

# **MS4 Annual Report**

**Permit # VAR040135**

## **Stormwater Discharge From Small Municipal Separate Storm Sewer Systems**

**Reporting period:  
July 1, 2015 thru June 30, 2016**

**Original Submittal:  
September 30, 2016**

**Resubmittal:  
November 1, 2016**



Report submitted by:  
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# Table of Contents

<b>1. Background</b> .....	1
1.1 Status of Best Management Practices .....	1
1.2 Modifications to MS4 Program Plan .....	1
1.3 New MS4 Outfalls .....	1
<b>2. MCM 1 &amp; 2: Public Education and Outreach and Public Involvement/Participation</b> .....	1
2.1 BMP: Pet Waste Management for Public Parks.....	1
2.2 BMP: Identifying High Priority Water Quality Issues .....	3
2.3 BMP: Drain Marking Program .....	4
2.4 BMP: Enhance City Website to Include Stormwater Related Information .....	5
2.5 BMP: Annual Stream Clean-up Events .....	5
2.6 BMP: Develop Public Outreach Plan .....	5
<b>3. MCM 3: Illicit Discharge Detection and Elimination</b> .....	7
3.1 BMP: Implement Stormwater Ordinance .....	7
3.2 BMP: Protect Sensitive Areas by use of City Code.....	7
3.3 BMP: Outfall Mapping.....	8
3.4 BMP: Outfall Screening .....	8
<b>4. MCM 4: Construction Site Stormwater Runoff Control</b> .....	9
4.1 BMP: Erosion and Sediment Control Ordinance.....	9
4.2 BMP: City Staff Training .....	10
<b>5. MCM 5: Post Construction Stormwater Management</b> .....	10
5.1 BMP: Adopt a Stormwater Ordinance to Control Impacts of Runoff .....	10
5.2 BMP: Stormwater Management Facility Database.....	10
<b>6. MCM 6: Pollution Prevention/Good Housekeeping</b> .....	11
6.1 BMP: Employee Training.....	11
6.2 BMP: Controls for Reducing the Discharge of Pollutants from City-owned Facilities and Property .....	12
6.3 BMP: Reduce the Amount of Solid Waste from City-owned Facilities by Encouraging Employees to Recycle Waste.....	13
6.4 BMP: Nutrient Management Plans .....	13
<b>7. Persons Responsible for Coordinating Small MS4 Stormwater Management Program</b> .....	13
<b>8. Certification Statement</b> .....	14
<b>Appendices</b> .....	15

# 1. Background

The City of Radford was granted coverage under MS4 General Permit Number VAR040135 on August 19, 2014. This permit will expire on June 30, 2018. This Annual Report is required by the permit and will include the status and progress of the BMPs implemented as part of the City's Program Plan. This report covers the period of July 1, 2015 through June 30, 2016.

This MS4 Annual Report is submitted to:

Virginia Department of Environmental Quality  
Jesse "Jay" Roberts  
Blue Ridge Regional Office - Roanoke  
3019 Peters Creek Road  
Roanoke, VA 24019

## 1.1 Status of Best Management Practices & Compliance

The City is in compliance with the MS4 Permit conditions due to its progress on the BMPs and goals in the Program Plan as explained in this report. The identified BMPs continue to be appropriate for the City's MS4 Program. During the coming plan year, the City will continue the activities as outlined in this report and the Program Plan in order to remain in compliance and assess progress toward achieving identified measurable goals for each of the MCMs.

## 1.2 Modifications to MS4 Program Plan

The City Engineer position remains vacant. This position was listed in Item 11 in the MS4 Registration. Jay Eanes remains as the duly authorized representative.

## 1.3 New MS4 Outfalls

There have been no new MS4 outfalls added to the City.

# 2. MCM 1 & 2: Public Education and Outreach and Public Involvement/Participation

## 2.1 BMP: Pet Waste Management for Public Parks

- General:** The City will continue to raise awareness and enforce current policies requiring pet owners to clean up after their animals while in public parks.
- Achievements:** The City’s Parks & Recreation Department continues its Pet Waste Management Program in the three heaviest used public park areas within the City’s Park system: Bisset Park, Wildwood Park, and the William D. Lorton, Jr. “Sparky’s Run” Dog Park.
- The Program consists of maintaining individual pet waste bag dispensers in key locations within each of these Parks. The Department maintains the dispensers and checks them on a regular basis to keep them full of the plastic waste bags. The dispensers also contain signs encouraging the public to collect their pet’s waste in the plastic bags available in the dispensers.
- The Department enforces a regulation that discourages citizens from allowing their pets to run at large (out of the individual control of their owners), requiring all pets to be on a leash while in the Parks.
- The City continues to produce its “Scoop the Poop” brochure specifically targeting the control of pet waste. The brochure is available at several locations in the City including:
- Treasurer’s Office: to be handed out when issuing Dog Tags (730 this plan year)
  - Two Veterinarian Offices within the City: Riverside Veterinary Clinic and West End Animal Clinic (3,000 visits this plan year)
  - Posted on the City’s website for Stormwater / Pollution Prevention (1,700+ visits this plan year)
  - Radford Recreation Center
  - City Manager’s Office (5,000 views this plan year)
  - Radford Public Library
- Schedule of Activities:** The City’s Parks & Recreation Department will continue to enforce the current Pet Waste Management Program. The Department will continue to evaluate the effectiveness of the Program during the coming plan year, adding or relocating the

pet waste bag dispensers based on observations of their use and according to input received by the public.

City staff will continue to produce and make available the “Scoop the Poop” brochure at the locations listed above, at the City’s Animal Shelter, and at various City-sponsored events during the coming plan year.

Documentation: The regulation is stated on the City’s website for the William D. Lorton, Jr. “Sparky’s Run” Dog Park. A City map showing Parks & Recreation Facilities, “Scoop the Poop” brochure, and pictures of relevant signage at City Parks are in Appendix A.

## 2.2 BMP: Identifying High Priority Water Quality Issues

General: The City has identified three water quality issues that are considered high priority and are being addressed by the Plan. These items are:

- A. Proper Disposal of Pet Waste – This program raises awareness of the need for proper disposal of pet waste to avoid release of bacteria into the stormwater system and, in turn, the New River.
- B. Collection of Yard Waste – This program educates citizens about proper disposal of yard waste (grass clippings, leaves, etc.) to reduce the amount of such waste discarded into the City’s storm sewer drains. In addition, the City collects yard waste as part of a composting program that develops topsoil for City use. These programs help reduce clogging in the storm sewer network and reduce pollutants (i.e. fertilizers, herbicides, and pesticides) from entering the storm sewer network.
- C. Nutrient Management Education – The City has produced a “Resident’s Guide for a Cleaner Environment” brochure to be distributed to citizens and to educate them about nutrient management for their own properties. This brochure is coordinated with the City’s internal efforts to develop Nutrient Management Plans for City-owned property. The brochure contains this statement: “Avoid the use of fertilizers and do not apply before heavy rainfall.”

Pesticides are toxic to humans, animals, aquatic insects, and plants. Follow label directions carefully or use alternatives whenever possible.” The literature on Nutrient Management explains what a Nutrient Management Plan is and why it is important for residents to have a plan for their homes.

**Achievements:** Development of the above programs and literature that address the 3 identified water quality issues. Brochures are available on the City’s stormwater website, which received 3,400 visits this plan year.

**Schedule of Activities:** Public awareness activities and materials have been developed for these 3 water quality issues and are being provided at the events listed in BMP 2.6, on the City’s website, and on the City’s Facebook page. Brochures for Leaf Collection and Disposal and for Pesticide and Fertilizer Information will be created and posted to the City’s website.

**Documentation:** See Appendix A for brochures and associated information.

## 2.3 BMP: Drain Marking Program

**General:** The City will implement a Storm Drain Marking Program. This will involve performing an inventory of the storm drain locations and identifying the drains most easily accessible to the public and that may be vulnerable to illicit dumping. These drains will be considered good candidates for permanent marking.

**Achievements:** The City’s storm sewer network has been completely mapped using GIS technology, based on compiling as-built and record information from City archives and from observations in the field.

All 1,339 curb inlets and 60% of the grate inlets in the City have been marked, using the drain marker shown in Appendix B.

**Schedule of Activities:** During the coming plan year, the City will continue the Storm Drain Marking Program. The remaining 40% of grate inlets will be marked during the coming plan year.

## 2.4 BMP: Enhance City Website to Include Stormwater Related Information

- General:** The City’s website will be enhanced to make stormwater related information available to the General Public. Included will be links to the relevant sections of the Virginia DEQ and EPA websites. Also included will be links to the City’s relevant ordinances and the MS4 Program Plan and annual reports.
- Achievements:** This website enhancement was completed in the previous plan year. This plan year, it received over 3,400 views.  
[www.radfordva.gov/stormwater](http://www.radfordva.gov/stormwater)
- Schedule of Activities:** The City will continually update the website to add relevant information as needed.

## 2.5 BMP: Annual Stream Clean-up Events

- General:** The City will sponsor, at least once per year, an event that encourages public participation in cleaning up the streams within the City limits. Emphasis is placed on removing foreign debris, litter, etc. The event will be publicized through various media in order to have as much participation as possible.
- Achievements:** Planning and coordination began during the current plan year in February 2016 for the August 27, 2016 “Fall into the New” event in the upcoming plan year. This regional river clean-up event will clean 9 miles of the New River adjacent to the City. Over 400 volunteers from the City and surrounding Counties are expected to participate.
- Schedule of Activities:** The City will again work with the ReNew the New Committee to participate in the regional event focused on cleaning up the New River, “Fall into the New” scheduled for August 27, 2016.

## 2.6 BMP: Develop Public Outreach Plan

- General:** The City will develop a plan to identify the target audience and develop strategies to reach a minimum of 20% of the target audience annually through public outreach activities. As part of

the plan, the goal will be to have a minimum of 4 public participation events annually.

**Achievements:**

The City previously identified the target audience as the citizen population.

The City's Public Information staff publicized events and initiatives aimed at educating citizens about the MS4 program and how they can be involved. The following events were held:

- NRV Regional Household Hazardous Waste Collection Days: Monthly, City promoted the event in coordination with the New River Resource Authority. The event was featured on the City Calendar website. Estimated attendance was 60, 110% of the target.
- Rake Leaves & Eat Pie – Pathways for Radford: November 29, 2015. City staff and citizens raked leaves and cleaned trails, parks, and tributaries within the City. Estimated attendance was 50, 100% of the target.
- Educational and informational programs at the City's Radford Public Library. Display by City staff of children's items found in the City's storm drains (including scooters, skateboards, and phones) reminding children and parents to put away outdoor toys to prevent losing them in the stormwater network. Estimated attendance/viewers were 8,000. 100% of target.
- Native American Heritage Festival in Bisset Park: April 8-9, 2016. A City-sponsored event, including a Student Day on April 8. City staff had a booth to promote awareness of the City's stormwater initiatives, good land stewardship, and hand out literature and educational materials. Estimated attendance was 1,000. However, inclement weather forced cancellation of the event. 0% of target audience attended due to the weather cancellations.
- Arbor Day Celebration: April 26, 2016. Activities included a tree planting by Radford High School students, educational aids, and a dedication of the new roundabout on 2<sup>nd</sup> Avenue. The event was featured on the City Calendar website. There was participation and presentations by City's Beautification Committee. Estimated attendance was 50. 110% of target.
- Dean Goes Green: April 23<sup>rd</sup>. Radford University SGA and Dean of Students Road Clean-Up on Tyler Avenue, from Lawrence Street to Clement Street. The event was co-hosted by the City

and University Advisory Commission. The City provided vests, trash bags, etc. Estimated attendance was 150. 100% of target.

**Schedule of Activities:** The above events are ongoing and/or annual, will occur again during the coming plan year, and are anticipated to draw a 5% increase in attendance compared to the current plan year. The Highlander Festival (October 8, 2016) will include a booth for Stormwater and other literature mentioned in this report. Attendance is anticipated to be 2,500, which is 50% of the target audience. Also, the City's Adopt-a-Spot program is scheduled to begin for the coming plan year.

**Documentation:** See Appendix A for documents for Adopt-a-Spot documentation.

### **3. MCM 3: Illicit Discharge Detection and Elimination**

#### **3.1 BMP: Implement Stormwater Ordinance**

**General:** The City will implement a Stormwater Ordinance and an Illicit Discharge Ordinance that will prohibit illegal and illicit dumping of non-stormwater discharges. The ordinance, at a minimum, will address detection, identification of source of discharge, mechanisms to eliminate discharges, and tracking. The ordinance will facilitate public reporting of illicit discharges.

**Achievements:** The draft Illicit Discharge Ordinance from the previous plan year was presented to the City Council during this plan year. The Council held a public hearing for and approved the Ordinance on the First Reading on June 13, 2016. Sections 32-25 and 32-26 etc. explain how the City will facilitate the public reporting of illicit discharges.

**Schedule of Activities:** Ordinance #1681 was adopted on the Second reading on July 11, 2016.

**Documentation:** Ordinance #1681: Illicit Discharge and Detection Elimination is located in Appendix B.

#### **3.2 BMP: Protect Sensitive Areas by use of City Code**

**General:** The City has adopted by Ordinance two "overlay districts" (Floodplain District and Riverfront Corridor Overlay District) in

the City Code that protect areas within a floodplain and that are adjacent to the New River. (Divisions 15 and 16 of Chapter 120.1: Zoning Ordinance)

**Achievements:** No changes to these districts were made during this plan year. City staff has continued to enforce the provisions of these overlay districts.

**Schedule of Activities:** City staff will continue to enforce the provisions of the overlay districts in the coming plan year.

**Documentation:** A copy of the overlay map is included in Appendix C.

### 3.3 BMP: Outfall Mapping

**General:** The City will create and maintain an accurate storm sewer system map and information table and locate and map all MS4 outfalls.

**Achievements:** The mapping of the City's storm sewer network and outfalls was completed during the plan year. Connection to the Radford University MS4 was identified. Connection by way of overland flow may also exist with the MS4's of Montgomery County and the Virginia Department of Transportation (VDOT).

**Schedule of Activities:** Notification to Radford University, Montgomery County, and VDOT will be done during the coming plan year.

**Documentation:** The City's Outfall Screening map showing the storm sewer network is provided in Appendix C.

### 3.4 BMP: Outfall Screening

**General:** The City will develop a procedure for dry weather screening of the MS4 stormwater outfalls.

**Achievements:** 52 MS4 outfalls were screened according to procedures developed for dry weather screening of the MS4 stormwater outfalls. Procedures include documenting results and follow-up actions on an Outfall Field Screening Report Spreadsheet.

Screenings are performed by the Water & Wastewater Division in conjunction with the Public Works Department.

**Schedule of Activities:** The City will screen 50 outfalls during the coming plan year, documenting results (in the Outfall Field Screening Report Form for individual outfalls and in the Spreadsheet cumulatively), and following-up as necessary.

**Documentation:** The Outfall Field Screening Report Spreadsheet and Form are provided in Appendix C.

## **4. MCM 4: Construction Site Stormwater Runoff Control**

### **4.1 BMP: Erosion and Sediment Control Ordinance**

**General:** Adopt and maintain an Ordinance in the City Code that requires compliance with the Virginia Erosion and Sediment Control Regulations.

**Achievements:** The City continues to enforce its Erosion and Sediment Control Ordinance. During the plan year, the City had the following activity:

- Single Family Residences – Agreement In Lieu of Plan – 3 permits; Total disturbed area = 0.55 acres
- Land Disturbing Permits – Erosion and Sediment Control Plans – 1 permit; Total disturbed area = 0.96 acres
- Enforcement actions: None
- Inspections: 1

**Schedule of Activities:** The City will continue to enforce the Erosion and Sediment Control Ordinance and track relevant activity during the coming plan year.

**Documentation:** The City's Erosion & Sediment Plan Inspection Report is provided in Appendix C.

## 4.2 BMP: City Staff Training

**General:** The City staff members that enforce the Erosion and Sediment Control Ordinance will maintain the appropriate VA DEQ certifications.

**Achievements:** City staff are in the process of earning the appropriate certifications. Inspections and other activities are currently being completed by outside consulting firms with certified personnel.

**Schedule of Activities:** City staff will be certified accordingly during the coming plan year.

## 5. MCM 5: Post Construction Stormwater Management

### 5.1 BMP: Adopt a Stormwater Ordinance to Control Impacts of Runoff

**General:** The City will implement a Stormwater Ordinance that will address both post-construction stormwater management and illicit discharges. The ordinance, at a minimum, will comply with the Virginia Stormwater Management Program regulations.

**Achievements:** Implementation of the City's Stormwater Management Ordinance that was adopted in the previous plan year.

**Schedule of Activities:** City staff will continue to enforce the provisions of the Stormwater Management Ordinance and monitor its effectiveness to determine if improvements are warranted.

**Documentation:** Stormwater Management Ordinance is available on the City's Stormwater Management Program website.

### 5.2 BMP: Stormwater Management Facility Database

**General:** The City will develop and maintain an electronic database (Excel spreadsheet) of all known publicly- and privately-owned stormwater management facilities.

- Achievements:** The eight City-owned stormwater management facilities and four private facilities have been identified on the City of Radford Storm Water Management map and included on the BMP Facilities Tracking Database spreadsheet with relevant information, including one new facility at 818 West Main Street (Family Dollar store).
- Schedule of Activities:** The City will continue to document all inspections and enforcement actions for these stormwater management facilities.
- Documentation:** An updated City of Radford Storm Water Management map is in Appendix C, and the BMP Facilities Tracking Database spreadsheet and Inspection Report are in Appendix D.

## **6. MCM 6: Pollution Prevention/Good Housekeeping**

### **6.1 BMP: Employee Training**

- General:** The City will implement an Employee Training Program designed to raise awareness within City employees of stormwater management practices as it relates to specific tasks and assignments.
- Achievements:** The City has developed Standard Operating Procedures for the following employee tasks and assignments:
- Asphalt Program: Good Housekeeping
  - Detention Pond Maintenance
  - Drainageway Maintenance
  - Vehicle and Equipment Storage
  - Good Housekeeping
  - IDDE Outfall Screening
  - Inlet, Pipe, & Vault Cleaning and Disposal
  - Landscape Chemical Application
  - Disposal and Maintenance of Landscape/Organic Waste
  - Building Maintenance
  - Parking Lot Sweeping and Repair
  - Recycling and Drop Center
  - Right of Way Maintenance

- Spill Prevention and Control
- Street Sweeping and Water Quality Protection
- Vehicle Maintenance
- Vehicle Washing

The City has trained its Public Works staff in the use of the Nutrient Management Plan, in BMP 6.4.

**Scheduled Activities:** The City will train its employees on the relevant Standard Operating Procedures needed for particular jobs and tasks. City staff will also utilize available VA DEQ training sessions related to Erosion & Sediment Control and Stormwater Management for employee training. Documentation of training information will be provided in the next Annual Report.

**Documentation:** The City’s Standard Operating Procedures are provided in Appendix E.

## 6.2 BMP: Controls for Reducing the Discharge of Pollutants from City-owned Facilities and Property

**General:** The City will continue to evaluate its operations and facilities for ways to reduce discharge of pollutants. This evaluation will include identifying potential sources of pollution, identifying and prioritizing problem areas, and determining methods to address and correct the problems. Some of these methods might include employee training, spill prevention plans, Stormwater Pollution Prevention Plans (SWPPPs), implementing new procedures, etc.

**Achievements:** The list of City-owned operations that require SWPPPs has been updated:

- Public Works Department: Solid Waste & Recycling Division Drop Center
- Public Works Department Facility
- Salt Storage Facility
- Parks & Recreation Department
- Electric Department Facility
- Water Treatment Plant

Scheduled Activities: SWPPPs will be developed for at least 50% of the identified facilities in the coming plan year. Included in this effort will be identifying needed training for City staff.

### 6.3 BMP: Reduce the Amount of Solid Waste from City-owned Facilities by Encouraging Employees to Recycle Waste

General: The City has an active recycling program that encourages City employees to participate. This program will continue and be evaluated for ways to improve and expand the program.

Achievements: The City collected over 10,386 tons of solid waste during this plan year. Of that, 1,920 tons (18%) were recycled.

Scheduled Activities: The City will continue the recycling program and encourage increased participation by providing information on the City's website and the local government television channel.

Documentation: The report showing solid waste collection and recycling totals is included in Appendix F.

### 6.4 BMP: Nutrient Management Plans

General: The City will evaluate its turf and landscaping operations and develop and maintain Nutrient Management Plans (NMP) where needed.

Achievements: The City has prepared Nutrient Management Plans for 15 City-owned sites, based on the recommendations of a certified Turf Management Planner.

Scheduled Activities: City staff will implement the Nutrient Management Plans, and train relevant staff as needed.

Documentation: The City's Nutrient Management Plans are in Appendix G.

## 7. Persons Responsible for Coordinating Small MS4 Stormwater Management Program

Within the City of Radford's organizational structure, the City Engineer is responsible for implementing the BMPs associated with the MS4 Program Plan. The City Engineer

position is currently vacant. The individual in the City's Engineering Department listed below has been identified in the interim as the responsible employee:

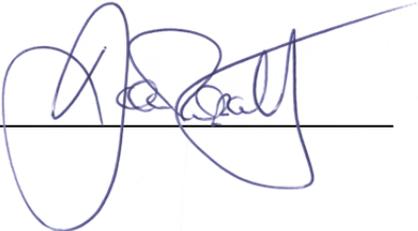
**Jay Eanes**  
**10 Robertson Street**  
**Radford, VA 24141**  
**Phone: 540-731-3603**  
**Email: [Jay.Eanes@radfordva.gov](mailto:Jay.Eanes@radfordva.gov)**

## 8. Certification Statement

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name: David Ridpath

Title: City Manager

Signature:  \_\_\_\_\_

Date: 9-30-16

# **APPENDIX A**

## **Public Education & Outreach**



### **ADOPT-A-SPOT PROGRAM**

To encourage citizen participation in litter cleanup of designated areas in their community at regular intervals. Individuals, organizations or businesses may agree to keep a designated area, other than a highway, cleared of litter for a two-year period.

In exchange, program participants are given materials to help them with the cleanup and a sign bearing their name to be posted in the area. At the end of the two-year period, the program participants will receive a special certificate of appreciation and may renew their agreement.

**ADOPTABLE LOCATIONS:** Are Attached and Named and Numbered.

1. The Adopt-a-Spot agreement must be approved by the City of Radford.
2. The Adopt – a – Spot Coordinator should coordinate, review and approve the proposed area(s) of adoption. If there is a question of safety or health, the proposed adoption should not be approved.
3. Any local community organization, business or individual (18 years or older) will be allowed to adopt a spot, provided that the City of Radford reserves the right to deny adoption requests or requests for signs or other supportive material for any reason whatsoever.
4. All participants must sign the agreement. If there are any special requirements, write, “see attachment” on the agreement form, provide such concerns on a separate page, and sign your name on the attached page.
5. Participants will be required to adopt for a minimum of two years, with four cleanups per year.
6. Group members less than 15 years of age must be supervised by an adult at least 18 years of age. There should be one adult 18 years of age or older for every six group members less than 15 years of age.
7. Participants are suggested to hold at least two meetings a year to review safety and other guidelines. No participants may be involved in a litter cleanup unless they have attended at least one such meeting a year. Coordinators should devise a means of being assured by the participants that these meetings have been held.
8. Radford will supply participants with trash bags and safety vests. The group’s representative should contact the City before a planned cleanup to arrange for pickup of materials.
9. The City Staff should assist in scheduling the disposal of filled trash bags, with the Public Works Director. Contact Lisa Blevins, Senior Administrative Assistant at 540-731-3605, to schedule pick up of filled trash bags.
10. Participants are urged to separate and recycle appropriate materials for their benefit.



### **ADOPT – A – SPOT PROCEDURES**

1. Pick a date – rally your team, get them excited about making a difference – they will see immediate results!
2. Call Lisa Blevins, at 540-731-3605, and advise when you want to pick up supplies, and how many people will be participating. Please give at least 2 days advance notice. Don't forget to state your group's name.
3. Pick up your supplies at the Department of Public Works at 699 17<sup>th</sup> Street.
4. Review safety guidelines with the group before starting – these can be found on the bottom of this page.
5. After your clean up, please complete Reporting form provided with your supplies - can also be filled out on line at [www.radfordva.gov](http://www.radfordva.gov) and return supplies!
6. For each safety vest that is not returned, there will be a \$10.00 charge.

### **SAFETY GUIDELINES**

Please review with all participants before cleanup!

1. Dress appropriately; loose clothing (long sleeved and long pants) are best.
2. Wear closed toe shoes.
3. Wear orange safety vests.
4. Wear rubber, work, or gardeners' gloves.
5. Children under 15 years old must be supervised by someone at least 18 years of age (no babies please!).
6. Participants must work facing oncoming traffic.
7. No litter is to be picked up in the street. Participants must stay clear of traffic at all times.
8. Do not pick up trash in tunnels, bridges, or overpasses.
9. Do not pick up trash in tall grass or weeds.
10. Do not pick up hazardous or any other chemical materials – call in item/location to
11. Be careful of poison ivy, poison oak, etc.
12. Be careful of insects, chiggers, snakes, etc.!
13. Be sure to take breaks whenever needed.

CITY OF RADFORD  
ADOPT- A - SPOT AGREEMENT

[Reset Form](#)

DATE:

ADOPT - A - SPOT ORGANIZATION: City of Radford Administration  
Jenni Wilder, Adopt - A - Spot Coordinator  
10 Robertson Street  
Radford, VA 24141  
540-731-3603

In order to enhance the environment and the appearance of our community, the applicant(s) undersigned, request permission to Adopt - A - Spot at the following location (spot name and number)

Said work will be performed under and in accordance with the City of Radford terms attached hereto and incorporated herein by reference.

Applicants with whom agreements are signed shall at all times indemnify and save harmless the City of Radford, their officials or agents, from responsibility, damage or liability arising from the exercise of the privileges granted under this agreement.

This agreement may be terminated by the City of Radford at any time the applicant(s) do not comply with this agreement or at any time the applicant's work effort is considered unsafe. The City reserves the right to revise or discontinue this program at any time.

Applicant(s) hereby assume all risk of damage or injury or resulting from the activities performed hereunder, and recognize that certain risks are inherent in litter pick up, especially in areas open to the public.

It is understood that the applicant is not an employee or volunteer of the City while participating in the Adopt-a-Spot program. As such, the City of Radford is not providing any worker's compensation insurance, general liability or automobile insurance or uninsured/underinsured insurance motorist coverage, for the acts or omissions of the applicant while engaged in any activities arising out of or related to this Adopt-a-Spot agreement and program. It is further understood that the City will not defend, hold harmless, or indemnify the applicant for any claims of loss, injury, death, or damage arising out of or related to this Adopt-a-Spot agreement and program.

Adopting Group or Individual

Primary Contact Name  Secondary Contact Name

Primary Phone No.  Secondary Phone No.

Primary Address

Primary E-mail Address  Primary Title

Primary Signature

**ADOPT - A - SPOT SUPPLIES REQUEST FORM**

**Use this form to request supplies for a scheduled cleanup. Please give at least 2 days advance notice. Supplies will need to be picked up from the Public Works Building at 699 17th Street, Monday - Friday between 9:00 a.m.- Noon.**

**We will contact you to let you know we have received your request. Please kindly let us know if you end up cancelling your cleanup by calling 540-731-3605, Lisa Blevins.**

**Thank you for your efforts to help keep Radford clean and beautiful.**

**Your Name**

**Your Phone Number**

**Your E-Mail**

**Adopting Person or Group**

**Adopted Spot**

**Date of Cleanup**

**Date To Pick Up Supplies**

**Expected Number of Participants**

**ADOPT - A - SPOT CLEAN UP REPORT FORM**

Use this form to submit your clean-up report to the Adopt - A - Spot Program Coordinator.  
Reminder: 4 Clean-ups per year are required.

ADOPTING PERSON OR GROUP

ADOPTED SPOT

DATE OF CLEANUP

NUMBER OF VOLUNTEERS

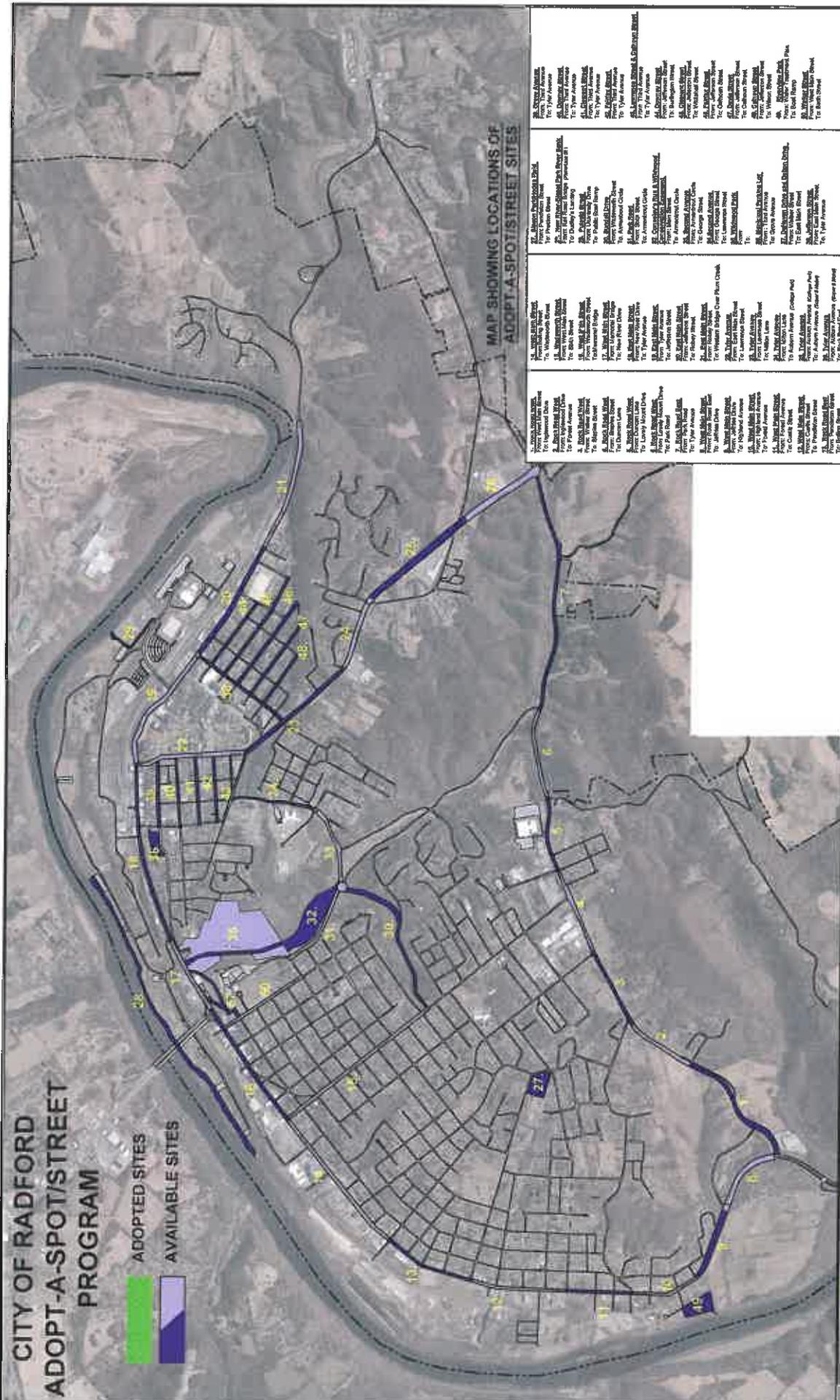
NUMBER OF HOURS

NUMBER OF BAGS OF LITTER COLLECTED

NUMBER OF BAGS OF RECYCLABLES COLLECTED

# CITY OF RADFORD ADOPT-A-SPOT/STREET PROGRAM

ADOPTED SITES  
AVAILABLE SITES



## MAP SHOWING LOCATIONS OF ADOPT-A-SPOT/STREET SITES

- 1. NORTH MAIN STREET  
From Washington Street  
To Washington Street
- 2. NORTH MAIN STREET  
From Washington Street  
To Washington Street
- 3. NORTH MAIN STREET  
From Washington Street  
To Washington Street
- 4. NORTH MAIN STREET  
From Washington Street  
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- 5. NORTH MAIN STREET  
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DESIGNED BY: JAMES  
DRAWN BY: JAMES  
CHECKED BY: JAMES

CITY OF RADFORD, VIRGINIA  
10 BROADWAY  
RADFORD, VIRGINIA  
CITY ENGINEER'S OFFICE

SCALE IN FEET  
0 100 200 400

1 OF 1 SHEET

2016 ADOPT-A-SPOT/STREET PROGRAM

City of Radford, Virginia  
 Adopt-A Spot/Street Program

ADOPTABLE SPOTS/STREETS AND PARTICIPATING ORGANIZATIONS

Spot Number	LOCATION	FROM	TO	ORGANIZATION
1	Rock Road West	West Main Street	Inglewood Drive	
2	Rock Road West	Inglewood Drive	Forest Avenue	
3	Rock Road West	Forest Avenue	Staples Street	
4	Rock Road West	Staples Street	Duncan Lane	
5	Rock Road West	Duncan Lane	Lovely Mount Drive	
6	Rock Road West	Lovely Mount Drive	Park Road	
7	Rock Road East	Park Road	Tyler Avenue	
8	West Main Street	Rock Road East	Jeffries Drive	
9	West Main Street	Jeffries Drive	Highland Avenue	
10	West Main Street	Highland Avenue	Forest Avenue	
11	West Main Street	Forest Avenue	Custis Street	
12	West Main Street	Custis Street	Pendleton Street	
13	West Main Street	Pendleton Street	Bolling Street	
14	West Main Street	Bolling Street	Wadsworth Street	
15	Wadsworth Street	West Main Street	Sundell Drive	
16	West Main Street	Wadsworth Street	Memorial Bridge	
17	West Main Street	Memorial Bridge	New River Drive	
18	East Main Street	New River Drive	Tyler Avenue	
19	East Main Street	Tyler Avenue	Jefferson Street	
20	East Main Street	Jefferson Street	Robey Street	
21	East Main Street	Robey Street	Western Bridge Over Plum Creek	
22	Tyler Avenue	East Main Street	Lawrence Street	
23	Tyler Avenue	Lawrence Street	Milton Lane	
24	Tyler Avenue	Milton Lane	Auburn Avenue (College Park)	
25	Tyler Avenue	Auburn Avenue (College Park)	Auburn Avenue (Super 8 Motel)	
26	Tyler Avenue	Auburn Avenue (Super 8 Motel)	Rock Road East	
27	Stinson Park/Hodge Field	Pendleton Street	Preston Street	
28	New River-Bissat Park/River Bank	Rail Road Bridge (Robertson St.)	Dudleys Landing Boat Ramp	
29	Pulaski Street	University Drive	Public Boat Ramp	
30	Sundell Drive	Wadsworth Street	Armentrout Circle	
31	Park Road	FROM Sixth Street	TO Armentrout Circle	
32	Wildwood Conservation Easement	Main Street	Armentrout Circle	
33	Second Avenue	Armentrout Circle	George Street	
34	Second Avenue	George Street	Lawrence Street	
35	Wildwood Park	Wildwood Park	Wildwood Park	
36	Municipal Parking Lot	Third Avenue	Grove Avenue	
37	DeHaven Drive and Dalton Drive	Walker Street	East Main Street	
38	Jefferson Street	East Main Street	Tyler Avenue	
39	Grove Avenue	Third Avenue	Tyler Avenue	
40	Downey Street	Third Avenue	Tyler Avenue	
41	Clement Street	Third Avenue	Tyler Avenue	
42	Fairfax Street	Third Avenue	Tyler Avenue	
43	Lawrence Street & Calhoun Street	Third Avenue	Tyler Avenue	
44	Downey Street	Jefferson Street	Burlington Street	
45	Clement Street	Jefferson Street	Whitehall Street	
46	Fairfax Street	Jefferson Street	Calhoun Street	
47	Davis Street	Jefferson Street	Calhoun Street	
48	Calhoun Street	Jefferson Street	Calhoun Street	
49	Riverview Park	Water Treatment Plant	Boat Ramp	
50	Walker Street	West Main Street	Sixth Street	

AVAILABLE FOR ADOPTION

Spot Number	NAME	FROM	TO

## Solid Waste & Recycling in Radford

The City of Radford offers residents multiple ways to dispose of trash and recyclable items.

