

# George Washington Memorial Parkway (Virginia)

## Final Comprehensive Local TMDL Action Plan

October 5, 2020



Bacteria TMDLs for Hunting Creek,  
Tidal Four Mile Run, Pimmit Run

Polychlorinated Biphenyl (PCB) TMDL for the  
Potomac River

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# CERTIFICATION

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_____	Superintendent	January 29, 2021
Name	Title	Date



# Comprehensive Local TMDL Action Plan George Washington Memorial Parkway (Virginia)

October 5, 2020

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# Comprehensive Local TMDL Action Plan

## George Washington Memorial Parkway (Virginia)

October 5, 2020



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## 1. Introduction

### 1.1. Purpose

This Comprehensive Local TMDL Action Plan documents how the National Park Service (NPS) George Washington Memorial Parkway (GWMP) will meet the “Local TMDL Special Condition” in Part II B of the General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) that became effective November 1, 2018 (2018 MS4 permit).

The MS4 permit requires the development and implementation of action plans for impaired waters where a Total Maximum Daily Load (TMDL) approved by the State Water Control Board (SWCB) assigns a waste load allocation (WLA) to the GWMP. A TMDL establishes the maximum amount of a pollutant that can enter a water body without violating water quality standards. A WLA represents the total pollutant loading that is allocated to a specific source.

The GWMP has been assigned WLAs for sediment (Difficult Run), bacteria (Difficult Run, Hunting Creek, Tidal Four Mile Run, Mine Run, and Pimmit Run), and polychlorinated biphenyl (PCB) (Potomac River). However, three of these WLAs are located in Great Falls Park – sediment and bacteria WLAs for Difficult Run and a bacteria WLA for Mine Run. Great Falls Park is located outside of the 2010 Census Urbanized Area and is not included in the GWMP MS4 service area. Therefore, these WLAs are not addressed in this action plan (see Section 1.2).

Section 2 presents the Bacteria TMDL Action Plan, and Section 3 presents the PCB TMDL Action Plan. The MS4 permit is addressed by: describing the WLAs assigned to the GWMP and the corresponding reduction requirements; identifying significant sources of the pollutants of concern discharging from the GWMP’s MS4; identifying best management practices (BMPs) to reduce the pollutants of concern in accordance with specific permit requirements; calculating



existing and planned pollutant reductions; developing outreach strategies to enhance the public's ability to eliminate and reduce discharges of pollutants; and, establishing an implementation schedule for the permit term.

