

# **George Mason University DRAFT Chesapeake Bay TMDL Action Plan**

Phase 3 Permit Term 2023-2028  
Permit Number VAR040106

September 29,2023

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## Executive Summary

George Mason University (Mason) is required to develop a Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan by the 2023-2028 General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 Permit third permit cycle) and in accordance with the Virginia Department of Environmental Quality (DEQ) Chesapeake Bay TMDL Action Plan Guidance Document (Guidance Document) dated May 18, 2015. This Action Plan details how Mason intends to provide the remaining 60% reduction in loading of the pollutants of concern (POCs) nitrogen, phosphorus and total suspended solids (TSS).

Mason's Phase 1 TMDL Action Plan, "George Mason University Chesapeake Bay TMDL Action Plan Permit Number VAR040106" by Timmons Group, dated October 2015, describes in detail the methodology used to determine the extent of the MS4 service area, including the estimated regulated impervious and pervious acres served by its MS4. No changes to Mason's MS4 service area or regulated impervious and pervious acres have been implemented since that time, therefore the information has been incorporated into the base information for the Phase 2 and Phase 3 TMDL Action Plan.

For compliance with the first permit cycle ending June 30, 2018, Mason utilized credit from existing oversized stormwater best management practices (BMPs) and implemented 320' of urban stream restoration on the Fairfax Campus. This provided reductions above and beyond the 5% requirement for the Phase 1 TMDL Action Plan. These additional reductions were credited toward the Phase 2 TMDL Action Plan reduction requirements.

For compliance with the second permit cycle ending Oct 30, 2023, Mason implemented 1,722' of urban stream restoration on the Fairfax Campus. This provided reductions above and beyond the 35% requirement for the Phase 2 TMDL Action Plan. These additional reductions were credited toward the Phase 3 TMDL Action Plan reduction requirements and have achieved the 60% Phase 3 TMDL reduction requirements as well.

Based on the stream restoration project completed in the second permit cycle, Mason has achieved and exceeded the Phase 3 TMDL Action Plan reduction requirements. Mason has fulfilled the Chesapeake Bay TMDL Special Condition for completion of 100% of required nitrogen, phosphorus, and sediment reductions.

## Current MS4 Program and Existing Legal Authority

Stormwater discharges within George Mason University (Mason) are regulated under the terms of a Virginia Pollutant Discharge Elimination System (VPDES) General Permit for Discharges from Small Municipal Separate Storm Sewer System (General Permit No. VAR040106). This MS4 permit is issued to Mason by Virginia Department of Environmental Quality (DEQ), consistent with the provisions of Section 402 of the Clean Water Act and the Virginia Stormwater Management Act, which authorizes the Virginia Stormwater Management Program (VSMP) Regulations. A review of Mason's current MS4 Program Plan and existing legal authorities confirms that Mason has several relevant existing legal authorities and policies to comply with the Part II – TMDL Special Conditions. The relevant existing legal authorities and policies include the following:

- Mason's MS4 Program Plan
- Mason's Illicit Discharge Detection and Elimination Policy
- Mason's Nutrient Management Program
- Mason's Environmental Management and Sustainability System Policy
- Mason's Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management
- Mason's Stormwater Master Plan
- Mason's Design Manual

Mason is currently working to update their Stormwater Master Plan in conjunction with development of the TMDL Action Plan. No other significant changes have occurred to Mason's MS4 Program or existing legal authority since the Phase 1 TMDL Action Plan. Therefore, Mason is in compliance with the special condition.

Mason's Fairfax and Science and Technology campuses are bordered by several different jurisdictions, each with their own MS4 Programs. These potentially interconnected MS4s include the City of Fairfax, Fairfax County, VDOT and Prince William County. There are currently no memorandums of understanding (MOUs) between Mason and these entities. Mason reserves the right to coordinate and clarify MS4 service boundaries and interjurisdictional responsibilities for pollutant of concern (POC) loads and reductions through such means in the future.

## Estimated Source Loads and POC Reduction Requirements

The Commonwealth of Virginia committed to a phased approach to address specific nutrient and sediment reductions being discharged from MS4s that drain to the Chesapeake Bay. The identified pollutants of concern include phosphorus, nitrogen, and total suspended solids (TSS). This phased approach requires MS4s to establish a baseline and develop approaches to achieve a 5% reduction of the POCs in the first permit cycle (2013-2018), an additional 35% reduction in the second permit cycle (2018-2023), and an additional 60% reduction in the third permit cycle (2023-2028) for a total of 100% reduction from the baseline to be achieved by the end of the third permit cycle in 2028. The plan should be in accordance with the DEQ Chesapeake Bay TMDL Action Plan Guidance Document (Guidance Document) dated May 18, 2015.

