TOTAL MAXIMUM DAILY LOAD (TMDL) ACTION PLAN FOR BACTERIA REDUCTION (*E. coli*) IN THE ROANOKE RIVER, TINKER CREEK, AND GLADE CREEK

Municipal Separate Storm Sewer System (MS4) General Permit No. VAR040060

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April 2025 (Updated)

TOWN OF VINTON, VIRGINIA
TMDL ACTION PLAN FOR BACTERIA *(E. coli)* REDUCTION

Contents

I. EXECUTIVE SUMMARY

The Town of Vinton's Total Maximum Daily Load (TMDL) Action Plan for E.coli Reduction in the Roanoke River, Tinker Creek, and Glade Creek (Bacteria Action Plan) has been prepared as required by Town of Vinton's General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer System (MS4s) General Permit No. VAR040026. The Town is subject to the requirements of this permit, effective November 1, 2023, through October 31, 2028.

The Town's strategy is to address the permit requirements is to progressively implement Best Management Practices (BMPs) to decrease the amount of E.coli that is discharged into the waterways in order to meet the DEQ-assigned waste load allocation to the maximum extent practicable. The Town will implement BMPs over multiple state permit cycles, using an adaptive iterative approach, to reduce *E. coli* discharges.

This Bacteria TMDL Action Plan has been prepared by Town Staff and approved by the Town Manager. However, nothing in this Action Plan shall be construed as binding the Town to any action until such time that the Vinton Town Council provides final approvals and/or appropriates funding for implementation.

It is expected that this Bacteria Action Plan will be revised from time-to-time to add and/or delete proposed BMPs, revise estimated implementation dates, and to reflect new information. Revised Bacteria Action Plans will be submitted to the DEQ with the MS4 Permit Program Annual Report that is due to DEQ by October 1st of each year.

The following is a tabulation of the Best Management Practices (BMPs) that the Town plans to implement in this permit cycle to decrease discharges of E.coli, to the maximum extent practicable, along with anticipated implementation date. *Note that some of these BMPs are also effective in addressing the Town's sediment wasteload allocations and are also included in the Town of Vinton TMDL Action Plan for Benthic/Sediment Reduction in the Roanoke River.

Some of the Town's modified BMPs will be aligned with Roanoke County's BMPs since the County has been the Town's Erosion Control (ESC) Program Administrator since February 14, 1984 and the Town's Virginia Stormwater Management Program (VSMP) Administrator since April 5, 2016. Additionally, the County operates the Spatial Database Engine (SDE) for the overall County including the Town of Vinton.

Additionally, the Erosion and stormwater Management (ESM) ordinance was adopted by Roanoke County Board of Supervisors on July 9, 2024, and became effective on August 1, 2024. The ordinance integrated the County of Roanoke's stormwater management (SWM) requirements with its erosion and sediment control (ESC) requirements to establish a consolidated program consistent with the Virginia Erosion and Stormwater Management Program (VESMP).

On September 17, 2024, the Vinton Town adopted Roanoke County's ESM ordinance, as amended by reference, and adopted a resolution to enter a Memorandum of Understanding for Roanoke County to be the Town's Virginia Erosion and Stormwater Management Program (VESMP) Authority.

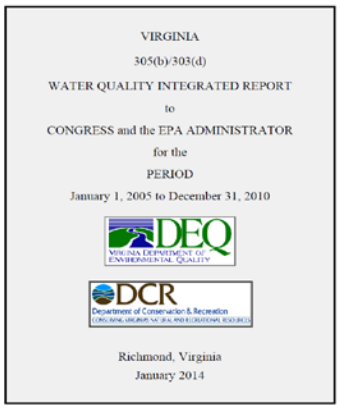
BMP # Designation	BMP Name/Task	Implementation Dates
DOMESTIC PETS		
B-1	Dog Waste Stations and Signage: • Develop written plan of where to install • Install one dog waste station per year until plan is achieved.	July 2020 Ongoing
B-2	Protect Stream Buffers: (See Roanoke County BMP B-2 – Roanoke County is the Town's VESMP Authority) • Ordinance Language Finalized • ROCO BOS Presentation • Ordinance Implemented	 July 2020 Fall 2020 Fall 2021
B-3*	Protect Stream Buffers: No-Mow Policy for Town-Owned Land and Roanoke County-Owned Parks within Town Limits	Spring 2021 Ongoing
B-4	Public Street Sweeping and Leaf Collection Program	July 2013 Ongoing
URBAN WILDLIFE		
B-5	Public Education: Reducing Food Sources Accessible to Wildlife (See Roanoke County BMP B-4)	July 2020 Ongoing
ILLICIT CONNECTIONS OR ILLICIT DISCHARGES TO THE MS4		
B-6	Public Education: Septic System Repair and Maintenance – Roanoke County Information Dissemination includes the Town Limits (Roanoke County BMP # B-5)	Ongoing
B-7	Business Outreach: Eliminating Illicit Discharges	Ongoing
B-8*	Enhanced Public Outreach	Ongoing
B-9*	Enhanced Employee Training	Ongoing

***** Also included in the Town of Vinton TMDL Action Plan for Sediment Reduction in the Roanoke River.

II. BACKGROUND

A. General

The Virginia Department of Environmental Quality (DEQ) routinely monitors and tests the Commonwealth's waters (streams, rivers, lakes, and estuaries) to confirm that they meet Virginia's water quality standards (9 VAC 25-260-10). According to Virginia Water Quality Standards, *"all state waters are designated for the following uses: recreational uses (e.g., swimming and boating); the propagation and growth of a balanced indigenous population of aquatic life, including game fish, which might be reasonably expected to inhabit them; wildlife; and the production of edible and marketable natural resources (e.g., fish and shellfish)."*