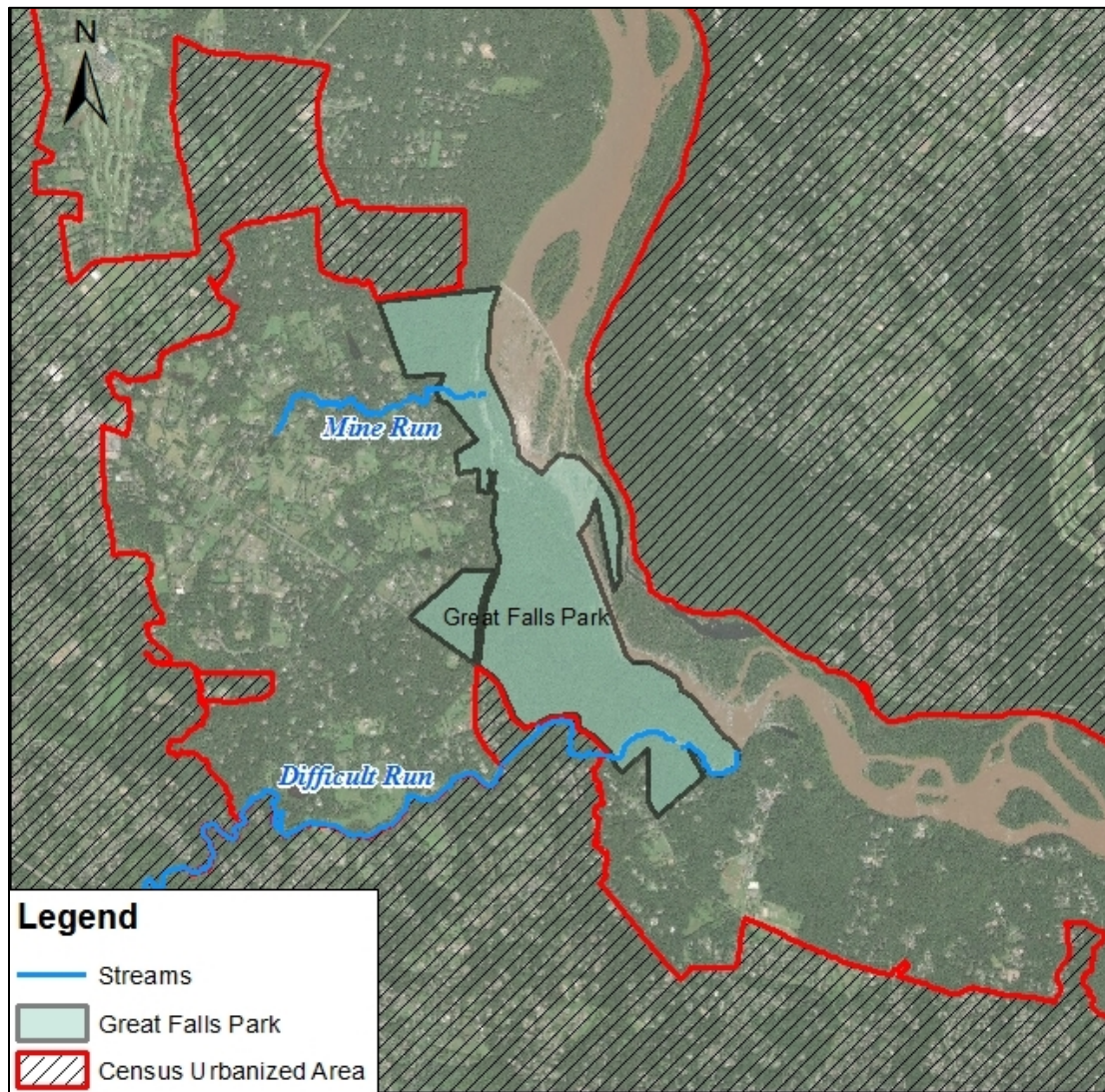
In accordance with the 2018 MS4 permit, the GWMP must update previously approved plans no later than 18 months after the effective permit date (May 1, 2020). The GWMP must also develop plans for WLAs assigned on or after July 1, 2013 no later than 30 months after the effective permit date (May 1, 2021). TMDLs approved after July 1, 2013 include the bacteria TMDLs for Mine and Pimmit Run. This Comprehensive Local TMDL Action Plan updates the previously approved plan and integrates strategies to address the WLAs approved after July 1, 2013 in compliance with the 2018 MS4 permit.

#### 1.2. Difficult Run and Mine Run TMDLs

The drainage areas from the GWMP to Difficult Run and Mine Run are located in Great Falls Park. Great Falls Park is located outside of the 2010 Census Urbanized Area and is not part of the GWMP MS4 service area in accordance with Part I E 3 a of the MS4 permit. Therefore, the WLAs for bacteria and sediment assigned to GWMP for Difficult Run and Mine Run are not addressed in this TMDL Action Plan. A map of Great Falls Park and the limits of the 2010 Census Urbanized Area is provided in Figure 1.A.



**Figure 1.A – Great Falls Park and Census Urbanized Area**



1.3. Plan Preparation

This plan has been prepared in accordance with Part II B of the MS4 permit, DEQ Guidance Memo 16-2006 "TMDL Action Planning for Local TMDL Maximum Daily Loads," applicable portions of DEQ Guidance Memo 15-2005 "Chesapeake Bay TMDL Special Conditions Guidance," and other guidance as provided by DEQ.

1.4. MS4 Service Area

The GWMP's responsibilities under the MS4 permit are based on the extent of the MS4 service area within the 2010 Census Urbanized Area. The WLAs in the TMDLs are aggregated to include other MS4 permit holders. This was done due to limitations in available MS4 service area



mapping data at the time of TMDL development. However, GWMP and other MS4 permittees have since refined and more precisely delineated their MS4 service areas. The methodology used to delineate the GWMP's regulated MS4 is described in the GWMP's Final Phase II Chesapeake Bay TMDL Action Plan. The GWMP's full MS4 service area maps are presented in Appendix A. Table 1.A shows the amount of MS4 impervious and pervious area within each TMDL watershed.

**Table 1.A – GWMP MS4 Impervious and Pervious Area by TMDL Watershed**

	Total Area (acres)	GWMP MS4 Area (acres)		
<b>Watershed</b>	<b>Total</b>	<b>Total</b>	<b>Imperv.</b>	<b>Pervious</b>
Hunting Creek	29,973	18.1	8.9	9.2
Tidal Four Mile Run	1,567	20.8	8.0	12.8
Pimmit Run	7,828	21.9	13.5	8.4



## 2. Bacteria TMDL Action Plan

The GWMP has been assigned WLAs for bacteria for Difficult Run, Tidal Four Mile Run, Hunting Creek, Mine Run, and Pimmit Run. The Difficult Run and Mine Run drainage area from GWMP is outside of the GWMP MS4 area and is not addressed in this action plan (see Section 1.2). Table 2.A provides an overview of the organization of the Bacteria TMDL Action Plan and how each section addresses the 2018 MS4 permit.

