Action Plan for the Neabsco Creek Bacteria TMDL

A Plan to Address NOVA's Assigned Wasteload Allocation for the Woodbridge Campus

2023 - 2028 MS4 General Permit

Permit #: VAR040095

April 2025

This document addresses Part II 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 wasteload allocation assigned to NOVA's regulated MS4 area in the *"Bacteria TMDL for* Neabsco Creek, Prince William County, Virginia," approved by the Environmental Protection Agency on September 10, 2008. For the purposes of this Plan, the 2000 and 2010 Census Urbanized Areas were used to define NOVA's regulated MS4 area as defined in 9VAC25-890 Section 1.

Northern Virginia Community College

Woodbridge Campus

Wetland Studies and Solutions, Inc.
a DAVEY company

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 Environmental Protection Agency on September 10, 2008, 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 X 10^{12} cfu/day which is equivalent to a 71% reduction 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 Program;
- An assessment of campus facilities; and
- A methodology to measure Action Plan effectiveness through MS4 annual reporting.

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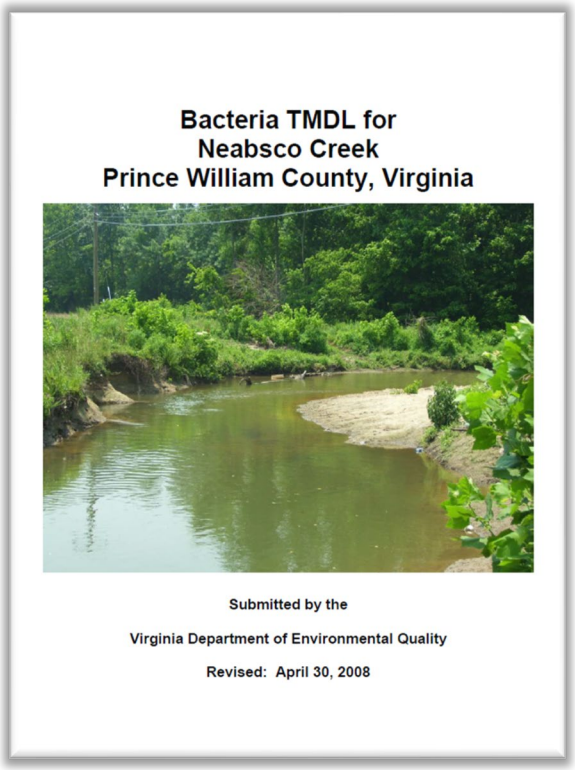
ACRONYMS

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
POC	Pollutant of Concern
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). 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 X 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:

$$TMDL = \sum WLA + \sum LA + MOS$$

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 designed to reduce loadings for pollutants of concern where NOVA is given a WLA to an impaired water for which a TMDL has been approved by the EPA as described below:

- For TMDLs approved by the EPA prior to July 1, 2018, and in which an individual or aggregate wasteload has been allocated to NOVA, NOVA shall update the previously approved local TMDL action plans to meet the conditions of Part II B 4, B 6, B 7, and B 8, as applicable, no later than 18 months after the permit effective date and continue implementation of the action plan. Updated action plans shall include:
    1) An evaluation of the results achieved by the previous action plan; and
    2) Any adaptive management strategies incorporated into updated action plans based on action plan evaluation.
- For TMDLs approved by EPA on or after July 1, 2018, and prior to October 31, 2023, and in which an individual or aggregate wasteload has been allocated to NOVA, NOVA shall develop and initiate implementation of action plans to meet the conditions of Part II B 4, B 5, B 6, B 7, and B 8 as applicable no later than 30 months after the permit effective date.

NOVA shall complete implementation of the TMDL action plans as determined by the schedule. TMDL action plans may be implemented in multiple phases over more than one permit cycle using the adaptive iterative approach provided adequate progress is achieved in the implementation of BMPs designed to reduce pollutant discharges in a manner that is consistent with the assumptions and requirements of the applicable TMDL.