VIRGINIA
305(b)/303(d)
WATER QUALITY INTEGRATED REPORT
to
CONGRESS and the EPA ADMINISTRATOR
for the
PERIOD
January 1, 2005 to December 31, 2010
DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
DCR
Department of Conservation & Recreation
Richmond, Virginia
January 2014

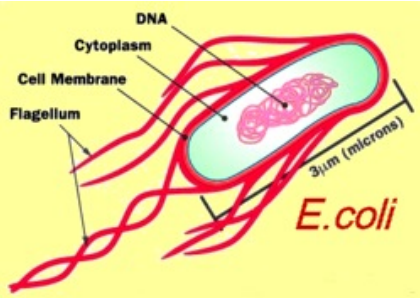
Where DEQ determines that a body of water does not meet Virginia's water quality standards, the water is termed "impaired". Impaired waters are listed on the Virginia Water Quality Assessment 305(b)/303(d) Integrated Report that is issued on even-number years to meet the requirements of the U.S. Clean Water Act sections 305(b) and 303(d) and the Virginia Water Quality Monitoring, Information and Restoration Act.

The Town has four (4) streams, including Roanoke River, with 18 identified impairments.

DEQ performs studies on impaired waters to determine the "total maximum daily load" that the water can assimilate and still meet water quality standards. These studies are called TMDL studies. TMDL studies assign "waste load allocations" (WLAs) to permitted point sources of pollution. WLAs are numerical limits of a pollutant of concern that a permitted point source must meet by implementing appropriate strategies, or Best Management Practices (BMPs) using the adaptive iterative approach. BMPs may be implemented over multiple state permit cycles as long as adequate progress to reduce the pollutant of concern is documented.

The Town of Vinton has coverage under the VPDES General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 General Permit). This MS Permit (General Permit No. VAR040026) is effective November 1, 2023, through October 31, 2028. Pursuant to this permit, all stormwater that passes through a Town-owned or Town-operated storm drain or improved channel is considered to be a point source discharge, and, therefore, subject to WLAs, where appropriate.

The Town has three streams, including Roanoke River with E.coli WLAs; the Roanoke River, Tinker Creek, and Glade Creek. E.coli is a bacterium that is commonly found in the lower intestine of people and warm-blooded animals. It can survive for a limited time outside of the body, and it is used as an indicator organism for fecal contamination.



E.coli diagram

Section II.B. of the MS4 Permit requires the Town to have an updated MS4 Program Plan that includes a specific TMDL Action Plan for pollutants allocated to the MS4 in approved TMDLs.

This specific TMDL Action Plan addresses reduction of E.coli discharged into the three streams with E.coli WLAs.

This Bacteria TMDL Action Plan has been prepared by Town Staff. Public input was sought through public advertisement and a public meeting. The Completed Plan was approved by the Town Manager. However, nothing in this Action Plan shall be construed as binding the Town to any action until such time that the Vinton Town Council provides final approvals and/or appropriates funding for implementation.

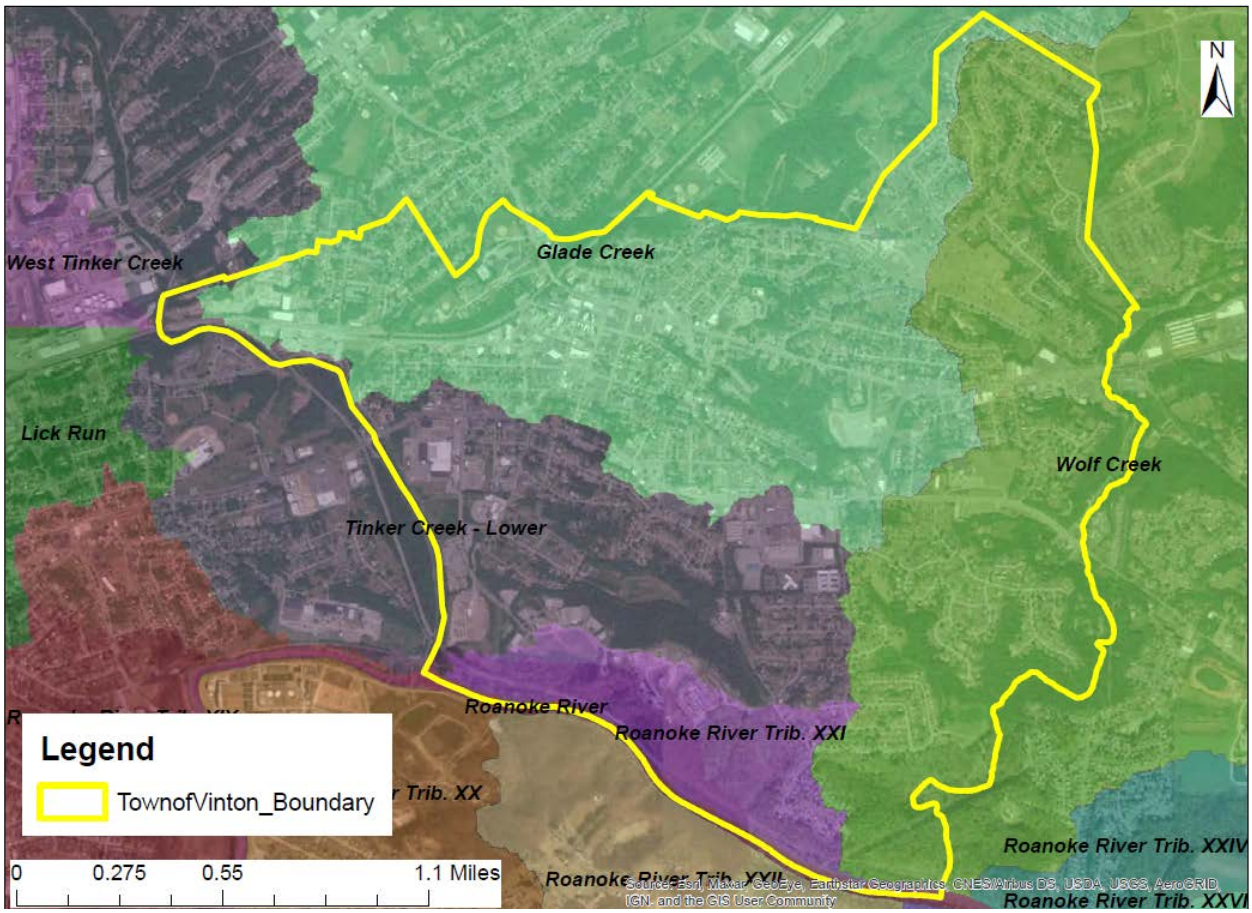
It is expected that this Bacteria TMDL Action Plan will be revised from time-to-time to add, modify, and/or delete BMPs, to adjust estimated implementation dates, and to reflect new information as it becomes available. Progress regarding implementation of this Plan will be included in the MS4 Annual Report that is submitted to DEQ by October 1st of each year in the permit term.

