



## City of Harrisonburg Stormwater Advisory Committee

*Agenda: Meeting No. 09*

October 1, 2014 5:00 – 7:00 p.m.

5:00 – 5:05	1. Review and Adopt Minutes
5:05 – 5:10	2. Public Comment (limited to 3 minutes per speaker)
5:10 – 5:20	3. Council Presentation Recap
5:20 - 5:40	4. Stormwater Utility Credits, Nutrient Trading Credits, and TMDLs
5:40 – 6:45	5. Public Outreach – a. Update on Community Groups Outreach  b. Stormwater Utility Public Input Meetings November 12, 2014 5:30 – 7:30PM Thomas Harrison Middle School December 2, 2014 5:30 – 7:30PM Spotswood Elementary School  c. Open House – review draft presentation material  d. Mock Q&A Session
6:45 – 6:55	6. General Questions / Discussion
6:55 – 7:00	7. Next Steps / Assignments



## City of Harrisonburg Stormwater Advisory Committee

*Minutes: Meeting No. 08*

September 3, 2014 5:00 – 7:00 p.m.

**Members in attendance:** Kathy Holm, Bill Jones, William Latham, Daniel Michael, Ted Byrd, J.M. Snell, Dale Chestnut and Eldon Kurtz.

**Staff/Other in attendance:** Thanh Dang, Carolyn Howard, Harsit Patel, Tom Hartman, John Eckman and Trey Jarrels.

### **Review and Adopt Minutes**

Bill Jones called for a motion to adopt the August 2014 SWAC meeting minutes. J.M. motioned to accept and Eldon seconded, the motion passed.

### **Public Comment**

Poti Giannakouros of Harrisonburg commented that recently there was a fish kill resulting from cleaning chemicals used during pressure washing that drew the public's attention to the problem of toxic runoff into our watershed. Poti mentioned that the SWAC and City council should consider a ban on coal tar sealant as a best management practice, and cited polycyclic aromatic hydrocarbons as a contributor to toxic runoff. He went on to say that the coal tar sealant does not provide an essential function, and that there are viable alternatives. Poti cited city ordinance Sec. 16-6-58. Weeds, etc., on lots and claimed that it was being enforced counter to state legislation and impedes the mitigation of stormwater runoff. He then stated that it may be time to revisit the approach to the ordinance, as not to hamper rain gardens and other creative stormwater mitigation.

### **Stormwater Utility Ordinance**

Thanh called for the SWAC's comments on the draft Stormwater Utility Ordinance. The Ordinance has been reviewed by City Attorney Chris Brown. Thanh stated that staff would not be asking Council to adopt the ordinance at the September 23 Council meeting, but would be presenting the ordinance to City Council prior to releasing for public comment. Upon review of the impervious mapping data staff plans to address some errors, and are not prepared to bring the stormwater utility fee structure to Council at this time. Plans are to use the September 23 meeting as an opportunity to revisit with Council. Chairman Bill Jones and Thanh will present an overview of the SWAC's progress and update council on the MS4 permit and the draft stormwater utility ordinance. The utility fee structure will be presented at the November 11 council meeting and public input meetings have been scheduled for November 12 and December 2.

Following discussion, J.M. moved that once corrections were made to the draft Stormwater Utility Ordinance and reviewed again by the City Attorney, it would be presented at the September 23 council meeting. Daniel seconded, the motion carried.

### **Stormwater Utility Fee Credit Options**

Carolyn started by recapping that the Virginia Stormwater Utility Law shall provide a full waiver of charges to public roads or any federal, state or public entity that has its own MS4 permit (e.g. VDOT and JMU). JMU foundation properties are excluded from the waiver because they are considered a private foundation and can be charged a utility fee by the City. The City can provide full or partial waivers of their utility fee based on permanent reduction of stormwater volume or flow or pollutant reductions. The stormwater law also provides the option for full or partial waivers for cemeteries, city properties, public or private entities that implement strategies that help to reduce stormwater volume or nutrient loading. The SWAC will recommend to Council that city owned parcels and cemeteries be charged the utility fee.

