CITY OF FALLS CHURCH, VIRGINIA

UPDATED BACTERIA TOTAL MAXIMUM DAILY LOAD (TMDL) ACTION PLAN

In compliance with General Permit for Discharges of Stormwater from Small Municipal Storm Sewer Systems
Registration Number VAR040065

City of Falls Church
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Updated: 05/02/2019

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Attachments

Attachment 1. City of Falls Church, VA Bacteria TMDL Action Plan, June 21, 2016
Attachment 2. City of Falls Church Sanitary Sewer Rehabilitation Progress

Acronyms

BMP	Best Management Practices
CIP	Capital Improvement Project
CFU	Colony-Forming Unit
DEQ	Virginia Department of Environmental Quality
DPW	City of Falls Church Department of Public Works
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
IDDE	Illicit Discharge Detection and Elimination
MS4	Municipal Separate Storm Sewer System
PEOP	City of Falls Church Public Education and Outreach Program
TMDL	Total Maximum Daily Load
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program

Updated Bacteria TMDL Action Plan Certification

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

Name _____ Signature _____

Title _____ Date _____

1.0 Introduction

As an operator of an MS4 regulated under the General VPDES Permit for Stormwater Discharges from Small MS4s (MS4 General Permit), the City of Falls Church (Registration Number VAR040065) developed a Bacteria TMDL Action Plan to address the following TMDLs:

- Fecal Coliform TMDL (Total Maximum Daily Load) Development for Four Mile Run, Virginia, which was approved by EPA on May 31, 2002.
- Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds, which was approved by EPA on November 10, 2010.

The Bacteria TMDL Action Plan, which included a schedule for implementation through June 30, 2018, was submitted to DEQ on June 26, 2016 (Attachment 1).

On November 1, 2018, DEQ re-authorized coverage of City MS4 discharges under the reissued MS4 General Permit. The reissued MS4 General Permit requires that the City update its Bacteria TMDL Action Plan to meet the amended MS4 General Permit conditions within 18-months of the renewed permit's effective date (by May 1, 2020) and develop an implementation schedule through October 30, 2023.

The reissued MS4 General Permit also requires that the City develop and implement TMDL Action Plans for TMDLs approved by EPA between July 1, 2013 and June 30, 2018 in which the City was allocated a wasteload or a portion of a wasteload. The following TMDL was approved within this timeframe:

- Bacteria TMDL Development for Tributaries to the Potomac River: Sugarland Run, Mine Run, and Pimmit Run (Pimmit Run TMDL), which was approved by EPA on September 26, 2013.

The City's MS4 is not allocated a wasteload in the Pimmit Run TMDL approved by EPA. However, the Pimmit Run TMDL was developed prior to a 2013 voluntary boundary adjustment agreement between the City and Fairfax County that authorized the City's annexation of approximately 36-acres of land previously accounted for as part of Fairfax County's wasteload allocation calculations. The City has chosen to voluntarily incorporate the Pimmit Run TMDL into its updated Bacteria TMDL Action Plan to ensure consistent program implementation throughout the City. Portions of the TMDL watersheds located in the City are identified in Figure 1. Table 1 contains the following information for the three (3) approved TMDLs addressed in this updated Bacteria TMDL Action Plan:

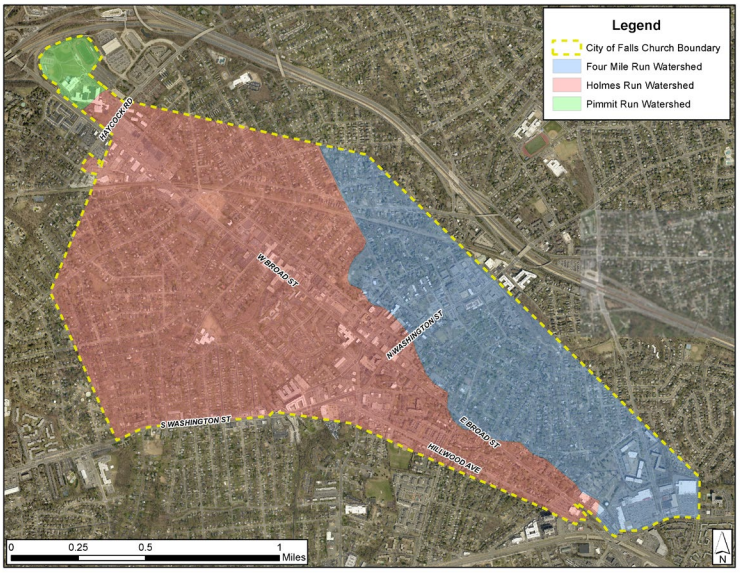

Figure 1. City of Falls Church TMDL Action Plan Watersheds.

- The TMDL project name;
- The EPA approval date of the TMDL;
- The wasteload allocated to the City of Falls Church; and
- The corresponding percent reduction.

Table 1. City of Falls Church TMDLs Addressed in the Updated Bacteria TMDL Action Plan

TMDL Project Name		Fecal Coliform TMDL Development for Four Mile Run, Virginia	Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds			Bacteria TMDL Development for Tributaries to the Potomac River: Sugarland Run, Mine Run, and Pimmit Run
EPA Approval Date		5/31/2002	11/10/2010			9/26/2013
Pollutant of Concern		Fecal Coliform	E. Coli			E. Coli
Waterbody Name		Four Mile Run	Holmes Run	Cameron Run	Hunting Creek	Pimmit Run
Sources	**Human**	✓	✓	✓	✓	✓
	Pet	✓	✓	✓	✓	✓
	Wildlife	✓	✓	✓	✓	✓
Type of Wasteload Allocation	**Aggregate**	✓	✓	✓	--	--
	Individual	--	--	--	--	--
WLA	**Fecal Coliform, cfu/year**	2.04E+13	--	--	--	--
	E. coli, cfu/year	--	5.12E+12	5.12E+12	1.02E+14	--
Percent Reduction		98%	83%	83%	83%	99.42%

As part of the development of the original Bacteria TMDL Action Plan, the City identified the following significant sources of bacteria that are not covered under a separate VDPES permit:

Four Mile Run Watershed

- Donald Frady Park, 311 East Broad Street
- Holmes Run George Mason High School, 7124 Leesburg Pike
- Howard Herman Stream Valley Park, 601 W. Broad Street

2.0 2016 Bacteria TMDL Action Plan Strategy Evaluation

The MS4 General Permit provides for the phased implementation of TMDL Action Pans over multiple permit cycles using an adaptive, iterative approach. Utilization of this approach allows the City to continually evaluate its selected strategies and to supplement, eliminate or modify their implementation so as to most effectively reduce MS4 discharge bacteria loads. As part of the required Bacteria TMDL Action Plan update, the City conducted a comprehensive evaluation of both its selected individual strategies (Attachment 1 - Table 3A) and commitments (Attachment 1 - Table 3B) provided in the original June 26, 2016 submission and developed recommendations for improving implementation through October 31, 2023. Recommendations considered were as follows:

- Retain – Retain the strategy in the updated Bacteria TMDL Action Plan as proposed and continue implementation;
- Eliminate – Eliminate the strategy from continued implementation in the updated Bacteria TMDL Action Plan;
- Modify – Significantly modify how the strategy is implemented in the updated Bacteria TMDL Action Plan; or
- Reclassify – Reclassify the strategy as a co-beneficial strategy in the updated Bacteria TMDL Action Plan. Co-beneficial strategies are those efforts implemented by the City as part of its overall stormwater strategies and not specifically for the reduction of bacteria. Reclassified strategies continue to be implemented and progress will be documented in accordance with the MS4 Program Plan and not the updated Bacteria TMDL Action Plan.

Table 2 through Table 17 provide a summary of evaluation results for each strategy included in the 2016 Bacteria TMDL Action Plan.

Table 2. Evaluation Summary of Bacteria TMDL Strategy – Prohibition of Illicit Discharges

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Human & Pet
Description	Section 35-21 of the City Code prohibits illicit discharges to the MS4 and state waters. Section 4-41 of the City Code makes it unlawful not to promptly remove dog excrement from any property other than the owners.		
Evaluation	This strategy is actually two (2) separate City legal authorities that are implemented by different City departments. Section 35-21 of the City Code provides DPW the legal authority necessary to eliminate illicit discharges. Section 4-41 of the City Code provides Animal Services the legal authority to require clean-up of excrement before entry into the City's MS4 . Both legal authorities provide the City valuable powers necessary for reducing bacteria loads and should be retained in the updated TMDL Action Plan. However, the legal authorities should be separated into two (2) strategies in order to highlight the different value each legal authority provides the City.		
Recommendation(s)	Reclassify. The IDDE prohibition under Section 35-21 of the City Code should be re-classified as a co-beneficial strategy as its implementation is not solely related to controlling sources of bacteria. The IDDE program should continue to be implemented as part of BMPs 3D and 3E of the MS4 Program Plan. Retain. The legal authority to require the clean-up of pet excrement under Section 4-41 of the City Code.		

Table 3. Evaluation Summary of Bacteria TMDL Strategy – Prohibition on New Septic Systems

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Human
Description	Section 42-3 of the City Code prohibits the installation of new septic tank systems within the City.		
Evaluation	As documented in the 2016 Bacteria TMDL Action Plan, sanitary sewer connections exist for over 99% of the City jurisdiction and there are no known septic tanks currently in use. This prohibition ensures that this strategy ensures that all new development and redevelopment are tied to the sanitary sewer rather than being treated on-lot facility.		
Recommendation(s)	Retain. The City's prohibition of new septic tanks should be retained in the updated Bacteria TMDL Action Plan.		

