COUNTY of ROANOKE

VIRGINIA

Municipal Separate Storm Sewer System

Program Plan

May 2019

(Revised November 2019)

Prepared By:

Department of Community Development

DEVELOPMENT AND ENGINEERING SERVICES

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Part I. Introduction

A. Background

According to the United States Environmental Protection Agency (US EPA), polluted stormwater runoff is a leading cause of impairment to nearly 40 percent of surveyed U.S. water bodies that do not meet water quality standards. Whether by overland flow or via stormwater systems, such as underground pipes, ditches, or open channels, polluted stormwater runoff is discharged into local receiving waters. Such untreated water pollution can result in the destruction of fish, wildlife, and aquatic life habitats; it can also cause a loss of aesthetic value, and can threaten public health due to its potential to contaminate food, drinking water supplies, and recreational waterways.

B. Municipal Separate Storm Sewer System (MS4) Program

The County of Roanoke is committed to continuing in the development, implementation, and enforcement of a Municipal Separate Storm Sewer System (MS4) Program, pursuant to the requirements of the MS4 Permit VAR040022, as issued by the Virginia Department of Environmental Quality. This program is designed to reduce the discharge of pollutants from the County's regulated MS4 area to the maximum extent practicable (MEP) and to satisfy the appropriate water quality requirements of the State Water Control Law and its attendant regulations.

The County's MS4 program includes elements that address six Minimum Control Measures (MCMs), as follows:

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management in New Development and Development on Prior-Developed Lands
6. Pollution Prevention and Good Housekeeping for Municipal Operations

When addressing these six MCMs, Roanoke County emphasizes the importance of lowering sediment, bacteria, and PCB discharges to the storm sewer system in accordance with the approved TMDLs within the County.

In addition to the six MCMs, the County's MS4 Program includes water quality-related Standard Operating Procedures and supporting documents. These documents are part of the MS4 Program Plan and are listed in the narrative of each BMP within the Program Plan and available for review in a separate folder on the County's stormwater webpage entitled "Supporting Documents." https://www.roanokecountyva.gov/DocumentCenter/Index/1538

Roanoke County is committed to establishing and sustaining a comprehensive program to improve the quality of stormwater runoff for citizens within its boundaries and beyond; such commitment will continue over the permit term and well into the future.

C. Roanoke County's Regulated MS4 Area

Roanoke County is partially urbanized. As such, only the areas categorized as urban by the 2010 U.S. Bureau of the Census are included in the County's regulated MS4 area.

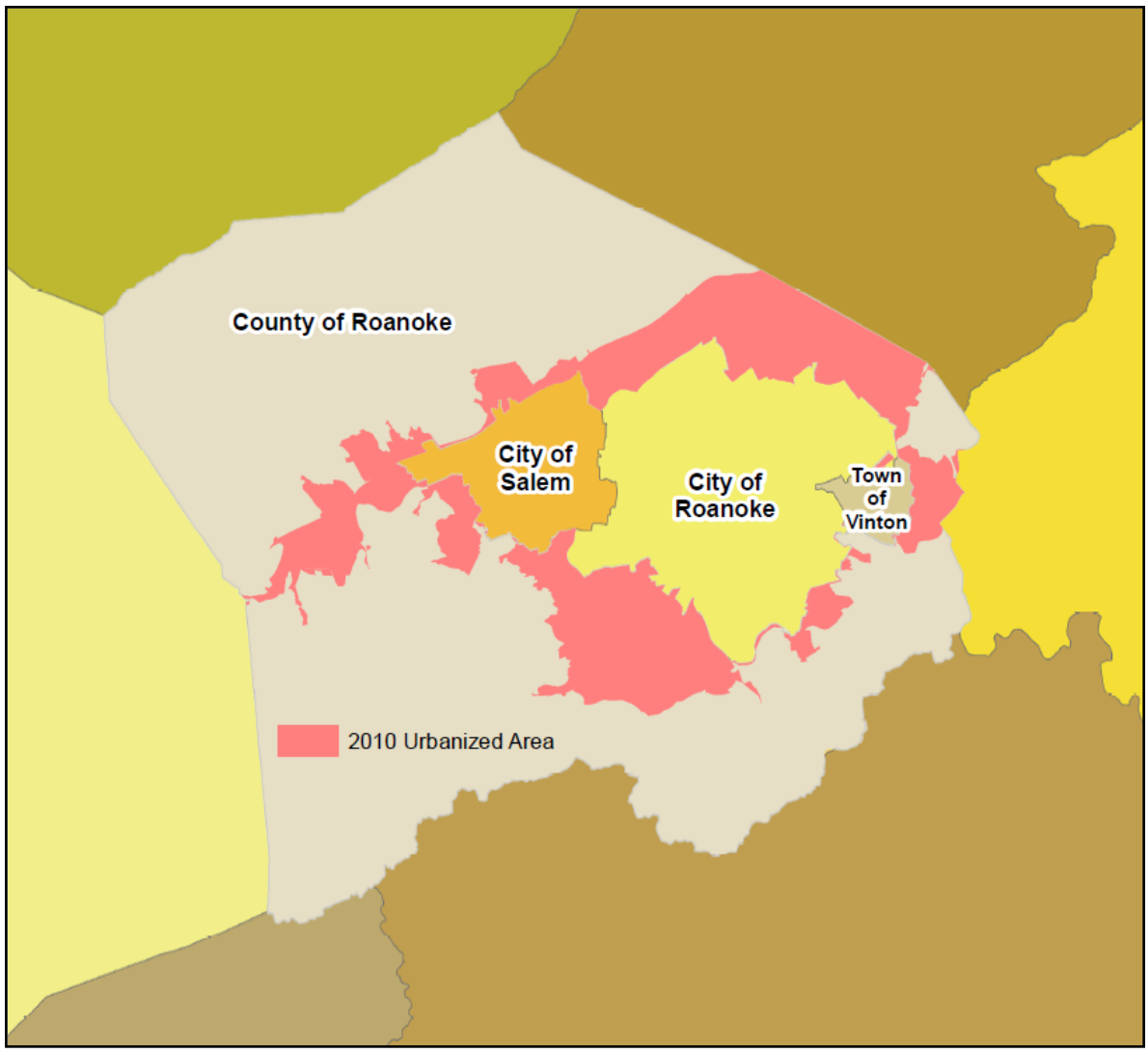

Figure 1: Roanoke County's Urbanized Areas, as determined by the 2010 U.S. Census

D. Roles and Responsibilities of Roanoke County's Divisions and Departments

Various divisions and departments within Roanoke County assist with implementing the MS4 permit requirements. Their roles and responsibilities are described below:

- **Department of Community Development, Development and Engineering Services Division** has the lead role in overseeing the County's efforts to comply with the MS4 permit, including the following:

  - Gathers the requisite data and prepares the MS4 Program Plan and MS4 Annual Reports
  - Conducts Program Administration, Plan Review, Inspection, and Enforcement to implement the Virginia Erosion and Sediment Control (ESC) and Stormwater Management (SWM) Programs.
  - Conducts and oversees county-wide stormwater-related employee training
  - Implements the Illicit Discharge Detection & Elimination (IDDE) Program
    - ✧ Inspects County-owned outfalls to locate potential illicit discharges
    - ✧ Responds to citizen complaints regarding illicit discharges and spills
    - ✧ Conducts enforcement, when necessary
  - Conducts stormwater-related public education and outreach efforts
    - ✧ Manages the contract with Clean Valley Council (CVC), which has been hired to assist the County in delivering certain portions of the County's Public Education and Outreach Program
  - Maintains existing and constructs new facets of the County's storm drainage (MS4) system
  - Oversees contract with 3rd party to inspect and maintain all County-owned stormwater management facilities (i.e., Best Management Practices (BMPs))
  - Implements post-construction BMP Program (i.e., conducts inspections & initiates enforcement) for all privately-owned BMPs in the County
  - Prepares SWPPPs for County-owned facilities and provides guidance to affected departments in conducting their quarterly and regional facility inspections
  - Prepares and manages activities associated with the County's TMDL Action Plans for sediment, bacteria, and PCBs

- **Department of Parks, Recreation, and Tourism (PRT)** implements nutrient management plans on recreational fields and other lawn areas managed by PRT; implements a Stormwater Pollution Prevention Plan at the Public Service Center (Kessler Mill) for its assigned work areas to address pollution prevention and good housekeeping activities at this facility. Installs and maintains pet waste stations in designated parks and greenways.

- **Department of General Services -** implements a Stormwater Pollution Prevention Plan at the Fleet Services Center and at the Public Service Center (Kessler Mill) for its assigned work areas to address pollution prevention and good housekeeping activities at these facilities.

- **Fire Department -** implements Spill Prevention, Control, and Countermeasures Plans (SPCC) at fire/rescue stations within the MS4 area; implements Stormwater Pollution Prevention Plans (SWPPPs) at its various fire/rescue stations within the MS4 area and at the Roanoke Valley Regional Fire/EMS Training Center; and responds to spill-related incidents by employing containment measures and then contacting a 3rd party contractor for actual clean-up.

- **Roanoke County Public Schools (RCPS) -** implements nutrient management plans on school ball fields and other lawn areas managed by RCPS; implements Stormwater Pollution Prevention Plans for various bus yard and vehicle repair/maintenance facilities to address pollution prevention and good housekeeping activities at each. Oversees the contract with a 3rd party to maintain all RCPS-owned stormwater management facilities (SWMFs). By way of a Memorandum of Agreement (MOA) with the County, dated July 30, 2019, RCPS has opted to fall under the County's MS4 permit coverage. (See Supporting Documents, folder entitled Introduction.)

- **Department of Public Information** (Web Content Manager) **-** assists with posting and managing data on the stormwater website and provides webpage statistics.

- **Communications and Information Technology** - assists with posting stormwater training data on the County's intranet site (Café)

- **County Attorney's Office -** assists the Department of Community Development with compliance and enforcement issues regarding regulated projects or post-construction SWMFs pursuant to the Virginia Erosion and Sediment Control Program and/or the Virginia Stormwater Management Program.

The following Departments, all of which have staff who drive throughout the County in the conduct of their day-to-day work activities, receive Illicit Discharge Detection and Elimination training to assure that they are prepared to respond in the event that they witness an active discharge event:

- Community Development
- Commissioner of the Revenue
- General Services
- Fire and Rescue
- Parks, Recreation, & Tourism
- Police
- Real Estate Valuation
- Regional Center for Animal Care & Protection
- Sheriff's Office
- Social Services

E. Purpose of Roanoke County's MS4 Program Plan

This MS4 Program Plan addresses the requirements of General Permit VAR040022, with an effective date of November 1, 2018 through October 31, 2023, entitled "General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s)." This Program Plan has been developed by Roanoke County's MS4 management and program staff in the Department of Community Development, and it

serves as a planning document. ***It is not an enforceable document.*** As outlined in DEQ's MS4 Permit Fact Sheet, "all enforceable provisions of the MS4 Program are contained within the General Permit."

Roanoke County will update this MS4 Program Plan, as required in Part 1.C.3 of the MS4 Permit, and such updates will be reported in the applicable Annual Report, pursuant to Part I.D.2 of the permit.

F. Physically-Interconnected MS4s

Roanoke County's MS4 is physically-interconnected with the following MS4s: the City of Salem, the City of Roanoke, the Town of Vinton, and VDOT.

Figure 2: Map of Roanoke County's Physically-Interconnected MS4s

Roanoke County is located outside the jurisdictional limits of and surrounds the City of Salem, the City of Roanoke, and the Town of Vinton. All four localities are regulated small MS4s. The majority of Roanoke County's watersheds drain to the Roanoke River, which flows west to east through the Roanoke Valley, as shown in Figure 2. (Note that a portion of Roanoke County's stormwater runoff drains north into the storm sewer system that is operated by Botetourt County, but Botetourt is not a regulated MS4.) Additionally, most roads are maintained by the Virginia Department of Transportation (VDOT), which is also a regulated MS4 entity.

Roanoke County provided a letter, dated June 28, 2019, to the City of Salem, the City of Roanoke, the Town of Vinton, and VDOT notifying each entity of their interconnection to Roanoke County's MS4. A copy of each of these letters is provided in the Supporting Documents, which can be found in the folder labeled "Introduction" on the CD included with this Program Plan.

G. Inter-Jurisdictional Cooperation

As coordinated by the Roanoke Valley-Alleghany Regional Commission, Roanoke County regularly meets with the cities of Roanoke and Salem and the Town of Vinton to discuss shared water quality issues and to coordinate MS4 activities, where appropriate. In addition, these same localities have individually contracted with a local non-profit organization, the Clean Valley Council (CVC), to provide regional education and outreach programs related to stormwater management and stormwater pollution prevention. Roanoke County's executed contract with CVC is located in the Supporting Documents, which can be found on the CD included with this Program Plan.

Part II. Minimum Control Measures

Pursuant to 9VAC25-89-40, Part I (Discharge Authorization and Special Conditions), the following Minimum Control Measures (MCMs) describe the actions that Roanoke County will use to develop, implement, and enforce its MS4 Program, all of which are designed to reduce the discharge of pollutants from this small MS4 to the maximum extent practical (MEP). The measures will also be employed to protect water quality and to satisfy the appropriate water quality requirements of the State Water Control Law and its attendant regulations.

- MCM-1: Public Education and Outreach
- MCM-2: Public Involvement and Participation
- MCM-3: Illicit Discharge Detection and Elimination
- MCM-4: Construction Site Stormwater Runoff Control
- MCM-5: Post-Construction Stormwater Management for New Development and Development on Prior-Developed Lands
- MCM-6: Pollution Prevention and Good Housekeeping for Municipal Operations
- TMDL: TMDL Special Conditions

NOTE:
As per Part I.B. of the General Permit, implementation of the above-listed MCMS and the Chesapeake Bay and Local TMDL requirements in Part II (as applicable) consistent with the provisions of an iterative MS4 program required pursuant to the General Permit constitutes compliance with the standard of reducing pollutants to the "maximum extent practicable," provides adequate progress in meeting water quality standards and satisfies the appropriate water quality requirements of the State Water Control Law and its attendant regulations. Due to this iterative nature of the MS4 Program, over the course of the permit term Roanoke County may find it necessary to change or replace one or more of the "anticipated" Best Management Practices (BMPs) used to satisfy the MCMs; such changes/replacements will be made when the County finds the BMP(s) to be ineffective.

Pursuant to 9VAC25-89-40, Part I.E. (Minimum Control Measures), Roanoke County's MS4 Program Plan includes the following:

MCM-1: Public Education and Outreach

1. A list of the high-priority stormwater issues that Roanoke County will communicate to the public as part of its Education and Outreach Program;

2. The rationale for selection of each high-priority stormwater issue and an explanation of how each education or outreach strategy is intended to have a positive impact on stormwater discharges;

3. Identification of the public [target] audience to receive each high-priority stormwater message;

4. The strategies from Table I of Part I.E.1.d. of the General Permit to be used to communicate each high-priority stormwater message; and

5. The anticipated time periods the messages will be communicated or made available to the public.

MCM-2: Public Involvement and Participation

1. The webpage address where the public can report (i) potential illicit discharges, improper disposal, or spills to the MS4, (ii) complaints regarding land disturbing activities, or (iii) other potential stormwater pollution concerns;

2. The webpage address that contains the methods for how the public can provide input on the Roanoke County's MS4 program; and

3. A description of the public involvement activities to be implemented by Roanoke County, the anticipated time period the activities will occur, and a metric for each activity to determine if the activity is beneficial to water quality. An example of metrics may include the weight of trash collected from a stream cleanup, the number of participants in a hazardous waste collection event, etc.