The SWAC can recommend the amount of waivers (utility fee credits) allowed for properties. Those properties that provide more substantial stormwater management (“going above and beyond”) the Virginia Stormwater Management Program requirements can receive an additional and/or larger utility fee credit for these voluntary BMPs that would count towards the City’s TMDL requirements.

The SWAC discussed using the terms “utility fee credit” and “TMDL credit” to differentiate between the stormwater utility credits and Chesapeake Bay TMDL credit program.

When someone applies for a “utility fee credit” the proposed time frame before property owners would have to submit a reapplication would be every 5 years, keeping in line with the VSMP program BMP inspection requirement. Property owners would then reapply to prove proper maintenance of the BMP to continue receiving the utility fee credit. Utility fee credits would not be transferrable between previous and new property owners. When a property changes ownership, the new owner would bring the records to Public Works to apply for their own utility fee credit. The effective date of a utility credit will fall within the billing cycle i.e. if a BMP is installed on 10/2015 it will not receive credit until 7/1/2016.

The plan is that between January 2015 and July 2015 when the fee is implemented, the property owners will have time to submit credit applications to be applied from the start. BMP’s must be installed per DEQ standards, and maintenance agreements would be kept on file. BMP’s that are not properly maintained could be subject to loss of utility fee credit upon city inspection. Regarding the stormwater utility credit limits, Carolyn recommended a minimum charge of one billing unit and for multi-family non-residential parcels many localities use a maximum utility fee credit of 50%.

Upon discussion regarding utility fee credit limits, the guidance manual (under development by Draper Aden and city staff) will state that for all parcels a maximum credit of 50% of the original fee is allowed and the minimum fee charged will be one billing unit.

City operations such as leaf collection would be eligible for a utility fee credit i.e. the Public Works Department's stormwater utility fee would not be reduced, although TMDL credit for the MS4 Permit may be applicable toward the city's nutrient reduction requirements. Developing guidelines from DEQ and follow up by staff will provide more information.

### **Public Works**

**a. Open House – Review draft presentation materials**

Carolyn and staff are in the process of developing a PowerPoint presentation where slides could be reformatted into boards that SWAC members could stand beside to present information and answer questions. After people sign in they can follow the boards through the room. A 500 square foot area would also be marked off in the middle, if the layout allows. The calculations will be available for property owners that would like us to look up their stormwater utility fee.

**b. Community Groups – updates and assignments for SWAC member outreach**

After the September council meeting staff and SWAC members will begin community outreach. Assignments and suggestions were added to the contact list.

### **General Questions / Discussion**

Trey Jarrels the new Stream Health Coordinator for the City of Harrisonburg was introduced to the SWAC.

### **Next Steps / Assignments**

Staff will follow up with changes to the stormwater utility ordinance and community outreach assignments. The next SWAC meeting will be held on Wednesday October 1 from 5-7pm at the Public Works Department.

# Credit System – Regulatory Framework

## Virginia Stormwater Utility Law

- **Full waivers of charges**
  - ✓ Public roads
  - ✓ Federal, state (**VDOT**), or local government, or public entity (**JMU**) with a MS4 permit
- **Full or partial waivers of charges...installs, operates, and maintains a stormwater management facility that achieves a permanent reduction in stormwater flow or pollutant loadings...based on the amount of the waiver in part on the percentage reduction in stormwater flow or pollutant loadings, or both.**



# Credit System – Regulatory Framework

## Virginia Stormwater Utility Law

- **Optional full or partial waivers of charges**
  - ✓ Cemeteries
  - ✓ City properties
  - ✓ *public or private entities that implement or participate in strategies, techniques, or programs that reduce stormwater flow or pollutant loadings, or decrease the cost of maintaining or operating the public stormwater management system.*

Note: City owned properties are not required by law to pay the stormwater utility fee. However, *the current recommendation of the SWAC is to charge the fee to all parcels including cemeteries and city owned properties, including schools, but excluding public rights-of-way.*



# Credit System Recommendations

## ➤ Single-Family Residential Credit System

- ✓ Maximum credit - 50% for installation of an approved BMP
- ✓ Valid for five (5) years.
- ✓ Proper installation and maintenance is required to continue receiving the credit.

