordinance requires a 10%-20% net reduction in phosphorus loads—consistent with State code. Documentation and sediment reduction computations are provided in annual reports along with the updated 2<sup>nd</sup> permit cycle Bay TMDL Action Plan.

The Bay TMDL Action Plan also documents nutrient and sediment reductions for in-place and planned watershed retrofit projects (e.g., green streets projects, Trades Center filtering systems, Ballston Pond retrofit,

Sparrow Pond retrofit, stream resiliency projects, etc.). These reductions are cross-referenced for this Action Plan. As additional projects are completed, documentation and sediment reduction computations are provided in annual reports along with the updated 2<sup>nd</sup> permit cycle Bay TMDL Action Plan.

Although bacteria are not a POC for the Bay TMDL nor are removal rates for bacteria published in the Stormwater Clearinghouse or other DEQ guidance, the types of stormwater management facilities installed with development and watershed retrofit projects can reduce bacteria concentrations.<sup>2</sup> However, current research shows variability in this performance—and the research is still relatively limited.

What can be stated is that, even if bacteria concentrations are not always reduced through stormwater treatment, bacteria load reductions will occur with reduced stormwater runoff volumes from the types of facilities that reduce runoff volume (e.g., bioretention and other runoff reduction practices). And cumulatively and over the long-term, widespread stormwater management facility implementation will have benefits for receiving water quality, including reduced bacteria loading.

### ***Implementation of Stormwater Management Facilities & Retrofit Projects***

Arlington has implemented multiple types of stormwater management facilities (SWMF) and retrofit projects throughout the County. There are currently over 190 public SWMF projects throughout the County, including bioretention facilities, stormwater vaults, manufactured best management practices (BMP), green roofs, bioswales, permeable pavement, and cisterns. Green infrastructure reduces stormwater runoff and captures pollutants of concern (sediment, nutrients, bacteria), thereby reducing loading of these pollutants to the MS4 and surface waters. Similarly to SWMF, stream resiliency and pond retrofit [projects](#) have the potential to reduce downstream bacteria loads as a result of the significant sediment reductions that occur with these projects. The [Ballston Pond retrofit project](#) will manage runoff from over 300 acres of urban / suburban landscape.

Arlington's Bay TMDL Action Plan documents sediment load reductions associated with existing and planned projects—which can also serve as a general proxy for associated bacteria reductions. These reductions are cross-referenced for this Action Plan. As additional projects are completed, documentation and sediment reduction computations will be provided in annual reports along with the updated 2<sup>nd</sup> permit cycle Bay TMDL Action Plan.

### ***Maintenance of Stormwater Management Facilities***

SWMF require inspection and maintenance to continue to function as designed. Public SWMFs are inspected and maintained on an annual basis and in some cases more frequently to ensure accumulated pollutants (trash, sediment) are being removed and disposed of, and to ensure vegetation is healthy.

In addition to public facilities, there are over 6,000 private SWMFs throughout the County, including bioretention facilities, micro-bioretention systems, planter boxes, dry wells, infiltration systems, detention vaults, green roofs, cisterns, manufactured systems, and permeable pavement systems.

The County requires maintenance agreements for stormwater management facilities that have been installed per regulatory requirements, including those on individual residential lots. Private facilities are required to be inspected annually and maintained as needed. Facility owners must submit an inspection form and photos to the County and provide documentation when needed maintenance is conducted. Information on how to and who can conduct inspections is provided on the County's [website](#). The link to the website and online forms are

---

<sup>2</sup> [http://www.bae.ncsu.edu/stormwater/pdfs/Part3\\_8hathaway\\_bacteria.pdf](http://www.bae.ncsu.edu/stormwater/pdfs/Part3_8hathaway_bacteria.pdf)  
[http://www.stormh2o.com/SW/Articles/Fecal\\_Indicator\\_Bacteria\\_Reduction\\_in\\_Urban\\_Runoff\\_18838.aspx](http://www.stormh2o.com/SW/Articles/Fecal_Indicator_Bacteria_Reduction_in_Urban_Runoff_18838.aspx)

provided in letters sent to property owners. Maintenance is required based on the findings of the inspections. [Maintenance guidance](#), including information fact sheets, videos, and list of maintenance contractors is provided online. Should a property owner fail to conduct an inspection or necessary maintenance, the County will do the work and charge the owner following appropriate notification.

**Selected strategy from MS4 Permit section 1.E.2.d.1 Table 4:**

- *Enhance maintenance of stormwater management facilities owned or operated by the permittee*
- *Enhance requirements for third parties to maintain stormwater management facilities*

**Stormwater Infrastructure Inspection & Maintenance Program**

As part of the County's [Stormwater Infrastructure](#) Maintenance Program, the County inspects, cleans, maintains, repairs, and upgrades stormwater infrastructure on a scheduled basis. Cleaning infrastructure removes debris and associated bacteria as well as pet and/or wildlife waste.

As required by the MS4 permit, a minimum of 500,000 linear feet of the MS4 will be inspected during the current permit cycle. 85,000 linear feet of pipe will be inspected by CCTV. Remote control carriage-mounted video cameras are inserted into a storm structure and travel through the pipe segment. The generated video is then analyzed to identify cracks, dislodged pipe joints, flow conditions, and any other system characteristics. Storm drain mains are also inspected for evidence of illicit connections to the system. Sanitary cross connections or illicit connections to the storm drain system can be significant sources of bacteria to the MS4. The County takes swift action to correct any identified illicit connections or evidence of improper disposal into the storm drain system.

