



***CHESAPEAKE BAY TMDL ACTION PLAN
PERMIT NUMBER VAR040106***

***Submitted to DEQ:
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Executive Summary

George Mason University (Mason) developed this Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan as required in the 2013-2018 General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (Permit Term II MS4 Permit) 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 is for both the Fairfax Campus and Science and Technology Campus and required an evaluation of the 2009 regulated land cover and MS4 boundary, calculation of the pollutant of concern (POC) loading and first permit term required reductions, projects to meet the reductions, a review of Mason's current MS4 program and existing legal authority, and a summary of the public comment process.

For compliance with the first permit cycle ending June 30, 2018, Mason's POC required reductions are 22.53 lbs/yr for nitrogen, 2.27 lbs/yr for phosphorus, and 2,586.43 lbs/yr for total suspended solids (TSS). Mason's Means and Methods for providing compliance with the first permit cycle is to utilize credit from any existing oversized stormwater best management practices (BMPs) and through implementation of an approximate 250' urban stream restoration project on the Fairfax Campus.

The existing oversized BMPs provide 4.199 lbs/yr of nitrogen, 0.609 lbs/yr of phosphorus, and 285.542 lbs/yr of TSS. The urban stream restoration project will provide 18.75 lbs/yr of N, 17.00 lbs/yr of P, and 11,220 lbs/yr of TSS. Using these control measures, the first permit cycle required reductions will be met and an additional credit of 0.144 lbs/yr of nitrogen, 15.323 lbs/yr of phosphorus, 8,912.105 lbs/yr of TSS will be applied towards meeting the second permit cycle required reductions. Mason estimates that it will cost \$425,000 to implement the 250' urban stream restoration project on the Fairfax Campus.

Introduction

As legislated by the Virginia Stormwater Management Program (VSMP) Permit Regulations (9VAC25-870- 400 et. seq.), the Virginia Department of Conservation and Recreation (DCR) issued a VSMP General Permit (VAR040106) for small Municipal Separate Storm Sewer Systems (MS4) to George Mason University (Mason) on July 9, 2008. This permit was updated and extended effective July 1, 2013 by Virginia Department of Environmental Quality (DEQ). This permit holds Mason accountable for developing and implementing an MS4 Program to address the requirements contained in the permit.

In order to meet the Special Condition for the Chesapeake Bay TMDL (Section 1.C) in the General Permit, Mason has developed the following Chesapeake Bay TMDL Action Plan (Action Plan) for its Fairfax and Science and Technology Campuses. As the basis for development of the Action Plan, Mason utilized both the Chesapeake Bay TMDL Special Condition Guidance Document (Guidance Memo No. 15-2005 dated May 18, 2015) and the VSMP General Permit (VAR040106). Furthermore, Mason utilized locally available aerial imagery, the Virginia Geographic Information Network (VGIN), and the Virginia Environmental Geographic Information System (VEGIS) coupled with information from Mason's in-house GIS to prepare the Action Plan.

This Action Plan documents the information sources and methodologies used in preparing the required plan elements and presents the means and methods that will be utilized to achieve the required Pollutant of Concern (POC) load reductions by the end of the first permit cycle (July 1, 2018). The following plan elements are included as sections in this Action Plan:

- [Review of Current MS4 Program and Existing Legal Authority](#) - (Addresses Section I.C.2a (1) and I.C.2.a (2) of the MS4 Permit)
- [Data Sources Utilized and Estimate of MS4 Regulated Acreages](#) – (Addresses Section I.C.2.a (4) and Section I.C.2.a (5) of the MS4 Permit)
- [Estimated POC Loads and Required Reductions from Existing Sources](#) – (Addresses Section 1.C.2.a (4) and Section I.C.2.a (5) of the MS4 Permit)
- [Estimated POC Loads and Required Reductions from New and Grandfathered Sources](#) – (Addresses Section 1.C.2.a (7) and Section I.C.2.a (8) of the MS4 Permit)
- [Estimated POC Load Reductions from Existing BMPs](#) - (Addresses Section I.C.2.a (6) of the MS4 Permit)
- [Means and Methods Strategy, Schedule, and Estimated Costs](#) – (Addresses I.C.2.a (6) and I.C.2.a (11) of the MS4 Permit)
- [List of Future Grandfathered Projects](#) – (Addresses I.C.2.a (10) of the MS4 Permit)
- [Public Comment Process](#) – (Addresses I.C.2.a (12) of the MS4 Permit)