### Approved BMPs

*Roof drain disconnection across at least*

*40 feet of grass*

Rain garden

Vegetated filter strip

Rain barrel

Pervious pavement



# Credit System Recommendations

## ➤ Non-Residential / Multi-Family Credit System

- ✓ X% water quality credit is allowed for installation and maintenance of water quality BMP(s).

Credit Earned = X% x (Original Fee) x (% of impervious area treated)

- ✓ Y% water quantity credit is allowed for installation and maintenance of BMP(s) providing both stream channel erosion control and flood control benefits.

Credit Earned = Y% x (Original Fee) x (% of impervious area treated)



# Credit System Recommendations

## ➤ Non-Residential / Multi-Family Credit System

- ✓ Z% credit may be allowed, for benefits achieved above the minimum required.
- ✓ Credit for a voluntary BMP(s) shall be doubled, but not exceed 50%.



# Credit System Recommendations

- **Effective date of credit**
- **Length of credit**
- **BMP installation standards**
- **Maintenance agreement required**
- **Transfer of credit applies only to the applicant.**
- **Loss of credit**
- **Offsite treatment**
- **Credit limits**



## Memorandum

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**To:** City of Harrisonburg Stormwater Advisory Committee, Tom Hartman, Thanh Dang, Harsit Patel  
**From:** Carolyn Howard  
**Date:** August 26, 2014  
**Project Name:** City of Harrisonburg Stormwater Utility Fee Development  
**Project Number:** C13126B-03  
**Subject:** Credit Systems: Regional Analysis and Recommendations  
**cc:** Julia Skare - Draper Aden Associates

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### REGULATORY FRAMEWORK

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Virginia Stormwater Utility Law §15.2-2114 of the Code of Virginia includes the following provisions regarding ‘full or partial waivers of charges’ or credits.

*C. A locality adopting such a system **shall** provide for full waivers of charges to the following:*

- 1. A federal, state, or local government, or public entity, that holds a permit to discharge stormwater from a municipal separate storm sewer system; except that the waiver of charges shall apply only to property covered by any such permit; and*
- 2. Public roads and street rights-of-way that are owned and maintained by state or local agencies including property rights-of-way acquired through the acquisitions process.*

Note: Since VDOT and JMU have a MS4 permit, properties owned by these entities are exempt from the city’s stormwater utility fee. JMU Foundation properties are not exempt from the city’s stormwater utility fee.

*D. A locality adopting such a system **shall** provide for full or partial waivers of charges to any person who installs, operates, and maintains a stormwater management facility that achieves a permanent reduction in stormwater flow or pollutant loadings. The locality shall base the amount of the waiver in part on the percentage reduction in stormwater flow or pollutant loadings, or both, from pre-installation to post-installation of the facility. No locality shall provide a waiver to any person who does not obtain a stormwater permit from the Department of Environmental Quality when such permit is required by statute or regulation.*

*E. A locality adopting such a system **may** provide for full or partial waivers of charges to cemeteries, property owned or operated by the locality administering the program, and public or private entities that implement or participate in strategies, techniques, or programs that reduce stormwater flow or pollutant loadings, or decrease the cost of maintaining or operating the public stormwater management system.*

Note: City owned properties are not required by law to pay the stormwater utility fee. However, the current recommendation of the SWAC is to charge the fee to all parcels including cemeteries and city owned properties, including schools, but excluding public rights-of-way as noted in C.2 above.

**CURRENT REGIONAL CREDIT SYSTEMS**

Regional examples of credit systems are provided below; all are based on percentage reduction of the fee.

**City of Charlottesville**

The city’s credit system for residential and non-residential parcels is based on three (3) factors:

- 1) The installation date,
- 2) Whether the stormwater facility was built voluntarily or as a ‘condition of development’ (i.e. required for permit approval), and
- 3) The amount of impervious area treated.