MCM-3: Illicit Discharge Detection and Elimination (IDDE)

1. The MS4 outfall map and outfall information table required by Part I.E.3.a.of the General Permit. The map and information table may be incorporated into the MS4 program plan by reference. The map shall be made available to DEQ within 14 days upon request;

2. Copies of written notifications of new physical interconnections given by Roanoke County to other MS4s; and

3. The IDDE procedures described in Part I.E.3.c. of the General Permit.

MCM-4: Construction Site Stormwater Runoff Control

1. The local ordinance citations for the County's VESCP and VSMP programs;

2. A description of the legal authorities utilized to ensure compliance with Part I.E.4.a. to control construction site stormwater runoff control such as ordinances, permits, orders, specific contract language, policies, and inter-jurisdictional agreements;

3. Written inspection procedures to ensure the erosion and sediment controls and stormwater management controls are properly implemented and that all associated documents are utilized during inspection including the inspection schedule;

4. Written procedures for requiring compliance through corrective action or enforcement action to the extent allowable under federal, state, or local law, regulation, ordinance, or other legal mechanisms; and

5. The roles and responsibilities of each of Roanoke County's departments, divisions, or subdivisions in implementing the construction site stormwater runoff control requirements in Part I.E.4.

MCM-5: Post-Construction Stormwater Management for New Development and Development on Prior-Developed Lands

1. A copy of the VSMP approval letter issued by DEQ;

2. Written inspection procedures and all associated documents utilized in the inspection of privately owned stormwater management facilities; and

3. Written procedures for compliance and enforcement of inspection and maintenance requirements for privately owned BMPs.

4. A description of the legal authorities utilized to ensure compliance with Part I.E.5.a. for post-construction stormwater runoff control such as ordinances (provide citation as appropriate), permits, orders, specific contract language, and inter-jurisdictional agreements;

5. Written inspection procedures and all associated documents used during inspection of stormwater management facilities owned or operated by Roanoke County;

6. The roles and responsibilities of each of Roanoke County's departments, divisions, or subdivisions in implementing the post-construction stormwater runoff control program; and

7. The stormwater management facility spreadsheet or database incorporated by reference and the location or webpage address where the spreadsheet or database can be reviewed.

MCM-6: Pollution Prevention and Good Housekeeping for Municipal Operations

1. The written procedures for the operations and maintenance activities, as required by Part I. E.6.a. of the MS4 Permit.

2. A list of all high-priority facilities owned or operated by Roanoke County, as required in accordance with Part I.E.6.c., and whether or not the facility has a high potential to discharge;

3. A list of lands for which turf and landscape nutrient management plans are required in accordance with Part I.E.6.i and j, including the following information:

   a) The total acreage on which nutrients are applied;

   b) The date of the most recently approved nutrient management plan for the property; and

   c) The location in which the individual turf and landscape nutrient management plan is located;

4. A summary of the mechanisms Roanoke County uses to ensure contractors working on behalf of the County implement the necessary good housekeeping and pollution prevention procedures and stormwater pollution plans, as appropriate; and

5. The written training plan as required in Part I.E.6.m. of the General Permit.

TMDL: Local TMDL Special Conditions

Roanoke County previously developed and currently implements local Total Maximum Daily Load (TMDL) Action Plans to reduce loadings for its pollutants of concern (sediment, bacteria, and PCBs), because the County discharges these pollutants of concern to impaired waters for which a TMDL has been approved by the U.S. Environmental Protection Agency (EPA) and in which an individual or aggregate wasteload has been allocated to Roanoke County.

Because these TMDLs were approved by the EPA prior to July 1, 2013, Roanoke County will update the previously approved local TMDL Action Plans to meet the conditions of Part II B 3, B 4, B 5, B 6, and B 7 of the MS4 Permit, as applicable, no later than 18 months after the MS4 Permit effective date and will continue implementation of the action plans.

Note that the County's 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.

MCM-1: Public Education and Outreach

This minimum control measure is intended to implement a public education and outreach program that is designed to:

1. Increase the public's knowledge of how to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns;

2. Increase the public's knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications; and

3. Implement a diverse program with strategies that are targeted toward individuals or groups most likely to have significant stormwater impacts.

The County has developed the following Best Management Practices (BMPs) to meet these program goals:

BMP 1-1: Stormwater Educational Resources
The County has created and will maintain a comprehensive listing of existing stormwater-related agencies and organizations along with pertinent educational programs and resources, which shall be made available to the public by way of the County's stormwater website.

BMP 1-2: Roanoke County Stormwater Newsletter
Roanoke County will create and distribute a Stormwater Newsletter, which shall be annually distributed to all Roanoke County residences.

BMP 1-3: Stream Monitoring and Education
Roanoke County will provide stream monitoring and informational stream seminars for Roanoke County students and residents.

BMP 1-4: Stormwater Education Program for Schoolchildren
Roanoke County will develop and implement a stormwater education program for its schoolchildren. Different programs will target appropriate grade levels.

BMP 1-5: Stormwater Public Awareness Program
Roanoke County has developed and will implement a Stormwater Public Awareness Program that includes the distribution of stormwater merchandise, public service announcements, and other high visibility educational media. The program includes:

1. A list of the high-priority stormwater issues that Roanoke County will communicate to the public as part of its public education and outreach program;

2. The rationale for selection of each high-priority stormwater issue and an explanation of how each education or outreach strategy is intended to have a positive impact on stormwater discharges;

3. Identification of the public audience to receive each high-priority stormwater message;

4. The strategies from Table 1 of Part I.E.1.d. to be used to communicate each high priority stormwater message; and

5. The anticipated time periods the messages will be communicated or made available to the public.

BMP 1-6: Roanoke County Stormwater Webpage
Roanoke County will maintain its 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
Roanoke County implements a stormwater quality education program for specific (target) audiences. This BMP coordinates with BMP 1-5.

This report provides a detailed description of each BMP, all standard operating procedures or policies necessary to implement each BMP, the measurable goal by which each BMP will be evaluated, and the persons, positions, or departments responsible for implementing each BMP.

BMP 1-1: Stormwater Educational Resources

The goal of this BMP is to create and maintain a comprehensive listing of stormwater-related agencies and organizations, educational programs and resources, such as current publications, websites, videos, maps, and training opportunities that directly address stormwater issues such as stormwater management, stormwater quality, floodplain management, stormwater pollution prevention, conservation practices, and riparian habitat protection. The public will be made aware of these resources by way of the County's stormwater website.

Responsible Party:
Roanoke County's Department of Community Development.

Schedule and Evaluation:
Roanoke County will annually maintain and update this stormwater resources database, which shall include a listing of key agencies and organizations, available print materials, videos, maps, and training opportunities related to stormwater quality, stormwater management, floodplain management, stormwater pollution prevention, conservation practices, and riparian habitat. The database will be made accessible through Roanoke County's website, and it will provide contact information and website links to aid the public in accessing these resources.

At the end of each annual period, the County will analyze its stormwater website usage to determine the effectiveness of making this information available to the public. The County will provide the website where the stormwater resources database is located, and it will submit a copy of this database and provide documentation of the number of website visits.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
- Audio-Visual Information, dated August 2019
- Environmental Educational Publications and Programs, dated August 2019
- Local and National Agencies, dated September 2019
- Printed Materials and Publications, dated August 2019

Measurable Goals:
Success for this BMP will be measured by tracking website usage and the number of requests received by the County for this or similar data.

Items to be reported in the Annual Report:
The Annual Report will contain the stormwater resources database, documentation of the number of stormwater website visits, and the County's stormwater website address. The County will annually evaluate this BMP and determine if any modifications are needed based on a review of the applicable measurable goals.

BMP 1-2: Roanoke County Stormwater Newsletter

The goal of this BMP is to create and distribute an annual Stormwater Newsletter, which shall be mailed to every residence in Roanoke County. The purpose of this newsletter shall be to (1) increase the public's knowledge on ways to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns; and (2) increase the public's knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications. The target public audience for this publication will be County residents.

The newsletter, while primarily aimed at County residents, will also address regional issues that affect the entire Roanoke River watershed. Topics may include: litter prevention, stormwater pollution prevention, stormwater quality education, residential best management practices, updates on local impaired water bodies, and TMDLs. It will also include subjects that are specific to Roanoke County's Stormwater Management Program. The stormwater newsletter's focus will be coordinated with the high-priority water quality issues identified in BMP 1-5, and it serves as a "traditional written materials" strategy per Table 1 of the MS4 Permit.

Responsible Party:
Department of Community Development.

Schedule and Evaluation:
Roanoke County will educate its residents about stormwater management via an annual newsletter. The County will provide additional copies of the newsletter to its various public libraries and schools, and it will post the newsletter on its stormwater website for additional outreach.

At the end of each annual period, the County will document its annual distribution total.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
None.

Measurable Goals:
Success for this BMP will be measured through the documentation of the number of County residences to which the newsletter was mailed.

Items to be reported in the Annual Report:
The Annual Report will contain a copy of the newsletter and the number of newsletters that were distributed. The County will annually evaluate this BMP to determine if modifications are needed based on the results of its analysis of the measurable goals and any feedback that was received from the public.

BMP 1-3: Stream Monitoring and Education

In cooperation with the Clean Valley Council (CVC), Roanoke County will provide stream monitoring and informational stream seminars for Roanoke County students and residents. The goal of this BMP is to educate students and residents about field procedures for biological stream monitoring, in addition to motivating citizens to monitor waterways in their neighborhood and enhance grassroots cooperation to promote the importance of stream monitoring within the County. These seminars and monitoring sessions will provide some field exposure to aquatic habitats, update citizens on local, state, and federal water quality regulations, and keep citizens updated on local stream health. In addition, this BMP falls under the "curriculum materials" strategy in Table 1 of the MS4 Permit and the "monitoring" category in Table 2 of the MS4 Permit.

Responsible Party:
Roanoke County's Department of Community Development, through the Clean Valley Council.

Schedule and Evaluation:

On behalf of Roanoke County, the Clean Valley Council will educate Roanoke County students and citizens by holding stream education seminars and monitoring sessions. Special emphasis will be placed on monitoring stream segments with a TMDL designation. The County will create a database to track the names of monitored streams and the number and type of groups participating, and it will be submitted to DEQ in the annual report.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19)
Stream Monitoring and Education Plan, dated July 2019

Measurable Goals:
Success for this BMP will be measured by tracking the number of citizens/students involved in stream monitoring activities conducted by the CVC on behalf of Roanoke County. In addition, Roanoke County will track the number of stream schools given by the CVC, the number of participating students, and their respective grade level(s).

Items to be reported in the Annual Report:

- Names of streams monitored in Roanoke County using the benthic macro-invertebrate method.
- Number of participants conducting stream monitoring.
- Number of stream schools provided.
- Number of attendees present at each stream school.
- Modifications to this BMP based upon results of analyses of measurable goals.

BMP 1-4: Stormwater Education Program for Schoolchildren

Roanoke County, through the Clean Valley Council (CVC), has established a stormwater education program for Roanoke County's schoolchildren. The CVC educators actually develop and implement various programs to address stormwater pollution prevention and related water quality issues. Different program materials have been developed to target appropriate grade levels and are correlated with the applicable Standards of Learning (SOLs). The messages for the various grade levels have been coordinated with the County's high-priority water quality issues, as identified in BMP 1-5. This BMP falls under the "curriculum materials" strategy in Table 1 of the MS4 Permit.

Responsible Party:
Roanoke County's Department of Community Development, through the Clean Valley Council.

Schedule and Evaluation:
The County will document how many children have been educated on stormwater quality by tracking the number of programs provided and the number of children reached.

At the end of each annual period, the County will analyze the statistics of how many programs were provided and how many children were reached to determine the most effective method.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
- Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19)
- Stormwater Education Program for Roanoke County's Schoolchildren, dated July 2019

Measurable Goals:
Success for this BMP will be measured by tracking the number of programs that were provided and the number of children that were reached.

Items to be reported in the Annual Report:
The Annual Report will contain the program names, a brief description of each program and their goals, dates and locations of each program that was presented, and the number of participants in each program. Evaluation and subsequent modifications to this BMP will be based on results of the County's analysis of the measurable goals.

BMP 1-5: Stormwater Public Awareness Program

Roanoke County's Stormwater Public Awareness Program targets three high-priority water quality issues that contribute to the degradation of stormwater runoff and the receiving waters into which it drains: excess bacteria, excess sediments, and excess nutrients.

Rationale for Selection - Sediment and bacteria were selected because the County has been assigned a Total Maximum Daily Load (TMDL) by DEQ for these impairments, meaning the County has been put on a "pollution diet" to limit these two pollutants from entering its waterways. Nutrients (phosphorus and nitrogen, in particular) were chosen because they have such negative impacts on receiving waters when in large quantities. Excess nutrients wash off of lawns, other managed turf areas, and farm fields and are carried in stormwater runoff to the area's receiving waters (streams, creeks, and the Roanoke River). Once in the waterways, they cause algal overgrowth, which in turn decreases the oxygen that marine life need to survive. This often results in fish kills, fish illnesses, and the tainting of human food. Groundwater supplies may also be affected by nutrient pollution.

The County's Public Awareness Program focuses on (1) ways to increase the public's knowledge about how to prevent these pollutants from getting into stormwater runoff, and (2) the hazards and legal implications of illegal discharges and improper disposal of wastes.

The County has developed relevant messages for this BMP and uses a variety of means and methods, including partnering with the Clean Valley Council and RVTV3, to communicate with the public via the distribution of printed materials (brochures, fact sheets, and newsletters), radio and TV advertisements, use of websites and social media, storm drain stenciling, speaking engagements, and through giveaways of stormwater-related merchandise.

In addition, as outlined in BMP 1-7, the County also targets certain public audiences with specific educational materials and messages, which are designed to help them reduce stormwater pollution in their day-to-day activities.

These efforts employ several of the strategies identified in Table 1 of the MS4 Permit, including traditional written materials, alternative materials, signage, and media materials.

Responsible Party:
Department of Community Development, with assistance from the CVC and RVTV.

Schedule and Evaluation:
The County's Public Awareness Program incorporates the development and distribution of printed materials, billboard and mass transit advertisements, signage at select locations, radio and television advertisements, newspaper articles, and use of websites and social media. The County will annually track the number and types of materials that are distributed and posted on websites/social media and the size of the audience that is exposed to such materials, as appropriate.

In addition, the County purchased a set of video programs that were designed for educating the general public on Illicit Discharge Detection and Elimination (IDDE) to the storm drainage system; such discharges include the selected three high-priority water quality issues: excess bacteria, excess sediment, and excess nutrients in stormwater. These videos fall under the "training materials" strategy identified in Table 1 of the MS4 Permit. The kit includes five videos of varying run times, as shown below, which are designed to be used in specific medium/media or to reach a specific audience.

30 sec, for local public media (as a Public Service Announcement)
60 sec, for broad community audiences
2 min, for short presentations booths, fairs, public events
5½ min, for short speaker presentations or young audiences
10½ min, in-depth for full understanding of illicit discharge and what can be done

The County will track the size of audiences exposed to the various videos and evaluate the response it receives from the public.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19)

Measurable Goals:
The County will document the type of public awareness method that was utilized, including the size of the audience reached, and any impact indicators that show what effect the method had on behavior.

Items to be reported in the Annual Report:
- Annual activities.
- Proposed program changes over the permit year.
- Conclusion of effectiveness of and any modifications to this BMP based on the analysis of effectiveness.

BMP 1-6: Roanoke County Stormwater Webpage

Roanoke County will maintain and monitor its Stormwater webpage, which enables the public to obtain information concerning the County's Stormwater Management Program, ordinances, design guidelines, general information, contact information, stormwater pollution prevention information, educational materials, and links to other organizations and sites. The website also helps to inform the citizens about on-going community-based projects, including storm drain stenciling, Save Our Streams and other similar stream monitoring programs, regional clean-ups, and other local water quality educational programs and events. The messages for the website will be coordinated with the high-priority water quality issues identified in BMP 1-5. The stormwater website address is https://www.roanokecountyva.gov/stormwater

Responsible Party:
The Department of Community Development, with assistance from the County's webmaster.

Schedule and Evaluation:
Roanoke County will maintain a stormwater website and document the webpage usage, including the annual number of visits to each page. The stormwater website will contain the appropriate videos from its IDDE Public Outreach kit (discussed in BMP 1-5) in an effort to inform the public about the hazards and legal ramifications of illicit discharges. The webpage will also include recent versions of the County's stormwater-related public education materials, such as newsletters, fact sheets, posters, brochures, etc.