- These locations allow for citizens to dispose of trash, debris and recyclables in proper locations and prevent littering.

Locations for Recycling:

- 200 George Street
- 699 Seventeenth Street

Drop Center Location:

- 606 Seventeenth Street

Solid Waste Curbside Trash Collection

For more information on Solid Waste Collection and Recycling

Visit: <http://www.radfordva.gov/758/>

Solid-Waste-Recycling

Call: 540-731-3605



### Littering Laws Continued:

#### Sec. 44-138. - Other violations.

A. Private property (litter and debris). It shall be the duty of each property owner and occupant to keep all private property free of litter and debris. These areas shall include, but are not restricted to,

sidewalks, alleys, driveways, yards and grounds, fences, walls, and property lines, drainages, and vacant lots which are owned or leased by the establishment or institution.

B. Public sidewalks and adjacent areas. Each owner or occupant whose property borders on a city sidewalk or strip between a street and sidewalk, shall be responsible for keeping such areas free of litter. It shall be unlawful to sweep litter on or into a street or street right-of-way.

C. Construction or demolition sites.

- It shall be unlawful for any owner or contractor to permit the accumulation of litter before, during, or after completion of any construction or demolition project.
- It shall be the duty of the persons in charge of a construction or development site to collect and contain all material to prevent scattering. All construction and/or demolition debris shall be removed from such site after completion of any project.
- Where any substance, litter, or foreign matter has been tracked or deposited on any street, it shall be promptly removed by the responsible person. The term "responsible person," as used in this section, means the driver, his employer, the owner, or the prime contractor in charge of construction or demolition on any property.
- Advertising material handbill. It shall be unlawful for any person in distributing handbills, leaflets, flyers, or other advertising material to do so in such a manner that it litters either public or private property.
- Penalties. Violation of any provision of this section shall be a class 4 misdemeanor, punishable as provided in sections 1-7 and 44-3 (Ord. No. 1127, § 10-26, 4-24-89; Code 1992, §

Keep Radford  
Beautiful

## Litter Prevention



## Litter Prevention



### Why People Litter?

- They feel no sense of community or ownership in the community,
- They believe someone else, a park maintenance or highway worker, will clean up after them,
- Litter has already accumulated,

### "Litter-Known" Facts:

Motorists and pedestrians are often blamed for litter. There are actually seven primary sources of litter:

- Household trash handling and its placement at the curb for collection,
- Dumpsters used by businesses,
- Loading docks,
- Construction and demolition sites,
- Trucks with uncovered loads,
- Pedestrians,
- Motorists,

Litter is blown about by wind and traffic or carried by water, it moves until trapped by a curb, building or fence. Once litter has accumulated it invites people to add more.

### Cost of Littering

Over 51 billion pieces of litter land on U.S. roadways each year.

- Litter cleanup costs the U.S. almost \$11.5 billion each year,
- Community's economy and quality of life suffer. The presence of litter in a community take a toll on the quality of life, property values and housing prices.
- Litter has environmental consequences. Wind and weather, tragic and animals move litter into gutters, lawns and landscaped areas, alleyways and parking structures. Debris may be carried by storm drains into local waterways . with potential for serious environmental contamination.

### What Can You Do?

- Set an example for others by choosing not to litter.
- IF you see litter, pick it up.
- Make sure trash cans have lids that can be securely fastened. Do not put loose trash in boxes.
- If you own a business, check dumpsters daily to see that top and side doors are closed.
- Do not throw trash out of the window.
- Dispose of cigarette waste in ashtrays.
- Volunteer to help organize or participate in a clean-up.
- Report areas where people have illegally dumped garbage and debris to your local highway public works, or conservation office and as that the material be removed.



### Littering and the Law

#### **Sec. 44-136. - Littering prohibited.**

It shall be unlawful for any person to drop, deposit or discard or otherwise dispose of litter in or upon any public or private property within the city, except in public containers or receptacles provided for the purpose, or in approved private containers or receptacles provided for public use.  
(Ord. No. 1127, § 10-24, 4-24-89; Code 1992, § 10-136)

#### **State law reference— Unlawful dumping of trash, etc., Code of Virginia, § 33.1-346:**

33.1-346: Dumping trash, companion animals, etc., on highway, right-of-way or private property; penalty.

A. It shall be unlawful for any person to dump or otherwise dispose of trash, garbage, refuse, litter, a companion animal for the purpose of disposal, or other unsightly matter, on public property, including a public highway, right-of-way, property adjacent to such highway or right-of-way, or on private property without the written consent of the owner thereof or his agent.

B. When any person is arrested for a violation of this section, and the matter alleged to have been illegally dumped or disposed of has been ejected from a motor vehicle or transported to the disposal site in a motor vehicle, the arresting officer may comply with the provisions of § 46.2-936 in making such arrest.

- When a violation of the provisions of this section has been observed by any person, and the matter illegally dumped or disposed of has been ejected or removed from a motor vehicle, the owner or operator of such motor vehicle shall be presumed to be the person ejecting or disposing of such matter. However, such presumption shall be rebuttable by competent evidence.

C. Any person convicted of a violation of this section shall be guilty of a misdemeanor punishable by confinement in jail for not more than 12 months and a fine of not less than \$250 or more than \$2,500, either or both.

This last one is more of code enforcement, but can act as a reminder to keep your yard tidy



### City of Radford

10 Robertson Street  
Radford, VA 24141  
Phone: 540-731-3603

## SCOOP THE POOP



### Be the Solution to Stormwater Pollution

#### THE PROBLEM

Pet waste is more than smelly and unsightly; it is a health risk to pets, people, and water bodies.

Pet waste left on the ground does not always dissolve or fertilize lawns. Often, it is washed by rain and melting snow and ice into our waterways.

More specifically, pet waste left on trails, sidewalks, streets, and grassy areas is carried by stormwater runoff into the storm drain before eventually discharging into a natural body of water, untreated.



#### Harmful effects of pet waste are:

- Pet waste decays, using up dissolved oxygen and releasing compounds that are harmful to fish and other aquatic life.
- Nutrients present in pet waste can cause excessive algal growth in a waterbody, potentially leading to fish kills and disrupting the water's natural ecology.
- Harmful bacteria such as E. Coli and Fecal Coliform can make our waters unfit for drinking, irrigation, recreation and other uses.
- Parasites present in pet waste can spread gastrointestinal illnesses in humans such as Giardia and Salmonella

## **The Solution:**

Pet owners can help protect human health and the environment by disposing of pet waste properly.

Be responsible and clean up after your pets. It's as easy as 1-2-3!

1. Bring a bag.
2. Use the bag to pick up the pet waste.
3. Dispose of the bag properly in trash.



Radford City has prepared this educational material to meet requirements of their stormwater permit administered by the Virginia Department of Conservation and Recreation.

For more information, contact:  
Radford City Manager's Office  
Phone: 540-731-3603  
[www.radfordva.gov/stormwater](http://www.radfordva.gov/stormwater)

**RESIDENT'S GUIDE FOR  
A CLEANER ENVIRONMENT**

**Be the Solution to Stormwater Pollution**



**Background**

Stormwater pollution, also referred to as Non-Point Source (NPS) pollution, results when rainfall and snowmelt is unable to naturally soak into the ground because of paved or otherwise solid surfaces, such as roads, rooftops, and sidewalks. Stormwater can pick up debris, chemicals, dirt, and other pollutants, and flow directly to a stream, river, lake, wetland, or into a storm sewer system.



**The Problem**

NPS pollution affects natural resources by degrading habitats for aquatic plants and animals, and impacting drinking water resources and recreational uses of water bodies.



Each one of us contributes to NPS pollution through our daily activities. You can help reduce NPS pollution and keep our environment clean by making simple changes in your daily lifestyle, as indicated on the back.



# The Solution



Avoid the use of fertilizers and do not apply before heavy rainfall. Pesticides are toxic to humans, animals, aquatic insects, and plants. Follow label directions carefully or use alternatives whenever possible.



Wash your car at a commercial car wash. If you wash your car at home, use eco-friendly detergents (non-phosphate).



Repair oil leaks from your car promptly. Recycle waste oil by taking it to a recycle center. Don't pour waste oil onto the ground or into a storm drain.



Compost yard waste. Never throw leaves or clippings in streets or storm drains.



Take unwanted household chemicals to hazardous waste removal days. Do not pour them down the drain or discard with regular household trash.



Don't throw animal waste into the street or storm drain. Pick up poop and dispose in the garbage.



Radford City has prepared this educational material to meet requirements of their storm-water permit administered by the Virginia Department of Conservation and Recreation.

For more information:  
Radford City Manager's Office  
Phone: 540-731-3603  
[www.radfordva.gov/stormwater](http://www.radfordva.gov/stormwater)

# Pet Waste Management Signage at City Parks



**APPENDIX B**  
**Storm Sewer Drains**

# GAIL COOK DEVILBISS, P.C.

A PROFESSIONAL CORPORATION

ATTORNEY AT LAW

POST OFFICE BOX 3562

RADFORD, VIRGINIA 24143-3562

1128 EAST MAIN STREET  
RADFORD, VIRGINIA 24141

TELEPHONE: (540) 639-4056  
TELECOPIER: (540) 639-5241  
EMAIL: [gcdlaw@verizon.net](mailto:gcdlaw@verizon.net)

July 18, 2016

Via Email: [boyd@andassoc.com](mailto:boyd@andassoc.com)

Anderson & Associates, Inc.  
Keith Boyd  
100 Ardmore Street  
Blacksburg, VA 24060

Re: Illicit Discharge

Dear Keith:

Please find attached hereto a copy of the City's Illicit Discharge Detection Elimination Ordinance No. 1681, adopted by the by the Radford City Council on July 11, 2016. The Ordinance will be submitted to Municipal Code the City's service provider for the maintenance and records of the Radford City Code.

Please advise if the City or I need to take any additional action with regard to supplementing the City's MS4 permit approval process and the City's adoption of the Illicit Discharge Detection Elimination Program. Thank you for your assistance and expertise regarding the specifications and requirements during the process of developing the City's Illicit Discharge Detection Elimination Ordinance.

Sincerely,



Gail Cook DeVilbiss  
Radford City Attorney

GCD/mcm  
attachments

cc: David Ridpath, City Manager  
Jenni Wilder, City Clerk  
Melissa Skelton, Deputy City Clerk

**ORDINANCE NO. 1681**

**AN ORDINANCE TO AMEND AND REORDAIN CHAPTER 32, OF THE RADFORD CITY CODE OF ORDINANCES, TO CREATE AN ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) ORDINANCE FOR THE CITY OF RADFORD TO PREVENT POLLUTANTS FROM ENTERING THE CITY'S MS4, IN ACCORDANCE WITH THE STORMWATER MANAGEMENT ACT, §§ 62.1-44.15:24, *ET SEQ.*, OF THE CODE OF VIRGINIA, AND THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATION, CHAPTER 870, 9VA25-870-10, *ET SEQ.*, OF THE VIRGINIA ADMINISTRATIVE CODE**

**WHEREAS**, the City operates a regulated Municipal Separate Storm Sewer System (MS4), and is required to adopt an illicit discharge detection and elimination program to prohibit illicit discharge of pollutants and connections to the City's MS4 as a part of the City's stormwater management and control program; and

**WHEREAS**, the City has adopted a stormwater management and control ordinance, the requirements of which are codified in Chapter 32, of the Radford City Code of Ordinances, which includes provisions to protect pollutants from entering the City's Municipal Separate Storm Sewer System (MS4), and the City now desires to adopt an illicit discharge detection and elimination ordinance to further prevent pollutants from entering the City's MS4, to supplement the City's Stormwater Management Ordinance and program

**WHEREAS**, a public hearing upon this Ordinance No. 1681, prior to its adoption, was held on April 11, 2016, at a regular meeting of the Radford City Council, to receive public comment, following the duly advertised notice thereof of the public hearing regarding this Ordinance No. 1681; and

**NOW THEREFORE BE IT ORDAINED** by the City Council of the City of Radford, Virginia, that a new article, division, or section entitled, "Illicit Discharge Detection and Elimination" is hereby adopted for and on behalf of the City as set forth herein, and the same shall be added to, and shall amend and become a part of Chapter 32, of the Radford City Code of Ordinances, to provide for and to establish an Illicit Discharge Detection and Elimination (IDDE) Ordinance for the City of Radford, Virginia, to protect pollutant's from entering the City's separate storm sewer system (the "MS4"), pursuant to the provisions set forth in this Ordinance Number 1681, and in accordance with and under the authority of the laws and regulations of the Stormwater Management Act (the "Act") §62.1-44.15:24 *et seq.*, of the Code of Virginia, 1950, as amended, and the Virginia Stormwater Management Program (VSMP) Regulation of the Virginia Administrative Code, 9VA25-870-10 *et seq.*, as enacted and adopted herein in this Ordinance No. 1681, for the City's separate storm sewer system (MS4), for and on behalf of the City, and Chapter 32, of the Radford City Code of Ordinances is hereby amended and reenacted herein, subject to any editing deemed necessary or required to amend and to include the same with the existing code provisions set forth in Chapter 32, of the Radford City Code of Ordinances, as follows:

## **ILLICIT DISCHARGE AND DETECTION ELIMINATION**

### **Sec. 32-18. Title and Authority.**

- a. This ordinance shall be known as the "Illicit Discharge Detection and Elimination Ordinance of the City of Radford, Virginia".
- b. The purpose of this ordinance is to ensure the general health, safety, and welfare of the citizens of the city and state, by protecting property and state waters through the prohibition of illicit discharges of non-stormwater with the city's regulated municipal separate storm sewer system (MS4) area; subject to certain exceptions, and to prevent water from being rendered dangerous to the health of persons living in the city.
- c. This ordinance regulates non-stormwater discharges and connections from entering the MS4 and establishes methods for controlling the introduction of pollutants into the MS4 in order to comply with the requirements of the Virginia Pollutant Discharge Elimination System's (VPDES) General Permit For Discharges of Stormwater From Small Municipal Separate Storm Sewer Systems permit issued to the city by the Commonwealth of Virginia, by the Virginia Department of Environmental Quality (DEQ).
- d. This ordinance establishes the City's illicit discharge and connection program that regulates non-stormwater discharges to the City's regulated Municipal Separate Storm Sewer System (MS4), consistent with state and federal regulations promulgated pursuant to the law.

### **Sec. 32-19. Purpose and Applicability.**

- a. The purpose of this ordinance is to ensure the general health, safety and welfare of the citizens of the City of Radford and the Commonwealth of Virginia, and to prevent water from being rendered dangerous to the health of persons living in the City of Radford. This ordinance promotes the public health, safety and welfare of persons in the city through the regulation of stormwater discharges to the city's separate storm sewer system and to prohibit the illicit discharge of nonstormwater to the city's storm sewer system, subject to certain exceptions. This ordinance is also intended to prohibit illicit connections and illicit discharges to the city's storm sewer system, and to establish inspection and monitoring procedures to ensure compliance with this ordinance.
- b. This ordinance shall apply to all activities that cause or allow direct or indirect illicit discharges or illicit connections into the city's municipal separate storm sewer system.
- c. This ordinance is applicable to any non-stormwater discharge that enters, or has the potential of entering, the MS4, located within the city's regulated MS4 area.

### **Sec. 32-20. Definitions.**

In addition to the definitions already set forth and defined in the Stormwater Management Ordinance in Chapter 38, of the Radford City Code of Ordinances, and Virginia Stormwater Management Act (the "Act"), the definitions set forth in Chapter 870, 9VAC25-870-10, *et seq.* of

the Virginia Stormwater Management Program (VSMP) Regulation, in the Virginia Administrative Code, and in Chapter 3.1 of Title 72.1 of the Code of Virginia, and any amendments thereunto, which are expressly adopted herein and incorporated herein by reference and made a part hereof, the following words and terms as used in this Ordinance shall have the following meanings unless otherwise specified herein. Where the definitions differ, those set forth in the Virginia Administrative Code and the Code of Virginia, and incorporated herein shall have precedence.

*"Act"* means the "Virginia Stormwater Management Act", Article 2.3 § 62.1-44.15:24 et seq. of Chapter 3.1 of Title 62.1 of the Code of Virginia.

*"Administrator"* means the position, person, or authority responsible in the city for administering the Illicit Discharge Detection and Elimination Ordinance for the city. The city manager or his designee shall be the administrator of this ordinance. Any reference to administrator as the term is used in this ordinance, includes and refers to any designee or designees, including but not limited to any employees, persons, departments, contractors, or agents of the city authorized and appointed by the city manager to administer the provisions of this ordinance for the city.

*"Best Management Practices" or "BMP"* means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface waters and ground water systems.

*"City"* means the City of Radford, Virginia.

*"Control measure"* means any best management practice (BMP) or other method used to prevent or reduce the discharge of pollutants to surface waters.

*"Discharge"* means to dispose, deposit, spill, pour, inject, dump, pump, leak, or place by any means, or that which is disposed, deposited, spilled, poured, injected, dumped, pumped, leaked, or placed, by any means.

*"Gray water"* means wastewater discharged from lavatories, bathtubs, showers, clothes washers and laundry sinks.

*"Groundwater"* means all subsurface water, including, but not limited to, that part within the zone of saturation.

*"Illicit connection"* means any connect, in any manner whatsoever, to the City's Municipal Separate Storm Sewer System ("MS4"), that is not authorized by applicable state law or city ordinance, and which has not been approved by the city in accordance with applicable city ordinances, or state laws, or as may otherwise be authorized by law.

*"Illicit discharge"* means any discharge to a municipal separate storm sewer that is not composed entirely of stormwater, except discharges pursuant to a separate VPDES or state permit (other than the state permit for discharges from the municipal separate storm sewer), discharges resulting from firefighting activities, and discharges identified by and in compliance with 9VAC25-870-400D2c(3).

*“Inspection”* mean and include, but is not limited to, any on-site physical examination of all facilities and grounds, premises, properties, or site which may discharge to a storm sewer system, or the state waters; a review of all records on the operation and maintenance of facilities and grounds, premises, properties, or sites, and the results of any monitoring performed for compliance with any local, state, or federal laws and/ or regulations, or permit requirements, including such inspections as permitted by the Act, for any on-site review of compliance with the MS4 state permit or VSMP, and any applicable design criteria, or an on-site review to obtain information or conduct surveys or investigations necessary in the implementation or enforcement of the Act and this ordinance.

*“Industrial wastes”* means any liquid or wastes resulting from any process of industry, manufacture, trade or business, or from the development of any natural resource.

*“Municipal separate storm sewer system”* or *“MS4”* means all separate storm sewers that are defined as municipal separate storm sewer systems or designated under 9VAC25-870-280 A 1, as a conveyance or system of conveyances otherwise known as a municipal separate storm sewer system or *“MS4”*, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains:

- (a) Owned or operated by a federal, state, city, town , county, district, association, or other public body, created by or pursuant to state law, including the city, having jurisdiction or delegated authority for erosion and sediment control and stormwater management, or a designated and approved management agency under § 208 of the Clean Water Act (CWA) that discharges to surface waters;
- (b) Designed or used for collecting or conveying stormwater;
- (c) That is not a combined sewer; and
- (d) That is not part of a publicly owned treatment works (POTW).

*“Municipal separate storm sewer system”* or *“MS4”* means all municipal separate storm sewers that are located within the portion of the City that is identified as *“urbanized”* by the U.S. Bureau of the Census in the latest Decennial Census.

*“Municipal Separate Storm Sewer System Management Program”* or *“MS4”* means a management program covering the duration of a state permit for a municipal separate storm sewer system that includes a comprehensive coordination, to reduce the discharge of pollutants to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA and regulations and the Act and attendant regulations, using management practices, control techniques, and system, design, and engineering methods, and such other provisions that are appropriate.

*“National Pollutant Discharge Elimination System”* or *“NPDES”* means the federal program for issuing, modifying, revoking, reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pre-treatment requirements under the Clean Water Act (CWA).

*"Non-Stormwater Discharge"* means any discharge to the storm drain system that is not composed entirely of stormwater.

*"Pollutant"* means anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquids and solid wastes; yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved particulate metals; animal wastes; wastes and residues that result from construction of a building or structure; and noxious or offensive matter of any kind.

*"Premises"* means any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

*"Regulations"* means the Virginia Stormwater Management Program (VSMP) Regulation or *"VSMP"* regulations of the Virginia Administrative Code, Chapter 870, 9VAC25-870-10, *et seq.*, as amended.

*"Sanitary sewer"* means a system of pipes, conduits or other devices that collect and/or convey sewage to a wastewater treatment or pumping facility.

*"Stormwater"* means precipitation that is discharged across the land surface or through conveyances to one or more waterways, which may include rainfall runoff, snow melt runoff, and surface runoff and drainage.

*"Storm drainage system"* means publicly owned facilities by which stormwater is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and man-made or altered drainage channels, reservoirs and other detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

*"Virginia Pollutant Discharge Elimination System" or "VPDES"* means the program issued by the Commonwealth of Virginia for imposing and enforcing pre-treatment requirements pursuant to the Clean Water Act (CWA).

*"Virginia Stormwater Management Program" or "VSMP"* means a program approved by the State Board, that has been established by a locality to manage the quality and quantity of runoff resulting from land-disturbing activities, which shall include such items as local ordinances, rules, permit requirements, annual standards and specifications, policies and guidelines, technical materials, and requirements for plan review, inspection, enforcement, where authorized in this article, and evaluation consistent with the requirements of this article and associated regulations.

*"Wastewater"* means any water or liquid, other than uncontaminated stormwater, discharged from a facility.

**Sec. 32-21. Compatibility with other ordinances, requirements and regulations.**

(a) This ordinance is intended to supplement other provisions and requirements of the Radford City Code. This ordinance is not intended to interfere with, abrogate, or annul any other ordinance, rule, regulation, statute, or other provision of law. Nothing in this ordinance shall negatively affect any other provisions and requirements of the Radford City Code, including but not limited to the city's Stormwater Management Ordinance and/or the city's Erosion and Sediment Control Ordinance, and any amendments thereunto.

(b) The requirements of this ordinance shall be considered minimum requirements, and where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule, regulation, statute, or other provision of law, whichever provisions are more restrictive or impose higher protective standards for human health or the environment shall apply.

**Sec. 32-22. Control of pollutant contributions from interconnected MS4s.**

(a) MS4 systems not owned or operated by the city, but which are interconnected with the city's MS4, shall be controlled so that they do not impair the operation of or contribution to the failure of the city's MS4 or of any interconnected MS4 to meet any applicable local, state, or federal law or regulation or permit. Any person who is the owner of interconnected MS4 systems shall be responsible for the quality within their systems and shall coordinate with the owners of the downstream MS4s.

**Sec. 32-23. Prohibited discharges and connections.**

(a) It shall be unlawful and a violation of this ordinance to allow any discharge that is not composed entirely of stormwater, except as described in subsection (b) below, which enters or has the potential of entering the MS4.

- (1) Discharging, or causing or allowing to be discharged, sewage, industrial wastes, yard wastes, gray water, or other wastes, into the storm sewer system, or any component thereof, or onto driveways, sidewalks, parking lots, the round or any other areas draining to the storm sewer system;
- (2) Connecting, or causing, or allowing connection of any sanitary sewer to the storm sewer system, including any sanitary sewer connected to the storm sewer system as of the date of the adoption of this ordinance;
- (3) Connecting, or causing or allowing connection to the storm sewer system, without a valid VSMP, VPDES or NPDES permit, any structure that conveys any liquid other than stormwater or discharges listed in subsection (b), including, but not limited to pipes, drains, sanitary sewer lines, washing machine drains, or floor drains.
- (4) The prohibitions set forth in subsections (2) and (3) listed above in this section expressly include, without limitations, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of the connection.

- (5) Throwing, placing, or depositing, or causing to be thrown, placed or deposited in the storm sewer system anything that impedes or interferes with the free flow of the stormwater system therein, or adversely affects water quality.
- (6) Failure by any property owner to notify the administrator, or his designee, of an illegal discharge or illicit connection on, or from, such owner's property to the City's storm sewer system or any component thereof.
- (7) Violate any condition or provision of this ordinance or any permit or approval granted for stormwater discharges or connections to allow any stormwater discharges to the City's MS4.
- (8) To enter in any stormwater retention pond, storm sewer or drain, except that this shall not apply to any city personnel or others authorized to perform work in such areas.

(b) Subject to the provisions of subsection (c) of this section, the following activities are deemed permissible non-stormwater discharges, and shall not be unlawful or a violation of this ordinance.

- (1) Discharges or flows covered by a separate individual or general VPDES or VSMP permit for non-stormwater discharges;
- (2) Individual non-stormwater discharges or flows that have been identified in writing by the Virginia Department of Environmental Quality as de minimis discharges that are not significant sources of pollutants to state waters and do not require a VPDES permit;
- (3) Water line flushing;
- (4) Landscape irrigation;
- (5) Diverted stream flows or rising groundwaters;
- (6) Uncontaminated groundwater infiltration, as defined by 40 CFR 35.2005(20);
- (7) Uncontaminated pumped groundwater;
- (8) Discharges from potable water sources, foundation drains, irrigation water, springs, water from crawl spaces or footing drains;
- (9) Air conditioning condensation;
- (10) Lawn watering;
- (11) Individual residential car washing;

- (12) Flows from riparian habitats and wetlands;
- (12) De-chlorinated swimming pool discharges with pH between 6.0 to 8.0 standard units, at ambient water temperature, and with less than 0.10 milligrams per liter or parts per million;
- (13) Street wash water;
- (15) Discharge or flows resulting from firefighting and other public safety activities;
- (16) Discharges associated with the maintenance or repair of public water, sanitary, and storm sewer lines, and public drinking water reservoirs and drinking water treatment or distributions systems conducted in accordance with applicable federal and state regulations and standards;
- (17) Discharges associated with any activity by the city, its employees and designees, in the maintenance of any component of a City maintained stormwater management facility conducted in accordance with applicable federal and state regulations and standards, and law;
- (18) Discharges specified in writing by the administrator as being necessary to protect public health and safety;
- (19) Any activity authorized by a valid Virginia Stormwater Management Program (VSMP) permit, a valid Virginia Pollutant Discharge Elimination System (VPDES) permit, a valid Virginia Pollution Abatement (VPA) permit, a National Pollutant Discharge Elimination System (NPDES) permit, or as may be otherwise permitted by law or the regulations.

(c) In the event any of the activities listed in subsection (b), of this section are found by the administrator to be a significant contributor of pollutants discharged into the MS4, the administrator shall serve a written notice to the party responsible for the activity ordering that the activity be ceased or conducted in a manner that will avoid the discharge of pollutants to MS4. The notice shall set forth and state the deadline by which the activity shall cease or be conducted without pollution. Failure to comply with such order within the time stated in the notice shall result in the revocation of the exemption listed in subsection (b) above, and shall constitute a violation of the provisions of this section and ordinance.

#### **Sec. 32-24. Best Management Practices.**

(a) The city may require the use of best management practices (BMPs) for any activity, operation, or facility which may cause or contribute to pollution or contamination of the city's MS4. The person, owner, or operator, of a commercial or industrial establishment shall provide, at the expense of the person, owner, or operator, reasonable protection from accidental discharge of prohibited materials and wastes into the city's MS4 system through the use of structural and non-

structural BMPs. Furthermore, any person responsible for a property, premises, or facility which is or may be the source of an illicit discharge may be required to implement, at such person's sole expense, additional structural and non-structural BMPs and/or implement a stormwater pollution prevention plan (SWPPP) to prevent the further discharge of pollutants to the MS4.

**Sec. 32-25. Notification of spills.**

(a) Pursuant to Section II.B.3 of 9VAC25-890-40, the city prohibits illicit discharges to the city's MS4. Any person owning or occupying any premises, property, or facility, who has knowledge of a discharge of pollutants from those premises, property, or facilities which may violate the prohibitions found in this ordinance shall immediately take action to abate the discharge and shall notify the city or the administrator, either in person or by phone within twenty-four (24) hours of becoming aware of the discharge. Observed discharges of hazardous materials or substances shall be immediately reported by calling "911". If the illicit discharge was emitted from a commercial or industrial establishment, the person, owner or operator of said establishment shall also retain an on-site written record of the discharge as well as the actions taken to prevent its recurrence.

**Sec. 32-26 Inspections and compliance monitoring.**

(a) The administrator shall have the authority to carry out all inspections and monitoring procedures necessary to determine compliance and/or noncompliance with this ordinance, and to enforce the requirements of this ordinance, including the prohibition of illicit discharges and connections to the storm sewer system. The administrator may monitor stormwater outfalls or other components of the municipal storm sewer system as may be appropriate in the administration and enforcement of this ordinance.

(b) The administrator shall have the authority, in the administrator's sole discretion, to require a Stormwater Pollution Prevention Plan (SWPPP) from any person whose property discharges, or has the potential to discharge, to the MS4.

(c) The administrator and his duly authorized designee(s), employees, agents, or any other representative of the city, bearing proper credentials and identification, shall be authorized to enter any public property or to request entry into any private premises, properties, or facilities, at any reasonable time for the purpose of enforcing this ordinance, including, but not limited to the taking of samples of discharges, inspecting monitoring equipment, inspecting and copying documents relevant to the enforcement of this ordinance, and such other items as may be deemed necessary for the enforcement of this ordinance.

(d) If the person in charge of the property refuses to allow the administrator to enter in accordance with subsection (c) above, then the administrator may present sworn testimony to a magistrate or court of competent jurisdiction and request the issuance of an inspection warrant to enter the premises, property or facility for the purpose of making such inspections and investigations. The administrator shall make a reasonable effort to obtain consent from the person, owner, occupant or operator in charge of the premises prior to seeking the issuance of an inspection warrant under this section.

(e) The administrator shall have the authority to require any person responsible for a discharge to the MS4 to document that such discharge meets and is in compliance with the requirements of this ordinance. This includes, but is not limited to, the ability of the administrator to require such person to provide monitoring reports, test results, and such other matters as may be deemed necessary to show that such discharge or connection is in compliance with the requirements of this ordinance. The cost of any required documentation shall be the responsibility of the person responsible for the discharge.

(f) The failure of any person to comply with any of the requirements of this section shall constitute a violation of this Ordinance.

#### **Sec. 32-27. Emergency Conditions.**

Notwithstanding any other provisions of this article, whenever the city determines that conditions or activities require immediate action to help protect public health, safety or welfare or to provide for compliance with this ordinance, or rules promulgated herein or city approved construction plans, city personnel, employees, and/or designee(s) designated by the administrator are authorized to enter at a reasonable time in or upon any property or premises in the city for the purpose of testing, inspecting, investigating, measuring, sampling, and correcting such emergency conditions. Failure to admit city personnel, employees, and/or designee(s) of the administrator, responding to emergency conditions as determined by the city or the administrator, shall constitute a separate violation of this ordinance.

#### **Sec. 32-28. Enforcements, violations, and penalties.**

(a) Notice of violation. Whenever the administrator finds that a person has violated a prohibition or failed to meet a requirement of this ordinance, the administrator may order compliance through written notice of violation to the responsible party or person. Such notice may require, without limitation:

- (1) The performance of monitoring, analyses and reporting.
- (2) The elimination of illicit connections or discharges.
- (3) That violating discharges, practices or operations shall cease and desist.
- (4) The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property or premises.
- (5) Payment of the costs of administration and remediation.
- (6) The implementation of source control or treatment BMPs.

(b) If abatement of a violation and/or restoration of affected property or premise are required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Such notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be performed by the city or a designated

governmental agency or contractor procured by the city or other governmental agency, and the expense thereof shall be charged to the violator.

(c) Any person who commits any of the acts prohibited by this chapter or violates any of the provisions of this ordinance shall be liable to the city for all costs of testing, containment, cleanup, abatement, removal, disposal, and any other related costs or expenses that the city may incur in connection with the enforcement of this ordinance and/or the prohibition and/or correction of a violation of this ordinance.