A minimum of 10,000 storm structures will be inspected and cleaned during this permit term as part of the County's catch basin cleaning program. Cleaning these structures removes accumulated sediment and debris that may contain bacteria as well as actual accumulated waste from wildlife and pets.

**Selected strategies from MS4 Permit section 1.E.2.d.1 Table 4:**

- *Implement an enhanced dry weather screening and illicit discharge, detection, and elimination program beyond the requirements of Part I E 3 to identify and remove illicit connections.*
- *Clean out storm drains to remove waste from wildlife.*

**Street Sweeping**

Arlington County owns and maintains more than 65% of the roadways (~375 miles out of a total of ~571 miles) in the County. Arlington County's [street sweeping program](#) is a part of the County's commitment to protect local streams, the Potomac River, and the Chesapeake Bay. Street sweeping helps remove accumulated floatables, sediment, nutrients, waste, and other pollutants from streets and prevent these pollutants from entering the MS4, and subsequently local streams. Sediment control is particularly beneficial because of the association between bacteria and sediment. Reducing sediment loading subsequently reduces bacteria loads to surface waters. The County does not maintain private, state (VDOT), or federal owned and maintained roads.

The current permit cycle requires the County to sweep a minimum of 30,000 lane miles. The County's street sweeping program is divided into two components --residential and commercial sweeping. The residential sweeping program occurs annually between April and October. The commercial sweeping program targets high traffic / traveled roadways within the County. The County also conducts street sweeping in response to resident

reports and accidents. Information including the number of lane passes completed and amount of materials collected during sweeping is provided in the County's MS4 Annual Reports.

### ***Arlington County Trades Center SWPPP***

A Stormwater Pollution Prevention Plan (SWPPP) for the Trades Center has been developed and implemented. The Trades Center SWPPP provides information about the facility and operations that are conducted at the facility, identifies potential sources of stormwater pollutants, provides an inventory and maintenance schedule for the stormwater management facilities, and identifies standard operating procedures and controls that are implemented to minimize non-stormwater discharges and pollutant releases to the storm drain system and surface waters.

Several stormwater management facilities (SWMF) are located throughout the Trades Center to treat stormwater runoff. Examples of SWMFs on the site include StormFilters®, StormCeptors®, and Ultra Urban Filters®. Inlet protection devices and drain filter inserts are also in place in various locations throughout the facility that have been identified as having high pollutant loading potential.

Site inspections are conducted to look for potential pollutant sources such as leaking dumpsters or garbage collection vehicles which can be sources of bacteria loading.

### ***Other High Priority Municipal Facility***

In addition to the Trades Center, there are five additional HPMFs within the County.

- North Side Salt Storage Facility (Old Dominion Drive and 25<sup>th</sup> Street North)
- 26<sup>th</sup> St N Leaf / Mulch Storage and Distribution Center (4628 26th Street North)
- Department of Parks and Recreation Nursery (4220 South Four Mile Run Drive)
- ART Bus Light Maintenance Facility (2910 S Eads Street)
- ART Bus Storage Facility (N Quincy Street)

Stormwater Pollution Prevention Plans (SWPPP) have been developed for each of these County owned facilities, as required by the MS4 permit. The plans provide information on the various on-site stormwater management facilities as well as the good housekeeping and pollution prevention controls (e.g., proper waste management, covered storage) that are implemented to minimize non-stormwater discharges and pollutant releases from the facilities. These facilities are inspected as specified in the respective SWPPP.

### ***Pollution Prevention Protocols for Street and Parking Lot Maintenance***

The County continues to implement its Pollution Prevention Protocols for Street, Road, Sidewalk, and Parking Lot Maintenance. This document provides information on the practices implemented by the County to minimize pollution discharges, including sediment, which may transport bacteria from activities and operations associated with maintenance and repair of County owned roadways and parking lots.

### ***Construction Site SWPPP Inspections / Portable Lavatories***

County construction inspectors check that Pollution Prevention (P2) plans required for County land disturbance permits are being implemented. The County has developed a pollution plan template for LDA permitted construction projects, which includes information on the proper [maintenance of portable lavatories](#). The units must be properly maintained, located away from storm drains, be level, not damaged or leaking, and situated away from drive lanes or heavy traffic areas (or coned off if they are in these locations). This prevents units from leaking or being knocked over and discharges getting into the storm drain system or surface waters. Units must

be replaced if leaking or damaged. Wash water from cleaning units cannot go to the storm drain system. Inspection of these lavatories is required to be documented on self-inspection reports.

**Selected strategy from MS4 Permit section 1.E.2.d.1 Table 4:**

- *Develop BMPs for locating, transporting, and maintaining portable toilets used on permittee-owned sites. Educate third parties that use portable toilets on BMPs for use.*

***Illicit Discharge Detection and Elimination (IDDE)***

Arlington County’s IDDE program includes storm sewer inspections, pollution discharge response and follow-up, enforcement, facility inspections, outfall screening, training, and education and outreach focusing on how to report illicit discharges and ways to prevent stormwater pollution.

