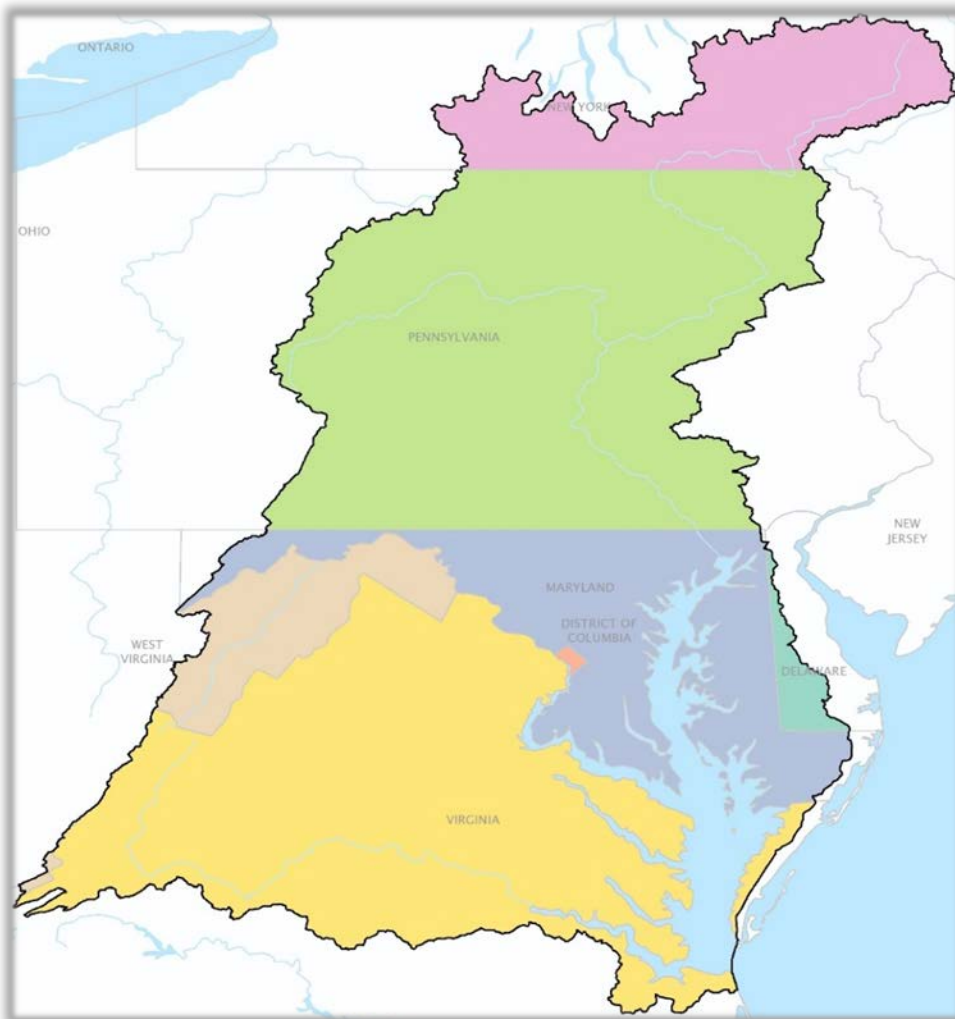


CHESAPEAKE BAY TMDL ACTION PLAN

(2013-2018 MS4 General Permit)

**A Plan for Achieving a 5%
Reduction of Existing Loads**

June 30, 2015



**Thomas Nelson
Community
College**



Historic Triangle Campus



Hampton Campus

This plan satisfies the requirements of Section I(C) of the MS4 General Permit (9VAC25-890-40) for Special Conditions for the Chesapeake Bay TMDL. This plan is consistent with the Chesapeake Bay TMDL and the Virginia Phase I and II WIPs to meet the Level 2 (L2) scoping run for existing developed lands as it represents an implementation of 5.0% of L2 as specified in the 2010 Phase I WIP.

EEE Consulting, Inc.



EXECUTIVE SUMMARY

Thomas Nelson Community College (TNCC), is authorized to discharge stormwater from its municipal separate storm sewer system (MS4) under the Virginia Pollutant Discharge Elimination System (VPDES) General Permit for Discharge of Stormwater from Small MS4s (MS4 General Permit). To maintain permit compliance, TNCC implements an MS4 Program Plan that includes best management practices (BMPs) to address six minimum control measures (MCMs) and special conditions for the Total Maximum Daily Load (TMDL) in which TNCC has been assigned a wasteload allocation (WLA). The Environmental Protection Agency (EPA) describes a TMDL as a “pollution diet” that identifies the maximum amount of a pollutant the waterway can receive and still meet water quality standards. A WLA determines the required reduction in pollutant of concern loadings from the MS4s to meet water quality standards. The MS4 General Permit serves as the regulatory mechanism for addressing the load reductions described in the TMDL, predominantly through the requirement of a TMDL Action Plan.