**Table 2.A – Bacteria TMDL Action Plan Permit Compliance Crosswalk**

Section	Plan Element	2018 MS4 Permit	
2.1	Overview of Bacteria TMDLs	Part II B 3	a. The TMDL project name. b. The EPA approval date of the TMDL. c. The wasteload allocated to the permittee (individually or in aggregate), and the corresponding percent reduction, if applicable.
2.2	Identification of Significant Sources of Bacteria	Part II B 3	d. Identification of the significant sources of the pollutants of concern discharging to the permittee's MS4 and that are not covered under a separate VPDES permit. For the purpose of this requirement, a significant source of pollutants means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL.
2.3	Best Management Practices	Part II B 3	e. The BMPs designed to reduce the pollutants of concern in accordance with Parts II B 4, B 5, and B 6.
2.4	Bacteria-Specific Permit Requirements	Part II B 3	f. Any calculations required in accordance with Part II B 4, B 5, or B 6.
		Part II B 4	a. [Not applicable]. b. If the permittee is not an approved VSMP authority, the permittee shall select at least one strategy listed in Table 5 below designed to reduce the load of bacteria to the MS4 relevant to sources of bacteria applicable within the MS4 regulated service area. Selection of the strategies



Section	Plan Element	2018 MS4 Permit	
			shall correspond to sources identified in Part II B 3 d.
2.5	Outreach Strategy	Part II B 3	g. For action plans developed in accordance with Part II B 4 and B 5, an outreach strategy to enhance the public's education (including employees) on methods to eliminate and reduce discharges of the pollutants.
2.6	Schedule of Anticipated Actions	Part II B 3	h. A schedule of anticipated actions planned for implementation during this permit term.

## 2.1. Overview of Bacteria TMDLs

Bacteria contamination is one of the most common causes of water quality impairment in Virginia streams. According to the U.S. EPA "Although they [fecal bacteria] are generally not harmful themselves, they indicate the possible presence of pathogenic (disease-causing) bacteria, viruses, and protozoans that also live in human and animal digestive systems. Therefore, their presence in streams suggests that pathogenic microorganisms might also be present and that swimming and eating shellfish might be a health risk."<sup>1</sup> In Virginia, water quality standards for bacteria were changed in 2003 from the 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 contamination.

### 2.1.1. *Tidal Four Mile Run Bacteria TMDL*

The impaired segment extends from the confluence with the Potomac River to the upstream limit of tidal waters. Two WLAs are assigned to GWMP's MS4 permit, one aggregated with Arlington County and VDOT and the other aggregated with the City of Alexandria and VDOT. Table 2.B provides a summary of the Four Mile Run bacteria TMDL and Figure 2.A. shows the area of GWMP draining to Four Mile Run.

<sup>1</sup> <https://archive.epa.gov/water/archive/web/html/vms511.html>



**Table 2.B – Tidal Four Mile Run Bacteria TMDL Summary**

TMDL Name	Approval Date	MS4 Existing Load	MS4 WLA	MS4 Reduction	MS4s Aggregated with GWMP
		CFU/Year			
"Bacteria TMDL for the Tidal Four Mile Run Watershed"	SWCB – 9/30/2010	Not Specified	2.23E+13	88%	Arlington County
					VDOT
	USEPA – 6/14/2010	Not Specified	1.53E+13	94%	City of Alexandria
					VDOT