Review of Current MS4 Program and Existing Legal Authority

As requested, Timmons Group (TG) performed a review of the Mason's current MS4 Program Plan and existing legal authorities in order to evaluate its ability to comply with the Special Condition for the Chesapeake Bay TMDL (Section I.C) in the MS4 Permit. Based on this review, it is our opinion that Mason does not require any new or modified legal authorities or policies at this time in order to meet the requirements of this special condition. The following is a list of Mason's relevant existing legal authorities and policies:

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

However, Mason may choose to coordinate with other adjacent MS4s (listed below) and explore the idea of establishing memorandums of understanding (MOU) to further clarify MS4 service boundary line(s) and inter-jurisdictional responsibilities for POC loads and subsequent required POC load reductions in the future. Appendix G of the *2014 MS4 Annual Report - Notice of Potential Interconnected MS4s* identified the following adjacent MS4s:

- Fairfax County (Fairfax Campus)
- City of Fairfax (Fairfax Campus)
- Virginia Department of Transportation (VDOT) (Fairfax and Science and Technology Campuses)
- Science and Technology County (Science and Technology Campus)

Data Sources Utilized and Estimate of MS4 Regulated Acreages

In order to determine the extent of Mason's MS4 service area and to estimate the regulated impervious and regulated pervious acres served by its MS4, a variety of different land cover data sources were investigated including Mason's in-house GIS data layers (aerial imagery from 2004 and 2013, topography, parcel boundaries, ponds, streams, and storm structures), aerial imagery from VGIN and VEGIS, and GIS data from Fairfax and Prince William Counties. After a review of these data sources and in accordance with DEQ's Guidance Document, the "VBMP2009" aerial imagery provided by VEGIS and VGIN was selected for use as the baseline aerial imagery for estimating the acreage of pervious, impervious, forested, and open water surface areas within the campuses. Mason's GIS data (best available) was used to supplement areas where land cover type was inconclusive from the aerial imagery.

Several of Mason's GIS data layers (topography, storm sewer, and parcel boundaries) were also used to attempt to analyze the extent of overlap from conveyances and associated drainage areas from neighboring MS4s. Unfortunately, the data available at this time (specifically outfall drainage areas) was not extensive enough to clearly differentiate which operator was responsible for which part of the system. And since no Memorandums of Understanding (MOUs) have been established between Mason and adjacent MS4 operators at this time, a conservative, "best professional judgement" decision was made (in accordance with Pages 5-6 of DEQ's Guidance Document) to use Mason's property boundaries ("jurisdictional" boundaries) for the two campuses as the MS4 service

area limits. As a result no inter- jurisdictional overlap areas were excluded from or included in Mason’s MS4 service area. Mason reserves the right to refine the service area as additional datasets become available.

Analysis of available aerial imagery shows that both of Mason’s campuses contain significant tracts of land that appear to be consistent with the definition of “forested lands” as shown in the footnote on page 5 of DEQ’s Guidance Document. As such, Mason excluded these lands (shown on Figures 1 and 2) from the regulated urban impervious and regulated urban pervious cover calculations per the DEQ Guidance Document. Lands within Mason’s MS4 service area that contained tree canopy based on the “VBMP2009” aerial imagery but did not appear to meet the aforementioned criteria for forested lands were classified as pervious lands.