B. Watershed Descriptions

1. Roanoke River

The Roanoke River originates in Montgomery County; flows through Roanoke County, Salem City, Roanoke City, and Town of Vinton; then flows through Roanoke County again; and continues into Bedford and Franklin Counties and Smith Mountain Lake.
The Town of Vinton borders the Roanoke River for 1.6 miles and the Town's entire 3.2 square mile area flows into the Roanoke River.

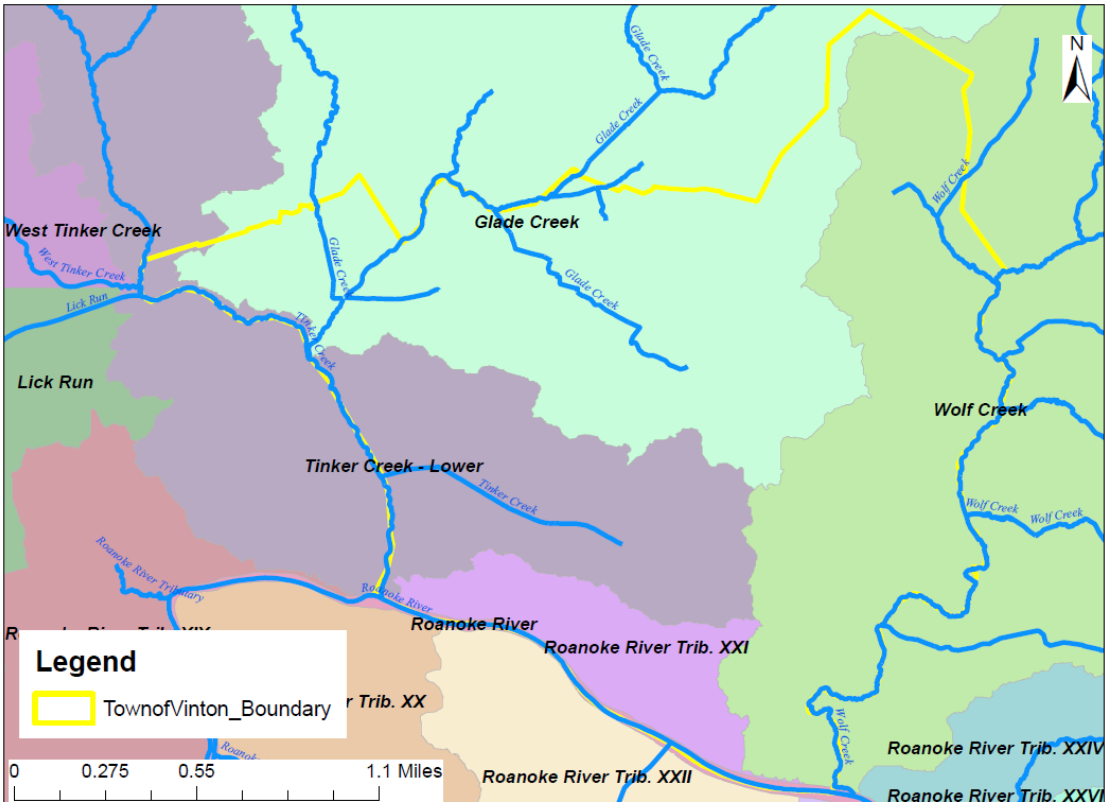
Two streams flow into the Roanoke River that has their own E.coli WLAs – Tinker Creek and Glade Creek. For the purposes of this description, the watersheds of these two streams are nested within the Roanoke River Watershed. More detailed descriptions of the two tributary streams are contained further within this section.



