

Action Plan for the Neabsco Creek Bacteria TMDL

(2013-2018 MS4 General Permit)

**A Plan to Address NOVA's
Assigned Waste Load Allocation
for the Woodbridge Campus**

**Northern Virginia
Community
College**



Woodbridge Campus

Permit # VAR040095
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This document addresses Section 1, Part B, of the General Virginia Pollution Discharge Elimination System Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer System. This document serves as a specific Total Maximum Daily Load Action Plan to identify the best management practices and other interim milestone activities to be implemented to address the bacteria waste load allocation assigned to NOVA's regulated MS4 area in the "Bacteria TMDL for Neabsco Creek, Prince William County, Virginia," approved by the State Water Control Board on April 28, 2009.

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EXECUTIVE SUMMARY

Northern Virginia Community College (NOVA), 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, NOVA 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 Loads (TMDL) in which NOVA 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 purpose of this Action Plan is to address the WLA assigned to the NOVA Woodbridge campus for the Neabsco Creek Bacteria TMDL in accordance with the special conditions in the MS4 General Permit. The TMDL entitled the “*Bacteria TMDL for Neabsco Creek, Prince William County, Virginia,*” and approved by the Department of Environmental Quality on April 28th, 2009, assigns an aggregated WLA to NOVA, Prince William County, Prince William County Public Schools, and the Virginia Department of Transportation – Northern Urban Area (VDOT) for *Escherichia coli* (*E.coli*) of 1.05×10^{12} cfu/day which is equivalent to a 71% from the existing conditions. The Action Plan addresses *E.coli* in accordance with the special conditions, demonstrating that NOVA uses an adaptive iterative approach to reduce or eliminate the pollutant to the maximum extent practicable. Compliance to the special conditions is demonstrated within the Action Plan through:

- ✓ Implementation of NOVA MS4 Program Best Management Practices (BMPs) and associated policies and procedures;
- ✓ BMPs integrated into the NOVA MS4 Program Plan beyond those required by the permit;
- ✓ Enhancement of the NOVA MS4 Public Education and Outreach Plan;
- ✓ An assessment of campus facilities;
- ✓ A methodology to measure Action Plan effectiveness through MS4 annual reporting.

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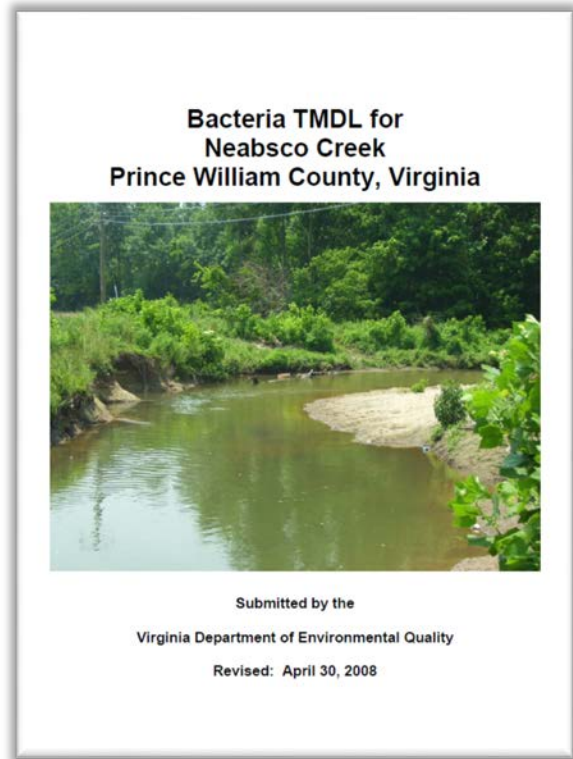
Acronyms

BMP	Best Management Practice
CUA	Census Urban Area
CWA	Clean Water Act
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
IDDE	Illicit Discharge Detection and Elimination
LA	Load Allocation
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MOS	Margin of Safety
MS4	Municipal Separate Stormwater Sewer System
MS4 GP	General Permit for Discharge of Stormwater from Small MS4s
NPDES	National Pollutant Discharge Elimination System
SWPPP	Stormwater Pollution Prevention Plan
SWM	Stormwater Management
TMDL	Total Maximum Daily Load
VAC	Virginia Administrative Code
VSMP	Virginia Stormwater Management Program
WLA	Wasteload Allocation

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 Virginia Department of Environmental Quality (DEQ) through the Virginia Stormwater Management Program (VSMP) and the Virginia Pollutant Discharge Elimination System (VPDES). Northern Virginia Community College (NOVA) 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, NOVA developed and implements a MS4 Program 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), as outlined in the MS4 General Permit. Implementation of these BMPs is consistent with the provisions of an iterative MS4 Program constituting compliance with the standard of reducing pollutants to the "maximum extent practicable" or MEP.