**Figure 2.A – Four Mile Run MS4 Area**





### 2.1.2. Hunting Creek Bacteria TMDL

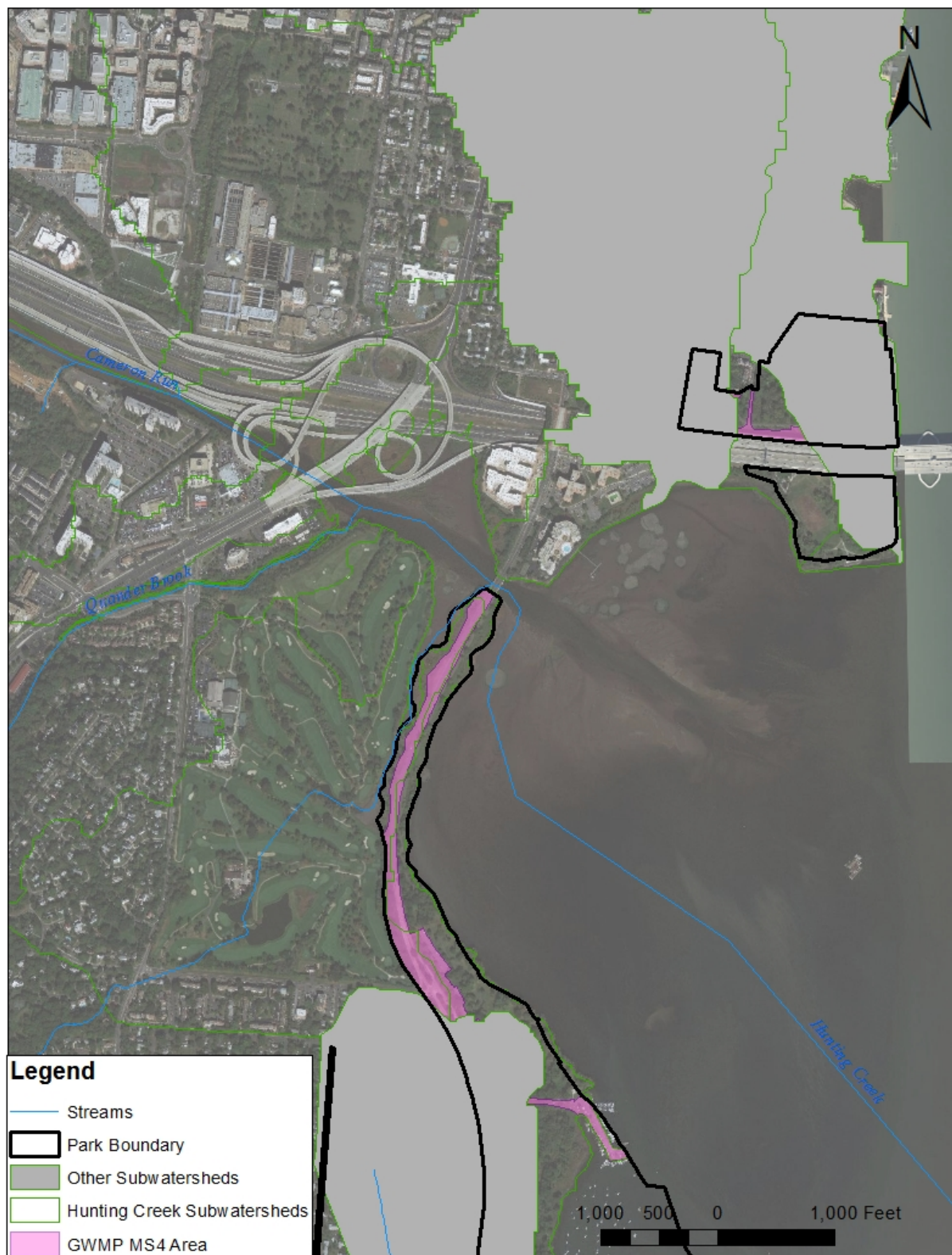
The Hunting Creek bacteria TMDL addresses bacteria impairment located between the Telegraph Road bridge and the Potomac River. Two WLAs are assigned to GWMP in the TMDL. Table 2.C provides a summary of the Hunting Creek bacteria TMDL and Figure 2.B. shows the area of GWMP draining to Hunting Creek.

**Table 2.C – Hunting Creek Bacteria TMDL Summary**

TMDL Name	Approval Date	MS4 Existing Load	MS4 WLA	MS4 Reduction	MS4s Aggregated with GWMP
		CFU/Year			
"Bacteria TMDL Development for the Hunting Creek, Cameron Run, and Holmes Run Watersheds"	SWCB – 8/4/2011	Not Specified	3.73E+13	92%	City of Alexandria
					VDOT
	USEPA – 11/10/2010	Not Specified	1.02E+14	83%	Fairfax County
					Fairfax County Public Schools
					VDOT