The County will monitor the most- and least-visited pages to determine if changes are needed to help expand the audience. Roanoke County will submit page statistics and any intended changes with the annual report.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
None.

Measurable Goals:
Webpage statistics including the most- and least- popular material will be analyzed for effectiveness of the website.

Items to be included in the Annual Report:
- Website address.
- Page statistics.
- Intended changes.
- Evaluation and resulting modifications to this BMP based on results of analysis of measurable goals.

BMP 1-7: Targeted Education Program

The goal of this BMP is to implement an education program for specific public (target) audiences to raise their awareness about stormwater quality. This program will focus on three high-priority stormwater issues (i.e., stormwater pollution) that contribute to the degradation of local waters: excess bacteria, excess sediment, and excess nutrients.

The intention of the program is to inform the target audiences about (1) ways to prevent these pollutants from getting into stormwater runoff and (2) the hazards and legal implications of illegal discharges and the improper disposal of wastes.

The County selected the target audiences based on the likelihood that each of them could generate excess bacteria, sediment, and/or nutrients from their day-to-day activities. The educational materials and messages mailed to each of the target audiences will be specific to their type of operation (such as car wash operations or kennel cleaning) to ensure the program is effective.

In accordance with Table 1 of Part 1 E 1 of the MS4 permit, the County selected various strategies per Table 1 of the MS4 Permit to deliver the targeted materials and messages to the selected public audiences. These are outlined on the next several pages in Figure 3.

Responsible Party:
Department of Community Development.

Schedule and Evaluation:
Roanoke County has developed a list of public (target) audiences to receive specific messages on an annual basis about ways to reduce stormwater pollution in their day-to-day activities. The County will track the size of audiences exposed to the various targeted messages and will evaluate any responses it receives from the selected public audiences.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
- Stormwater Education Program for Specific Audiences, dated November 2019
- Various printed materials and PSAs

Measurable Goals:
The County will document which materials were provided to the various public audiences, including the size of each audience reached, and any impact indicators that show what effect the method had on behavior.

Items to be reported in the Annual Report:
- Target audiences population number and number reached each permit year.
- Summary of materials used and method of delivery.

Figure 3. Stormwater Education Program for Specific Audiences

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Estimated Audience Size	Overall Messages	Means to Deliver Messages	Strategy Type per Table 1 in MS4 Permit	Rationale
#1 SEDIMENT	Car Washing/Detail Facilities	Business Licenses/Yellow Pages	11	• All wash water to sanitary sewer. • Potential damage caused to streams by wash water.	• Mailer, annually • PSAs on local cable station	• Traditional written materials • Media materials	Commercial car wash facilities can contribute significant sediment if wash water is discharged into the County's MS4.
	Car Washing/Detail Facilities	Business Licenses/Yellow Pages	37	• All wash water to sanitary sewer. • Potential damage caused to streams by wash water.	• Mailer, annually • PSAs on local cable station	• Traditional written materials • Media materials	Vehicle washing and/or detailing can contribute significant sediment if wash water is discharged into the County's MS4, which drains, untreated, to area streams. Residential car washing is specifically allowed; but, it still may contribute significant sediment if wash water is not properly handled.
	Auto Body Shops	Business Licenses/Yellow Pages	44	• All wash water to sanitary sewer. • Potential damage caused to streams by wash water.	• Mailer, annually • PSAs on local cable station	• Traditional written materials • Media materials	
	Homeowners	Tax Records	39,509	• Potential damage caused to streams by wash water. • Direct wash water to grass area for filtration and infiltration. • Never allow wash water to flow into street or storm drains.	• County Publication sent annually to homeowners • PSAs on local cable station • Handouts at local environmental events, 4 events per year minimum	• Traditional written materials • Media materials • Alternative materials	
	Contractors Involved in Land-Disturbing Activities	Community Development Permit Records and Yellow Pages	111	• Damage caused to streams by sediments. • Healthy fish populations require clear stream bottoms. • Silt fence is not enough. • Limit disturbed areas. • Stabilize as quickly as possible.	• Brochure given to land-disturbance permittee when permit is issued. • Brochure given with enforcement actions	• Traditional written materials	Erosion and sediment control is required by regulations; however, more effective implementation may occur with additional education.

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Estimated Audience Size	Overall Messages	Means to Deliver Messages	Strategy Type per Table 1 in MS4 Permit	Rationale
#2 BACTERIA	Restaurants	Business Licenses/ Yellow Pages	80	• Excessive bacteria 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.	• Mailer, annually • PSAs on local cable station	• Traditional written materials • Media materials	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 area streams.
	Pet Owners (dogs/cats)	Pet Licenses	8,569 dogs 377 cats	• Excessive bacteria hinders stream usage. • Dog waste ends up in streams. • Pick up after your pet and properly dispose of waste.	• County Publication sent annually to Homeowners • PSAs on local cable station	• Traditional written materials • Media materials	Dog waste is a major source of bacteria in area streams.
	Veterinarian Offices	Business Licenses/ Yellow Pages	10	• Excessive bacteria hinders stream usage. • Dog waste ends up in streams. • Pick up after your pet and properly dispose of waste.	• Brochures placed in Veterinarian offices, annually • PSAs on local cable station	• Traditional written materials • Media materials	Dog waste is a major source of bacteria in area streams.
	Pet Stores/Pet Boarding/ Grooming	Business Licenses/ Yellow Pages	38	• Excessive bacteria hinders stream usage. • Dog waste ends up in streams. • Pick up after your pet and properly dispose of waste.	• Brochures placed in pet stores, annually • PSAs on local cable station	• Traditional written materials • Media materials	Dog waste is a major source of bacteria in area streams.
	County Police and Firemen; Animal Control Officer	County Records	2	• Excessive bacteria hinders stream usage. • Dog waste ends up in streams. • Pick up after your pet and properly dispose of waste.	• County publications sent to applicable employees	• Traditional written materials	Dog waste is a major source of bacteria in area streams; these County employees own or handle dogs as part of their work.

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Estimated Audience Size	Overall Messages	Means to Deliver Messages	Strategy Type per Table 1 in MS4 Permit	Rationale
#3 NUTRIENTS	Homeowners	Tax Records/GIS	39,509	• How nutrients damage streams. • Do not over-fertilize. Use soil tests. • Keep fertilizer off of pavements. • Do not over-water lawns.	• County Publication sent annually to Homeowners • PSAs on local cable station	• Traditional written materials • Media materials	Excessive nutrients are carried off of lawns and other managed turf areas to the County's MS4 and then to local streams; this, in turn, leads to the overgrowth of algae in the streams, which adversely impacts fish and other marine life.
	Nurseries/ Greenhouses	Business Licenses/ Yellow Pages	4	• How nutrients damage streams. • Do not over-fertilize. Use soil tests. • Keep fertilizer off of pavements.	• Mailer, annually • PSAs on local cable station	• Traditional written materials • Media materials	
	Lawn Care Services	Business Licenses/ Yellow Pages	96	• How nutrients damage streams. • Do not over-fertilize. Use soil tests. • Keep fertilizer off of pavements. • Encourage use of organic products.	• Mailer, annually • PSAs on local cable station	• Traditional written materials • Media materials	

MCM-2: Public Involvement and Participation

This minimum control measure (MCM) is intended to provide a means for the public to be involved with and participate in the County's Stormwater Program in an effort to improve water quality and support local restoration and clean-up projects.

The County has developed the following Best Management Practices (BMPs) to meet these program goals:

BMP 2-1: Storm Drain Stenciling Program
The County will implement a storm drain inlet stenciling program, which is designed to engage citizens and educate the public about the consequences of dumping waste into the storm drainage system.

BMP 2-2: Stormwater Public Events
The County will participate in and/or conduct at least 4 public events per year (in two different categories, as listed in Table 2 in the MS4 Permit) to bring attention to current stormwater pollution issues.

BMP 2-3: MS4 Program and Stormwater Pollution Prevention Website
Roanoke County will maintain a webpage that is dedicated to the MS4 Program and Stormwater Pollution Prevention. This webpage will contain the effective MS4 permit and coverage letter, the most current MS4 Program Plan, the Annual Report for each permit year covered by the current permit, and a mechanism for the public to report (i) potential illicit discharges, improper disposal, or spills to the MS4, (ii) complaints regarding land disturbing activities, or (iii) other potential stormwater pollution concerns. It will also include the methods for how the public can provide input on the Roanoke County's MS4 program

BMP 2-4: Household Hazardous Waste Event
Roanoke County will participate in Household Hazardous Waste Collection events to help citizens dispose of household materials that could be hazardous to dispose of in landfills.

This report provides a detailed description of each BMP, all standard operating procedures or policies necessary to implement each BMP, the measurable goal by which each BMP will be evaluated, and the persons, positions, or departments responsible for implementing each BMP.

BMP 2-1: Storm Drain Stenciling Program

The goal of this BMP is to coordinate a storm drain inlet stenciling program through the Clean Valley Council. This effort will be coordinated with interested parties from local schools, neighborhoods, businesses, and other groups to stencil messages on storm drain inlets in an effort to educate people about the consequences of dumping waste into the storm drainage system. This BMP falls under the signage strategy identified in Table 1 of the MS4 Permit and the "pollution prevention" category identified in Table 2 of the Permit.

Responsible Party: Roanoke County's Department of Community Development, through the Clean Valley Council.

Schedule and Evaluation:
The County coordinates its storm drain stenciling program through the CVC. A minimum of 50 storm drain inlets will be stenciled per year with messages designed to raise public awareness about stormwater pollution. The County will document the number and location of the inlets that are stenciled in each permit year.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19)
Storm Drain Stenciling Program, July 2019

Measurable Goals:
The County will document the number of storm drains stenciled, the number of participants, and the groups that participated. Using these numbers as indicators, the County will evaluate the effectiveness of this BMP and make adjustments to annually increase attendance.

Items to be reported in the Annual Report:

- Number and location of storm drains that were stenciled.
- Number of participants and names of groups participating.
- Evaluation and proposed modifications to this BMP based on results of analysis of attendance record.

BMP 2-2: Stormwater Public Events

The goal of this BMP is to engage citizens in various public events to raise awareness about ways to improve water quality and to support local restoration and clean-up projects. To that end, Roanoke County will participate in and/or conduct at least 4 public events per year (in two different categories, as listed in Table 2 in the MS4 Permit) to bring attention to current stormwater pollution issues.

Responsible Party:
The County's Department of Community Development, in conjunction with Clean Valley Council, Roanoke Valley Resource Authority (RVRA), and the County's Department of Parks Recreation and Tourism (PRT).

Schedule and Evaluation:
The County will participate in and/or conduct at least four of the following events in at least two of the categories on an annual basis to engage the public and raise awareness about stormwater pollution issues.

Public Event	Responsible Party	Category (per Table 2 in MS4 Permit)	Metric
Clean Valley Day (stream and watershed clean-up)	CVC	Restoration	Weight of trash collected; number of participants
Household hazardous waste collection (see BMP 2-4)	RVRA	Disposal or Collection	Weight of waste collected; number of participants
Storm drain stenciling program (see BMP 2-1)	CVC	Pollution Prevention	Number and location of storm drains stenciled; number of participants
Implementation of pet waste stations in parks and along greenways (see BMP T7 in Roanoke County's Bacteria TMDL Action Plan)	PRT	Pollution Prevention	Number and location of pet waste stations installed/maintained
Stormwater education program for Roanoke County's schoolchildren to meet applicable SOLs	CVC	Educational	Number of programs provided; number of children taught
Stream monitoring and informational stream seminars	CVC	Monitoring	Number of stream schools given; number of participating students

The County will document the details of these events in accordance with the metrics that are specified above. The County will evaluate the effectiveness of the various public events to determine if they are beneficial to water quality.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19)

Measurable Goals:
The County will document the details of the events, the number of County or CVC participants, and the number of people in attendance (where applicable). Success for this BMP will be measured by the completion of at least four of the listed events and fulfillment of their corresponding metrics.

Items to be reported in the Annual Report:
These items, where appropriate, will be reported for the various public events:

- A description of the public involvement activities implemented by the County.
  - Event name (and agenda, if applicable).
  - County or CVC participants.
  - Number of participants.
  - Number of citizens (or students) in attendance.

- A report of the metric as defined for each event and an evaluation as to whether or not the activity is beneficial to improving water quality.
  - Weight of trash collected.
  - Number of stream schools given.
  - Weight of hazardous waste materials collected.
  - Number and location of pet waste stations installed/maintained.
  - Number and location of storm drains stenciled.

- The name of other MS4 permittees with whom Roanoke County collaborated in the public involvement opportunities.

BMP 2-3: MS4 Program and Stormwater Pollution Prevention Website

Roanoke County will maintain a webpage that is dedicated to the MS4 Program and to Stormwater Pollution Prevention. This website will contain the effective MS4 permit and coverage letter, the most current MS4 Program Plan, the Annual Report for each permit year covered by the current permit, and a mechanism for the public to report *(i) potential illicit discharges, improper disposal, or spills to the MS4, (ii) complaints regarding land disturbing activities, or (iii) other potential stormwater pollution concerns.* It will also include the methods for how the public can provide input on Roanoke County's MS4 program.

Responsible Party:
The Department of Community Development, with support from Roanoke County's webmaster.

Schedule and Evaluation:
Roanoke County maintains a webpage that is dedicated to its MS4 Program and Stormwater Pollution Prevention topics. The page can be accessed by clicking on this link: https://www.roanokecountyva.gov/1755/Stormwater-MS4-Permit. This page provides links for the public to report (i) potential illicit discharges, improper disposal, or spills to the MS4, (ii) complaints regarding land disturbing activities, or (iii) other potential stormwater pollution concerns. It also provides a link for the public to submit input on Roanoke County's MS4 program.

The annual report for each year of the current permit's term will be posted to this webpage no later than 30 days after it has been submitted to DEQ.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
None.

Measurable Goals:
Success for this BMP will be measured by the successful posting of the MS4 permit, the corresponding permit coverage letter, the MS4 Program, and the MS4 Annual Report (the latter of which will be posted within 30 days following its submittal to DEQ), along with a mechanism for the public to report its stormwater-related concerns and the methods by which the public can provide input on Roanoke County's MS4 program.

Items to be reported in the Annual Report:
- A summary of any public input on the MS4 program received (including stormwater complaints) and how Roanoke County responded.
- Webpage address to the MS4 Program and stormwater website.

BMP 2-4: Household Hazardous Waste Event

The goal of this BMP is to provide citizens with an opportunity to dispose of their potentially-hazardous household materials in an environmentally-friendly manner; this will avoid having such products end up in local landfills.

Responsible Party:
The Department of Community Development, through the Roanoke Valley Resource Authority (RVRA).

Schedule and Evaluation:
Roanoke County will participate in at least one Household Hazardous Waste Collection event each year. For each event, the County will document the number of attendees and the total weight of the collected waste.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
None.

Measurable Goals:
Success for this BMP will be measured by the continued participation in Household Hazardous Waste Collection Events.

Items to be reported in the Annual Report:
- Number of participants in the Household Hazardous Waste Collection event.
- Weight of waste collected at the event.

MCM-3: Illicit Discharge Detection and Elimination (IDDE)

The goal of this minimum control measure is to develop, implement, and enforce a program to detect and eliminate illicit discharges to the storm sewer system. The BMPs that have been established to complete this measure are listed below:

BMP 3-1: Municipal Separate Storm Sewer System (MS4) Map

The County maintains a map in its GIS network for all known locations of its municipal separate storm sewer system (MS4). This database will be maintained so that a map of all the public storm sewers in the County will be available to the public.

BMP 3-2: Illicit Discharge Ordinance

Roanoke County's Illicit Discharge Ordinance has been adopted and will be maintained to provide authority to address illicit discharges. It includes language prohibiting non-stormwater discharges into the storm drainage [MS4] system.

BMP 3-3: Illicit Discharge Detection and Elimination Program

Roanoke County maintains written procedures and implements a program to detect, identify, and address non-stormwater discharges and illegal dumping into its MS4.

BMP 3-4: Dry Weather Screening

Roanoke County implements a program to annually inspect at least 50 storm drain outfalls within its MS4 area in search of unauthorized discharges.