Installation Date	Condition of Development or Voluntary	Percent Credit for Impervious Area Treated
Pre-July 1, 2009	Either	20%
Post-July 1, 2009	Voluntary	40% to 100% <sup>1</sup> Depending on the Level of Pollutant Removal <sup>2</sup>
Post-July 1, 2009 & Pre-July 1, 2014	Condition of Development	30%
Post-July 1, 2014	Condition of Development	40%

1. The maximum credit that may be applied to a property’s stormwater utility bill is 90% of the stormwater utility fee or 100% of the fee minus the amount of one billing unit, whichever results in the lower bill.
2. Refer to Appendix A for the credit calculator for this scenario.

Refer to Appendix A for the City of Charlottesville Stormwater Utility Credits Manual (pages 7 – 10) for examples of credit calculations.

The Stormwater Utility Law allows for credit reductions based on “...reduction in stormwater flow or pollutant loadings, or both...” Charlottesville’s credit system references ‘treatment’ (i.e. pollutant loadings) of impervious areas, not specifically ‘stormwater flow’ (i.e. quantity control). However, quantity control is inherent to most BMPs that reduce pollutant loadings.

## City of Lynchburg

### Single-Family Residential Credit System (Refer to Appendix B.)

1. The maximum credit a homeowner can receive is 50% for installation of an approved BMP. For a description of the amount of credit, refer to page 4 of Single-Family Residential Credit Manual (Appendix B).
2. The credits are valid for three years.
3. Proper installation and maintenance is required to continue receiving the credit.

#### Approved BMPs

- Rain garden
- Vegetated filter strip
- Rain barrel
- Pervious pavement

### Non-Residential / Multi-Family Credit System (Refer to Appendix C.)

1. For *pollutant reducing* BMPs –

Credit Earned = 20% x (Original Fee) x (% of impervious area treated)

2. For *volume reducing* BMPs -

Credit Earned = 50% x (Original Fee) x (% of impervious area treated)

3. For properties with a compliant VPDES Industrial Stormwater Permit and discharge either to a stream through a private facility or to the Lynchburg storm sewer or combined sewer system are eligible to receive a 20 % credit.
4. The maximum credit a property owner can receive is 50% for installation of an approved BMP.

In the City of Lynchburg, combined sewer overflows and flooding is a significant concern, so volume reducing BMPs are critical to their system – hence the greater credit earned.

## City of Roanoke

### Single-Family Residential Credit System (Refer to Appendix D.)

Definition of Single Family Residential Property – *“Property on which a dwelling exists which is occupied exclusively by one family for noncommercial purposes. Duplexes are included as a single family residential property for the purposes of this credit manual.”*

1. A homeowner can receive a 10% credit for installation, use, and maintenance of an approved Level 1 BMP.
2. A homeowner can receive a 25% credit for installation, use, and maintenance of an approved Level 2 BMP.

#### Approved Level 1 BMPs

- Rain barrels
- Vegetated filter strip
- Grass Channel
- Roof Drain Disconnection
- Lawn Maintenance BMPS (3)
- Minimum Tree Canopy of 20% over lot
- Covered storage for waste, refuse, and recyclables
- Traditional septic & alternative onsite sewage system maintenance

#### Approved Level 2 BMPs

- Pervious Pavements
- Rain Gardens
- Infiltration Practices (sand filter)
- Cisterns for water reuse
- Green Roofs

The City’s credit system requires continued use and maintenance and provides a provision for BMPs owned by Homeowners Associations.

*In cases where a property is served by a BMP owned by a separate entity or a Homeowners Association, the property owner may receive credit for the BMP if they provide documentation showing they share in the maintenance obligation and costs of the BMP.*

Commercial, Industrial, Institutional, and Multi-Family Residential Properties Credit System  
(Refer to Appendix E.)