(d) Any person who violates any of the provisions of this ordinance shall be guilty of a Class 1 misdemeanor and, upon conviction, is subject to punishment by a fine of not more than two thousand five hundred dollars (\$2,500.00) per violation, per day, and confinement in jail for not more than twelve (12) months, either or both.

(e) Each day during which a violation of this ordinance occurs or continues shall be deemed a separate and distinct violation of this ordinance.

(f) The administrator may bring legal action to enjoin a violation of this ordinance and the existence of any other remedy shall be no defense to any such actions.

(g) In addition to any of the remedies set forth above, the administrator may seek to impose, or have imposed by the appropriate authority, any of the remedies provided for by § 62.1-44.15:48, Code of Virginia, as amended, which are incorporated herein by reference, and made a part hereof.

(e) In any court action that may result from enforcement of this ordinance, a judge hearing the case may direct the person responsible for the violation or the property owner to correct the violation and each day that the violation continues shall constitute a separate violation of this ordinance.

(f) Any person who knowingly makes any false statements, representations, or certifications in any record, report, or other document, either filed or requested pursuant to this ordinance, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required or used by the administrator under this ordinance in monitoring discharges or connections, shall be guilty of a violation of this ordinance.

(g) The remedies set forth in this section shall be cumulative, not exclusive, and it shall be no defense to any action that one or more of the remedies set forth in this section have been sought or granted, and the pursuit of any one remedy or cause of action shall not preclude the pursuit of another.

#### **Sec. 32-29. Severability of Invalid Provisions.**

If the provisions of any article, division, section, subsection, clause, paragraph, or any portion of this ordinance is for any reason held to be invalid or unconstitutional by any court of competent jurisdiction, then any such order of judgment shall not be so construed as to render invalid or unconstitutional any of the remaining provisions of this ordinance.

This Ordinance No. 1681 shall become effective as of the date of its Adoption.

First Reading: June 13, 2016

Motion: Mr. Nicholson  
Second: Dr. Harshberger

Recorded Vote:

Dr. Harshberger:	Yes
Mr. Marshall:	Yes
Mr. Nicholson:	Yes
Mr. Turk:	Yes
Mayor Brown:	Yes

Second Reading: July 11, 2016

Motion: Dr. Harshberger  
Second: Mr. Marshall

Recorded Vote:

Mr. Gropman:	Yes
Dr. Harshberger:	Yes
Mr. Marshall:	Yes
Mr. Turk:	Yes
Mayor Brown:	Yes

ATTEST:

  
Melissa Skelton, Radford Deputy City Clerk



# Storm Sewer Drain Marker



## **APPENDIX C**

### **City Mapping**



EROSION AND SEDIMENT PLAN

INSPECTION REPORT

Project Name: \_\_\_\_\_ Permit No. \_\_\_\_\_

Project Location Address: \_\_\_\_\_

Inspection Date: \_\_\_\_\_ Time: \_\_\_\_\_ Inspected by: \_\_\_\_\_

STAGE OF CONSTRUCTION

- Pre-Construction Conference, Rough Grading, Finish Grading, Clearing and Grubbing, Building Construction, Final Stabilization

INSPECTION CHECKLIST

Table with 3 columns: Yes, No, NA. Rows include MS-1 to MS-19 with various stabilization questions.

\*Refers to the minimum standards of the Virginia Erosion and Sediment Control Regulations (VR 625-02-00).

=====

Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Verbal/Written notification given to: \_\_\_\_\_

Inspection by: \_\_\_\_\_ Date: \_\_\_\_\_

Certified Inspector (Signature)



NOTICE TO COMPLY

Project File #: \_\_\_\_\_

Date: \_\_\_\_\_

To: \_\_\_\_\_

Re: \_\_\_\_\_

(Project Name)

An inspection of the above-referenced project on \_\_\_\_\_ revealed that the following violations are present:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The following recommendations are made regarding the necessary corrections:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Notice is hereby given that these violations shall be corrected in accordance with the approved Erosion and Sediment Control Plan on or before \_\_\_\_\_. The site will be re-inspected at that time.

Failure to comply with this notice will result in necessary legal enforcement action by the locality to effect the implementation of the approved plan. Please contact this department if there are any questions.

Inspector: \_\_\_\_\_

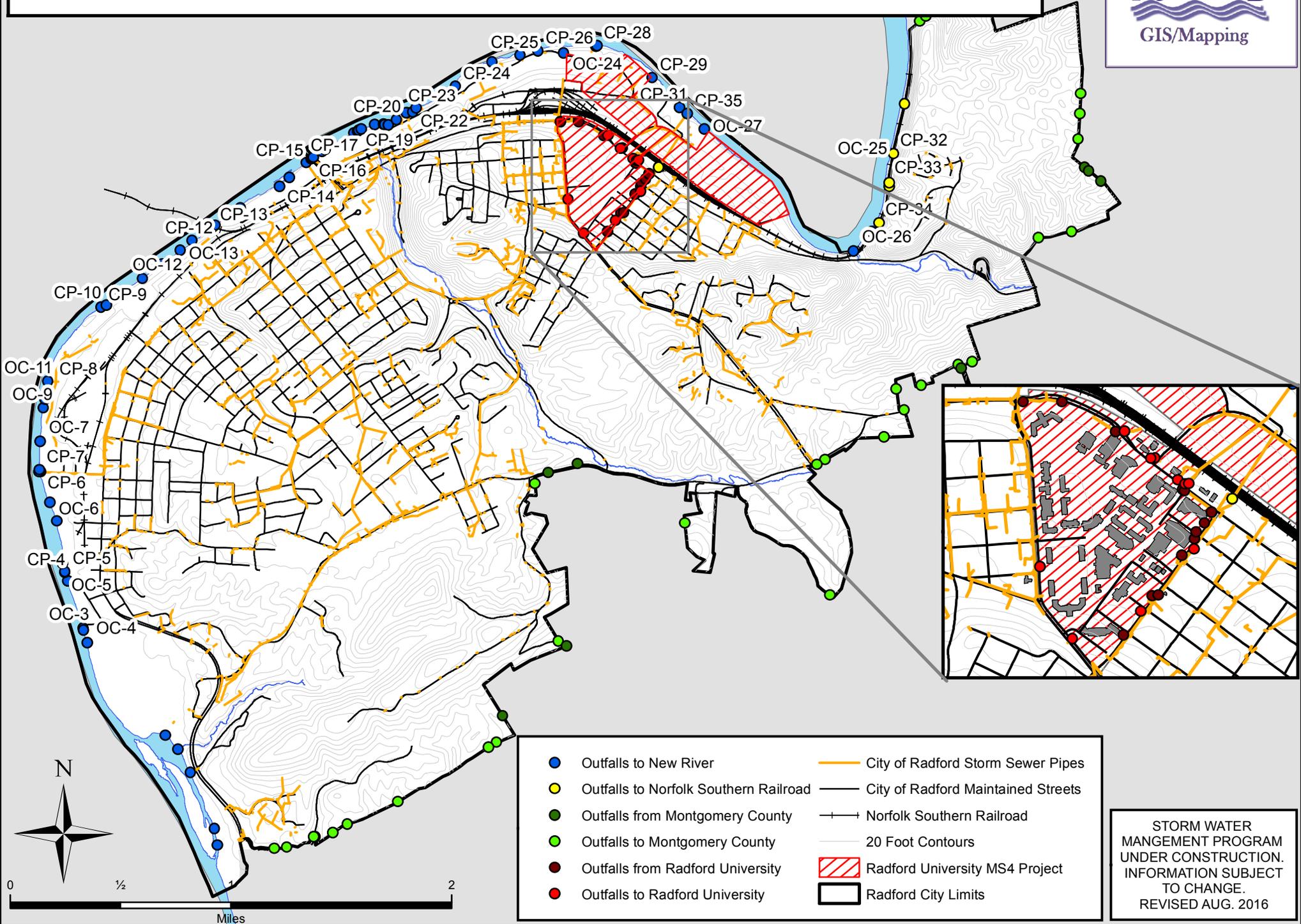
(Signature)

Program Administrator: \_\_\_\_\_

(Signature)

Copies to: Commonwealth's Attorney  
City Council  
Plan Approving Authority

# CITY OF RADFORD MS4 OUTFALL SCREENING 2016



STORM WATER  
 MANAGEMENT PROGRAM  
 UNDER CONSTRUCTION.  
 INFORMATION SUBJECT  
 TO CHANGE.  
 REVISED AUG. 2016

City of Radford Outfall Screen Report Spreadsheet: Open Channel

OBJECTID	Outfall ID	Comment	Collection Date	Outflow Material	Outflow Shape	Flow present?	Flow Description	Sample Taken?	Flow Color	Solids, Scum, or Odor Present?	Collector Name	Photo1	Photo2	Datafile	GNSS_Height	Latitude	Longitude	Elevation_FT
3	OC-3		10/01/2015	Concrete	Trapezoid	NO	None	NO	NO	NO	Jenn Whiteis	20151001_031.jpg			0			0
4	OC-4		10/01/2015	Earthen	N/A	YES	Trickle	NO	NO	NO	Jenn Whiteis	none	none		0			0
5	OC-5		03/23/2016	Earthen	N/A	YES	Moderate	NO	NO	NO	Ben Allamong	ba_16083_0001716.jpg			0			0
6	OC-6		06/20/2016	Earthen	N/A	YES	Moderate	NO	NO	NO	John DeGroot	none	none		0			0
7	OC-7		03/16/2016	Earthen	N/A	NO	None	NO	NO	NO	Ben Allamong	none			0			0
9	OC-9		03/16/2016	Earthen	N/A	NO	None	NO	NO	NO	Jenn Whiteis	none	none		0			0
10	OC-10		03/16/2016	Earthen	N/A	NO	None	NO	NO	NO	Jenn Whiteis	jw_16076_4240.jpg	none		0			0
11	OC-11		03/16/2016	Rip-Rap	N/A	NO	None	NO	NO	NO	Jenn Whiteis	jw_16076_4255.jpg	none		0			0
12	OC-12		03/18/2016	Earthen	N/A	NO	None	NO	NO	NO	Ben Allamong	none	none		0			0
13	OC-13		03/18/2016	Earthen	N/A	YES	Trickle	NO	NO	NO	Ben Allamong	ba_16078_4644.jpg	none		0			0
15	OC-15		06/24/2015	Concrete	Trapezoid	NO	None	NO	NO	NO	PhillipCampbell/Jenn Whiteis	JW_2015175_27and28.jpg	jd_16083_0004325.jpg		492.182	37.11736297	-80.59555552	1,614.77
16	OC-16		09/13/2016	Earthen	N/A	YES	Moderate	NO	NO	NO	PhillipCampbell/Jenn Whiteis	pc_2016257_02855.jpg	pc_2016257_012856.jpg	PC_SEPT13.cor	489.704	37.1289735	-80.58971404	1,606.64
17	OC-17		11/23/2015	Earthen	N/A	YES	Significant	NO	NO	NO	Jenn Whiteis	2015328_008.jpg			0			0
18	OC-18		09/28/2015	Earthen	N/A	YES	Moderate	NO	NO	NO	Jenn Whiteis	2015328_017.jpg			526.626			1,727.78
20	OC-20		09/28/2015	Earthen	N/A	NO	None	NO	NO	NO	Jenn Whiteis	None			0			0
21	OC-21		03/28/2016	Earthen	N/A	NO	None	NO	NO	NO	John DeGroot	jd_16088_0008366.jpg			0			0
22	OC-22		03/28/2016	Earthen	N/A	NO	None	NO	NO	NO	Ben Allamong	ba_16088_0001759.jpg			0			0
23	OC-23		03/28/2016	Earthen	N/A	YES	Moderate	NO	NO	NO	John DeGroot	jd_16088_0008379.jpg			0			0
24	OC-24		09/28/2015	Concrete	Trapezoid	YES	Moderate	NO	NO	NO	Jenn Whiteis	20150928_0024.jpg	IMG_0003763.jpg	BAAPRILFOOLS	0			0
25	OC-25		10/07/2015	Rip-Rap	N/A	NO	None	NO	NO	NO	Jenn Whiteis	20151007_034.jpg			520.635			1,708.12
26	OC-26	Plum Creek	10/07/2015	Earthen	N/A	YES	Significant	NO	NO	NO	Jenn Whiteis	20151007_031.jpg	20151007_032.jpg		0			0
27	OC-27		04/06/2016	Earthen	N/A	NO	None	NO	NO	NO	Ben Allamong	None			0			0

City of Radford Outfall Screen Report Spreadsheet: Closed Pipe

OBJECTID	Outfall ID	Comment	Collection Date	Pipe Bearing	Pipe Diameter	Pipe Material	Pipe Shape	Number of Pipes	Flow present?	Flow Description	Sample Taken?	Flow Color	Solids, Scum, or Odor Present?	Collector Name	Photo1	Photo2	Datafile	GNSS_Height	Latitude	Longitude	Elevation_FT
4	CP-4		03/23/2016	300	24	HDPE	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16083_0004334.jpg			525.661			1,724.61
5	CP-5	from water treatment plant	03/23/2016	283	24	RCP	Circular	Single	YES	Moderate	NO	NO	NO	John DeGroot	jd_16083_0004333.jpg			526.425			1,727.12
6	CP-6		03/23/2016	273	48	RCP	Circular	Single	NO	None	NO	N/A	NO	Jenn Whiteis/John DeGroot	jd_16083_0004325.jpg	JW_2015175_27and28.jpg		520.089			1,706.33
7	CP-7	pipe silted in	06/24/2015	245	30	PVC	Circular	Single	NO	None	NO	N/A	YES	Jenn Whiteis	JW_2015175_0029.jpg			522.152			1,713.10
8	CP-8		03/16/2016	94	24	CMP	Circular	Single	NO	None	NO	N/A	NO	Jenn Whiteis	jw_16076_4255.jpg			533.122			1,749.09
9	CP-9	silted in	06/24/2015	293	30	IRON	Circular	Single	NO	None	NO	NO	NO	Jenn Whiteis	pc_2016257_02851.jpg	JW_2015175_0037.jpg	PC_SEPT13.cor	495.243	37.12826784	-80.59083366	1,624.81
10	CP-10		06/24/2015	303	30	IRON	Circular	Single	NO	None	NO	NO	NO	Jenn Whiteis/Ben Allamong	JW_2015175_0038.jpg	ba_16076_608.jpg		491.635	37.12841286	-80.59037405	1,612.98
11	CP-11		03/18/2016	353	24	IRON	Circular	Single	YES	Trickle	NO	NO	NO	Ben Allamong	ba_16078_6650.jpg	pc_2016257_012856.jpg	PC_SEPT13.cor	489.704	37.1289735	-80.58971404	1,606.64
12	CP-12		06/24/2015	312	36	RCP	Circular	Single	NO	None	NO	NO	NO	JennWhiteis	JW_2015175_0044.jpg	pc_2016257_02859.jpg	PC_SEPT13.cor	490.636	37.13277443	-80.5834242	1,609.70
13	CP-13	broken pipe	03/18/2016	332	24	IRON	Circular	Single	NO	None	NO	NO	NO	Ben Allamong	ba_16078_3637.jpg			527.051			1,729.17
14	CP-14		03/21/2016	319	18	RCP	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16081_0001312.jpg			531.468			1,743.66
15	CP-15		03/21/2016	312	30	RCP	Circular	Single	YES	Trickle	NO	NO	NO	John DeGroot	jd_16081_0001313.jpg			532.44			1,746.85
16	CP-16		03/21/2016	309	30	RCP	Elliptical	Single	NO	None	NO	NO	NO	John DeGroot	jd_16081_0001314.jpg			479.777			1,574.07
17	CP-17	full of debris	03/21/2016	320	12	RCP	Elliptical	Single	NO	None	NO	NO	NO	Ben Allamong	ba_16081_0001694.jpg			513.298			1,684.05
18	CP-18		03/28/2016	318	18	HDPE	Circular	Single	NO	None	NO	NO	NO	Ben Allamong	ba_16088_0001754.jpg	2015328_009.jpg		526.261			1,726.58
19	CP-19	mostly buried	03/28/2016	330	12	HDPE	Circular	Single	NO	None	NO	NO	NO	Ben Allamong	ba_16088_0001753.jpg	2015328_012.jpg		526.501			1,727.37
20	CP-20		11/23/2015	348	18	HDPE	Circular	Single	NO	None	NO	NO	NO	Jenn Whiteis	2015328_013.jpg			529.538			1,737.33
22	CP-22		03/28/2016	317	18	HDPE	Circular	Single	NO	None	NO	NO	NO	Ben Allamong	ba_16088_0001749.jpg			524.656			1,721.31
23	CP-23		03/28/2016	323	12	HDPE	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16088_0008361.jpg			0			0
24	CP-24		03/28/2016	290	36	RCP	Elliptical	Single	NO	None	NO	NO	NO	Ben Allamong	ba_16088_0001760.jpg			0			0
25	CP-25	bb drainain	03/28/2016	340	24	HDPE	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16088_0008389.jpg	20151007_001		525.578			1,724.34
26	CP-26	bb drainain	03/28/2016	317	18	RCP	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16088_0008396.jpg			524.202			1,719.82
28	CP-28		04/01/2016	352	30	RCP	Circular	Single	NO	None	NO	NO	NO	Jenn Whiteis	20151007_006.jpg	IMG_0003771.jpg	BAAPRILFOOLS	522.371			1,713.82
29	CP-29	flows to river	04/01/2016	74	60	RCP	Elliptical	Single	NO	None	NO	NO	YES	John DeGroot	IMG_0003781.jpg		BAAPRILFOOLS	524.104			1,719.50
30	CP-30	below community garden?	10/07/2015	30	24	HDPE	Circular	Single	NO	None	NO	NO	NO	Jenn Whiteis	20151007_013.jpg			522.763			1,715.10
31	CP-31		04/06/2016	25	15	HDPE	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16097_0004795.jpg			525.79			1,725.03
32	CP-32		06/16/2016	280	15	RCP	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16168_00152041.jpg			530.748			1,741.30
33	CP-33		06/16/2016	77	24	IRON	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16168_00152037.jpg			530.834			1,741.58
34	CP-34		06/16/2016	304	24	IRON	Circular	Single	NO	None	NO	NO	NO	John DeGroot	jd_16168_00152035.jpg			529.052			1,735.73
35	CP-35		04/06/2016	36	54	RCP	Elliptical	Single	YES	Trickle	NO	NO	NO	John DeGroot	jd_16097_0004796.jpg	20151007_016.jpg		522.736			1,715.01

## MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION				
Permittee Name:		NPDES Permit No.: VA		
Date of Inspection:		Outfall ID No.:		
Land Uses in Outfall Drainage Area (Select All):		Latitude: _____° _____' _____"		
<input type="checkbox"/> Industrial	<input type="checkbox"/> Urban Residential	Longitude: _____° _____' _____"		
<input type="checkbox"/> Commercial	<input type="checkbox"/> Suburban Residential	Dry Weather Inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No		
<input type="checkbox"/> Open Space	<input type="checkbox"/> Other:	Date of Previous Precipitation:		
Inspector Name(s):		Amount of Previous Precipitation: _____ in		
		Were Photographs Taken? <input type="checkbox"/> Yes <input type="checkbox"/> No		
		Are Photographs Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No		
OUTFALL DESCRIPTION				
TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	
Dry Weather Flow Present at Outfall During Inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(If No, skip to Certification Section)</i>				
Description of Flow Rate: <input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Significant <input type="checkbox"/> N/A				
DRY WEATHER FLOW EVALUATION				
Does the dry weather flow contain color? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, provide a description below.				
Does the dry weather flow contain an odor? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, provide a description below.				
Is there an observed change in the receiving waters as a result of the discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, provide a description below.				
Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, provide a description below.				

Were sample(s) collected of the dry weather flow?  Yes  No (If Yes, No. Samples: \_\_\_\_\_)

**FIELD / LABORATORY ANALYSIS**

PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		

Indicate the parameters above that were analyzed by a DEP-certified laboratory:

**ILLICIT DISCHARGES**

Is the dry weather flow an illicit discharge?  Yes  No  
 If Yes, describe efforts made to determine the source(s) of the illicit discharge.

Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.

Inspector Comments:

**RESPONSIBLE OFFICIAL CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Responsible Official Name \_\_\_\_\_ Signature \_\_\_\_\_

Telephone No. \_\_\_\_\_ Date \_\_\_\_\_

# CITY OF RADFORD STORM WATER MANAGEMENT



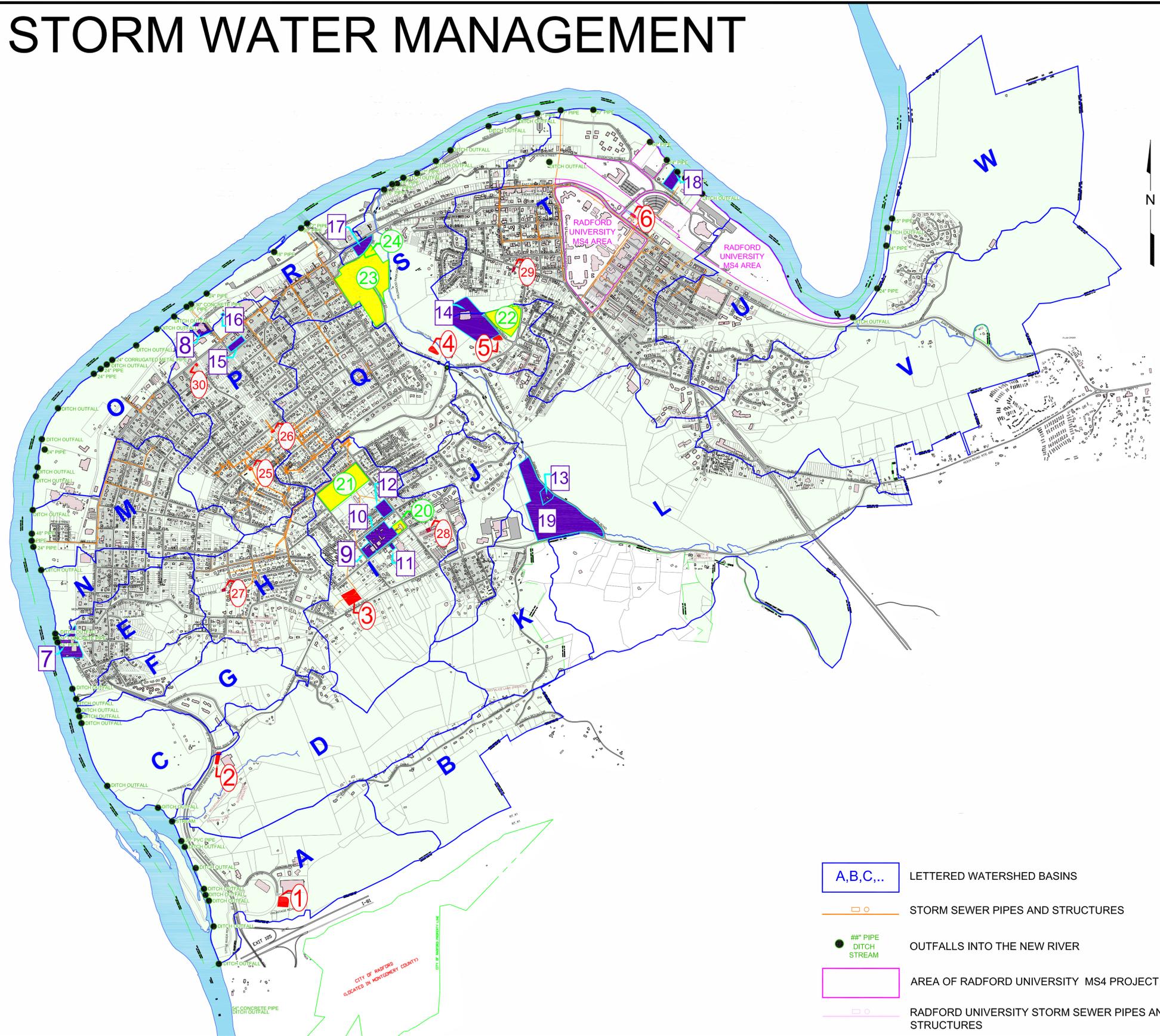
## STORM WATER MANAGEMENT FACILITY

- ① INDUSTRIAL PARK
- ② INTERSECTION OF ROCK ROAD WEST AND WEST MAIN ST.
- ③ NORTH SIDE OF ROCK ROAD WEST BETWEEN FOREST AVE. AND STAPLES ST.
- ④ SECOND AVE. PARK ROAD IMPROVEMENT PROJECT
- ⑤ BELLE HETH ELEMENTARY
- ⑥ EAST MAIN STREET BEHIND ALLEN BUILDING
- ⑫ SUNSET PARK
- ⑬ SEVENTH STREET
- ⑭ SUMMIT RIDGE (PRIVATE)
- ⑮ HEATHER GLEN (PRIVATE)
- ⑯ WEST SIDE CROSSING (PRIVATE)
- ⑰ FAMILY DOLLAR (PRIVATE)



## OPERATIONAL FACILITIES / PROPERTY

- ⑦ WATER TREATMENT PLANT
- ⑧ RADFORD CITY POLICE DEPARTMENT AND ADMINISTRATION BUILDING
- ⑨ RADFORD ELECTRIC DEPARTMENT
- ⑩ RADFORD PUBLIC WORKS DEPARTMENT
- ⑪ RADFORD SOLID WASTE DROP-OFF
- ⑫ RADFORD FIRE DEPARTMENT
- ⑬ RADFORD CITY EQUIPMENT STORAGE
- ⑭ RADFORD RECREATION DEPARTMENT
- ⑮ RADFORD MUNICIPAL BUILDING
- ⑯ GLENCOE
- ⑰ RADFORD CITY PUBLIC LIBRARY
- ⑱ RADFORD ANIMAL SHELTER
- ⑲ FORMER SOLID WASTE LANDFILL (CLOSED)
- ⑳ RADFORD CITY SCHOOLS ADMINISTRATION BUILDING
- ㉑ McHARG ELEMENTARY SCHOOL
- ㉒ BELLE HETH ELEMENTARY SCHOOL
- ㉓ DALTON INTERMEDIATE & RADFORD HIGH SCHOOL
- ㉔ ARNHIEM



- A,B,C,... LETTERED WATERSHED BASINS
- STORM SEWER PIPES AND STRUCTURES
- DITCH OUTFALL
- DITCH STREAM
- AREA OF RADFORD UNIVERSITY MS4 PROJECT
- RADFORD UNIVERSITY STORM SEWER PIPES AND STRUCTURES

DISCLAIMER: The information contained on this page is NOT to be construed or used as a "legal description". map information is believed to be accurate, but accuracy is not guaranteed. Any errors or omissions should be reported to the City Engineer's Office. In no event will the City of Radford be liable for any damages, including loss of profits, business interruptions, loss of business information or other pecuniary loss that might arise from the use of this map or the information it contains.

STORM WATER MANAGEMENT MAP UNDER DEVELOPMENT  
INFORMATION SUBJECT TO FIELD VERIFICATION.



CITY OF RADFORD, VIRGINIA  
10 ROBERTSON STREET  
RADFORD, VIRGINIA  
CITY ENGINEER'S OFFICE

DESIGNED BY: \_\_\_\_\_  
DRAWN BY: JEANES  
CHECKED BY: \_\_\_\_\_  
DATE: 24 SEP 15

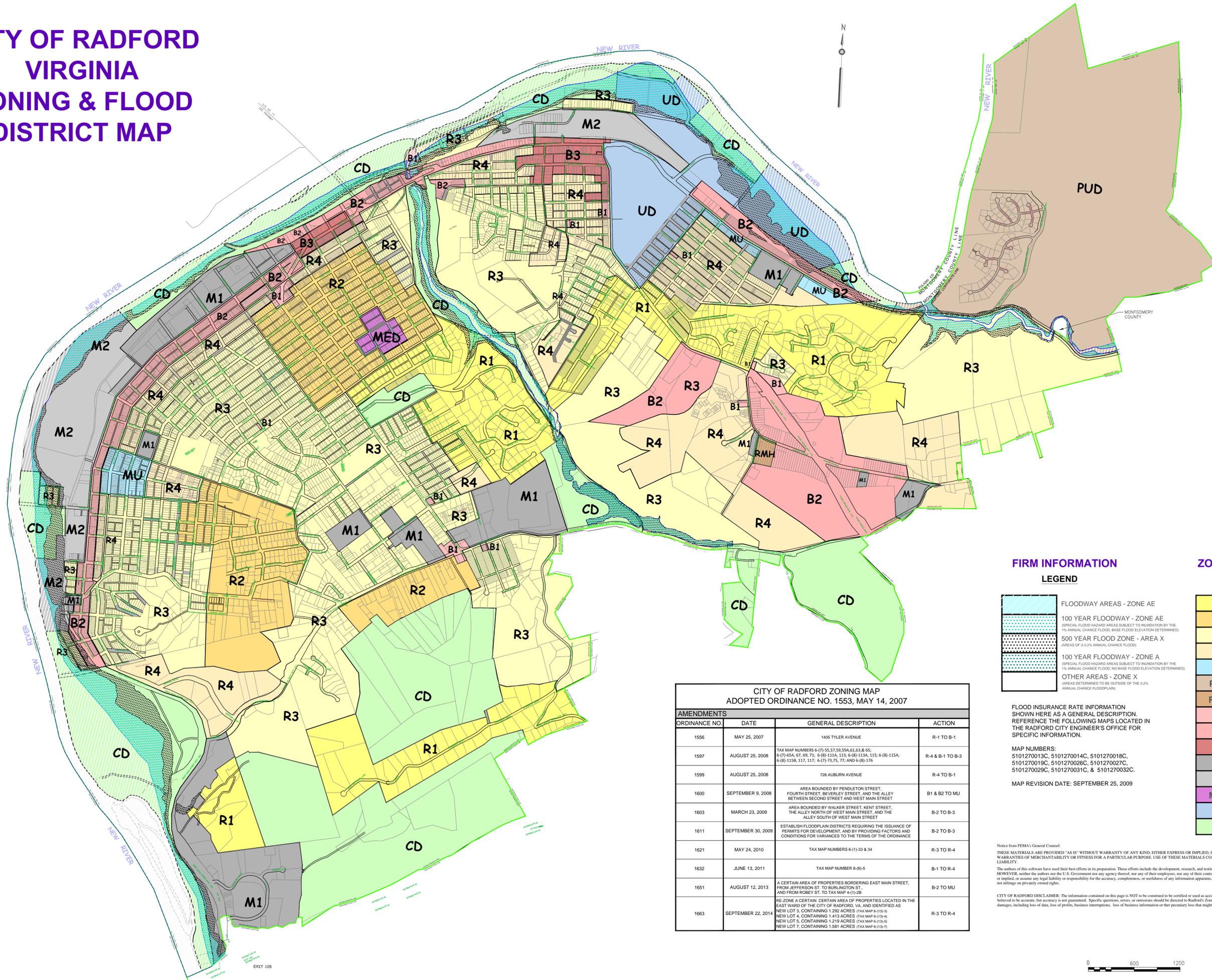
REVISIONS:  
29 SEP 15  
21 SEP 16

CITY OF RADFORD  
OPERATIONAL FACILITIES/PROPERTY - STORMWATER MANAGEMENT FACILITIES - OUTFALLS  
STORM WATER MANAGEMENT

1200 600 0 1200 2400 3600  
SCALE IN FEET

1 SHEET  
OF 1

# CITY OF RADFORD VIRGINIA ZONING & FLOOD DISTRICT MAP



### FIRM INFORMATION LEGEND

	FLOODWAY AREAS - ZONE AE
	100 YEAR FLOODWAY - ZONE AE (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD; BASE FLOOD ELEVATION DETERMINED)
	500 YEAR FLOOD ZONE - AREA X (AREAS OF A 0.2% ANNUAL CHANCE FLOOD)
	100 YEAR FLOODWAY - ZONE A (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD; NO BASE FLOOD ELEVATION DETERMINED)
	OTHER AREAS - ZONE X (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN)

### ZONING DISTRICTS LEGEND

	<b>R1</b>	RESIDENTIAL 1
	<b>R2</b>	RESIDENTIAL 2
	<b>R3</b>	RESIDENTIAL 3
	<b>R4</b>	MULTIPLE DWELLING 1
	<b>MU</b>	MIXED USE
	<b>PUD</b>	PLANNED UNIT DEVELOPMENT
	<b>RMH</b>	MANUFACTURED HOMES
	<b>B1</b>	BUSINESS LIMITED/ NEIGHBORHOOD
	<b>B2</b>	BUSINESS, GENERAL
	<b>B3</b>	BUSINESS, CENTRAL
	<b>M1</b>	RESTRICTED INDUSTRIAL
	<b>M2</b>	HEAVY INDUSTRIAL
	<b>MED</b>	MEDICAL ARTS
	<b>UD</b>	UNIVERSITY
	<b>CD</b>	CONSERVATION

CITY OF RADFORD ZONING MAP ADOPTED ORDINANCE NO. 1553, MAY 14, 2007			
AMENDMENTS			
ORDINANCE NO.	DATE	GENERAL DESCRIPTION	ACTION
1556	MAY 25, 2007	1405 TYLER AVENUE	R-1 TO B-1
1597	AUGUST 25, 2008	TAX MAP NUMBERS 6-475-55,57,59,59A,61,63, & 65; 6-476-65A, 67, 69, 71; 6-48-111A, 113, 6-48-113A, 115; 6-48-115A; 6-48-115B, 117, 117; 6-47-73,75, 77; AND 6-48-376	R-4 & B-1 TO B-3
1599	AUGUST 25, 2008	726 AUBURN AVENUE	R-4 TO B-1
1600	SEPTEMBER 9, 2008	AREA BOUNDED BY PENDLETON STREET, FOURTH STREET, BEVERLY STREET, AND THE ALLEY BETWEEN SECOND STREET AND WEST MAIN STREET	B1 & B2 TO MU
1603	MARCH 23, 2009	AREA BOUNDED BY WALKER STREET, KENT STREET, THE ALLEY NORTH OF WEST MAIN STREET, AND THE ALLEY SOUTH OF WEST MAIN STREET	B-2 TO B-3
1611	SEPTEMBER 30, 2009	ESTABLISH FLOODPLAIN DISTRICTS REQUIRING THE ISSUANCE OF PERMITS FOR DEVELOPMENT, AND BY PROVIDING FACTORS AND CONDITIONS FOR VARIANCES TO THE TERMS OF THE ORDINANCE	B-2 TO B-3
1621	MAY 24, 2010	TAX MAP NUMBERS 6-11-33 & 34	R-3 TO R-4
1632	JUNE 13, 2011	TAX MAP NUMBER 8-48-5	B-1 TO R-4
1651	AUGUST 12, 2013	A CERTAIN AREA OF PROPERTIES BORDERING EAST MAIN STREET, FROM JEFFERSON ST. TO BURLINGTON ST., AND FROM ROBEY ST. TO TAX MAP 4-11-28	B-2 TO MU
1663	SEPTEMBER 22, 2014	RE-ZONE A CERTAIN CERTAIN AREA OF PROPERTIES LOCATED IN THE EAST WARD OF THE CITY OF RADFORD, VA, AND IDENTIFIED AS: NEW LOT 3, CONTAINING 1.292 ACRES (TAX MAP 6-113-3) NEW LOT 4, CONTAINING 1.413 ACRES (TAX MAP 6-113-4) NEW LOT 5, CONTAINING 1.219 ACRES (TAX MAP 6-113-5) NEW LOT 7, CONTAINING 1.581 ACRES (TAX MAP 6-113-7)	R-3 TO R-4

FLOOD INSURANCE RATE INFORMATION  
SHOWN HERE AS A GENERAL DESCRIPTION.  
REFERENCE THE FOLLOWING MAPS LOCATED IN  
THE RADFORD CITY ENGINEER'S OFFICE FOR  
SPECIFIC INFORMATION.