Based on slide number 18 in DEQ’s *Chesapeake Bay TMDL Action Plan Informational Session Presentation* (presented by the Office of VPDES Permits in December 2014), the following areas were also excluded from Mason’s POC load generation and load reduction requirements calculations:

- Streams (open waters)
- Ponds receiving flow from streams (open waters)

Ponds that did not appear to receive flow from streams according to the “VBMP2009” aerial imagery or Mason’s GIS data were classified as pervious areas.

No lands operated by a separate MS4 or lands regulated under a General VPDES Permit for Stormwater Discharges Associated with Industrial Activity (VAR05) were found within Mason’s campus property boundaries. Also, in accordance with the DEQ Guidance Document, the pre-construction land use (predevelopment conditions) was used as a baseline for lands that were in transition as of June 30, 2009. Based on the VEGIS’s “VBMP2009” aerial imagery several areas were found to be in transition at Mason’s Fairfax and Science and Technology Campus. All of Mason’s lands in transition initiated construction prior to June 30, 2009 and were completed between July 1, 2009 and June 30, 2014. All lands in transition were designed to meet an average land cover condition of 16% or less. As such no additional offsets are required under the Special Condition beyond those required for existing conditions. Table 1 – Mason’s Lands in Transition as of June 30, 2009 provides a summary of the areas that were actively in transition as of June 30, 2009.

Table 1. Mason’s Lands in Transition as June 30, 2009	
Campus	Approximate Area (acres)
Fairfax	35.92
Science and Technology	27.10
Total	63.02

Tables 2 and 3 provide a summary of the estimated MS4 regulated acreages by land cover type for the Fairfax and Science and Technology campuses respectively.

Table 2. Mason MS4 Regulated Areas by Land Cover Type Fairfax Campus		
Land Cover Type	Total Area (acres)	Regulated Area (acres)
Impervious	185.01	185.01
Pervious	161.80	161.80
Forested*	298.82	298.82
Open Water*	5.28	0.00
Total	650.91	645.63

*Excluded from load calculations

Table 3. Mason MS4 Regulated Areas by Land Cover Type Science and Technology Campus		
Land Cover Type	Total Area (acres)	Regulated Area (acres)
Impervious	22.94	22.94
Pervious	34.73	34.73
Forested*	75.53	75.53
Open Water*	1.32	0.00
Total	134.52	133.20


*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)

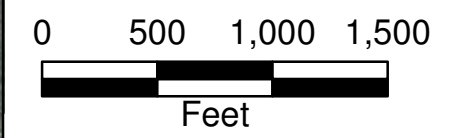



Figure 2


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



Estimated POC Loads and Required Reductions from Existing Sources

Once the regulated urban pervious acres and regulated urban impervious acres were estimated, Mason used the appropriate tables provided in the permit (Tables 2.b and 3.b in the permit) to estimate the existing source loads and required load reductions for the pollutants of concern for each of the campuses within Mason's MS4 service area. Tables 4 and 5 provide the estimated existing source loads for the Fairfax and Science and Technology campuses respectively. Tables 6 and 7 provide the estimated total pollutant load reductions required by the end of each permit cycle for the Fairfax and Science and Technology campuses respectively. Though these tables present the required load reductions for all three permit cycles (5%, 35%, 60%, and total), only the 5% load reduction requirements need to be addressed under this Action Plan.