This report provides a detailed description of each BMP, all standard operating procedures or policies necessary to implement each BMP, the measurable goal by which each BMP will be evaluated, and the persons, positions, or departments responsible for implementing each BMP.

BMP 3-1: Municipal Separate Storm Sewer System (MS4) Map

The goal of this program is to develop and maintain an accurate MS4 outfall map (with corresponding outfall information table), which shows the storm sewer system that is owned or operated by the County within the Census Urbanized Area identified by the 2010 decennial census.

The MS4 map shall include the location of MS4 outfalls that discharge to surface waters, a unique identifier for each mapped item, the name and location of receiving waters to which the MS4 outfall (or point of discharge) discharges, the MS4 regulated service area, and all stormwater management facilities owned or operated by Roanoke County.

The outfall information table associated with the MS4 outfall map shall include the following information for each outfall or point of discharge for those cases in which Roanoke County elects to map the known point of discharge:

a) A unique identifier as specified on the storm sewer system map;
b) The latitude and longitude of the outfall or point of discharge;
c) The estimated regulated acreage draining to the outfall or point of discharge;
d) The name of the receiving water;
e) The 6th Order Hydrologic Unit Code of the receiving water;
f) An indication as to whether the receiving water is listed as impaired in the Virginia 2016 305(b)/303(d) Water Quality Assessment Integrated Report;
g) The predominant land use for each outfall discharging to an impaired water; and
h) The name of any EPA-approved TMDLs for which the Roanoke County is assigned a wasteload allocation.

Responsible Party:
The Department of Community Development, with assistance from the Department of Communications/Information Technology.

Schedule and Evaluation:
Roanoke County maintains an accurate MS4 map and will annually update it no later than October 1 of each year. The County's updates to the storm sewer system map and outfall information table will include any new outfalls constructed or TMDLs approved, or both, during the immediate preceding reporting period.

In addition, no later than July 1, 2019, Roanoke County will submit to DEQ a GIS-compatible shapefile of the County's MS4 map, as described in Part I E 3 a of the MS4 permit.

Roanoke County will provide written notification to any downstream adjacent MS4 of any known physical interconnection established or discovered after the effective date of the current permit.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:

- GIS database
  - MS4 Outfall Map, dated 7-25-19
  - Outfall Information Table, dated 7-30-19
- Letters to Physically-Interconnected Downstream Regulated MS4s, dated 6-28-19

Measurable Goals:

Success for this BMP will be measured by demonstrating that the County has updated its MS4 outfall map and outfall information table to include any new outfalls constructed or TMDLs approved or both during the immediate preceding reporting period.

Items to be reported in the Annual Report:

- A confirmation statement that the MS4 outfall map and outfall information table have been updated to reflect any changes to the MS4 occurring on or before June 30 of the reporting year.
- A copy of written notification to any downstream adjacent MS4 of any known physical interconnection established or discovered after the effective date of this permit.

BMP 3-2: Illicit Discharge Ordinance

The goal of this BMP is to adopt regulations that prohibit illicit discharges into the County's Municipal Separate Storm Sewer System and that also provide the County with an enforcement mechanism.

Responsible Party:
The Department of Community Development, in cooperation with the County Attorney.

Schedule and Evaluation:

Roanoke County's Illicit Discharge Ordinance was adopted on April 22, 2014; it is compliant with Virginia's stormwater regulations. Enforcement measures and penalties are included in the Illicit Discharge Ordinance. The County will update the ordinance, as necessary, to maintain the effectiveness of the program.

Standard Operating Procedures or Policies:
- The IDDE procedures described in Part I.E.3.c. of the General Permit.

Supporting Documents:
- Illicit Discharge Ordinance, effective date 7-1-14

Measurable Goals:
Success of this BMP will be measured by the continued compliance of the County's Illicit Discharge Ordinance with the MS4 General Permit.

Items to be reported in the Annual Report:
- Analysis of compliance of the Roanoke County Illicit Discharge Ordinance with the MS4 General Permit.
- Any changes to the Illicit Discharge Ordinance.

BMP 3-3: Illicit Discharge Detection and Elimination Program

The goal of this BMP is to detect, identify, and eliminate non-stormwater discharges and illegal dumping into the County's MS4. As part of this effort, the County will maintain written procedures that include:

1) A description of the legal authorities, policies, standard operating procedures or other legal mechanisms available to Roanoke County to eliminate identified sources of ongoing illicit discharges including procedures for using legal enforcement authorities.

2) A timeframe upon which to conduct an investigation to identify and locate the source of any observed unauthorized non-stormwater discharge. Priority of investigations shall be given to discharges of sanitary sewage and those believed to be a risk to human health and public safety. Per the MS4 permit, discharges authorized under a separate VPDES or state permit require no further action.

3) Methodologies to determine the source of all illicit discharges. If Roanoke County is unable to identify the source of an illicit discharge within six months of beginning the investigation, then staff will document that the source remains unidentified. If the observed discharge is intermittent, staff will document that attempts to observe the discharge flowing were unsuccessful.

4) Methodologies for conducting a follow-up investigation for illicit discharges that are continuous or that Roanoke County expects to occur more frequently than a one-time discharge to verify that the discharge has been eliminated except as provided for in Part I E 3 c (4);

5) A mechanism to track all illicit discharge investigations to document the following:
   - The dates that the illicit discharge was initially observed, reported, or both;
   - The results of the investigation, including the source, if identified;
   - Any follow-up to the investigation;
   - Resolution of the investigation; and
   - The date that the investigation was closed.

Responsible Party:
The Department of Community Development.

Schedule and Evaluation:
Roanoke County maintains written procedures for and implements an investigation program to respond to potential illicit discharges into its MS4. The County will update its procedures, as necessary, to maintain the effectiveness of the program.

Standard Operating Procedures or Policies:
- The IDDE procedures described in Part I.E.3.c. of the General Permit.

Supporting Documents:

- GIS database
  - MS4 Outfall Map, dated 7-25-19
  - Outfall Information Table, dated 7-30-19

Measurable Goals:

Success for this BMP will be measured by compliance with written procedures and documentation of the complaints received/investigated and closed.

Items to be reported in the Annual Report:

- A list of illicit discharges to the MS4 including spills reaching the MS4 with information as follows:
  - The source of illicit discharge.
  - The dates that the discharge was observed, reported, or both.
  - Whether the discharge was discovered by Roanoke County during dry weather screening, reported by the public, or other method (describe).
  - How the investigation was resolved.
  - A description of any follow-up activities.
  - The date the investigation was closed.

BMP 3-4: Dry Weather Screening

The goal of this BMP is to inspect storm drain outfalls to detect illicit discharges during dry weather (i.e., when the storm drainage system would normally be dry) so that actions may be taken to eliminate them.

To support this effort, the County will maintain dry weather field screening protocols to detect, identify, and eliminate illicit discharges to the MS4. The protocol shall include:

a) A prioritized schedule of field screening activities and rationale for prioritization determined by Roanoke County based on such criteria as age of the infrastructure, land use, historical illegal discharges, dumping or cross connections;

b) A schedule to annually screen a minimum of 50 outfalls

c) A mechanism to track the following information:
   - The unique outfall identifier;
   - Time since the last precipitation event;
   - The estimated quantity of the last precipitation event;
   - Site descriptions (e.g., conveyance type and dominant watershed land uses);
   - Whether or not a discharge was observed; and
   - If a discharge was observed, the estimated discharge rate (e.g., width and depth of discharge flow rate) and visual characteristics of the discharge (e.g., odor, color, clarity, floatables, deposits or stains, vegetation condition, structural condition, and biology).

Responsible Party:
The Department of Community Development.

Schedule and Evaluation:
Roanoke County implements an annual outfall inspection program to detect and locate the source of dry weather illicit discharges that enter its MS4. The County will conduct additional outfall inspections, as necessary, to maintain the effectiveness of the program.

Standard Operating Procedures or Policies:
- The IDDE procedures described in Part I.E.3.c. of the General Permit (Also refer to description in **BMP 3-3**).

Supporting Documents:
- GIS database
  - MS4 Outfall Map, dated 7-25-19
  - Outfall Information Table, dated 7-30-19

Measurable Goals:
Success for this BMP will be measured by field screening a minimum of 50 outfalls per year and documenting the results of these inspections.

Items to be reported in the Annual Report:

- The total number of outfalls screened during the reporting period, as part of the dry weather screening program.
- A summary of the inspection results.
- If an illicit discharge into the MS4 was discovered, the following information will be provided:
    - The source of illicit discharge.
    - The dates that the discharge was observed.
    - How the investigation was resolved.
    - A description of any follow-up activities.
    - The date the investigation was closed.

MCM-4: Construction Site Stormwater Runoff Control

The goal of this minimum control measure is to reduce pollutants that may enter the MS4 via stormwater runoff from construction activities. To accomplish this, the County implements the Virginia Erosion and Sediment Control (VESC) Program and the Virginia Stormwater Management Program (VSMP). The BMPs that will be used to satisfy this MCM are listed below:

BMP 4-1: Legal Authorities

Roanoke County utilizes certain legal authorities to comply with Virginia's Erosion and Sediment Control Program and its Stormwater Management Program in an effort to reduce pollutants that may enter its MS4 via stormwater runoff from construction activities.

BMP 4-2: Plan Review

The County maintains and implements written procedures to ensure the proper implementation of controls for erosion and sediment and stormwater management to reduce pollutants that may enter its MS4 via stormwater runoff from construction activities.

BMP 4-3: Site Inspections

The County maintains and implements written inspection procedures to ensure that controls for erosion and sediment and stormwater management are properly implemented and that all associated documents are utilized during inspection, including the inspection schedule.

BMP 4-4: Compliance and Enforcement

The County maintains and implements written procedures for compliance and enforcement regarding construction site stormwater runoff requirements.

BMP 4-5: Responsible Land Disturber Certification

Roanoke County employees who oversee the performance of regulated land disturbance activities conducted by the County are DEQ-certified as Responsible Land Disturbers in accordance with the VESC Program.

This report provides a detailed description of each BMP, all standard operating procedures or policies necessary to implement each BMP, the measurable goal by which each BMP will be evaluated, and the persons, positions, or departments responsible for implementing each BMP.

BMP 4-1: Legal Authorities

The goal of this BMP is to maintain and use certain legal authorities to comply with Virginia's Erosion and Sediment Control Program and the Virginia Stormwater Management Program (VSMP). The County uses the following legal authorities:

- **Erosion and Sediment Control (ESC) Ordinance #022316-7,** effective date Feb. 23, 2016: its purpose is to reduce pollutants in stormwater runoff from construction activities in an effort to keep such pollutants from entering the County's MS4.

  This ordinance requires ESC controls for all regulated land disturbances of 2,500 square feet or more and an engineered ESC Plan for any land disturbance greater than 10,000 square feet. The ESC Plan must provide for the implementation of appropriate erosion and sediment controls, to include their proper placement, design, and maintenance requirements. The ordinance includes site inspection and compliance/enforcement procedures for erosion and sediment control.

- **Erosion and Sediment Control (ESC) Permit:** authorizes commencement of land disturbing activities for which an approved ESC Plan or Agreement-in-lieu-of an ESC Plan have been approved by the County.

- **Agreement-in-lieu-of an Erosion and Sediment Control Plan**, dated 1-22-19: requires compliance with the minimum control measures, as listed in the Virginia Erosion and Sediment Control Regulations (9VAC25-840), for projects that disturb less than 10,000 square feet.

- **Stormwater Management Ordinance #042214-12,** effective date 2-23-16: its purpose is to protect property, state waters, stream channels, and other natural resources from the potential harm of unmanaged stormwater, and to establish requirements whereby stormwater is managed to protect water quality and downstream property owners.

- **Virginia Stormwater Management Program (VSMP) Permit:** issued by the County for projects that will cause one acre or more of land disturbance, and for which there is a County-approved stormwater management plan.

- **Agreement-in-lieu-of a Stormwater Management Plan**, dated December 2019: requires compliance with certain stormwater management control strategies and is only applicable for the construction of single family homes.

- **MS4 Coverage Letter from the Virginia DEQ**, dated 10-29-18: provides Roanoke County with coverage under the General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems General Permit Number VAR040022.

- **Letter from DEQ Approving Alternative Inspection Program (ESC):** authorizes Roanoke County to conduct an alternative inspection program for ESC.

- **Stormwater Management Design Manual**, dated 3-22-16: provides design guidelines for regulated land-disturbing projects to ensure their compliance with the VSMP requirements.

Responsible Party:

- The Department of Community Development implements the County's Erosion and Sediment Control and Stormwater Management programs, which includes conducting plan reviews, site inspections, compliance/enforcement activities, and project permitting.
- The County Attorney's office provides support to the Department of Community Development during compliance/enforcement actions, as necessary.

Schedule and Evaluation:

Roanoke County implements an ESC ordinance to comply with the Virginia's Erosion and Sediment Control Law and Regulations and a SWM Ordinance to comply with the VSMP. The County will update the ordinances and supporting documents, as needed, to remain consistent with these programs.

Standard Operating Procedures or Policies:

There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:

- Agreement-in-lieu-of a Stormwater Management Plan, dated December 2019
- Agreement-in-lieu-of an Erosion and Sediment Control Plan, dated 1-22-19
- DEQ Approval Letter - Alternative Inspection Program (ESC), dated 7-29-13
- Erosion and Sediment Control Ordinance, effective date 2-23-16
- Erosion and Sediment Control Permit (no date)
- Erosion and Sediment Control/Virginia Stormwater Management Program Permit, individual (blue) (no date)
- Erosion and Sediment Control/Virginia Stormwater Management Program Permit, overall development (green) (no date)
- Explanation of Permit Card Colors (no date)
- MS4 Coverage Letter from the Virginia DEQ, dated 10-29-18
- Stormwater Management Design Manual, dated 3-22-16
- Stormwater Management Ordinance, effective date 2-23-16

Measurable Goals:

Success for this BMP will be measured by the annual evaluation of the ESC and SWM ordinances, coordinating updates to the supporting documents, and the continued compliance of the ordinances with Virginia's ESC and VSMP programs.

Items to be reported in the Annual Report:

- Analysis of the Roanoke County Erosion and Sediment Control Ordinance and any proposed changes to it.
- Analysis of the Roanoke County Stormwater Management Ordinance and any proposed changes to it.

BMP 4-2: Plan Review

The goal of this BMP is to maintain and implement written procedures to address the proper implementation of erosion and sediment controls and stormwater management controls to address construction site stormwater runoff.

Responsible Party:
The Department of Community Development.

Schedule and Evaluation:

Roanoke County maintains and implements ESC and VSMP procedures to comply with Virginia's Erosion and Sediment Control Program and the Virginia Stormwater Management Program. The County will update these procedures and supporting documents, as necessary, to remain consistent with both programs.

Standard Operating Procedures or Policies:

- None

Supporting Documents:

- Land Development Procedures, dated 12-16-09
- Engineering Review Checklist, dated 4-2-13
- Digital Plan Submission Guide, dated 2-18-15
- Agreement-in-lieu-of an Erosion and Sediment Control Plan, dated 1-22-19
- Agreement-in-lieu-of a Stormwater Management Plan, dated December 2019
- Stormwater Management Design Manual, dated 3-22-16

Measurable Goals:
Success for this BMP will be measured by the annual evaluation of the written procedures and supporting documents and the number of plans approved.

Items to be reported in the Annual Report:

- Analysis of the written procedures and any proposed changes.
- Total number of plans reviewed for ESC or VSMP compliance.
- Any changes to the supporting documents.

BMP 4-3: Site Inspections

The goal of this BMP is to maintain and implement written inspection procedures to address the proper installation and maintenance of erosion and sediment controls and stormwater management techniques used on active, regulated land-disturbing projects and to ensure that all associated documents are utilized during inspection, including the inspection schedule.

Responsible Party:
The Department of Community Development.