MAP NUMBERS:  
5101270013C, 5101270014C, 5101270018C,  
5101270019C, 5101270026C, 5101270027C,  
5101270029C, 5101270031C, & 5101270032C.

MAP REVISION DATE: SEPTEMBER 25, 2009

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OFFICIAL ZONING MAP  
ORDINANCE 1553 DATED: MAY 14, 2007  
LATEST REVISION DATE: SEPTEMBER 29, 2015



PREPARED BY  
CITY OF RADFORD  
ENGINEERING OFFICE

SHEET  
1 OF 1  
FILE NUMBER

City of Radford Virginia  
Zoning & Flood Districts

REVISIONS:  
23 MAR 09  
29 SEP 15

SCALE: 1: 600  
DATE: 14 MAY 07  
DESIGNED BY: JCE  
DRAWN BY: JCE  
CHECKED BY: JHH

CITY OF RADFORD, VIRGINIA  
10 ROBERTSON STREET  
RADFORD, VIRGINIA  
CITY ENGINEER'S OFFICE

## **APPENDIX D**

### **BMP Facilities**

**City of Radford**

**Annual BMP Operation & Maintenance Inspection form  
Detention, Retention and Extended Detention Basins and Wet Ponds**

Owner Name:	Facility Name/Number (See Stormwater Facility Map):	
Property Address:		
Street		
City:		
Zip code:		
Date BMP placed in Service:	Latitude:	Longitude:
Site: plan/permit number:	As-built plans available:	
Date of Inspection:	Date of Last Inspection:	
Inspector:	Contact Information	

BMP Element	Problem	Yes	No	N/A	Corrective Action
<b>Contributing Drainage Area</b>	Excessive trash/debris				Remove trash/debris and properly dispose.
	Bare exposed soil				Stabilize with seed and mulch. E&S measures may be warranted until stabilized.
	Evidence of erosion				Backfill area, seed, mulch and consider matting. E&S measures may be warranted until stabilized.
	Excessive landscape waste/yard clippings				Remove landscape waste and yard clippings to prevent clogging and properly dispose of them.
<b>Pretreatment / Forebay / Inflow</b>	Excessive trash/debris/sediment or other blockage				Remove trash/debris/sediment or blockages and properly dispose of.
	Dead vegetation, exposed soil				Replace vegetation and stabilize according to plans. E&S measures may be warranted until stabilized.
	Evidence of erosion, undercutting, or bare soils				Backfill area, seed, mulch and consider matting, E&S measures may be warranted until stabilized.
	Structural deterioration of inlets, outfalls or pretreatment overflow weirs into the facility				Repair and restabilize area. Consult plans for approved configuration or an engineer. E&S measures may be warranted until stabilized.
	Animal burrows				Fill in immediately and stabilize.
<b>Aquatic Bench / Vegetation</b>	Plantings inconsistent with approved plans.				Consult approved plans and/or management to ensure no approved plant substitutions were used. Remove unapproved plants and replace any required plantings in kind.
	Dead vegetation/exposed soil				Replace vegetation and stabilize according to plans. E&S measures may be warranted until stabilized.
	Invasive plants, such as cattails and phragmites, exceeds 15% of the planted area.				Invasive plants should be removed immediately. Vegetation may require periodic harvesting for proper long term management.
<b>Berm/ Embankment</b>	Overgrown, including woody growth 5' beyond the outfall pipe and/or embankment.				Removal of woody species near or on the embankment is critical for proper function and long term stability. Remove all woody growth including stumps. Consult an engineer for backfill specifications. Mow thick growth.
	There is sparse vegetative cover and erosion channels are present.				Backfill area with structural fill and consult engineer for proper specifications. Stabilize with seed and mulch, consider matting, E&S measures may be warranted until stabilized.
	Cracking, bulging, sloughing and seepage				Consult an engineer immediately to prevent failure.
	Evidence of animal burrows.				Fill in immediately and stabilize.
<b>Riser</b>	Structural condition of the riser is deteriorating.				Consult an engineer to recommend a repair and review the approved plans.
	Adjustable control valve inaccessible and inoperable (if present).				Repair valve to be operational.
	Pieces of the riser are broken or missing.				Repair immediately in accordance with the approved plans. Consult an engineer as needed.
	Riser or low flow orifice is blocked.				Remove blockage and properly dispose of.
	Riser provides inadequate conveyance out of facility.				Repair to properly convey drainage to the outfall per the approved plan. Consult an engineer as needed.
	Evidence of erosion or undermining at/around riser.				Repair erosion. Consult engineer for structural repairs as needed.
<b>Outlet / Outfall</b>	Structural deterioration				Consult engineer for proper repair procedures.
	Exposed rebar, joint failure, loss of joint material, misalignment, leaking or corrosion				Repair concrete to cover rebar. Consult engineer for all other structural repairs.
	Excessive trash/debris/sediment or blockages.				Remove trash/debris/sediment/blockages and properly dispose of.
	Evidence of erosion and bare soil.				Backfill area, seed, mulch and consider matting, E&S measures may be warranted until stabilized.
	Valves, manholes or locks cannot be opened or operated (if present).				Repair/replace any broken fixtures.
	Erosion of outfall channel or riprap deterioration.				Repair and/or supplement riprap outlet protection in accordance with the approved plans.
<b>Overall</b>	Outlets provide inadequate conveyance out of facility.				Repair to properly convey drainage to the outfall per the approved plan. Consult an engineer as needed.
	Access to the facility is in need of repair.				Restore access for maintenance equipment per the approved plans.
	Encroachment on facility or easement by buildings or other structures.				Contact Operations and Maintenance or Plant Services Division
	Evidence of oil/chemical accumulation, odor, algae, color or pollution.				Report to management and consult IDDE manual.
	Fences and/or safety signage is inadequate.				Repair fences and signage for public safety.
	Trash in the pool				Remove immediately and observe safety procedures.
	Additional notes:				

City of Radford MS4  
BMP Facilities Tracking Database

October 11, 2016

Facility ID	Owner	Latitude	Longitude	Type of Facility	Acres Treated	Pervious Acres	Impervious Acres	Brought Online	Last Inspection	Completed During Reporting Year	Unit Code (HUC12)	VAHU6	Agreement Status
(1) INDUSTRIAL PARK	City of Radford	37° 5'38.99"N	80°34'28.60"W	Detention	13.280			12/31/1990	-	-	50500011801	NES7	N/A City Owned
(2) ROCK ROAD WEST & WEST MAIN ST. INTERSECTION "VDOT Rock Road Improvement"	City of Radford	37° 6'13.98"N	80°34'48.22"W	Detention				03/10/2003	-	-	50500011801	NES7	N/A City Owned
(3) NORTH SIDE OF ROCK ROAD WEST BETWEEN FOREST AVE. AND STAPLES ST. "Sundell Drive -Staples Drainage Improvements 1979"	City of Radford	37° 6'50.61"N	80°34'10.25"W	Detention				08/01/1977	-	-	50500011801	NES7	N/A City Owned
(4) SECOND AVE./PARK ROAD IMPROVEMENT PROJECT	City of Radford	37° 7'48.85"N	80°33'47.48"W	Detention Extended				07/21/2015	-	-	50500011801	NES7	N/A City Owned
(5) SOUTH / WEST OF BELLE HETH ELEMENTARY SCHOOL "Second Avenue & George Street Improvements"	City of Radford	37° 7'52.23"N	80°33'28.50"W	Detention	5.257	2.619	2.638	01/20/2001	-	-	50500011801	NES7	N/A City Owned
(6) EAST MAIN ST. BEHIND ALLEN BUILDING "Jefferson Street Improvements"	City of Radford	37° 8'21.36"N	80°32'50.47"W	Detention				02/01/1997	-	-	50500011801	NES7	N/A City Owned
(25) SUNSET PARK* "Sunset Park & Fairgrounds Basins Drainage Improvements Project"	City of Radford	37° 7'20.48"N	80°34'40.63"W	Detention				08/06/2004	-	-	50500011801	NES7	N/A City Owned
(26) SEVENTH STREET* "Sunset Park & Fairgrounds Basins Drainage Improvements Project"	City of Radford	37° 7'29.05"N	80°34'34.44"W	Detention				08/06/2004	-	-	50500011801	NES7	N/A City Owned
(27) SUMMIT RIDGE (PRIVATE)*	Seventh Street Subdivision	37° 6'51.99"N	80°34'47.77"W	Detention	3.520	2.750	0.770	03/04/2011	-	-	50500011801	NES7	
(28) HEATHER GLEN (PRIVATE)*	Heather Glen, LP	37° 7'7.02"N	80°33'48.07"W	Detention	4.293			12/09/2003	-	-	50500011801	NES7	
(29) WEST SIDE CROSSING (PRIVATE)*	Westside 1205 LLC	37° 8'8.40"N	80°33'24.62"W	Detention Extended	9.043	5.183	3.860	03/03/2014	-	-	50500011801	NES7	
(30) FAMILY DOLLAR (PRIVATE) <sup>1</sup>	LFD Radford VA LLC	37° 7'44.36"N	80°34'57.10"W	Detention	1.020	0.685	0.335	01/19/2016	01/19/2016	1	50500011801	NES7	Under Agreement

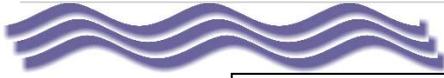
\*INADVERTANTLY LEFT OFF OF MS4 SUBMITTAL MAP

<sup>1</sup> New Private Facility 1/19/2016

(#) Refers to Number on Storm Water Management Facility Map

## **APPENDIX E**

### **Standard Operating Procedures**

**Standard Operating Procedure:****Good Housekeeping – ASPHALT PROGRAM**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

**Reasons for Procedure**

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

**1.0 Purpose**

The purpose of the **Good Housekeeping – ASPHALT PROGRAM** SOP is to provide guidance for City employees to control pollutant discharges during asphalt program construction and reconstruction activities, including maintenance, repair, replacement, and installation of asphalt pavement in the City. These procedures are critical steps that must be included in the basic practices of the Asphalt Program construction by City staff and contracted staff.

**2.0 Scope**

At Asphalt Program construction sites.

**3.0 Responsibility**

All City employees or City-contracted personnel who conduct asphalt paving construction and reconstruction.

**3.1 Managers and Supervisors**

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with Building Maintenance. This includes City contractors who conduct asphalt paving construction and reconstruction. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

**3.2 Personnel Performing the Job**

City Employee's and outside contract personnel are responsible for following the City's **Good Housekeeping – ASPHALT PROGRAM** SOP's "Do's" and "Dont's"



## 4.0 Procedures

### ***“DO’s”***

- Cover inlets and manholes with protection during application of seal coat, tack slurry, slurry seal, and/or fog seal. Conduct operations during dry weather.
- Place drip pans, absorbent materials, or plastic under equipment when not in use to catch & contain drips & leaks to prevent soil contamination and runoff.
- When possible, recycle broken asphalt and old or spilled asphalt. If it cannot be recycled, collect and remove and dispose offsite as solid waste in accordance with standard specifications.
- Substances used to coat transport trucks, asphalt trucks, and spreading equipment shall not contain soap, shall be non-foaming and non-toxic.
- During thermoplastic striping, the pre-heater must be filled carefully to prevent splashing or spilling of materials; the same with filling the melting tanks during pavement marker application; leave 6” at top of pre-heater, and also in the melting tanks, to allow room for material to move and splash when vehicles are deadheaded.
- When servicing or filling melting tanks, ensure all pressure is released before removing lids to avoid spills.
- Monitor all asphalt program equipment closely for leaks; use drip pan as needed.

### ***“DONT’s”***

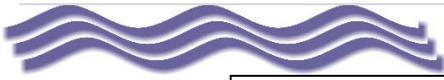
- **DO NOT** allow any materials or sediment to enter storm drain system. Apply temporary perimeter controls like silt fence until stabilized or permanent controls are in place.
- **DO NOT** apply seal coat, tack coat, slurry seal, or fog seal when rain is predicted; limit paving applications in wet weather.
- **DO NOT** let petroleum or petroleum covered aggregate enter the storm system during chip sealing application and sweeping.
- **DO NOT** transfer or load bituminous materials, or pre-heat, transfer or load thermoplastic near drain inlets or waterways.
- **DO NOT** wash down or hose down the paving equipment except where the wash water will only enter the sanitary sewer drain as an approved discharge.
- **DO NOT** repair asphalt paving equipment on a roadside surface; transport to the maintenance shop for repairs.
- **DO NOT** coat transport trucks and spreading equipment with soap, foaming products, or toxic substances.
- **DO NOT** fill pre-heaters or melting tanks beyond 6” from the top to leave room for splashing.

**5.0 Annual Review of Procedure/Training**

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

**6.0 Regulatory impacts**

Discharges of any material other than stormwater are prohibited by the City of Radford's illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.



**Standard Operating Procedure:  
Detention Pond Maintenance**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

### Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

#### 1.0 Purpose

The purpose of the **Detention Pond Maintenance** SOP is to provide guidance for City employees to control pollutant discharges by keeping these stormwater facilities operating properly with routine maintenance including mowing and debris control. These procedures are critical steps that must be included during pond maintenance on an annual basis, as an intermediate inspection, or on an as-needed basis after a storm event.

#### 2.0 Scope

This procedure applies to all detention ponds currently existing at City facilities.

#### 3.0 Responsibility

All City employees or City-contracted personnel responsible for maintenance of stormwater features.

##### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with Detention Pond Maintenance. This includes non-City companies that are contracted to perform work for the City. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

##### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Detention Pond Maintenance** SOP's "Do's" and "Dont's"



#### 4.0 Procedures

##### ***“DO’s”***

- Inspect inlet and outlet works initially on a monthly basis until the appropriate timing of maintenance is established; then conduct maintenance per schedule.
- Conduct maintenance per schedule, or on an as-needed basis as identified during an annual inspection or on an as-needed basis after a storm event.
- Keep screen and/or trash rack free from debris using established maintenance schedule or on an as-needed basis after a storm event; notify supervisor if screen or rack is in need of maintenance.
- Report damage/compromise to side slopes, pond banks, inlet pipe, trickle channels, outlet structure; prepare a repair schedule and complete repairs.
- Remove vegetation adjacent to outlet works that may interfere with operation; note if noxious weeds present and notify supervisor.
- Remove debris and trash from the detention pond and surrounding area and dispose properly.
- When mowing, collect grass clippings and all other clippings/trimmings and take offsite for disposal or dispose in trash on site.
- Notify supervisor any hazardous conditions or materials found during inspection.

##### ***“DONT’s”***

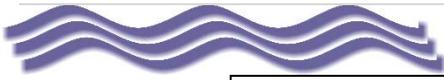
- **DO NOT** mow detention pond too close to the surface; height should be 4 to 6 inches to maintain healthy grasses.
- **DO NOT** clean equipment or conduct maintenance on equipment in the detention pond, or near a storm drain or other stormwater conveyance feature.
- **DO NOT** leave grass clippings or trimming residue in pond; collect and dispose of in trash.
- **DO NOT** apply landscaping chemicals in pond area, or in areas where the residue could make it into the pond during a storm event.
- **DO NOT** attempt to clean up any unidentified or possibly hazardous materials found in or around pond during inspections; notify supervisor immediately upon discovery of hazardous materials.

#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.



**Standard Operating Procedure:  
Drainageway Maintenance**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of the **Drainageway Maintenance** SOP is to provide guidance for City employees to control pollutant discharges by promoting maintenance of our primary "filter" for stormwater runoff reaching 'waters of the state', including our creeks, drainage channels, ditches, and grass swales with or without active flows. Drainageways can be a source of pollutants if not properly maintained. These procedures are critical steps that must be included for all maintenance activities in City drainageways.

### 2.0 Scope

This procedure applies to City drainageways and related surface water conveyance features.

### 3.0 Responsibility

All City employees or City-contracted personnel who maintain stormwater conveyance structures.

#### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with Drainageway Maintenance. This includes non-City companies that are contracted to perform work for the City. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Drainageway Maintenance** SOP's "Do's" and "Dont's"



#### 4.0 Procedures

##### **“DO’s”**

- Conduct maintenance per schedule, or on an as-needed basis as identified during an inspection based on identified sediment and debris buildup, or on an as-needed basis after a storm event.
- Remove debris and trash from the drainageway and surrounding area and dispose properly before mowing; make note if noxious weeds present and notify supervisor.
- Inspect drainageway outfalls and trickle channel features (if applicable) while in field doing maintenance; note any feature that needs repair and/or replace due to defective materials; note any unusual conditions in the drainageway during the inspection and report them.
- Report any suspected illegal connections or other waste dumping activities in the drainageway; these would include flows during dry-weather conditions, or unusual fluids. These may require special disposal operations; report to Supervisor.
- Clean out sediment from culverts in drainageways, ditches and swales; check if needs to re-graded (invert has filled in with fine-graded sediments). When mowing, collect grass clippings and all other clippings/trimmings and take offsite for disposal or dispose in trash.
- Maintain a longer riparian fringe at top of bank when mowing to catch pollutants.
- Report bare ground that may lead to erosion; re-vegetate as necessary. Report locations of grass clippings, etc being placed in drainageway; remove these wastes.

##### **“DONT’s”**

- **DO NOT** mow drainageways, ditches, or swales too close to the surface; height should be 4 to 6 inches to maintain healthy grasses.
- **DO NOT** clean equipment or conduct maintenance on equipment in the drainageway, channel, ditch, or near a storm drain or other stormwater conveyance feature.
- **DO NOT** leave grass clippings or trimming residue in channel; collect and dispose of in trash.
- **DO NOT** apply landscaping chemicals in channel area, or in areas where the residue could make it into the drainageway during a storm event.
- **DO NOT** make contact with anyone suspected of an illicit discharge without first contacting supervisor for instructions.
- **DO NOT** attempt to clean up any unidentified or possibly hazardous materials found in or around channel during inspections; notify supervisor immediately upon discovery.

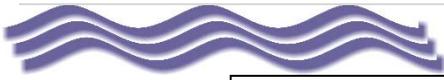
#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



**Standard Operating Procedure:  
Vehicle and Equipment Storage**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## **Reasons for Procedure**

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### **1.0 Purpose**

The purpose of the **Vehicle and Equipment Storage** SOP is to provide guidance for City employees to control pollutant discharges by promoting proper storage of vehicles and equipment for longer periods of time that have the potential to leak, spill, or release chemicals or hazardous materials. The potential exists for vehicle or equipment to leak fluids that then are wither infiltrating into the ground or are carried off with stormwater. These procedures are critical steps that must be included in any long-term storage activities, at all city or City-contracted facilities that store vehicles and equipment for longer periods of time.

### **2.0 Scope**

At all City or at City-contracted facilities where vehicles or equipment are stored or parked for longer periods of time.

### **3.0 Responsibility**

All City or City-contracted employees who oversee the long-term storage of vehicles and equipment.

#### **3.1 Managers and Supervisors**

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with Vehicle and Equipment Storage. This includes City-contracted employees who oversee the long-term storage of vehicles and equipment. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### **3.2 Personnel Performing the Job**

City Employee's and outside contract personnel are responsible for following the City's **Vehicle and Equipment Storage** SOP's "Do's" and "Dont's"



#### 4.0 Procedures

##### ***“DO’s”***

- Monitor parked vehicles and equipment closely for leaks; use drip pans as needed. Check drip pans frequently and dispose of fluids appropriately.
- Monitor vehicle and equipment fluids closely, and keep fluids at proper levels.
- Have spill cleanup materials available and ready to go to address any leaks or spills.
- Clean up spills promptly, with DRY methods (rags and absorbents), if possible. Clean up is not complete until absorbent is swept up and disposed properly.
- Conduct daily inspections to ensure that all vehicles and equipment are stored correctly.
- Keep clutter around stored vehicles and equipment to a minimum; a more organized storage area is easier to both spot a leak or spill, as well as to properly clean up.

##### ***“DONT’s”***

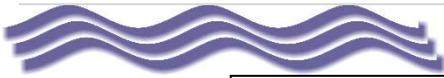
- **DO NOT** store outdoors a vehicle or piece of equipment that is KNOWN to have a leak; move indoors and schedule repair.
- **DO NOT** allow exposure of buildup of oil and grease on vehicle or equipment being stored outdoors. Clean off buildup before storing outdoors.
- **DO NOT** wash or hose down any outdoor vehicle or equipment storage areas except where the wash water will only enter the sanitary sewer drain as an approved discharge.
- **DO NOT** repair equipment or vehicles outside; use a covered, designated area for such repairs.
- **DO NOT** allow clutter and mess to conceal any leak problem in the storage area.

#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.



**Standard Operating Procedure:  
Good Housekeeping**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of **Good Housekeeping** is to control pollutant discharges by promoting efficient and safe practices (storage, use, cleanup, and disposal) when handling materials potentially harmful to stormwater such as fertilizers, pesticides, herbicides, cleaning solutions, paint products, and automotive products. Good housekeeping is simply the practice of keeping **all materials, supplies and containers well organized; storing materials securely** when not in use; **cleaning up after work activities**; and **disposing of materials properly**. These procedures are simple steps that must be included in everyday work activities to protect stormwater from contact with pollutants, and are a joint responsibility of everyone in the work place.

### 2.0 Scope

This procedure applies to all offices where materials stored could be spilled; all outdoor work areas where materials are stored or used; and all areas that store or use equipment that has the potential to spill or leak.

### 3.0 Responsibility

All City employee's or City-contracted employees who work with any chemicals, cleaning solutions, paint products, automobile fluids, or any materials that could be spilled; or work with any equipment.

#### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of Good Housekeeping. This includes non-City companies that are contracted to perform work for the City. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Good Housekeeping** SOP's "Do's" and "Dont's"

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



#### 4.0 Procedures

##### **“DO’s”**

- Keep all work areas neat and well organized.
- Sweep or pick up all trash and debris daily or as needed.
- Have spill cleanup materials available and ready to go.
- Clean up spills promptly, with DRY methods, if possible.
- Conduct daily inspections to ensure that equipment and materials are being handled, disposed and stored correctly.
- Recycle or dispose of all wastes properly and promptly.
- Keep equipment clean; do not allow a buildup of oil/grease.
- Monitor parked vehicles closely for leaks; use drip pan as needed.
- Keep unused containers closed with a tight fitting lid and label.

##### **“DONT’s”**

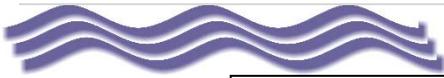
- **DO NOT** let waste accumulate at or around the work place.
- **DO NOT** transfer, pour or dispose of materials outdoors, near or in storm drains, or drainage ditches. Use signage to reinforce.
- **DO NOT** wash down or hose down any outdoor Dumpster or storage areas except where the wash water will only enter the sanitary sewer drain as an approved discharge.
- **DO NOT** handle containers alone if awkward or require over-exertion on your part. Get help and spread the weight load.
- **DO NOT** repair equipment or vehicles outside; use a covered, designated area for such repairs.
- **DO NOT** hose down work area (unless floor drain is connected to the sanitary sewer); use dry sweeping method if possible.
- **DO NOT** place a waste in an area not designated for its hazardous nature or if that areas’ disposal method is not a recommended one.

#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

**Standard Operating Procedure:****IDDE: Outfall Screening**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

**Reasons for Procedure**

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

**1.0 Purpose**

The purpose of the **IDDE: Outfall Screening** SOP is to provide basic guidance for City employees conducting illicit discharge inspections of storm drainage system outfalls.

**2.0 Scope**

This procedure applies to City outfalls as shown on the Stormwater Management Map located on the City's GIS website or the print map in the City's Engineering Department.

**3.0 Responsibility**

All City employees or City-contracted personnel who are responsible for and/or who will conduct illicit discharge inspections.

**3.1 Managers and Supervisors**

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with IDDE: Outfall Screening inspections. This includes non-City companies that are contracted to perform work for the City. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

**3.2 Personnel Performing the Job**

City Employee's and outside contract personnel are responsible for following the City's **IDDE: Outfall Screening** SOP's "Do's" and "Dont's"



## 4.0 Procedures

### 4.1 Do's and Don't's

#### "DO's"

- Inspections are to occur during dry weather (no runoff producing precipitation in last 48 hours).
- Conduct inspections with at least two staff per crew.
- Conduct inspections during low groundwater and leaf off conditions if possible.
- Complete Site Info section on Outfall Field Screening Report Form before leaving the office.
- Ensure outfall is accessible
- Characterize the outfall by recording information on the Outfall Field Screening Report
- Photograph the outfall with a digital camera or Trimble GPS unit.
- If dry weather flow is present and does not appear to be an illicit discharge, attempt to identify the source of the flow (document flow for future comparison).
- Document dry outfalls for future comparison.
- Follow procedure below in if an illicit discharge is suspected.

#### "DONT's"

- **DO NOT** enter private property without permission.
- **DO NOT** inspect outfalls if it is not safe to do so.

### 4.2 Equipment List:

1. System map
2. Outfall Field Screening Report Forms
3. City identification
4. Digital camera (spare batteries)
5. Cell phone
6. Clip board and pencils
7. Dry erase board and pens
8. Flashlight (spare batteries)
9. Disposable gloves
10. Folding wood ruler
11. Temperature probe
12. pH probe
13. Ammonia test strips
14. Five 1-liter (polyethylene) sample bottles
15. Watch with second hand
16. Calculator
17. Hand sanitizer
18. Safety vests
19. First aid kit
20. Machete
21. Cooler
22. Permanent marker



#### **4.3 Suspected Illicit Discharge Procedures**

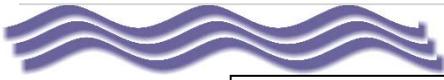
- Contact the Public Works Superintendent immediately.
- Use Outfall Field Screening Report Form to document observations
- Visually inspect general area for possible sources
- Take photos
- Estimate flow
- Collect samples if they would help with source identification.
- Attempt to locate where the discharge is coming from.

#### **5.0 Annual Review of Procedure/Training**

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### **6.0 Regulatory impacts**

Discharges of any material other than stormwater are prohibited by the City of Radford's illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.



**Standard Operating Procedure:  
Inlet, Pipe & Vault Cleaning and Disposal**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of the **Inlet, Pipe & Vault Cleaning and Disposal** SOP is to provide guidance for City employees to control pollutant discharges by promoting maintenance of our primary "filter" for stormwater runoff before it enters a waterway. Any pollutant that ends up on a street or in a parking lot can end up in the stormwater conveyance system which then transports urban runoff and snow melt to the waterway. Maintaining street inlets, storm sewers, culverts, vaults, and other conveyance features keep sediment and debris buildup from entering the stormwater system. This is accomplished most often using a Vactor Truck for the cleaning or pressure application, an operation which includes disposal of the wastes generated from the cleaning. Because wastes resulting from cleanup can contribute to the problem, the disposal of the wastes must be managed appropriately. These procedures are critical steps that must be included in every trip out in the VactorTruck, every transfer location during the day, and every trip back in to the Public Works Facility

### 2.0 Scope

This procedure applies to City storm drain inlets, storm sewers, outfalls, culverts, drainage ditches, catch basins, swales, vaults, and related.

### 3.0 Responsibility

All City employees or City-contracted personnel who are responsible for and/or who operate Vactor Truck equipment to maintain stormwater conveyance structures.

#### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with Inlet, pipe, vault, culvert and similar cleaning. This includes non-City companies that are contracted to perform work for the City. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Inlet, Pipe & Vault Cleaning and Disposal** SOP's "Do's" and "Dont's"

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



#### 4.0 Procedures

##### **“DO’s”**

- Conduct stormwater system maintenance per schedule or as needed based on identified sediment and debris buildup; remove debris, rubbish, and sediment.
- Discharge Vector Truck wastes and flushing water at the Cloyd’s Mountain Landfill per the New River Resource Authority’s Guidelines.
- Inspect conveyance features while in field; note any conveyance feature that needs repair and/or replace due to defective materials.
- Report any suspected illegal connections or other waste dumping activities.
- Transport wastes from Vector Truck activities to a permanent disposal site as soon as possible, and dispose according to all regulations.
- Monitor parked Vector Truck closely for leaks; use drip pan as needed.
- Be on the lookout for contaminated sediments (oil sheen, floating wastes); it may require special disposal operations; report to Supervisor.

##### **“DONT’s”**

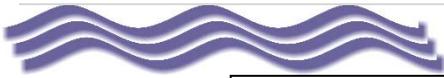
- **DO NOT** conduct Vector Truck flushing activities when a heavy rain is forecast.
- **DO NOT** transfer or dispose of collected sediments outdoors, near or in storm drains, or drainage ditches.
- **DO NOT** wash down/ hose down the Vector truck except where the wash water will only enter an approved discharge point (i.e. sanitary sewer, or designated cleanout area like the Cloyd’s Mountain Landfill)
- **DO NOT** discharge any contaminated stormwater from inlet, culvert, or other conveyance cleaning into surface water.
- **DO NOT** repair Vector Truck equipment or vehicles outside; use a covered, designated area for such repairs.
- **DO NOT** temporarily store Vector Truck wastes in areas where the debris may be returned back to storm sewer system with the next rainfall; transport to permanent disposal as soon as possible.

#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.



**Standard Operating Procedure:  
Landscape Chemical Application**

Date: 6/30/2016\*      Rev: 10/13/2016  
Version: 1.1      Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of the Landscape Chemical Application procedure is to supplement the City's **Nutrient Management Plan** during routine landscape maintenance activities is to minimize or prevent the discharge of pesticides and fertilizers deposited into the drainage system by promoting proper storage and application of chemicals during landscape maintenance activities. These procedures are critical steps that must be included in every landscape maintenance activity that includes chemical application to either control weeds or pests or to provide adequate fertilization.

### 2.0 Scope

This procedure applies to all City employees or City-contracted services, who work with any landscape chemicals, and all municipal facilities and operations where pesticides, herbicides or fertilizers are stored, mixed, applied, recycled or disposed.

### 3.0 Responsibility

All City staff are responsible for preventing illicit discharges from their operations.

#### 3.1 Managers and Supervisors

The Public Works Superintendent, Supervisors and the City's Horticulturist are responsible for ensuring their staff's compliance with the correct methods of disposing of landscape waste materials. This includes non-City companies that are contracted to perform landscaping functions. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Nutrient Management Plan** and the **Landscape Chemical Application** SOP's "Do's" and "Don'ts"

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



#### 4.0 Procedures

##### ***“DO’s”***

- Follow the City of Radford’s ***Nutrient Management Plan***.
- Utilize soil test analyses to optimize fertilizer applications.
- Follow label directions when storing, handling, mixing, recycling and disposing of chemicals and empty container; properly calibrate application equipment to ensure proper amount of chemicals are applied.
- Have spill cleanup materials available and ready to go in case of spill; clean up chemical spills promptly, with DRY methods, if possible.
- When watering landscaped area after fertilizer application, take care to not allow water to runoff into streets or other conduits to the waterways.
- Keep all fertilizer chemicals covered to keep dry and reduce water damage.
- Keep application equipment clean; do not allow a buildup of chemicals.
- Keep unused containers closed tightly; use a tight fitting lid; label containers.
- Keep all pesticide and herbicide chemicals in leak proof shelters away from elements to help prevent contamination of the stormwater system.
- Recycle or dispose of all spent or excess chemicals properly and promptly.

##### ***“DONT’s”***

- **DO NOT** keep chemicals in a damaged container; replace or transfer chemicals to new holding containers.
- **DO NOT** transfer, pour or dispose of chemicals outdoors, near or in storm drains, or drainage areas; transfer over impervious surface so spills can’t seep into ground.
- **DO NOT** apply chemicals if not had proper training on uses, types, amounts, and application requirements.
- **DO NOT** handle chemical containers alone if awkward or require over-exertion on your part. Get help and spread the weight load so accidents don’t happen.
- **DO NOT** over-purchase landscaping chemicals; keep only necessary quantities on hand.
- **DO NOT** over-water landscape areas after fertilizer application such that water discharges off-site, to the street or to the waterway directly.
- **DO NOT** apply landscape chemicals to frozen ground.

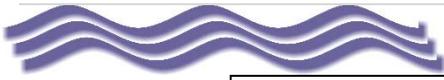
#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees who perform routine landscaping duties. Any Supervisors who hire contractors to perform these job duties are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



**Standard Operating Procedure:**  
**Disposal and Maintenance of Landscaping/Organic Waste**  
Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of this procedure is to ensure that wastes generated as a result of landscaping or landscape maintenance operations do not clog or cause contamination of the stormwater sewer system.