Table 4. Estimated Existing Source Loads Fairfax Campus				
<i>Per Table 2b in the MS4 Permit: Calculation for Estimating Existing Source Loads for the Potomac River Basin (Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)</i>				
Subsource	POC	Total Existing Acres Served by MS4 as of 6/30/2009 (acres)	2009 EOS Loading Rate (lbs/acre)	Estimated Total POC Load Based on 2009 Progress Run (lbs)
Regulated Urban Impervious	N	185.01	16.86	3,119.27
Regulated Urban Pervious		161.80	10.07	1,629.33
Regulated Urban Impervious	P	185.01	1.62	299.72
Regulated Urban Pervious		161.80	0.41	66.34
Regulated Urban Impervious	TSS	185.01	1171.32	216,705.91
Regulated Urban Pervious		161.80	175.80	28,444.44

Table 5. Estimated Existing Source Loads Science and Technology Campus				
<i>Per Table 2b in the MS4 Permit: Calculation for Estimating Existing Source Loads for the Potomac River Basin (Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)</i>				
Subsource	POC	Total Existing Acres Served by MS4 as of 6/30/2009 (acres)	2009 EOS Loading Rate (lbs/acre)	Estimated Total POC Load Based on 2009 Progress Run (lbs)
Regulated Urban Impervious	N	22.94	16.86	386.77
Regulated Urban Pervious		34.73	10.07	349.73
Regulated Urban Impervious	P	22.94	1.62	37.16
Regulated Urban Pervious		34.73	0.41	14.24
Regulated Urban Impervious	TSS	22.94	1,171.32	26,870.08
Regulated Urban Pervious		34.73	175.80	6,105.53

Table 6. Estimated Total Pollutant Load Reductions Required Fairfax Campus							
<i>Per Table 3b in the MS4 Permit: Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the Potomac River Basin (Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)</i>							
Subsource	POC	Total Existing Acres Served by MS4 as of 6/30/2009 (acres)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre)	5% Total Reduction Required First Permit Cycle (lbs)	35% Total Reduction Required Second Permit Cycle (lbs)	60% Total Reduction Required Third Permit Cycle (lbs)	Total Reduction (lbs)
Regulated Urban Impervious	N	185.01	0.08	14.80	103.61	177.61	296.02
Regulated Urban Pervious		161.80	0.03	4.85	33.98	58.25	97.08
Regulated Urban Impervious	P	185.01	0.01	1.85	12.95	22.20	37.00
Regulated Urban Pervious		161.80	0.001	0.16	1.13	1.94	3.23
Regulated Urban Impervious	TSS	185.01	11.71	2,166.47	15,165.27	25,997.61	43,329.35
Regulated Urban Pervious		161.80	0.77	124.59	872.10	1,495.03	2,491.72

Table 7. Estimated Total Pollutant Load Reductions Required Science and Technology Campus							
<i>Per Table 3b in the MS4 Permit: Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the Potomac River Basin (Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)</i>							
Subsource	POC	Total Existing Acres Served by MS4 as of 6/30/2009 (acres)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre)	5% Total Reduction Required First Permit Cycle (lbs)	35% Total Reduction Required Second Permit Cycle (lbs)	60% Total Reduction Required Third Permit Cycle (lbs)	Total Reduction (lbs)
Regulated Urban Impervious	N	22.94	0.08	1.84	12.85	22.02	36.71
Regulated Urban Pervious		34.73	0.03	1.04	7.29	12.50	20.84
Regulated Urban Impervious	P	22.94	0.01	0.23	1.61	2.75	4.59
Regulated Urban Pervious		34.73	0.001	0.03	0.24	0.42	0.69
Regulated Urban Impervious	TSS	22.94	11.71	268.63	1,880.39	3,223.53	5,372.55
Regulated Urban Pervious		34.73	0.77	26.74	187.19	320.91	534.84

Therefore, as can be calculated using the estimates shown in the tables, the total combined load reductions required by the end of the first permit cycle (July 1, 2018) for the Fairfax campus are 19.65 lbs. of nitrogen, 2.01 lbs. of phosphorus and 2,291.06 lbs. of total suspended solids. For the Science and Technology campus, the total combined load reductions required by the end of the first permit cycle are 2.88 lbs. of nitrogen, 0.26 lbs. of phosphorus, and 295.37 lbs. of total suspended solids. When combining the Fairfax and Science and Technology campuses, Mason's total required reduction is 22.53 lbs of nitrogen, 2.27 lbs of phosphorus, and 2,586.43 lbs of total suspended solids. Table 8 – Total Required Reduction for Mason summarizes the total required POC reductions for compliance with the first permit cycle (5%).