The Chesapeake Bay TMDL was established by the EPA on December 29, 2010 and initiated WLAs for phosphorus, nitrogen and total suspended solids. In response, the Commonwealth of Virginia developed Watershed Implementation Plans (WIPs) that, in part, identify the MS4 General Permit as a mechanism for enforcing load reductions in urban areas. Subsequently, the Commonwealth included special conditions into the latest MS4 General Permit to address the reductions required by the TMDL for the pollutants of concern. The WIPs intended the reductions to be achieved over the course of three 5-year permit cycles, with the first cycle (2013 – 2018) requiring 5% of the reductions be achieved. Reduction requirements for the following two permit cycles are anticipated to increase substantially, requiring an additional 35% and 60% of the reductions be achieved, respectively.

TNCC has developed an Action Plan consistent with the Chesapeake Bay Action Plan Guidance Memo (Memo No. 15-2005) provided by the Virginia Department of Environmental Quality (DEQ). The guidance was used to determine the required pollutant load reductions for each regulated campus, the Historic Triangle campus in the James River basin and the Hampton campus in the York River basin. Subsequently, the means and methods for achieving pollutant reductions required by the current MS4 General Permit within each basin were identified:

- Historic Triangle campus: required pollutant load reductions are achieved with an existing regional stormwater management facility that treats the entirety of the developed campus.
- Hampton campus: required pollutant load reductions will be achieved with implementation and documentation of street sweeping efforts.

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Acronyms

BMP	Best Management Practice
CGP	Construction General Permit
CUA	Census Urban Area
CWA	Clean Water Act
DEQ	Virginia Department of Environmental Quality
EOS	Edge of Stream
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
GIS	Geographic Information System
IDDE	Illicit Discharge Detection and Elimination
LA	Load Allocation
L2	Level 2
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
MS4 GP	General Permit for Discharge of Stormwater from Small MS4s
NMP	Nutrient Management Plan
POC	Pollutant of Concern
RLDA	Regulated Land Disturbing Activity
SWPPP	Stormwater Pollution Prevention Plan
SWM	Stormwater Management
TMDL	Total Maximum Daily Load
TNCC	Thomas Nelson Community College
VAC	Virginia Administrative Code
VCCS	Virginia Community College System
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program
WIP	Watershed Implementation Plan
WLA	Wasteload Allocation

Definitions

Best Management Practices (BMPs) are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface waters and groundwater systems.

Census Urbanized Area (CUA) are areas identified as urban by the Census Bureau. MS4 regulations only apply within CUAs.

Existing Sources are pervious and impervious urban land uses served by the MS4 as of June 30, 2009.

Impervious Cover is a surface composed of material that significantly impedes or prevents natural infiltration of water into soil.

L2 Scoping Run is a model run to determine required reductions from urban sources as of June 30, 2009. The L2 reductions are summarized in the following table:

Pollutant of Concern	Regulated Impervious (%)	Regulated Pervious (%)
Nitrogen	9	6
Phosphorus	16	7.25
Sediment	20	8.75

Municipal Separate Storm Sewer System (MS4) is a conveyance or system of conveyances otherwise known as a municipal separate storm sewer system (MS4), including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains that are:

- Owned or operated by a federal state, city, town, county, district, association, or other public body, created by or pursuant to state law that discharges to surface waters;
- Designed or used for collecting or conveying stormwater;
- That is not a combined sewer; and
- That is not part of a publicly owned treatment works.

New Sources are pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2009.

TNCC MS4 Program Plan is the guiding document of the TNCC's MS4 Program and includes best management practices to address conditions of the MS4 General Permit.

Pollutants of Concern (POC) are total nitrogen ("TN"), total phosphorus ("TP"), and total suspended solids ("TSS").

Prior Developed Lands are lands that has been previously utilized for residential, commercial, industrial, institutional, recreation, transportation, or utility facilities or structures, and that will have the impervious areas associated with those uses altered during a land-disturbing activity.

Transitional Sources are regulated land disturbing activities that are temporary in nature and discharge through the MS4.

1.0 INTRODUCTION AND PURPOSE

Mandated by Congress under the Clean Water Act (CWA), the National Pollutant Discharge Elimination System (NPDES) storm water program includes the Municipal Separate Storm Sewer System (MS4), Construction, and Industrial General Permits. In Virginia the NPDES Program is administered by the Department of Environmental Quality (DEQ) through the Virginia Stormwater Management Program (VSMP) and the Virginia Pollutant Discharge Elimination System (VPDES). John Tyler Community College (TNCC) is authorized to discharge stormwater from its MS4 under the VPDES General Permit for Discharge of Stormwater from Small MS4s (MS4 General Permit). As part of the MS4 General Permit authorization, TNCC developed and implements a MS4 Program Plan (the Plan) with best management practices (BMPs) to address the six minimum control measures (MCMs) and the special conditions for applicable total maximum daily loads (TMDLs) outlined in the MS4 General Permit. Implementation of these BMPs is consistent with the provisions of an iterative MS4 Program, which constitutes compliance with the standard of reducing pollutants to the "maximum extent practicable" or MEP.

"TNCC's MS4 program strives to improve environmental compliance, quality and stewardship through effective management, implementation, and enforcement."

The TNCC MS4 program strives to improve environmental compliance, quality and stewardship through effective management, implementation, and enforcement of sound technical guidelines, criteria and practices for stormwater management and erosion and sediment control. The plan presented herein demonstrates how TNCC's MS4 Program Plan addresses sediment and nutrients (nitrogen and phosphorus) in its MS4 regulated area consistent with the requirements of the Chesapeake Bay TMDL.

