Town of Bridgewater

Update to the

TMDL Implementation Plan for Fecal Coliform Reduction for the North River Watershed

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Town of Bridgewater

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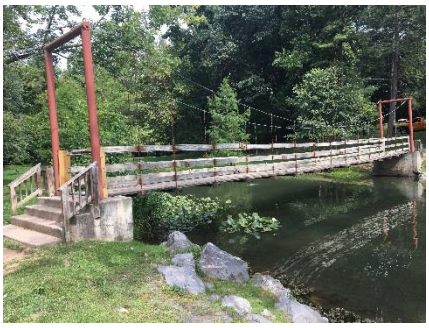

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Executive Summary

The Town of Bridgewater (Town) 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, the Town 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 (TMDLs) in which the Town has been assigned a wasteload allocation (WLA). For reference, the Town developed its third and final phase TMDL Action Plan for the Chesapeake Bay in November 2024, consistent with DEQ's Chesapeake Bay Action Plan Guidance Memo (Memo No. 20-2003).

The Environmental Protection Agency (EPA) approved a bacteria TMDL for the North River on March 29, 2006, and as a result, the Town is subject to Part II of the MS4 General Permit requirements (9VAC25-890-40). The Town initially developed a TMDL Action Plan in November 2015 (A Total Maximum Daily Load Reduction Implementation Plan for Fecal Coliform Reduction for the North River Watershed), in compliance with the Part II requirements.

This TMDL Action Plan updates the 2015 Action Plan. Implementation strategies identified by the Town in the 2015 Plan were the connection of several properties to the public sanitary sewer system and the pet waste management. These strategies were successfully implemented with more properties and pet waste management program expansion identified as implementation strategies in this TMDL Action Plan update.

Abbreviations

BMP	Best Management Practice
CUA	Census Urbanized Area
DEQ	Virginia Department of Environmental Quality
EOS	Edge-of-Stream
IP	Implementation Plan
LB(S)	Pound(s)
MS4	Municipal Separate Storm Sewer System
NLCD	National Land Cover Database
POCs	Pollutant(s) of Concern
TMDL	Total Maximum Daily Load
VPDES	Virginia Pollutant Discharge Elimination System
WLA	Wasteload Allocation

1.0 PURPOSE

This update to the Town of Bridgewater's (Town) initial Total Maximum Daily Load (TMDL) Action Plan for Fecal Coliform Reduction builds on the initial Plan developed in 2015. Per the approved bacteria TMDL, "fecal coliform loads modeled from impervious areas within the MS4 area are included in the wasteload allocation (WLA) component of the TMDL" and "it is assumed that the E. coli load originating on the portion of the impervious land segments covered by the MS4 permit will be controlled by those permits." An additional WLA was developed for residential land uses within the Town (sub-watershed NR-23) specific to nonpoint source loading. This Plan identifies the implementation strategies the Town intends to employ to reduce fecal coliform contamination from those non-point sources.

The Town's MS4 permit requires the Town to "develop and maintain a local TMDL action plan designed to reduce loadings for pollutants of concern if the permittee discharges the pollutants of concern to an impaired water for which a TMDL has been approved by the U.S. Environmental Protection Agency (EPA)" (9VAC25-890-40.II.B.2.a).

A Bacteria Total Maximum Daily Load Development (TMDL) for the North River was approved by the EPA in March 2006. As of the 2022 assessment cycle, this impairment remains in place although improvements have been documented. The TMDL for the North River is based on the fecal coliform standard, however, this standard was replaced by DEQ with an E. Coli standard after development of this TMDL.

Per the 2006 TMDL for the North River, the Town is to mitigate 6.10×10^{11} colony-forming units/year (cfu/yr) through "MS4 regulation requiring implementation of best management practices to reduce pollutants to the 'maximum extent practicable.'" This represents a 90% reduction in the TMDL nonpoint source allocation load of 6.78×10^{10} cfu/yr for the Town. Additionally, the TMDL requires a 100% reduction of the 5.56×10^{11} cfu/yr for the nonpoint sources of fecal coliform from residential uses (not otherwise captured in the MS4 permit). Significant sources of nonpoint fecal coliform loading for the Town's residential land use areas were assumed to be discharges from private septic systems and stormwater runoff from impervious land cover, particularly related to pet waste.