The County’s “[Report Stream Pollution](#)” webpage provides information on how to report illicit discharges as well as sanitary sewer overflows. The Fire Department Hazardous Materials Team is the initial responder for most illicit discharge events, including spills, dispatched through the County’s Emergency Communications Center. If the Fire Department determines the discharge consists of a hazardous substance or is intentionally discharged, additional follow-up through the Fire Marshal’s office occurs. Non-hazardous discharges are referred to the appropriate agency (e.g., sanitary sewage releases to the DES Water, Sewer, Streets Bureau; erosion/sediment control issues to DES, etc.).

Once illicit discharges are discovered, the County works quickly to identify the source and when applicable, the responsible party. Several County divisions may work together to ensure any identified discharges to the MS4 from private sanitary cross connections or damaged or overflowing private laterals are addressed as soon as possible.

***High Risk / Commercial Facility Inspections***

County staff conduct annual inspections of commercial facilities that have been identified to be potential sources of significant pollutant loading. Inspections involve a detailed visual assessment of the property. Screening observations / parameters include cleanliness of site (general housekeeping conditions); outdoor storage / exposed materials; waste management areas (including grease storage), and any evidence of unauthorized non-stormwater discharges such as wash water discharges. Points of connection to the County’s MS4 are screened for any evidence of dry weather flow and/or illicit non-stormwater discharges. Dry weather flow is evaluated for presence of ammonia, which may indicate a sewage or wash water input.

Dumpster leachate or dumpsters without drain plugs can be a source of bacteria. When issues are found, business owners or property managers are notified and informed of any corrective actions or improved housekeeping efforts that need to be taken. Good housekeeping around dumpsters and used grease storage containers is important to prevent attraction and concentration of urban wildlife including rats, mice, raccoons, birds, and feral cats.

The County has developed [educational materials](#) targeting maintaining outdoor areas, waste receptacles, and managing wash water, including the [Back-of-House Maintenance for Restaurants](#) information sheets and [posters](#). This information is provided to managers or owners following inspections as needed. Additional information can be found in the Public Education and Outreach section of this plan.

**Selected strategy from MS4 Permit section 1.E.2.d.1 Table 4:**

- *Inspect commercial trash areas, grease traps, washdown practices, and enforce corresponding ordinances or policies.*

### ***Coordination with Other County Agencies***

Staff with the Department of Environmental Services, Office of Sustainability and Environmental Management coordinate with other County agencies on matters that involve stormwater pollution prevention, with associated benefits for reducing bacteria loading to the MS4.

#### ***Arlington County Public Health Department – Rodent Control Program***

The County’s Health Department currently has a rodent (rat and mouse) control program that focuses on [prevention efforts](#) to reduce concentrations of rodents at residences and businesses. The current program provides community education on methods that can be used to prevent attraction and reduce harborage as well as consultation and guidance on eliminating rats on private properties. Good housekeeping for outdoor areas and proper trash handling, storage and management are emphasized.

#### ***Private Septic System Tracking and Maintenance***

The Arlington County Health Department partners with the Fairfax County Health Department to track septic systems in the County and ensure proper inspection and maintenance are being conducted. System owners are required to pump out their septic system every five (5) years by a licensed contractor and provide the County with the work manifest. This is a requirement of the County’s [Chesapeake Bay Ordinance](#). Owners of these systems are encouraged to review the EPA’s “[A Homeowner’s Guide to Septic Systems](#)”.

**Selected strategy from MS4 Permit section 1.E.2.d.1 Table 4:**

- Educate the public on how to determine whether their septic system is failing.
- Implement septic tank inspection and maintenance program.

### **Public Education and Outreach**

Arlington has developed a targeted outreach and education program focused on [pet waste pick up](#) and proper disposal. Past studies have shown that a significant source of bacteria loading is the result of not picking up and/or improperly disposing of pet waste. Outreach is conducted through a variety of communication avenues and media. The main message is to help people understand the connection between pet waste and its potential impact on people, dogs, and stream health. The County is also working with volunteer groups such as the Arlington Regional Master Naturalists and non-profit organizations such as EcoAction Arlington to help develop and disseminate public outreach materials and applicable messaging. Many of the efforts and programs described in this section are being implemented in addition to the public education/participation elements identified in the County’s MS4 Program Plan.

#### ***Arlington County Website***

The County’s website has information on picking up and proper disposal of [pet waste](#) as well as other ways to reduce pollution.

#### ***Social Media and Newsletters***

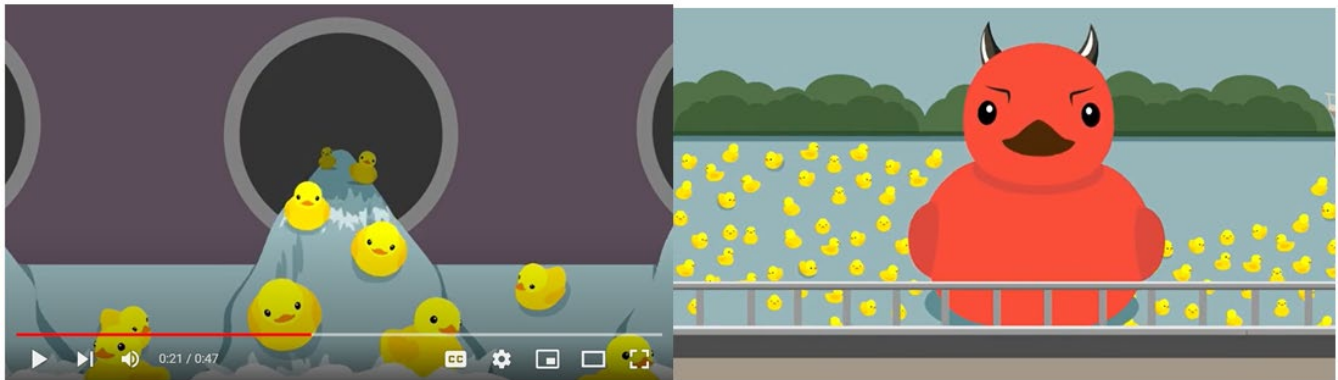
Posts with information on picking up pet waste are posted on the County’s [social media](#) platforms. Information on proper disposal of pet waste is included in newsletters ([Inside Arlington](#)) and County email distributions such as the DES Green Events bulletin email.