1.1 Total Maximum Daily Loads

A TMDL is the total amount of a given pollutant that a waterbody can assimilate and still meet water quality standards. Typically, TMDLs are represented numerically in three main components: Waste Load Allocations (WLAs), a Load Allocation (LA), and a Margin of Safety. A WLA is the allocated amount of pollutant from areas discharging through a pipe or other conveyance considered a point source. Point sources include sewage treatment plants, industrial facilities and storm sewer systems. In contrast, an LA is the amount of pollutant from existing non-point sources and natural background such as farm runoff and atmospheric deposition. As a point source discharge, MS4's are assigned a WLA representing the annual loading of the pollutant of concern (POC) that can be discharged from its regulated MS4 area.

1.2 MS4 General Permit Special Conditions

TNCC's MS4 General Permit includes a series of special conditions that must be addressed for permit compliance where TNCC has been assigned a WLA as part of an approved TMDL. The special conditions state that any TMDL approved by the State Water Control Board (SWCB) assigning a WLA to an MS4 must be addressed by the Permittee through the measurable goals of their MS4 Program Plan.

In 1998, large portions of Chesapeake Bay and its tidal tributaries within Virginia were identified as not meeting water quality standards and listed as impaired because of excess nitrogen, phosphorus and sediment. Due to the Chesapeake Bay waters remaining on the impaired waters list, the Environmental Protection Agency (EPA) required that a TMDL be developed, which was issued on December 29, 2010.

1.3 Watershed Implementation Plan and Strategy for MS4s

The Chesapeake Bay Watershed Implementation Plans (WIPs) are plans that detail how and when the six Chesapeake Bay states and the District of Columbia will meet pollutant allocations. In the Phase I and Phase II WIPs for the Chesapeake Bay TMDL, Virginia committed to a phased approach to reducing nutrients and suspended solids discharging from MS4s. The issuance of the 2013-2018 MS4 General Permit set forth special conditions required by all MS4 General Permit holders within the Chesapeake Bay watershed. In part, the special conditions require the permittee to achieve 5% of the required reductions identified in the so-called Level 2 Scoping Run from existing baseline loads by July 1, 2018. Baseline loads are defined as those occurring on June 20, 2009, and are computed using loading rates provided in the MS4 General Permit.

1.4 TNCC Chesapeake Bay Action Plan

The TNCC Action Plan presented herein provides a review of the current MS4 program, which demonstrates TNCC's ability to ensure compliance with the special conditions and includes the means and methods TNCC will use to meet 5.0% of the Level 2 (L2) scoping run reduction for existing development during the first MS4 General Permit cycle. This Action Plan was developed to comply with the special conditions of the MS4 General Permit (9VAC25-890) and under the advisement of DEQ's Guidance Memo No. 15-2005 (DEQ Guidance), which provides background information and procedures to meet the Chesapeake Bay TMDL special condition requirements.

2.0 APPLICABLE OVERVIEW OF TNCC'S MS4 PROGRAM

TNCC's MS4 General Permit regulates stormwater discharges from areas included within census urbanized areas (CUAs). TNCC campuses included in CUAs include the Historic Triangle and Hampton campuses, as depicted in Appendix A. TNCC's collective efforts, as described in the TNCC MS4 Program Plan, result in a significant reduction of pollutants that could potentially be discharged from its regulated MS4. BMPs already included in the TNCC Program Plan that address sediment and nutrients are described in the following sections. Each subsection is provided to address the referenced special condition in the MS4 General Permit.

2.1 Current Program and Existing Legal Authority

As a non-traditional MS4, TNCC does not have the ability to create legal authorities and has not identified any necessary legal authorities necessary to meet the requirements of the special conditions. However, TNCC's MS4 Program includes Minimum Control Measures (MCMs) that include policies and procedures consistent the goals of the Chesapeake Bay TMDL. A summary of the applicable MCMs is listed below to address the following special condition:

- ✓ *"A review of the current MS4 program implemented as a requirement of this state permit including a review of the existing legal authorities and the operator's ability to ensure compliance with this special condition."* [Section I(C)(2)(a)(1)]
- *MCM 1 (Public Education and Outreach)* – TNCC's MS4 Program includes a Public Education and Outreach Program (PEOP) that identifies the Chesapeake Bay TMDL pollutants of concern (POCs) as a high priority water quality issue. The PEOP is described in BMP 1.2 of the TNCC MS4 Program Plan and includes the distribution of educational materials regarding methods to reduce introduction of the POCs into stormwater runoff.
- *MCM 3 (Illicit Discharge Detection and Elimination)* – TNCC's MS4 Program includes an Illicit Discharge Detection and Elimination (IDDE) Program that includes written procedures to detect, identify, and address non-stormwater discharges, including illegal dumping, to the small MS4 with policies and procedures for when and how to use legal authorities. TNCC prohibits non-stormwater discharges into the storm sewer system through language provided within the Standards of Conduct for employees and the Student Handbook for students. IDDE BMPs are described in the Minimum Control Measure 3 BMPs in the TNCC MS4 Program Plan. The IDDE Program is effective at addressing the POC through staff training, prohibition of illicit discharges, and annual outfall screening.
- *MCM 4 (Construction Site Runoff Control)* – TNCC's MS4 Program includes a Construction Site Runoff Control Program that includes mechanisms to ensure compliance and enforcement on regulated construction sites with implementation of the DEQ-approved "*VCCS Annual Erosion and Sediment Control and Stormwater Management Standards and Specifications.*"

The standards and specifications are consistent with the Virginia Erosion and Sediment Control and Stormwater Management Laws and Regulations and includes:

- Required plan approval prior to commencement of a regulated land disturbance activity;
- Construction site inspections and enforcement; and
- Certification of post-construction stormwater management facilities.