**Figure 2.B – Hunting Creek MS4 Area**





### 2.1.3. Pimmit Run Bacteria TMDL

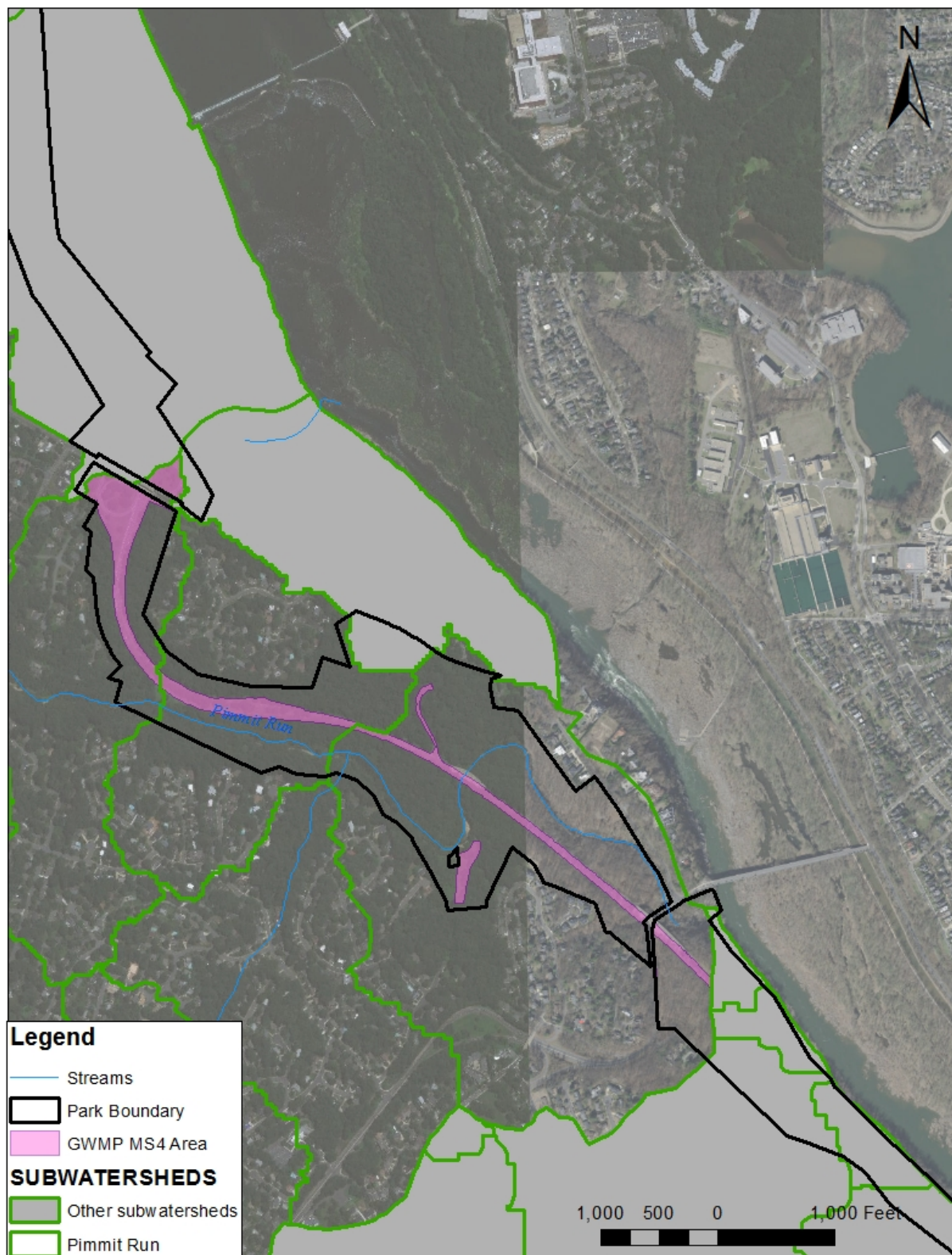
The Pimmit Run bacteria TMDL addresses the entire length of the stream from the headwaters to the confluence with the Potomac River. Two WLAs are assigned to GWMP in the TMDL. Table 2.D provides a summary of the Pimmit Run bacteria TMDL and Figure 2.C. shows the area of GWMP draining to Pimmit Run.

**Table 2.D – Pimmit Run Bacteria TMDL Summary**

TMDL Name	Approval Date	MS4 Existing Load	MS4 WLA	MS4 Reduction	MS4s Aggregated with GWMP
		CFU/Year			
"Bacteria TMDL Development for Tributaries to the Potomac River: Sugarland Run, Mine Run, and Pimmit Run"	SWCB – 4/4/2014	Not Specified	8.80E+11	99.42%	Fairfax County
					Fairfax County Public Schools
					VDOT
	USEPA – 9/26/2013	Not Specified	2.35E+11	99.42%	Arlington County
					VDOT



**Figure 2.C – Pimmit Run MS4 Area**





## 2.2. Identification of Significant Sources of Bacteria

The three TMDLs evaluate the sources of bacteria within the watersheds. The following are identified as the primary sources: sanitary sewer; septic systems; pets; and, wildlife. GWMP operates no septic systems in its MS4 area.