The 2013-2018 MS4 General Permit required an evaluation of the 2009 regulated land cover, calculation of POC loading, and identification of means and methods to achieve a 5% reduction to the POC loading. Mason's Phase 1 TMDL Action Plan, "George Mason University Chesapeake Bay TMDL Action Plan Permit Number VAR040106" by Timmons Group, dated October 2015, describes in detail the methodology used to determine the extent of the MS4 service area (including the estimated regulated impervious and pervious acres served by its MS4), as well as the calculations of the POCs and reduction requirements. The existing source loads and required reductions for the POCs are summarized in *Table 1*.

### Phase 1 (2013-2018)

Mason's Phase 1 TMDL Action Plan required a reduction of 22.53 lbs/yr of nitrogen, 2.27 lbs/yr of phosphorus, and 2,586.43 lbs/yr of TSS. Mason met the reduction requirements through credit from oversized BMPs and urban stream restoration. Additional credit from Phase 1 was credited toward the Phase 2 reduction requirements.

### Phase 2 (2018-2023)

No changes to Mason's MS4 service area or regulated impervious and pervious acres have occurred since the Phase 1 TMDL Action Plan. Therefore, the same areas and reduction requirements have been incorporated into the base information for the Phase 2 TMDL Action Plan.

As presented in *Table 1*, the load reduction requirements for the Phase 2 TMDL Action Plan 35% reduction, inclusive of the credits from Phase 1, are 136.39 lbs of nitrogen, -0.67 lbs of phosphorus, and -14,394.89 lbs of total suspended solids (TSS). This means that no reductions of phosphorus or TSS are required to meet the Phase 2 reduction requirements.

Mason met the reduction requirements through the 1,722' urban stream restoration completed in 2022. With the updated design parameters, the stream restoration project was able to achieve a

reduction of 477.8 lbs of Nitrogen, 58.0 lbs of Phosphorus, and 19,963.9 lbs of TSS. This met the reductions required by Phase 2 and also provided additional credits toward the Phase 3 reduction requirements, meeting all the Phase 3 reduction requirements.

#### Phase 3 (2023-2028)

No changes to Mason's MS4 service area or regulated impervious and pervious acres have occurred since the Phase 1 TMDL Action Plan. Therefore, the same areas and reduction requirements have been incorporated into the base information for this Phase 3 TMDL Action Plan.

As presented in *Table 1*, the load reduction requirements for the Phase 3 TMDL Action Plan 60% reduction, inclusive of the credits from Phase 2, are -80.84 lb of nitrogen, -22.82 lb of phosphorus, and -3,315.8 lb of total suspended solids (TSS). This means that no reductions of nitrogen, phosphorus or TSS are required to meet the Phase 3 TMDL requirements.

Mason has met the Phase 3 reduction requirements through the 1,722' urban stream restoration completed in 2022. Mason has fulfilled the Chesapeake Bay TMDL Special Condition for completion of 100% of required nitrogen, phosphorus, and sediment reductions.