The Construction Site Runoff Control Program is especially effective at reducing downstream conveyance of sediment from transitional sources. Minimum Control Measure 4 BMPs in the TNCC MS4 Program Plan describe construction site runoff control BMPs.

- *MCM 5 (Post-Construction Stormwater Management)* – TNCC’s MS4 Program includes a Post-Construction SWM Program that ensures water quality criteria in the Virginia Stormwater Management Regulations has been achieved on new developments and developments on prior developed land since July 1, 2009. Included among these requirements are written policies and procedures in the VCCS Erosion and Sediment Control and Stormwater Management Standards and Specifications to ensure that stormwater management facilities are designed and installed in accordance with appropriate law and regulations. Post-construction, the Program includes schedules and written procedures to ensure long-term inspections and maintenance of stormwater management BMPs. Minimum Control Measure 5 BMPs in the TNCC MS4 Program Plan describe post-construction stormwater management BMPs.

Implementation of this program addresses the following MS4 General Permit special conditions for the Action Plan to include:

- ✓ *“The means and methods that will be utilized to address discharges into the MS4 from new sources [Section I(C)(2)(a)(3)]*

- *MCM 6 (Good Housekeeping)* – TNCC’s MS4 Program includes a Pollution Prevention/Good Housekeeping Program that includes policies and procedures to ensure that day-to-day operations minimize the exposure of pollutants to rainfall on campus grounds to the maximum extent practicable. The program is supported with TNCC’s Pollution Prevention & Good Housekeeping Manual and annual training for applicable staff. TNCC also utilizes contract language to ensure appropriate certifications for application of fertilizers per a DEQ-approved Nutrient Management Plan. Minimum Control Measure 6 BMPs in the TNCC MS4 Program Plan describe pollution prevention and good housekeeping BMPs.

2.2 New or Modified Legal Authorities

Consistent with the MS4 General Permit, TNCC uses an iterative approach to ensure the College is minimizing the discharge of pollutants through its MS4 to the MEP. The iterative approach is implemented through the annual reporting process with the review of the effectiveness of each MS4 Program Plan BMP. BMPs are modified, as necessary, to increase effectiveness. If new or modified authorities are identified as part of the annual “measure of effectiveness” as described for each BMP in the PVCC MS4 Program Plan annual reporting, they will be reported through the annual report process. The iterative process addresses the following special condition in the MS4 General Permit:

- ✓ *“The identification of any new or modified legal authorities such as ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition.” [Section 1(C)(2)(a)(2)]*

As a non-traditional MS4, TNCC does not have the legal authority to create legal authorities. No new or modifications to existing policies and procedures were identified as necessary to meet the requirements of the special conditions. Means and methods to meet the special conditions are described in Section 4.

3.0 POLLUTANT LOADINGS

The MS4 General Permit requires TNCC to estimate the annual loadings and the POC load reductions (5.0% of the loads identified from the L2 Scoping Run). To complete this requirement, TNCC determined the amount of pervious and impervious land cover for their regulated campuses and input the data into the appropriate loading and reduction tables provided in the MS4 General Permit. The methodology to determine sediment and nutrient loadings and the required reductions are described in the following sub-sections.

3.1 Baseline Loading Characterization

Before estimating the loads and required reductions, TNCC first evaluated the extent of their regulated MS4 area, including the regulated acres of urban pervious and impervious surface served by its MS4 as of June 30, 2009. These evaluations were conducted using Geographic Information System (GIS) digitization and aerial photography, as depicted in Appendix A.

TNCC’s MS4 regulated area was calculated using the TNCC property boundaries as a conservative estimate of the areas the MS4 serves. Campus boundaries were obtained from James City County and City of Hampton GIS data. Aerial photography was obtained from the 2009 Virginia Base Map Program Orthophotography Program Aerials¹. The extent of pervious, impervious and forest areas were digitized based on the aerial imagery and best professional judgment. For areas that were under construction or disturbed in the 2009 aerial imagery, current aerial images were used to determine whether the areas resulted in pervious or impervious surfaces after construction. Baseline land cover results are provided in Table 1. The determination of regulated area was based on the 2010 CUA.

Table 1: Classification of Campus Land Cover Area (Acres)

Land Cover	Historic Triangle Campus	Hampton Campus
Impervious	9.56	40.8
Pervious	7.26	17.7
Forest*	30.41	33.7
Surface Water*	0.0	0.22

* Consistent with methodology described in the DEQ Guidance, these areas are not included in the loading computations described in Section 3.2.