Schedule and Evaluation:
Roanoke County maintains and implements ESC and VSMP site inspection procedures to comply with Virginia's Erosion and Sediment Control Program and Virginia's Stormwater Management Program. The County will update these procedures and supporting documents, as necessary, to remain consistent with both programs, as they relate to construction site stormwater runoff. In addition, inspections will be conducted in accordance with the County's Alternate Inspection Schedule, as approved by DEQ.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
- ESC Inspection and Enforcement Procedures, dated May 2019
- VSMP Inspection and Enforcement Procedures, dated May 2019
- Inspector Protocol
- ESC Inspection Report
- VSMP Inspection Report
- Alternative Inspection Program ESC
- Alternative Inspection Frequency ESC - Tabular Rating Sheet
- Letter from DEQ Approving Alternative Inspection Program (ESC)

Measurable Goals:
Success for this BMP will be measured by the annual evaluation of the written ESC/VSMP site inspection procedures and the number of inspections conducted.

Items to be reported in the Annual Report:
- Analysis of the site inspection procedures and any proposed changes.
- Total number of construction site stormwater runoff (ESC/VSMP) inspections conducted.

BMP 4-4: Compliance and Enforcement

The goal of this BMP is to maintain and implement written procedures for achieving compliance on active construction sites through corrective action or enforcement action to the extent allowable under federal, state, or local law, regulation, ordinance, or other legal mechanisms.

Responsible Party:

- The Department of Community Development has the overall responsibility to implement the County's ESC program and VSMP, which includes conducting plan reviews, site inspections, compliance/enforcement activities, and project permitting.
- The County Attorney's office provides support to the Department of Community Development during compliance/enforcement actions, as necessary.

Schedule and Evaluation:
Roanoke County implements compliance and enforcement procedures to strive for compliance with its ESC program and VSMP on active construction sites. The County will revise its written enforcement procedures, as needed.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:

- Erosion and Sediment Control Inspection and Enforcement Procedures, dated May 2019
- VSMP Inspection and Enforcement Procedures, dated May 2019
- Erosion and Sediment Control Ordinance, effective date 2-23-16
- Stormwater Management Ordinance, effective date 2-23-16

Measurable Goals:
Success for this BMP will be measured by the annual evaluation of the erosion and sediment control and VSMP compliance/enforcement procedures and documentation of the total number and type of enforcement actions implemented.

Items to be reported in the Annual Report:

- Analysis of the compliance and enforcement procedures and any proposed changes.
- The total number and type of enforcement actions implemented.

BMP 4-5: Responsible Land Disturber Certification

The goal of this BMP is to ensure that employees who oversee the performance of regulated land disturbance activities conducted by the County will have the qualifications to properly implement erosion and sediment control measures. Such employees will be DEQ-certified as Responsible Land Disturbers in accordance with the Virginia Erosion and Sediment Control Law and Regulations.

Responsible Party:
The Department of Community Development.

Schedule and Evaluation:
Roanoke County requires employees that oversee the performance of regulated land disturbance activities conducted by the County to be certified by DEQ as Responsible Land Disturbers.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
None.

Measurable Goals:
Success for this BMP will be measured by maintenance of the Responsible Land Disturber certification by the applicable employees.

Items to be reported in the Annual Report:

- Summary report of the names of applicable employees and the expiration dates of their certification.

MCM-5: Post-Construction Stormwater Management for New Development and Development on Prior-Developed Lands

The goal of this minimum control measure is to implement a post-construction stormwater runoff management program that is consistent with the Virginia Stormwater Management Act (§ 62.1-44.15:24 et seq. of the Code of Virginia) and the Virginia Stormwater Management Program (VSMP) Regulations (9VAC25-870). The BMPs that will be used to satisfy this minimum control measure are listed below:

BMP 5-1: Stormwater Management Legal Authorities

Roanoke County utilizes certain legal authorities to comply with Virginia's Stormwater Management Act and Stormwater Management Program (VSMP) Regulations.

BMP 5-2: Post-Construction Inspections for Existing Stormwater Management Facilities

Roanoke County maintains and implements written inspection and maintenance procedures for post-construction stormwater management facilities (SWMFs) that discharge to the MS4 to address the long-term operation and maintenance requirements of these facilities.

BMP 5-3 Stormwater Management Facility Tracking

Roanoke County maintains and implements a GIS-based system to track stormwater management facilities to address the long-term operation and maintenance requirements of these facilities.

BMP 5-4 Strategies to Encourage Long-Term Maintenance of Stormwater Control Measures on Single Family Residential Lots

Roanoke County implements strategies to promote the long-term maintenance of stormwater control measures that are designed to treat stormwater runoff solely from the individual single family residential lot. These strategies are used in lieu of recorded maintenance agreements and post-construction inspections by the County.

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BMP 5-5 Storm Sewer System Maintenance

Roanoke County implements a program to maintain and repair its storm sewer system within its MS4 program area. Such maintenance helps to keep the system working as designed, which minimizes the risk of surcharging and overflows; it also helps to minimize street flooding associated with clogged inlet structures and conveyances.

This report provides a detailed description of each BMP named above, all standard operating procedures or policies necessary to implement each BMP, the measurable goal by which each BMP will be evaluated, and the persons, positions, or departments responsible for implementing each BMP.

BMP 5-1: Stormwater Management Legal Authorities

The goal of this BMP is to maintain and use certain legal authorities to comply with Virginia's Stormwater Management Act and Stormwater Management Program (VSMP) Regulations, as it relates to post-construction stormwater management facilities. The County uses the following legal authorities:

- **Stormwater Management Ordinance #042214-12**, effective date 2-23-16; its purpose is to protect property, state waters, stream channels, and other natural resources from the potential harm of unmanaged stormwater, and to establish requirements whereby stormwater is managed to protect water quality and downstream property owners.

Responsible Party:

- The Department of Community Development has the overall responsibility to implement the County's SWM Ordinance.
- The County Attorney's office provides support to the Department of Community Development during compliance/enforcement actions, as necessary.

Schedule and Evaluation:

Roanoke County implements a SWM ordinance to comply with Virginia's Stormwater Management Act and Stormwater Management Program (VSMP) Regulations. The County will update this ordinance and the supporting documents, as necessary, to remain consistent with Virginia's VSMP program.

Standard Operating Procedures or Policies:

There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:

- VSMP Approval Letter from DEQ, dated 10-29-18
- Stormwater Management Facility (SWMF) Maintenance Agreement, dated 4-7-16
- Stormwater Management Ordinance, effective date 2-23-16

Measurable Goals:

Success for this BMP will be measured by an annual evaluation of the Stormwater Management Ordinance.

Items to be reported in the Annual Report:

- Analysis of compliance of the Roanoke County Stormwater Management Ordinance.
- Any changes that are planned for the Stormwater Management Ordinance.

BMP 5-2: Stormwater Management Facility Post-Construction Inspections

The goal of this BMP is to develop and implement written inspection and maintenance procedures to provide for the long-term operation and maintenance requirements of post-construction stormwater management facilities.

Inspections will be conducted as follows:

- County-owned SWM facilities will be annually inspected.
    - When it is determined that maintenance is required during inspections of County-owned facilities, Roanoke County (or the Roanoke County Public Schools, as appropriate) will conduct the maintenance in accordance with its written procedures.
    - The County will inspect privately-owned SWM facilities that discharge into the MS4 once every 5 years. In addition, the County will:
        - Require the owner to develop and record a maintenance agreement, including an inspection schedule to the extent allowable under state or local law or other legal mechanism;
        - Utilize its legal authority for enforcement of the maintenance responsibilities if maintenance is neglected by the owner; and
        - Will implement a progressive compliance and enforcement strategy, which is included in the Program Plan.

Responsible Party:
The Department of Community Development, with assistance from the County Attorney's office during compliance/enforcement actions, as needed.

- Note that Roanoke County Public Schools (RCPS) rely on the County's Department of Community Development to conduct inspections of RCPS-owned SWMFs; however, RCPS conducts maintenance for their school-owned SWMFs.

Schedule and Evaluation:
Roanoke County maintains and implements procedures for post-construction stormwater management facility inspection/maintenance and compliance/enforcement to comply with the Virginia Stormwater Management Act and the Stormwater Management Program Regulations. The County will update these procedures and supporting documents, as necessary, to remain consistent with Virginia's VSMP program.

Standard Operating Procedures or Policies:
- Inspection/maintenance procedures for post-construction SWMFs
- Compliance/enforcement procedures for needed maintenance of post-construction SWMFs

Supporting Documents:
- ESC and SWM Certifications, dated June 2019
- MOA with Roanoke County Public Schools, dated 7-30-19

- Notice of Inspection Letter (no date)
- Request for Inspection Records Underground SWMF (no date)
- Request for Maintenance & Inspection Summary (no date)
- SWMF Inspection and Enforcement Procedures, dated May 2019
- SWMF Inspection Forms (no date)

Measurable Goals:
Success for this BMP will be measured by the annual evaluation of the written post-construction inspection procedures and completion of the required post-construction inspections.

Items to be reported in the Annual Report:

- The number of privately-owned SWMF inspections conducted, and
    - The number of enforcement actions initiated by Roanoke County to ensure long-term maintenance of privately-owned SWMFs including the type of enforcement action.
- Total number of inspections conducted on SWMFs owned by Roanoke County or RCPS, and
    - A description of the significant maintenance, repair, or retrofit activities performed on the SWMFs owned or operated by Roanoke County or RCPS to enable them to continue to function as designed. (This does not include routine activities such as grass mowing or trash collection.)

BMP 5-3: Post-Construction Stormwater Management Facility Tracking

The goal of this BMP is to maintain an electronic database or spreadsheet of all known County-owned and privately-owned stormwater management facilities that discharge into the MS4. This spreadsheet is available online at the following webpage: https://www.roanokecountyva.gov/stormwater

The County's database will include the following information, as applicable:

- The SWMF type
- The SWMF location (latitude and longitude)
- The 6th Order Hydrologic Unit Code in which the SWMF is located
- The acres treated by the SWMF, including total acres, impervious acres, and pervious acres
- The date the SWMF was brought online (MM/YYYY). If the date brought online is not known, the County will use June 30, 2005
- Indication as to whether the SWMF is owned by the County or privately-owned
    - If the stormwater management facility is privately-owned, whether or not a maintenance agreement exists
- Indication as to whether the SWMF is part of Roanoke County's local TMDL action plans
- The date of Roanoke County's most recent inspection of the SWMF

Responsible Party:
The Department of Community Development, with the assistance of the Department of Communications and Information Technology.

Schedule and Evaluation:

- The electronic database or spreadsheet of all known County-owned and privately-owned SWMFs that discharge into the MS4 will be updated no later than 30 days after (1) a new SWMF is brought online, (2) a new BMP is implemented to meet a TMDL load reduction, or (3) after discovery of an existing SWMF.
- Roanoke County will use DEQ's Construction Stormwater Database, or other application as specified by DEQ, to report each of its SWMFs installed after July 1, 2014, to address the control of post-construction runoff from land-disturbing activities for which Roanoke County is required to obtain a General VPDES Permit for Discharges of Stormwater from Construction Activities.
- No later than October 1 of each year, Roanoke County will electronically report all other SWMFs and BMPs implemented between July 1 and June 30 of each year using the DEQ BMP Warehouse and associated reporting template.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
- SWMFs that Discharge to MS4, dated December 2019.

Measurable Goals:
Success for this BMP will be measured by updating of the electronic database or spreadsheet and by submittal of the SWMF information to DEQ through the Virginia Construction Stormwater General Permit database and the DEQ BMP Warehouse, as described above.

Items to be reported in the Annual Report:
- A confirmation statement that Roanoke County submitted SWMF information through the Virginia Construction Stormwater General Permit database for those land-disturbing activities for which Roanoke County was required to obtain coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities in accordance with Part I E 5 f of the permit, or
    - A statement that the County did not complete any projects requiring coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities.
- A confirmation statement that Roanoke County electronically reported SWMFs and BMPs implemented between July 1 and June 30 of each year using the DEQ BMP Warehouse (per Part I E 5 g of the permit) and the date on which the information was submitted.

BMP 5-4 Strategies to Encourage Long-Term Maintenance of Stormwater Control Measures on Single Family Residential Lots

The goal of this BMP is to implement strategies to promote the long-term maintenance of stormwater control measures that are intended to treat stormwater runoff solely from the individual single family residential (SFR) lot. These strategies will be used to replace recorded maintenance agreements and post-construction inspections by the County.

Responsible Party:
The Department of Community Development.

Schedule and Evaluation:
Roanoke County implements various strategies to promote the long-term maintenance of stormwater control measures to treat runoff from SFR structures. The County will update these strategies, as necessary, to remain consistent with Virginia's VSMP program.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
- Annual Stormwater Newsletter for Residents, dated April 2019
- Residential Fact Sheet, dated 9-29-16

Measurable Goals:
Success for this BMP will be measured by tracking the number of new residential lots covered by the strategies, proper implementation of the strategies, and evaluating the effectiveness of the strategies in promoting the long-term maintenance of stormwater control measures.

Items to be reported in the Annual Report:
- Number of new residential lots using the strategies each year.
- Implementation of the strategies.
- Evaluation of the effectiveness of the strategies in promoting long-term maintenance.

BMP 5-5 Storm Sewer System Maintenance

The goal of this BMP is to actively maintain and repair the County's storm sewer (i.e., drainage) system in its MS4 program area. Such maintenance helps to keep the system working as designed, which minimizes the risk of surcharging and overflows; it also helps to minimize street flooding associated with clogged inlet structures and conveyances. In addition, the County's maintenance crews have the potential to discover illicit connections and observe where pollutants may be entering the regulated storm sewer system.

Responsible Party:
The Department of Community Development, Division of Stormwater Operations and Maintenance.

Schedule and Evaluation:
Roanoke County implements and is committed to continuing its storm sewer (drainage) system maintenance program. The number of large stormwater maintenance/repair projects will be documented. In addition, the number of emergency projects and small-scale maintenance/repair projects completed each year will be tracked.

Standard Operating Procedures or Policies:
- Water-quality related SOPs

Supporting Documents:
- Illicit Discharge Ordinance, effective date 7-1-14
- Erosion and Sediment Control Ordinance, effective date 2-23-16

Measurable Goals:
Success for this BMP will be measured by the continuation of this program, and the increase in total value of improvement that has been completed to maintain the storm sewer system.

Items to be reported in the Annual Report:
- Number of large projects completed.
- Number of small projects or emergency projects completed.
- Total value of improvements completed.

MCM-6: Pollution Prevention and Good Housekeeping for Municipal Operations

The goal of this minimum control measure is to implement a Pollution Prevention and Good Housekeeping Program to reduce stormwater runoff pollution and prevent illicit discharges during day-to-day operations at Roanoke County's various high-priority municipal facilities. The BMPs that will be used to satisfy this minimum control measure are listed below:

BMP 6-1: Spill Prevention, Control, and Countermeasure Plans

Roanoke County has developed and will maintain Spill Prevention, Control, and Countermeasures (SPCC) plans for some of its municipal facilities. These plans will be updated and new plans will be prepared, as needed.

BMP 6-2: Standard Operating Procedures

Roanoke County will maintain and implement written standard operating procedures (SOPs) for daily operations and maintenance activities that have a potential of discharging pollutants directly or with stormwater runoff into the MS4. The SOPs will be used in training activities.

BMP 6-3: Employee Training

Roanoke County implements biennial training for applicable employees in (1) recognition and reporting of illicit discharges; (2) good housekeeping and pollution prevention practices for: *(a) road, street, and parking lot maintenance, (b) maintenance and public works facilities, and (c) recreational facilities;* (3) spill response by emergency response employees; (4) herbicide application training; and (5) contractor oversight for environmental compliance.

BMP 6-4: Stormwater Pollution Prevention Plans for Municipal Facilities

Roanoke County will identify all high-priority facilities that have a high potential to discharge pollutants in stormwater. Stormwater Pollution Prevention Plans (SWPPPs) will be prepared, implemented, and maintained. SWPPPs will be used in training activities.

BMP 6-5 Nutrient Management Plans

Roanoke County will identify all County owned lands where nutrients are applied to a contiguous area of 1 acre or more. Nutrient Management Plans will be prepared by a certified nutrient management planner. Nutrient Management Plans will be implemented and maintained.