#### ***Northern Virginia Clean Water Partners***

The County continues to partner with Northern Virginia Clean Water Partners—a regional collaboration effort. The group’s website, <http://www.onlyrain.org/>, has a [page](#) targeted to dog owners that focuses on responsible



dog ownership and pick up and disposal of pet waste. In partnership with the group, public service announcement (PSA) on picking up and properly disposing of pet waste are aired on cable television. Links to the PSAs are posted on the County’s social media pages. [<https://youtu.be/Q7XyazeUvcA>].



**Storm Drain Marking**

The County will continue to implement its [storm drain marking](#) program. This program involves volunteers and County staff affixing No Dumping – Drains to Local Stream decals on storm drains throughout the County, including those located at high priority municipal facilities.



**Signs**

Signs with a variety of messages about why pet waste should be properly disposed of have been created and installed at County Dog Parks. There are multiple signs with unique messages and photos. The signs are rotated to help keep the messaging fresh. and increase the likelihood that individuals will read the signs and remember the messages. Recent additions have emphasized pet waste pickup in natural areas, modeling the desired behavior, and short, memorable messages.



Signs have also been placed on County street sweepers and inside ART Buses (Arlington’s bus system) that have messages targeted at pet owners about keeping pollution out of streams.



County Street Sweeper with Outreach Messaging



Sign on ART BUS

### **Public Events / Distribution of Only Rain Pet Waste Pick-up Bag Dispensers**

Arlington County staff disseminate information on proper pet waste disposal at public events. Pet waste pick up bag dispensers are distributed at community events such as the County Fair and Paws on the Pike. Bag dispensers have the “Only Rain Down the Drain” message on them reinforcing the visual on the storm drain markers that appear across the Northern Virginia region. During distribution, staff talk about the relationship between picking up pet waste and stream health. Bag dispensers have also been distributed to the Animal Welfare League of Arlington. Dog toys with the Only Rain Down the Drain messaging have also been distributed at public events and have been provided to Animal Control officers to distribute when they observe good behaviors being carried out by pet owners.

County staff have also developed and implemented an informal survey focusing on effectiveness of pet waste pick-up messaging. The informal survey functions to collect public feedback, learn which messages resonate most, and to provide education and facilitate conversation while individuals are completing the survey. Pet owners overwhelmingly report always picking up dog waste in neighborhoods and in grassed park areas, but in recent surveys they reported being less likely to pick it up in wooded or natural areas.

### **Pet Waste Postcards**

Pet waste postcards are provided to Arlington County Nature Centers and Park Rangers to distribute to park visitors. Postcards have been provided to property managers, organizations, businesses, and companies that provide pet services. Postcards are provided to the Animal Welfare League of Arlington for adoption kits and low-cost rabies clinics. County staff also distribute postcards at events.



Clean feet. Clean paws.  
Please pick up after your dog.



**BAG IT +  
TRASH IT!**



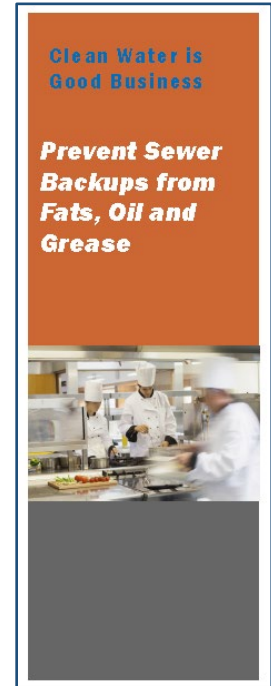
### ***Fats, Oils, Grease Outreach and Education***

The County has developed education and outreach materials focused on [fats, oil, and grease](#) (FOG) to explain the connection between improperly managed FOG and sanitary blockages and overflows, which can be a significant source of bacteria loading to the MS4 and surface waters. Information is provided on the County's website, with a link to the Washington Metropolitan Council of Government's "[Protect Your Pipes](#)" outreach campaign. Targeted information for restaurants and businesses is also included on the [website](#).

Posts with information on managing FOG are also provided on social media platforms.



The County continues to distribute its brochure, “Proper Maintenance of Cooking Oil Recycling Containers” to establishments that recycle cooking oil and grease. These recycling containers are typically stored outside. The objective is to keep containers and the areas around them clean and free of grease to prevent discharges of grease via stormwater runoff to the storm drain system. Additionally, keeping these areas clean will prevent attraction and concentrations of rodents. Waste from these animals can be a source of *E. coli* bacteria.