1. A 10% water quality credit is allowed for installation and maintenance of water quality BMP(s).

$$\text{Credit Earned} = 10\% \times (\text{Original Fee}) \times (\% \text{ of impervious area treated})$$

2. A 10% water quantity credit is allowed for installation and maintenance of BMP(s) providing both stream channel erosion control and flood control benefits.

$$\text{Credit Earned} = 10\% \times (\text{Original Fee}) \times (\% \text{ of impervious area treated})$$

3. A 5% credit may be allowed, at the City Manager's discretion, for benefits achieved above the minimum required.
4. Credit for a voluntary BMP(s) shall be doubled, but not exceed 50%.
5. *The owner of an eligible BMP that treats off-site impervious surface, meaning the stormwater runoff that originates outside of the boundary of the subject property, may take a credit for treating the off-site impervious surface. The off-site credit amount shall be calculated in the same manner as if the BMP was located on the off-site parcel. However, in no case shall the total credit exceed the total amount of the annual stormwater utility fee charged to the parcel owner.*
6. For properties with a compliant VPDES Industrial Stormwater Permit are eligible to receive a 10 % credit.
7. *Credits may be provided to individual properties served by a Regional BMP. In circumstances where an applicant is attempting to claim credit for a BMP that is owned by a separate entity, proof that the Applicant shares in the maintenance obligations and costs will need to be submitted in order for credit to be applied.*

## CREDIT SYSTEM RECOMMENDATION

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### Single-Family Residential Credit System

In considering the options for a residential credit system, the annual utility fee and the cost of BMPs must be considered to provide sufficient incentive to implement BMPs. The City of Lynchburg's system is simple and provides a larger credit to homeowners.

Recommendation: Adopt the City of Lynchburg's system with the following additions.

#### Approved BMPs

- *Roof drain disconnection across at least 40 feet of grass*
- Rain garden
- Vegetated filter strip
- Rain barrel
- Pervious pavement

1. Add credit for roof drain disconnection, where the water from the drain flows across at least 40 feet of vegetation or grass prior to flowing across an impervious surface or into storm drain.
2. Add a provision for BMPs owned by Homeowners Associations allowing homeowners a credit, if they provide documentation showing they share in the maintenance obligation and costs of the BMP.
3. This system should be applicable to any property on which a single-family, duplex, or townhome dwelling exists which is occupied exclusively by one family for noncommercial purposes.

### Non-Residential / Multi-Family Credit System

The Charlottesville credit system is very complex, but has the advantage of providing information to help the city meet its TMDL pollutant removal requirements / MS4 permit compliance. The Lynchburg and Roanoke credit systems are very similar; however, the Roanoke credit system provides more flexibility with regards to offsite and regional stormwater management facilities.

Recommendation: Adopt the City of Roanoke's credit system; the percentage of credit may be adjusted to meet Harrisonburg's needs and a definition of 'voluntary BMP(s)' should be discussed and included in the final documentation.

## **CREDIT POLICIES RECOMMENDATIONS**

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Based on review of the regional credit policies, we offer the following recommendations for general policies for the credit system.

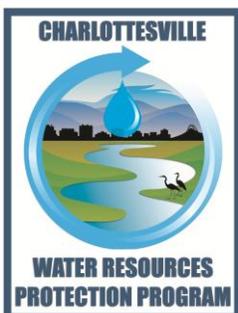
1. **Effective date of credit:** Credit will be granted the next fiscal year following approval of the credit. For example, if a homeowner installs a rain barrel on October 1, 2015, the credit will be applied to the fee on July 1, 2016.
2. **Length of credit:** Credits will be valid for five (5) years or until change of ownership, whichever is first. The owner will need to re-apply for the credit every five (5) years.
3. **BMP installation:** The stormwater BMP must be designed and installed as per Virginia DEQ standards, completed and functioning prior to application for credit, and actively maintained by the owner.
4. **Maintenance agreement:** Credit will be approved upon execution of a maintenance agreement with the city. As a general rule, maintenance agreements required for Virginia Stormwater Management Program (VSMP) permit approval for new construction projects will be recorded. Maintenance agreements for 'voluntary' BMP installation to obtain a credit will be filed by the city, but not recorded.
5. **Transfer of credit:** The stormwater credit applies only to the applicant. Credits do not transfer with ownership changes. A new application must be submitted by the new owners to receive the credit.
6. **Loss of credit:** An unsatisfactory inspection by city staff will result in the facility being ineligible for credit, unless corrective action is taken in the timeframe prescribed by the city. The city will complete spot inspections of BMPs to confirm the BMPs are functioning as designed and maintained.
7. **Offsite treatment:** Credit may also be taken for voluntarily treating off-site areas that are not currently controlled by another stormwater management facility. However, the credit will be adjusted if the off-site property owner decides to install their own facility that treats a portion or all of the impervious area treated by the facility receiving credit. It is recommended that a property owner coordinate with the city prior to considering any off-site treatment options.
8. **Credit limits:** For residential parcels, the minimum fee charged will be one billing unit. For multi-family / non-residential parcels, a maximum credit of 50% of the original fee is allowed.