### 2.0 Scope

This procedure applies to all landscaping maintenance activities and operations performed by City employees or outside contract companies.

### 3.0 Responsibility

All City employees **or City-contracted companies** responsible for maintenance of landscaped features.

#### 3.1 Managers and Supervisors

The Public Works Superintendent and Supervisors are responsible for ensuring their staff's compliance with the correct methods of disposing of landscape waste materials. This includes non-City companies that are contracted to perform landscaping functions. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Disposal and Maintenance of Landscaping/Organic Waste** SOP's Procedures and "Do's" and "Dont's"



## **4.0 Procedures**

### **4.1 Vegetation Maintenance**

All vegetation shall be maintained in such a way as keeps stormwater conveyances, including drains, clear and free of vegetative debris.

### **4.2 Landscape Waste Generation**

Any organic, plant or soil wastes generated as a result of landscape maintenance, including but not limited to leaves, soil cores, grass clippings, or other debris shall be handled in an environmentally responsible manner to reduce likelihood of this material entering stormwater conveyances or local streams.

#### **4.2.1 Grass Clippings**

Grass clippings shall be collected or blown back on to grassed areas. In no cases shall grass clippings be blown onto pavement, where they can then be washed down a storm drain.

#### **4.2.3 Leaves**

Leaves shall be picked up as promptly as practical in order to keep storm drains clear from obstruction, which could cause damaging flooding, and keep leaves from entering the storm sewer system. In the event leaves cannot be picked up in a timely manner, they should be blown back onto vegetated surfaces.

#### **4.2.4 Sticks, limbs, or whole vegetation**

Limbs, sticks, or other vegetative debris generated either as a result of maintenance activities or from natural causes should be cleaned up immediately upon generation or discovery. If vegetative debris cannot be removed from a site in a timely manner, it should be moved to a vegetated area where it cannot block stormwater conveyances or storm drains.

### **4.3 Proper Disposal**

The City has a landscape compost site located at Crackers Neck. All vegetative waste that cannot be re-used on site should be taken to the compost site. Contractors performing work, unless otherwise directed, are responsible for proper offsite disposal of materials.

**“DO’s”**

- Inspect newly landscaped areas initially on a monthly basis until the appropriate timing of maintenance is established; then conduct maintenance per schedule.
- Conduct routine maintenance per schedule, or on an as-needed basis as identified during an inspection, or on an as-needed basis after a storm event.
- Oversee landscape contractors to ensure that correct procedures are followed and contaminants are kept to a minimum, and contained.
- Ask the contractor for a list of items they will be bringing on site for landscape work, and how they will control, contain and dispose of the materials not used.
- Report damage/compromise to landscape areas or bare areas void of vegetation that may result in sediment being transported off site; prepare a repair schedule & complete repairs.
- Remove paper, debris and trash from the landscaped and surrounding areas, and rake leaves and dispose properly prior to mowing activities.
- After mowing & pulling & trimming, collect grass clippings and all other clippings/trimmings/wastes and take offsite for disposal or dispose in trash on site.
- Notify supervisor of any hazardous conditions or materials found during the performance of maintenance activities.

**“DONT’s”**

- **DO NOT** allow grass clippings to be blown onto pavement, where they can then be washed down a storm drain.
- **DO NOT** place leaves onto the roadway or sidewalk, where they can then be washed down a storm drain.
- **DO NOT** clean equipment or conduct maintenance on equipment on or near the landscaped area, or near a storm drain or other stormwater conveyance feature.
- **DO NOT** leave grass clippings or trimming residue on landscaped area; collect and dispose of in trash.
- **DO NOT** apply landscaping chemicals in areas where the residue could make it into the drainageway, channel, ditch, or detention pond (if applicable) during a storm event (see **Chemical Application SOP** for procedures).
- **DO NOT** water if chemical applications resulted in excess fertilizer, herbicide or pesticide on the landscaped areas or on the sidewalks or parking lots. Sweep up excess & dispose properly before applying water.
- **DO NOT** attempt to clean up any unidentified or possibly hazardous materials found on or around landscaped areas during maintenance; notify supervisor immediately upon discovery of hazardous materials.

**5.0 Annual Review of Procedure/Training**

Supervisors are responsible for reviewing this procedure at least once each year with all employees who perform routine landscaping duties. Any Supervisors who hire contractors to perform these job duties are required to convey the requirements of this procedure to the contractors.

**6.0 Regulatory impacts**

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



**Standard Operating Procedure:  
Building Maintenance**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of the **Building Maintenance** SOP is to provide guidance for City employees to control the maintenance and construction activities that take place at municipal facilities and their surrounding grounds with procedures to mitigate the contaminated debris, trash, and potential chemicals from reaching our stormwater system.

These procedures are simple steps that must be included in everyday work activities to protect stormwater from contact with pollutants and are a joint responsibility of everyone in the work place conducting maintenance on buildings.

### 2.0 Scope

All buildings and facilities where maintenance activities occur.

### 3.0 Responsibility

All City employees or City-contracted personnel who work/conduct maintenance on City buildings, including painting, window washing, sidewalk cleaning and the like, and building contractors.

#### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with Building Maintenance. This includes City contractors who work/conduct maintenance on City buildings. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Building Maintenance** SOP's "Do's" and "Dont's"



#### 4.0 Procedures

##### **“DO’s”**

- Remove trash and debris around building and grounds daily or as needed.
- Place temporary inlet protection at stormwater inlets to catch contaminants and wash water from maintenance activities.
- Have spill cleanup materials available and ready to go during painting activities or any activity that has chemicals standing by for use.
- Clean up paint or other spills promptly, with DRY methods, if possible.
- Oversee contractors to ensure that correct procedures are followed and contaminants are kept to a minimum, and contained.
- Ask the contractor for a list of chemicals they will be bringing on site for the maintenance work, and how they will control, contain and dispose of the unused portion of the chemicals and materials.
- Expect contractors to follow proper cleanup procedures; monitor progress.
- Keep maintenance equipment clean; do not allow a buildup of wastes. Maintain a record of contractor work, and if any spills/problems occurred.

##### **“DONT’s”**

- **DO NOT** let trash and waste accumulate at or around the building.
- **DO NOT** transfer, pour or dispose of maintenance materials outdoors in parking lots, near or in storm drains, drainage ditches, or any other location where they can runoff into the storm drain system.
- **DO NOT** let maintenance wash water, chemicals, paint, or any other maintenance residue enter the storm drain system.
- **DO NOT** handle containers alone if awkward or require over-exertion on your part. Get help and spread the weight load.
- **DO NOT** repair maintenance equipment outside; use a covered, designated area for such repairs.
- **DO NOT** hose down debris collected from sidewalk cleaning (unless floor drain is connected to the sanitary sewer); use dry sweeping method and dispose properly in trash.
- **DO NOT** let contractors conduct maintenance in conflict with proper procedures for the work; monitor closely.

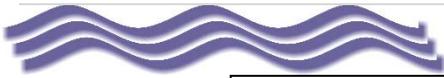
#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

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**Standard Operating Procedure:  
Parking Lot Sweeping and Repair**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of the **Parking Lot Sweeping and Repair** SOP is to provide guidance for City employees to control pollutant discharges by promoting efficient pickup of fine-grained sediment particles on **parking lots, and other large outdoor paved surfaces** that carry a substantial portion of the pollutant load, as well as managing repair materials used to conduct routine pothole repair. In addition, because the operation and maintenance of street sweepers used to sweep parking lots can contribute to the problem if not handled properly, procedures for resultant sweeping debris and refuse must be managed appropriately. Please also use the **Street Sweeping SOP** for proper procedures. These procedures are critical steps that must be included in every trip out to sweep parking lots, maintain the parking lots, or similar, in conjunction with the **Street Sweeping SOP**.

### 2.0 Scope

Parking lots and other large outdoor paved surfaces within the City and other City-contracted areas.

### 3.0 Responsibility

All City employee and City-contracted personnel who operate street sweeping equipment, pothole patching and asphalt overlay equipment.

#### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with Parking Lot Sweeping and Repair. This includes City-contracted employees who operate street sweeping equipment, pothole patching and asphalt overlay equipment. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Parking Lot Sweeping and Repair Storage** SOP's "Do's" and "Dont's"

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



#### 4.0 Procedures

##### *“DO’s”*

- Operate all sweeper equipment according to manufacturer’s settings and standards; perform regular maintenance of sweepers per schedule or as needed.
- Follow sweeping schedule established for that facility’s parking lot area. Note areas that are prone to additional sediment and debris buildup and add to schedule.
- Conduct additional inspections after large storm event, after snow piles melt, after a special event held in the parking lot or similar, and after temporary storage of materials; make note of a lot that has consistently higher content of debris & report.
- If parking lot has outfall or storm drain, protect this feature when materials are stored in parking lot or if snow is brought to parking lot for long-term melting; place snow piles away from these inlets so debris is not carried away with resulting melt.
- Make note of excessive litter and suggest putting a garbage receptacle at the site.
- If unusual sweeper debris is noted, bring to attention of supervisor for testing.
- Use **OSHA Material Handling & Storage**, and **Spill Prevention and Control SOPs** for repair (patching and pothole repairs) activities to make sure no adverse effects from repair activities. Make sure repair equipment does not contribute oil, diesel, or transmission fluid leaks to lot area and follow instructions on SOPs for clean up

##### *“DONT’s”*

- **DO NOT** ignore any leak or drips from sweeper equipment; put in a repair ticket and utilize a drip pan during temporary storage of vehicle.
- **DO NOT** make any repairs to sweeper equipment or vehicles in the parking lot; use a covered, designated area for such repairs.
- **DO NOT** wash down the parking lot with the exception of a very fine water spray for dust control.
- **DO NOT** empty sweeper hoppers wastes near storm drains or detention ponds or drainageways where rain event could mobilize sweeper wastes.
- **DO NOT** bring excess repair materials to the parking lot and use up what is brought. Never leave repair materials stored without proper storing techniques.
- **DO NOT** hose down left over materials after repair activities; use dry clean-up methods and sweep up excess material and properly dispose.

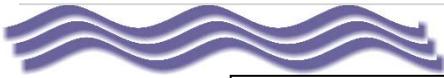
#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



**Standard Operating Procedure:  
Right-Of-Way (ROW) Maintenance**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of this procedure is to control pollutant discharges by using routine maintenance procedures for mowing and debris control, and weed control along City ROWs. Application of fertilizers, pesticides and herbicides activities should refer to the **Chemical Application SOP**. These procedures are critical steps that must be included during routine landscaping activities at City ROW areas by employees and contractors.

### 2.0 Scope

This procedure applies to all City ROW property, including vacant lots, medians and greenspace.

### 3.0 Responsibility

All City employees **or** City-contracted personnel responsible for maintenance of City ROW property.

#### 3.1 Managers and Supervisors

The Public Works Superintendent and Supervisors are responsible for ensuring their staff's compliance with the correct methods for mowing, debris control, and weed control. Application of fertilizers, pesticides and herbicides activities should refer to the **Chemical Application SOP**. This includes non-City companies that are contracted to perform landscaping functions. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **ROW Maintenance SOP's**, "Do's" and "Dont's" for ROW Maintenance.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



#### 4.0 Procedures

##### **“DO’s”**

- Inspect new ROW areas or medians initially on a monthly basis until the correct timing of maintenance is established; then conduct maintenance per schedule.
- Conduct routine ROW maintenance per schedule, or on an as-needed basis as identified during an inspection or on an as-needed basis when conditions warrant.
- Oversee ROW landscape contractors to ensure that correct procedures are followed and contaminants are kept to a minimum and contained.
- Ask the contractor for a list of items they will be bringing on site for ROW landscape work, and how they will control, contain and dispose of the materials not used.
- Report damage/compromise to ROW areas, median areas or bare areas void of vegetation that may result in sediment being transported off site; prepare a repair schedule & complete repairs.
- Remove paper, debris and trash from the ROWs, medians, and surrounding areas. Rake leaves and dispose properly prior to mowing activities.
- After mowing & pulling & trimming, collect grass clippings and all other clippings/trimmings/wastes and take offsite for disposal or dispose in trash on site.
- Notify supervisor of any hazardous conditions or materials found during the performance of maintenance activities.

##### **“DONT’s”**

- **DO NOT** clean equipment or conduct maintenance on equipment on or near the ROW area, or near a storm drain or other stormwater conveyance feature.
- **DO NOT** leave grass clippings or trimming residue on median or ROW area; collect and dispose of in trash.
- **DO NOT** apply landscaping chemicals in areas where the residue could make it into the drainageway, channel, ditch, or detention pond (if applicable) during a storm event (see **Chemical Application SOP** for procedures).
- **DO NOT** use herbicide for weed control on the ROW areas or in the median unless instructed to by the City’s Horticulturist. Use only approved chemicals, in approved amounts, and never when a heavy rain is forecast.
- **DO NOT** attempt to clean up any unidentified or possibly hazardous materials found on or around median or ROW areas during maintenance; notify supervisor immediately upon discovery of hazardous materials.

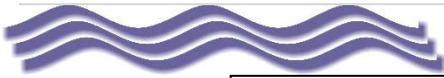
#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees who perform routine landscaping duties. Any Supervisors who hire contractors to perform these job duties are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



**Standard Operating Procedure:  
Spill Prevention and Control**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of the **Spill Prevention and Control** SOP is to provide guidance for City employees to control pollutant discharges by promoting proper use of equipment during fueling, cleaning, painting, chemical applications, and any other activities that involve a liquid that could be spilled. Spill prevention is one of the most preventable causes of water quality pollution that occurs. These procedures are critical steps that must be included in everyday work activities to protect stormwater from contact with pollutants, and are a joint responsibility of everyone in the workplace who utilize chemicals, fuel vehicles, maintain and repair equipment, apply landscape chemicals, and conduct municipal operations with liquids.

### 2.0 Scope

All indoor offices where materials stored could be spilled; all outdoor work areas where materials are stored or used; and all areas that store or use equipment that has the potential to spill or leak.

### 3.0 Responsibility

All City or City-contracted personnel who work with any landscape chemicals, cleaning solutions, paint products, automobile fluids, or any materials that could be spilled; work with any equipment; or fuel vehicles.

#### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with **Spill Prevention and Control**. This includes non-City companies that are contracted to perform duties for the City. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's Spill Prevention and Control SOP's "Do's" and "Dont's"



#### 4.0 Procedures

##### **“DO’s”**

- Keep all work areas neat & well organized with *only* enough chemical to get job done.
- Be knowledgeable about material you are working with; be familiar with MSDS fact sheets & SPCC plan.
- Have spill cleanup materials available and ready to go; familiarize yourself with locations of spill kits and cleaning materials and how to use them.
- Notify supervisor if spill is discovered and is unknown; there may be special instructions.
- Clean up spills promptly, with DRY methods (rags and absorbents), if possible. Clean up is not complete until the absorbent used is disposed properly.
- Conduct inspections of your work area materials to ensure equipment and containers are secure and stored responsibly. Transfer if leaking observed.
- Handle, use, transfer, store, and re-package all chemicals indoors or under cover to lessen potential for spills that can be carried away by stormwater.
- Keep unused containers closed with a tight fitting lid and label.

##### **“DONT’s”**

- **DO NOT** delay in cleanup of spills. Delay allows for spreading of wastes by wind, rain, and traffic. If you have to delay any cleanup, string warning tape or cone off to keep area secure.
- **DO NOT** transfer or pour materials outdoors near or in storm drains or drainage ditches.
- **DO NOT** hose down work area where spills could occur (unless floor drain is hooked to the sanitary sewer); use dry sweeping methods.
- **DO NOT** handle containers alone if awkward or require over-exertion on your part. Get help and spread the load.
- **DO NOT** remove or damage spill kits; these are available in case of a spill event. Notify supervisor if spill kit is gone from designated location or is missing some important components.

#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

**Standard Operating Procedure:****Street Sweeping for Water Quality Protection**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

**Reasons for Procedure**

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

**1.0 Purpose**

The purpose of this procedure is to outline the housekeeping measures that must be taken to prevent run-off of materials from entering groundwater and storm water systems.

**2.0 Scope**

Street sweeping is an operational best management practice (BMP) developed to control pollutant discharges by promoting efficient pickup of fine-grained sediment particles on **city streets, bridges, public right-of-way, parking lots**, and other **large outdoor paved surfaces** that carry a substantial portion of the pollutant load. In addition, because the operation and maintenance of street sweepers can contribute to the problem, procedures for resultant sweeping debris and refuse must be managed appropriately.

**3.0 Responsibility**

All City staff are responsible for preventing illicit discharges from their operations. All sweeper hopper debris must be taken directly to a permanent disposal site, or if absolutely necessary, to a secure temporary storage area with no possible impact from wind and rain. These procedures are critical steps that must be included in every trip out to sweep City streets or similar, every transfer location during the day, and every trip back in.

**3.1 Managers and Supervisors**

The Public Works Superintendent and Supervisors are responsible for ensuring their staff's compliance with the correct methods of Street Sweeping. This includes non-City companies that are contracted to perform street sweeping for the City. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

**3.2 Personnel Performing the Job**

City Employee's and outside contract personnel are responsible for following the City's **Street Sweeping SOP's "Do's" and "Dont's"**

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



#### 4.0 Procedures

##### "DO's"

- Before starting out, check pavement for leaks from the equipment; if leak observed, make note to repair and consider drip pan use.
- Operate all sweeper equipment according to manufacturer's settings and standards.
- Perform regular maintenance of sweepers per schedule or as needed.
- Make note of areas that indicate storage of construction materials, have higher than normal median maintenance (grass cuttings on street), and areas of snow melt that may require additional or increased sweeping activities.
- Make note of any streets that have consistently higher content of debris and/or sediments and inform supervisor who can increase schedule of operations.
- Make sure that sweeper debris is taken directly to the permanent disposal site or is taken to a secure temporary location, away from inlets or direct runoff, for storage.
- Washing of sweeper equipment only at wash rack to trap grease, oils and sediment.
- If unusual sweeper debris is noted, bring to attention of supervisor for testing.

##### "DONT's"

- **DO NOT** ignore any leak or drips from sweeper equipment; put in a repair ticket and utilize a drip pan during temporary storage of vehicle.
- **DO NOT** transfer or dispose of sweeper materials near or in storm drains, or drainage ditches, even temporarily.
- **DO NOT** wash street sweeping equipment outside except at the Road & Bridge Vehicle Wash area that has the benefit of the oil and grease trap to collect pollutant.
- **DO NOT** ignore routine maintenance requirements for the sweeper equipment that can possibly mitigate future problems and nip potential equipment leaks in the bud.
- **DO NOT** repair sweeper equipment or vehicles outside; use a covered, designated area for such repairs.
- **DO NOT** wash down any streets or curbs with the exception of very fine water spray for dust control.

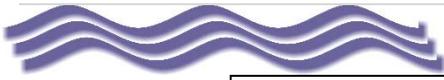
#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees who have these job duties.

#### 6.0 Regulatory impacts

All outdoor material storage areas that contain products that would be expected to be mobilized in stormwater runoff are considered high priority facilities by the Virginia DEQ. The City of Radford received authorization to discharge to surface waters under the State General Permit Number VAR040135 effective August 19, 2014. Pollution prevention best management practices (BMP's) and good housekeeping practices are required and unannounced inspections by DEQ may occur.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



**Standard Operating Procedure:  
Vehicle Maintenance**

Date: 6/30/2016\*    Version: 1    Review Frequency: Annual

## Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of the **Vehicle Maintenance** SOP is to provide guidance for City employees to control pollutant discharges by promoting regular maintenance of City-contracted vehicles and equipment, as well as appropriate activities within the maintenance shop and bays. Several operational components of vehicle maintenance activities have the potential for polluting receiving waters, including storage while waiting for repair (leaks); parts cleaning (spills), storage of maintenance fluids used in repairs and routine maintenance (leaks & spills); and the maintenance facility itself (poor good housekeeping practices). These procedures are critical steps that must be included during all maintenance activities, pre-repair storage and post-storage of vehicles to be maintained.

### 2.0 Scope

The City's Garage on Seventeenth Street, specifically the maintenance bays and corresponding storage areas.

### 3.0 Responsibility

City employees or City-contracted personnel who perform maintenance on City vehicles and equipment.

#### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with Vehicle Maintenance. This includes non-City personnel who perform maintenance on City vehicles and equipment. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's **Vehicle Maintenance** SOP's "Do's" and "Dont's"



#### 4.0 Procedures

##### **“DO’s”**

- Keep all work areas neat & well organized. Sweep up all trash & debris daily or as needed. Label containers, sign procedures, and designate work areas.
- Conduct daily inspections to ensure that equipment & materials are being handled, disposed and stored correctly. Recycle or dispose of all wastes properly and promptly.
- Have spill cleanup materials nearby. Clean up spills promptly, with DRY methods; cleanup is completed ONLY after absorbent disposed properly and rags disposed of properly or sent to industrial laundry.
- Keep wastes separated to increase waste recycling/disposal options and reduce costs.
- Conduct maintenance and repair activities indoors or under cover whenever possible to minimize exposure of fluids to stormwater runoff.
- Park vehicles to be maintained in the designated areas. Monitor parked vehicles closely for leaks; use drip pan as needed.
- Drain fluids from leaking or wrecked vehicles, and from motor parts, as soon as possible and dispose of fluids properly.

##### **“DONT’s”**

- **DO NOT** let waste accumulate at or around the work place; more clutter equals more accident opportunities.
- **DO NOT** transfer, pour or dispose of maintenance fluids outdoors near or in storm drains or ditches.
- **DO NOT** wash or hose down the garage area except where the wash water will only enter the sanitary sewer drain as an approved discharge; use dry clean- up methods as often as possible.
- **DO NOT** repair equipment or vehicles outside; use a covered, designated area for such repairs.
- **DO NOT** leave a leaking vehicle unattended; use a drip pan temporarily and then drain fluids if not being repaired and waiting for final deposition.
- **DO NOT** mix waste oil, fuel, antifreeze or chlorinated solvents. Consult a hazardous waste hauler.

#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*



**Standard Operating Procedure:  
Vehicle Washing**

Date: 6/30/2016\* Rev. 10/11/2016  
Version: 1.1 Review Frequency: Annual

### Reasons for Procedure

The City of Radford has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes the City to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. Pollution prevention and good housekeeping practices are a requirement of this permit.

Standard Operating Procedures (SOPs) have been prepared for all activities conducted as part of the City's Municipal Operations that have the potential to impact 'waters of the state. One of the primary goals of these SOPs is to provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants from a site during the performance of municipal operations activities.

### 1.0 Purpose

The purpose of the **Vehicle Washing** SOP is to provide guidance for City employees to control pollutant discharges by promoting a conscious effort when washing City-contracted vehicles and equipment to reduce the amount of sediment, antifreeze, heavy metals, oil and other materials that may runoff from the wash rack. Uncontrolled washing activities have a potential to produce a high concentration of pollutants in runoff wash water to the stormwater system. These procedures are critical steps that must be included in every vehicle washing activity.

### 2.0 Scope

All areas where vehicles and equipment are cleaned or rinsed.

### 3.0 Responsibility

All City employees and City-contracted personnel including Trustees, who provide vehicle washing services.

#### 3.1 Managers and Supervisors

All Supervisors are responsible for ensuring their staff's compliance with the correct methods of dealing with **Vehicle Washing**. This includes non-City companies that are contracted to perform work for the City including Trustees. Supervisors are responsible for ensuring training is conducted with the most recent version of the SOP.

#### 3.2 Personnel Performing the Job

City Employee's and outside contract personnel are responsible for following the City's Vehicle Washing SOP's "Do's" and "Dont's"



#### 4.0 Procedures

##### **“DO’s”**

- Keep the wash area neat and well organized. Sweep or pick up all trash and debris daily or as needed, before it is carried away during a storm event.
- Use a non-porous drain sock to hold back wash water from any storm drain and direct wash water to a sanitary sewer drain.
- Keep the non-porous drain sock handy and close by as it will be used frequently. Replace the non-porous drain sock when it can no longer hold back wash water from a storm drain.
- Prior to any washing activity, put the “sock” around all sides of a storm drain to block any sediment, debris and water from washing activity and route the water to a sanitary sewer drain.
- After each washing activity, sweep up the sediment and debris after it is dry to keep it from going back down the storm drain or off site during a storm event. Transfer to a container for storage. Use DRY cleanup only, do not hose down accumulated sediments.
- Transport the dried sediment to the Vactor Truck washout area when quantity collected and stored is sufficient to warrant a trip there.
- Use biodegradable, phosphate free detergents.
- Keep equipment clean; do not allow a buildup of oil/grease. Conduct daily inspections.

##### **“DONT’s”**

- **DO NOT** let waste accumulate at Wash Area.
- **DO NOT** let sediments that were kept from the storm drain with the non-porous drain sock go either back down the drain or be carried off site in a rain event.
- **DO NOT** wash or hose down the washing area except where the wash water will only enter the sanitary sewer drain as an approved discharge.
- **DO NOT** handle detergent containers alone if awkward or requires over-exertion on your part. Get help and spread the weight load.
- **DO NOT** use phosphate detergents.
- **DO NOT** use spray-on acid-based wheel cleaners where the rinse water may flow to a storm drain untreated.

#### 5.0 Annual Review of Procedure/Training

Supervisors are responsible for reviewing this procedure at least once each year with all employees. Any Supervisors who hire contractors are required to convey the requirements of this procedure to the contractors.

#### 6.0 Regulatory impacts

Discharges of any material other than stormwater are prohibited by the City of Radford’s illicit Discharge Ordinance. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances. Proper handling and disposal of landscape wastes will help keep this material out of the stormwater drainage network.

*\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version.*

# **APPENDIX F**

## **Recycling**

## RECYCLING REPORT FOR THE FISCAL YEAR

JULY 2015 THRU JUNE 2016

<u>ANTIFREZZE</u>	<u>OIL</u>	<u>SOLVENTS</u>	<u>TIRES</u>	<u>BATTERIES</u>
	1.16	.10 PER YEAR	4.93	1.22

<u>SOLID WASTE DROP CENTER</u>	<u>SOILD WASTE TRUCKS</u>	<u>WOODCHIPS</u>	<u>BRUSH</u>	<u>DEBRI</u>	<u>ASPHALT</u>
1,259.38	7,125.25	132.88	586.29	81.26	

<u>ALUMINUM NONFERROUS</u>	<u>IRON FERROUS</u>	<u>DROP CENTER STEEL</u>	<u>FUNDING FACTORY ON DEC. REPORT</u>	<u>E-WASTE</u>
1.35	6.59	39.69		3.4

<u>SINGAL STREAM</u>	<u>CARDBOARD</u>	<u>GRASS &amp; LEAVES</u>	<u>PALLETS</u>
223.77	41.65	863	14.29

<u>TOTAL TONS COLLECTED</u>	<u>TOTAL TONS RECYCLED</u>	<u>PERCENTAGE RECYCLED</u>
10,386.21 TONS	1,920.32 TONS	18%

NOTE: NUMBERS ARE IN TONAGE

# **APPENDIX G**

## **Nutrient Management Plans**



192 Briarherst Drive, Amherst, Virginia 24521 ❖ 434-665-2813 (Cell) ❖ 434-946-7483 (Off.) ❖ habelrf@gmail.com

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Nutrient Management planning is a large part of Virginia's strategy to clean and protect the state's waterways and to help meet the EPA's goal of restoring the ecosystem of the Chesapeake Bay. When fertilizer is used improperly, the nutrients nitrogen and phosphorus are not used by the plant and can then be carried into streams, lakes, and rivers. These nutrients then cause major ecological problems. Turfgrass covers an estimated 1.2 million acres of the Chesapeake Bay watershed in Virginia. According to Virginia's Watershed Implementation Plan (WIP), 500,000 acres must be addressed by nutrient management plans by 2025.

Urban Nutrient Management aims to limit the amount of nutrient rich runoff reaching the waters of Virginia ultimately the Chesapeake Bay from golf courses, athletic fields, homes, business complexes, etc. This is accomplished through following a site specific, agronomically and environmentally sound, Nutrient Management Plan written by a Certified Nutrient Management Planner. The goal of a Nutrient Management Plan is to manage the amount, placement, timing, and application of fertilizer, bio-solids and other nutrient rich materials all while achieving the healthiest turf or landscape area possible.

While not all of Virginia is included in the Chesapeake Bay Watershed, all of Virginia's waters can be improved by following a nutrient management plan. The Chesapeake Bay cleanup is being used as a model for future endeavors. The Albemarle Sound and Gulf of Mexico may soon be under the same restrictions as the Bay. The Roanoke, Nottaway and Meherrin Rivers all flow into North Carolina's Albemarle Sound, while the New, Holston and Clinch rivers flow to the Mississippi River and Gulf of Mexico.

These plans can be voluntary, but in several cases, they are required by law. Both golf courses and state owned lands are currently required to have plans, as well as fertilized land that is publicly owned within a Municipal Separate Storm Sewer System (MS4) permit area. These laws apply to both areas inside and outside of the Chesapeake Bay Watershed.

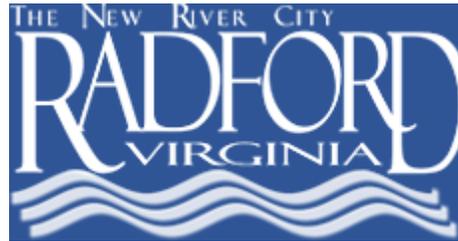
Thank you for choosing me to write your Nutrient Management Plan. It is my goal to provide you with the most agronomically and environmentally sound plan available. For this plan to be effective, it is important that you follow the soil test based guidelines of your plan and that you keep detailed records of your applications. While you do not have to follow the specific fertilizer analyses shown, the success of this plan hinges on not exceeding the nutrient amounts that are allowed for by the Standards and Criteria. These amounts are stressed multiple times in the discussion of Soil Test Results and Application Worksheets. In cases where plans are required by law, the limits set by the Standards and Criteria are law.

If this is a renewal plan, please be aware that the Standards and Criteria were revised in July 2014. Many guidelines have changed and old recommendations may be out of compliance with the new standards.

Together, we will do our part to protect Virginia's natural beauty and the Chesapeake Bay. Please do not hesitate to contact me if you have questions or suggestions. Your input is integral to making your Nutrient Management Plan a living and usable document.

Thank You,

Robert Habel  
Owner - CNMP - VT '05



## Nutrient Management Plan

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**Prepared For:**

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Certification Code: 654

<b>Acreage - 15 Fields, 4 Common Area, 15 locations</b> (Breakdown on Page 5)	
<b>Total:</b>	43.5

<b>County:</b>	City of Radford
<b>Watershed:</b>	NE57

**Plan Written:** June 1, 2016

**Plan Expires:** June 1, 2019

Planner Signature

# Table of Contents

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<b>1. Narrative .....</b>	<b>3</b>
<b>    <u>1.1. Statement of Compliance.....</u></b>	<b>3</b>
<b>    <u>1.2. Plan Overview.....</u></b>	<b>3</b>
<b>    <u>1.3. Location .....</u></b>	<b>4</b>
<b>    <u>1.4. Nutrient Management Principals .....</u></b>	<b>2</b>
<b>    <u>1.5. Best Management Practices for Water Quality Protection .....</u></b>	<b>5</b>
<b>    <u>1.6. Application Equipment Calibration .....</u></b>	<b>5</b>
<b>    <u>1.7. Season of Fertilization.....</u></b>	<b>6</b>
<b>2. Management Areas .....</b>	<b>7</b>
<b>3. Soil Test Summaries .....</b>	<b>26</b>
<b>4. Nutrient Application Worksheets.....</b>	<b>30</b>
<b>5. Fertilizer Application Records.....</b>	<b>34</b>
<b>6. Reference Material.....</b>	<b>35</b>
<b>7. Soil Test Results .....</b>	<b>51</b>

**Sources:**

Maps – Maps are produced using Google Earth or provided by client.

Photos/Logos – Obtained from client, clients website, or taken by planner.

Site information – Obtained from client or clients website.

Technical Information –

*Agronomy Handbook – A&L Labs – 2001*

*Best Golf Course Management Practices – McCarty – 2001*

*Environmental Best Management Practices for Golf Courses – Virginia GCSAA – January 2012*

*Golf Course Management and Construction, Environmental Issues – Balogh, Walker, USGA – 1992*

*Soil Fertility and Fertilizers 6<sup>th</sup> Ed. – Havlin, Beaton, Tisdale, Nelson – 1999*

*Spectrum Analytic Agronomic Library – www.spectrumanalytic.com*

*Sports Turf Management in the Transition Zone – Goatley, Askew, Ervin, McCall, VSTMA, Etc. – 2008*

*Turf Management for Golf Courses 2<sup>nd</sup> Ed. – Beard, USGA – 2002*

*Turfgrass Soil Fertility and Chemical Problems – Carrow, Waddington, Rieke – 2001*

*Urban Nutrient Management Handbook – VA DCR, Virginia Tech, Virginia State Uni. – May 2011*

*Virginia Nutrient Management Standards and Criteria – Commonwealth of Virginia – July 2014*

**Disclaimer:** *Statements and recommendations made within this document based on published research data and experience. Recommendations are based on the soil tests included in this document and not intended for use on any other facility. Products suggested are used in methods suggest by label guidelines when available, be sure to read label before using products as labels can change. Maximum rates are provided by Virginia Department of Conservation and Recreation Standards and Criteria and are not to be exceeded even when product label suggests otherwise. No guarantee or warranty is made, expressed or implied, concerning crop performance as a result of using the contents of this document.*

**Definitions:**

*M = 1000 FT<sup>2</sup>*

*# = Pounds of product*

*N = Nitrogen*

*P = Phosphorus*

*K = Potassium*

*NMP = Nutrient Management Plan*

*MS4 = Municipal Separate Storm Sewer System*

## **1. Narrative**

### **1.1. Statement of Compliance**

The City of Radford is required to have and follow this Nutrient Management Plan according to the Rules and Regulations of the Code of Virginia. According to 9VAC25-890-40 MS4 General Permit, permittees are required under the “Turf and Landscape Management” section of the permit (GP Section II.B.6.c) to develop NMPs on “all lands owned or operated by the MS4 operator where nutrients are applied to a contiguous area greater than one acre.” Thus, the City of Radford agrees to comply with all requirements set forth in the Nutrient Management Training and Certification Regulations, 4VAC50-85-10 et seq., and to follow recommendations for turf fertilization and management as described in the Virginia Nutrient Management Standards and Criteria, Revised July 2014. This includes implementing this Department of Conservation and Recreation reviewed Nutrient Management Plan and maintaining fertilization records. All nutrient applications to City of Radford properties, performed by City of Radford staff or other contractors, shall comply with the provisions of this Nutrient Management Plan as of June 1, 2016. This plan is effective for three years (until June 1, 2019) or until major renovations or major changes to maintenance occurs. The planner should be alerted if this occurs or if new soil tests are taken within the three-year period, a minor revision may be needed if tests show major differences. The process of updating this plan for a new three-year cycle should begin no later than 6 months prior to plan expiration (January 2019).