3.2 Annual Loadings from Existing Sources

The data summarized in Table 1 was used to estimate pollutant loads from existing sources as of June 30, 2009 using the James River basin and York River basin calculation sheets provided in the MS4 General Permit for estimating existing source loads. A calculation sheet was completed for

¹ Virginia Base Map Program Orthophotography Program, 2009. <http://www.vita.virginia.gov/isp/default.aspx?id=8412>

each regulated TNCC campus as provided in Tables 2 and 3 which address the following special condition:

- ✓ *“An estimate of the annual POC loads discharged from the existing sources as of June 30, 2009, based on the 2009 progress run. The operator shall utilize the applicable versions of Tables ... based on the river basin to which the MS4 discharges by multiplying the total existing acres served by the MS4 on June 30, 2009, and the 2009 Edge of Stream (EOS) loading rate.” [Section I(C)(2)(a)(4)]*

Table 2: Baseline loadings from the Historic Triangle Campus in the James River Basin

Pollutant	Regulated Urban Land Cover	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre)	Estimated Total POC Load Based on 2009 Progress Run (lbs)	Total Load (lbs)
Nitrogen	Impervious	9.56	9.39	89.77	140.52
	Pervious	7.26	6.99	50.75	
Phosphorus	Impervious	9.56	1.76	16.83	20.46
	Pervious	7.26	0.5	3.63	
TSS	Impervious	9.56	676.94	6,471.55	7,205.39
	Pervious	7.26	9.39	89.77	

Table 3: Baseline loadings from the Hampton Campus in the York River Basin

Pollutant	Regulated Urban Land Cover	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre)	Estimated Total POC Load Based on 2009 Progress Run (lbs)	Total Load (lbs)
Nitrogen	Impervious	40.8	7.31	298.25	433.65
	Pervious	17.7	7.65	135.41	
Phosphorus	Impervious	40.8	1.51	61.61	70.64
	Pervious	17.7	0.51	9.03	
TSS	Impervious	40.8	456.68	18,632.54	19,911.90
	Pervious	17.7	72.28	1,279.36	

3.3 Annual Loadings from New Sources and Grandfathered Projects

In addition to computing baseline loadings from existing conditions as of June 30, 2009, the special conditions require the determination of offsets for increased loads from development occurring on or after July 1, 2009, including grandfathered projects. No offsets are necessary for new sources since:

- Loadings from new sources are addressed with the water quality criteria in the stormwater management regulations. Water quality criteria for new sources from regulated development between July 1, 2009 and June 30, 2014 was based on an average land cover condition of 16% and therefore appropriate offsets were incorporated within the development project’s stormwater management plan.
- No TNCC projects are grandfathered.

Since no offsets for new sources are necessary, the following special conditions are addressed:

- ✓ *“A list of future projects and associated acreage that qualify as grandfathered in accordance with 9VAC25-870-48” [Section I(C)(2)(a)(10)]*
- ✓ *“The means and methods to offset the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2014, that disturb one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities. The operator shall offset 5.0% of the calculated increased load from these new sources during the permit cycle.” [Section I(C)(2)(a)(7)]*
- ✓ *“The means and methods to offset the increased loads from projects as grandfathered in accordance with 9VAC25-870-48, that disturb one acre or greater that begin construction after July 1, 2014, where the project utilizes an average land cover condition greater than 16% impervious cover in the design of post-development stormwater management facilities.” [Section I(C)(2)(a)(8)]*
- ✓ *“Implementation of the means and methods to address discharges from new sources in accordance with the minimum control measure in Section II ... related to post-construction stormwater management in new development and development of prior developed lands and in order to offset 5.0% of the total increase in POC loads between July 1, 2009, and June 30, 2014. Increases in the POC load from grandfathered projects initiating construction after July 1, 2014, must be offset prior to completion of the project.” [Section I(C)(3)(c)]*

3.4 Required Load Reductions

The MS4 General Permit requires TNCC to reduce 5.0% of the L2 Scoping Run POC reductions for existing sources as of June 30, 2009. The required load reductions for both campuses for this permit cycle were calculated using the calculation sheets in the MS4 General Permit for determining POC reductions for the James River and York River basins. The calculation sheets were modified with the corrected loading rates provided in DEQ’s Guidance. Required load reductions for each campus are depicted in Tables 4 and 5. Since each regulated campus is in a different river basin, reductions are campus-specific and may not be combined. The information in the tables addresses the following special condition to provide:

- ✓ *“A determination of the total pollutant load reductions necessary to reduce the annual POC loads from existing sources utilizing the applicable versions of Tables ... based on the river basin to which the MS4 discharges. This shall be calculated by multiplying the total existing acres served by the MS4 by the first permit cycle required reduction in loading rate. For the purposes of this determination, the operator shall utilize those existing acres identified by the 2000 U.S. Census Bureau urbanized area and served by the MS4.” [Section I(C)(2)(a)(5)]*

Table 4: Estimated POC Reductions for the Historic Triangle Campus in the James River Basin

Pollutant	Regulated Urban Land Cover	Existing Acres Served by MS4 (06/30/09)	Reduction in Loading Rate (lbs/acre)	Reduction Required First Permit Cycle (lbs)	Total Reduction (lbs)
Nitrogen	Impervious	9.56	0.042255	0.404	0.56
	Pervious	7.26	0.02097	0.152	
Phosphorus	Impervious	9.56	0.01408	0.14	0.15
	Pervious	7.26	0.0018125	0.01	
TSS	Impervious	9.56	6.7694	64.72	67.93
	Pervious	7.26	0.442225	3.21	