Domestic pets are the predominant controllable source of bacteria from the GWMP MS4. Two types of domestic pets, dogs and cats, were considered in the Hunting Creek and Pimmit Run TMDLs while the Four Mile Run TMDL considered dogs. In the GWMP, dogs are more likely to become a source because they are more likely to be walked within the park area.

As required by the MS4 permit, the GWMP reviewed its MS4 area in the TMDL watersheds to identify any significant sources of bacteria. A source is considered significant if the pollutant loading is expected to be greater than the average pollutant load for the land use identified in the TMDL. The roadway within the park was not identified as a significant source of bacteria. Land uses identified that may have a greater than average bacteria pollutant load due to dog walking were the Mount Vernon Trail, Jones Point Park, and the Potomac Heritage Trail. These parks and trail systems will be subject to the general BMPs identified in Section 2.3.

## 2.3. Bacteria Best Management Practices

The GWMP's program to reduce the bacteria load focuses on public education and field staff training as described in the GWMP MS4 Program Plan. In addition, the GWMP has policies in place designed to eliminate illicit discharges of bacteria and ensure that individuals leash and pick up after their pets. Table 2.E summarizes the components of the GWMP's program and the roles and responsibilities of staff.

**Table 2.E – GWMP Bacteria Reduction Program**

Program Element	Description
<b>MS4 Program Plan</b>	
MCM #1 – Public Education and Outreach	The GWMP has identified pet wastes and illicit discharges as high-priority stormwater topics and selected public education strategies of signage and media materials.
MCM #2 – Public Involvement and Participation	The park's website will be used to provide information to the public on illicit discharge identification and reporting.
MCM #3 – Illicit Discharge Detection and Elimination	The GWMP has developed an Illicit Discharge Detection and Elimination (IDDE) program designed to prevent, identify, and eliminate sources of pollutants, including bacteria.



Program Element	Description
MCM #6 – Pollution Prevention/Good Housekeeping	This section of the program plan describes the audience and frequency of the training program for pollution prevention. Under the program, field personnel receive training in the recognition and reporting of illicit discharges, including those related to bacteria.
<b>Regulations</b>	
Title 36, Codes of Federal Regulation Compendium, George Washington Memorial Parkway	Section 2.15 requires that: <ul style="list-style-type: none"> <li>• All pets must be restrained on a leash.</li> <li>• Pet excrement must be removed and disposed in a refuse can or carried out of the park.</li> <li>• Pets are prohibited from entering the Potomac River from within the GWMP managed areas.</li> </ul>

#### 2.4. Bacteria-Specific Permit Requirements

Part II B 4 b of the MS4 permit requires permittees that are not a VSMP authority such as the GWMP to select and implement at least one strategy listed in Table 5 of the MS4 permit. The strategies must correspond with the sources identified in Section 2.2. Table 2.F identifies how the GWMP demonstrates compliance with Table 5 of the MS4 permit. Examples of existing signage regarding pet regulations in the park are shown in Figure 2.D.

**Table 2.F – Selection of Bacteria Reduction Strategy from MS4 Permit Table 5**

Source	Table 5 Strategy	GWMP Program
Domestic Pets	Adopt and enforce pet waste ordinances or policies, or leash laws or policies.	The US Park Police are responsible for implementing Section 2.15 of the GWMP Compendium (36CFR) that requires pets to be leashed and that pet waste be removed and disposed in a refuse can or carried out of the park.



**Figure 2.D – Signage Regarding Pet Regulations in GWMP**



## 2.5. Bacteria Outreach Strategy

The GWMP has adopted an outreach strategy to enhance the public's understanding about how to eliminate and reduce the discharge of bacteria from the MS4. The strategy focuses on educating pet owners on the importance of picking up fecal matter as well as training GWMP field staff to identify and report potential sources of bacteria pollution. The MS4 Program Plan (MCM #1) includes signage and media materials to educate the public about pet waste as a high priority issue. GWMP field staff receive pollution prevention training at least once every 24 months. This training includes how to identify and report potential sources of bacteria to the MS4.



## 2.6. Schedule of Anticipated Actions

This Bacteria TMDL Action Plan will be implemented with the following schedule and milestones.