### **1.2. Plan Overview**

Radford (population 15,859), is 36 miles southwest of Roanoke, Va., on Route 11 and I-81 in the New River Valley, close to the beautiful Blue Ridge Mountains of Virginia. The City of Radford and the surrounding region provide a rich variety of cultural and leisure activities. Outdoor enthusiasts will find opportunities to hike, kayak, fish, swim and camp. Dozens of bicycling and hiking trails are accessible with less than a 30-minute drive, including access points to the Appalachian Trail and Jefferson National Forest.

There are 11 locations with 15 sports fields and 4 locations managed as general turf. All areas are cool season turf and are unirrigated. They are fertilized once a year in the spring by City of Radford Staff.

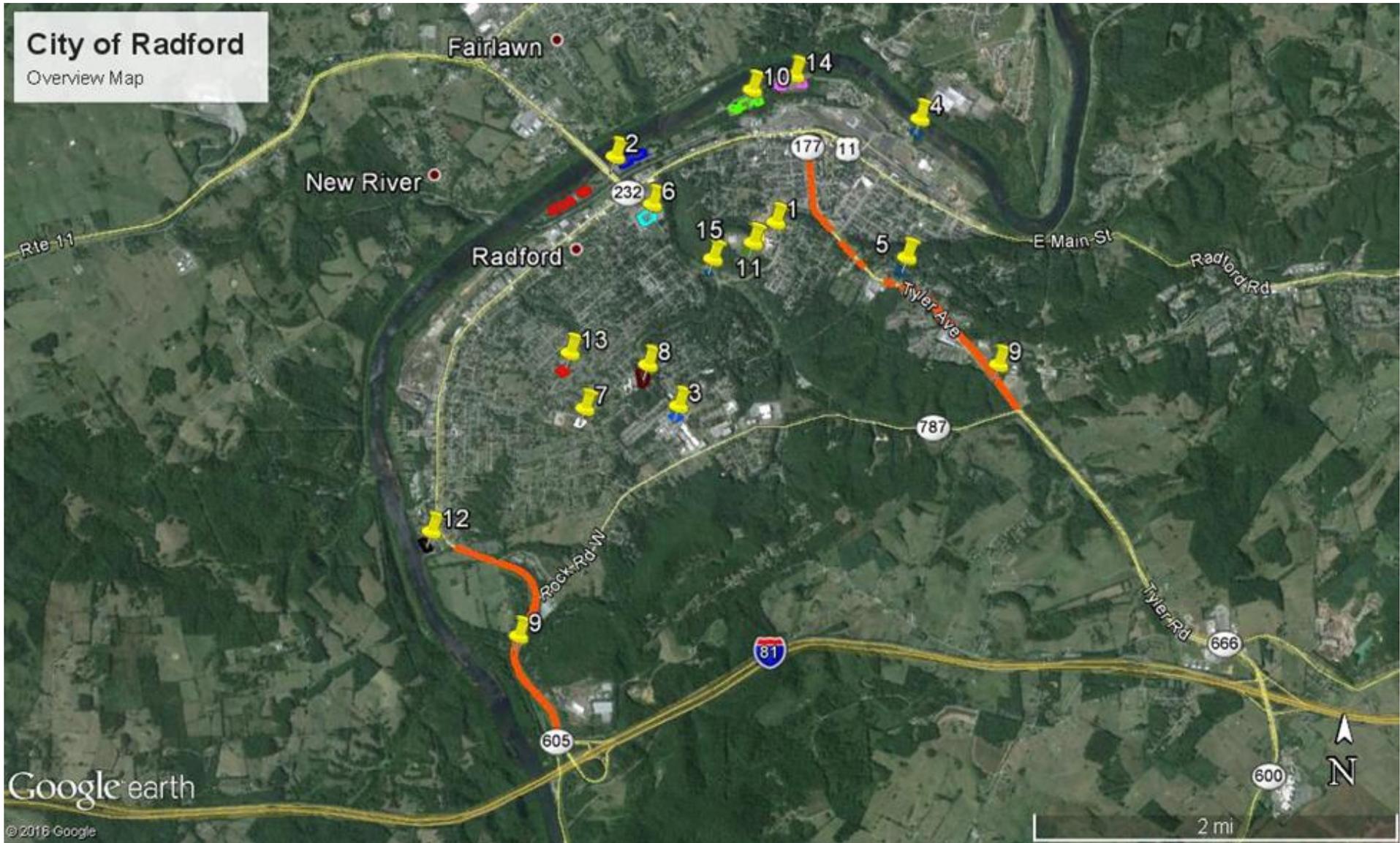
It should be noted that heavy (more than .5 #/M of water soluble nitrogen) spring fertilization tends to favor shoot growth and leads to more mowing, clippings disease and other issues. It is recommended that if turf is to only be fertilized once per year that this should occur in the fall. Fall fertilization helps the turf recover from harsh summer conditions, feeds the roots and helps the turf enter the next growing season in good condition.

Since these areas are only fertilized once in the spring, a slow release product will be recommended. All areas will be fertilized using the same program. Separate programs will be provided using DCR provided framework for regularly fertilized areas and for the varying levels of phosphorus input dictated by soil tests.

### 1.3. Location

Radford is located in Southwest Virginia along the New River between Montgomery and Pulaski Counties. It is easily accessed from Interstate 81.

Location/Acreage/Watershed Code Breakdown				
Location	Acres	Irrigation	Grass	Watershed Code
1. Belle Heth Field	1.5		Cool	<b>NE57</b> <b>43.5 Acres</b>
2. Bisset Park				
A. East	4.5		Cool	
B. West	4.5		Cool	
3. Dobbins Park	1		Cool	
4. Dog Park	.9		Cool	
5. Haven Heights	.9		Cool	
6. High School Practice	3.6		Cool	
7. Hodge Field	.6		Cool	
8. Mcharg Field	2.7		Cool	
9. Medians	10.7		Cool	
10. New River Valley Complex	3.6		Cool	
11. Radford Memorial field	2.5		Cool	
12. Riverview Park	1.5		Cool	
13. Sunset Park	1.2		Cool	
14. Veterans Park	3.3		Cool	
15. Wildwood Park	.5		Cool	



#### **1.4. Nutrient Management Principals**

Nutrient Management Plans focus on two primary objectives healthy plants and clean water. The *Standards and Criteria* are based upon many years of scientific research and the rates suggested are optimal for plant health within the intended usage. Low input areas, like home lawns, require some fertilizer to maintain plant vigor thus maintaining turf cover and preventing erosion. High use areas, like sports fields, require frequent fertilizer input to help maintain plant health and to aid in recovery from stress. Clean water is maintained by applying fertilizer in a responsible manner ensuring minimum movement away from the intended site.

There are four different types of elements essential for plant health. Non-mineral, Primary and Secondary elements are all considered Macronutrients. The fourth is Micronutrients. Non-mineral elements consist of carbon, hydrogen, and oxygen; these elements are obtained from air and water. The Primary nutrients are nitrogen, phosphorus, and potassium. Secondary elements are calcium, magnesium, and sulfur. Micronutrients are iron, manganese, boron, zinc copper molybdenum, chlorine, cobalt, and nickel. All of these elements are obtained from the soil and must be supplemented with fertilizer, lime or other soil amendments when a soil test shows a deficiency. In high maintenance situations, some elements are spray applied and absorbed through the leaf tissue.

Nitrogen and Phosphorus are the focus of a nutrient management plan, as these nutrients cause ecological problems. Lime is also important because having improper pH can make applied fertilizers unavailable to the plant and more likely to leach or runoff. While nitrogen and phosphorus are the focus, other nutrients are also discussed in the plan, these nutrients are beneficial to plant health, but do not cause water quality problems.

**Nitrogen (N)** – This element is responsible for green color, shoot growth and density, root growth, carbohydrate reserves, recuperative potential, heat, cold, drought hardiness, wear tolerance, and disease susceptibility. Nitrogen has a very complex cycle and only certain forms are available to the plant. It leaches through the soil rapidly and does not accumulate thus you cannot soil test for N. Due to these factors, nitrogen management is a large part of nutrient management. Nitrogen management includes but is not limited to using slow release materials, timing the applications in accordance with plant growth, and making multiple applications so that the element is available when it is needed by the plant.

There are multiple N rates used in this plan due to the diversity of the areas being fertilized. Please see each section and nutrient application worksheets for specifics.

Slow release products were used exclusively in this plan. If making changes, please continue to use slow release fertilizers or contact your planner for help determining the proper rates.

**Phosphorus (P)** – Phosphorus controls the establishment rate of newly seeded turf, plant maturation, root growth, and seed production. Like nitrogen, P also has a complex cycle. The major difference is that P readily attaches soil, it can be quantified by a soil test and only leaches when it completely saturates the soil. Phosphorus moves away from the application site when it is improperly applied to compacted soil or other impervious surfaces, when applied in excess, and since it attaches to the soil, with sediment rich runoff. Phosphorus management is also important to nutrient management. It should only be applied when called for by a soil

test, to soils that are not compacted to prevent runoff and only applied to actively growing turf with sufficient turf cover/rooting to hold the soil in place.

Maximum P rates are outlined in application worksheets. Do not exceed this number.

**Potassium (K)** - Potassium is responsible for root growth, heat, cold, and drought hardiness, wear tolerance, and disease susceptibility. While the *Standards and Criteria* do regulate the application of K, but in some cases, K input may exceed recommended levels, as it does not have the same detrimental effects on the health of Virginia's waters as N and P. Potassium is considered the plant nutrient most responsible for turf quality. It helps plants respond to stresses like drought, extreme heat/cold, and insect/disease pressure. The plants increased ability to respond to stress in a positive manner can help reduce the need for increased N and P fertility and reseeding caused by stress. In addition to the benefits of K, it is difficult to limit the amount of K used as most modern slow release fertilizers contain both N and K while limiting or completely removing P. Nitrogen only products are not readily available in slow release form and custom blended fertilizers are expensive.

Potassium levels have been exceeded in most of areas of this plan. As discussed above, K helps the plant deal with stress. Sports fields and common areas are generally stressed be it from excessive use, compaction, improper pH, or lack of proper care due to budget and personnel restraints.

**Lime** - Liming is a critical management practice for maintaining soil pH at optimal levels for plant growth. Liming supplies the essential elements Calcium and/or Magnesium, reduces the solubility and potential toxicity of Aluminum and Manganese, and increases the availability of essential nutrients. Many soil elements change form because of chemical reactions in the soil due to pHs that are either too acidic or too basic. Plants may not be able to use elements in some of these forms making some elements essential to plant health unavailable. Most plants grow well in the pH range 5.8 to 6.5.

Buffer pH is used to provide an indication of the soil's total (active + reserve) acidity and ability to resist a change in pH. This buffer measurement is the major factor in determining the amount of lime to apply. The Buffer pH starts at 7 (no lime needed) and goes lower as the soil's total acidity increases and more lime is needed to raise the soil pH. As an example, a clay soil with a pH of 6.1 could have a buffer pH of 6.8 and need 1 ton/A of lime in order to maintain/increase that pH around 6.2. A sandy soil could have a much lower pH but have the same buffer pH thus, needing the same amount of lime to change the pH to 6.2. This is because sandy soils have a lower cation exchange capacity thus, less storage for reserve acid.

Attempting to change the pH in the deep rooting zone of an established turf is difficult at best. One method of getting lime somewhat deeper in established turf areas is to apply lime in conjunction with aeration. Applying lime in the fall and winter months is recommended because the freeze/thaw cycle aids in mixing lime throughout the root zone.

Lime provides the essential nutrients Calcium and Magnesium. Calcium is the main component of plant cell walls while magnesium is the atom upon which chlorophyll is built. It is important that these elements be present in the soil not only to help regulate the soils acidity but to insure plant health. When a soils pH is acidic, these elements can be added with lime. Calcitic

lime should be used when calcium is deficient and magnesium is high. Dolomitic lime, which is more common, is used when the both are deficient or balanced. If pH does not need to be adjusted, calcium levels can be raised with gypsum and magnesium is raised with Epsom salts. The *Standards and Criteria* provide guidance on adjusting soil pH levels but do not include any recommendations for Ca or Mg, as they do not affect water quality.

Not all liming materials are the same, if the liming material chosen does not equate to 100% Calcium Carbonate Equivalent (CCE% should be listed on bag) see chart on page 50 to adjust the required amount of lime.

**Sulfur (S)** - Sulfur is responsible for the plants green color, shoot growth and density, root growth, carbohydrate reserves, and disease susceptibility. Elemental sulfur applications should be avoided unless you are attempting to acidify (lower pH) the soil and should be applied at no more than 5#/M and watered in due to the turf burn potential. Unless called for by a soil test, the occasional use of sulfur containing fertilizers and micro nutrient packages should be the only S input needed to supplement the soil S content. This element is not included in the *Standards and Criteria*.

**Iron (Fe)** – Iron contributes to the plants green color, shoot growth and density, root growth, carbohydrate reserves, heat, cold and drought hardiness and wear tolerance. Iron is often included in fertilizer and micronutrient blends because it produces a faster greening of turf than nitrogen. According to the *Standards and Criteria*, Fe applications can be occasionally substituted for N applications because it produces greening. This is a good strategy, but Fe apps cannot replace N. While Fe is used inside the plant, the greening created by Fe is superficial and caused by the iron rusting on the plants surface. Fe should be used as an N replacement only when the plant is healthy and greening is desired without increased growth.

**Micros** – Other micronutrients are not mentioned by the *Standards and Criteria*. These elements are very important to plant growth, but regular input is not needed unless you are managing a sand based soil with low nutrient holding capacity. Most soils contain all the necessary micros and they will be available for the plant as long as the proper pH is maintained.

### **1.5. Best Management Practices for Water Quality Protection**

The following list comes from the *Urban Nutrient Management Handbook* page 8-12 and details steps that can reduce the impact of nutrient management practices on water quality. A PDF of the complete handbook can be found online through [ext.vt.edu](http://ext.vt.edu), on the CD provided with the plan or a printed copy can be obtained from DCR.

- Base fertilization practices on a soil test.
- Supplement the soil test with a plant tissue test when necessary.
- Aerate compacted soil to reduce runoff and aid phosphorus and lime in entering the soil.
- Minimize fertilizer rates on slopes and sandy soils. If using quickly available sources of nitrogen on deep, sandy soils or near shallow water tables, use no more than 0.25 to 0.50 pound of nitrogen per 1,000 square feet per application.
- Establish and maintain a buffer zone of reduced- to zero-input vegetation around bodies of water. In some cases, native vegetation might be appropriate, but whatever plant material is selected, it must persist indefinitely to serve as a functional buffer zone.
- Consider using iron as a supplement to nitrogen for greening response.
- Use at least 50 percent slowly available sources of nitrogen on soils subject to leaching.
- Time applications carefully. Do not apply fertilizer before a heavy rainfall.
- Irrigate lightly (0.10 to 0.25 inch) after each application of quick-release fertilizer so it is washed off the foliage and moved into the soil. (Wait to irrigate if foliar activity is desired)
- Avoid over irrigation.
- Return grass clippings to the turf to improve nutrient cycling and reduce the amount of fertilizer needed to produce healthy plants. Use a mulching mower whenever possible and consider that a mulching mower can even be used to manage fall leaves (Goatley 2006).
- When collected, compost grass clippings rather than disposing of them in landfills.
- Use a drop (gravity) spreader near bodies of water or impenetrable areas to lessen the chance of spreading material on these surfaces.
- Perhaps the most important best management practice toward improving water quality is to simply sweep or blow fertilizers and clippings off hardscape surfaces and back into the turf.

### **1.6. Application Equipment Calibration**

An agronomically and environmentally sound fertilizer program can be negated by improperly calibrated equipment. It is important to calibrate your equipment prior to every application. Even moving from one location to another can knock your application equipment out of adjustment so once you have your equipment calibrated for a particular product write down the setting. Use that setting to check the calibration for every site and adjust if necessary. The next time you use that product, use your records as a starting point and not a final calibration as equipment can wear over time thus changing the calibration point. For more information on how to calibrate your equipment see the *Urban Nutrient Management Handbook* Chapter 10 ([ext.vt.edu](http://ext.vt.edu)) or visit your equipment manufactures website. Please remember that the number on the bag is not sufficient, every spreader and every application is different, and that the bag number only serves as a calibration starting point.

### 1.7. Season of Fertilization

According to the *Virginia Nutrient Management Standards and Criteria, Revised July 2014*, fertilizers must be applied in between the following dates. These are guidelines and averages, in warmer years fertilizers could be applied earlier and in cooler years fertilizers should be applied later. Fertilizers should not be applied to frozen ground or to grass that is not actively growing. For warm season grasses please wait for green up to occur. For warm season grasses that are overseeded, follow the cool season application window. If overseeding is skipped, please revert to warm season window.

	Average Frost Dates	Cool Season Applications	Warm Season Applications
Spring	April 25	March 14	April 25
Fall	October 15	November 26	September 15

**Maps** – Maps showing fertilized areas and flood prone areas were provided by City of Salem, other satellite and topo maps created using Google Earth are to scale as shown in bottom left of each map. For all maps, unless otherwise indicated, North is oriented towards top of page. Additional Flood maps created by Web Soil Survey.

**Nutrient Applications** - Each location addressed by this plan has its own section. Some sections cover multiple management areas. Soil tests and application schedules are grouped into 3 categories and are located in their own section. Application records are all located in one section together or on the disk provided. A blank worksheet is also included on the disk to help with calculations if any changes in fertilizer analysis occur. Do not hesitate to call if there are questions.

**Flooding Frequency Class Designations** – Several areas are indicated as flood prone by Web Soil Survey. Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

	"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.
	"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.
	"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.
	"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.
	"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.
	"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

## 2. Management Areas

### 2.1. Belle Heth Field

#### A: Description

Belle Heth is an Elementary School located in Radford, Virginia.

#### B: Location

From Tyler Ave. turn onto Lawrence St. and then onto 2<sup>nd</sup> Ave. Belle Heth Elementary is located on the right.

Address: 151 George St, Radford, VA 24141

GPS Coordinates: 37.132721, -80.558222

#### C: Areas Managed

The multiple use field is 1.5 acres of unirrigated cool season turf.



#### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- There is no flood risk in this area.

## 2.2. Bisset Park

### A: Description

Bisset is Radford's largest city park and is located on 57 acres of riverfront land in the central part of the city. The park offers walking trails, athletic fields, picnic shelters, children's playground, a sand volleyball area and other opportunities for outdoor recreation.

### B: Location

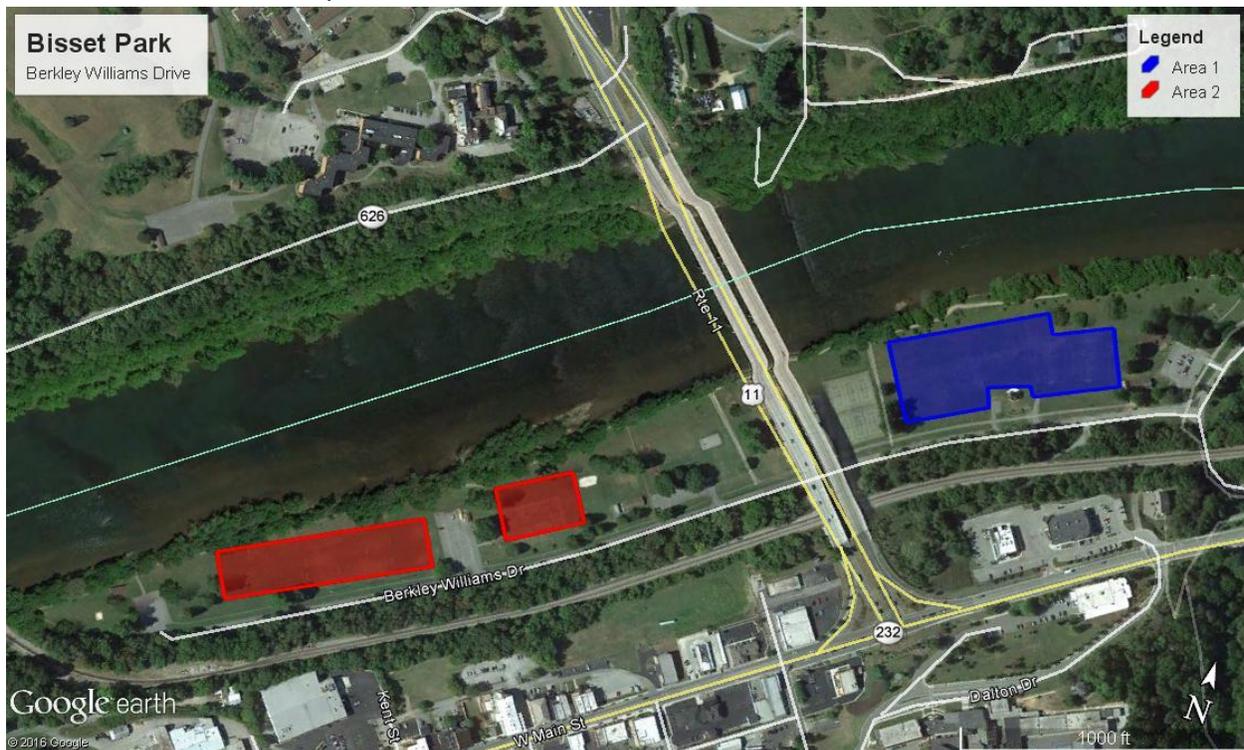
From Main Street turn onto New River Drive. The park is located between the Railroad and the New River.

Address: Berkley Williams Drive, Radford, VA 24141

GPS Coordinates: 37.138401, -80.569889

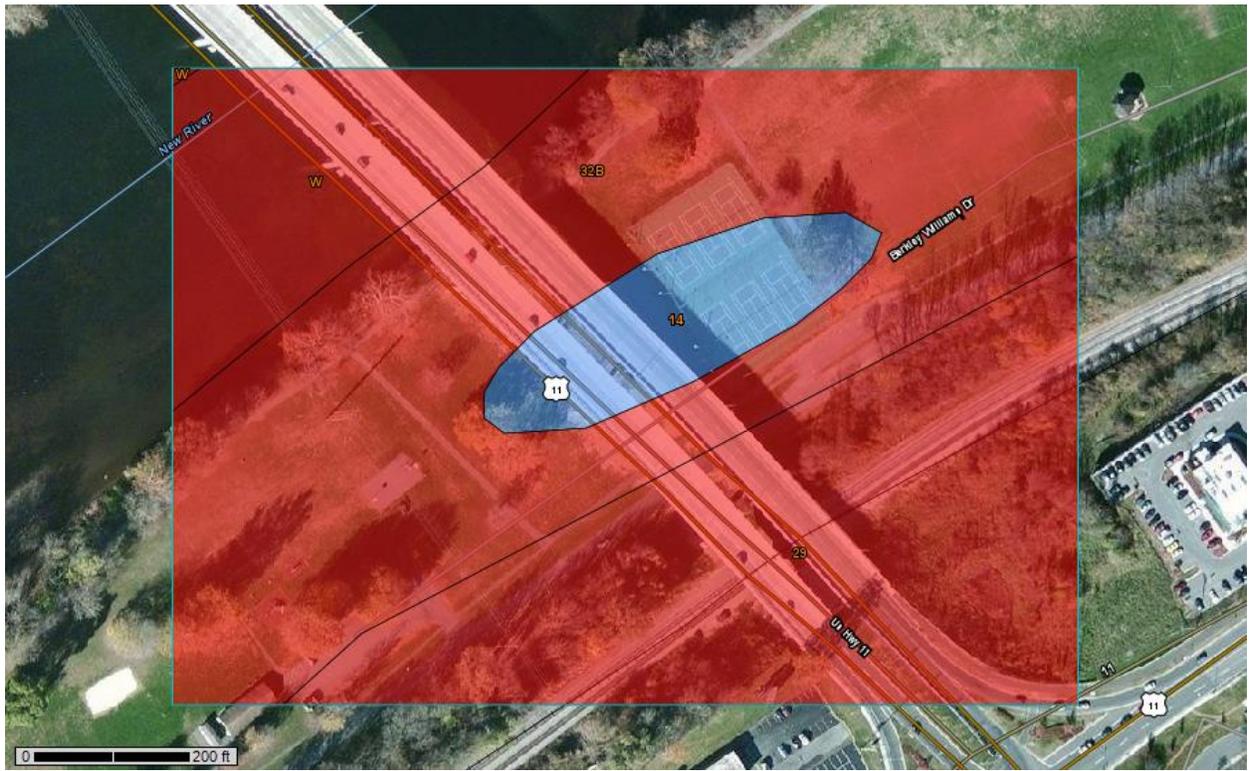
### C: Areas Managed

There are two fertilized sports field areas that are each 4.5 acres, cool season, and unirrigated. Area 1 is to the east of RT. 11 (Blue). Area 2 is the 2 areas to the west of RT. 11 (Red). Each area is divided into multiple soccer fields.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- The New River is located to the north of the field.
- According to Web Soil Survey, there is a frequent risk of flooding in the area under the bridge. Please refrain from making fertilizer applications when heavy rains are expected.



### **2.3. Dobbins Park**

#### **A: Description**

Dobbins Park is a multiuse field and playground.

#### **B: Location**

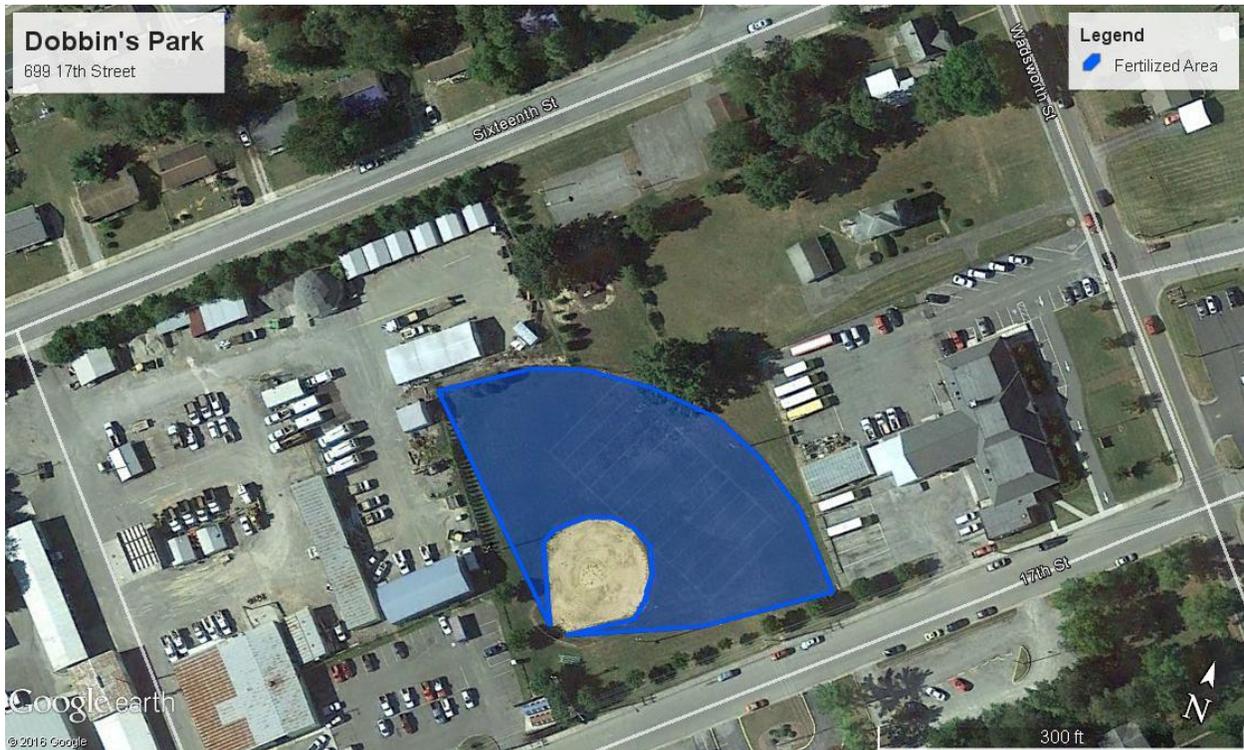
From Tyler Ave. turn west onto Rock Road, turn right onto Wadsworth St. and then left onto 17<sup>th</sup> St. Dobbins Park will be on the right.

Address: 699 17<sup>th</sup> Street, Radford, VA 24141

GPS Coordinates: 37.118594, -80.566579

#### **C: Areas Managed**

The multiple use field is 1 acre of unirrigated cool season turf.



#### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.

## 2.4. Dog Park

### A: Description

Sparky's Run Dog Park is located beside the Radford Animal Control Building.

### B: Location

From Main Street, on the campus of Radford University, cross the railroad tracks via University Drive heading toward the Deadmon Center. The Dog Park is located on Pulaski Street across University Drive from Cupp Stadium.

Address: 102 Pulaski Street, Radford, VA 24141

GPS Coordinates: 37.141040, -80.542378

### C: Areas Managed

The dog park is .9 acres of unirrigated cool season general turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- This facility is adjacent to the New River
- According to Web Soil Survey, there is no risk of flooding in this area.

## 2.5. Haven Heights

### A: Description

Haven Heights is a park located on Haven Drive.

### B: Location

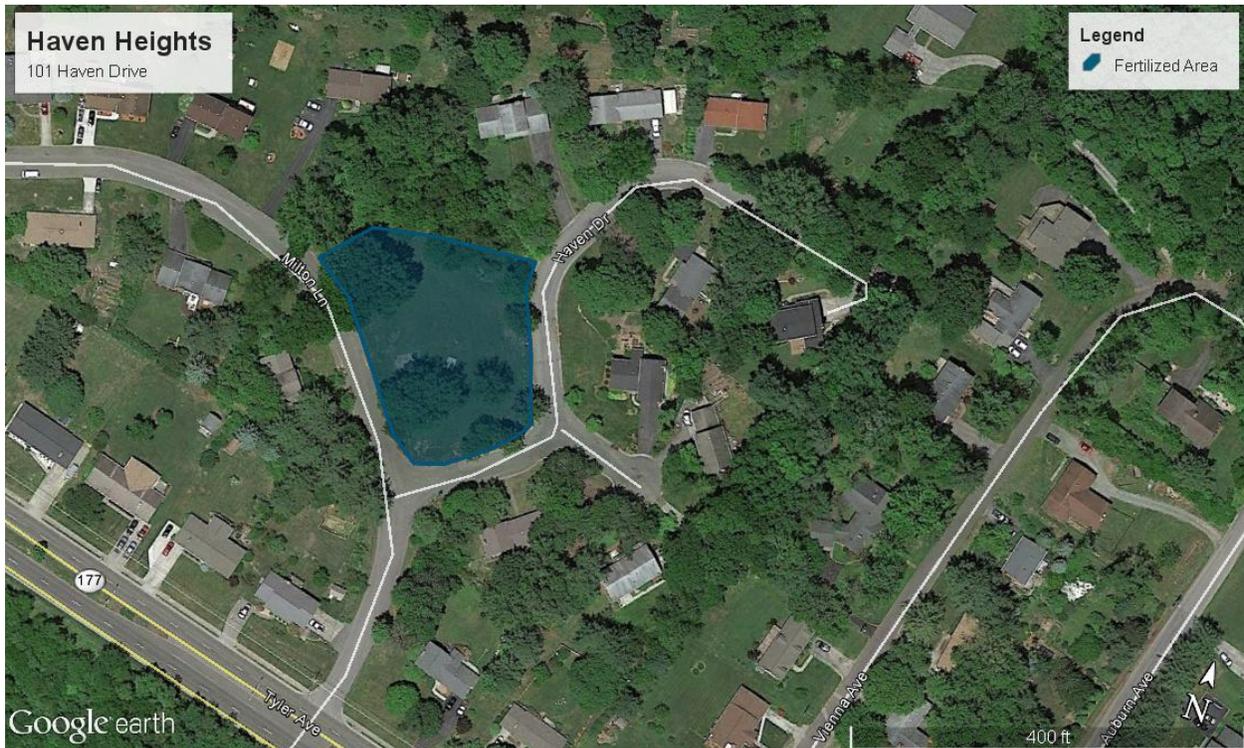
From Tyler Ave, turn on to Milton Drive across from Food Lion and Dollar General. The Park is located on corner of Milton and Haven Drives.

Address: 101 Haven Dr, Radford, VA 24141

GPS Coordinates: 37.129707, -80.543756

### C: Areas Managed

Haven Heights park is .9 acres of unirrigated cool season general turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- According to Web Soil Survey, there is no risk of flooding in this area.
- Please be cautious when making fertilizer applications in this area. It is the low point of the surrounding neighborhoods and is a drainage collection point.

## **2.6. High School Practice Field**

### **A: Description**

The practice field at the High School is maintained by the City of Radford.

### **B: Location**

From Main Street turn onto Walker Street. The practice field will be on left near tennis courts.

Address: 351 Walker St, Radford, VA 24141

GPS Coordinates: 37.134057, -80.570262

### **C: Areas Managed**

The practice field is 3.6 acres of unirrigated cool season turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- According to Web Soil Survey, there is no risk of flooding in this area.

## 2.7. Hodge Field

### A: Description

Hodge field is baseball/softball field.

### B: Location

From West Main Street turn onto Pendleton Street. Follow Pendleton until it ends at Preston Street. Field is located at this intersection.