Table 4. Evaluation Summary of Bacteria TMDL Strategy – Sanitary Sewer Inspection Program

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Human
Description	DPW oversees a comprehensive sanitary sewer inspection and rehabilitation program.		
Evaluation	This strategy is likely the most effective effort undertaken by the City to reduce bacterial levels in local waterways. To date, the City's sanitary sewer inspection and rehabilitation program has resulted in the relining of approximately 21.5 miles of the City's 48.7 miles of sanitary sewers including over 16 miles in the Holmes Run watershed and 5.3 miles in the Four Mile Run watershed. A visual representation of the rehabilitated sanitary sewer lines is provided in Attachment 2. The City anticipates future annual CIP funding for continuing this rehabilitation program.		
Recommendation(s)	Retain. The City's comprehensive sanitary sewer inspection program should be retained in the updated Bacteria TMDL Action Plan.		

Table 5. Evaluation Summary of Bacteria TMDL Strategy – Dry Weather Outfall Inspection Program

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Human & Pet
Description	DPW implements a dry weather outfall inspection program and has adopted an IDDE Manual.		
Evaluation	This strategy provides the City with the opportunity to proactively identify potential sources of bacteria and eliminate their discharge. However, this strategy is discussed and reported upon under BMP 3E of the MS4 Program Plan. As the implementation status of this strategy is already being tracked, documented and reported upon, this strategy should not be duplicated in the Bacteria TMDL Action Plan. However, if a bacteria source is identified and eliminated, the City should be sure to apply the credit toward bacteria reductions.		
Recommendation(s)	Reclassify. The dry weather outfall inspection program should be re-classified as a co-beneficial strategy as its implementation is not solely related to controlling sources of bacteria. The dry weather outfall inspection program should continue to be implemented as part of BMP 3D of the MS4 Program Plan.		

Table 6. Evaluation Summary of Bacteria TMDL Strategy – Stormwater Control & Runoff Reduction

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Pet & Wildlife
Description	Chapter 35, Article I of the City Code establishes stormwater quality and runoff reduction requirements.		
Evaluation	Similar to dry weather screening, this strategy is discussed and reported upon under BMP 5B of the MS4 Program Plan and, as such, is not being implemented solely for the reduction of bacteria although benefits may be recognized. As the implementation status of this strategy is also already being tracked, documented and reported upon, this strategy should not be duplicated in the Bacteria TMDL Action Plan.		
Recommendation(s)	Reclassify. The stormwater control & runoff reduction strategy should be re-classified as a co-beneficial strategy as its implementation is not solely related to controlling sources of bacteria. The strategy should continue to be implemented as part of BMP 5B of the MS4 Program Plan.		

Table 7. Evaluation Summary of Bacteria TMDL Strategy – Catch Basin and Sweeping Program

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Pet & Wildlife
Description	DPW implements catch basin and street sweeping programs. Street sweeping and catch basin cleaning remove potentially bacteria-laden materials from the MS4 system.		
Evaluation	The City currently provides scheduled street sweeping throughout portions of the calendar year. An effort is made to correlate the quantity of street sweepings collected to the quantity of sediment and nutrients eliminated from stormwater discharge. The City bases this correlation on guidance provided by DEQ. DEQ has not provided the City similar guidance as to how to correlate bacteria reductions. It is assumed that bacteria loadings may be reduced by the implementation of street sweeping and catch basin cleaning programs and as such the City should report the total load collected, the number of catch basins cleaned, the number of times each street is swept per year and the total lane miles swept for each watershed.		
Recommendation(s)	Reclassify. The catch basin and sweeping strategy should be classified as a co-beneficial strategy until such time as DEQ provides guidance on correlating City efforts with bacteria reductions.		

Table 8. Evaluation Summary of Bacteria TMDL Strategy – Stream Daylighting

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	All Sources
Description	The City considers the potential for stream daylighting as part of any stream restoration project to meet the Chesapeake Bay TMDL. Daylighting is a strategy of the City's Watershed Management Plan.		
Evaluation	The City continues to look for stream restoration projects, including stream daylighting, as part of the implementation of its Watershed Management Plan. As part of all City stream restoration projects, restoration of a multi-layered riparian zone is installed to provide a stream buffer and filtering actions. While the City should continue to identify and implement stream restoration projects when an opportunity presents itself and report the length of riparian buffers installed along the streambanks, it is not recommended that this strategy remains as a commitment in the updated Bacteria TMDL Action Plan.		
Recommendation(s)	Reclassify. The stream daylighting strategy should be classified as a co-beneficial strategy until such time as DEQ provides guidance on correlating City efforts with bacteria reductions. The City not only considers the potential benefits associated with stream daylighting but also riparian buffer restoration associated with stream restoration.		

Table 9. Evaluation Summary of Bacteria TMDL Strategy – Pet Waste Stations (Private Property)

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Pet
Description	The City has created an incentive for the installation of pet waste stations on private property by giving them a credit on their stormwater utility fee.		
Evaluation	The City of Falls Church Stormwater Utility Fee Credits Manual (March 19, 2014) describes the mechanism by which private property owners can receive potential credits towards their annual stormwater utility fee for the installation and maintenance of pet waste stations. This incentive program has the potential to promote the installation and management of pet waste stations on private property throughout the City and thus reducing the bacteria contribution from pet wastes. The City must improve its mechanism for tracking those engaging in this opportunity.		
Recommendation(s)	Retain. The Pet Waste Stations (Private Property) strategy should be retained and, perhaps, even promoted as a means to ensure additional action by private property owners.		

Table 10. Evaluation Summary of Bacteria TMDL Strategy – General City Education and Outreach

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Pet
Description	The City has developed outreach materials on proper pet waste disposal for distribution at City events and programs.		
Evaluation	The City updated its Public Education and Outreach Program in June 2019 to comply with the MS4 General Permit. At that time, it recognized Addressing Pet Waste as a high-priority stormwater issue and outlined how it would be addressed as part of the City's general stormwater public education and outreach program. The general stormwater public education program, including addressing pet waste, is tracked and reported under BMP 1A of the MS4 Program Plan. The City should continue to report these efforts under BMP 1A.		
Recommendation(s)	Reclassify as co-beneficial. The General City Education and Outreach strategy has been incorporated into the City's enhanced PEOP under BMP 1A of the MS4 Program Plan.		

Table 11. Evaluation Summary of Bacteria TMDL Strategy – Targeted City Education and Outreach

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Pet
Description	Dog license holders are mailed an educational insert with their dog license renewal reminder sent by the City Treasurer.		
Evaluation	This strategy is included in the City's updated PEOP. Additionally, the educational insert is now distributed by the City Treasurer to pet owners when they purchase their pet license rather than it being mailed to them at a later date.		
Recommendation(s)	Retain. The Targeted City Education and Outreach strategy has been incorporated into the City's enhanced PEOP under BMP 1A of the MS4 Program Plan.		

Table 12. Evaluation Summary of Bacteria TMDL Strategy – Regional Education and Outreach

TMDL Action Plan Reference Table	Table 3A	Intended Source Control	Pet
Description	The City participates in the regional Clean Water Partners program. This program includes a focus on the proper disposal of pet waste.		
Evaluation	The City continues to participate in the regional Clean Waters Program. The Clean Waters Program provides audio and video public service announcements and social media educational outreach for the northern Virginia region on various stormwater pollution initiatives including pet waste.		
Recommendation(s)	Reclassify as co-beneficial. The Regional Education and Outreach strategy has been incorporated into the City's enhanced PEOP under BMP 1A of the MS4 Program Plan.		

Table 13. Evaluation Summary of Bacteria TMDL Strategy – Prohibition of Illicit Discharges (Pet Excrement)

TMDL Action Plan Reference Table	Table 3B	Intended Source Control	Pet
Description	While Section 4-41 of the City Code makes it unlawful to not promptly remove dog excrement from any property other than the owner's, the City's fine is less than those in surrounding localities.		
Evaluation	The City's legal authority remains in place; however, there has been no desire to raise the penalties associated with failure to promptly remove dog excrement.		
Recommendation(s)	Eliminate. While the legal authority to regulate control of pet waste excrement remains in place, the commitment to evaluate the associated penalties should be eliminated from the updated Bacteria TMDL Action Plan.		

Table 14. Evaluation Summary of Bacteria TMDL Strategy – Identification of Additional Medium and Priority Sites

TMDL Action Plan Reference Table	Table 3B	Intended Source Control	Pet
Description	At the end of each MS4 permit cycle, the City will conduct an analysis similar to that in Table 2A to determine whether there are any additional medium risk or priority sites.		
Evaluation	A desktop evaluation was conducted for one new City facility, Mr. Brown's Park, located in the 100 block of W. Broad Street (Holmes Run watershed). This small pocket park is comprised of seating and a small stage with an artificial turf surface. It is expected to be a low source of bacteria from either dogs or geese.		
Recommendation(s)	Retain. The City should continue to evaluate City-owned properties and facilities as potentially significant sources of bacteria.		

Table 15. Evaluation Summary of Bacteria TMDL Strategy – Pet Signage at Medium and Priority Sites

TMDL Action Plan Reference Table	Table 3B	Intended Source Control	Pet
Description	The City will install signage at medium risk and priority sites for pet waste identified in Table 2A [2016 Bacteria TMDL Action Plan]. The signage will remind pet owners to clean up waste and highlight the fines for non-compliance.		
Evaluation	The strategy as described in the Bacteria TMDL Action Plan does not discuss the type of signage or its ensured maintenance. As such, the installation of non-weather protective signage such as posters installed at park signboards will not survive adverse weather conditions over multiple seasons. The City should install permanent weather-resistant signs at medium risk and significant sources to ensure long-term survivability.		
Recommendation(s)	Modify. The City should develop and implement a schedule to install signs at medium risk and identified significant sites using permanent materials (e.g., metal, plastic) and document their location using georeferencing.		