BMP 6-6 Pesticide Applicator Certification

All employees and County-hired contractors who apply pesticides/herbicides shall have the proper Virginia Pesticide Applicator Certificate.

This report provides a detailed description of each BMP, all standard operating procedures or policies necessary to implement each BMP, the measurable goal by which each BMP will be evaluated, and the persons, positions, or departments responsible for implementing each BMP.

BMP 6-1: Spill Prevention, Control, and Countermeasure Plans

The goal of this BMP is to develop, maintain, and implement Spill Prevention, Control, and Countermeasure (SPCC) Plans for appropriate municipal facilities, as required by Federal Oil Spills Prevention and Preparedness Regulations (40 CFR Part 112), to help municipal facilities prevent a discharge of oil into navigable waters or adjoining shorelines.

Responsible Party:
The Department of Community Development is responsible to develop and update SPCC plans. Applicable departments are responsible for compliance with SPCC plans.

Schedule and Evaluation:
Roanoke County updates its SPCC plans, as necessary, and creates new plans for County facilities, as needed. Training is provided for those employees who are involved with any County SPCC plan.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
SPCC Plans for existing County Facilities (individually dated)

Measurable Goals:
Success for this BMP will be measured by the updating of existing SPCC plans in accordance with Federal Oil Spills Prevention and Preparedness Regulations (40 CFR Part 1120), which require plans to be reviewed and updated every 5 years, or when a change has occurred. In addition, success will be measured by the creation of new SPCC plan creation of new SPCC plans for applicable County facilities.

Items to be reported in the Annual Report:
- Summary of evaluation of SPCC Plans.
- List of new facilities in need of SPCC Plans.
- List of completed SPCC Plans.

BMP 6-2: Standard Operating Procedures

The goal of this BMP is to develop and implement written standard operating procedures (SOPs) to help prevent pollutant discharge from activities at municipal facilities such as (1) road, street, and parking lot maintenance, (2) equipment maintenance, and (3) the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers. These SOPs will be used in the employee training program (**see BMP 6-3**) and are designed to:

1) Prevent illicit discharges
2) Ensure the proper disposal of waste materials, including landscape wastes
3) Prevent the discharge of wastewater or County vehicle wash water or both into the MS4 without authorization under a separate VPDES permit
4) Require implementation of best management practices when discharging water pumped from utility construction and maintenance activities
5) Minimize the pollutants in stormwater runoff from bulk storage areas (e.g., salt storage, topsoil stockpiles) through the use of best management practices
6) Prevent pollutant discharge into the MS4 from leaking municipal automobiles and equipment
7) Ensure that the application of materials, including fertilizers and pesticides, is conducted in accordance with the manufacturer's recommendations

Responsible Party:
The Department of Community Development develops, evaluates, and amends the written SOPs and provides support to applicable departments, the latter of which are responsible to comply with the SOPs that are pertinent to their activities.

Schedule and Evaluation:
SOPs will be annually evaluated and revised, as needed.

Standard Operating Procedures or Policies:
- Water Quality-Related Standard Operating Procedures, dated June 2017

Supporting Documents:
- Roanoke County MS4 Training Plan, dated July 2019
- PCB PowerPoint 12-9-16
- Training Plan Positions Assessment, dated 9-27-14
- Required MS4 Training Plans forms Specific Departments (no date)

Measurable Goals:
Success for this BMP will be measured by the updating of the written SOPs, as necessary, and by employee training on the appropriate SOPs.

Items to be reported in the Annual Report:

- A summary of any standard operating procedures developed or modified during the permit year.

BMP 6-3: Employee Training

The goal of this BMP is to provide County employees with necessary training to support the requirements of the MS4 Permit. The written training plan provides for the following:

1) Field personnel receive training in the Recognition and Reporting of Illicit Discharges no less than once per 24 months;

2) Employees performing road, street, and parking lot maintenance receive training in Pollution Prevention and Good Housekeeping associated with those activities no less than once per 24 months;

1) Employees working in and around maintenance, public works, or recreational facilities receive training in Pollution Prevention and Good Housekeeping practices associated with those facilities no less than once per 24 months;

2) Employees and contractors hired by Roanoke County who apply pesticides and herbicides are trained or certified in accordance with the Virginia Pesticide Control Act (§ 3.2-3900 et seq. of the Code of Virginia). Certification by the Virginia Department of Agriculture and Consumer Services (VDACS) Pesticide and Herbicide Applicator program shall constitute compliance with this requirement;

3) Employees and contractors serving as plan reviewers, inspectors, program administrators, and construction site operators obtain the appropriate certifications as required under the Virginia Erosion and Sediment Control Law and its attendant regulations;

4) Employees and contractors implementing the stormwater program obtain the appropriate certifications as required under the Virginia Stormwater Management Act and its attendant regulations; and

5) Employees whose duties include emergency response have been trained in spill response. Training of emergency responders such as firefighters and law-enforcement officers on the handling of spill releases as part of a larger emergency response training shall satisfy this training requirement and be documented in the training plan.

Responsible Party:
The Department of Community Development provides the appropriate departments with access to the training materials; each department is responsible to make certain that their employees take and comply with the pertinent training.

Schedule and Evaluation:
Employee training will be conducted on a biennial basis. The County will review the training program on a biennial basis and update it, as needed.

Standard Operating Procedures or Policies:

- Water Quality-Related Standard Operating Procedures, dated June 2017

Supporting Documents:

- Roanoke County MS4 Training Plan, dated July 2019

Measurable Goals:

This BMP will be measured by training of the pertinent County employees in accordance with the schedule. In addition, Roanoke County will maintain documentation of each training event for a minimum of three years after the training event.

Note, in accordance with the MS4 Permit, Roanoke County may fulfill the training requirements in Part I E 6 m, in total or in part, through regional training programs involving two or more MS4 permittees; however, Roanoke County remains responsible for ensuring compliance with the training requirements.

Items to be reported in the Annual Report:

- A list of the training events conducted in accordance with Part I E 6 m, including the following information:
  - The date of the training event.
  - The number of employees who attended the training event.
  - The objective of the training event.

BMP 6-4: Stormwater Pollution Prevention Plans for Municipal Facilities

The goal of this BMP is to identify high-priority facilities in Roanoke County that have a high potential of discharging pollutants and to prepare, maintain, and implement a site-specific stormwater pollution prevention plan (SWPPP) for each identified facility.

High- priority facilities that have a high potential for discharging pollutants are those facilities that are not covered under a separate VPDES permit and for which any of the following materials or activities occur and are expected to have exposure to stormwater resulting from rain, snow, snowmelt, or runoff:

1) Areas where residuals from using, storing or cleaning machinery or equipment remain and are exposed to stormwater

2) Materials or residuals on the ground or in stormwater inlets from spills or leaks

3) Material handling equipment

4) Materials or products that would be expected to be mobilized in stormwater runoff during loading or unloading or transporting activities (e.g., rock, salt, fill dirt)

5) Materials or products stored outdoors (except final products intended for outside use where exposure to stormwater does not result in the discharge of pollutants)

6) Materials or products that would be expected to be mobilized in stormwater runoff contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers

7) Waste material except waste in covered, non-leaking containers (e.g., dumpsters);

8) Application or disposal of process wastewater (unless otherwise permitted)

9) Particulate matter or visible deposits of residuals from roof stacks, vents or both not otherwise regulated (i.e., under an air quality control permit) and evident in the stormwater runoff

Roanoke County's SWPPP Implementation Schedule is provided at the end of this BMP section. It identifies the high-priority facilities that have a high potential to discharge pollutants. This document also indicates when the various SWPPPs were prepared. Each SWPPP is kept at the high-priority facility for which it was written and contains the following information:

1) A site description that includes a site map identifying all outfalls, direction of stormwater flows, existing source controls, and receiving water bodies

2) A description and checklist of the potential pollutants and pollutant sources

3) A description of all potential non-stormwater discharges

4) Written procedures designed to reduce and prevent pollutant discharge

5) A description of the applicable training as required in Part I E 6 m of the MS4 Permit (**see BMP 6-3**)

6) Procedures to conduct an annual comprehensive site compliance evaluation;

7) An inspection frequency of no less than once per year and maintenance requirements for site-specific source controls. The date of each inspection and associated findings and follow-up shall be logged in each SWPPP

8) A log of each unauthorized discharge, release, or spill incident reported in accordance with Part III G of the MS4 Permit, to include the following:
    a. Date of incident
    b. Material discharged, released, or spilled
    c. Estimated quantity discharged, released or spilled

Responsible Party:
The Department of Community Development evaluates the high-priority facilities and prepares and updates the necessary SWPPPs. The applicable departments implement their SWPPPs, conduct the requisite training and facility inspections, and handle incident reporting in the event of an unauthorized discharge, release, or spill.

Schedule and Evaluation:
Roanoke County has identified all municipal high-priority facilities, and it has determined which of these high-priority facilities have a high potential to discharge pollutants in stormwater. All necessary SWPPPs have been completed, and they will be maintained for as long as each facility has a high potential to discharge pollutants.

In accordance with the MS4 Permit, no later than June 30 of each year, Roanoke County will review any of its high-priority facilities for which a SWPPP has not been developed to determine if the facility has a high potential to discharge pollutants. If the facility is determined to be a high-priority facility with a high potential to discharge pollutants, the County will develop a SWPPP no later than December 31 of that same year.

If activities change at a facility such that it no longer meets the criteria of a high-priority facility with a high potential to discharge pollutants, Roanoke County may remove the facility from the list of high-priority facilities with a high potential to discharge pollutants.

Standard Operating Procedures or Policies:
- Water Quality-Related Standard Operating Procedures, dated June 2017

Supporting Documents:
- SWPPP Implementation Schedule (includes a list of high-priority facilities and whether or not they have a high potential to discharge pollutants in stormwater), dated September 2017
- Completed SWPPPs (dates vary)
- Contractor Good Housekeeping and Pollution Prevention Procedures, dated December 2019
- Roanoke County MS4 Training Plan, dated July 2019

Measurable Goals:
Success for this BMP will be measured by the implementation/maintenance of the required SWPPPs and the SWPPPs being kept at the high-priority facility for which they were written and used as part of the staff training conducted at said facility.

In addition, Roanoke County will review the contents of any site-specific SWPPP no later than 30 days after any unauthorized discharge, release, or spill reported in accordance with Part III G of the MS4 Permit to determine if additional measures are necessary to prevent future unauthorized discharges, releases, or spills. If necessary, the County will update the SWPPP no later than 90 days after the unauthorized discharge.

Items to be reported in the Annual Report:

- A summary of any new SWPPPs developed in accordance Part I E 6 c of the MS4 Permit during the reporting period.
- A summary of any SWPPPs modified in accordance with Part I E 6 f of the MS4 Permit or the rationale of any high-priority facilities de-listed in accordance with Part I E 6 h of the MS4 Permit during the reporting period.

SWPPP Implementation Schedule

Location	High-Priority Activities	High Potential of Discharging Pollutants?	Reasons for High Potential or Not	SWPPP Completion Date/or last Revision Date
Roanoke County				
Public Service Center	Store Equip/Fertilizers Public Works Yard	Yes	Exterior material & equipment storage	June 1, 2015
Fleet Service Center	Vehicle maintenance	"	Heavy vehicle maintenance	"
#1 North County Fire & Rescue*	Equipment washing, fueling activities	"	Exterior fueling and washing	Revised November 2016
#3 Cave Spring Fire*	"	"	"	"
#5 Hollins Fire and Rescue*	"	"	"	"
#6 Mount Pleasant Fire & Rescue*	"	"	"	"
#9 Fort Lewis Fire and Rescue*	"	"	"	"
EMS Training Facility	Chemicals used in training	"	Exterior training exercises with chemicals	January 2017
Roanoke County Public Schools				
Maintenance Dept. Shop, Office, Warehouse; 702 South Market St. Salem, VA	Vehicle storage	No	Parking lot	June 1, 2015
Small Engine & Welding Shop 622 South Market Street, Salem, VA	"	"	"	"
Transportation Dept. Bus Maintenance, Parking Lot; 701 South Market Street, Salem, VA	Vehicle maintenance	Yes	Exterior fueling & washing	"
Maintenance/Storage Facility Burton Center for Arts and Technology	Vehicle storage	No	Parking lot	March 2016
Cave Spring Bus Lot	Vehicle maintenance	Yes	Exterior fueling & washing	"
Glenvar Bus Lot**	"	"	"	February 2017
Northside Bus Lot**	"	"	"	"
Vinton Bus Lot**	"	"	"	"

*One SWPPP for 5 Fire Stations **One SWPPP for 3 Bus Lots

BMP 6-5: Nutrient Management Plans

The goal of this BMP is to ensure that excessive nutrients are not being applied to County-owned lands. To achieve this, Roanoke County will maintain and implement turf and landscape nutrient management plans that have been developed by a certified turf and landscape nutrient management planner (in accordance with § 10.1-104.2 of the Code of Virginia) on all lands owned or operated by the County where nutrients are applied to a contiguous area greater than one acre. If nutrients are being applied to achieve final stabilization of a land disturbance project, application amounts will follow the manufacturer's recommendations.

Responsible Party:
The Department of Community Development will track progress. The Department of Parks, Recreation, and Tourism (PRT) is responsible for the preparation, implementation, and maintenance of Nutrient Management Plans on County-owned lands. Roanoke County Public Schools (RCPS) is responsible for the preparation, implementation, and maintenance of Nutrient Management Plans on RCPS-owned lands.

Schedule and Evaluation:
All County-owned lands where nutrients are applied to a contiguous area of 1 acre or more have been identified and Nutrient Management Plans are in place. The County will continue to implement these plans and update them, as needed.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
- Nutrient Management Program Plan and Log - Roanoke County, dated 7-1-14
- Nutrient Management Program Plan and Log - Schools, dated 7-1-14
- Nutrient Management Plans for County-owned and RCPS-owned lands (dates vary)

Measurable Goals:
Success for this BMP will be me**a**sured by the implementation of the Nutrient Management Plans for the applicable lands.

Items to be reported in the Annual Report:
- A summary of any new turf and landscape nutrient management plans developed in the permit year that includes:
  - Location and the total acreage of each land area.
  - The date of the approved nutrient management plan.

BMP 6-6: Pesticide Applicator Certification

The goal of this BMP is to ensure that all employees and contractors hired by the County who apply pesticides and herbicides are trained or certified in accordance with the Virginia Pesticide Control Act (§ 3.2-3900 et seq. of the Code of Virginia). Certification by the Virginia Department of Agriculture and Consumer Services (VCACS) Pesticide and Herbicide Applicator program shall constitute compliance with this requirement.

Responsible Party:
The Department of Community Development shall track compliance. The Departments of Parks, Recreation and Tourism and General Services are responsible to ensure that their employees or contractors who apply pesticides on County-owned lands have current pesticide/herbicide applicator certifications.

Schedule and Evaluation:
Roanoke County annually reviews the pesticide/herbicide applicator certifications held by its employees and hired contractors.

Standard Operating Procedures or Policies:
There are no pertinent standard operating procedures (SOPs) or policies needed to implement this BMP.

Supporting Documents:
None.

Measurable Goals:
Success for this BMP will be measured by maintenance of current certification by the applicable employees and any hired contractors.

Items to be reported in the Annual Report:
- Summary report of the names of applicable employees and any hired contractors and the expiration dates of their certification.

Part III. Total Maximum Daily Load (TMDL) Action Plans

Roanoke County previously developed and currently implements local Total Maximum Daily Load (TMDL) Action Plans to reduce loadings for its pollutants of concern (sediment, bacteria, and PCBs), because the County discharges these pollutants of concern to impaired waters for which a TMDL has been approved by the U.S. Environmental Protection Agency (EPA) and in which an individual or aggregate wasteload has been allocated to Roanoke County.

Because these TMDLs were approved by the EPA prior to July 1, 2013, and an individual or aggregate wasteload was allocated to Roanoke County, the County must and will update its previously-approved local TMDL Action Plans to meet the conditions of Part II B 3, B 4, B 5, B 6, and B 7 of the MS4 Permit, as applicable, no later than 18 months after the MS4 Permit effective date and will continue implementation of the action plans.