Town of Vinton Watersheds

2. Tinker Creek

Tinker Creek originates in Botetourt County on Tinker Mountain, flows through the Hollins area of Roanoke County, then enters City of Roanoke and discharges into the Roanoke River just downstream from the discharge point at the Western Virginia Water Authority's Roanoke Regional Water Pollution Control Plant. Tinker Creek forms the western boundary between the Town of Vinton and the City of Roanoke. Tinker Creek's estimated drainage area is 489 acres.



Town of Vinton Watersheds and Receiving Waters

3. Glade Creek

Glade Creek originates in Botetourt County near Curry Gap, flows through northeastern Roanoke County including Vinyard Park, a small portion of the City of Roanoke, northwestern Town of Vinton, and discharges into Tinker Creek across from Roanoke City's Fallon Park. Glade Creek's estimated drainage area is 711 acres.

C. Impairment and TMDL Wasteload Allocation

The Roanoke River, Tinker Creek, and Glade Creek were originally listed as "impaired" because they did not meet the Virginia water quality standard for fecal coliform bacteria. Since the initial listing, the state water quality standard has been changed from fecal coliform bacteria to E.coli bacteria.

The current Virginia water quality standard for E.coli to protect primary contact recreation (swimming) is a monthly geometric mean of 126 colony forming units per 100 milliliters (CFU/100 ml), based on a minimum of four monthly samples in a month. If insufficient samples are available to determine a valid geometric mean, then no more than 10% of the samples may exceed 235 CFU/100ml.

1. Roanoke River

The Roanoke River was initially listed as impaired in 1998 for fecal coliform. The likely sources were identified as discharges from municipal separate storm sewer systems, livestock grazing, runoff from urbanized high density areas, septic and other onsite treatment systems, sanitary sewer overflows, wet weather discharges (non-point source), and wildlife other than waterfowl. The Roanoke River is listed as impaired from the Spring Hollow Reservoir water intake, in west Roanoke County, to Smith Mountain Lake.

A TMDL study was performed and approved by U.S. EPA on August 2, 2006 and the Virginia State Water Control Board on June 27, 2007. During the TMDL study, the pollutant of concern was changed from fecal coliform to E.coli due to changes in the Virginia water quality standards.

The TMDL study determined that Vinton was contributing 2,770,000,000,000 (2.77E+12) colony forming units per year and that an approximate **98.8% reduction** was required to remove the impairment. *Vinton's WLA was set at 33,200,000,000 (3.32E+10) colony forming units per year. The WLAs for Tinker Creek and Glade Creek are nested within the Roanoke River WLA.*

2. Tinker Creek

Tinker Creek was initially listed as impaired in 1996 for fecal coliform. The likely sources were identified as discharges from municipal separate storm sewer systems, livestock grazing, runoff from urbanized high density areas, sanitary sewer overflows, wastes from pets, unspecified domestic waste, and wildlife other than waterfowl. Tinker Creek is impaired for its entire length.

A TMDL study was performed and approved by U.S. EPA on August 5, 2004 and the Virginia State Water Control Board on December2, 2004. During the TMDL study, the pollutant of concern was changed from fecal coliform to E.coli due to changes in the Virginia water quality standards.

The TMDL study determined that Vinton required an approximate **98% reduction** from developed lands. *Vinton's WLA was set at 342,000,000,000 (3.42E+11) colony forming units per year. The WLA for Glade Creek is nested within the Tinker Creek WLA.*

3. Glade Creek

Glade Creek was initially listed as impaired in 1998 for fecal coliform. The likely sources were identified as discharges from municipal separate storm sewer systems, livestock grazing, runoff from urbanized high density areas, sanitary sewer overflows, wastes from pets, unspecified domestic waste, and wildlife other than waterfowl. Glade Creek is impaired for its entire length.

A TMDL study was performed and approved by U.S. EPA on August 5, 2004 and the Virginia State Water Control Board on December 2, 2004. During the TMDL study, the pollutant of concern was changed from fecal coliform to E.coli due to changes in the Virginia water quality standards.

The TMDL study determined that Vinton required an approximate **96% reduction** from developed lands. Vinton*'s WLA was set at 87,800,000,000 (8.78E+10) colony forming units per year.*

D. Significant Sources of *E. coli* Discharging into MS4

No specific localized significant sources of *E. coli* have been determined. The two TMDL studies identified the following as the most likely sources: discharges from municipal separate storm sewer systems, livestock, runoff from urbanized high-density areas, septic and other onsite treatment systems, sanitary sewer overflows, wet weather discharges (non-point source), wastes from pets, unspecified domestic waste, and wildlife other than waterfowl.

The Town focus its efforts on the following strategies to lower the discharge of *E. coli* from its MS4 system:

BMP B-1 Dog Waste Stations and Signage

- Develop a written plan of where to install the dog waste station.
- Install one dog waste station per year until plan is achieved.