Table 16. Evaluation Summary of Bacteria TMDL Strategy – Iterative Pet Waste Reduction Steps at Priority Sites

TMDL Action Plan Reference Table	Table 3B	Intended Source Control	Pet
Description	The City will take the following iterative steps at priority sites where pet waste has been identified as a risk factor: ▪ Establish for each priority site a representative segment or area that will be used to measure progress at reducing dog waste deposits. ▪ Conduct an annual field visit of each priority site between April 1 and June 30 and document the number of deposits in the representative segment or area. ▪ Install a pet waste station at any priority site where four years of documentation after signage is installed indicates that the site continues to represent a potentially significant source of bacteria. A significant source of bacteria is defined in the MS4 permit as a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL. Develop a site-specific plan for any priority site where four years of documentation after a pet waste station is installed indicates that the site continues to represent a significant source of bacteria.		
Evaluation	As proposed, this strategy is not an effective method to reduce bacteria pollutant loads or an efficient use of City resources. The 2016 Bacteria TMDL Action Plan identified two City facilities, Donald Frady Park and Howard Herman Stream Valley Park, as a potential high-priority risk for dog wastes. The City does not have planned any activities that could change the current evaluation status of these two facilities. It is recommended that rather than continue a drawn-out intensive effort, the City install the pet waste stations at these two facilities. Long-term maintenance could be handled through private contracts or through the use of local "sponsors" in conjunction with the Pet Waste Stations – Private Property strategy.		
Recommendation(s)	Modify. The City should develop and implement a schedule to install pet waste stations at both the Donald Frady Park and Howard Herman Stream Valley Park and implement a mechanism to ensure their maintenance and upkeep.		

Table 17. Evaluation Summary of Bacteria TMDL Strategy – Canada Geese Management at Priority Sites

TMDL Action Plan Reference Table	Table 3B	Intended Source Control	Wildlife
Description	The City will develop and implement a strategy to address geese waste at priority sites. Techniques may include but are not limited to egg addling/oiling and deployment of collies or other means of making the site an undesirable location for nesting. The strategy will include an annual field visit during geese nesting season to help determine strategy effectiveness.		
Evaluation	During the initial evaluation, the George Mason High School was considered a priority for potential waterfowl bacteria contribution. The George Mason High School facility is currently undergoing a major renovation/reconstruction project. The previously identified waterfowl concern is no longer present and, as such, the current need for Canada Geese management on public facilities in the City does not exist.		
Recommendation(s)	Eliminate. Development and implementation of a Canada Geese Management at Priority Sites is not an effective strategy to reduce bacteria loads in the City. This strategy should be eliminated from implementation. The City should reconsider the value of this strategy as part of the next MS4 General Permit cycle.		

3.0 Updated Bacteria TMDL Action Plan and Schedule of Anticipated Implementation Actions[1]

Consistent with the adaptive, iterative approach for TMDL Action Plan implementation described in the MS4 General Permit, the City has updated its Bacteria TMDL Action Plan and associated implementation schedule to include the following strategies aimed at reducing the bacteria loads in stormwater runoff discharged through its MS4. These strategies are divided into two categories:

- **Bacteria TMDL Action Plan Strategies:** Specific strategies aimed at reducing bacteria pollutant loads and are specific to the updated Bacteria TMDL Action Plan.
- **Co-Beneficial Strategies:** Stormwater strategies that are implemented as part of the City's overall stormwater program and through which may also result in reducing bacteria pollutant loads. The implementation of co-beneficial strategies is documented as another part of the City's stormwater program.

3.1 Bacteria TMDL Action Plan Strategies

The City's bacteria-specific strategies include eight (8) specific strategies with a direct and measurable impact on bacteria pollutant loads. Table 18 below, summarizes these strategies and the associated "source" category as outlined in the MS4 General Permit Table 5. As the strategies in Table 5 are listed as examples, and not intended to be all-inclusive, City strategies are incorporated below by source category and are not aligned specifically with example strategies. The MS4 General Permit requires permittees to implement at least three (3) strategies – a benchmark which the City has met and surpassed. Details of each strategy can be found following the summary table, below.

Table 18. Falls Church Bacteria-Specific Strategies Summary Table

Strategy		Source Category (MS4 General Permit, Table 5)	Implementation Schedule Table
1	Prohibition of Illicit Discharges - Pet Excrement	Domestic pets (dogs and cats)	Table 19
2	Prohibition on New Septic Systems	Illicit connections or illicit discharges to the MS4	Table 20
3	Sanitary Sewer Inspection Program	Illicit connections or illicit discharges to the MS4	Table 21
4	Pet Waste Stations (Private Property)	Domestic pets (dogs and cats)	Table 22
5	Targeted City Education and Outreach	Domestic pets (dogs and cats)	Table 23
6	Identification of Additional Medium and Priority Sites	Domestic pets (dogs and cats) / wildlife	Table 24
7	Pet Signage at Medium and Priority Sites	Domestic pets (dogs and cats)	Table 25
8	Iterative Pet Waste Reduction Steps at Priority Sites (Modified)	Domestic pets (dogs and cats)	Table 26

[1] The strategies and associated schedules contained in the updated Bacteria TMDL Action Plan are subject to modification based on both the short-term and long-term impacts to City resource availability as a result of the COVID-19 pandemic.

Table 19. Implementation Schedule Through October 31, 2023 for Modified Prohibition of Illicit Discharges – Pet Excrement Strategy

Implementation Schedule	Completion Date			
	10/31/2020	10/31/2021	10/31/2022	10/31/2023
The City will maintain legal authority to enforce the required local authority to enforce clean-up of pet wastes from locations other than the pet owner's property.	✓	✓	✓	✓
The City will continue to promote awareness of the City requirement and, if necessary, use enforcement to ensure its compliance.	✓	✓	✓	✓

Table 20. Implementation Schedule Through October 31, 2023 for Prohibition on New Septic Systems

Implementation Schedule	Completion Date			
	10/31/2020	10/31/2021	10/31/2022	10/31/2023
The City will continue to prohibit the installation of septic tanks as a means of sanitary sewage treatment under Section 42-3 of the City Code.	✓	✓	✓	✓

Table 21. Implementation Schedule Through October 31, 2023 for Sanitary Sewer Inspection Program

Implementation Schedule	Completion Date			
	10/31/2020	10/31/2021	10/31/2022	10/31/2023
The City will continue to implement an aggressive sanitary sewer inspection and rehabilitation program as described in the City's Capital Improvements Program and funded in annual CIP Budgets.	✓	✓	✓	✓
The City will continue to track the sanitary sewer inspection and rehabilitation using the City GIS.	✓	✓	✓	✓
The City will provide an updated length of sanitary sewer line inspected and rehabilitated for each watershed as part of each MS4 Annual Report.	✓	✓	✓	✓

Table 22. Implementation Schedule Through October 31, 2023 for Pet Waste Stations (Private Property)

Implementation Schedule	Completion Date			
	10/31/2020	10/31/2021	10/31/2022	10/31/2023
The City will continue to provide opportunity for property owners to apply for and obtain credit for the installation and maintenance of private pet waste stations as outlined in the City of Falls Church Stormwater Utility Fee Credits Manual.	✓	✓	✓	✓
The City will provide an updated list of property owners receiving the SWU credit as part of the MS4 Annual Report.	✓	✓	✓	✓

Table 22. Implementation Schedule Through October 31, 2023 for Targeted City Education and Outreach

Implementation Schedule	Completion Date			
	10/31/2020	10/31/2021	10/31/2022	10/31/2023
The City will continue to prohibit the installation of septic tanks as a means of sanitary sewage treatment under Section 42-3 of the City Code.	✓	✓	✓	✓

Table 23. Implementation Schedule Through October 31, 2023 for Identification of Additional Medium and Priority Sites

Implementation Schedule	Completion Date			
	10/31/2020	10/31/2021	10/31/2022	10/31/2023
The City will review the original property priority classifications to identify any changes in the current classification.	--	--	✓	--
The City will conduct an initial desk-top evaluation to establish a priority classification for any new City property not previously classified.	--	--	✓	--

Table 24. Implementation Schedule Through October 31, 2023 for Pet Signage at Medium and Priority Sites

Implementation Schedule	Completion Date			
	10/31/2020	10/31/2021	10/31/2022	10/31/2023
The City will install permanent, weather-resistant signs detailing the requirement to clean-up pet wastes at the following locations:				
Donald Frady Park	--	--	✓	--
Howard Herman Stream Valley Park	--	--	✓	--
Berman Park	--	--	✓	--
Big Chimneys Park	--	--	✓	--
Cavalier Trail Park	--	--	✓	--
Cherry Hill Park	--	--	✓	--
City Hall	--	--	✓	--
City Community Center	--	--	✓	--
Crossman Park / Four Mile Run	--	--	✓	--
Falls Church Volunteer Fire Department	--	--	✓	--
Roberts Park	--	--	✓	--
West End Park	--	--	✓	--

Table 25. Implementation Schedule Through October 31, 2023 for Modified Iterative Pet Waste Reduction Steps at Priority Sites

Implementation Schedule	Completion Date			
	10/31/2020	**10/31/2021**	**10/31/2022**	**10/31/2023**
The City will install pet waste stations at the following locations:				
Donald Frady Park	--	--	✓	--
Howard Herman Stream Valley Park	--	--	✓	--
The City will maintain a GIS layer available to the public identifying the location of the pet waste stations.	--	--	✓	✓

Implementation Schedule	Completion Date			
	10/31/2020	10/31/2021	10/31/2022	10/31/2023
The City will develop maintenance procedures to ensure the pet waste stations are maintained.	--	--	✓	--
The City will enhance its PEOP to incorporate the pet waste station locations.	--	--	✓	--
The City will implement maintenance procedures to ensure the pet waste stations are maintained.	--	--	--	✓

3.2 Co-Beneficial Stormwater Management Strategies

In addition to the seven (7) bacteria-specific strategies discussed above, the City will continue to implement co-beneficial strategies as part of its overall stormwater management program. The strategies, described below, are and will continue to be implemented as part of the City's overall stormwater program and will likely result in the added, indirect, benefit of reductions in bacteria loads in stormwater runoff discharged through its MS4.