Note that the County's 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.

EPA-approved TMDLs that affect Roanoke County include the following:

Sediment - Upper Roanoke River Watershed
- EPA Approved: 05/10/2006
- SWCB Approved: 09/07/2006

PCBs - Roanoke (Staunton) River Watershed
- EPA Approved: 04/09/2010
- SWCB Approved: 12/09/2010

Bacteria (E. Coli) - Tinker Creek
- EPA Approved: 08/05/2004
- SWCB Approved: 12/02/2004

Bacteria (E. Coli) - Upper Roanoke River Watershed
- EPA Approved: 08/02/2006
- SWCB Approved: 06/27/2007

Associated with these TMDLs, Roanoke County has 13 TMDL wasteload allocations, as described in Part IV of this Plan.

Roanoke County's completed TMDL Action Plans, as listed below, are incorporated into this Program Plan and have been included in the Supporting Documents section. (See TMDLs on the attached CD.)

TMDL Action Plan for E. Coli, dated 9-24-19
The *Total Maximum Daily Load Action Plan for E. Coli Reduction in the Roanoke River, Ore Branch, Tinker Creek, Glade Creek, Carvin Creek, and Lick Run* was completed in July 2015 and submitted to DEQ with the corresponding MS4 Annual Report.

TMDL Action Plan for Sediment dated 9-24-19
The *Total Maximum Daily Load Action Plan for Sediment Reduction in the Roanoke River* was completed in July 2015 and submitted to DEQ with the corresponding MS4 Annual Report.

TMDL Action Plan for PCBs, dated 12-13-16
The *Total Maximum Daily Load Action Plan for PCBs in the Roanoke River, Mason Creek, Peters Creek, Tinker Creek, Wolf Creek, and an Unnamed Tributary to the Roanoke River* was completed in June 2016 and submitted to DEQ with the corresponding MS4 Annual Report.

As stated above, these TMDL Action Plans will be revised, as necessary, to meet the conditions of Part II B 3, B 4, B 5, B 6, and B 7 of the MS4 Permit, as applicable, no later than 18 months after the MS4 Permit effective date (i.e., November 1, 2018) Roanoke County will provide an opportunity for public comment on these plan revisions for no less than 15 days.

Each MS4 Annual Report in the permit term will include a summary of actions conducted by the County to implement each of its local TMDL Action Plans.

Part IV. Supporting Information

A. Watershed Summary

Roanoke County is home to over 90,000 residents and occupies almost 250 square miles of land in the southwestern portion of Virginia along the western slopes of the Blue Ridge Mountains. The County contains the headwaters of many streams that flow to the Roanoke River. The Roanoke River flows in an easterly direction through the central part of Roanoke County, the neighboring City of Salem, City of Roanoke, and the Town of Vinton. Roanoke County's geography can be characterized as a mountainous region, complete with hilly terrain mixed with large valleys. Elevations range from over 3600 ft. to 900 ft. above sea level.

This section details a list of all known waters, currently located within the urbanized portion of the County, that receive discharges or that have the potential to receive discharges from the MS4 area. Table 1 lists the names of the waterways, the Hydrologic Unit Codes (HUCs), as identified in the most recent version of the Virginia's 6th Order National Watershed Boundary Dataset, the estimated drainage area that is served by the regulated small MS4 discharging to these surface waters (in acres), and the downstream impaired receiving waters into which the waterway directly discharges.

Following the table is a description of the approximate land use for each drainage area in Roanoke County that was studied in the 1997 Roanoke Valley Regional Stormwater Management Plan. In addition to the land use descriptions, there is a summary of all local Total Maximum Daily Load (TMDL) studies that have been completed and the appropriate wasteload allocations for Roanoke County.

Table 1
Roanoke County Watersheds, HUCs, Impaired Receiving Waters, and Drainage Areas

Watershed	HUC	Impaired Receiving Waters	MS4 Urbanized Watershed Drainage Area (Acres)
Back Creek	RU15	Back Creek	3,750
Barnhardt Creek	RU14	Roanoke River	830
Big Bear Rock Branch	RU09	Roanoke River	1,039
Bowman Hollow	RU09	Roanoke River	162
Butt Hollow Creek	RU09	Roanoke River	499
Callahan Branch	RU09	Roanoke River	763
Carvin Creek	RU12	Carvin Creek	1,672
Cole Hollow Branch	RU09	Roanoke River	168
Cook Creek	RU13	Glade Creek	679
Cove Hollow	RU09	Roanoke River	4
Deer Branch	RU12	Carvin Creek	2,191
Dixie Caverns	RU09	Roanoke River	44
Dry Branch	RU09	Roanoke River	489
Dry Hollow	RU09	Roanoke River	221
Garnand Branch	RU14	Roanoke River	343
Gish Branch	RU10	Mason Creek	282
Glade Creek	RU13	Glade Creek	1,688
High School Branch	RU09	Roanoke River	46
Lick Run	RU13	Lick Run	328
Mason Creek	RU10	Mason Creek	357
Mill Branch	RU09	Roanoke River	80
Mill Creek	RU09	Roanoke River	461
Mudlick Creek	RU14	Mudlick Creek	3,995
Murray Run	RU14	Murray Run	798
Ore Branch	RU14	Ore Branch	883
Paint Bank Branch	RU09	Roanoke River	169
Peters Creek	RU14	Peters Creek	1,625
Roanoke River & Unnamed Tributaries	RU05, 09, 14&16	Roanoke River	2,101
Snyders Branch	RU09	Roanoke River	201
Stypes Branch	RU09	Roanoke River	267
Tinker Creek	RU11	Tinker Creek	2,687
Twelve O'clock Branch	RU09	Roanoke River	557
West Dry Branch	RU09	Roanoke River	69
West Tinker Creek	RU13	Lick Run	141
Wolf Creek	RU14	Roanoke River	1,471

B. Land Use Descriptions for Each Watershed Discharging to Impaired Receiving Waters

Back Creek:

The Back Creek watershed contains fourteen existing specific land uses, but three are more prevalent: woods, agricultural, and residential. Approximately 75% of the watershed is wooded; agricultural and residential areas comprise about 10% of the watershed. The remaining 5% of the watershed consists of pasture, brush, and open space. Back Creek has been listed as an Impaired Water (Category 4A) for E-coli.

Barnhardt Creek:

The Barnhardt Creek watershed is a 4.2 square mile drainage basin located in south central Roanoke County, southern Salem, and southwestern Roanoke City. The Barnhardt Creek watershed originates on Poor Mountain, at an elevation approximately 2700 feet above sea level, and flows in a northeasterly direction to its confluence with the Roanoke River at the boundary of the City of Salem and City of Roanoke.

The Barnhardt Creek watershed contains fifteen existing land uses, but four are more prevalent: woods, 1/2-acre residential lots, 1/4-acre residential lots, and open space. Approximately 50% of the watershed is comprised of wooded areas, especially in the upstream reaches of Barnhardt Creek. The 1/2- acre residential lots comprise close to 20% of the watershed. Open space and 1/4-acre residential lots each comprise about 10% of the watershed area. The remaining 10% of the watershed consists of agricultural, commercial, and residential areas of various densities. Barnhardt Creek discharges to the impaired receiving waters of the Roanoke River after it passes out of Roanoke County into the cities of Roanoke and Salem.

Barnhardt Creek has been listed as an Impaired Water (Category 5C) for pH and (Category (4A) for E-coli.

Big Bear Rock Branch:

The Big Bear Rock Branch watershed is a 2.1 square mile drainage basin located in west central Roanoke County. The Big Bear Rock Branch originates on Ft. Lewis Mountain, at an elevation approximately 3250 feet above sea level, and flows in a southeasterly direction to its confluence with the Roanoke River.

The Big Bear Rock Branch has four major land uses: woods, 1/3-, 1/2- and 2-acre residential, commercial, and industrial uses. Approximately 45% of the watershed is wooded areas, 30% is residential lots of various sizes, 20% is industrial businesses, and 5% is commercial. Big Bear Rock Branch directly discharges to the impaired receiving waters of the Roanoke River.

Bowman Hollow:

The Bowman Hollow watershed is a 2.3 square mile drainage basin located in south central Roanoke County and southern Salem. The Bowman Hollow watershed originates on Poor Mountain near Twelve O'clock Knob, at an approximate elevation of 2600 feet, and flows in a northeasterly direction until its confluence with the Roanoke River.

The Bowman Hollow watershed contains thirteen existing land uses, but four are more prevalent: woods, 1/2-acre residential lots, 1/4-acre residential lots, and open space. Approximately 50% of the watershed is comprised of wooded areas, especially in the upstream reaches of Bowman Hollow. The 1/2- acre residential lots comprise close to 20% of the watershed. Open space and 1/4-acre residential lots each comprise about 10% of the watershed area. The remaining 10% of the watershed consists of agricultural, commercial, and residential areas of various densities. After it passes out of Roanoke County and into the City of Salem, Bowman Hollow discharges to the impaired receiving waters of the Roanoke River.

Butt Hollow Creek:

The Butt Hollow Creek watershed is a 2.7 square mile drainage basin located in north central Roanoke County and western Salem. The Butt Hollow Creek watershed originates on Fort Lewis Mountain, at an elevation of 3260 feet above sea level, and flows southeasterly to its confluence with the Roanoke River.

The Butt Hollow Creek watershed contains ten existing land uses. Woods comprise approximately 80% of the watershed area. Residential areas of various densities comprise about 15% of the watershed. The remaining 5% of the watershed area contains agricultural, open space, and commercial uses. Butt Hollow Creek directly discharges to the impaired receiving waters of the Roanoke River.

Callahan Branch

The Callahan Branch watershed is a 3.4 square mile drainage basin located in west central Roanoke County and western Salem. The Callahan Branch watershed originates on Fort Lewis Mountain, at an elevation of 3000 feet above sea level, and flows southeasterly to its confluence with the Roanoke River.

The Callahan Branch watershed contains six predominate land uses 33% is mixed residential, 25% commercial, 25% wooded, 10% industrial, and the remaining 10% of the watershed area is impervious area and open space. Callahan Branch directly discharges to the impaired receiving waters of the Roanoke River.

Carvin Creek:

The Carvin Creek watershed is a 28 square mile drainage basin located in northeast Roanoke County, northern Roanoke City, and the northern part of the watershed is located in Botetourt County. The watershed originates on Tinker Mountain, at an approximate elevation of 3200 feet above sea level, and flows northeast to the Carvin Cove Reservoir,

which is a public supply for drinking water. The creek then flows southeast to its confluence with Tinker Creek.

Two streams drain the Carvin Creek watershed, West Fork Carvin Creek and Deer Branch. The West Fork Carvin Creek sub-watershed is primarily undeveloped but has some development consisting of residential ¼-acre lots and commercial uses. The Deer Branch sub-watershed has residential development (mostly 1/4-acre lots) and some commercial and wooded areas.

The Carvin Creek watershed, as a whole, contains fifteen land uses, but only five major land uses: woods, agriculture and pasture, open water,1/4-acre residential lots, and commercial. Approximately 75% of the watershed is wooded, 10% is residential, 5% of the watershed is pasture, 5% is open water, and 5% is commercial. Carvin Creek has a wasteload allocation for E-coli from a TMDL report that was completed in 2004.

Cole Hollow Branch:

The Cole Hollow Branch watershed is a 5.9 square mile drainage basin located in north central Roanoke County, with the southern portion of the watershed located in the City of Salem. Cole Hollow Branch originates on Ft. Lewis Mountain, at an approximate elevation of 3020 feet above sea level, and flows south to its confluence with the Roanoke River. There is only one significant stream that drains the Cole Hollow Branch watershed: Paint Bank Branch. This stream also originates on Ft. Lewis Mountain and its sub-watershed is primarily undeveloped.

The Cole Hollow Branch watershed contains several specific land uses, but five major uses: woods, open areas, residential areas, agriculture, and commercial development. Approximately 70% of the watershed is woods and open areas, 20% of the watershed is residential development, 5% is agriculture, and 5% is commercial. Cole Hollow Branch discharges to the impaired receiving waters of the Roanoke River after it passes out of Roanoke County into the City of Salem.

Cove Hollow:

The Cove Hollow watershed is a 3.3 square mile drainage basin located in the western part of Roanoke County. Cove Hollow originates on Poor Mountain, at an approximate elevation of 3100 feet above sea level, and flows north to its confluence with the Roanoke River.

Dry Branch:

The Dry Branch watershed is a 4.5 square mile drainage basin located primarily in north central Roanoke County and the southern portion of the watershed is located in northern Salem City. Dry Branch originates on Ft. Lewis Mountain, at an approximate elevation of 2900 feet, and flows southeasterly to its confluence with the Roanoke River.

The Dry Branch watershed contains eight land uses, but only 2 major uses: woods and 1/4-acre residential lots. Approximately 75% of the watershed is comprised of wooded areas. The 1/4-acre residential lots comprise approximately 10% of the watershed. The remaining

15% of the watershed consists of open space, commercial, agricultural and residential areas of various densities. Dry Branch directly discharges to the impaired receiving waters of the Roanoke River.

Dry Hollow:

The Dry Hollow watershed is a 3.96 square mile drainage basin located in the western part of Roanoke County. Dry Hollow originates on Poor Mountain, at an approximate elevation of 3200 feet above sea level, and flows north to its confluence with the Roanoke River.

Garnand Branch:

The Garnand Branch watershed is a 3.2 square mile drainage basin located in the Garden City area of Roanoke City and the Mount Pleasant area of Roanoke County. Garnand Branch originates in Garden City and flows north to its confluence with the Roanoke River at the base of Mill Mountain in the City of Roanoke.

Gish Branch:

The Gish Branch watershed is a 2 square mile drainage basin located in north central Roanoke County and the City of Salem. The watershed originates on Ft. Lewis Mountain, at an elevation of 3080 feet, and flows in a southeasterly direction until its confluence with Mason Creek.

The Gish Branch watershed contains eight existing land uses, but 2 predominate: woods and commercial areas. Approximately 60% of the Gish Branch watershed is comprised of wooded areas, especially in the upstream sub-basins of Gish Branch. Commercial development comprises 20% of the watershed. The remaining 20% consists of agricultural, open space, paved areas, and residential areas of various densities. Gish Branch discharges to the impaired receiving waters of Mason Creek after it passes out of Roanoke County into the City of Salem.

Glade Creek:

The Glade Creek watershed is a 33 square mile drainage basin located in northeast Roanoke County, northeast Roanoke City, and northwest Vinton; it also stretches into Botetourt County. Glade Creek originates in the Blue Ridge Mountains near Curry Gap and flows southwesterly until its confluence with Tinker Creek. Cook Creek is a tributary on the northwestern reach of Glade Creek.

The Glade Creek watershed contains fifteen land uses, but the four major ones are: woods, agriculture, ½-acre and ¼-acre residential lots, and commercial development. Approximately 50% of the watershed consists of wooded areas, 20% is agriculture, 15% is residential, and 5% is commercial. The remaining 10% of the watershed consists of pasture, brush, industrial development, and open space. Glade Creek has a wasteload allocation for E-coli from a TMDL report that was completed in 2004.

High School Branch:

The High School Branch watershed is a 1.8 square mile drainage basin located in the western part of Roanoke County and the City of Salem. High School Branch originates on Little Brushy Mountain, at an approximate elevation of 1400 feet above sea level, in Roanoke County and flows south to its confluence with the Roanoke River in the City of Salem.

Lick Run:

The Lick Run watershed is a 7.8 mile drainage basin located in north central Roanoke County and Roanoke City. The Lick Run watershed originates at the intersection of Interstate 81 and U.S. Route 11. Lick Run flows southeasterly until its confluence with Tinker Creek.

The Lick Run watershed contains thirteen land uses, but the six major land use types are: 1/4- acre residential lots, open space, industrial development, agriculture, commercial, and paved areas. Approximately 25% of the watershed is comprised of 1/4- acre lots. Open space comprises 20% of the watershed. Industrial and agriculture each comprise about 15% of the watershed. Commercial and paved areas each comprise about 10% of the watershed. The remaining 5% of the watershed includes residential areas of various densities, railroad yards, and wooded areas. Lick Run has a wasteload allocation for E-coli from a TMDL report that was completed in 2004.