2.0 CURRENT AND MODIFIED LEGAL AUTHORITIES

2.1 CURRENT LEGAL AUTHORITIES

The Town utilizes its authority to implement appropriate stormwater controls through ordinances and programs. The Town's current MS4 program is compliant with the requirements of the Town's MS4 permit and includes six minimum control measures which form the basis of the program. These include:

1. Public Outreach and Information
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Controls

5. Post Construction Stormwater Management
6. Pollution Prevention/Good housekeeping

Information about the MS4 program including the program plan and annual reports can be found on the Bridgewater stormwater website at https://bridgewater.town/residents/stormwater_management/index.php.

In addition to the programmatic elements, the Town also relies on the Bridgewater Stormwater Management Ordinance to provide legal authority in stormwater management. The Bridgewater Stormwater Management Ordinance was created to comply with the Virginia Stormwater Management Program (VSMP) and covers the expectations and authority of the Town in matters of erosion and sediment control, and stormwater management.

The Town also complies with the Chesapeake Bay Preservation Ordinance. The purpose of this ordinance is to protect and improve the water quality of the Chesapeake Bay and its tributaries, as required by the Chesapeake Bay Preservation Act.

2.2 MODIFIED LEGAL AUTHORITIES

To better protect the environment from impacts of stormwater, The Town recently updated its Stormwater Management Ordinance to incorporate the provisions of Rockingham County's Post Construction Stormwater Ordinance (Rockingham County, Va. Code, § 6C-1, et seq.). This update to the ordinance, effective February 1, 2021, is effective within the Town and requires the management of stormwater following construction projects. While not credited towards the Town's Chesapeake Bay permit reduction requirements, this ordinance update is helping to protect the Chesapeake Bay from unintended stormwater pollution from development or related activities.

In 2016, the Town adopted a Septic Tank Ordinance requiring residents on private septic systems to submit a Qualifying Septic Report every five (5) years and preventing the construction or replacement of conventional or alternative septic systems.

3.0 2015 ACTION PLAN EVALUATION

The 2015 TMDL Action Plan identified three (3) best management practice strategies to reduce fecal coliform contamination from the Town's MS4. These strategies were:

1. Repaired Septic Tanks
2. Pet Litter Control Program with Composting
3. Pet Litter Control Program without Composting

In 2015 there were 49 buildings within the Town that had private septic systems. The Town identified eight (8) of these buildings as candidates to be connected to the public sanitary sewer system. To date (April 2025), 23 of the identified buildings have been connected to the public sanitary sewer system. It was estimated that attaching the 8

identified buildings to the public sanitary sewer system would reduce ground water contamination by 40 cfu/100 ml. Assuming each building has an average household use of 50 gallons/day (1 gallon = 3785.412 mL), the fecal coliform reduction per year would be 2.76 x 10^7 cfu/yr per building, with a total reduction in fecal coliform contamination of 5.80 x 10^8 cfu/yr.

The Town also identified ten (10) public parks to receive pet waste receptacles. To date, twenty (20) pet waste receptacles have been installed throughout the Town. In addition to the pet waste receptacles, the Town planned to distribute 2,556 flyers with the 2015 fourth quarter water bills and to hold a minimum of three (3) public meetings within a six (6) month time frame to increase public awareness around the proper disposal of pet waste. Potential fecal coliform loading due to pets within the Town was estimated at 4.57 x 10^{14} cfu/yr. The objective of the pet waste control program was to reduce potential fecal coliform loading by 40%. The Town was able to install double the number of planned pet waste receptacles during the implementation period. Due to this, a conservative estimate of the achieved reduction from the pet waste management plan due to the waste receptacles and the public outreach is 40% of potential fecal coliform loading, resulting in a reduction of 1.83 x 10^{14} cfu/yr.

4.0 MANAGEMENT STRATEGIES

During the implementation period for the 2015 Plan, the Town was able to exceed the objectives set forth in the Plan. The Town will build upon the 2015 Plan during this permit cycle. The Town will continue with and expand upon the previously identified implementation strategies related to pet waste and connection of buildings to the public sanitary sewer.