# *City of Charlottesville* **Water Resources Protection Program**



## **Stormwater Utility Fee Credits Manual**

*Your guide to reducing stormwater utility fees and protecting our City's water resources.*



**City of Charlottesville, Virginia**  
605 E. Main St., Charlottesville, VA 22902  
[www.charlottesville.org/stormwater](http://www.charlottesville.org/stormwater)

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# *City of Charlottesville*

## **Water Resources Protection Program**

# **Stormwater Utility Credits Manual**

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### **Forms**

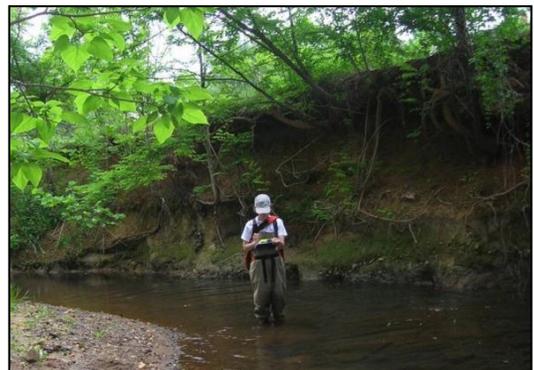
Credit Application Form  
Credit Calculation Form  
Stormwater Management Facility Inspection Form

# Stormwater Overview

**Everyone in Charlottesville is affected by stormwater!** Stormwater is water that flows over our yards, streets, buildings, parking lots, and other surfaces when it rains or snows. When the land was covered by forests, most of this water soaked into the ground. Today, about one third of the City is covered with hard (impervious) surfaces. When rain falls on these surfaces, the water cannot infiltrate into the ground. Instead, it runs off as stormwater into a system of drains, ditches, and pipes. In all, the City is responsible for managing over 56 miles of stormwater pipe and 4,200 stormwater structures!

When stormwater flows over parking lots, lawns, and streets it picks up pollutants such as oil, grease, heavy metals, pesticides, fertilizers, sediment, trash, debris, and pet waste. These pollutants flow directly into our local creeks, streams, and the Rivanna River before ultimately reaching the Chesapeake Bay. As a result, many of our streams have been designated as “impaired” by the Virginia Department of Environmental Quality. State and federal law makes the City responsible for developing and implementing plans to restore these impaired waterways.

In addition, since less stormwater soaks into the ground, it can accumulate and lead to drainage issues. Increased stormwater flow also causes stream bank erosion, which threatens water quality and private property. Much of the City’s stormwater infrastructure was installed in the 1950s and 1960s and is now old and in need of repair, which also contributes to these problems.



**Stream bank erosion caused by increased stormwater flows. Uncontrolled stormwater can result in drainage issues and degraded water quality.**

## Water Resources Protection Program

**Over the past few years the City has been working hard to develop solutions to local water resources challenges.** A Water Resources Protection Program (WRPP) is being implemented to address these challenges in an economically and environmentally sustainable manner. The WRPP is designed to comply with federal and state water quality regulations, rehabilitate aging stormwater infrastructure, implement projects to address drainage and flooding problems, and restore degraded streams.