Table 1: MS4 POC Loading and Reduction Calculations

Subsource	Campus	POC	Total Existing Acres Served by MS4 as of 6/30/2009 (acres)	Loading Rate (lbs/acre)	Estimated POC Load (lbs)	5% Total Reduction Required First permit Cycle (lbs)	5% Total Reduction Required First Permit Cycle (lbs)	Reduction Achieved First Permit Cycle (lbs)	Credit Toward Second Permit Cycle (lbs)*	35% Total Reduction Required Second Permit Cycle (lbs)	35% Total Reduction Required Second Permit Cycle (lbs)	Remaining Reduction Required Second Permit Cycle (lbs)	Reduction Achieved Second Permit Cycle (lbs)**	Credit Toward Third Permit Cycle (lbs)**	60% Total Reduction Required Third Permit Cycle (lbs)	60% Total Reduction Required Third Permit Cycle (lbs)	Remaining Reduction Required Third Permit Cycle (lbs)
Regulated Urban Impervious	Fairfax	N	185.01	16.86	3,119.27	14.80	22.53	43.87	21.34	103.61	157.73	136.39	477.8	341.41	189.33	260.57	-80.84
	PW		22.94		386.77	1.84				12.85							
Regulated Urban Pervious	Fairfax		161.80	10.07	1,629.33	4.85				33.98							
	PW		34.73		349.73	1.04				7.29							
Regulated Urban Impervious	Fairfax	P	185.01	1.62	299.72	1.85	2.28	18.88	16.60	12.95	15.93	-0.67	58.0	58.67	32.34	35.85	-22.82
	PW		22.94		37.16	0.23				1.61							
Regulated Urban Pervious	Fairfax		161.80	0.41	66.34	0.16				1.13							
	PW		34.73		14.24	0.03				0.24							
Regulated Urban Impervious	Fairfax	TSS	185.01	1,171.32	216,705.91	2,166.47	2,586.42	35,086.26	32,499.84	15,165.27	18,104.95	-14,394.89	19,963.9	34,358.79	29,229.12	31,042.99	-3,315.8
	PW		22.94		26,870.08	268.63				1,880.39							
Regulated Urban Pervious	Fairfax		161.80	175.80	28,444.44	124.59				872.10							
	PW		34.73		6,105.53	26.74				187.19							

\*Reduction achieved first permit cycle and credit toward second permit cycle are based on the credit for the over designed BMPs and the BANCs assessment of the 320' stream restoration project performed by Mason

\*\*Reduction achieved second permit cycle and credit toward third permit cycle are based on the credit from 1,722' stream restoration project performed by Mason

## Conclusion

Mason developed this Phase 3 Chesapeake Bay TMDL Action Plan as required in the 2023-2028 third permit cycle of its MS4 Permit Number VAR040106 and in accordance with the DEQ Guidance Document dated May 18, 2015.

This TMDL Action Plan concludes that the phase 3 pollutant reduction requirements have been met by the stream restoration project completed in 2022. Mason has fulfilled the Chesapeake Bay TMDL Special Condition for completion of 100% of required nitrogen, phosphorus, and sediment reductions.

Mason reserves the right to modify this TMDL Action Plan as needed to maintain compliance with the third permit cycle of its MS4 Permit and to implement and take credit for additional creditable facilities or practices as provided for in the Chesapeake Bay TMDL Special Condition Guidance.



# Appendix A

<b>Mason MS4 Regulated Areas by Land Cover Type Fairfax Campus</b>		
<b>Land Cover Type</b>	<b>Total Area (acres)</b>	<b>Regulated Area (acres)</b>
Impervious	185.01	185.01
Pervious	161.80	161.80
Forested*	298.82	298.82
Open Water*	5.28	0.00
<b>Total</b>	<b>650.91</b>	<b>645.63</b>

\*Excluded from load calculations

<b>Mason MS4 Regulated Areas by Land Cover Type Science and Technology Campus</b>		
<b>Land Cover Type</b>	<b>Total Area (acres)</b>	<b>Regulated Area (acres)</b>
Impervious	22.94	22.94
Pervious	34.73	34.73
Forested*	75.53	75.53
Open Water*	1.32	0.00
<b>Total</b>	<b>134.52</b>	<b>133.20</b>




\*Excluded from load calculations

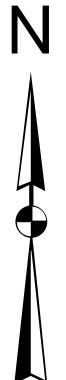
Figures 1 and 2 provide maps of the Fairfax and Science and Technology campuses respectively that depict the MS4 service area boundaries, regulated lands, and lands that have been excluded in accordance with DEQ's Guidance Document.

# Figure 1

Fairfax Campus  
2009 Regulated  
Area Map



-  MS4 Service Area
-  **Regulated Area**
-  Regulated  
Forest (Excluded)  
Open Waters (Excluded)



0 500 1,000 1,500  
Feet








# Figure 2

Science and Technology  
Campus

2009 MS4 Regulated  
Area Map

-  MS4 Service Area
-  **Regulated Area**
-  Regulated  
Forest (Excluded)  
Open Water (Excluded)

N



0 500 1,000

Feet



# Appendix B



## References

Virginia Administrative Code 9VAC25-890-40 “General Permit for the Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems”.

“George Mason University MS4 Program Plan Permit Number VAR040106”.

“George Mason University Chesapeake Bay TMDL Action Plan Permit Number VAR040106” by Timmons Group, dated October 2015.

“Guidance Memo No. 15-2005” by DEQ, dated May 18, 2015.

Virginia Runoff Reduction Method Worksheets

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