Table 5: Estimated POC Reductions for the Hampton Campus in the York River Basin

Pollutant	Regulated Urban Land Cover	Existing Acres Served by MS4 (06/30/09)	Reduction in Loading Rate (lbs/acre)	Reduction Required First Permit Cycle (lbs)	Total Reduction (lbs)
Nitrogen	Impervious	40.8	0.032895	1.34	1.75
	Pervious	17.7	0.02295	0.41	
Phosphorus	Impervious	40.8	0.01208	0.493	0.53
	Pervious	17.7	0.00184875	0.033	
TSS	Impervious	40.8	4.5668	186.33	191.97
	Pervious	17.7	0.3184125	5.64	

4.0 MEANS TO ACHIEVE POLLUTANT REDUCTIONS

DEQ's Guidance was used to identify appropriate means and methods for achieving the required reductions computed in Section 3.4. The means and methods are described in the following subsections and will be incorporated into the TNCC MS4 Program Plan for implementation, addressing the following MS4 General Permit special condition:

- ✓ *"Implementation of means and methods sufficient to meet the required reductions of POC loads from existing sources in accordance with the Chesapeake Bay TMDL Action Plan." [Section I(C)(3)(d)]*

POC load reductions described in this section demonstrate compliance with the reduction requirements for this MS4 General Permit cycle with the understanding that any changes in established BMP efficiencies will not be retroactively applied to projects approved to meet reductions for this MS4 General Permit cycle.

4.1 Reductions for the Historic Triangle Campus

Consistent with the DEQ Guidance, certain credits from historic water quality BMPs can be credit towards pollutant load reductions requirements. Specifically, permittees can receive full credit from BMPs that were:

- Initially installed on or after January 1, 2006 and prior to July 1, 2009, and;
- Constructed to address water quality within the permittee's regulated service area.

The entirety of the Historic Triangle campus is treated by a regional water quality BMP, as described in the *Thomas Nelson Community College Historic Triangle Campus 2013-2028 Stormwater Master Plan* (Historic Triangle Master Plan). The BMP is designed as a "wet extended detention pond" and was completed in October 2006. The *Historic Triangle Master Plan*, available by request, includes the water quality computations for the BMP that are summarized in Appendix B for the purposes of this Action Plan. A description of the computational rationale is described as follows:

- I. Computations, as described in the *Historic Triangle Master Plan*, demonstrate that the total required phosphorus reductions required for the Historic Triangle campuses 15-year build-out (representative of the campuses' full build-out) is 18.92 pounds. Computations also show that 23.34 pounds of phosphorus are available to the campus from the regional BMP, a surplus of 4.42 pounds (23.34 – 18.92). The additional pollutant removal is a result of a BMP with an efficiency higher than would be necessary to achieve reductions required by the Virginia Stormwater Management Program (VSMP) regulations and a buildout that results in less impervious cover than originally incorporated into the design of the BMP.

- II. A letter provided by James City County states that the County is agreeable to allowing the remaining phosphorus credits provided by the BMP be used towards the reductions required for the campus as part of the TNCC Chesapeake Bay Action Plan. Therefore, it is established that 4.42 pounds of phosphorus are available for use towards Chesapeake Bay TMDL reduction requirements.
- III. The DEQ Guidance allows for full credit for BMPs constructed between January 1, 2006 and prior to July 1, 2009. Although the regional BMP treating the Historic Triangle campus was designed to treat the current buildout (built after January 1, 2006 and July 1, 2009) and for the full future buildout, only the credit for the current buildout is taken in this Action Plan. Using the Simple Method, the *Historic Triangle Master Plan* finds that the BMP provides 1.45 lbs of phosphorus reduction per impervious acre. Since the buildout between January 1, 2006 and prior to July 1, 2009 equals 9.12 impervious acres, 13.22 lbs of phosphorus are available for full credit towards the required Chesapeake Bay reductions. Corresponding nitrogen and TSS removal from the BMP is found to be 22.89 and 5,564.9 pounds, respectively. Computations are summarized in Appendix B. A summary of required reductions and reductions achieved by the regional BMP are summarized in Table 6. Reductions exceed 100% of the reductions required by the L2 Scoping Run.

It is noted that the reductions determined in the *Historic Triangle Master Plan* were without the benefit of the existence of the DEQ Guidance and therefore did not reflect the full credit applicable for the water quality BMP treating the buildout between January 1, 2006 and July 1, 2009. Subsequent revisions to the *Historic Triangle Master Plan* will reflect this Action Plan.

Table 6: Summary of POC Reductions from the Warhill Pond

Pollutant	Reductions Required by L2 Scoping Run	
	Run (lbs/yr)	Reductions Provided by Existing BMP (lbs/yr)
Nitrogen	0.56	22.89
Phosphorus	0.15	13.22
TSS	67.93	5,564.90

To receive credit for BMPs installed on or after January 1, 2006 and prior to July 1, 2009, permittees will be required to include the following in their Action Plan:

1. An affirmative statement that a complete list, to the maximum extent practicable, of historical BMPs was submitted to the Department by September 1, 2015. The affirmation statement is provided in Appendix C.