Table 8 - Total Required Reduction for Mason			
Campus	5% POC Required Reduction (lbs)		
	N	P	TSS
Fairfax / Science and Technology	22.53	2.27	2,586.43

Estimated POC Loads and Required Reductions from New and Grandfathered Sources

Mason's Design Manual (DM) governs the design, construction, renovation, and/or alteration of facilities or spaces on all of its campuses. Mason implemented the first DM in 2004 and has continued to revise the DM as required for consistency with revised regulations. The DM adopted the Commonwealth of Virginia's Stormwater Management Handbook (First Edition, 1999) for stormwater design compliance. Chapter 2 of the Virginia Stormwater Management Handbook (First Edition, 1999) requires stormwater management and BMP compliance by either utilizing the performance-based water quality criteria or the technology-based water quality criteria. Both the performance-based water quality criteria and the

technology-based water quality criteria are considered to be equivalent when implemented as described in the Virginia Stormwater Management Handbook.

The performance-based water quality criteria states that for land development, the calculated post- development nonpoint source pollutant runoff load shall be compared to the calculated pre-development load using the average land cover condition for the existing site. The average land cover condition in accordance with the Virginia Stormwater Management Handbook is described as followed:

“The definition of the average land cover condition is important to the successful implementation of the performance-based water quality criteria. An analysis of the Chesapeake Bay watershed identified the average land cover condition using the following categories: urban land use, forest cover, pasture land, conservation till acreage, and conventional till acreage. Using the pollutant load values from the N.U.R.P. studies, the average land cover condition was then used to establish a baseline existing land use condition pollutant load value of 0.45 lb./ac./yr. of phosphorous. Since the Simple Method is based on impervious cover, an equivalent percent impervious cover is needed. 16% impervious cover has been determined to be an equivalent pollutant load source for all of the urban and non-urban land uses which contribute nonpoint source pollution. These values (16% impervious cover and 0.45 lb./ac./yr. of phosphorous) represent the average land cover conditions for the Chesapeake Bay watershed. (Keep in mind that these values may be adjusted based on actual land use conditions within the locality or individual watersheds within the locality at the time of DCR or CBLAD program adoption, whichever occurred first.) This allows the designer to calculate, using the Simple Method, the pre- developed pollutant load using average land cover conditions, and the post-developed pollutant load using the project post-developed impervious cover. The difference between the pre- and post-developed pollutant load represents the increase in pollutant load which must then be controlled by an appropriate BMP.”

Since 16% impervious cover represents the average land cover condition for the Chesapeake Bay Watershed and the Virginia Stormwater Management Handbook (First Edition, 1999) requires the post- development pollutant runoff load to be consistent with the average land cover condition (16% impervious cover), it is assumed that the average land cover condition for post-development did not exceed 16% for “new sources” (construction initiated between June 30, 2009 and June 30, 2014) or “grandfathered” (construction initiated after July 1, 2014) projects on Mason’s campuses where the performance-based approach was utilized.

The technology-based water quality criteria states that for land development, the post-developed stormwater runoff from the impervious cover shall be treated by an appropriate BMP as required by the post-developed condition percent impervious cover as specified in Table 2-3 of the Virginia Stormwater Management Handbook (First Edition, 1999). Since the technology-based water quality criteria requires appropriate BMP implementation based on post-development stormwater runoff percent impervious cover, it is assumed that all “new sources” (construction initiated between June 30, 2009 and June 30, 2014) and “grandfathered” (construction initiated after July 1, 2014) projects on Mason’s campuses where the technology-based criteria was utilized were designed in accordance with the technology-based approach in the Virginia Stormwater Management Handbook (First Edition, 1999).