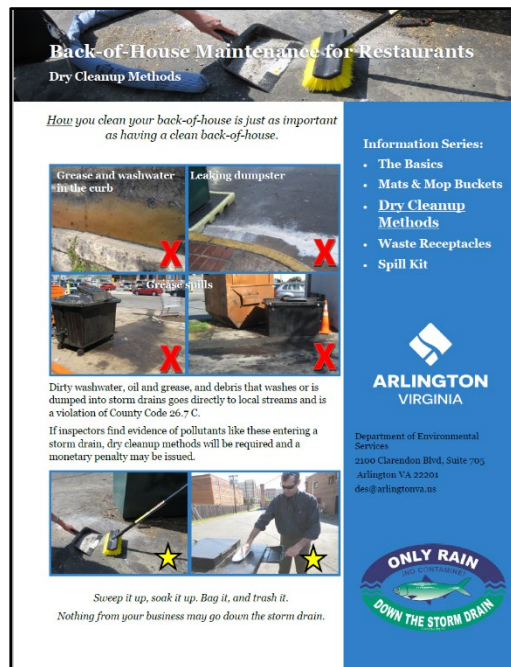
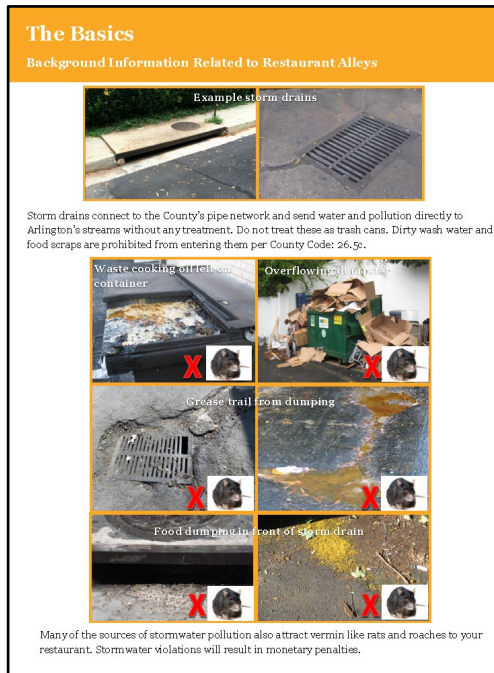


The County has recently updated its [Fats, Oils, and Grease \(FOG\) Discharge Policy](#) and Industrial [Pretreatment Program](#) to better manage / control the types of discharges and inputs to the sanitary sewer system. This will help prevent damage to collection infrastructure and/or the plant, and subsequent impacts to level of treatment or SSOs that could occur as a result. The policy provides information on FOG best management practices.

All food serving establishments are expected to conduct and document FOG BMP training for their employees within the first week of employment. In addition to facility-specific education tools that a FSE may use, the County subscribes to - and makes available to - FSEs upon request, an online FOG BMP training tool known as “FOGQUEST.” Additionally, FOG BMP links are provided on the County’s public website for use in training FSE personnel.

## Back-of-House Maintenance for Restaurants

The County has developed a series of information sheets focused on proper maintenance and cleaning of areas behind [restaurants](#) and other establishments. Topics discussed include washing mats and buckets, dry cleanup methods, maintaining waste receptacles, and clean-up / skill kits. The packets are distributed during inspections, complaint follow-up investigations, and meetings with businesses.



## Bacteria Monitoring Program

The County continues to implement its [bacteriological monitoring program](#). Volunteers collect bacteria monthly at 21 sites throughout the County. Volunteer monitors are trained to report evidence of illicit discharges they may see while monitoring. They also notify staff about high levels of *E.coli* bacteria. Staff conduct follow-up site investigations in response to repeated samples with high *E.coli* bacteria counts.

## Employee Training

Stormwater pollution prevention training program is conducted on an annual basis targeted to employees that are employed at the Trades Center and conduct field operations. The training includes information on how to recognize illicit discharges, and how to report these incidents.

Additional training on stormwater pollution prevention for construction and land disturbing activities is also conducted. This training for inspectors focuses on reducing pollutant loading from various activities and provides information on recognizing and reporting illicit discharges or poor housekeeping.

# Portable Lavatories

Portable lavatories are level, in good condition, not leaking, and situated away from storm drains?  
 Yes  
 No  
 NA

- Should be level
- Placed far away from storm drain as possible or downhill from drain
- Not situated in high traffic areas
- Check for leaks