2. Appropriate calculations for the BMPs that the permittee is claiming for credit towards its required POC load reductions. Computations are provided in Appendix B and supported in additional depth within the *Historic Triangle Master Plan* that is available upon request.

4.2 Reductions for the Hampton Campus

The regional water quality BMP described in the previous section is located within the James River basin. Since nutrient and sediment credits are not transferrable between Chesapeake Bay basins, credit from the BMP may only be applied to satisfy reduction requirements for the TNCC Historic Triangle Campus. A review of existing BMPs at the Hampton campus did not identify BMPs that could identify existing credit in accordance with DEQ’s Guidance.

To achieve the required reductions at the Hampton campus, TNCC will implement a street sweeping program. The “mass loading approach,” as described in DEQ’s Guidance, was utilized to determine the extent of street sweeping efforts necessary. Per the mass loading approach, the overall weight of material collected through street sweeping is multiplied by a dry weight factor and then a factor specific to each POC in order to quantify the pollutant reductions achieved. Given the target pollutant reductions and the dry weight and POC factors, it was determined that TNCC must collect a minimum of 1,000 pounds of material per year to meet all POC reduction requirements. Required reductions and sweeping efforts are summarized in Table 7.

Table 7: Required Street Sweeping per the Mass Loading Approach

Pollutant	Reductions Required by L2 Scoping Run (lbs/yr)	Dry Weight Factor	POC Multiplication Factor	Required Street Sweeping Material Weight (lbs/yr)
Nitrogen	1.75	0.7	.0025	1,000.0*
Phosphorus	0.53	0.7	.001	757.1
TSS	191.97	0.7	0.3	914.1

* Necessary to receive required reductions for each pollutant.

5.0 IMPLEMENTATION TO THE MEP

Implementation of the Action Plan is dependent on continued execution of the TNCC MS4 Program Plan. MS4 Program Plan BMPs will continue to be implemented per the schedules outlined in the TNCC MS4 Program Plan to address the following special condition:

- ✓ *“The means and methods, such as management practices and retrofit programs that will be utilized to meet the required reductions included in subdivision 2 a (5) of this subsection ... and a schedule to achieve those reductions. The schedule should include annual benchmarks to demonstrate the ongoing progress in meeting those reductions.”* [Section I(C)(2)(a)(6)]

The cost associated with street sweeping to achieve the minimum material collection of 1,000 pounds per year is estimated to be approximately \$625 per year. This estimate is based on cost information provided by TNCC related to past street sweeping efforts and does not include capital costs of equipment already owned by TNCC. This statement addresses the following special condition:

- ✓ *“An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle.”* [Section I(C)(2)(a)(11)]

5.1 Supplemental Means and Methods

The Minimum Control Measure BMPs described in Section 2.1 will continue to be implemented by TNCC as part of the TNCC MS4 Program Plan. Continued implementation of these BMPs, in addition to the means and methods described in Section 4, demonstrates implementation of the TNCC Chesapeake Bay Action Plan to the maximum extent practicable and demonstrate adequate progress satisfying the following special conditions:

- ✓ *“Implementation of nutrient management plans ...”* [Section I(C)(3)(a)]
- ✓ *“Implementation of the minimum control measure ... related to construction site stormwater runoff control in accordance with this state permit shall address discharges from transitional sources.”* [Section I(C)(3)(b)]

5.2 Public Comment Period

Prior to the submittal of this Action Plan, TNCC will solicit public comment on this Action Plan. TNCC will consider all comments that are provided. Public comment will be provided through the following means:

- A draft of the Chesapeake Bay TMDL Action Plan will be posted on TNCC’s website for a minimum of 14 total days.
- An email will be sent to the target audience audiences identified in Minimum Control Measure 1 of the TNCC MS4 Program Plan with a link where the public may comment on the Action Plan.

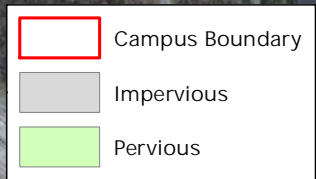
Solicitation of public comment on the Action Plan addresses the following special condition:

- ✓ *“An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan.”* [Section I(C)(2)(a)(12)]

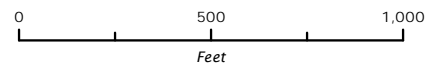
5.3 Annual Reporting

The effectiveness of the Action Plan will be measured through the MS4 General Permit annual reporting requirement. TNCC will report annually on the implementation on the BMPs described in Section 4.1 of this Plan.