**Table 2.G – Bacteria TMDL Action Plan Schedule and Milestones**

Action Item	Description	Schedule
MS4 Program Plan	<ul style="list-style-type: none"> <li>MCM #1 – Public Education and Outreach BMPs</li> <li>MCM #2, BMP 2A – Public Involvement and Participation BMPs</li> <li>MCM #3 – Illicit Discharge Detection and Elimination</li> </ul>	Ongoing in accordance with the MS4 Program Plan.
	<ul style="list-style-type: none"> <li>MCM #6, BMP 6H – Field Staff Training</li> </ul>	Every 24 months in accordance with the MS4 Program Plan
Implement Regulations	<ul style="list-style-type: none"> <li>Pets on Leash – Section 2.15 of the Title 36 CFR Compendium for the GWMP</li> <li>Pet Waste Removal – Section 2.15 of the Title 36 CFR Compendium for the GWMP</li> </ul>	Ongoing.



### 3. PCB TMDL Action Plan

The GWMP is listed as an MS4 permittee subject to the Polychlorinated Biphenyl (PCB) TMDL for the tidal Potomac. Table 3.A provides an overview of the organization of the PCB TMDL Action Plan and how each section addresses the 2018 MS4 permit.

**Table 3.A – PCB TMDL Action Plan Permit Compliance Crosswalk**

Section	Plan Element	2018 MS4 Permit	
3.1	Overview of PCB TMDL	Part II B 3	a. The TMDL project name. b. The EPA approval date of the TMDL. c. The wasteload allocated to the permittee (individually or in aggregate), and the corresponding percent reduction, if applicable.
3.2	Identification of Significant Sources of PCBs	Part II B 3	d. Identification of the significant sources of the pollutants of concern discharging to the permittee's MS4 and that are not covered under a separate VPDES permit. For the purpose of this requirement, a significant source of pollutants means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL.
3.3	Best Management Practices	Part II B 3	e. The BMPs designed to reduce the pollutants of concern in accordance with Parts II B 4, B 5, and B 6.
3.4	PCB-Specific Permit Requirements	Part II B 3	f. Any calculations required in accordance with Part II B 4, B 5, or B 6.
		Part II B 6	a. For each PCB TMDL action plan, the permittee shall include an inventory of potentially significant sources of PCBs owned or operated by the permittee that drains to the MS4 that includes the following information: (1) Location of the potential source; (2) Whether or not the potential source is from current site activities or activities previously



Section	Plan Element	2018 MS4 Permit	
			<p>conducted at the site that have been terminated (i.e., legacy activities); and,</p> <p>(3) A description of any measures being implemented or to be implemented to prevent exposure to stormwater and the discharge of PCBs from the site.</p> <p>b. If at any time during the term of this permit, the permittee discovers a previously unidentified significant source of PCBs within the permittee's MS4 regulated service area, the permittee shall notify DEQ in writing within 30 days of discovery.</p>
3.5	Schedule of Anticipated Actions	Part II B 3	h. A schedule of anticipated actions planned for implementation during this permit term.

### 3.1. Overview of PCB TMDL

PCBs are a legacy pollutant and were used as a coolant and as an insulator, particularly in transformers, hydraulic equipment, and electrical equipment. The manufacture of PCBs was banned in 1979; however, PCBs are persistent in the environment and do not readily decompose under normal conditions. They also tend to settle into the sediment of waterways or adsorb to terrestrial soils. PCBs may still be released by illegal or improper dumping of PCB-containing wastes or leaks from legacy electrical transformers containing PCBs.

The tidal waters of the Potomac River and several of its tributaries were placed on the Virginia 303(d) impaired waters lists for elevated fish tissue levels of PCBs starting in 2002. The District of Columbia, Maryland, and Virginia agreed to coordinate the TMDL development process. The objective of the PCB TMDL is to ensure that the "fish consumption" use is protected in each of the impaired waterbodies by identifying maximum allowable loads of PCBs that would meet the applicable PCB water quality criteria and result in fish tissue PCB concentrations that do not exceed jurisdictional thresholds.

While the Potomac River PCB TMDL assesses the tidal Potomac River and tributary waters, the TMDL only establishes WLAs for the direct drainage portions of the MS4 permitted jurisdictions. The portion of the GWMP draining to the tidal Potomac River is from Pimmit Run to the southern terminus of the Parkway at Mount Vernon. Table 3.B provides a summary of the PCB TMDL.