Example of slide from training presentation

## Schedule of Implementation of Anticipated Actions for 2021-2026

Management Strategies & Practices	Actions	Implementation Schedule
Dog Parks (Management and Outreach)	-Continue to provide pick up bag dispensers and waste receptacles. -Continue outreach efforts, rotate signs, work with sponsor groups.	On-going
Reducing Sanitary Sewer Exfiltration to the MS4 and Surface Waters	-Continue sanitary maintenance program including relining. -Inspect a minimum of 400,000 linear feet of sanitary mains by end of permit term	On-going By June 2026
Stormwater Infrastructure Inspection, Maintenance, and Cross-Connection Removal	-Continue stormwater infrastructure inspection and maintenance program -Inspect 500,000 linear feet by end of permit term	On-going By June 2026
Street Sweeping	-Continue street sweeping program -Sweep 30,000 lane miles by end of permit term	On-going By June 2026
Illicit Discharge Detection and Elimination Program	Investigate pollution reports and unauthorized discharges. Cease discharges as soon as possible Continue to educate public about how to report and prevention pollution	On-going
Commercial Facility Inspections	Conduct annual inspections and complaint driven investigations. Address any observed issues.	On-going
Health Department Programs: <ul style="list-style-type: none"> <li>• Rodent Control Program</li> <li>• Septic Systems</li> <li>• Restaurant Inspections</li> </ul>	-Continue vector control outreach and response -Monitor compliance with pump out requirements -Continue inspections of food serving establishments	On-going
Stormwater Management Facilities	-Continue to require SWMFs for non-exempted LDA >=2500 sf -Continue to ensure both public and private SWMFs are inspected and maintained	On-going
Stormwater Retrofit and Resiliency Projects	-Continue to implement various retrofit and resiliency projects to reduce pollutant loading -Continue to inspect and maintain projects	On-going
High Priority Municipal Facility Stormwater Pollution Prevention Plan Implementation	Implement SWPPPs for facilities: ensure good housekeeping practices are being taken, facility inspections, SWMF inspections and maintenance, employee training	On-going
Pollution Prevention Protocols for Street and Parking Lot Maintenance	Protocols updated for permit cycle 2021-2026, information incorporated into employee training	On-going
Construction Site ESC/SWPPP Inspections	Check and monitor compliance with SWPPP requirements, inspect sites, check portable lavatories	On-going
<b>Education and Outreach Efforts</b>	Comprehensive program described in MS4 Program Plan and annual reports	On-going
County Website	Continue to keep applicable websites updated	On-going

Social Media / Newsletters / Distribution Groups	Continue to disseminate information through social media platforms, e-newsletters, distribution list servs.	On-going
Partnerships / Regional Campaigns	-Continue to partner with Clean Water Partners and WMCOG on educational programs / PSAs -Continue to work with Arlington Regional Master Naturalists and Master Gardeners	On-going
Storm Drain Marking	Continue storm drain marking program	On-going
Signs and Postcards	-Install pet waste pick up signs at Dog Parks and other County Properties -Signs on street sweepers -Signs in ART Buses -Distribute postcards to nature centers, Animal Welfare League of Arlington, and other targeted outreach	On-going
Volunteer Bacteria Monitoring Program	Continue program – volunteer training, data QA/QC, trend analyses, follow-up on high bacteria counts	On-going
Public Events	Continue to participate in organized events (County Fair, Dog Theme Events)	On-going
Fats, Oils, Grease (FOG) Program and Education	-Continue permit inspection program -Include information on website -Continue outreach initiatives	On-going
Back-of-House Maintenance for Restaurants – Information Series	Continue to distribute materials and meet with owners/managers	On-going



## **Methods for Assessment of Effectiveness**

Assessing the effectiveness of reducing *E. coli* bacteria loading is complicated due to several factors, including but not limited to, seasonal variability, dry versus wet weather, inability to control wildlife populations, and inability to control human behavior (third parties). Additionally, groundwater levels play a role in bacteria levels. Moisture in storm pipes can produce suitable habitat for bacteria to survive.

Research shows that there is strong evidence that bacteria can survive or even multiply in sediment deposits. This indicates that stormwater infrastructure, gutters, drainage ditches, moist soils, leaf piles and other places sediment accumulates can be sources of bacteria. Increased in-stream *E. coli* concentrations are also associated with re-suspension of bacteria living on stream bottom sediment during storm events. *E. coli* bacteria can also disappear out of the water column and settle to the stream bottom where they can persist for weeks or even months, and then be re-suspended during storm events. As a result, higher concentrations of bacteria are commonly found when in-stream sampling and outfall screening is conducted during wet weather.

## ***Analysis of Volunteer In-Stream E. coli Monitoring Program Data***

There are twenty-one (21) *E. coli* bacteria volunteer monitoring locations throughout the County. Site information is provided in the table below.

<b>Site</b>	<b>General Location</b>	<b>Watershed Name and Location Details</b>
FMR1	Benjamin Banneker Park, below Van Buren Street	Upper Four Mile Run
FMR2	East Falls Church Park (N. Roosevelt Street)	Upper Four Mile Run
FMR3	Bluemont Park	Upper Four Mile Run - Below conf of small trib. from I-66
FMR4	Glencarlyn Park, near N. Carlin Springs Road	Upper Four Mile Run - Above conf. of Lubber Run Tributary
FMR5	Glencarlyn Park	Upper Four Mile Run - Below conf. of Lubber Run Tributary
FMR6	Glencarlyn Park	Lower Four Mile Run - Below conf. of Upper Long Branch
FMR7	Glencarlyn Park	Lower Four Mile Run - Below conf. w/small trib. at 7 <sup>th</sup> Street
FMR8	Barcroft Park	Lower Four Mile Run - Below conf. w/ Doctor's Branch
FMR9	Shirlington Dog Park	Lower Four Mile Run - Below Walter Reed Drive and upstream of the pedestrian bridge
FMR10	Mt. Vernon Ave Bridge	Lower Four Mile Run
LBR 1	Woodlawn Park	Four Mile Run Tributary - Eastern drainage, collected from the culvert on the right
LBR 2	Woodlawn Park	Four Mile Run Tributary - Western drainage, collected from the culvert on the left
LBR 3	Lubber Run Park	Four Mile Run Tributary - Upstream of the concrete pedestrian bridge upstream of the amphitheater
ULB1	Glencarlyn Park	Four Mile Run Tributary - Upper Long Branch above dog park
DB1	Alcova Heights Park	Four Mile Run Tributary - Downstream of the sewer crossing next to the playground