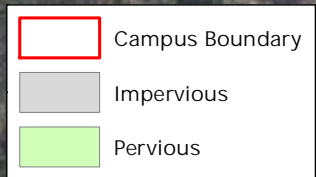
Appendix A: Mapping for Characterization of TNCC Campuses



**HAMPTON CAMPUS
IMPERVIOUS AND PERVIOUS LAND COVER
THOMAS NELSON COMMUNITY COLLEGE**



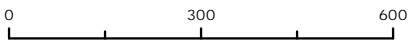
Hampton, Virginia
Sources: 2009 VGIN Imagery
Prepared by Brian Brown, May 14, 2015




EEE Consulting, Inc.
Environmental, Engineering and Educational Solutions



**HISTORIC TRIANGLE CAMPUS
IMPERVIOUS AND PERVIOUS LAND COVER
THOMAS NELSON COMMUNITY COLLEGE**



James City, Virginia
Sources: 2009 VGIN Imagery
Prepared by Brian Brown, May 14, 2015

Appendix B: Supporting POC Reduction Calculations

Background: The regional BMP treating the entirety of the Historic Triangle campus treats a total of 187.72 acres, including an intended full buildout of the watershed that includes 58.77 acres of impervious cover, resulting in a watershed that is 31.3% imperviousness. The design allocated 25.22 acres of the built-out impervious cover to the Historic Triangle campus. Water quality computations are based on the Simple Method that is based on impervious cover and was the applicable computational method at the time of the development. The phosphorus loading to the BMP and the achieved reductions (based on the BMP receiving a 60% removal efficiency credit) is computed as:

$$L_{removed\ TP} = \{[0.05 + (0.009 \times I_{post})] \times DA \times 2.28\} \times 0.60$$

Where:

$L_{removed}$ = Post-development load reduction achieved by the BMP (pounds per year)

I_{post} = Post-development % impervious cover to BMP (percent in whole number)

DA = Drainage area to BMP (acres)

0.60 = Pollutant removal fraction for BMP (retention pond)

Therefore:

$$L_{removed\ TP} = \{[0.05 + (0.009 \times 31.3)] \times 187.72 \times 2.28\} \times 0.60 = 85.2 \text{ pounds TP per year}$$

Since the BMP is designed to treat a full buildout of 58.77 impervious acres, the total reduction is divided by the total acres to be treated to determine the phosphorus reduction per acre as:

$$L_{removed\ TP/acre} = \frac{85.2 \text{ pounds per year}}{58.77 \text{ acres}} = 1.45 \text{ pounds TP per acre per year}$$

The water quality BMP serves as treatment for 9.12 acres of impervious cover built between January 1, 2006 and prior to July 1, 2009. Therefore, the following phosphorus load reduction is credited towards the Historic Triangle campus Chesapeake Bay reductions requirements:

$$L_{removed\ TP} = 9.12 \text{ acres} \times 1.45 \text{ pounds per acre} = 13.22 \text{ lbs TP per year}$$

To determine the nitrogen and sediment reductions achieved, the total phosphorus load to the BMP is first found as:

$$L_{post\ TP} = \{[0.05 + (0.009 \times 31.3)] \times 187.72 \times 2.28\} = 142 \text{ pounds TP per year}$$

Next, Table 4: Ratio of Phosphorus Loading Rate to Nitrogen and Total Suspended Solids Loading Rates for Chesapeake Bay Basins, as provided in the MS4 General Permit, is used to determine the nitrogen and phosphorus loads in the James River basin to the BMP as:

$$L_{post\ TN} = 142 \text{ pounds TP} \times 5.2 \frac{\text{pounds TN}}{\text{pound TP}} = 738.4 \text{ pounds of TN per year}$$

$$L_{post\ TSS} = 142 \text{ pounds TP} \times 420.9 \frac{\text{pounds TSS}}{\text{pound TP}} = 59,767.8 \text{ pounds of TSS per year}$$

With the loads to the BMP computed, the achieved reductions are determined based on the removal efficiencies for nitrogen (20%) and sediment (60%) provided in DEQ's Chesapeake Bay Guidance as:

$$L_{removed\ TN} = 738.4 \text{ pounds of TN per year} \times 0.2 = 147.68 \text{ pounds of TN per year}$$

$$L_{removed\ TSS} = 59,767.8 \text{ pounds of TSS per year} \times 0.60 = 35,860.68 \text{ pounds of TSS per year}$$

Following a similar approach as the determination of phosphorus reductions, the total loadings removed are divided by the total impervious acres considered for the full buildout of the drainage area to the BMP (58.77 acres) as:

$$L_{removed\ TN} = \frac{147.68 \text{ pounds of TN per year}}{58.77 \text{ acres}} = 2.51 \text{ pounds TN per imp. acre}$$

$$L_{removed\ TSS} = \frac{35,860.68 \text{ pounds of TSS per year}}{58.77 \text{ acres}} = 610.19 \text{ pounds TSS per imp. acre}$$

The water quality BMP serves as treatment for 9.12 acres of impervious cover built between January 1, 2006 and prior to July 1, 2009. Therefore, the following nitrogen and sediment load reductions are credited towards the Historic Triangle campus Chesapeake Bay reductions requirements:

$$L_{removed\ TN} = 9.12 \text{ acres} \times 2.51 \text{ pounds per acre} = 22.89 \text{ lbs TN per year}$$

$$L_{removed\ TSS} = 9.12 \text{ acres} \times 610.19 \text{ pounds per acre} = 5,564.90 \text{ lbs TSS per year}$$

Appendix C: BMP Reporting Affirmation Statement

AFFIRMATION

"I certify that a complete list, to the maximum extent practicable, of historical BMPs was submitted to the Department by September 1, 2015."

Printed Name: _____ Title: _____

Signature: _____ Date: _____