Address: 1201 Preston St, Radford, VA 24141

GPS Coordinates: 37.118065, -80.575117

### C: Areas Managed

Hodge Field is .6 acres of unirrigated cool season turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- According to Web Soil Survey, there is no risk of flooding in this area.

## 2.8. McHarg Field

### A: Description

There is a multipurpose field located at Mcharg Elementary School.

### B: Location

From Tyler Ave. turn west onto Rock Road, turn right onto Wadsworth St. and continue to 12<sup>th</sup> Street. Field is located on left.

Address: 698 12th Street, Radford VA 24141

GPS Coordinates: 37.122886, -80.569398

### C: Areas Managed

McHarg Field is 2.7 acres of unirrigated cool season turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- According to Web Soil Survey, there is no risk of flooding in this area.

## 2.9. Medians

### A: Description

Grass medians are fertilized along Tyler Ave and West Main Street as well as the at the intersection of Main St. and Rte. 11.

### B: Location

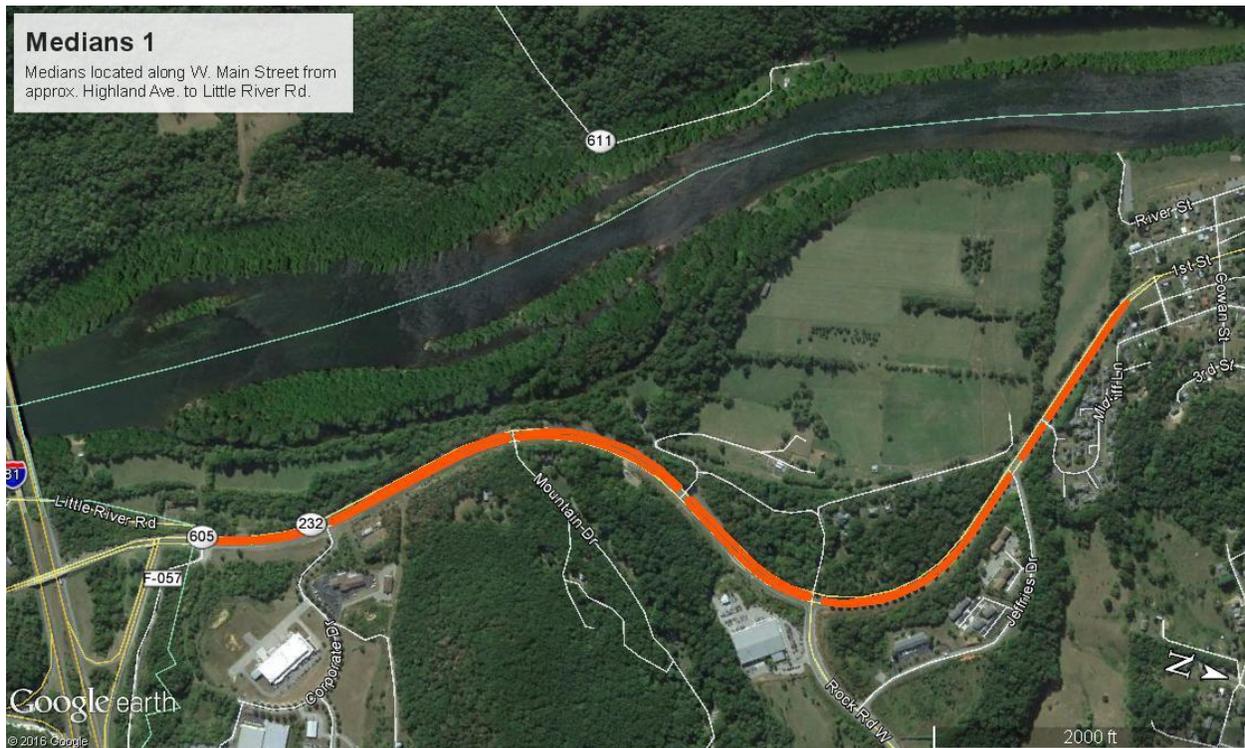
Medians on Tyler Ave from Rock Road to Main Street.

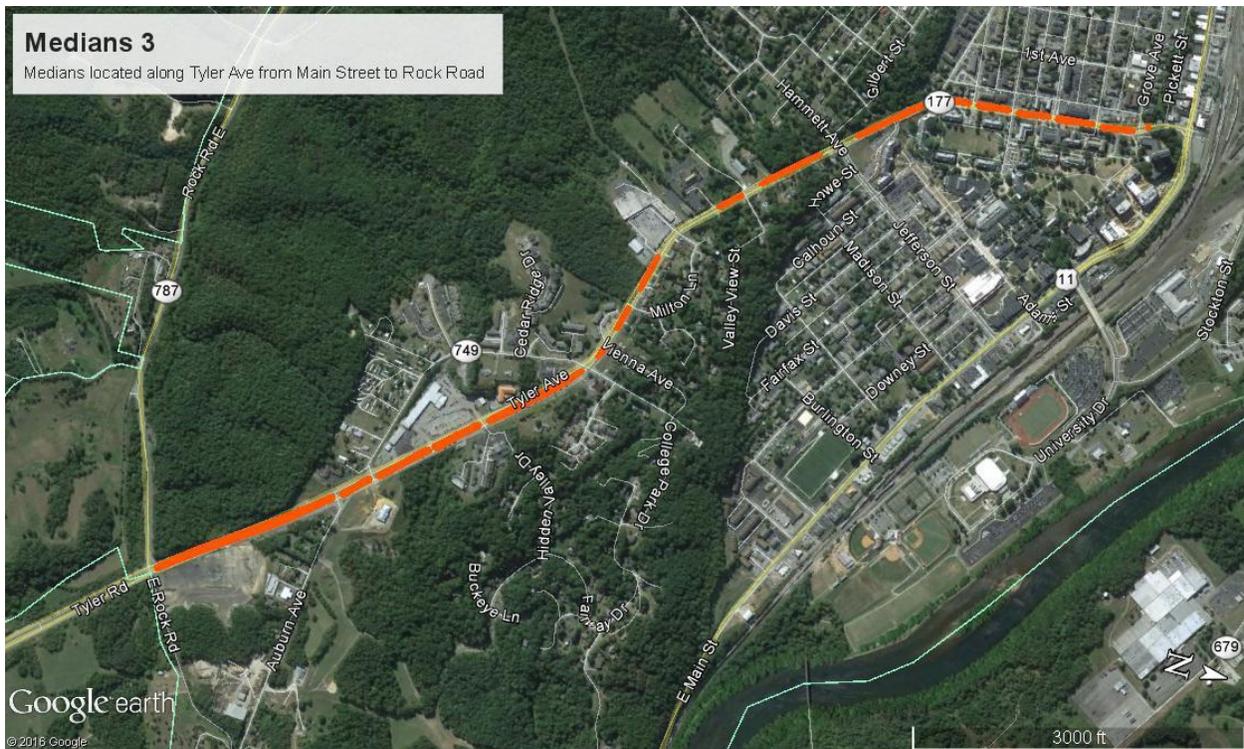
Medians on West Main Street from Highlands Ave. to Little River Road.

Medians at Rte. 11 and Main St.

### C: Areas Managed

The median areas are 10.7 acres of unirrigated cool season general turf.





**Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- According to Web Soil Survey, there is no risk of flooding in this area.
- Due to the nature of these areas it is best to fertilize only when rain is not forecasted.

## 2.10. New River Valley Complex

### A: Description

There are 3 fields at this location

### B: Location

From Main Street turn onto New River Drive. Bear to the right past Bisset Park. New River Valley Complex will be on the right.

Address: New River Dr., Radford, VA 24141

GPS Coordinates: 37.143881, -80.559809

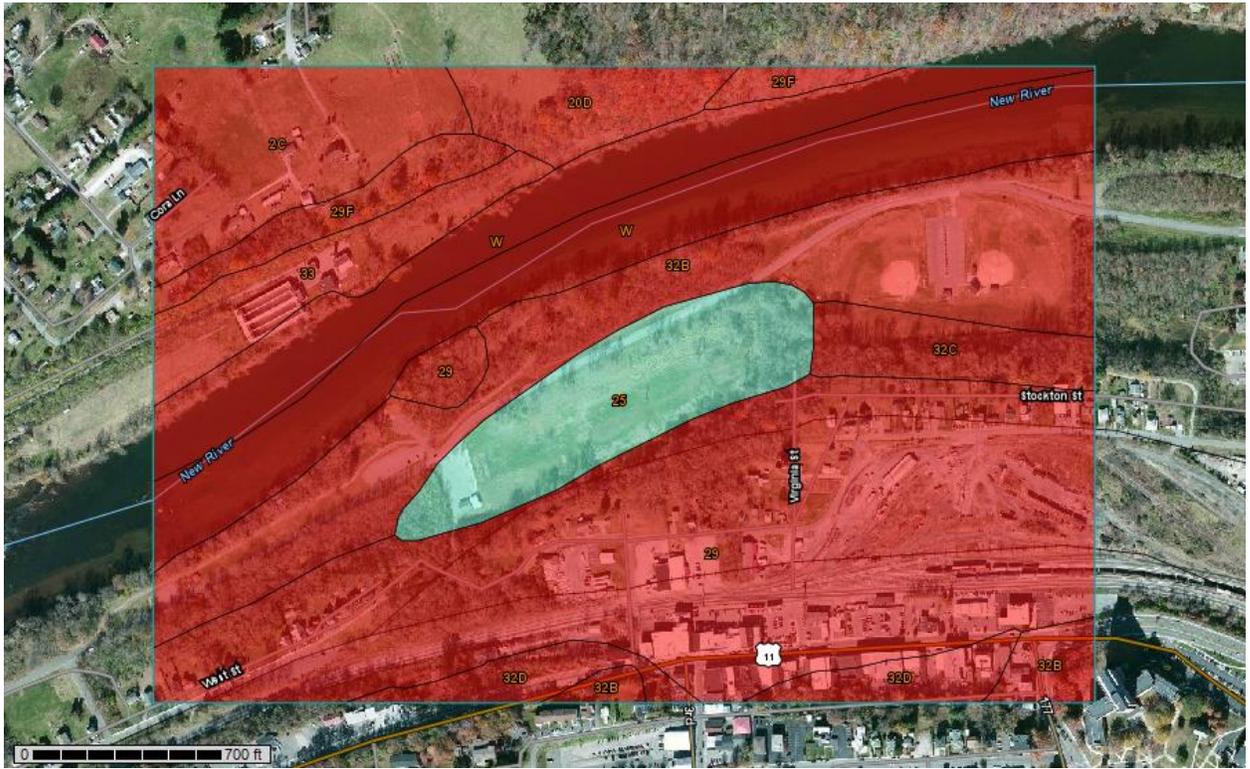
### C: Areas Managed

NRV Sports Complex is 3.6 acres of unirrigated cool season turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- The New River is located to the North of this site
- According to Web Soil Survey, there is occasional risk of flooding in this area. The construction of this park has occurred since the web soil survey data was compiled. The flooding risk may have been alleviated by this construction, but be aware that fertilizer should not be applied prior to rains that may cause flooding or ponding of water in this area.



## **2.11. Radford Memorial Field**

### **A: Description**

There is a baseball field at this location.

### **B: Location**

From Tyler Ave. turn onto Lawrence St. and then onto 2<sup>nd</sup> Ave continue past Belle Heth Elementary and turn right onto George Street. The field will be on the left.

Address: 151 George St, Radford, VA 24141

GPS Coordinates: 37.132721, -80.558222

### **C: Areas Managed**

Radford Memorial Field is 2.5 acres of unirrigated cool season turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- According to Web Soil Survey, there is no risk of flooding in this area.

## 2.12. Riverview Park

### A: Description

There is a soccer field at this location.

### B: Location

From West Main Street turn West onto Cowan Street and the left onto River Street. The field will be on the left.

Address: 2506 River St., Radford, VA 24141

GPS Coordinates: 37.108655, -80.591133

### C: Areas Managed

The multipurpose field is 1.5 acres of unirrigated cool season turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- The New River is to the West of this site.
- According to Web Soil Survey, there is occasional risk of flooding in this area. Be aware of the potential for flood causing rains prior to fertilization.



## 2.13. Sunset Park

### A: Description

There is a multipurpose field at this site.

### B: Location

From West Main Street turn onto Pendleton Street. Follow Pendleton until it ends at Preston Street. Turn left onto Preston Street, field is on left at corner of Preston and 8<sup>th</sup> Street.

Address: 900 8th St., Radford, VA 24141

GPS Coordinates: 37.122004, -80.578754

### C: Areas Managed

The multipurpose field is 1.2 acres of unirrigated cool season turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- According to Web Soil Survey, there is no risk of flooding in this area.
- The area in the north of the park that is not included in the fertilized area is a storm water retention pond. Please avoid fertilization of this park prior to heavy rains.

## 2.14. Veterans Park

### A: Description

There are 2 baseball/softball fields at this location

### B: Location

From Main Street turn onto New River Drive. Bear to the right past Bisset Park. Continue past New River Valley Complex. Veterans Park will be on the right.

Address: 1200 New River Dr., Radford, VA 24141

GPS Coordinates: 37.145359, -80.554947

### C: Areas Managed

Veterans Park has two baseball/softball fields that are a total of 3.3 acres of unirrigated cool season turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- The New River is to the North of this site.
- According to Web Soil Survey, there is no risk of flooding in this area.

## 2.15. Wildwood Park

### A: Description

The area around the trailhead parking lot is fertilized

### B: Location

From Tyler Ave. turn onto Lawrence St. and then onto 2nd Ave continue past Belle Heth Elementary. Continue on 2<sup>nd</sup> Ave to traffic circle. Bear right in the circle and trailhead parking lot will be on the right.

Address: 939 Park Rd, Radford, VA 24141

GPS Coordinates: 37.129742, -80.563210

### C: Areas Managed

Wildwood Park is .5 acres of unirrigated cool season general turf.



### **Environmentally Sensitive –**

- There are many roads, sidewalks and storm water drains throughout the area. Be cautious when making fertilizer applications near these areas and always clean up any fertilizers accidentally spread on pavement and sidewalks.
- The area to the north of the lot is a storm water retention pond. Please avoid fertilizing if heavy rains are expected.
- According to Web Soil Survey, there is no risk of flooding in this area.

### 3. Soil Test Summaries

Discussion of soil test results and allowable nutrient inputs. Specific applications details can be found in Nutrient Application Worksheet.

Soil samples were taken by Robert Habel on 3/8/16 and 3/29/16. A minimum of 10 random sub samples were collected, at a depth of 3-4 inches, using a soil probe and placed in plastic bags. Thatch and other organics were removed prior to boxing.

Soil tests are rated in terms of Very Low to Very High. In order to comply with Virginia Nutrient Management Standards and Criteria, Revised July 2014, no phosphorus or potassium may be applied if a soil test rates that element Very High. In economic terms, nutrients are not necessarily needed if they test above a medium rating; plant response is not guaranteed if soils already test above medium and therefore money can be saved by using a nitrogen only fertilizer. (See plant response chart page 36)

- Locations are only fertilized once a year in the spring. All locations will follow same program.
- Additional programs will be written to follow DCR framework using Max N. Minimal P will be suggested as all areas were in good condition.
- Application plans and Application Record sheets are grouped together. Additional blank record forms are available on included CD.

Soil Test Summary									
Customer Name:		City of Radford							
Testing Lab:		Waypoint Analytical							
Sample Date:		3/8/16 and 3/29/16							
Analysis Date:		4/15/2016							
Planner Name		Five Oaks Agronomy Consulting, LLC							
Certification Number		654							
Managed Area ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)	
Soil Test ID#									
RAD 01	Medians	7.50		16	4.1	L	104	73.8	M
RAD 02	River View Park	6.80		10	1.3	L-	159	112.9	H
RAD 03	Hodge Field	5.90	6.71	10	1.3	L-	152	107.9	H
RAD 04	Sunset park	6.00	6.76	15	3.6	L	237	168.3	VH
RAD 05	Dobbins	5.70	6.73	24	7.7	M-	172	122.1	H
RAD 06	Bisset #1	7.10		17	4.5	L	226	160.5	VH
RAD 07	Bisset #2	6.40		46	17.8	M+	243	172.5	VH
RAD 08	New River	6.20		24	7.7	M-	134	95.1	H-
RAD 09	Veterans Field	6.20		14	3.2	L	95	67.5	M
RAD 10	Dog Park	6.60		30	10.5	M-	174	123.5	H
RAD 11	Wildwood Park	7.50		59	23.8	H-	143	101.5	H-
RAD 12	Haven Heights	6.80		33	11.9	M	164	116.4	H
RAD 13	McHarg	6.10		11	1.8	L-	175	124.3	H
RAD 14	Belle Heth	6.70		18	5.0	L+	194	137.7	H
RAD 15	Radford Memorial	6.40		10	1.3	L-	169	120.0	H
RAD 16	High School	7.10		30	10.5	M-	260	184.6	VH

**All Locations –**

Every location will be treated the same. H- was the highest phosphorus level from all 16 soil tests. 1#/M P will be allowed. Potassium rated VH across several locations. At a level of VH 0#/M K is allowed, but since these are high use fields some K will be allowed since K helps turfgrass to deal with stress.

0.9 #/M of Nitrogen will be applied this will be a high slow release material to spread feeding over several month period.

Lime is need at several locations see section below for liming recommendations.

**Lime –**

Lime is needed at Hodge Field, Sunset Park and Dobbins Park. These applications are needed regardless of which application schedule you are following.

1.5 Tons of lime is required; this should be made in 3 apps of 50#/M. Spring and fall is the best time for lime application. Attempt to coordinate with aerification.

## Optional applications

### General Turf –

These locations are all fertilized common areas (non-sports turf).

Soil tests average medium (M) levels of phosphorus and high (H-) levels of potassium. 1.5 #/M of phosphorus is allowed. 1 #/M of potassium will be allowed.

Regulations allow for up to 3.5 lbs/M of nitrogen per year. If using 100% water-soluble nitrogen .7 lbs may be applied every 30 days. If using slow release materials, .9 lbs may be used every 30 days. Do not exceed stated per year total.

Soil Test Summary									
Customer Name:		City of Radford							
Testing Lab:		Waypoint Analytical							
Sample Date:		3/8/16 and 3/29/16							
Analysis Date:		4/15/2016							
Planner Name		Five Oaks Agronomy Consulting, LLC							
Certification Number		654							
Managed Area ID	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)	
Soil Test ID#									
RAD 01	Medians	7.50	16	4.1	L	104	73.8	M	
RAD 10	Dog Park	6.60	30	10.5	M-	174	123.5	H	
RAD 11	Wildwood Park	7.50	59	23.8	H-	143	101.5	H-	
RAD 12	Haven Heights	6.80	33	11.9	M	164	116.4	H	
<b>Average Results</b>				<b>12.5</b>	<b>M</b>		<b>103.8</b>	<b>H-</b>	
		<b>Lime</b>		<b>P</b>		<b>K</b>			
<b>Allowed Inputs</b>				<b>1.5 #/M</b>			<b>1 #/M</b>		

**Low Input fields (4 apps) –**

These fields all receive 4 apps of fertilizer. Irrigation may or may not be present.

Soil tests average low (L+) levels of phosphorus and high (H) levels of potassium. 2 #/M of phosphorus is allowed. 0.75 #/M of potassium will be allowed.

Regulations allow for up to 3 lbs/M of nitrogen per year. If using 100% water-soluble nitrogen .7 lbs may be applied every 30 days. If using slow release materials, .9 lbs may be used every 30 days. Do not exceed stated per year total.

Soil Test Summary									
Customer Name:		City of Radford							
Testing Lab:		Waypoint Analytical							
Sample Date:		3/8/16 and 3/29/16							
Analysis Date:		4/15/2016							
Planner Name		Five Oaks Agronomy Consulting, LLC							
Certification Number		654							
Managed Area ID	Soil Test ID#	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)
RAD 02	River View Park	6.80		10	1.3	L-	159	112.9	H
RAD 03	Hodge Field	5.90	6.71	10	1.3	L-	152	107.9	H
RAD 04	Sunset park	6.00	6.76	15	3.6	L	237	168.3	VH
RAD 05	Dobbins	5.70	6.73	24	7.7	M-	172	122.1	H
RAD 06	Bisset #1	7.10		17	4.5	L	226	160.5	VH
RAD 07	Bisset #2	6.40		46	17.8	M+	243	172.5	VH
RAD 08	New River	6.20		24	7.7	M-	134	95.1	H-
RAD 09	Veterans Field	6.20		14	3.2	L	95	67.5	M
RAD 13	McHarg	6.10		11	1.8	L-	175	124.3	H
RAD 14	Belle Heth	6.70		18	5.0	L+	194	137.7	H
RAD 15	Radford Memorial	6.40		10	1.3	L-	169	120.0	H
RAD 16	High School	7.10		30	10.5	M-	260	184.6	VH
<b>Average Results</b>					<b>5.5</b>	<b>L+</b>		<b>131.11</b>	<b>H</b>
			<b>Lime</b>		<b>P</b>		<b>K</b>		
<b>Allowed Inputs</b>					<b>2 #/M</b>		<b>0.75 #/M</b>		

#### **4. Nutrient Application Worksheets**

*The following worksheets detail specific fertilizer applications using the previously discussed soil test information. All nutrient input level recommendations come from the Department of Conservation and Recreation's Nutrient Management Standards and Criteria, this document is part of the Code of Virginia and thus is law for those required to have a Nutrient Management Plan. While applications do not have to be followed specifically, it is important to note that per month nitrogen levels shall not be exceeded and per year phosphorus levels shall not be exceeded. In some cases, potassium input may exceed recommended levels, as it does not have the same detrimental effects on the health of Virginia's waters as nitrogen and phosphorus. Potassium is considered the plant nutrient most responsible for quality. It helps plants respond to stresses like drought, extreme heat/cold, and insect/disease pressure. The plants increased ability to respond to stress in a positive manner can help reduce the need for increased N and P fertility and reseeding caused by stress.*

**NUTRIENT APPLICATION WORK SHEET**

<b>Name:</b>	City of Radford			<b>Management Area:</b>	All Locations								
<b>Prepared:</b>	6/1/2016			<b>Area:</b>	43.5	<b>Turf Type:</b>	Cool Season						
<b>Expires:</b>	6/1/2019												
<b>Total Yearly Nutrient Needs</b>	<b>Application Month/Day</b>	<b>Analysis N - P - K</b>	<b>Interval (days)</b>	<b>Fertilizer Description</b>	<b>Rate/M</b>	<b>lbs/app</b>	<b>% Slow Release N</b>	<b>Total/M N - P - K</b>			<b>Lime lbs/M</b>	<b>Gypsum</b>	<b>lbs/app lime/gyp</b>
<b>Nitrogen</b>	<b>No applications before March 14</b>												
3	April	25 - 2 - 5	30	20% XRT 40% NB	3.60	6821	83	0.90 - 0.07 - 0.18					
<b>Phosphorus</b>													
1													
<b>Potassium</b>													
0													
	<b>No applications after November 26</b>												
	<b>Lime</b>												
	<b>See soil test discussion for info on needed lime applications</b>												
							<b>Total used:</b>	0.90 - 0.07 - 0.18					
					<b>Do not exceed yearly maximum allowed by Regulation:</b>			<b>3.5 - 1 - 0</b>					
<b>Notes</b>	<ul style="list-style-type: none"> <li>• Please stay within frost free days indicated.</li> <li>• Application rates are based on use of at least 15% slow release fertilizer. 0.9 #/M N allowed if using at least 15% slow release nitrogen. If using less than 15% only 0.7 #/M nitrogen allowed.</li> <li>• All fertilizer analyses are subject to change; do not exceed stated monthly Total N or yearly total P. Please contact your planner if you need help adjusting a fertilizer application to meet the requirements of this plan.</li> </ul>												

**NUTRIENT APPLICATION WORK SHEET**

<b>Name:</b>	City of Radford			<b>Management Area:</b>	Medians, Dog Park, Haven Heights, Wildwood								
<b>Prepared:</b>	6/1/2016			<b>Area:</b>	13	<b>Turf Type:</b>	Cool Season						
<b>Expires:</b>	6/1/2019												
<b>Total Yearly Nutrient Needs</b>	<b>Application Month/Day</b>	<b>Analysis N - P - K</b>	<b>Interval (days)</b>	<b>Fertilizer Description</b>	<b>Rate/M</b>	<b>lbs/app</b>	<b>% Slow Release N</b>	<b>Total/M N - P - K</b>			<b>Lime lbs/M</b>	<b>Gypsum</b>	<b>lbs/app lime/gyp</b>
<b>Nitrogen</b>	<b>No applications before March 14</b>												
3.5	April	25 - 2 - 5	30	20% XRT 40% NB	3.20	1812	83	0.80 - 0.06 - 0.16					
<b>Phosphorus</b>													
1.5	September	16 - 2 - 3	30	50%CRN; 20% NB; 15%AS; 2%Fe; Micros	5.63	3185	50	0.90 - 0.11 - 0.17					
<b>Potassium</b>													
1	October	16 - 2 - 3	30	50%CRN; 20% NB; 15%AS; 2%Fe; Micros	5.63	3185	50	0.90 - 0.11 - 0.17					
	November	16 - 2 - 3	30	50%CRN; 20% NB; 15%AS; 2%Fe; Micros	5.63	3185	50	0.90 - 0.11 - 0.17					
	<b>No applications after November 26</b>												
	<b>Lime</b>												
							<b>Total used:</b>	3.50 - 0.40 - 0.67					
							<b>Do not exceed yearly maximum allowed by Regulation:</b>			3.5 - 1.5 - 1			
<b>Notes</b>	<ul style="list-style-type: none"> <li>•Tested M in Phosphorus and H- Potassium.</li> <li>• Please stay within frost free days indicated.</li> <li>• Application rates are based on use of atleast 15% slow release fertilizer. 0.9 #/M N allowed if using atleast 15% slow release nitrogen. If using less than 15% only 0.7 #/M nitrogen allowed.</li> <li>• All fertilizer analyses are subject to change; do not exceed stated monthly Total N or yearly total P. Please contact your planner if you need help adjusting a fertilizer application to meet the requirements of this plan.</li> </ul>												

**NUTRIENT APPLICATION WORK SHEET**

NUTRIENT APPLICATION WORK SHEET											
Name:	City of Radford			Management Area:	Sports fields						
Prepared:	6/1/2016			Area:	30.5	Turf Type:	Cool Season				
Expires:	6/1/2019										
Total Yearly Nutrient Needs	Application Month/Day	Analysis N - P - K	Interval (days)	Fertilizer Description	Rate/M	lbs/app	% Slow Release N	Total/M N - P - K	Lime lbs/M	Gypsum	lbs/app lime/gyp
<b>Nitrogen</b>	<b>No applications before March 14</b>										
3	April	25 - 2 - 5	30	20% XRT 40% NB	2.40	3189	83	0.60 - 0.05 - 0.12			
<b>Phosphorus</b>											
2	September	16 - 2 - 3	30	50%CRN; 20% NB; 15%AS; 2%Fe; Micros	5.00	6643	50	0.80 - 0.10 - 0.15			
<b>Potassium</b>											
0.75	October	16 - 2 - 3	30	50%CRN; 20% NB; 15%AS; 2%Fe; Micros	5.00	6643	50	0.80 - 0.10 - 0.15			
	November	16 - 2 - 3	30	50%CRN; 20% NB; 15%AS; 2%Fe; Micros	5.00	6643	50	0.80 - 0.10 - 0.15			
	<b>No applications after November 26</b>										
	Lime										
	<b>See soil test discussion for info on needed lime applications</b>										
						<b>Total used:</b>		3.00 - 0.35 - 0.57			
					<b>Do not exceed yearly maximum allowed by Regulation:</b>				<b>3 - 2 - 0.75</b>		
Notes	<ul style="list-style-type: none"> <li>•Tested M in Phosphorus and H- Potassium.</li> <li>• Please stay within frost free days indicated.</li> <li>• Application rates are based on use of atleast 15% slow release fertilizer. 0.9 #/M N allowed if using atleast 15% slow release nitrogen. If using less than 15% only 0.7 #/M nitrogen allowed.</li> <li>• All fertilizer analyses are subject to change; do not exceed stated monthly Total N or yearly total P. Please contact your planner if you need help adjusting a fertilizer application to meet the requirements of this plan.</li> </ul>										



## 6. Reference Material

Nutrient Availability According to pH

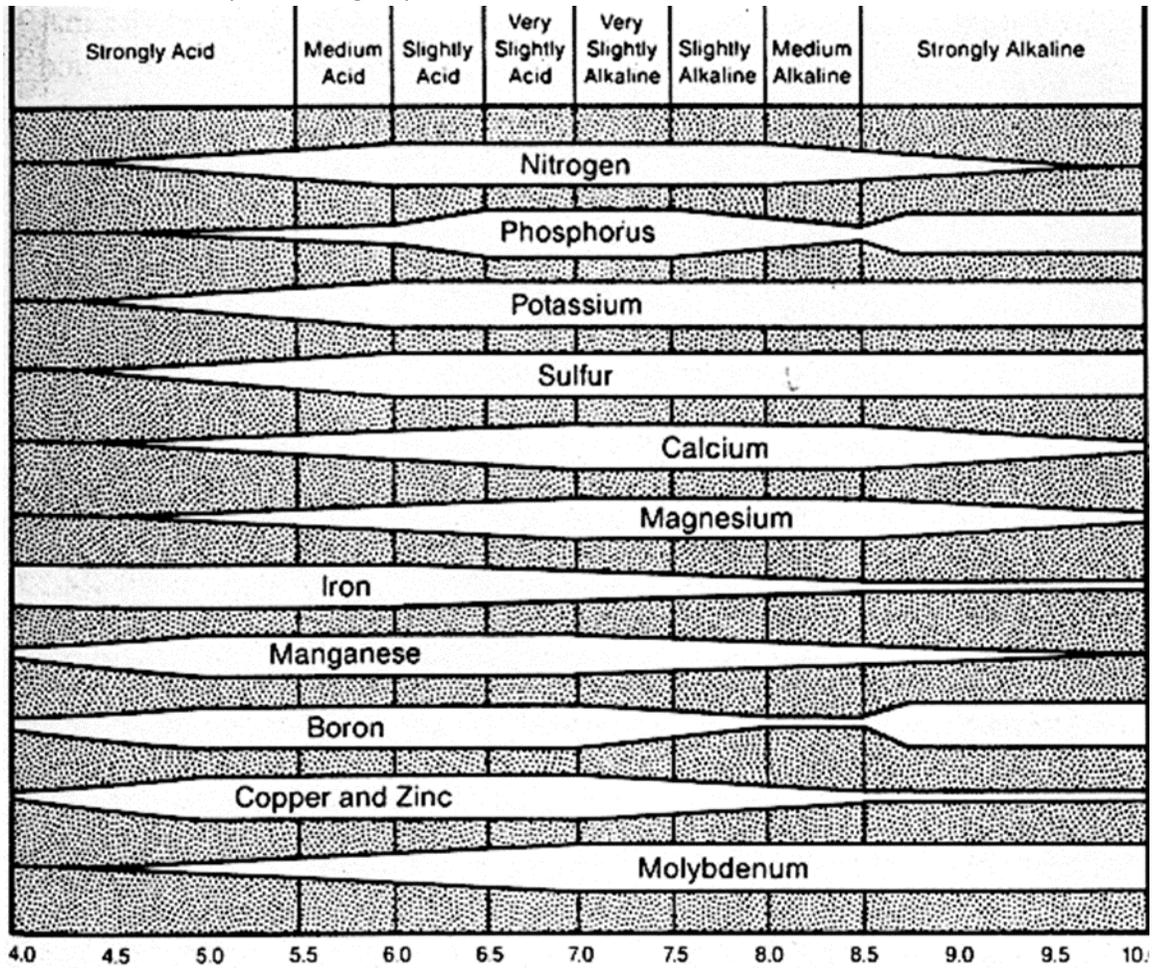


Figure 1: Nutrient Availability at pH

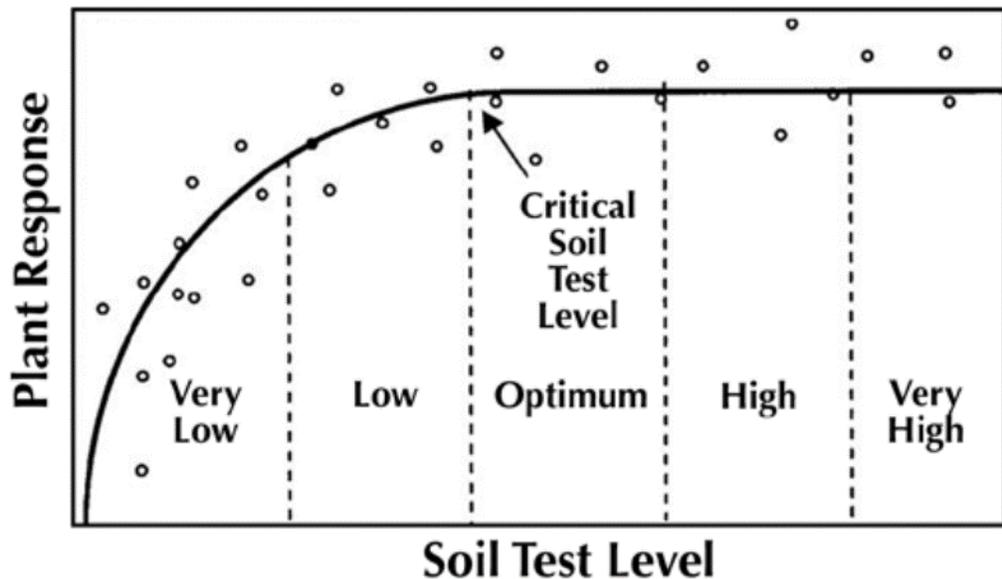


Figure 2: Plant Response Chart

**Very low:** A plant response is most likely if the indicated nutrient is applied. A large portion of the nutrient requirement must come from fertilization.

**Low:** A plant response is likely if the indicated nutrient is applied. A portion of the nutrient requirement must come from fertilization.