In 2002, the DEQ listed Neabsco Creek on their biennial 303(d) TMDL Priority List and Report due to violations of the state's water quality standard for fecal coliform bacteria, now expressed as *E. coli*. As a consequence, a TMDL was developed and approved on April 28, 2009 by the State Water Control Board (SWCB). The TMDL assigned MS4 Permit holders a waste load allocation (WLA) for *E. coli* discharges. The WLA represents the allowable *E. coli* load from the MS4s to prevent instances of exceedance of *E. coli* discharge water quality standards. The TMDL calculated the WLA for MS4 regulated areas to be 1.05×10^{12} colony forming units per day (cfu/day), representing a 71% reduction in the existing loading.

1.1 Total Maximum Daily Loads

A TMDL is the total maximum daily load, or the amount of pollutant a water body can assimilate and still meet water quality standards for its designated use. Typically, TMDLs are represented numerically in three main components:

- Wasteload Allocations (WLA) for point source contributions and MS4 Permit operators
- Load Allocations (LA) for non-point source contributions and natural background sources

- Margin of Safety (MOS)

Point source pollution is any single identifiable source from which pollutants are discharged. If point source discharges, including a permitted MS4, are present in the TMDL watershed, then any allocations assigned to that permittee must be in the form of a WLA. The NOVA Woodbridge campus's MS4 outfalls are defined as point source discharges and therefore fall under this category in the TMDL. Pollution that is not from an identifiable source, such as a pipe or a ditch, but rather originates from multiple sources over a relatively large area, are considered to be non-point source pollution. These sources are typically categorized into agricultural, livestock, and wildlife, with Load Allocations (LAs) assigned for each. The Margin of Safety (MOS) is a required component that accounts for the modeling uncertainty in the response of the waterbody to loading reductions and is implicitly incorporated into a TMDL computation. The TMDL is expressed in the following equation:

$$\text{TMDL} = \sum \text{WLA} + \sum \text{LA} + \text{MOS}$$

The Neabsco Creek TMDL represents the sum of calculable sources plus a margin of safety that is required to not exceed the state water quality standard for recreation of a 30-day geometric mean of 126 cfu/100 ml and an instantaneous water quality standard of 235 cfu/100 ml. The cfu/ml unit represents a volumetric concentration of viable bacteria cells that can multiply under controlled conditions.

1.2 TMDL Special Conditions

NOVA operates a portion of their regulated MS4 within the Neabsco Creek TMDL watershed, at the Woodbridge campus, and is therefore subject to the TMDL WLAs assigned to MS4s in the TMDL. The special conditions for the TMDL listed in the MS4 General Permit require NOVA to develop a TMDL Action Plan that identifies the BMPs and other interim milestone activities to be implemented during the remaining terms of this state permit and specifically:

- Includes a list of legal authorities applicable to reducing discharge of *E.coli* from the MS4
- A list of management practices and controls, beyond those required within the six minimum control measures of the MS4 General Permit, that are implemented as part of NOVA's MS4 Program and applicable to reductions in *E.coli* discharge from the MS4;
- Enhancement of the NOVA Public Education and Outreach Plan (PEOP) and employee training program to promote methods to eliminate and reduce discharges of *E.coli* into the NOVA's MS4;
- An identification and assessment of facilities that are owned and operated by the MS4, not covered under a separate VPDES permit, with the potential (greater than the average expected loading) to be significant sources of *E.coli* discharge to the MS4;
- A methodology to assess the effectiveness of the NOVA Action Plan in reducing the discharge of *E.coli* from the college's applicable MS4 campuses.

1.3 NOVA Neabsco Creek Action Plan

The purpose of the NOVA Action Plan for the Neabsco Creek Bacteria TMDL is to address each of the MS4 General Permit special conditions listed in Section 1.2. As an adaptive and iterative approach to meet surface water quality goals, the Action Plan may be revised from time to time to reduce *E.coli* discharges from NOVA’s MS4 at the Woodbridge campus to the maximum extent practicable (MEP). The Action Plan is incorporated, by reference, into NOVA’s MS4 Program Plan, which outlines the best management practices that address the entirety of the conditions set forth in the MS4 General Permit.