# Stormwater Utility Fee

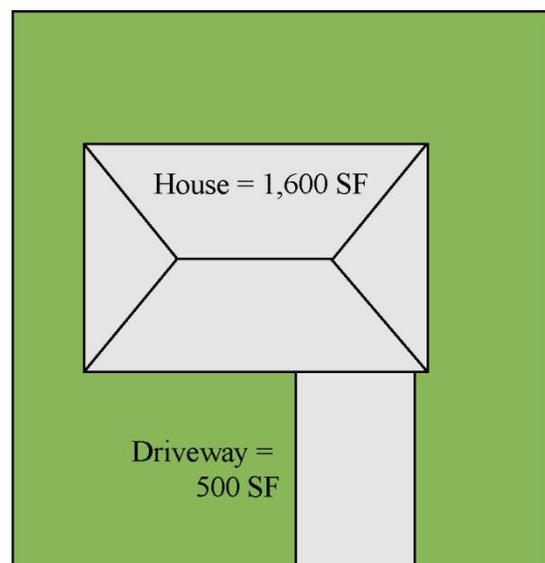
## *What is a stormwater utility fee?*

The City of Charlottesville has adopted a stormwater utility fee to provide an adequate and stable source of funding for the WRPP. A stormwater utility fee is a fee for service based on the amount of impervious surface area on a property (roofs, parking areas, walkways, etc.). This is similar in concept to how the City distributes the cost for sanitary sewer and drinking water services. Per the stormwater utility ordinance passed by City Council, impervious surface is defined as “*area covered by hard surfaces such as structures, paving, compacted gravel, concrete, or other man-made features that prevent, restrict, or impede the downward passage of stormwater into the underlying soil*”.

This approach has several advantages. First, it fairly distributes the cost of the City’s stormwater services across all eligible properties based on the amount of impervious surface. Second, under State Law, the revenue from a stormwater utility must be placed in a special fund that can only be used for stormwater management; therefore establishing a dedicated funding source to accomplish the goals of the WRPP. Finally, State Law requires the City to provide “credits” to property owners who have implemented stormwater management facilities to reduce their stormwater utility fees.

## *How is the fee calculated?*

Since a stormwater utility is a fee for service, all eligible properties are charged regardless of their tax status. **Each eligible property is charged in 500 square foot (SF) increments of impervious area.** These are called “billing units.” Fractions are rounded up to the next whole unit. For example, a property that has 2,100 square feet of impervious cover has five billing units ( $2,100 / 500 = 4.2$ , rounded to 5 billing units). The number of billing units is then multiplied by the rate adopted by City Council (\$1.20 per billing unit per month). Unimproved property (defined as a property with less than 300 square feet of impervious cover) is not assessed a fee.



### Example Fee Calculation

- Total impervious area = 2,100 SF
- Divide by 500 SF = 4.2
- Round to the next whole number = 5 billing units (BUs)
- Multiply the number of BUs (5) by the rate (\$1.20) x 12 months for an annual fee of \$72.00

# *Is there anything I can do to reduce my bill?*

**Yes! There are two ways for you to impact the amount of your payment.**

First, property owners can remove impervious surfaces from their property. This will result in a direct fee reduction if the removal of impervious surface results in fewer billing units.

Second, the City's Credit Program provides an opportunity for property owners to reduce their stormwater utility bill by operating and maintaining a stormwater management facility.

## **Credit Program**

A credit is a reduction to the stormwater fee that can be pursued by a property owner if they operate and maintain a stormwater management facility that reduces pollution, helps to control stormwater runoff, or both. Existing stormwater management facilities are eligible for a credit regardless of when the facility was built as long as they meet the applicable standards at the time of installation. There are a wide variety of practices that can be implemented in Charlottesville that qualify for credit, including bioretention facilities, permeable pavement, and green roofs, just to name a few.

The City has adopted two goals for the credit program. First, credits should recognize the avoided cost to the City that is provided by the ongoing operation and maintenance of a stormwater management facility. Second, credits should provide a mechanism for property owners to make investments to help the City achieve the goals of the WRPP.