- The City will continue to identify "Addressing Pet Wastes" as one of three high priority stormwater issues and continue implementation of its enhanced education and outreach program as described in its PEOP.
- The City will continue to implement prohibit and require the elimination of illicit discharges as described in its MS4 Program Plan.
- The City will continue to implement a MS4 outfall dry weather screening program as described in its MS4 Program Plan.
- The City will continue to implement a VSMP program as described in its MS4 Program Plan.
- The City will continue to implement it's street sweeping and catch basin cleaning activities. Upon such time that DEQ provides written guidance on correlating such maintenance activities with bacteria pollutant reduction, the City will evaluate whether to realign the strategy as a bacteria-specific strategy.
- The City will continue to implement specific projects outlined in its Watershed Management Program as future resources provide.

City efforts regarding implementation of these strategies will be discussed in the MS4 Annual Report as part of the appropriate MS4 Program Plan BMP.

4.0 Enhanced Public Education and Outreach

With the June 2019 update of its PEOP, the City enhanced its public education and outreach regarding the importance of addressing pet wastes. The City's enhanced strategies re-enforce consistent messaging using traditional, social, radio and television distribution means to reach both City residents and employees, as well as, regional neighbors whose pets may contribute to the bacteria loading. This messaging is also directly aimed at City pet owners through the distribution of the pet waste postcard provided when a pet owner purchases a pet license from the City Treasurer.

The City has incorporated the importance of identifying and reporting illicit discharges, including sewage, in its employee training program. The City also calls out sanitary sewage as an additional pollutant that must be controlled as part of its employee training on minimizing stormwater pollution from land-disturbing activities.

With the commitments included in this updated Bacteria TMDL Action Plan to provide signage at City facilities, promote a mechanism for stormwater utility fee credits and providing a GIS layer identifying where public pet waste stations are located, the City continues to enhance delivery and implementation of its public education and outreach program associated with reducing bacteria contributions to stormwater from pet waste.

Attachment 1

City of Falls Church, VA Bacteria TMDL Action Plan, June 21, 2016

CITY OF FALLS CHURCH, VIRGINIA

Bacteria TMDL Action Plan

In compliance with General Permit for Discharges of Stormwater from Small Municipal Storm Sewer Systems VAR040065

DEQ Submittal – June 21, 2016

City of Falls Church
Department of Public Works
300 Park Avenue | Falls Church, Virginia 22046
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CERTIFICATION

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

Name	Title	Date
[illegible]	Civil Engineer	6/27/16

City of Falls Church, Virginia
Bacteria TMDL Action Plan

June 21, 2016

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A Bacteria Reduction Actions from Four Mile Run Implementation Plan

City of Falls Church, Virginia
Bacteria TMDL Action Plan

June 21, 2016

1. Introduction

1.1 Purpose

Contamination by fecal coliform bacteria is the most common cause of water quality violations in Virginia streams. According to the Virginia Department of Environmental Quality (DEQ) and the United States Geologic Survey "Although fecal coliform bacteria are not necessarily dangerous to humans, their presence in streams indicates that the water is contaminated with fecal waste from warm-blooded animals… For this reason, fecal coliform bacteria are known as 'indicator organisms;' their presence in recreational waters indicates an increased risk to human health."[1] In Virginia, water quality standards for bacteria were changed in 2003 from more general fecal coliform bacteria to E. coli (*Escherichia coli*). E. coli is a subset of fecal coliform bacteria and is considered a better indicator of the pathogenic potential of the contamination.

The City's Municipal Separate Storm Sewer System (MS4) permit (VAR040065) requires the development of action plans for impaired streams where a Total Maximum Daily Load (TMDL) approved by the State Water Control Board[2] assigns a Waste Load Allocation (WLA) to the City. A TMDL establishes the maximum amount of a pollutant that can enter a water body without violating water quality standards. The City is subject to two bacteria-related TMDLs:

- "Fecal Coliform TMDL (Total Maximum Daily Load) Development for Four Mile Run, Virginia" was approved by the State Water Control Board on May 31, 2002. This TMDL affects regulated areas of the City draining to Four Mile Run and is referenced as the Four Mile Run Bacteria TMDL in this plan.
- "Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds" was approved by the State Water Control Board on August 4, 2011. This TMDL affects regulated areas of the City draining to Tripps Run, which is part of the Holmes Run watershed. It is referenced as the Holmes Run Bacteria TMDL in this plan.

This Bacteria TMDL Action Plan addresses both the Four Mile Run Bacteria TMDL and the Holmes Run Bacteria TMDL.

In addition to these TMDLs, an implementation plan was developed for the Four Mile Run Bacteria TMDL entitled "Implementation Plan for the Fecal Coliform TMDL (Total Maximum Daily Load) for Four Mile Run, Virginia," which was approved by the State Water Control Board on June 17, 2004. This implementation plan represented a regional effort involving the City of Falls Church, the City of Alexandria, Fairfax County, and Arlington County. Actions identified in the implementation plan have

[1] "Identifying Sources of Fecal Coliform Bacteria in Accotink Creek," USGS and Virginia DEQ, undated.
[2] MS4 permit Section I, Part B "Special condition for approved TMDLs other than the Chesapeake Bay TMDL."

been considered in the development of this action plan to the extent that they remain relevant and are applicable to the City's regulated MS4.

1.2 Permit Compliance Crosswalk

DEQ published draft guidance in April 2015 for MS4s to use in the development of TMDL action plans. Table 1A provides an overview of the organization of this plan and how each section addresses the City's MS4 permit and the draft guidance.

Table 1A – Action Plan and Permit Compliance Crosswalk

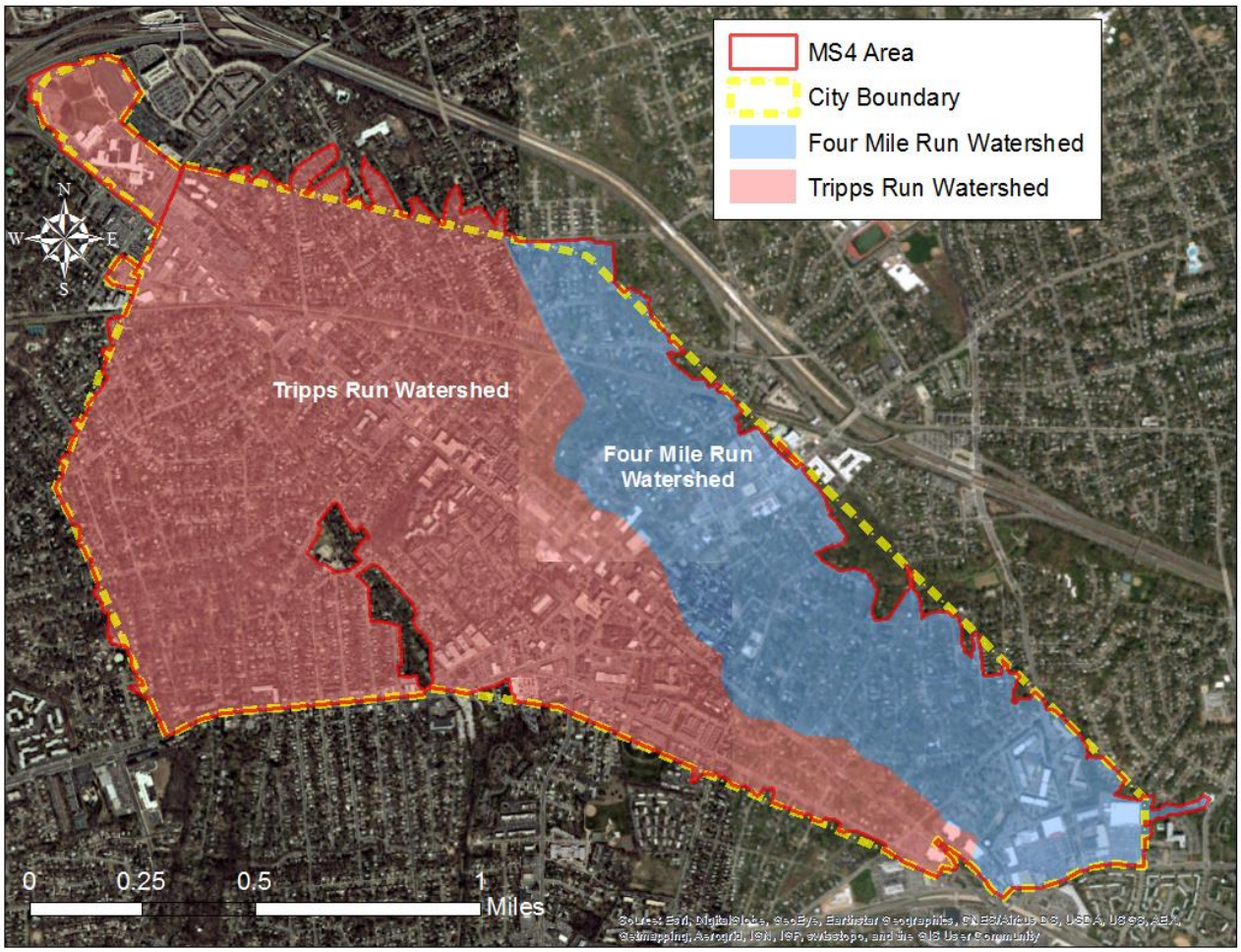
Action Plan Section	Action Plan Element	DEQ Guidance Section	MS4 Permit Section
Sec. 1	Introduction	1. The name(s) of the Final TMDL report(s).	Sec. I.B
		2. The pollutant(s) causing the impairment(s).	Sec. I.B.2.a
		3. The WLA(s) assigned to the MS4 as aggregate or individual WLAs.	Sec. I.B.2.b
Sec. 2	Evaluation of Significant Sources of Bacteria	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;	Sec. I.B.2.d
Sec. 3	Current Program and Legal Authority	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;	Sec. I.B.2.b
		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;	Sec. I.B.2.a
Sec. 4	Enhanced Education, Outreach, and 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;	Sec. I.B.2.c
Sec. 5	Schedule and Milestones	8. A schedule of interim milestones and implementation of the items in 5, 6, and 7;	Sec. I.B.2.e
Sec. 6	Assessment of Effectiveness	9. Methods to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs; and	Sec. I.B.2.e