BMP B-2* Protect Stream Buffers: Ordinance (See Roanoke County BMP B-2 – Roanoke County is the Town's VESMP Authority)

- Roanoke County (ROCO) Ordinance Language Finalized
- ROCO Board of Supervisors (BOS) Presentation
- Ordinance Approved by BOS and Implemented

BMP B-3* Protect Stream Buffers: No-Mow Policy for Town-Owned and Roanoke County-Owned Parks within Town Limits

BMP B-4 Public Street Sweeping and Leaf Collection Program

BMP B-5* Public Education: Reducing Food Sources Accessible to Wildlife (See Roanoke County BMP B-4)

BMP B-6* Public Education: Septic System Repair and Maintenance – Roanoke County Information Dissemination includes the Town Limits (Roanoke County BMP # B-5)

BMP B-7* Business Outreach: Eliminating Illicit Discharges

BMP B-8* Enhanced Public Outreach

BMP B-9 Enhanced Employee Training

***BMPs to be fulfilled by Roanoke County Stormwater Division through current and continued coordination and collaboration.**

III. BMPs DESIGNED TO REDUCE BACTERIA (E. coli)

The following Best Management Practices (BMPs) have been specifically identified to reduce discharges of *E. coli* from the Town's MS4. Many of the BMPs listed below are also effective in reducing sediment discharges. Note that the highlighted categories shown below align with "*Table 5 Strategies for Bacteria Reduction Stormwater Control/Management Strategy"* in the MS4 Permit Section II.B.5.

A. Domestic Pets and Wildlife

BMP B-1: Dog Waste Stations and Signage Installations

It is believed that dog waste is one of the most significant sources of controllable bacteria. Nationally, there are 0.58 dog per household (according to the American Veterinary Medical Association), and each dog, on average, generates 0.42 pounds of fecal material per day. Applying these national averages to the Town, with 3,774 households based on 2020 Census, gives a total of approximately 2,189 dogs that generate approximately 152 tons of fecal material per year.

The Town currently has ordinances that prohibit dogs running at large, requires that house dogs be kept free of flies and nuisance odors, and prohibits depositing waste in public space or on other's property.

The Town has been implementing this BMP since 2017 and has installed five (5) dog waste stations and signage on the town-owned properties such as its greenways, trails, and Farmers' Market. Additionally, apartment buildings have been encouraged to install dog waste station(s), in which Roland E. Cook Lofts, a 21-units apartment building has installed a dog waste station and a signage at their complex. For the locations of existing "Mutt Mitt" dog waste stations, see the online map at https://www.roanokecountyva.gov/2594/GIS-Mapping-Support. Each dog waste station will have signage reminding owners to pick up after their dogs.

BMP B-2: Protect Stream Buffers: Ordinance

*Roanoke County BMP # B-2 has been incorporated in the ESM ordinance and the County is the Town's VESMP Authority.

Stream buffers can be effective in dissuading stream access and in filtering stormwater runoff that sheet flows through the buffer, which helps to remove sediment, bacteria, and other pollutants.

This activity began in permit year 2016 - 2017. The stream buffer requirements were incorporated into the County's/Town's now-retired Erosion & Sediment Control (ESC) Ordinance (effective date July 27, 2021) and carried over into its new Erosion and Stormwater Management (ESM) Ordinance, effective date August 1, 2024. Pursuant to the requirements, a 25-ft. wide stream buffer along perennial streams must be established in which no land grading

may occur.

The ESM Ordinance with stream buffer requirements may be accessed here: https://www.roanokecountyva.gov/DocumentCenter/View/29575/070924-3-E1-Ordinance---Amending-Ch-81-Repeal-Ch-23-Create-Consolidated-Erosion-and-Stormwater-Mgmt-Program?bidId=

BMP B-3: Protect Stream Buffers: No Mow Policy for Town-Owned Lands and County-Owned Parks

Stream buffers can be effective in filtering stormwater runoff that sheet flows through the buffer, removing sediments, bacteria, and other pollutants. Unfortunately, some of the privately owned-land along streams in the Town has already been developed, which limits where stream buffers could be provided.

The Town owns properties adjacent to Glade Creek, portion of Tinker Creek and Wolf Creek, which have been developed into greenways and historically, the Town has mowed much of this property up to the top of stream bank. More recently, the Town has recognized that this practice contributes to accelerated stream bank erosion and provides dogs with ready access to the streams.

No Mow Stream Buffers

A no-mow policy for Town-owned lands is being implemented by the Town's Department of Public Works and for the County's owned land/parks, the County's Department of Parks, Recreation, and Tourism (PRT). This policy attempts to balance the competing goals of providing adequate access to streams for the public, providing adequate views of the streams, excluding dogs, protecting stream banks, and providing vegetative filters.

A no-mow policy for Town-owned lands was prepared in December 2024 and to be effective by April 2025, even though the Public Works Department mowing personnel have not been mowing along the streams since 2015 of Wolf Creek, and 2017 of Tinker Creek. The stream along Glade Creek is maintained by Roanoke County PRT Department.

No-Mow Policy
For Town of Vinton Public Lands
(Effective Date: April 2025)

Background

Streams are an asset to Town of Vinton properties. Leaving natural vegetated banks with a suitable no-mow buffer can serve to protect streams from excessive erosion and pollution.

Policy

It shall be the general policy of to leave a buffer strip consisting of 10 feet in width from the top edge of the streambank. This may include the existing natural vegetation and a no-mow area that would make up the 10 feet wide buffer along all streams located within the Town properties. A no-mow buffer is desirable and may be provided if such area is consistent with the property's use. The locations of no-mow stream buffers are generally indicated on the applicable drawings of the property.

Exception

Mowing may occur closer than 10 feet from a stream bank, as follows:

- To allow public access to a stream for maintenance, inspection, etc.
- Where existing facilities do not allow maintaining a 10 feet wide no-mow buffer; or
- Where a 10 feet wide no-mow buffer is consistent with the desired use of the greenway and/or park.

BMP B-4: Public Street Sweeping and Leaf Collection Program

The street sweeping program offers the greatest benefit to capture roadway contaminants, debris, and sediment before entering the Town's storm sewer collection system.