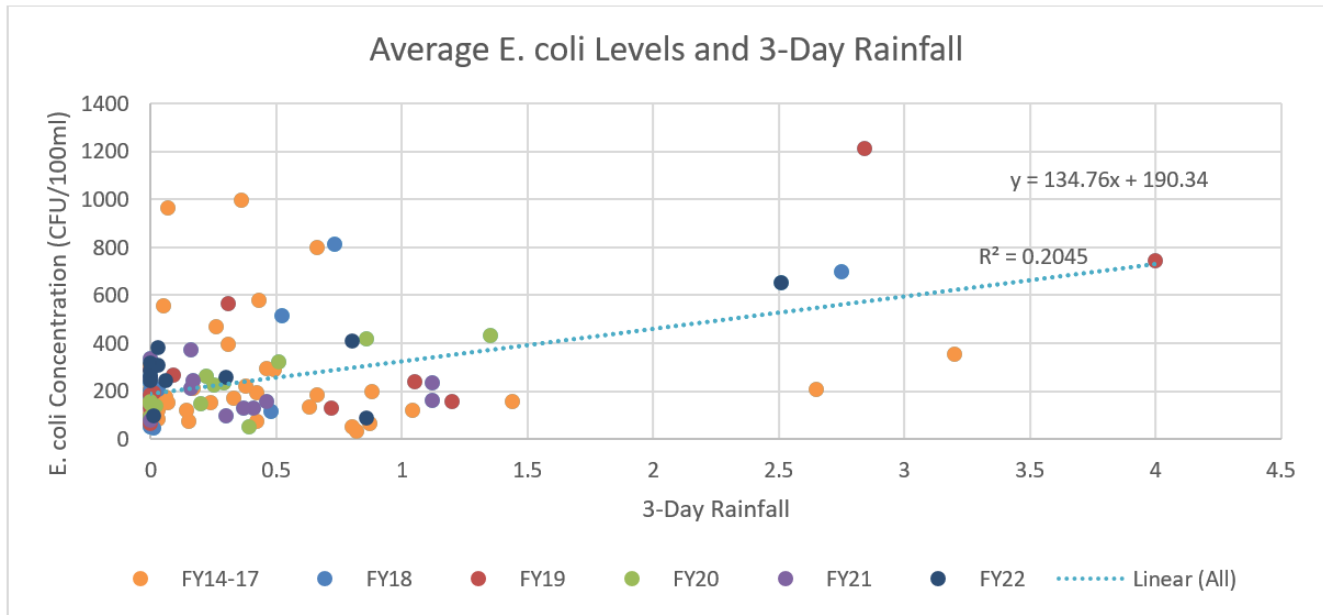
LLB1	Troy Park	Four Mile Run Tributary - Lower Long Branch
DR1	Zachary Taylor Park	Potomac Drainages - Above Military Rd, upstream of the confluence with Tributary B
DR2	Zachary Taylor Park	Potomac Drainages - Below Military Rd. by the wooden staircase
WR1	Windy Run Park	Potomac Drainages - Windy Run watershed, at the trail crossing with Windy Run
GB 1	Gulf Branch Park	Potomac Drainages - Gulf Branch watershed, below Military Rd.
LP1	Upper Pimmit Run Park	Potomac Drainages - Little Pimmit Run watershed, upstream of N. Dumbarton St.

Volunteers collect one sample per month. Volunteers use the Coliscan EasyGel method to analyze in-stream *E. coli* concentrations. The County’s current protocol for *E. coli* bacteria monitoring using the Coliscan EasyGel method was documented in a VA DEQ-approved Quality Assurance Project Plan (QAPP) in 2014.

The County uses this information to identify potential hot spots and areas where additional monitoring and source tracking may be needed. For example, high bacteria concentrations of in-stream *E. coli* bacteria may indicate a source immediately upstream. Various follow-up methods can be employed to help isolate and / or locate a potential source.

The County will continue to analyze the *E. coli* monitoring data to look for trends of overall reductions of bacteria levels. However, the data will fluctuate based on weather conditions, temperature, and precipitation prior to and during monitoring events. Past data analysis supports a correlation between rainfall within three days of sampling and bacteria concentrations – concentrations are higher when a rainfall event has occurred within three days of monitoring. This correlation is not surprising because of the sediment, nutrients, and bacteria delivered by stormwater runoff to local streams. And as discussed previously, elevated bacteria concentrations could also indicate a re-suspension of bacteria from the benthic sediments. Winter weather months (December – April) tend to have low *E. coli* averages. Cold winter temperatures and the decreased park and trail usage near streams during this period appear to be the primary reasons for the lower counts. Detailed monitoring information and data analysis can be found in MS4 Annual Reports.

A specific trend the County will continue to evaluate is bacteria concentrations during dry weather periods. A downward trend could indicate effectiveness of efforts conducted by the County to reduce *E. coli* bacteria loading from anthropogenic sources. However, bacteria regrowth is a key confounding variable in this analysis.