Action Plan Section	Action Plan Element	DEQ Guidance Section	MS4 Permit Section
		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).	Sec. I.B.2.e

1.3 Areas Subject to the Bacteria TMDL Action Plan

This action plan applies to those areas that drain to the City's regulated MS4, which is defined in the MS4 permit as any area that drains to a City owned or operated storm drain outfall. Map 1A shows the City's MS4 area for the Four Mile Run and Tripps Run/Holmes Run watersheds.

Map 1A – City of Falls Church MS4 Area Showing Watersheds



1.4 Summary of Four Mile Run Bacteria TMDL and Implementation Plan

The Four Mile Run Bacteria TMDL was developed by the Northern Virginia Regional Commission (NVRC) for a fecal coliform bacteria impairment. The TMDL included a source assessment using Bacteria Source Tracking (BST), which used genetic fingerprinting to match the DNA of bacteria in different segments of Four Mile Run with their potential sources. Subject to the caveats noted in the TMDL, Table 1B shows the results of the BST study for the Upper Four Mile Run segment, in which the City is located, and for the entire Four Mile Run watershed. The BST analysis suggests that while the majority of bacteria can be traced to various wildlife (waterfowl, raccoon, and deer, in particular), there is a significant portion of bacteria caused by humans or influenced by human behavior (pet waste).

Table 1B – Results of Four Mile Run Bacteria Source Tracking

Sample Area	Waterfowl	Human	Raccoon	Canine	Other
Upper Four Mile Run	32%	8%	20%	19%	20%
All Four Mile Run	32%	18%	19%	13%	13%

The Four Mile Run Bacteria TMDL resulted in an aggregated WLA of 2.04E+13 cfu/year for the City of Falls Church, the City of Alexandria, Fairfax County, and Arlington County and a set of bacteria reduction targets determined necessary to reduce loadings sufficient for compliance with Virginia's water quality standards for bacteria. Table 1C shows the necessary reductions.

Table 1C – Bacteria Reductions from Existing Conditions Required to Meet the Four Mile Run Bacteria TMDL

Waterfowl	Raccoon	Human	Dog	Other Wildlife
95%	95%	98%	98%	95%

It is important to note that in its Decision Rationale, the U.S. EPA acknowledged the role of wildlife in the fecal coliform bacteria impairment and stated "EPA believes that a significant reduction in wildlife is not practical and will not be necessary due to the implementation plan below." The Decision Rationale then goes on to discuss a phased implementation plan "In the first phase of the implementation, the Commonwealth will begin implementing the reductions (other than wildlife) called for in the TMDL. In Phase 2, which can occur concurrently to Phase 1, the Commonwealth will consider addressing its standards to accommodate this natural loading condition."

The regional implementation plan developed for the Four Mile Run watershed reflects the phased approach cited by the U.S. EPA and focused on actions targeting bacteria from anthropogenic sources – primarily human and canine. Strategies in the plan were broken into Pollution Prevention (targeting bacteria at its source), Mitigation (removing or rendering lifeless the bacteria), and Indirect Measures (changing long-term behaviors and attitudes through outreach and education). Participating localities then identified potential actions associated with each strategy. Strategies and actions relevant to the City are presented in Appendix A and have been considered in the development of the proposed program in Section 3 and Section 4. Note that not all of the strategies and actions from the implementation plan are applicable to this action plan since the implementation plan addresses sources unrelated to the City's MS4

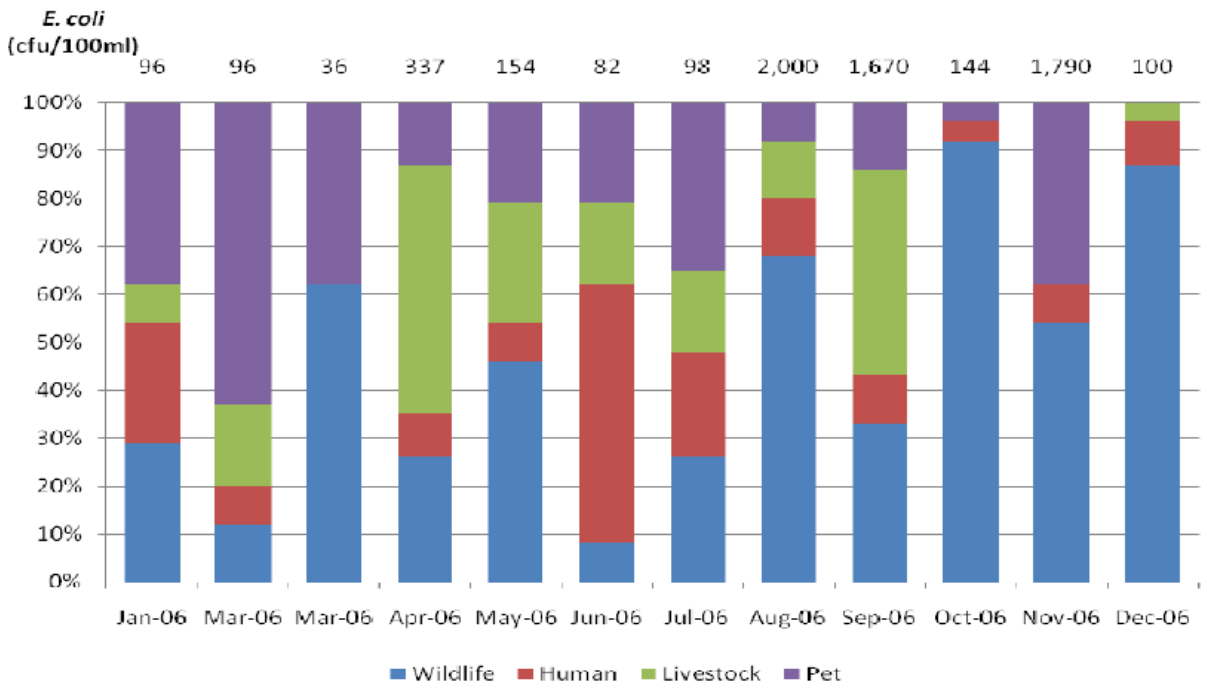
permit. Further, some strategies have been superseded or modified by the City's MS4 Program Plan and the City's Public Education and Outreach Plan.

1.5 Summary of Holmes Run Bacteria TMDL

The Holmes Run Bacteria TMDL was developed by the Interstate Commission on the Potomac River Basin (ICPRB) for a bacteria impairment. Tripps Run is the tributary of Holmes Run that drains the City. The Holmes Run watershed was first listed as impaired for fecal coliform bacteria in Virginia's 2004 305(b)/303(d) Water Quality Assessment Integrated Report and then for E. coli in Virginia's 2008 report.

Similar to Four Mile Run, the Holmes Run TMDL included a bacteria source assessment. The closest station to the City where BST was conducted (Station 1AHOR001.04 located at the confluence of Holmes Run and Pickett Street) was sampled 12 times during 2006. Table 1D shows the results of the assessment and indicates a mix of wildlife, human, livestock, and pet sources.

Table 1D – Results of Holmes Run Bacteria Source Tracking (Station 1AHOR001.04)



The Holmes Run Bacteria TMDL resulted in a WLA of 5.12E+12 cfu/year for the City of Falls Church and an overall percent reduction target of 83% for compliance with Virginia's water quality standards for E. coli. The most likely scenario for achieving required reductions (Table 5-1 of the TMDL) provides for 100% reduction in human sources, 50% reduction in wildlife direct deposition, and 83% reduction in edge of stream load (which includes pet waste).

Although a regional implementation plan was not developed for Holmes Run, the TMDL (Section 6.3.2) establishes expectations for MS4s in the development of future action plans. Specifically, the TMDL states that WLAs will be achieved through the "iterative implementation of programmatic BMPs."

1.6 Bacteria Monitoring Results and Trends

Monitoring of Four Mile Run is conducted at several locations, both by DEQ and volunteers coordinated through the Arlington County Office of Sustainability and Environmental Management. The DEQ station closest to Falls Church is Station 1AFOU002.22, which is located at the intersection of Four Mile Run and Columbia Pike in Arlington. Violations at this station were a prominent factor in the listing of Four Mile Run as an impaired water. For fecal coliform bacteria, there was a 31.8% violation rate between April 1991 and November 2006. Of note is that while the median value of samples was 300 cfu/100ml, which is below the instantaneous violation standard of 1,000 cfu/100 ml for fecal coliform, the average of the samples was 1,407 cfu/100 ml. This high average was primarily due to several extreme spikes in fecal coliform levels. As noted, Virginia's bacteria standard switched from fecal coliform to E. coli during this time period. For E. coli, there was a 22.2% violation rate between January 2006 and November 2008. Both the median (27.5 cfu/100 ml) and average (189.7 cfu/100 ml) for this period of time was below the instantaneous violation standard of 235 cfu/100 ml for E. coli. So, while violations continued to occur, the number and severity of violations was reduced. No further monitoring has taken place at this station since November 2008. Therefore, it is not possible to determine whether programs put in place through the Four Mile Run implementation plan continue to reduce the levels of violation.