The street sweeping program to target weekly sweeping of all primary streets will return the greatest benefit of collecting and thus preventing roadway contaminants, sediment and debris, from entering the stormwater collection system. Other streets are swept bi-weekly, every third week, every fourth week, and on as needed basis (once a while) for one street.

The leaf collection program, which is normally done in the months of November and December, also minimizes leaf and yard waste from entering the stormwater collection system.

Additionally, with the street sweeper being configured to vacuum debris from drainage inlet continues to optimize both the use and effectiveness of the Town single street sweeper and achieves desired results. Success of this BMP is measured mileage of streets swept; number of debris vacuumed from drainage inlets; amount of leaf collected; and total expanses of street sweeping and leaf collection programs.

The leaf collection program minimizes leaf and yard debris that contaminated with pet waste (bacteria) from entering storm sewer system.

B. Urban Wildlife

BMP B-5: Public Education: Reducing Food Sources Accessible to Wildlife – Roanoke County Information Dissemination (Mailer) includes the Town Limits (See Roanoke County BMP B-4)

The Roanoke Valley is blessed with natural beauty and an abundance of wildlife. However, problems often arise when wildlife can access food sources derived, either purposefully or inadvertently, from people. These problems include wildlife becoming dependent on people for food, increased potential for disease for both people and animals, increased property damage, and increased bacteria discharged from animal waste.

By July 2020, Roanoke County expanded its public education program to encourage citizens to reduce food sources accessible to wildlife. Typical messages will include:

- Keep trash cans covered and protected from animals
- Do not feed pets outdoors
- Secure bird feeders from squirrels, bears, and other animals
- Do NOT feed wild animals, including Canadian geese

C. Illicit Connections or Illicit Discharges to the MS4

BMP B-6: Public Education: Septic System Repair & Maintenance

Onsite sewage disposal systems predominately consist of septic tanks with drain fields. There are about 58 septic tanks or other onsite sewage disposal systems located within the Town Limits, with approximately 50% of them installed prior to 1970.

Malfunctioning or poorly maintained onsite sewage disposal systems may result in discharges of bacteria from human waste. Roanoke County information dissemination includes the Town of Vinton.

Beginning in July 2020, the Town partnered with Roanoke County in expanding its public education program to encourage citizens to periodically pump out their septic systems and to keep them properly operating. The Town along with Roanoke County will continue these messages.

BMP B-7: Business Outreach: Eliminating Illicit Discharges

The Town conducts site inspections of targeted businesses that have an elevated potential to discharge bacteria, such as veterinary clinics, kennels, pet stores, restaurants, vehicle maintenance shops, and car washing facilities. If the business owner is willing, Town staff conduct an inspection of the selected facility and discuss ways to minimize illicit discharges in the day-to-day operations at the facility. If an actual or potential illicit discharge is identified, the Town's inspection staff work with the business owner to eliminate or reduce the risk. A minimum of 5 businesses will be inspected each year.

***BMP B-8 Enhanced Public Outreach for Bacteria *(E.coli)* – Roanoke County Public Outreach include the Town Limits (Roanoke County BMP # B-7)**

***Certain components of the BMPS as listed below are implemented with continued coordination with Roanoke County Stormwater Division**

In accordance with the MS4 Permit requirements, the Town's Public Education Program targets three high-priority water quality issues that contribute to the degradation of stormwater runoff and receiving waters: excess bacteria, excess sediment, and excess nutrients. The following BMPs, as outlined in the Town's MS4 Program Plan, address these issues:

> **BMP 1-1. Stormwater Educational Resources -** The Town maintains a comprehensive listing of existing stormwater-related agencies and organizations along with pertinent educational programs and resources, which is made available to the public on the Town's stormwater website.
>
> ***BMP 1-2. Coordination in the Development and Distribution of Roanoke County Stormwater Newsletter -** Continue to coordinate with Roanoke County Stormwater Division with the development and distribution of Roanoke County Stormwater Informational Mailer to Town of Vinton Residents and Businesses.

BMP 1-3. Stream Monitoring and Education - On behalf of Town of Vinton, Clean Valley Council provides stream monitoring and informational stream seminars for Town of Vinton students and residents.

BMP 1-4. Stormwater Education Program for Schoolchildren - Through the Clean Valley Council, Town of Vinton implements a stormwater education program for its schoolchildren. Different programs target appropriate grade levels.

***BMP 1-5. Stormwater Public Awareness Programs -** The Town of Vinton implements a Stormwater Public Awareness Program by coordinating with Roanoke County Stormwater Division in the distribution of stormwater merchandise, public service announcements, and other high visibility educational media.

BMP 1-6. Town of Vinton Stormwater Webpage - Town of Vinton maintains a Stormwater webpage as a means to inform the public on the various ways to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and addressing other local water pollution concerns**.**

***BMP 1-7. Targeted Education Program -** This BMP is a joint project with the County of Roanoke. The annual mailing and/or distribution of the educational materials for this targeted education program by the County of Roanoke included the Town of Vinton households, businesses, and contractors involved in land-disturbing activities.

BMP 2-3: MS4 Program and Stormwater Pollution Prevention Website - Town of Vinton maintains a webpage that is dedicated to the MS4 Program and Stormwater Pollution Prevention.