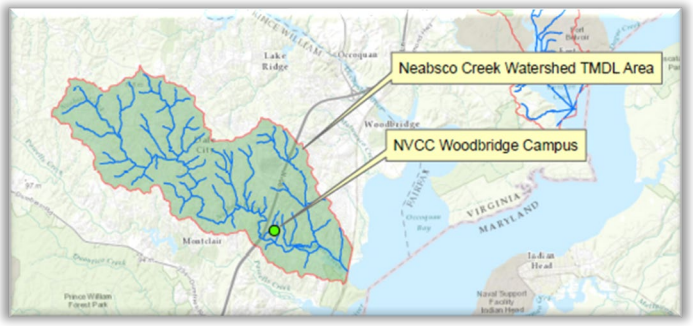
Each local TMDL action plan developed by NOVA shall include the following:

- The TMDL project name;
- The EPA approval date of the TMDL;
- The wasteload allocated to NOVA (individually or in aggregate), and the corresponding percent reduction, if applicable;
- Identification of the significant sources of the pollutants of concern discharging to NOVA's MS4 and that are not covered under a separate VPDES permit. For the purposes of this requirement, a significant source of pollutants means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL;
- The BMPs designed to reduce the pollutants of concern in accordance with Parts II B 5, B 6, B 7, and B 8;
- Any calculations required in accordance with Part II B 5, B 6, B 7or B 8;
- For action plans developed in accordance with Part II B 5, B 6, and B 8, an outreach strategy to enhance the public's education (including employees) on methods to eliminate and reduce discharges of the pollutants; and
- A schedule of anticipated actions planned for implementation during this permit term.

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 Part II B. 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 X 10^{12} cfu/day which is equivalent to a 71% reduction 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. Human activity sources are the primary targets in the TMDL for reduction to the MEP. 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 the Piedmont physiographic region of northern Virginia, and encompasses approximately 15.6 square miles (10,009 acres). A review of the NOVA'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 and its property boundary borders 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 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*.

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.

Wildlife has been determined to be a source of *E. coli* at NOVA. Specifically, waterfowl and other birds are assumed to present an increased loading of *E. coli* as they migrate towards stormwater management facilities and roam the campus. This presents the most likely scenario where NOVA should focus efforts in reducing loading identified in the TMDL WLA.

4.0 APPLICABLE OVERVIEW OF NOVA'S MS4 PROGRAM

NOVA's MS4 Permit regulates stormwater discharges from areas included within census urban 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. No new policies and procedures or modifications to existing policies and procedures were identified as necessary to meet the requirements of the special conditions.

4.1. Minimum Control Measures

The General Permit requires the Program Plan to include BMPs to address the requirements of six MCMs described in Part I E of the General Permit. BMPs already included in the NOVA Program Plan that address *E. coli* are summarized below.

4.1.1. MCM 1 Public Education and Outreach

NOVA's MS4 Program includes, by reference, a Public Education and Outreach Program (PEOP) that often incorporates educational information about TMDL pollutants of concern, including *E. coli*. The PEOP efforts communicate that *E. coli* is a major contributor of concern and includes, as part of the relevant message for identifying methods to reduce introduction of *E. coli* into stormwater runoff.

4.1.2. MCM 2 Public Participation

NOVA will post this Action Plan on their Stormwater Pollution Prevention webpage at https://www.nvcc.edu/stormwater/. Availability of the Action Plan will increase awareness of the TMDL with web page visitors.

4.1.3. 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, the Student Handbook for students, and in the college's Environmental Compliance Policy. 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.

4.1.4. 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 Standards and Specifications for Erosion and Sediment Control and Stormwater Management."* 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. portable toilets) is minimized. Minimum Control Measure 4 BMPs in the NOVA MS4 Program Plan describe construction site runoff control BMPs.

4.1.5. 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 Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management 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.

4.1.6. MCM 6 Good Housekeeping

NOVA's MS4 Program includes a Good Housekeeping and Pollution Prevention Program that includes 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 Good Housekeeping and Pollution Prevention Manual and biennial training for applicable staff. Minimum Control Measure 6 BMPs in the NOVA MS4 Program Plan describe good housekeeping and pollution prevention BMPs.

5.0 IMPLEMENTATION OF THE STRATEGY TO REDUCE BACTERIA

NOVA has existing BMPs designed to reduce the pollutants of concern. An outreach strategy has been implemented to enhance the public's education (including employees) on methods to eliminate and reduce discharges of the pollutants, with a schedule of anticipated actions planned for implementation during this permit term.

NOVA is a nontraditional MS4 permittee; therefore, NOVA shall select at least one strategy listed in Table 1 below designed to reduce the load of bacteria to the MS4 relevant to sources of bacteria applicable within the MS4 regulated service area. Selection of the strategies shall correspond to sources identified in Part II B 5 b of the General Permit.