Volunteer monitoring of Four Mile Run takes place at Banneker Park, which is located in Arlington near the City border. Monitoring is conducted monthly. For the period of January 2014 and July 2015, 19 samples were taken with a 26.3% violation rate.

Water quality for Holmes Run is available from three monitoring stations. The closest to the City is Station 1AHOR005.48 located at the intersection of Sleepy Hollow Road and Tripps Run. Further downstream is Station 1AHOR001.78 (Beauregard Street and Holmes Run) and Station 1AHOR001.04 (Pickett Street and Holmes Run). Violation rates ranged from 0.0% for fecal coliform bacteria between September 2001 and March 2003 to 63.3% for E. coli between January 2010 and December 2015. Of note, the highest violation rate is for the most recent samples taken at the station located at the intersection of Sleepy Hollow Road.

Table 1E summarizes monitoring results for Four Mile Run and Holmes Run at the DEQ stations. It is important to stress that these are snapshots in time and do not necessarily represent trends. Further, the results can only be used to determine the extent that the entire TMDL is being met and cannot be used to determine loadings from the City's MS4.

Table 1E – Bacteria Monitoring Results for Four Mile Run and Holmes Run

Station	Param.	Period	# Samp.	% Viol.	Viol. Limit	Median Value	Avg. Value
Four Mile Run							
1AFOU002.22	Fecal	4/91 to 11/06	44	31.8%	1,000	300	1,407
1AFOU00.2.22	E. coli	1/06 to 11/08	18	22.2%	235	27.5	189.7
Holmes Run							
1AHOR001.04	Fecal	9/01 to 3/03	8	0.0%	1,000	150	300
1AHOR001.04	E. coli	1/06 to 12/06	12	25.0%	235	63	107.3
1AHOR001.78	Fecal	4/91 to 6/01	42	14.3%	1,000	100	352.9
1AHOR005.48	E. coli	1/10 to 12/15	30	63.3%	235	289.5	510.8

2. Evaluation of Significant Sources of Bacteria

As described in the Four Mile Run and Holmes Run TMDLs, sources of bacteria are generally broken into human, pet, and wildlife. Sections 2.1 through 2.3 of this action plan provide an evaluation of significant sources of bacteria within each of these categories and how they relate to the City's MS4. Section 2.4 provides an evaluation of City-owned or operated property. A significant source is defined in the MS4 permit as a "discharge where the expected pollutant load is greater than the average pollutant loading for the land use identified in the TMDL."

2.1 Human Sources

Potential human sources of bacteria identified in the TMDLs include failing septic systems and sanitary sewer cross-connections, spills (including combined sewer overflow), or leaks. Direct deposition from the homeless population is also a possibility.

The Four Mile Run TMDL documents that 99.9% of the population of the watershed is served by sanitary sewer, and that there were less than 50 septic systems in the entire watershed (including the City of Alexandria, Arlington County, and Fairfax County) as of the date of the TMDL (2002). Likewise, the Holmes Run TMDL states that there are no known septic systems in the City of Falls Church. As a result, septic systems are not expected to be a source of bacteria in the City. New septic systems are prohibited under Section 42-3 of the City Code.

With regard to the sanitary sewer system, the City's Department of Public Works (DPW) owns and operates approximately 47 miles of sanitary sewer pipe. Since there is no combined sewer in the City, the sanitary sewer would only be a source of bacteria to the MS4 if there was an illegal cross-connection between the systems or if exfiltration from the sanitary sewer entered the storm sewer through infiltration. To address these potential sources, the City has enacted a rigorous dry weather outfall monitoring program designed to detect illicit connections. The City's program is described in its MS4 Program Plan, Minimum Control Measure (MCM) #3, BMP D. DPW also manages a comprehensive program to inspect

sanitary sewer pipe conditions through the use of a robotic video camera. Based on the results of these inspections, the City annually rehabilitates several miles of pipe using the cured-in-place pipe (CIPP) technique. This process provides new, fiberglass pipe that is resistant to corrosion. It is also seamless, which eliminates infiltration and exfiltration issues. The City projects that the entire system will be rehabilitated prior to the year 2030.

The City is not aware of a concentrated homeless population that would be a significant source of fecal matter.

Based on this analysis, the City finds that the most effective means of reducing and eliminating human sources is to continue to implement its dry weather outfall monitoring program and to continue to inspect and re-line the sanitary sewer system.

2.2 Pet Sources

Both TMDLs identified canines as the primary source of bacteria from pets. Pet waste can enter the MS4 when it is left on a surface that drains to a storm sewer. This can include an impervious surface or a grassy area with direct flow to a storm sewer inlet. Off-leash dog parks are an example of a specific land use with a potential high risk for bacteria from pets to enter into the MS4. While there are numerous dog parks in surrounding localities, there are no dog parks in the City of Falls Church.

Other areas where bacteria from pet waste could potentially be concentrated include those areas where owners are likely to walk their pets. This includes walking trails, residential sidewalks, parks, public open space, and private open space such as community association common areas.

As described in the TMDLs and the Four Mile Run implementation plan, there are a number of ways to reduce or eliminate bacteria from pets. These include ordinances requiring that owners clean up after their pets (pooper-scooper laws), installation of signage advertising fines applicable to non-compliance with local ordinances, education about the negative impacts of pet waste on water quality and public health, information about proper disposal of pet waste, and installation of pet waste stations in problem areas or areas with a high number of dog walkers to make it convenient to dispose of pet waste. The City has implemented many of these actions, which are further discussed in Section 3 and Section 4.

2.3 Wildlife Sources

Significant potential wildlife sources cited in the TMDLs include waterfowl, raccoon, and deer. Entry of fecal matter from these sources into local streams is typically by direct deposit. As stated in the TMDLs, the U.S. EPA does not expect that MS4s will actively reduce wildlife to control bacteria.

Canada geese, however, will congregate in parking lots and grassy areas where their droppings have the potential to enter into the storm sewer system. These waterfowl have become extremely well adapted to urban and suburban living. While they will primarily congregate in grassy areas near water bodies (including stormwater ponds), they can also be found in large parking lots and other open areas such as parks and athletic fields. The City does not currently have large bodies of open water. However, the City does have large open areas. Specific locations are further discussed in Section 2.4. Options for controlling Canada geese are discussed in Section 3.

2.4 Assessment of Property Owned or Operated by the City

There are no City-owned or operated properties that are expected to be a significant source of bacteria from human sources since there are no septic systems and no combined sewers or related infrastructure. However, City-owned or operated properties could become significant sources of bacteria where people frequently walk their dogs or where Canada geese congregate in large numbers.

The City conducted a desktop review of City-owned or operated properties to assess risk factors associated with bacteria. For waterfowl, risk factors included the presence of large open areas without trees and proximity to open water without tree canopy. For dogs, the risk factor included known walking areas as identified by City staff. Properties without any of these initial risk factors were designated "low risk" for the purpose of this action plan. For the remaining properties, City staff conducted a further assessment to determine whether there were visible signs of concentrated dog or waterfowl waste. Properties without visible signs of concentrated waste were designated as "medium risk." If concentrated waste was present, the property was designated as a "priority site."

Table 2A provides a summary of the assessment. Low risk properties are indicated in green, while medium risk properties are indicated in yellow. Priority sites are highlighted in orange.

Table 2A – Evaluation of Potential Bacteria Sources from City Property

Facility	Address	Evaluation Parameter				
		Waterfowl			Dogs	
		Large Open Area	**Proximity to Open Water**	**Waste Observed**	**Known Walking Area**	**Waste Observed**
Berman Park	311 Park Avenue	No	No	No	Yes	No
Big Chimneys Park	Gundry Drive and West Annandale Road	No	No	No	Yes	No
Cavalier Trail Park	South Maple and Tripps Run	No	No	No	Yes	No
Cherry Hill Park	312 Park Avenue	No	No	No	Yes	No
Cherry Street Courts	Cherry Street	Yes	No	No	No	No
City Hall	300 Park Avenue	Yes	No	No	Yes	No
City Community Center	223 Little Falls Street	Yes	No	No	Yes	No
Crossman Park/Four Mile Run	1900 Westmoreland Street	No	No	No	Yes	No
Donald Frady Park	311 East Broad Street	No	No	No	Yes	Yes
Fort Taylor Park	N. Roosevelt Street	No	No	No	No	No
George Mason HS	7124 Leesburg Pike	Yes	No	Yes	No	No

Facility	Address	Evaluation Parameter				
		Waterfowl			Dogs	
		Large Open Area	**Proximity to Open Water**	**Waste Observed**	**Known Walking Area**	**Waste Observed**
Howard Herman Stream Valley Park	601 W. Broad Street	No	Yes	No	Yes	Yes
Jessie Thackrey Preschool	201 N. Cherry Street	Yes	No	No	No	No
Falls Church Volunteer Fire Department	6950 Little Falls Road	No	No	No	Yes	No
Falls Church Property Yard	7100 Gordon Road	No	No	No	No	No
Lincoln Park	Lincoln Avenue and Great Falls Street	No	No	No	No	No
Madison Park	334 Lawton Street	Yes	No	No	No	No
Mary Ellen Henderson MS	7134 Leesburg Pike	Yes	No	No	No	No
Roberts Park	Terminus of Lynn Place	Yes	No	No	Yes	No
Thomas Jefferson ES	601 S. Oak Street	Yes	No	No	No	No
West End Park	1048 W. Broad Street	No	No	No	Yes	No

Strategies designed to address each risk category are identified and discussed in Section 3.2.