2.0 THE NEABSCO CREEK TMDL

The “*Bacteria TMDL for Neabsco Creek, Prince William County, Virginia*” assigns a WLA for the pollutant *Escherichia coli*, commonly abbreviated as *E. coli*. This particular bacteria is typically found in the lower intestines of warm-blooded organisms. Certain strains of the bacteria can be harmful and can survive for a limited amount of time outside of a



host. Fecal contamination from these organisms, if ingested by another host, can cause serious poisoning. A WLA was calculated for existing point sources, including MS4 permit operators, along with LAs and the MOS to meet the water quality standard and reduce the risk of waterborne illness. MS4 allocations were based on each share of the contributing urbanized area in the TMDL watersheds. The TMDLs were established based on a scenario where no violations of either the *E. coli* geometric mean standard or the instantaneous *E. coli* standard would occur. The scenario results in the following reductions:

- 79% reduction from direct wildlife sources
- 20% reduction from pet sources
- 1% reduction from direct livestock sources

2.1 NOVA Wasteload Allocation

NOVA, Prince William County, Prince William County Public Schools, and the Virginia Department of Transportation – Northern Urban Area (VDOT) received an aggregated WLA of 1.05×10^{12} cfu/day which is equivalent to a 71% from the existing conditions. Since wildlife is understood as a significant contributor or cause for violations of the state water quality standard for *E. coli*, DEQ acknowledges that it may not be possible to meet the standard, and therefore required reductions. It is also noted that the Environmental Protection Agency (EPA) neither encourages

nor supports the practice of wildlife reductions if other implementation strategies to address anthropogenic sources can be achieved.

The TMDL does not identify specific strategies for reduction of wildlife sources beyond the understanding that direct reduction of 'nuisance' populations by local stakeholders is possible. Anthropogenic sources are the primary targets in the TMDL for reduction to the MEP. Future studies of the effectiveness of exhaustive efforts to reduce anthropogenic sources may result in a re-designation of the water body by DEQ for secondary contact recreation, a lowering of the water quality standard. This designation would require demonstration that typical recreational uses would include only those which have a low probability for total body immersion or ingestion of waters and that the background contamination is natural. Other than wildlife, the TMDL allocation scenario focuses on pet and livestock sources, neither of which are of high relevance to the NOVA Woodbridge campus.

3.0 WOODBRIDGE CAMPUS CHARACTERIZATION

The Neabsco Creek watershed is located entirely within the boundary of Prince William County, in piedmont physiographic region of northern Virginia, and encompasses approximately 15.6 square miles (10,009 acres). A review of the NVC's campuses finds the Woodbridge campus as the only campus subject to the TMDL. The NOVA Woodbridge Campus is located in the lower portion of the watershed, within less than ¼ mile of Neabsco Creek. The creek continues southeast until reaching the Potomac River, which drains to the Chesapeake Bay.

3.1 Potential Campus Sources of *E.coli*

The TMDL considered potential sources of *E. coli* bacteria from both point source and non-point source contributions within the Neabsco Creek watershed. These sources include sanitary sewer systems and septic systems, livestock, nonpoint agricultural, urban runoff, and wildlife. Of these sources, urban runoff (pet waste and facilities) and wildlife are potentially applicable to NOVA's MS4.

3.1.1 Pet Waste

The Woodbridge campus is not in close vicinity to residential areas and therefore pets are not typically observed on campus. Therefore, pet waste is not considered an *E.coli* source from the Woodbridge campus.

3.1.2 Facilities

A field inspection of NOVA facilities at the Woodbridge campus did not identify any facilities that would be a significant source of *E.coli*. The conclusion based on site inspection addresses the following special condition:

- ✓ *Assess all significant sources of pollutant(s) from facilities of concern owned and operated by the MS4 operator that are not covered under a separate VPDES permit and identify all municipal facilities that may be a significant source of the identified pollutant. [Section I(B)(2)(b)]*

Although not a significant source, facilities associated with the campus solid waste stream, such as maintenance buildings and dumpsters, could potentially be a source. However, the *NOVA Good Housekeeping and Pollution Prevention Manual*, along with annual staff training, addresses these concerns with the implementation of best management practices (i.e. keeping dumpsters covered).

3.1.3 Wildlife Sources

The TMDL indicates that removal of all anthropogenic sources of *E. coli* would not allow the Neabsco Creek watersheds to meet water quality standards, as wildlife input by itself exceeds the maximum load for the recreational designation. Neither DEQ nor EPA propose elimination of wildlife to allow for attainment of this standard, and changing of the natural background conditions is not the intent of the TMDL. As such, the focus of this Action Plan is to reduce only non-natural *E. coli* sources until such time that a Use Attainability Study addresses the primary designation of the watershed.

4.0 APPLICABLE OVERVIEW OF NOVA'S MS4 PROGRAM

NOVA's MS4 Permit regulates stormwater discharges from areas included within census urbanized areas (CUAs), including its Woodbridge campus within the TMDL watershed. NOVA's collective efforts, as described in the NOVA MS4 Program Plan, result in significant reduction of pollutants that could potentially be discharged from its regulated MS4. BMPs already included in the NOVA Program Plan that address *E.coli* are described in the following sub-sections. Each sub-section is provided to address the referenced special condition in the MS4 General Permit.