**Analysis of DEQ’s Long Term Trend Monitoring Station Data**

The County will evaluate bacteria data and concentration trend analysis for the Four Mile Run long term trend station 1AFOU001.92. Data from 2002-2023 was assessed. The testing method DEQ used for *E. coli* changed in 2014. The data did not show a clear trend that could be used to assess effectiveness of bacteria mitigation from controllable, anthropogenic sources.

Finally, implementation of the programs and practices summarized in the previous section will be assessed and documented —with particular emphasis on the quantitative sediment reductions associated with implementation of the Chesapeake Bay TMDL. As noted above, documentation and sediment reduction computations will be provided in annual reports along with the updated 2<sup>nd</sup> permit cycle Chesapeake Bay TMDL Action Plan.

**Summary**

The goal of this action plan is to reduce bacteria loadings from controllable, anthropogenic sources to the maximum extent practicable as part of a long-term comprehensive multi-pollutant watershed management program.

As discussed in this Action Plan, the County will continue to implement a suite of programs and practices to reduce bacteria loading to the MS4—and is exceeding permit requirements as the County’s program is not limited solely to the Four Mile Run watershed and the small section of Pimmit Run watershed, where the stream segments listed for bacteria impairment are located. The County will continue to focus on its enhanced outreach program to increase public awareness on methods to reduce bacteria loading.

There are multiple reasons why reducing bacteria loading from urban lands and in-stream bacteria concentrations is extremely challenging, including:

- The pre-dominance of uncontrollable wildlife sources
- The variability of *E. coli* bacteria levels in streams
- Bacteria re-growth and re-suspension
- The inability to completely control human behavior

- A growing population with high residential and workforce turnover

It is important to emphasize that, even for relatively controllable anthropogenic sources, it is not possible for a government to eliminate certain human behaviors. As a common example, despite the County's enhanced education and outreach campaign focused on pet waste pick up and proper disposal, some pet owners do not pick up after their pets. Enforcement tools can only be used when this activity is witnessed firsthand by County officials on public property. Even when public education or corrective action is successful, Arlington's population growth and flux mean that the County must continue its efforts to maintain its current status.

Because of these factors, in the best professional judgment of County staff, the combination of programs and best practices outlined in this Plan will provide adequate process toward the shared goal of reducing bacteria loading to surface waters while acknowledging that the specific WLA for the *E. coli* bacteria TMDL assigned in the County's MS4 permit will not be achieved.

Given that this is a multi-permit cycle effort, as progress continues to be made and new water quality information becomes available, it may be possible in the future to estimate a date for WLA achievement. The County anticipates extending most of the programs and practices set forth in this Action Plan into future permit cycles with adjustments being made based on new information, priorities, and experience.

Progress and implementation of practices described in this Action Plan will be documented in the County's MS4 Permit Annual Reports.

**Appendix A – Summary of Public Comments**

In accordance with part 1.E.2.f, the public was provided the opportunity to comment on the initial draft plan for a minimum of fifteen days to meet the local TMDL action plan requirements. The draft action plan was available on the County’s website (“Bacteria & PCB TMDL Actions Plans”) starting in late October 2022. Online public comment forms were made available from November 1 through November 15, 2022. Various media / outreach mechanisms were used to notify the public. The following table provides the public comments received and the County’s response to each comment.

Commenter	Comment	County Response
Joslin D Gallatin	Should Arlington test for other contaminants? More signs about trash and pet waste.	<p>The County currently conducts biological monitoring, dry weather screening, and wet weather screening for various water quality parameters including nutrients, metals, hydrocarbons, sediment, and trash. A summary of monitoring results can be found in the County’s Municipal Separate Storm Sewer System (MS4) Permit Annual Report.</p> <p>The County continues to implement its education and outreach program, which includes placing signs in various locations as well as disseminating information via social media, newsletters, its website, and public events, presentations, and meetings.</p>
Dick McNamara	The plan seems appropriate to solve today's problem. The Missing Middle Housing plans and Plan Langston Blvd will make this much worse to address in the future. 8400 units in PLB will probably have that many dogs for the single no kids occupants. Further MMH will more than triple the density of SFH homes in Arlington with equal added dogs. All water that feeds the Potomac River will be impacted, new sewers all around. Impacts are dramatic and for the worse. Every water shed and tributary will be more polluted and require more remediation that these plans do not currently address.	<p>The County anticipates continuing the programs and practices outlined in this Plan. This TMDL Action Plan is meant to be a living document that will be reviewed and revised over time to address changes in Arlington’s natural and built environment and comply with any regulatory changes. Adjustments may be made based on or in response to new water quality information, development changes, and/or experience gained during implementation. New or improved technology and/or alternative management practices will be assessed and implemented when found to be feasible. Further, the County will continue its adaptive and comprehensive pollution prevention programs that aim to reduce discharges of pollutants of concern from multiple sources, including development activity, to local water resources. For more information, please visit: <a href="https://www.arlingtonva.us/stormwater">Stormwater Management – Official Website of Arlington County Virginia Government (arlingtonva.us)</a></p>

Dorothy L. Dake	County needs to continue its education programs and treatment (based on best practices and evolving improvements) as outlined in the Plan. The Plan outlines the challenges; however, efforts must be maintained and enhanced where possible to control the spread of E. coli bacteria.	The County plans on continuing its education and outreach programs as well as continuing implementation of pollution prevention practices and stormwater management projects aimed at reducing pollution and protecting local water resources.
-----------------	---	--