3. Legal Authority and Current and Proposed Program

This section details the legal authority adopted by the City necessary to prevent the discharge of bacteria to the MS4 and to take appropriate enforcement action if necessary. In addition, this section describes the City's current stormwater program elements applicable to bacteria and proposed enhancements to further reduce bacteria contamination.

3.1 Legal Authority

The City prohibits all illicit discharges to the MS4, including fecal matter containing bacteria, in Section 35-21 of the City Code. Subsection (a) states "Prohibited discharges. It shall be unlawful to: (1) Cause or allow illicit discharges to the stormwater management system or state waters; (2) Cause a connection to the stormwater management system that will or has the potential to allow for an illicit discharge to enter the system; or, (3) Violate any permit granted for stormwater discharges."

The City also specifically addresses the failure to remove dog excrement in Section 4-41 of the City Code. This section states "It shall be unlawful for any owner, keeper, or walker of a dog to fail to

immediately remove the dog's excrement from any property other than the dog owner's property. Any violation of this section shall, upon conviction, be punishable by a fine of not more than $50.00."

After review of the City Code, the City does not believe that additional legal authority is required for compliance with the MS4 permit "Special condition for approved TMDLs other than the Chesapeake Bay TMDL." However, the City may consider increasing the fine for a violation of Section 4-41. The fine for a similar violation in Arlington County and the City of Alexandria is $100. Violation of Fairfax County's ordinance is a Class 4 misdemeanor, which carries a fine up to $250.

3.2 Current and Proposed Program

The City has in place a rigorous program aimed at preventing the discharge of bacteria from the MS4. The program is described in the City's MS4 Program Plan as well as the MS4 Public Education and Outreach Plan, both of which have been submitted to DEQ under the MS4 permit. The MS4 Public Education and Outreach Plan identifies bacteria as a high-priority water quality issue and contains strategies to reach at least 20% of target audiences with a pollution prevention message annually. Table 3A summarizes the City's current bacteria reduction program.

Table 3A – City of Falls Church Current Bacteria Reduction Program

Program Element	Source	Description	Goal	Implementation Mechanism and Schedule
Prohibition on Illicit Discharges	Human & Pet	Section 35-21 of the City Code prohibits illicit discharges to the MS4 and state waters. Section 4-41 of the City Code makes it unlawful not to promptly remove dog excrement from any property other than the owner's.	These City Code sections provide the City with legal recourse to enforce the prohibition against illicit discharges. Potential penalties have been integrated into public education and outreach materials.	City Code. Ongoing.
Prohibition on New Septic Systems	Human	Section 42-3 of the City Code prohibits new system installation in the City.	This City Code section eliminates the potential for new septic systems to contribute to bacteria contamination. There are no known existing systems in the City.	City Code. Ongoing.
Sanitary Sewer Inspection Program	Human	DPW manages a comprehensive sanitary sewer pipe inspection and rehabilitation program.	This program is designed to reduce and eventually eliminate the potential for bacteria exfiltration from the sanitary sewer system.	City Budget – Sewer Fund. Ongoing. Approximately three miles of pipe are rehabilitated annually. Complete rehabilitation anticipated by 2030.
Dry Weather Outfall Inspection Program	Human & Pet	DPW implements a dry weather outfall inspection program and has adopted an Illicit Discharge Detection and Elimination (IDDE) Manual.	This program is designed to identify and remediate illicit discharges from the MS4. This includes potential discharges from cross-connections with	MS4 Program Plan, MCM #3, BMP D. Ongoing. A minimum of 50 outfalls are inspected annually. Inspection results are reported in the MS4 annual report to DEQ.

Program Element	Source	Description	Goal	Implementation Mechanism and Schedule
			the sanitary sewer system.	
Stormwater Control and Runoff Reduction	Pet & Wildlife	Chapter 35, Article I "Stormwater Management" of the City Code establishes stormwater quality and runoff reduction requirements.	Reducing the amount of runoff and encouraging infiltration reduces the potential for bacteria in stormwater to reach the MS4.	City Code and MS4 Program Plan, MCM #5. Ongoing. Consistency status is reported in the MS4 annual report to DEQ.
Catchbasin and Sweeping Programs	Pet & Wildlife	DPW implements catch basin and street sweeping programs.	Street sweeping and catch basin cleaning remove potentially bacteria-laden materials from the MS4 system. Decaying organic materials can provide an environment where bacteria thrive.	City Budget – Stormwater Fund and MS4 Program Plan MCM #6, BMP A. Ongoing. Material removed is reported in the MS4 annual report to DEQ.
Stream Daylighting	All Sources	The City considers the potential for stream daylighting as part of any stream restoration project to meet the Chesapeake Bay TMDL. Daylighting is a strategy of the City's Watershed Management Plan.	Daylighting previously piped streams can help to restore a more healthy microbial diversity and naturally eradicate bacteria through exposure to UV radiation from the sun.	City Budget – Stormwater Fund. Ongoing. Projects are reported in the MS4 annual report to DEQ.
Pet Waste Stations	Pet	The City has created an incentive for installation of stations on private property by giving them a credit on their stormwater utility fee.	This program is designed to increase proper pet waste disposal on private property by making it more convenient for dog walkers.	Ongoing. Tracked as part of the City's stormwater utility fee implementation.
General City Education and Outreach	Pet	The City has developed outreach materials on proper pet waste disposal for distribution at City events and programs.	Education and outreach helps to create a link between human behavior and local water quality and provides options for residents and businesses to be a good steward of the environment.	MS4 Program Plan, MCM #1, BMP E. Ongoing. Efforts are reported in the MS4 annual report to DEQ.
Targeted City Education and Outreach	Pet	Dog license holders are mailed an educational insert with their dog license renewal reminder sent by the City Treasurer.	This program is designed to ensure that education materials reach the specific intended target audience.	MS4 Program Plan, MCM #1 and MS4 Public Education and Outreach Plan. Ongoing. Approximately 33% of dog license holders are reached annually. Efforts are reported in the MS4 annual report to DEQ.

Program Element	Source	Description	Goal	Implementation Mechanism and Schedule
Regional Education and Outreach	Pet	The City participates in the regional Clean Water Partners program. This program includes a focus on proper disposal of pet waste.	This program is designed to reach a broader audience at a more frequent interval than the City could do on its own. The program includes TV, radio, and web-based advertising.	MS4 Program Plan, MCM #1 and MS4 Public Education and Outreach Plan. Ongoing. Clean Water Partners publishes an annual report that includes the results of a survey of the effectiveness of the program.

The City's existing program has been developed over time in an iterative manner based on periodic assessments of potential sources and effective means of reducing these sources. In reviewing the program against the sources identified in Section 2, the City has identified the following additional actions that will be implemented and integrated into the MS4 Program Plan.

Table 3B – City of Falls Church Additional Bacteria Reduction Actions

Program Element	Source	Description	Goal
Prohibition on Illicit Discharges	Pet	While Section 4-41 of the City Code makes it unlawful to not promptly remove dog excrement from any property other than the owner's, the City's fine is less than those in surrounding localities.	To ensure that the penalty in Section 4-41 serves as an effective deterrent.
Identification of Additional Medium Risk and Priority Sites	Pet	At the end of each MS4 permit cycle, the City will conduct an analysis similar to that in Table 2A to determine whether there are any additional medium risk or priority sites.	To continually assess whether publicly owned or operated facilities could become or have become a potential source of bacteria. The intent is to identify new facilities and not to remove existing facilities identified as medium risk or priority sites.
Pet Waste Signage at Medium Risk and Priority Sites	Pet	The City will install signage at medium risk and priority sites for pet waste identified in Table 2A. The signage will remind pet owners to clean up waste and highlight the fines for non-compliance.	To educate pet owners about the responsibility to clean up waste and the penalties associated with non-compliance.
Iterative Pet Waste Reduction Steps at Priority Sites	Pet	The City will take the following iterative steps at priority sites where pet waste has been identified as a risk factor: • Establish for each priority site a representative segment or area that will be used to measure progress at reducing dog waste deposits. • Conduct an annual field visit of each priority site between April 1 and June 30 and document the number of deposits in the representative segment or area.	To implement additional strategies over time designed to reduce bacteria where previous strategies have not been effective.

Program Element	Source	Description	Goal
		• Install a pet waste station at any priority site where four years of documentation after signage is installed indicates that the site continues to represent a potentially significant source of bacteria. A significant source of bacteria is defined in the MS4 permit as a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL. • Develop a site-specific plan for any priority site where four years of documentation after a pet waste station is installed indicates that the site continues to represent a significant source of bacteria.	
Canada Geese Management at Priority Sites	Wildlife	The City will develop and implement a strategy to address geese waste at priority sites. Techniques may include but are not limited to egg addling/oiling and deployment of collies or other means of making the site an undesirable location for nesting. The strategy will include an annual field visit during geese nesting season to help determine strategy effectiveness.	To reduce the likelihood that Canada geese waste will enter into the storm sewer system and contribute to bacteria pollution from public property.

4. Enhanced Education, Outreach, and Training

As previously noted, bacteria from pets was identified as a high-priority water quality issue in the City's MS4 Public Education and Outreach Program developed in 2014 as a requirement of Section II.B.1.c of the MS4 permit. The MS4 Program Plan was updated accordingly. Implementation is documented in annual reports to DEQ. The City believes that the updated education and outreach efforts meet the requirements of an enhanced program. The City will assess the effectiveness and appropriateness of these efforts in the MS4 annual report to DEQ and make modifications as necessary.