Table 1: Bacteria Reduction Strategies for Stormwater Management

Source	Strategies (provided as an example and not meant to be all inclusive or limiting)
Domestic pets (dogs and cats)	Provide signage to pick up dog waste, providing pet waste bags and disposal containers. Adopt and enforce pet waste ordinances or policies, or leash laws or policies. Place dog parks away from environmentally sensitive areas. Maintain dog parks by removing disposed of pet waste bags and cleaning up other sources of bacteria. Protect riparian buffers and provide unmanicured vegetative buffers along streams to dissuade stream access.
Urban wildlife	Educate the public on how to reduce food sources accessible to urban wildlife (e.g., manage restaurant dumpsters and grease traps, residential garbage, feed pets indoors). Install storm drain inlet or outlet controls. Clean out storm drains to remove waste from wildlife. Implement and enforce urban trash management practices. Implement rooftop disconnection programs or site designs that minimize connections to reduce bacteria from rooftops Implement a program for removing animal carcasses from roadways and properly disposing of the same (either through proper storage or through transport to a licensed facility).

Source	Strategies (provided as an example and not meant to be all inclusive or limiting)
Illicit connections or illicit discharges to the MS4	Implement an enhanced dry weather screening and illicit discharge, detection, and elimination program beyond the requirements of Part I E 3 to identify and remove illicit connections and identify leaking sanitary sewer lines infiltrating to the MS4 and implement repairs. Implement a program to identify potentially failing septic systems. Educate the public on how to determine whether their septic system is failing. Implement septic tank inspection and maintenance program. Implement an educational program beyond any requirements in Part I E 1 though E 6 to explain to citizens why they should not dump materials into the MS4.
Dry weather urban flows (irrigations, car washing, powerwashing, etc.)	Implement public education programs to reduce dry weather flows from storm sewers related to lawn and park irrigation practices, car washing, powerwashing and other nonstormwater flows. Provide irrigation controller rebates. Implement and enforce ordinances or policies related to outdoor water waste. Inspect commercial trash areas, grease traps, washdown practices, and enforce corresponding ordinances or policies.
Birds (Canadian geese, gulls, pigeons, etc.)	Identify areas with high bird populations and evaluate deterrents, population controls, habitat modifications and other measures that may reduce bird-associated bacteria loading. Prohibit feeding of birds.
Other sources	Enhance maintenance of stormwater management facilities owned or operated by the permittee. Enhance requirements for third parties to maintain stormwater management facilities. Develop BMPs for locating, transporting, and maintaining portable toilets used on permittee-owned sites. Educate third parties that use portable toilets on BMPs for use. Provide public education on appropriate recreational vehicle dumping practices.

5.1. Evaluation of the Results Achieved by the 2018 – 2023 Action Plan

During the 2018 - 2023 MS4 Permit cycle, NOVA selected one strategy from the list in Table 1 to further reduce the load of bacteria to the MS4. Because waterfowl populations congregate at the Woodbridge retention pond, NOVA contracted with a vendor to deter waterfowl, especially Canadian geese from inhabiting and loitering on campus via providing trained dog harassment methods three to four times per week to run off the geese; thereby, reducing bird-associated bacteria loading.

Based on an evaluation of the results of the strategy employed for the 2018 - 2023 permit cycle, NOVA has met the 2018 – 2023 action plan goals to the maximum extent practicable.

5.2. Adaptive Management Strategies for the 2023 – 2028 Action Plan

In future permit years NOVA will, at a minimum, select one strategy from Table 1. This proposed strategy will be included in the annual MS4 Program Plan update and implementation will be reported during the annual MS4 reporting process.

6.0 SCHEDULE

NOVA will implement the practices and controls described in Section 4 to reduce the potential of *E. coli* discharged to surface waters to the maximum extent practicable. In accordance with Part II B 2 and Part II B 3 (h) NOVA will complete implementation of the TMDL action plan in accordance with the schedule of anticipated actions planned for implementation during this permit term shown below in Table 2. The method of assessment is implemented through the annual reporting process with the review of the effectiveness of each MS4 Program Plan BMP.

Table 2: Schedule of Anticipated Actions Planned for Implementation of Bacteria Reduction

Year	Strategies	Method	Completion Date
2024 - 2025	Identify areas with high bird populations and evaluate deterrents, population controls, habitat modifications and other measures that may reduce bird-associated bacteria loading.	Geese Management via trained dog harassment on campus 3 - 4 times per week.	Annually by June 30
Future Permit Years	Select at least one strategy from Table 1 and include in the MS4 Program Plan.	To be determined	Annually by June 30