**Medium:** A plant response may or may not occur if the indicated nutrient is applied. A small portion of the nutrient requirement must come from fertilization.

**High:** Plant response is not expected. No additional fertilizer is needed.

**Very high:** Plant response is not expected. The soil can supply much more than the turf requires. Additional fertilizer should not be added to avoid nutritional problems and adverse environmental consequences.

## **Standards and Criteria**

### **Section VI. Turfgrass Nutrient Recommendations for Home Lawns, Office Parks, Public Lands and Other Similar Residential/Commercial Grounds**

#### **Definitions**

For the purposes of this section, the following definitions, as presented by the Association of American Plant Food Control Officials (AAPFCO), apply:

“Enhanced efficiency fertilizer” describes fertilizer products with characteristics that allow increased plant nutrient availability and reduce the potential of nutrient losses to the environment when compared to an appropriate reference product.

“Slow or controlled release fertilizer” means a fertilizer containing a plant nutrient in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant significantly longer than a reference “rapidly available nutrient fertilizer” such as ammonium nitrate, urea, ammonium phosphate or potassium chloride. A slow or controlled release fertilizer must contain a minimum of 15 percent slowly available forms of nitrogen.

“Water soluble nitrogen”, “WSN”, or “readily available nitrogen” means: Water soluble nitrogen in either ammonical, urea, or nitrate form that does not have a controlled release, or slow response.

#### **Recommended Season of Application For Nitrogen Fertilizers - Applies to all Turf**

A nitrogen fertilization schedule weighted toward fall application is recommended and preferred for agronomic quality and persistence of cool season turfgrass; however, the acceptable window of applications is much wider than this for nutrient management. The nutrient management recommended application season for nitrogen fertilizers to cool season turfgrasses begins six weeks prior to the last spring average killing frost date and ends six weeks past the first fall average killing frost date (see Figures 6-1 & 6-2). Applications of nitrogen during the intervening late fall and winter period should be avoided due to higher potential leaching or runoff risk, but where necessary, apply no more than 0.5 pounds per 1,000 ft<sup>2</sup> of water soluble nitrogen within a 30-day period. Higher application rates may be used during this late fall and winter period by using materials containing slowly available sources of nitrogen, if the water soluble nitrogen contained in the fertilizer does not exceed the recommended maximum of 0.5 pounds per 1,000 ft<sup>2</sup> rate. Do not apply nitrogen or phosphorus fertilizers when the ground is frozen.

The acceptable nitrogen fertilizer application season for non-overseeded warm season turfgrass begins no earlier than the last spring average killing frost date and ends no later than one month prior to the first fall average killing frost date (see Figures 6-1 & 6-2).

Figure 6-1

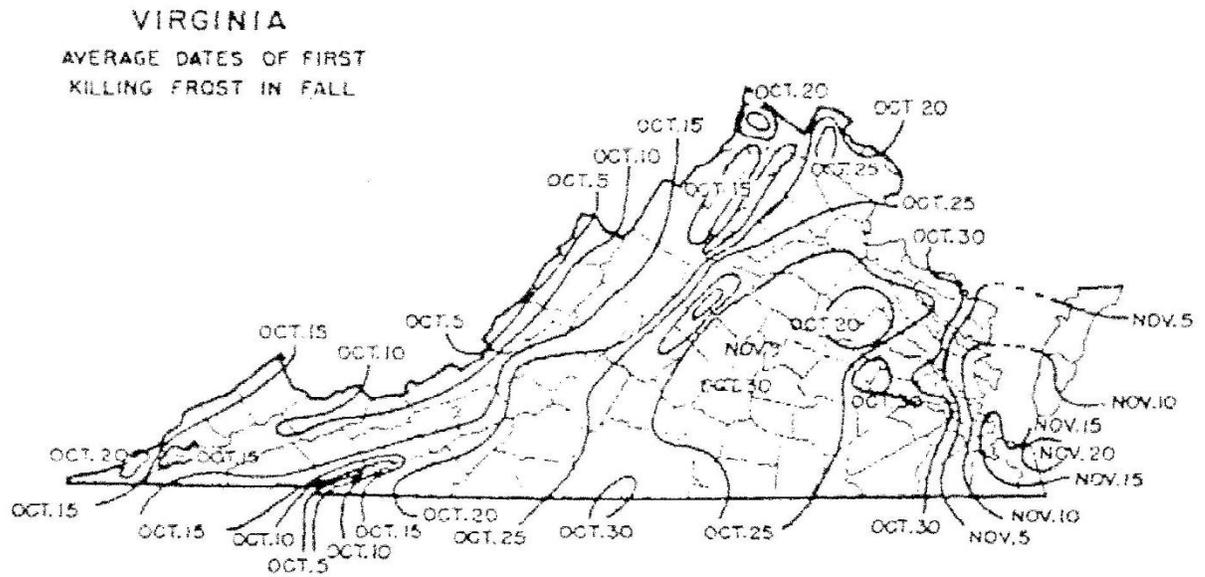
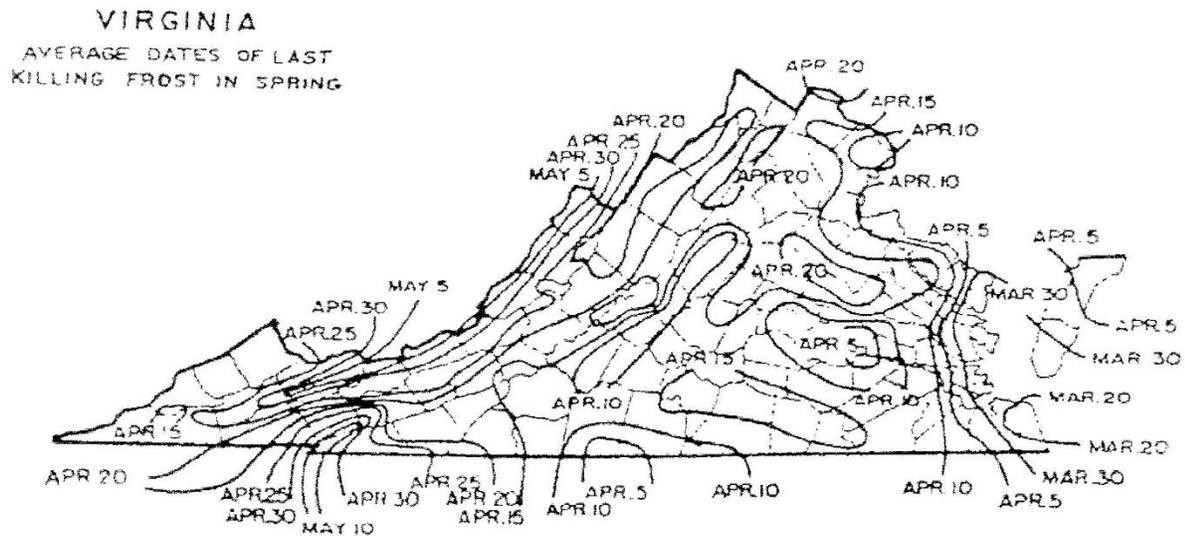


Figure 6-2



### Per Application Rates

Do not apply more than 0.7 pounds of water soluble nitrogen per 1,000 ft<sup>2</sup> within a 30-day period. For cool season grasses, do not apply more than 0.9 pounds of total nitrogen per 1,000 ft<sup>2</sup> within a 30-day period. For warm season grasses, do not apply more than 1.0 pounds of total nitrogen per 1,000 ft<sup>2</sup> within a 30-day period. Lower per application rates of water soluble nitrogen sources or use of slowly available nitrogen sources should be utilized on very permeable sandy soils, shallow soils over fractured bedrock, or areas near water wells.

### Annual Application Rates for Home Lawns and Commercial Turf

Up to 3.5 pounds per 1,000 ft<sup>2</sup> of nitrogen may be applied annually to cool season grass species or up to 4 pounds per 1,000 ft<sup>2</sup> may be applied annually to warm season grass species using 100 percent water soluble nitrogen sources. Lower rates of nitrogen application may be desirable on those mature stands of grasses that require less nitrogen for long-term quality. As a result, lower application rates will probably be more suited to the fine leaf fescues (hard fescue, chewings fescue, creeping red fescue, and sheep fescue) and non-overseeded zoysiagrass. Lower rates should also be used on less intensively managed areas.

### Use of Slowly Available Forms of Nitrogen

For slow or controlled release fertilizer sources, or enhanced efficiency fertilizer sources, no more than 0.9 pounds of nitrogen per 1,000 ft<sup>2</sup> may be applied to cool season grasses within a 30-day period and no more than 1.0 pounds of nitrogen per 1,000 ft<sup>2</sup> may be applied to warm season grasses within a 30-day period.

Provided the fertilizer label guarantees that the product can be used in such a way that it will not release more than 0.7 pounds of nitrogen per 1,000 ft<sup>2</sup> in a 30-day period, no more than 2.5 pounds of nitrogen per 1,000 ft<sup>2</sup> may be applied in a single application. Additionally, total annual applications shall not exceed 80 percent of the annual nitrogen rates for cool or warm season grasses.

### Phosphorus and Potassium Nutrient Needs (Established Turf)

Apply phosphorus (P<sub>2</sub>O<sub>5</sub>) and potassium (K<sub>2</sub>O) fertilizers as indicated necessary by a soil test using the following guidelines:

<u>Soil Test Level</u>	<u>Nutrient Needs (pounds per 1,000 ft<sup>2</sup>)*</u>	
	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

\* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range. (For example the recommendation for a P<sub>2</sub>O<sub>5</sub> soil test level of L- would be 3 pounds per 1,000 ft<sup>2</sup>.)

Do not use high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

## Recommendations for Establishment of Turf

These recommendations are for timely planted turfgrass, that is, the seed or vegetative material (sod, plugs, and /or sprigs), are planted at a time of the year when temperatures and moisture are adequate to maximize turfgrass establishment. These recommended establishment periods would be late summer to early fall for cool-season turfgrasses and late spring through mid-summer for warm-season turfgrasses.

### Nitrogen Applications

At the time of establishment, apply no more than 0.9 pounds per 1,000 ft<sup>2</sup> of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft<sup>2</sup> of total nitrogen for warm season grasses, using a material containing slowly available forms of nitrogen, followed by one or two applications beginning 30 days after planting, not to exceed a total of 1.8 pounds per 1,000 ft<sup>2</sup> total for cool season grasses and 2.0 pounds per 1,000 ft<sup>2</sup> for warm season grasses for the establishment period. Applications of WSN cannot exceed more than 0.7 pounds per 1,000 ft<sup>2</sup> within a 30-day period.

### Phosphorus and Potassium Recommendations for Establishment

<u>Soil Test Level</u>	<u>Nutrient Needs (pounds per</u>	
	<u>1,000 ft<sup>2</sup>) *</u>	
	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>
L	3-4	2-3
M	2-3	1-2
H	2-1	0.5-1
VH	0	0

\* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.

## Nutrient Recommendations for Golf Courses

### Nitrogen Timing

The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date maps contained in the Season of Application for Nitrogen section, Figures 6-1 and 6-2.

If the full rate or the highest rate of the recommendation range for a monthly application is applied in a single application, then the interval of application for nitrogen shall be at least 30 days to allow turf to utilize previous nitrogen applications. If several applications are to be made for the monthly nitrogen rate, then the timing of the applications shall be at approximately even intervals, with the rate per application to be evenly divided between each application with the total nitrogen applied not to exceed the maximum monthly rate. Use of Water Insoluble Nitrogen forms of Nitrogen is encouraged.

### Nitrogen Rates

	Grass Type	Maximum WSN Rate Per Application - pounds per 1,000 ft <sup>2</sup>	Total Annual Nitrogen Rate - pounds per 1,000 ft <sup>2</sup> <sup>a</sup>
Greens		0.7 <sup>(b)</sup>	3-6
Tees		0.7 <sup>(b)</sup>	2-5
Fairways	Cool Season	0.7 <sup>(c)</sup>	2-3
	Warm Season	0.7 <sup>(c)</sup>	3-4
Fairways – Intensive Management	Cool Season	0.5 <sup>(d)</sup>	3-4
	Warm Season	0.5 <sup>(d)</sup>	3.5-4.5
	Overseeding Warm Season Fairways	.5	1.25
Roughs		0.7 <sup>(e)</sup>	1-3

### Fairways-Overseeding Warm Season Fairways

- For warm season grasses, up to 0.7 pounds of nitrogen per 1,000 ft<sup>2</sup> in a 30-day period may be applied in the Fall after perennial ryegrass overseeding is well established. An additional nitrogen application of 0.7 pounds per 1,000 ft<sup>2</sup> may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Applications using WSN may not exceed 0.7 pounds per 1,000 ft<sup>2</sup> within a 30-day period.
- Soluble nitrogen rates of 0.25 pounds per 1,000 ft<sup>2</sup> or less which may be a component of a pesticide or minor element application, may be applied any time during the application windows described in Recommended Season of Application for Nitrogen Fertilizers of this section, but must be considered with the total annual nitrogen application rate.

(a) Use higher rates for intensively used turf where accelerated growth and/or rapid recovery are required, use lower rates for maintenance of lesser used areas; do not exceed total annual nitrogen levels as stated above.

- (b) Greens and Tees – Per application timing must be a minimum of 30 days between applications. A rate of 0.9 pounds per 1,000 ft<sup>2</sup> of total nitrogen may be applied for cool season grasses or 1.0 pounds per 1,000 ft<sup>2</sup> of total nitrogen may be applied for warm season grasses using a material containing slowly available forms of nitrogen.
- (c) Fairways-Normal Management (Non-Irrigated or Irrigated) - Per Application timing must be a minimum of 30 days between applications. Total nitrogen application rates of 0.9 pounds per 1,000 ft<sup>2</sup> of total nitrogen may be applied for cool season grasses or 1.0 pound per 1,000 ft<sup>2</sup> of total nitrogen may be applied for warm season grasses using a material containing slowly available forms of nitrogen.
- (d) Fairways-Intensive Management (Irrigated)- Per Application timing must be a minimum of 15 days between applications. This option requires optimized timing of more frequent applications of nitrogen with lesser rates per application. Alternatively, a maximum application rate of 0.9 pounds per 1,000 ft<sup>2</sup> of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft<sup>2</sup> of total nitrogen for warm season grasses using a material containing slowly available forms of nitrogen may be applied with a minimum of 30 days between applications.
- (e) Foliar fertilizer may be applied to warm season grasses within 30 days prior to the first killing frost in the fall, at a rate not to exceed 0.1 pounds per 1,000 ft<sup>2</sup> of nitrogen per application. This application must be accounted for in the total annual nitrogen rate.

**Phosphorus and Potassium Recommendations for Established Golf Courses**

Apply phosphorus (P<sub>2</sub>O<sub>5</sub>) and potassium (K<sub>2</sub>O) fertilizers as indicated by a soil test using the following guidelines:

<u>Soil Test Level</u>	<u>Nutrient Needs (pounds per 1,000 ft<sup>2</sup>)*</u>	
	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

- \* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.
- For irrigated turf grown on Naturally Occurring and Modified Sand Based soils only, up to 0.5 pounds of P<sub>2</sub>O<sub>5</sub> per 1,000 ft<sup>2</sup> may be applied, if needed, to aid in recovery of damaged turf during times of extreme use. No phosphorus applications shall be made when the soil phosphorus test level is above 65% saturation, based on the soil test phosphorus values and region as listed in Table 4-1 of Section IV.
- Avoid the general use of high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

**Nitrogen Management on Athletic Fields - Cool Season Grasses**

- This program is intended for those fields which are under heavy use.
- Nitrogen recommendations are based on the assumption that there is adequate soil moisture to promote good turf growth at the time of application. If no rainfall has occurred since the last application, further applications should be delayed until significant soil moisture is available.

Cool Season Grasses	Maintenance Program <sup>a</sup>	
	Normal	Intensive
When to Apply <sup>b</sup>	Pounds per 1,000 ft <sup>2</sup> Nitrogen	
After August 15	-----	<u>0.5</u>
September	<u>0.7</u>	<u>0.7<sup>c</sup></u>
October	<u>0.7<sup>c</sup></u>	<u>0.7<sup>c</sup></u>
November	0.5	<u>0.7<sup>c</sup></u>
April 15 - May 15	0.5	0.5
June 1 - June 15	----	0.5

**Notes:**

- Soluble nitrogen rates of 0.25 pounds per 1,000 ft<sup>2</sup> or less which may be a component of a pesticide or minor element application may be applied any time the turf is actively growing, but must be considered with the total annual nitrogen application rate.
  - WSN = water soluble nitrogen; WIN = water insoluble nitrogen
- (a) Intensive managed areas must be irrigated.
- (b) The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date maps contained in the preceding Season of Application for Nitrogen section, using Figures 6-1 and 6-2.
- (c) Rates up to 0.9 pounds per 1,000 ft<sup>2</sup> of total nitrogen can be applied using a material containing slowly available forms of nitrogen, with a minimum of 30 days between applications.
- (d) Make this application only if turf use warrants additional nitrogen for sustaining desirable growth and /or color.

**Nitrogen Management on Athletic Fields - Warm Season Grasses**

The following comments apply to both Naturally Occurring or Modified Sand based Fields and Predominantly Silt/Clay Soil Fields:

- Annual nitrogen rates for warm season grasses shall not exceed **4 pounds** in areas which have the average first killing frost on or before October 20, and shall not exceed **5 pounds** in areas which have the average first killing frost after October 20 as shown in Figure 6-1. Nitrogen rates and timings for overseeding warm season grasses are not included in these rates.
- April 15 - May 15 applications should not be made until after complete green-up of turf.
- Nitrogen applications June through August should be coordinated with anticipated rainfall if irrigation is not available.
- Use the lower end of the ranges for non-irrigated fields and the higher end of the ranges should be used on fields with irrigation.

- Nitrogen rates towards the higher end of the ranges may be applied on heavily used fields to accelerate recovery, however per application and annual rates cannot be exceeded.

<b>Bermudagrass - Predominantly Silt/Clay Soil Fields <sup>a</sup></b>		
<b>When to Apply<sup>b</sup></b>	<b>Pounds per 1,000 ft<sup>2</sup> Nitrogen<sup>e</sup></b>	<b>First Fall Killing Frost Date<sup>b</sup></b>
April 15 - May 15	0.5- 0.7 <sup>(c)</sup>	Before Oct. 20
June	0.7	
July	0.5 - 0.7 <sup>(d)</sup>	
August	0.5 - 0.7 <sup>(d)</sup>	
Sept 1 - Sept 15	0.5 -0.7 <sup>(c)</sup>	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 <sup>(e)</sup>	
Feb-Mar	0.5 <sup>(e)</sup>	

<b>Bermudagrass - Naturally Occurring or Modified Sand based Fields <sup>a</sup></b>		
<b>When to Apply<sup>b</sup></b>	<b>Pounds per 1,000 ft<sup>2</sup> Nitrogen</b>	<b>First Fall Killing Frost Date<sup>b</sup></b>
April 15 - May 15	0.5 -0.7 <sup>(c)</sup>	Before Oct. 20
June1	0.7 <sup>(c)</sup>	
July	0.7 <sup>(c)</sup>	
August	0.7 <sup>(c)</sup>	
Sept 1 - Sept 15	0.7 <sup>c</sup>	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 <sup>(e)</sup>	
Feb - Mar	0.5 <sup>(e)</sup>	

The following notes apply to both of the Bermudagrass tables above:

- (a) In the Piedmont and the Ridge and Valley areas of Virginia, the existing native soil will normally be comprised predominantly of clay and/or silt and these soils have inherently lower water infiltration and percolation rates and greater nutrient holding capacity. However, most areas of the Coastal Plain have existing native soils that are predominantly sandy textured soils and other facilities throughout the state may choose to install modified soil root zones that are predominantly sand (>50%) in order to maximize drainage and reduce compaction tendency. If subsurface drain tile surrounded by sand and/or gravel has been installed under the playing surface of any of these fields, their nitrogen programs should be managed as predominantly sand-based systems to minimize nutrient leaching.
- (b) The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date maps contained in the Season of Application for Nitrogen section, Figures 6-1 and 6-2.
- (c) WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft<sup>2</sup> each with a minimum of 15 days between applications. Alternatively, using a material that contains slowly available nitrogen sources, split applications of 0.5 pounds per 1,000 ft<sup>2</sup> may be applied with a minimum of 15 days between applications.

- (d) If a material containing slowly available forms of nitrogen is used, rates up to 1.0 pounds of nitrogen per 1,000 ft<sup>2</sup> may be applied in a single application with a minimum of 30 days between applications.
- (e) For overseeded warm season grasses, an additional 0.7 pounds per 1,000ft<sup>2</sup> of WSN may be applied in the Fall after the perennial ryegrass overseeding is well established. The WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft<sup>2</sup> of nitrogen each, with a minimum of 15 days between applications. Additional WSN application of 0.5 pounds per 1,000 ft<sup>2</sup> may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Alternatively, split applications of 0.5 pounds of nitrogen per 1,000 ft<sup>2</sup> each with a minimum of 15 days between applications may be applied using a material containing slowly available nitrogen sources.

**Phosphorus and Potassium Recommendations Athletic Fields**

Apply phosphorus (P<sub>2</sub>O<sub>5</sub>) and potassium (K<sub>2</sub>O) fertilizers as indicated by a soil test using the following guidelines:

<u>Soil Test Level</u>	<u>Nutrient Needs (pounds per 1,000 ft<sup>2</sup>)*</u>	
	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

- \* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.
- For irrigated turf grown on Naturally Occurring and Modified Sand Based soils only, up to 0.5 pounds of P<sub>2</sub>O<sub>5</sub> per 1,000 ft<sup>2</sup> may be applied, if needed, to aid in recovery of damaged turf during times of extreme use. No phosphorus applications shall be made when the soil phosphorus test level is above 65% saturation, based on the soil test phosphorus values and region as listed in Table 4-1 of Section IV.
- Avoid the general use of high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

## **Establishment/Grow-In Recommendations for Golf Courses, Athletic Fields, and Sod Production**

(These rates replace normal maintenance fertilizer applications that would have occurred during these time periods.)

### **Warm Season Grasses:**

#### **Predominantly Silt/Clay Soils**

- ◆ Plant Date - late May -June for sprigs, plugs, sod, or seeding.
- ◆ Apply  $P_2O_5$  and  $K_2O$  as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- ◆ At Planting - Up to 1.0 pounds of nitrogen per 1,000 ft<sup>2</sup> using a material containing slowly available forms of nitrogen may be applied as one application or lesser amounts applied at regular intervals, through the first 4 weeks, not to exceed a total of 1.0 pounds of nitrogen per 1,000ft<sup>2</sup>.
- ◆ Four weeks after planting - 0.25 pounds.of WSN per 1,000 ft<sup>2</sup> per week for the next 4 weeks.

#### **Naturally Occurring or Modified Sand Based Soils**

- ◆ Plant Date - late May -June for sprigs, plugs, sod, or seeding.
- ◆ Apply  $P_2O_5$  and  $K_2O$  as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- ◆ At Planting - Up to 1.0 pounds of nitrogen per 1,000 ft<sup>2</sup> using a material containing slowly available forms of nitrogen may be applied as one application or lesser amounts at regular intervals through the first 4 weeks, not to exceed a total of 1.0 pounds of nitrogen per 1,000 ft<sup>2</sup>.
- ◆ Four weeks after planting - 0.25 pounds per1,000 ft<sup>2</sup> using a material containing slowly available forms of nitrogen per week for the next 4 weeks.

### **Cool Season Grasses:**

#### **Predominantly Silt/Clay Soils**

- ◆ Plant Date - August - September (preferred)
- ◆ Apply  $P_2O_5$  and  $K_2O$  as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- ◆ At Planting - up to 0.9 pounds of nitrogen per 1,000 ft<sup>2</sup> using a material containing slowly available forms of nitrogen may be applied; 30 days after planting, apply up to 0.5 pounds of nitrogen per 1,000 ft<sup>2</sup> every week for the next 4 weeks.

#### **Naturally Occurring or Modified Sand Based Soils**

- ◆ Plant Date - August -September (preferred)
- ◆ Apply  $P_2O_5$  and  $K_2O$  as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- ◆ At Planting - up to 0.9 pounds of nitrogen per 1,000 ft<sup>2</sup> using a material containing slowly available forms of nitrogen may be applied.
- ◆ Apply up to 0.25 pounds of nitrogen per 1,000 ft<sup>2</sup> per week after germination is complete, for the next 8 weeks. If using a material that contains slowly available forms of nitrogen, up to 0.5 pounds of nitrogen per 1,000 ft<sup>2</sup> every two weeks may be applied after germination is complete for the next 8 weeks.

**Sod Installations:**

Site preparation should include a soil test, which can be done several months before the project begins in order to have time to get test results back. Phosphorus, potassium and lime applications should be based on soil test analysis to increase the likelihood of a successful installation. Shallow incorporation of material into the top 2 inches of the soil is preferred prior to sod installation, especially if lime is required.

No more than 0.7 pounds of nitrogen per 1,000 ft<sup>2</sup> of WSN may be applied before sod is installed. Alternatively, using a material with slowly available forms of nitrogen, 0.9 pounds of nitrogen per 1,000 ft<sup>2</sup> for cool season grasses or 1.0 pounds of nitrogen per 1,000 ft<sup>2</sup> for warm season grasses may be applied before sod is installed.

After installation apply adequate amounts of water to maintain sufficient soil moisture (i.e. to prevent visible wilt symptoms). Excessive water will limit initial root development. After roots begin to establish (as verified by lightly tugging on the sod pieces), shift irrigation strategy to a deep and infrequent program in order to encourage deep root growth. Apply approximately 1 inch of water per week (either by rainfall or irrigation), making sure that the water is being accepted by the soil profile without running off. This will insure thorough wetting of the soil profile.

After sod has completed rooting and is well established, initiate the normal nitrogen management program as described for the appropriate use shall be recommended.

**Phosphorus and Potassium Recommendations for Establishment/Grow-In/Installation**

<u>Soil Test Level</u>	<u>Nutrient Needs (pounds per 1,000 ft<sup>2</sup>)*</u>	
	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>
L	3-4	2-3
M	2-3	1-2
H	2-1	0.5-1
VH	0	0

\* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.

## **Other Turf Management Considerations for Golf Courses, Athletic fields, and Home Lawns**

### **Lime Recommendations**

Lime should be recommended based on a soil test to maintain soil pH within an agronomic range for turfgrass.

For new seedings where lime is recommended, incorporate the lime into the topsoil for best results.

### **Returning Grass Clippings**

Recycling of clippings on turf should be encouraged as an effective means of recycling nitrogen, phosphorus, and potassium. Proper mowing practices that ensure no more than 1/3 of the leaf blade is removed in any cutting event will enhance turf appearance and performance when clippings are returned. Return all leaf clippings from mowing events to the turf rather than discharging them onto sidewalks or streets. Rotary mulching mowers can further enhance clipping recycling by reducing the size of clippings being returned to the turfgrass canopy.

### **Management of Collected Clippings**

If clippings are collected they should be disposed of properly. They may be composted or spread uniformly as a thin layer over other turf areas or areas where the nutrient content of the clippings can be recycled through actively growing plants. They should not be blown onto impervious surfaces or surface waters, dumped down stormwater drains, or piled outside where rainwater will leach out the nutrients creating the potential for nutrient loss to the environment.

### **Use of Iron**

Iron applications (particularly foliar applications) may periodically be used for enhanced greening as an alternative to nitrogen. These applications are most beneficial if applied in late spring through summer for cool season grasses and in late summer/fall applications for warm-season grasses.

### **Impervious Surfaces**

Do not apply fertilizers containing nitrogen or phosphorus to impervious surfaces (sidewalks, streets, etc.). Remove any granular materials that land on impervious surfaces by sweeping and collecting, and either put the collected material back in the bag, or spread it onto the turf and /or using a leaf blower etc. to return the fertilizer back to the turfgrass canopy.

**Table 3-1**  
**Lime Recommendations for Virginia Crops (tons/acre)**  
 Lime Rates based on Va Tech Soil buffer pH

Buffer pH	Target Soil pH					Acidity meq/100g
	5.2	5.8	6.2	6.5	6.8	
6.60	0.00	0.00	0.00	0.00	0.00	0.00
6.50	0.00	0.00	0.00	0.00	0.00	0.03
6.40	0.00	0.00	0.00	0.00	0.50	0.06
6.38	0.00	0.00	0.25	0.25	0.50	0.12
6.36	0.00	0.00	0.25	0.25	0.75	0.24
6.34	0.00	0.00	0.25	0.50	0.75	0.36
6.32	0.00	0.00	0.50	0.50	0.75	0.48
6.30	0.00	0.00	0.50	0.75	1.00	0.59
6.28	0.00	0.25	0.75	0.75	1.00	0.71
6.26	0.00	0.25	0.75	1.00	1.25	0.83
6.24	0.00	0.25	0.75	1.00	1.25	0.95
6.22	0.00	0.50	1.00	1.00	1.50	1.07
6.20	0.00	0.50	1.00	1.25	1.50	1.19
6.18	0.00	0.75	1.25	1.25	1.75	1.30
6.16	0.00	0.75	1.25	1.50	1.75	1.42
6.14	0.25	0.75	1.50	1.50	2.00	1.54
6.12	0.25	1.00	1.50	1.75	2.00	1.66
6.10	0.50	1.00	1.50	1.75	2.25	1.78
6.08	0.50	1.25	1.75	2.00	2.25	1.90
6.06	0.50	1.25	1.75	2.00	2.25	2.02
6.04	0.75	1.25	2.00	2.00	2.50	2.13
6.02	0.75	1.50	2.00	2.25	2.50	2.25
6.00	1.00	1.50	2.00	2.25	2.75	2.37
5.95	1.00	1.75	2.25	2.50	3.00	2.67
5.90	1.25	2.00	2.50	3.00	3.25	2.96
5.85	1.50	2.25	2.75	3.25	3.50	3.26
5.80	1.75	2.50	3.25	3.50	3.75	3.56
5.75	2.00	2.75	3.50	3.75	4.25	3.85
5.70	2.25	3.00	3.75	4.00	4.50	4.15
5.65	2.50	3.25	4.00	4.25	4.75	4.45
5.60	2.75	3.50	4.25	4.50	5.00	4.74
5.55	3.00	3.75	4.50	4.75	5.25	5.04
5.50	3.25	4.00	4.75	5.25	5.50	5.34
5.40	3.75	4.50	5.25	5.75	6.25	5.93
5.30	4.25	5.00	5.75	6.25	6.75	6.52

Lime recommendations in the table above are based on the use of a liming material equivalent in neutralizing power to 100% CaCO<sub>3</sub>. For application rates of liming material that is less than 100% neutralizing power of CaCO<sub>3</sub> (pure calcium carbonate) use the table in this section, Lime Rate Adjustment for CCE.

## Lime Recommendations Using Other Testing Labs

For approved labs other than Virginia Tech, use the lime recommendations given by the lab. IF there are no recommendations with the soil analysis, use the table below for A&L Agricultural, Spectrum Analytical, and Brookside Laboratories.

**Table 3-2**  
Lime Application Rate<sup>1</sup> (tons/acre) to achieve desired pH based on SMP Buffer Test

Soil-Buffer pH	Target Soil pH				
	5.2	5.8	6.2	6.5	6.8
6.9	0	0.25	0.50	0.50	0.75
6.8	0.50	0.75	1.00	1.00	1.25
6.7	1.00	1.50	1.50	1.75	2.00
6.6	1.50	1.75	2.00	2.25	2.50
6.5	2.00	2.25	2.50	3.00	3.25
6.4	2.75	3.00	3.25	3.75	4.00
6.3	3.25	3.50	4.00	4.50	5.00

<sup>1</sup> Ag-ground lime of 90% plus total neutralizing power (TNP) or CaCO<sub>3</sub> equivalent., and fineness of 40% < 100 mesh, 50% < 60 mesh, 70% < 20 mesh and 95% < 8 mesh. Adjustments in the application rate should be made for liming materials with different particle sizes, or neutralizing value.

**Waters Agricultural Laboratories** uses the Adams and Evans single buffer method which uses a different table for recommendations than the Mehlich or the SMP tables supplied here. In the event you would have lab reports from Waters Lab, which do not have lime recommendations, contact the lab for recommendations based on their analysis procedure.

## Lime Rate Adjustment for CCE

Using the lime application rate to achieve the desired target pH based on the soil test buffer pH, use the table below to adjust that rate based on the % CCE of the liming material to be applied.

**Table 3-3**  
Lime Application Rate Adjustment Based on % CCE of Material

T/ac*	% CCE of Your Liming Material										
	50	60	70	80	90	100	110	120	130	140	150
0.5	1.00	0.75	0.75	0.75	0.50	0.50	0.50	0.50	0.50	0.25	0.25
1.0	2.00	1.75	1.50	1.25	1.00	1.00	1.00	0.75	0.75	0.75	0.75
1.5	3.00	2.50	2.25	2.00	1.75	1.50	1.25	1.25	1.25	1.00	1.00
2.0	4.00	3.25	2.75	2.50	2.25	2.00	1.75	1.75	1.50	1.50	1.25
2.5	5.00	4.25	3.50	3.25	2.75	2.50	2.25	2.00	2.00	1.75	1.75
3.0	6.00	5.00	4.25	3.75	3.25	3.00	2.75	2.50	2.25	2.25	2.00
3.5	7.00	5.75	5.00	4.50	4.00	3.50	3.25	3.00	2.75	2.50	2.25
4.0	8.00	6.75	5.75	5.00	4.50	4.00	3.75	3.25	3.00	2.75	2.75

\* Lime recommendation to adjust pH as determined from soil test analysis.

## **7. Soil Test Results**

See attached file.

SAMPLE ID	
RAD 01	Medians
RAD 02	River View Park
RAD 03	Hodge Field
RAD 04	Sunset park
RAD 05	Dobbins
RAD 06	Bisset #1
RAD 07	Bisset #2
RAD 08	New River Complex
RAD 09	Veterans Field
RAD 10	Dog Park
RAD 11	Wildwood Park
RAD 12	Haven Heights
RAD 13	McHarg
RAD 14	Belle Heth
RAD 15	Radford Memorial
RAD 16	High School