**Table 3.B – Tidal Potomac PCB TMDL Summary**

TMDL Name	Approval Date	Baseline Load	Direct Drainage WLA	MS4 Reduction	MS4s Aggregated with GWMP
		g/Year <sup>2</sup>			
"Total Maximum Daily Loads of Polychlorinated Biphenyls (PCBs) for Tidal Portions of the Potomac and Anacostia Rivers in the District of Columbia, Maryland, and Virginia"	EPA – 10/31/2007 SWCB – 4/11/2010	Potomac River at Chain Bridge (4910): 78.6	0.973	98.8%	Fairfax County, City of Fairfax, City of Falls Church, George Mason University, Northern Virginia Community College, Town of Vienna, US Army- Fort Belvoir, US Central Intelligence Agency, VDOT
		Lower Potomac/Four Mile Run (4960): 19.9	0.943	95.3%	
		Dogue, Hunting, Little Hunting Creeks (4980): 85.9	37.4	56.5%	

### 3.2. Identification of Significant Sources of PCBs

This action plan is directed at those facilities and activities that are most likely to constitute a significant source of PCBs to surface waters. The first step in implementing this approach was to identify the portion of the MS4 that is subject to the PCB TMDL. The second step was to evaluate whether the facilities and activities subject to the TMDL are considered a significant source of PCBs.

A desktop evaluation of GWMP facilities within the regulated MS4 services area (Appendix A) was completed to determine the likelihood of PCB contamination that could affect stormwater runoff. Two factors were assessed: high-risk Standard Industrial Classifications (SICs) and registration in the EPA PCB Transformer Registration Database.

No GWMP sites or activities subject to this action plan fall under one of DEQ's high risk categories for PCBs. High risk category sites for potential sources of residual PCBs include the

<sup>2</sup> TMDL Table 12 Direct drainage loads by watershed and FIPS code (Fairfax County/GWMP direct drainages)



following SICs: 26&27 (Paper and Allied Products), 30 (Rubber and Misc. Plastics), 33 (Primary Metal Industries), 34 (Fabricated Metal Products), 37 (Transportation Equipment), 49 (Electrical, Gas, and Sanitary Services), 5093 (Scrap Metal Recycling), and 1221 & 1222 (Bituminous Coal).

No GWMP facilities are listed as currently operating a PCB-containing transformer per the EPA PCB Transformer Registration Database at <https://www.epa.gov/pcbs/registering-transformers-containing-polychlorinated-biphenyls-pcbs>.

In addition, the U.S. EPA cited potential indoor uses of PCBs as having the potential of entering the environment if not disposed of properly. These include but are not limited to fluorescent light ballast and caulking. There are few structures within the footprint of the GWMP. Structures include the historic Arlington House and public restroom facilities. An environmental assessment for the rehabilitation of Arlington House was conducted in August 2016 and is available at <https://parkplanning.nps.gov/document.cfm?parkID=186&projectID=58878&documentID=74751>. PCBs were not identified as an environmental risk in the assessment.

This assessment identified no significant sources of PCBs in the GWMP MS4 service area. The GWMP maintenance facility has been issued a separate VPDES stormwater industrial permit (Permit VAR051790) and was not evaluated in this MS4 action plan.

### 3.3. PCB Best Management Practices

The GWMP's program to reduce and eliminate potential PCB pollution focuses on field staff training as described in the GWMP MS4 Program Plan. Since there are no identified sources of PCBs in the MS4, the GWMP plans to use its staff training on hazardous materials and emergency response to address any potential release or spill of PCBs along the GWMP. Table 3.C summarizes the components of the GWMP's program.



**Table 3.C – GWMP Program to Address Hazardous Materials (such as PCBs)**

Program Element	Description
<b>MS4 Program Plan</b>	
MCM #6 – Pollution Prevention/Good Housekeeping	This section of the program plan describes the audience and frequency of the training program for pollution prevention. Under the program, employees who could cause or respond to petroleum, oils, and lubricants spills receive annual Hazardous Waste Operations and Emergency Response (HAZWOPER) training.

#### 3.4. PCB-Specific Permit Requirements

Part II B 6 of the MS4 permit requires GWMP to include an inventory of potentially significant sources of PCBs that are owned or operated by the park. As noted in Section 3.2, an assessment conducted by GWMP did not identify any potentially significant sources of PCBs. In accordance with the MS4 permit, if the GWMP discovers a previously unidentified significant source of PCBs within the regulated MS4 service area, the GWMP will notify DEQ within 30 days of discovery.

#### 3.5. Schedule of Anticipated Actions

The HAZWOPER training for appropriate employees is held annually.



#### **4. Opportunity for Public Comment**

This plan was made available for public comment in accordance with Part II B 7 of the MS4 permit. The plan was posted on the park website for comment from September 16 to October 2, 2020. No comments were received.



**Appendix A**  
**GWMP MS4 Service Area Delineation**