The City has also developed a staff training module aimed at illicit discharge recognition and reporting (Falls Church Employee Stormwater Training Module #1). This training module will be reviewed and updated to ensure that it covers potential sources of bacteria likely to be encountered by City staff. This includes identifying pet waste and geese waste priority sites for potential further action by the City. Enhanced training will take place beginning June 30, 2017.

5. Schedule and Milestones

The City will continue the existing program in accordance with the schedule identified in Table 3A and in the MS4 Program Plan. Additional actions identified in Table 3B and Section 4 will be implemented and documented in the MS4 annual report in accordance with Table 5A.

Table 5A – Schedule and Milestones for Program Enhancements

Program Element	Description	Implementation Mechanism and Schedule	Responsible Party
Prohibition on Illicit Discharges	While Section 4-41 of the City Code makes it unlawful to not promptly remove dog excrement from any property other than the owner's, the City's fine is less than those in surrounding localities.	The City Manager will assess the efficacy of increasing the fine by June 30, 2017. Any change would be at the discretion of the City Council.	City Manager/City Attorney
Identification of Additional Medium Risk and Priority Sites	At the end of each MS4 permit cycle, the City will conduct an analysis similar to that in Table 2A to determine whether there are any additional medium risk or priority sites.	The City will conduct the assessment during Permit Year 5 of each MS4 permit cycle and update this action plan accordingly.	DPW
Pet Waste Signage at Medium Risk and Priority Sites	The City will install signage at medium risk and priority sites for pet waste identified in Table 2A. The signage will remind pet owners to clean up waste and highlight the fines for non-compliance.	The City will install signage at medium risk and priority sites no later than June 30, 2017. In future permit cycles, the City will install signage within one year of the identification of a property as medium risk or priority (if signage does not already exist).	DPW, Parks, and Schools
Iterative Pet Waste Reduction Steps at Priority Sites	The City will take the following iterative steps at priority sites where pet waste has been identified as a risk factor: • Establish for each priority site a representative segment or area that will be used to measure progress at reducing dog waste deposits. • Conduct an annual field visit of each priority site between April 1 and June 30 and document the number of deposits in the representative segment or area. • Install a pet waste station at any priority site where four years of documentation after signage is installed indicates that the site continues to represent a potentially significant source of bacteria. A significant source of bacteria is defined in the MS4 permit as a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL.	The City will identify representative segments or areas and conduct the field visits prior to June 30, 2018. Field visits will be conducted annually thereafter. The specific schedule for implementing pet waste stations and/or site-specific plans will be based on the results of annual field visits.	DPW, Parks, and Schools

Program Element	Description	Implementation Mechanism and Schedule	Responsible Party
	• Develop a site-specific plan for any priority site where four years of documentation after a pet waste station is installed indicates that the site continues to represent a significant source of bacteria.		
Canada Geese Management at Priority Sites	The City will develop and implement a strategy to address geese waste at priority sites. Techniques may include but are not limited to egg addling/oiling and deployment of collies or other means of making the site an undesirable location for nesting. The strategy will include an annual field visit during geese nesting season to help determine strategy effectiveness.	The City will develop and begin implementing the plan by June 30, 2018. In future permit cycles, the City will develop and implement plans within one year of the identification of a property as a priority site.	DPW
Illicit Discharge Staff Training	The City will incorporate the identification of pet waste and geese waste hotspots into Falls Church Employee Stormwater Training Module #1 – Illicit Discharge Detection and Elimination.	The City will incorporate the enhanced training beginning no later than June 30, 2017.	DPW

6. Assessment of Effectiveness

Unlike structural stormwater management controls, the practices put in place to reduce bacteria pollution do not have assigned reduction efficiencies. Further, ambient in-stream water quality monitoring programs, while effective at measuring overall progress toward bacteria reduction targets, are not appropriate indicators of MS4 permit compliance.[3]

The effectiveness of this plan will be assessed in the following manner:

- Human Sources: The City has established a goal to rehabilitate the entire sanitary sewer system by the year 2030, which should significantly reduce or eliminate bacteria from human sources. Effectiveness will be assessed based on annual progress toward meeting the 2030 system rehabilitation target.

- Pet Sources: An annual field visit will be conducted at each priority site associated with pet sources. The results of the field visits will document the effectiveness of the City's efforts over time and guide the implementation of additional control measures. In addition, annual surveys

[3] Holmes Run Bacteria TMDL Section 6.3.2 "Ambient instream monitoring would not be an appropriate means of determining permit compliance [for MS4 permits]. Ambient monitoring would be appropriate to determine if the entire TMDL is being met by all attributed sources. This is in accordance with recent EPA guidance."

conducted by the Clean Water Partners program will be used to assess the effectiveness of regional public education and outreach efforts.

- Wildlife Sources: An annual field visit will be conducted at each priority site associated with geese. These field visits will take place during geese nesting season. Lack of active nesting geese presence will the primary indicator of the success of the City's program.

These assessment measures will be reported annually to DEQ in each MS4 permit annual report and used to update the MS4 Program Plan as appropriate.

Appendix A
Bacteria Reduction Actions from Four Mile Run Implementation Plan

Commitment Category	**Actions**
Sanitary Sewer Infrastructure Commitments	• Inspect all sanitary sewer crossings and sanitary trunk lines parallel to and in the stream corridors of the Four Mile Run watershed. Any parallel lines to stream channels or stream crossings found to be failing will receive a high priority rating to ensure timely repair efforts. • Begin a three-year project to evaluate and rehabilitate a priority sewer basin within the City limits. • Maintain the sanitary sewer infrastructure by regular inspection and cleaning; spot repairs of failed sections of sewer line. • Train appropriate personnel on proper sewage disposal during sanitary sewer backups and subsequent repair work.
Inappropriate (Illicit) Discharge Commitments	Continue enforcement of Solid Waste Ordinance Section 13-7(a), which prohibits non-stormwater discharges into any streams or drainage areas in the City.
	Develop an inappropriate (illicit) discharge program for their portion of the Four Mile Run watershed. This new program will build on the optical brightener monitoring previously performed throughout the watershed. Any discovered inappropriate discharges will be eliminated from the storm system
Proper Pet Waste Disposal Commitments	Explore requesting developers to proffer the provision of pick-up bags and receptacles for pet waste with informative signage on larger multi-family development projects through the site plan development process.
	Review enforcement tools (ordinances, etc.) to ensure that the tools are consistent with one another and with the goals of the TMDL. Presentations or other training methods will be employed to educate police and park staff about the TMDL water quality effort and the related enforcement tools. Efforts will also be made to reach the general population of the City regarding these tools. Such efforts may include articles published in City newsletters, discussions with dog sponsoring groups, and/or postings on the City website.
	Maintain and operate the newly installed pick-up bags and receptacles at all of their municipals parks. Informative signs will be added at appropriate locations.
Stormwater Treatment Commitments	Continue to manage and enforce its Chesapeake Bay and MS4 programs. The City will also prepare to meet the challenges of the upcoming Potomac Tributary Strategies Program.
Street and Stormwater Infrastructure Management Commitments	Increase the frequency and effectiveness of current street sweeping program.
	Inspect, and clean as needed, every catch basin in its portion of the Four Mile Run watershed four times annually. The City will seek opportunities to increase the frequency of inspection and cleaning.
Stream Corridor Restoration Commitments	Where appropriate and directed by the City Manager/City Council, explore opportunities through the City site plan process and municipal projects to daylight outfalls and underground stream segments of Four Mile Run and its tributaries.

Stormwater Runoff Reduction and Reuse Commitments	Work to include stormwater runoff reduction and reuse technologies in the Chesapeake Bay Program.
	Strive to ensure that municipal projects include stormwater runoff reduction and reuse technologies where appropriate.
General Education and Outreach Commitments	Continue the Stream Stewards Program and incorporate bacteria as a NPS pollutant into general NPS outreach and education materials, including presentations.
	Incorporate information regarding bacteria as a NPS pollutant into the general NPS brochures that will be distributed via direct mail to all City residents.
	Publish articles regarding bacteria as a NPS pollutant in the FOCUS section of the Falls Church News-Press on a quarterly basis. In addition, similar articles will be publishes bi-annually in The Falls Church Environment newsletter. Such articles will be made available to civic associations for incusing in their publications.
	Complete their storm drain marking program in 2004, resulting in the application of markers next to every storm drain in the City portion of the Four Mile Run watershed.
	Include information regarding bacteria as a NPS pollutant on their webpage. Where appropriate, such information will include reference to this implementation plan and discussion of the City's proactive approach to the impairment.
	Include information regarding bacteria s a NPS pollutant through a scrolling text message on the City's public access cable channel.
	Include information regarding bacteria as a NPS pollutant on the Operation EarthWatch and Ecology Club programs that target elementary school students.
	Include information regarding bacteria as a NPS pollutant in the bi-annual City-wide cleanups.
	Seek funding to participate in the Northern Virginia Regional Pollution-Prevention (P2) Media Strategy program.
Directed Outreach Commitments	Develop a brochure "Your Dog and the Chesapeake Bay," which will include information about the TMDL and Implementation Strategy. This brochure will be distributed to dog owners through a wide range of channels.

Attachment 2

City of Falls Church Sanitary Sewer Rehabilitation Progress

Legend

- Sewer Lines Missing Data
- Unlined Sewer Lines
- Lined Sewer Lines

- Fourmile Run Watershed
- Holmes Run Watershed
- Pimmit Run Watershed

1:22,000

City of Falls Church
Sanitary Sewer
Rehabilitation Progress
as of 03/30/2020

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