Management strategies, per 9VAC25-890-40.II.B.5 Table 5, selected to be implemented by the Town during the current permit cycle include:

1. Illicit Discharges to the MS4: Implement a program to identify potentially failing septic systems.
2. Illicit Discharges to the MS4: Educate the public on how to determine whether their septic system is failing.
3. Domestic Pets: Provide signage to pick up dog waste, providing pet waste bags and disposal containers.

While twenty-three (23) buildings have been connected to the public sanitary sewer system since 2015, an additional twenty-six (26) buildings remain on private septic systems. The Town will review and revise its program to identify potentially failing septic systems at these properties and prioritize connecting these identified buildings to the public sanitary sewer system. Those buildings that were easiest to transition to the public system have already been connected. Therefore, as the Town continues to connect buildings to the public sanitary sewer system, the process becomes less straightforward and more complex and involved. The Town plans to connect an additional four (4) buildings to the public sanitary sewer system, as funds become available. The removal of another four (4) buildings will be implemented during the next two (2) permit cycles and will use an “adaptive iterative approach” (9VAC25-890-40.II.B.3) to couple the program that identifies the buildings with the design process necessary to complete the connections.

The Town will provide public outreach to the building owners who continue to use private septic systems to educate them on how to evaluate their septic system and remind property owners of the reporting requirements pertaining to private septic systems.

Since 2016, the Town has installed twenty (20) pet waste receptacles in Town parks and public spaces. The Town will identify eight (8) additional locations for the pet waste receptacles. Public feedback will be solicited to identify these additional locations based on local needs.

Implementation will occur in two phases:

1. Phase I
    a. Develop a program to identify potentially failing septic systems.
    b. Educate the public on how to determine if their septic system is failing.
    c. Identify locations for additional pet waste receptacles.
2. Phase II
    a. Connect four (4) buildings to the sanitary sewer system based on buildings identified in Phase I. Buildings will be connected to the sanitary sewer system as funding becomes available. The connections of the buildings will occur during the next two (2) permit cycles.
    b. Install the pet waste receptacles with signage at the identified locations. This is expected to be a eighteen to twenty-four-month process.

The pet waste management program is anticipated to reduce the pet-based load to the North River by 30%, including both the installation of pet waste receptacles and outreach efforts on the importance of properly disposing of pet waste. This reduction is based on the efficacy of the program during the previous implementation period. Funding for the installation of pet-waste receptacles may be available through grants.

Connection of the buildings to the public sanitary sewer is expected to reduce the fecal coliform (E. Coli) loading to the North River by 40 cfu/100 ml. It is assumed that each building will discharge 50 gallons/day to the sanitary sewer system. It is anticipated that the connecting the buildings to the sanitary sewer system will cost $300,000 - $750,000. The Town will explore grants to offset this cost.

Efficacy will be determined by the total number of pet waste stations installed and the total number of buildings connected to the sanitary sewer system during the implementation period for the Plan.

5.0 OUTREACH & ADDITIONAL STRATEGIES

The ability to successfully implement the strategies relies on the local community. Providing information and encouraging engagement will facilitate community involvement.

Outreach efforts will include:

- Flyers
- Directed mailings
- Public meetings
- Articles for local media publications
- Update the Town website to include links to 3rd party information, including both governmental and non-profits (where appropriate)
- Host a booth at local community events

The Town will also seek to identify additional significant sources of fecal coliform discharging to the Town's MS4 that are not covered under a separate VPDES permit.

6.0 SUMMARY

This TMDL Action Plan establishes a strategy for the Town to reduce fecal coliform loading to the North River from the Town's MS4 discharges. The Town's Stormwater Ordinance and the Septic Tank Ordinance provide regulatory support important to the implementation of the management strategies identified herein, allowing the Town to achieve the stated objectives.

7.0 REFERENCES

2006, January. Department of Environmental Quality (DEQ). Bacteria Total Maximum Daily Load Development for North River prepared by Department of Biological Systems Engineering, Virginia Tech, VT-BSE Document No. 2005-0012.

2015, November 30. Town of Bridgewater. A Total Maximum Daily Load Reduction Implementation Plan for Fecal Coliform Reduction for the North River Watershed. Prepared by Lineage Architects, P.C.