Because development projects on Mason’s campuses are designed in accordance with Mason’s DM and the Virginia Stormwater Management Handbook (First Edition, 1999), the post-development average land cover condition, after implementing appropriate BMPs should not exceed 16% imperviousness and therefore no additional load reductions for “new sources” and “grandfathered” projects is required. In conformity with Mason’s design review processes, all “new sources” and “grandfathered” projects plans and specifications are reviewed for compliance with the Virginia Stormwater

Management Handbook (First Edition, 1999) and for potential over design of BMPs that would provide Mason with additional BMP crediting.

Estimated POC Load Reductions from Existing BMPs

Mason reviewed all available plan information to determine the estimated load reductions from existing BMPs on both the Fairfax campus and the Science and Technology Campus. The Masonvale site plan prepared by Bowman Consulting located in the northwestern corner of the Fairfax campus shows a total of nine (9) BMPs that include dry ponds, rain gardens, vegetated swales and pervious pavement. The BMPs at the Masonvale site were oversized resulting in treatment surplus of N (2.681 lbs), P (0.389 lbs), and TSS (182.318 lbs). The Life Sciences Building site plan prepared by Timmons Group located in the middle of the Science and Technology campus shows a total of three (3) bioretention facilities. The bioretention basins at the Life Sciences Building were oversized resulting in a treatment surplus of N (1.518 lbs), P (0.22 lbs), and TSS (103.224 lbs). The BMPs at the Masonvale site and the Life Sciences Building provide a total treatment surplus of N (4.199 lbs), P (0.609 lbs) and TSS (285.542 lbs). Table 9 – Estimated POC Load Reductions from existing BMPs summarizes the total POC load that Mason can claim towards compliance with the 5% POC required load reductions.

Table 9 - Estimated POC Load Reductions from Existing BMPs				
BMP	N	P	TSS	Date Completed
Masonvale Site (lbs)	2.681	0.389	182.318	Oct. 2010
Life Sciences Building (3) Bioretention (lbs)	1.518	0.20	103.224	June 2011
Total (lbs)	4.199	0.609	285.542	

The Masonvale site initiated construction prior to June 30, 2009 and was completed between July 1, 2009 and June 30, 2014. The Masonvale site was designed to meet an average land cover condition of 16% or less. Therefore no additional offsets are required for the Masonvale site development.

After incorporating the Masonvale and Life Sciences Building BMP load reduction surplus (Table 9) from Mason's total 5% required reductions Mason is still required to provide reductions for N (18.606 lbs), P (1.677 lbs), and TSS (2,307.895 lbs) to comply with the 5% POC load reduction requirements. Table 10 – Total Required Reductions after Subtracting Estimated Load Reductions from Existing BMP Credit (lbs) summarizes Mason's total remaining required reductions for compliance with the 5% POC load reduction requirements.

Table 10 - Total Required Reductions After Subtracting Estimated Load Reductions from Existing BMPs (lbs)			
Total Required Reductions for Fairfax/PWC (lbs)	5% POC Required Reduction (lbs)		
	N	P	TSS
	22.53	2.27	2,586.43
Estimated POC Load Reductions from existing BMPs (lbs)	4.199	0.609	285.542
Total Remaining Reductions Required for 5% Permit Cycle (lbs)	18.606	1.677	2,307.895