Mason Creek:

The Mason Creek watershed is a 29.6 square mile drainage basin located in north central Roanoke County, eastern Salem, and western Roanoke City. The Mason Creek watershed originates on Ft. Lewis Mountain, at an elevation of 3260 feet, and flows in a northeasterly direction to Masons Cove, where it turns and flows southeasterly to its confluence with the Roanoke River. Mason Creek has two significant streams that drain the watershed, Gish Branch and Jumping Run.

Mason Creek watershed consists of 14 different land uses. The most predominant one is wooded area, which comprises 80% of the watershed. Approximately 10% of the land use is residential development of various densities, and the remaining 10% is open space, commercial or agriculture areas. Mason Creek has been listed as an Impaired Water (Category 5A) for Benthic, and (Category 4A) for E-coli; and has a wasteload allocation for PCBs from a TMDL report completed in 2010.

Mill Branch:

The Mill Branch watershed is a 1.1 square mile drainage basin located in the western part of Roanoke County. Mill Branch originates near the foot of Poor Mountain, at an approximate elevation of 1700 feet above sea level, and flows north to its confluence with the Roanoke River.

Mill Creek:

The Mill Creek watershed is a 1 square mile drainage basin located in the western part of Roanoke County. Mill Creek originates near the bottom of Twelve o'clock Knob, at an approximate elevation of 1600 feet above sea level, and flows north to its confluence with the Roanoke River.

Mudlick Creek:

Mudlick Creek is a 9.6 square mile drainage basin located in east central Roanoke County and southeast Roanoke City. The basin originates on Long Ridge near Poor Mountain, at an elevation of approximately 2300 feet, and flows in a southeasterly direction until its confluence with the Roanoke River. There are two significant streams that drain the Mudlick Creek watershed: West Mudlick Creek and Murdock Creek.

The Mudlick Creek watershed contains 13 distinct land uses, but only four major uses: woods, agriculture, 1/3- and 1/4- acre residential and commercial lots. The woodland areas cover 25% of the watershed. The 1/4- acre residential areas consist of 50% of the entire watershed and 5% of the watershed is used for agricultural, 5% for commercial, and 5% for 1/3- acre residential lots. The remaining 10% of the watershed consists of pasture, brush, open space, paved areas, and 1/8-, 1/2-, 1-, and 2-acre residential lots. Mudlick Creek has been listed as an Impaired Water (Category 5A) for Benthic, and (Category 4A) for E-coli.

Murray Run:

The Murray Run watershed is a 2.9 square mile drainage basin mostly located in south central Roanoke County and southeast Roanoke City. The watershed originates south of Roanoke City and north of Starkey, at an elevation approximately 1400 feet, and flows in a northeasterly direction until its confluence with the Roanoke River.

The Murray Run watershed consists of 10 specific land uses, with 6 major uses: 1/4-, 1/3- and 1/8-acre residential lots, woods, open space, and commercial development. Approximately 40% of the watershed is comprised of ¼-acre residential lots. The rest of the watershed consists of the following: 10% for 1/3-acre lots, 10% for 1/8-acre residential lots, 10% for wooded areas, 10% for open space and 10% for commercial development. The remaining 10% of the watershed consists of industrial development, paved areas, 1/2-acre residential lots, and brush.

Murray Run has been listed as an Impaired Water (Category 5A) for Benthic, and (Category 4A) for E-coli.

Ore Branch:

The Ore Branch watershed is a 4.1 square mile drainage basin mostly located in south central Roanoke County and south central Roanoke City. The watershed originates south of Roanoke City near Chestnut, at an elevation of 1700 feet, and flows northeasterly until its confluence with the Roanoke River.

The Ore Branch watershed contains fourteen different land uses, but four are predominant: woods, commercial development, 1/4-acre, and 1/2-acre residential lots. Approximately 30% of the watershed is comprised of wooded areas. Commercial areas comprise approximately 20% of the watershed. Together, 1/4- and 1/2-acre residential lots comprise approximately 30% of the watershed. One eighth- acre residential lots comprise 5%, 1/3-acre residential lots comprise 5%, and paved areas comprise 5% of the watershed. The remaining 5% of the watershed consists of open space and 1 acre lots. Ore Branch has a wasteload allocation for E-coli from a TMDL report that was completed in 2006.

Peters Creek:

The Peters Creek watershed is a 9 square mile drainage basin located in central Roanoke County, northwest Roanoke City and northeast Salem. The watershed originates on Brushy Mountain, at an elevation of approximately 2380 feet, and flows in a southeasterly direction to its confluence with the Roanoke River. Three significant streams in Roanoke County drain the Peters Creek watershed: Peters Creek Tributaries A, B, and C.

The Peters Creek watershed contains fourteen different land uses, only two of which predominate: 1/4- acre lots and woods. Approximately 40% of the Peters Creek watershed consists of 1/4-acre residential lots. Wooded areas comprise approximately 35% of the watershed. Agricultural, commercial, open space, and paved areas each comprise 5% of the watershed. The remaining 5% of the watershed is a combination of brush, industrial areas, and 1- and 2-acre residential lots. Peters Creek has been listed as an Impaired Water (Category 4A) for E-coli and has a wasteload allocation for PCBs from a TMDL Report that was completed in 2010.

Snyders Branch:

The Snyders Branch watershed is a 2.9 square mile drainage basin located in the western part of Roanoke County. Snyders Branch originates north of Interstate 81, at an approximate elevation of 1600 feet above sea level, and flows south through the City of Salem to its confluence with the Roanoke River.

Stypes Branch:

The Stypes Branch watershed is a 3.5 square mile drainage basin located in the Glenvar area of Roanoke County. Stypes Branch originates on Fort Lewis Mountain, at an approximate elevation of 2700 feet above sea level, and flows south to its confluence with the Roanoke River.

Tinker Creek:

The Tinker Creek watershed is a 112 square mile watershed located in northeast Roanoke County, northeast Roanoke City, northwest Vinton, and southeast Botetourt County. The Tinker Creek watershed originates on Tinker Mountain near Mt. Union, at an elevation of approximately 2400 feet, and flows in a southerly direction until its confluence with the Roanoke River. There are four significant streams that drain the Tinker Creek watershed: Carvin Creek, Glade Creek, West Tinker Creek, and Lick Run.

The Tinker Creek watershed consists of sixteen existing land uses but only 3 predominate: woods, agriculture, and 1/4- acre residential lots. Approximately 50% of the watershed is wooded. Agricultural land use comprises approximately 25% of the watershed. Approximately 10% of the watershed is comprised of 1/4-acre residential lots. The remaining 15% of the watershed consists of mainly open space, commercial areas, 1/2- acre residential lots, and industrial areas. Tinker Creek has been listed as an impaired water (Category 5A) for Benthic, (Category 5C) for temperature; and has a TMDL wasteload allocation for E-coli from a TMDL report completed in 2004, and a wasteload allocation for PCBs from a TMDL report completed in 2010.

Twelve O'clock Branch:

The Twelve O'clock Branch watershed is a 1.7 square mile drainage basin located along the western City of Salem/Roanoke County boundary. Twelve O'clock Branch originates near Twelve O'clock Knob, at an approximate elevation of 2200 feet above sea level, and flows north through the City of Salem to its confluence with the Roanoke River.

West Dry Branch:

The West Dry Branch watershed is a 5 square mile drainage basin located in the western part of Roanoke County. West Dry Branch originates on Poor Mountain, at an approximate elevation of 2600 feet above sea level, and flows north to its confluence with the Roanoke River.

Wolf Creek:

The Wolf Creek watershed is a 4.9 square mile drainage basin located in eastern Roanoke County and east Vinton. The Wolf Creek basin originates in the Blue Ridge Mountains at Stewart Knob, at an approximate elevation of 2435 feet, and flows in a southwesterly direction until its confluence with the Roanoke River.

The Wolf Creek watershed contains eleven land uses, but only 5 predominate: woods, agriculture, and 1/2-, 1/3-, and 1/4-acre residential lots. Approximately 40% of the watershed is comprised of wooded areas, 20% is agricultural, and 25% is 1/4-acre residential. One half- and 1/3-acre residential land uses each comprise about 5% of the watershed. The remaining 5% of the watershed consists of the other 6 land uses: pasture, commercial, open space, 1- and 2-acre residential, and paved areas. Wolf Creek directly discharges to the impaired receiving waters of the Roanoke River, and it has a wasteload allocation for PCBs from a TMDL report completed in 2010.

C. Wasteload Allocations

Table 2 provides a listing of all current wasteload allocations for Roanoke County, as assigned by the Virginia Department f Environmental Quality (DEQ).

Table 2
Wasteload Allocations for Roanoke County Watersheds with Completed TMDLs

TMDL Waterways and Impaired Tributaries*	Year TMDL Completed	Parameter	WLA
Tinker Creek Watershed	2004	**E. Coli**	
Carvin Creek			4.07E+12 (colony forming units/yr)
Glade Creek			8.02E+10 (colony forming units/yr)
Lick Run			3.29E+09 (colony forming units/yr)
Tinker Creek			5.36E+11 (colony forming units/yr)
Roanoke River Watershed	2006	**E. Coli**	
Ore Branch			1.07E+09 (colony forming units/yr)
Roanoke River			2.84E+11 (colony forming units/yr)
Roanoke River Watershed	2006	**Sediment**	
Roanoke River			1,823 (tons/yr)
Roanoke River Watershed	2009	**PCBs**	
Roanoke River			47.9 (mg/yr)
Masons Creek			0.1 (mg/yr)
Peters Creek			4.7 (mg/yr)
Tinker Creek			38.4 (mg/yr)
Wolf Creek			10 (mg/yr)
Unnamed Tributary to Roanoke River			0.5 (mg/yr)

This information is based upon DEQ's list of approved and draft TMDL's at http://www.deq.state.va.us/tmdl/develop.html for streams located within the urbanized portion of Roanoke County, as defined by the 2010 U.S. Census.

Part V. Supporting Documents

(See Attached CD or 'Supporting Documents' folder on County MS4 webpage)

Folder Name	Document Name
Introduction	Letters to Physically-Interconnected Downstream Regulated MS4s, dated 6-28-19 MOA with Roanoke County Public Schools, dated 7-30-19
BMP 1-1	Audio-Visual Information, August 2019 Environmental Educational Publications and Programs, August 2019 Local and National Agencies, September 2019 Printed Materials and Publications, August 2019
BMP 1-3	Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19) Stream Monitoring and Education Plan, dated July 2019
BMP 1-4	Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19) Stormwater Education Program for Roanoke County's Schoolchildren, dated July 2019
BMP 1-5	Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19)
BMP 1-7:	Stormwater Education Program for Specific Audiences, dated November 2019 (includes Printed Materials and PSAs)
BMP 2-1	Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19) Storm Drain Stenciling Program, July 2019
BMP 2-2	Clean Valley Council Contract # 2018-116 (Renewal 1, dated 8-14-19)
BMP 3-1	MS4 Outfall Map, dated 7-25-19 Outfall Information Table, dated 7-30-19 Letters to Physically-Interconnected Downstream Regulated MS4s, dated 6-28-19
BMP 3-2	Illicit Discharge Detection and Elimination Procedures, July 2019 Illicit Discharge Ordinance, effective date 7-1-14
BMP 3-3	Illicit Discharge Detection and Elimination Procedures, July 2019 MS4 Outfall Map, dated 7-25-19 Outfall Information Table, dated 7-30-19
BMP 3-4	Illicit Discharge Detection and Elimination Procedures, July 2019 MS4 Outfall Map, dated 7-25-19 Outfall Information Table, dated 7-30-19
BMP 4-1	Agreement-in-lieu-of a Stormwater Management Plan, dated December 2019

	Agreement-in-lieu-of an Erosion and Sediment Control Plan, dated 1-22-19 DEQ Approval Letter - Alternative Inspection Program (ESC), dated 7-29-13 Erosion and Sediment Control Ordinance, effective date 2-23-16 Erosion and Sediment Control Permit (no date) Erosion and Sediment Control/Virginia Stormwater Management Program Permit, individual (blue) (no date) Erosion and Sediment Control/Virginia Stormwater Management Program Permit, overall development (green) (no date) Explanation of Permit Card Colors (no date) MS4 Coverage Letter from the Virginia DEQ, dated 10-29-18 Stormwater Management Design Manual, dated 3-22-16 Stormwater Management Ordinance, effective date 2-23-16
BMP 4-2	Land Development Procedures, dated 12-16-09 Engineering Review Checklist, dated 4-2-13 Digital Plan Submission Guide, dated 2-18-15 Agreement-in-lieu-of an Erosion and Sediment Control Plan, dated 1-22-19 Agreement-in-lieu-of a Stormwater Management Plan, dated December 2019 Stormwater Management Design Manual, dated 3-22-16
BMP 4-3	ESC Inspection and Enforcement Procedures, dated May 2019 VSMP Inspection and Enforcement Procedures, dated May 2019 ESC & SWM Certifications, dated June 2019 Inspector Protocol, dated 7-30-19 ESC Inspection Report - blank VSMP Inspection Report - blank Alternative Inspection Program ESC, dated 7-29-13 Alternative Inspection Frequency ESC - Tabular Rating Sheet, dated 7-29-13 Letter from DEQ Approving Alternative Inspection Program (ESC), dated 7-29-13
BMP 4-4	Erosion and Sediment Control Inspection and Enforcement Procedures, dated May 2019 VSMP Inspection and Enforcement Procedures, dated May 2019 Erosion and Sediment Control Ordinance, effective date 2-23-16 Stormwater Management Ordinance, effective date 2-23-16
BMP 5-1	VSMP Approval Letter from DEQ, dated 10-29-18 Stormwater Management Facility (SWMF) Maintenance Agreement, dated 4-7-16 Stormwater Management Ordinance, effective date 2-23-16
BMP 5-2	ESC and SWM Certifications, dated June 2019

	MOA with Roanoke County Public Schools, dated 7-30-19 Notice of Inspection Letter (no date) Request for Inspection Records Underground SWMF (no date) Request for Maintenance & Inspection Summary (no date) SWMF Inspection and Enforcement Procedures, dated May 2019 SWMF Inspection Forms (no date)
BMP 5-3	SWMFs that Discharge to MS4, dated December 2019
BMP 5-4	Annual Stormwater Newsletter for Residents, dated April 2019 Residential Fact Sheet, dated 9-29-16
BMP 5-5	Water Quality-Related Standard Operating Procedures, dated June 2017 Illicit Discharge Ordinance, effective date 7-1-14 Erosion and Sediment Control Ordinance, effective date 2-23-16
BMP 6-1	SPCC Plans for existing County Facilities (individually dated)
BMP 6-2	Water Quality-Related Standard Operating Procedures, dated June 2017 PCB PowerPoint 12-9-16 Roanoke County PCB Facts, dated 6-30-16
BMP 6-3	Water Quality-Related Standard Operating Procedures, dated June 2017 Roanoke County MS4 Training Plan, dated July 2019 PCB PowerPoint 12-9-16 Training Plan Positions Assessment, dated 9-27-14 Required MS4 Training Plans forms Specific Departments (no date)
BMP 6-4	Water Quality-Related Standard Operating Procedures, dated June 2017 SWPPP Implementation Schedule (includes a list of high-priority facilities and whether or not they have a high potential to discharge pollutants in stormwater), dated September 2017 Completed SWPPPs Contractor Good Housekeeping and Pollution Prevention Procedures, dated December 2019 Roanoke County MS4 Training Plan, dated July 2019
BMP-6-5	Nutrient Management Program Plan and Log - Roanoke County, dated 7-1-14 Nutrient Management Program Plan and Log - Schools, dated 7-1-14 Nutrient Management Plans for County-owned and RCPS-owned lands (dates vary)
TMDLs	TMDL Action Plan for Bacteria (E. Coli), dated 9-24-19

TMDL Action Plan for Sediment, dated 9-24-19
TMDL Action Plan for PCBs, dated 12-13-16