The BMPs listed above have been revised, where appropriate, to include messages from the Bacteria TMDL Action Plan: (1) Use of Dog Waste Stations; (2) Protecting Stream Buffers; (3) Reducing Food Sources Accessible to Wildlife; (4) Septic System Repair & Maintenance; and (5) Eliminating Illicit Discharges. This effort also extended to training materials developed for the Town and County employees. See **BMP B-9: Enhanced Employee Training**.

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Estimated Audience Size	Overall Messages	Means to Deliver Messages	Rationale
BACTERIA	Restaurants and/or Mobile Trucks	Business Licenses/Yellow Pages	43	• An excessive bacterium hinders stream usage and contributes to algae overgrowth, which hurts aquatic life. • All wastewater to sanitary sewers. • Keep exterior trash receptacles and dumpsters covered and do not wash out into storm drain. • Clean kitchen hoods and floor mats; properly dispose of wastewater. • Do not feed wild animals, including geese.	• Mailer, annually • PSAs on local cable station	Uncovered dumpsters containing garbage and dumpsters and greasy floor mats that are rinsed out onto the pavement can contribute bacteria to our MS4, which discharges directly to our streams. Feeding wildlife leads to increased bacteria discharged from animal waste.
	Pet Owners (Dogs/Cats): Tags issued by Roanoke County	Pet Licenses	700 dogs and 60 cats	• An excessive bacterium hinders stream usage. • Dog waste ends up in streams. • Pick up after your pet and properly dispose of waste. • Do not feed wild animals, including geese. • Keep trash cans covered and protected from animals • Do not feed pets outdoors.	• County publication sent annually to home/pet owners • PSAs on local cable station	Dog waste is a major source of bacteria in our streams. Feeding wildlife leads to increased bacteria discharged from animal waste.
	Veterinarian Offices	Business Licenses/ Yellow Pages	1	• Excessive bacteria hinders stream usage. • Dog waste ends up in streams. • Pick up after pets and properly dispose of waste. • Do not feed wild animals, including geese. • Keep trash cans covered and protected from animals • Do not feed pets outdoors.	• Brochures placed in Veterinarian offices, annually • PSAs on local cable station	Dog waste is a major source of bacteria in County streams. Feeding wildlife leads to increased bacteria discharged from animal waste.
	Pet Stores/Pet Boarding/ Mobile Pet Grooming/	Business Licenses/ Yellow Pages	3		• Brochures placed in Veterinarian offices, annually • PSAs on local cable station	
	Community Resource Officer	Town Records	1	• An excessive bacterium hinders stream usage. • Dog waste ends up in streams. • Pick up after your pet and properly dispose of waste.	• In-house training	The employee owns and/or handle dog as part of his/her work. Dog waste is a major source of bacteria in our streams.
	Septic System Owners	Water/Sewer Billing Records	58	• Keep septic system maintained; provide periodic pump out. • Repair failing septic system	• County publication sent annually to septic owners.	Malfunctioning or poorly maintained onsite sewage disposal systems may result in discharges of bacteria from human waste.

BMP B-9: Enhanced Employee Training for Bacteria (*E. coli)*

In accordance with the MS4 Permit requirements, The Town's Public Education Program targets three high-priority water quality issues that contribute to the degradation of stormwater runoff and receiving waters: *excess bacteria, excess sediment, and excess nutrients*. Thus, the Town has enhanced its employee training program to recognize bacteria (*E. coli*) as a "high-priority water quality issue." Training courses include the following, as outlined in the MS4 Program Plan, as discussed in the Annual Report in BMP 6-4:

- **Recognition and Reporting of Illicit Discharge** – all applicable field personnel will receive training on a biennial basis in the recognition and reporting of illicit discharges. Among many potential illicit discharges, sediment and bacteria are identified as potential pollutants in this training.

- **Good Housekeeping and Pollution Prevention Practices** – all employees that perform road, street, and parking lot maintenance, or are employed in and around maintenance and public works facilities and at greenway/trail facilities will receive biennial training in good housekeeping and pollution prevention practices. Sediment and bacteria are identified as potential pollutants in this training.

  NOTE: All employees who were required to take Good Housekeeping and Pollution Prevention Practices were required to read and follow the Town's Standard Operating Procedures (SOPs). These procedures were designed to eliminate or minimize pollutant discharges in stormwater, are detailed in BMP 6-5 of the MS4 Program Plan.

- **Contractor Oversight for Environmental Compliance** – all supervisors who oversee Contractors that perform work for the Town or employees involved in developing contracts for Contractors will take this training on a biennial basis. The training explains that all Contractors must have their own written good housekeeping and pollution prevention program, or they must comply with the Town's written policies and SOPs. This training discusses the significance of soil erosion from construction sites, the potential harm to receiving waters, and the need to use effective erosion and sediment controls. It also discusses the need to carefully place and maintain portable toilets onsite to ensure bacterial wastes do not enter stormwater runoff. Town employees who oversee Contractors working for the Town must ensure compliance by Contractors.

- **Hazardous Materials (HAZ-MAT) Training** – although not directly related to sediment reduction, the County of Roanoke currently maintains basic hazardous materials training for its employees including Town of Vinton employees, volunteers, in Fire and Rescue. All career (paid) staff are certified to HAZ-MAT Operations. HAZ-MAT certification does not expire from the Virginia Department of Fire Programs; however, all career personnel receive annual, internal training on this topic as part of their career development training.