Means and Methods Strategy, Schedule, and Estimated Costs

Mason intends to provide compliance for the remaining 5% POC load required reductions for N, P, and TSS shown in Table 10 – Total Required Reductions after Subtracting Estimated Load Reductions from Existing BMP Credit (lbs), through an approximate 250 linear foot urban stream restoration project on a zero to fifth order stream that is not tidally influenced and is located on the Fairfax campus. The 250 LF proposed urban stream restoration project will be located on Fairfax's main campus with the final location determined after a stream feasibility assessment (BANCS Assessment) has been completed for the Fairfax campus. Mason anticipates that the proposed 250 LF urban stream restoration project will provide 5% compliance with N (18.75 lbs), P (17.00 lbs), and TSS (11,220 lbs). The proposed urban stream restoration project will utilize the interim approved removal rates (0.075 lb/lf/yr for N, 0.068 lb/lf/yr for P, and 44.88 lb/lf/yr for TSS) within appendix V.J of the TMDL Action Plan Guidance dated May 18, 2015 and generated from the Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects, September 2014, to calculate the Total POC Removal Credit for the proposed 250LF urban stream restoration project. Table 12 – Estimated Stream Restoration Reduction POC Cost/LBS shows the approximate cost to remove N (18.75 lbs @ \$20,000/LB), P (17.00 lbs @ \$22,058.82/LB), and TSS (11,220 lbs @ \$33.42/LB).

Table 11 - Estimated Stream Restoration Reduction Credits			
Pollutant	N	P	TSS
Interim Approved Removal Rates (lbs/lf/year)	0.075	0.068	44.88
Stream Restoration Length (Linear Feet)	250	250	250
Total POC Removal Credit (lbs)	18.75	17.00	11,220.00

Table 12- Estimated Stream Restoration Cost and POC Cost/LBS						
Stream Restoration (Linear Feet)	*Unit Cost	Total Cost	POC Cost/LB			Notes
			N	P	TSS	
250	\$ 1,500	\$ 375,000	\$ 20,000.00	\$ 22,058.82	\$ 33.42	Meets 5% permit cycle requirements for all POC.

*Unit Cost information derived from Stream Restoration projects listed in Fairfax County DPWES Capital Projects Summary Reports dated April 2015. Does not include cost for stream feasibility assessment (BANCS Assessment).

In accordance with the TMDL Action Plan Guidance and the Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects, September 2014, Mason intends to perform urban stream restoration feasibility assessments for approximately 13,000 linear feet of stream on the Fairfax Campus to assure the location provided in this TMDL Action is appropriate and to determine future urban stream restoration project locations. Based on the results of the stream restoration feasibility assessment, Mason may adjust the location of their proposed stream restoration project to the most suitable location available. Table 13 – Mason Urban Stream Restoration Estimated Schedule and Costs shows the approximate schedule for this urban stream restoration project and estimated costs associated with this project.

Mason reserves the right to re-define the necessary actions to meet the required reduction.

Table 13 – Mason Urban Stream Restoration Estimated Schedule and Costs			
Permit Cycle	Year	Action	Estimated Cost
1	2015/2016	Stream Restoration Feasibility (BANCS Assessment)	\$50,000.00
	2016	Stream Restoration Design and Permitting (250 LF)	\$50,380.00
	2017	Stream Restoration Construction Activates	\$324,620.00
	2018		
Total			\$425,000.00

List of Future Grandfathered Projects

Mason does not have any future grandfathered projects to include in this TMDL Action Plan.

Public Comment Process

Mason encourages the public's involvement and participation in the development and implementation of its MS4 Program. In keeping with this objective, Mason posted a copy of its Draft Chesapeake Bay TMDL Action Plan on its website (<http://facilities.gmu.edu/ProjMgmtConst/LandDevelopment/ms4.cfm>) to solicit public comment on the draft plan. All comments received from the public were taken into consideration when developing the final version of the Action Plan that was submitted to DEQ with its MS4 Annual Report in October of 2015.

Conclusion

Mason developed this first permit term Action Plan as required in the 2013–2018 Phase II MS4 Permit Number VAR040106 and in accordance with the DEQ Guidance Document dated May 18, 2015. This TMDL Action Plan concludes that the first permit term pollutant reduction requirements calculated will be met by implementing the proposed urban stream restoration project identified in the Means and Methods Strategy, Schedule, and Estimated Costs section of this TMDL Action Plan. Mason reserves the right to modify this TMDL Action Plan as needed to maintain compliance with its Phase II MS4 Permit.