4.1 Legal Authority and Minimum Control Measures

As a non-traditional MS4, NOVA 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, NOVA's MS4 Program includes Minimum Control Measures (MCMs) that include policies and procedures consistent the goals of the MS4 General Permit special conditions. A summary of the applicable MCMs is listed below to address the following special condition:

- ✓ *“Develop and maintain a list of its legal authorities such as ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements applicable to reducing the pollutant identified in each applicable WLA.” [Section I(B)(2)(a)]*

- *MCM 1 (Public Education and Outreach)* – NOVA’s MS4 Program includes, by reference, a Public Education and Outreach Program (PEOP) that incorporates educational information about TMDL pollutants of concern, including E.coli. The PEOP includes, as part of the relevant message for Water Quality Issue #1, the distribution of educational materials regarding methods to reduce introduction of E.coli into stormwater runoff.
- *MCM 2 (Public Participation)* – NOVA will post this Action Plan on their stormwater pollution prevention webpage at <http://www.NOVA.edu/stormwater/index.html>. Availability of the Action Plan will increase awareness of the TMDL with web page visitors.
- *MCM 3 (Illicit Discharge Detection and Elimination)* – NOVA’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. NOVA 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 NOVA 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)* – NOVA’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.

Through inspections and enforcement, especially in regards to stormwater pollution prevention plan (SWPPP) inspections, potential for *E.coli* discharges (i.e. port-a-johns) is minimized. Minimum Control Measure 4 BMPs in the NOVA MS4 Program Plan describe construction site runoff control BMPs.

- *MCM 5 (Post-Construction Stormwater Management)* – NOVA’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. 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. Although the facilities are designed to achieve target phosphorus reductions, many water quality BMPs also are effective at *E.coli* removal. 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 NOVA MS4 Program Plan describe post-construction stormwater management BMPs.

- **MCM 6 (Good Housekeeping)** – NOVA’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 NOVA’s Pollution Prevention & Good Housekeeping Manual and annual training for applicable staff. Minimum Control Measure 6 BMPs in the NOVA MS4 Program Plan describe pollution prevention and good housekeeping BMPs.

No new policies and procedures or modifications to existing policies and procedures were identified as necessary to meet the requirements of the special conditions.

4.2 Practices and Controls beyond the Minimum Control Measures

NOVA has existing prohibitions and increased training aimed to improve the water quality of the local waterways. Each of the TMDL scenarios allocated source for reductions is addressed in the following sub-sections to address the following special conditions:

- ✓ *“Identify and maintain an updated list of all additional management practices, control techniques and system design and engineering methods, beyond those identified in Section II V, that have been implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA.” [Section I(B)(2)(b)]*

4.2.1 Prohibition of Potential Sources

Pets and livestock are not a typical occurrence on campus. If unauthorized use of NOVA property becomes an issue in the future, specific policies, stricter enforcement, or other actions may be incorporated into this Action Plan.

4.2.2 Increased Frequency of Staff Training

As part of the NOVA Public Education and Outreach Plan, the permit required staff training frequency is increased from biennially to annually. Training is based on the “NOVA Good Housekeeping/Pollution Prevention Manual” that includes discussion regarding TMDLs. The

increased frequency of applicable staff training is expected to reduce the potential of *E.coli* exposure to precipitation and subsequent runoff discharge.

4.2.3 Enhanced Public Education and Outreach Plan

As previously mentioned, NOVA lists “information regarding TMDLs pollutants of concern,” including *E.coli*, into the relevant message of “*Water Quality Issue #1: Public education on stormwater impacts*” of the NOVA Public Education and Outreach Plan. As a result, the target audience, including all students, faculty and staff receive an email that in part, provides information promoting the elimination and reduction of *E.coli*. The inclusion of information regarding *E.coli* sources in stormwater runoff into the Public Education and Outreach Program and staff training materials addresses the following permit special condition:

- ✓ *“General Permit SEC I.B.2.c: Enhance [its] public education and outreach and employee training programs to also promote methods to eliminate and reduce discharges of the pollutants identified*

5.0 IMPLEMENTATION TO THE MEP

NOVA will implement the MS4 Program components described in Section 4 to reduce the potential of *E.coli* discharge to surface waters to the maximum extent practicable. The method of assessment is implemented through the annual reporting process with the review of the effectiveness of each MS4 Program Plan BMP. Interim milestone activities consist of the annually reported implementation of the Program components described herein; therefore addressing the following special condition:

- ✓ *“Develop and implement a method to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs.” [Section I(B)(2)(e)]*