The BMPs listed above and the Town's Standard Operating Procedures (SOPs) for Pollution Prevention and Good Housekeeping have been revised, where appropriate, to include messages from the Bacteria TMDL Action Plan: (1) Use of Dog Waste Stations; (2) Protecting Stream Buffers; (3) Reducing Food Sources Accessible to Wildlife; (4) Septic System Repair & Maintenance; and (5) Eliminating Illicit Discharges.

IV. Annual Reporting Requirements

The MS4 Annual Report will include a summary of actions conducted to implement this Bacteria TMDL Action Plan during the reporting period of July 1st - June 30th for each year of the permit term.

In accordance with the MS4 Permit, the report is submitted to DEQ by October 1st of each year.

V. Evaluation of TMDL Action Plan

The *Total Maximum Daily Load (TMDL) Action Plan for Bacteria Reduction (E. coli) in the Roanoke River, Tinker Creek, and Glade Creek* was originally completed in April 2020.

To satisfy the requirements of Section II.B.2.a.(1) of the current MS4 Permit, the Town hereby provides "an evaluation of the results achieved by the previous action plan" named above.

The Bacteria TMDL is somewhat subjective and the MS4 permit identifies mostly qualitative measures to reduce loads to the MS4. As such, the Town has implemented strategies using the following three permit categories from Table 5 in II.B.5: (a) Domestic Pets; (b) Urban Wildlife, and (c) Illicit Connections or Illicit Discharges to the MS4.

For each of these categories, the Town has developed one or more Best Management Practice (BMP) to help decrease the discharge of *E. coli* from the MS4 in an effort towards meeting the DEQ-assigned waste load allocation. The Town finds them to be effective, as described below:

DOMESTIC PETS		EVALUATION/EFFECTIVENESS
B-1	Dog Waste Stations and Signage	It is believed that dog waste is one of the most significant sources of controllable bacteria. As such, it is beneficial for the Town to maintain dog waste stations and associated signage in public properties, greenways, and parks to reduce the discharge of *E. coli* from dog waste into receiving waters.
B-2	Protect Stream Buffers: Implement Ordinance (See Roanoke County BMP-2 – Roanoke County is the Town's VESMP Authority)	Continued implementation of the stream buffer ordinance is an effective strategy to assist the County in its overall long-term reduction of bacteria, as stream buffers can be effective in dissuading stream access and in filtering stormwater runoff that sheet flows through the buffer, which helps to remove sediment, bacteria, and other pollutants.
B-3	Protect Stream Buffers: No-Mow Policy for Town-Owned Land and Roanoke County Owned-Park within Town Limits	A no-mow policy for Town-owned lands and Roanoke County (ROCO)-owned land is being implemented by the Town's Department of Public Works and ROCO Department of Parks, Recreation, and Tourism, respectively. This policy attempts to balance the competing goals of providing adequate access to streams for the public, providing adequate views of the streams, excluding dogs, protecting stream banks, and providing vegetative filters. The implementation of this policy began in spring 2017 in the Town and spring 2021 in the County and helps to keep dogs (and their waste) away from streams.
B-4	Public Street Sweeping and Leaf Collection Program	The street sweeping and leaf collection program has been in place since 2013. The street sweeping program to target weekly sweeping of all primary streets will return the greatest benefit of collecting and thus preventing roadway contaminants, sediment and debris, from entering the stormwater collection system. Other streets are swept bi-weekly or at three-week intervals. This continues to optimize both the use and effectiveness of the Town single street sweeper and achieves desired results. The fall leaf collection program, which is normally done in the months of November and December, also minimizes leaf and yard waste from entering the stormwater collection system.
URBAN WILDLIFE		**EVALUATION/EFFECTIVENESS**
B-5	Public Education: Reducing Food Sources Accessible to Wildlife.	Public education program encourages citizens to reduce food sources accessible to wildlife with a host of messages, including (1) Keep trash cans covered and protected from animals, (2) Do not feed pets outdoors, (3) Secure bird feeders from squirrels, bears, and other animals, and (4) Do NOT feed wild animals, including Canadian geese. Such messages help keep wild animals and their feces away from homes and nearby storm drains.

	ILLICIT DISCHARGE CONNECTIONS OR ILLICIT DISCHARGES TO THE MS4	EVALUATION/EFFECTIVENESS
B-6	Public Education: Septic System Repair and Maintenance	The Town along with Roanoke County's expanded public education program is effective in encouraging citizens to periodically pump out their septic systems and to keep them properly operating. With recent grant funding, the County has also been able to offer free septic tank pump-outs to over 70 homes, including homes located within the Town Limits.
B-7	Business Outreach: Eliminating Illicit Discharges	Visiting targeted businesses that have an elevated potential to discharge bacteria in the conduct of their day-to-day activities is an effective means for the Town to identify illicit discharges and work with business owners to have them eliminated.
B-8	Enhanced Public Outreach for Bacteria *(E. coli)*	Use of tailored messages to address bacteria that are focused on the proper target audiences is an effective means to raise awareness, improve individual's actions, and increase support for water quality programs in general.
B-9	Enhanced Employee Training for Bacteria *(E. coli)*	The Town believes that raising awareness of applicable Town employees involved in certain municipal operations will lead to better implementation of pollution prevention strategies, which will help to minimize the discharge of bacteria from County facilities.

Conclusion

Although the Town's bacteria-related BMPs do not have numeric efficiencies, the Town has consistently met its BMP metrics as described in each MS4 Annual Report. The Town finds its approach to be consistent with the Bacteria (E.coli) TMDL, and believes the selected strategies are effective in increasing public awareness of bacteria sources and ways to reduce their loads to the MS4.