**Examples of practices that can receive credit – bioretention facility (top); cistern (middle); permeable pavement (bottom).**

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## *What are the eligibility requirements?*

**To be eligible for credit, a stormwater management facility must meet the following criteria:**

- ✓ A property owner must have installed the stormwater management facility prior to applying for the credit and the stormwater management facility must be functioning as designed.
- ✓ A property owner must own and physically maintain all components of the facility – a property owner who only provides aesthetic maintenance is not eligible for a credit.
- ✓ The facility must have been built in accordance with the City-recognized design standards in place at the time of installation.
- ✓ The facility must be actively maintained so that it is functioning as designed.
- ✓ The property owner must enter into a maintenance agreement with the City that includes the right of the City to conduct periodic inspections. The City may require that an existing agreement be modified in order for the facility to be eligible for credit.
- ✓ An unsatisfactory inspection by City staff will result in the facility being ineligible for credit unless corrective action is taken in the timeframe prescribed by the City.

Refer to “How do I apply?” and the Credit Application Form for additional details.

## *How much credit can I get?*

The amount of credit depends on when the facility was built and whether it was implemented voluntarily or as a condition of development. **It is important to remember that only the impervious area treated by the facility, and not the entire impervious area of a site, is eligible for a credit.** Credit may also be taken for voluntarily treating off-site areas that are not currently controlled by another stormwater management facility. However, the credit will be adjusted if the off-site property owner decides to install their own facility that treats a portion or all of the impervious area treated by the facility receiving credit. It is recommended that a property owner coordinate with the City prior to considering any off-site treatment options.

The maximum credit that a property owner may receive for a stormwater management facility required as a condition of development is a 40% credit of the fee for the impervious area treated. The maximum credit is a 100% credit of the fee for the impervious area treated by a voluntary stormwater management facility. For voluntary treatment, the maximum credit that may be applied to a property’s stormwater utility bill is 90% of the stormwater utility fee or 100% of the fee minus the amount of one billing unit, whichever results in the lower bill.

## Credit Level Table

Installation Date	Condition of Development or Voluntary	Percent Credit for Impervious Area Treated
Pre-July 1, 2009	Either	20%
Post-July 1, 2009	Voluntary	40% to 100% <sup>1</sup> Depending on the Level of Pollutant Removal – <u>See Credit Calculator for Post-July 1, 2009 Voluntary Facilities</u>
Post-July 1, 2009 & Pre-July 1, 2014	Condition of Development	30%
Post-July 1, 2014	Condition of Development	40%

1. The maximum credit that may be applied to a property’s stormwater utility bill is 90% of the stormwater utility fee or 100% of the fee minus the amount of one billing unit, whichever results in the lower bill.

## Credit Calculator for Post-July 1, 2009 Voluntary Facilities

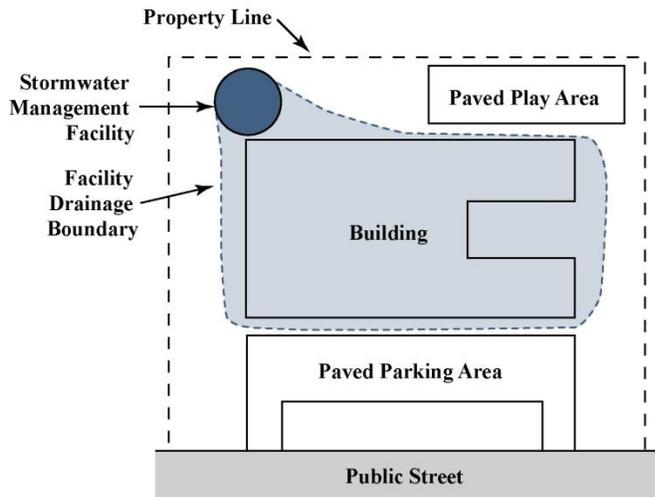
The following calculation is used to determine the credit to be given to a voluntary eligible facility installed post-July 1, 2009. The formula was developed as a sliding scale where a facility of minimum pollutant removal efficiency (15%) receives a 40% credit and a facility of 70% or greater efficiency receives the maximum credit. Facility efficiency is as documented in the Virginia Stormwater BMP Clearinghouse, the Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects, or other state-approved guidance documents.

- (A) Facility Phosphorus Removal Efficiency Must be 15% or Greater
- (B) Facility Phosphorus Removal Efficiency of \_\_\_\_% / 100 x 1.76<sup>1</sup> = \_\_\_\_\_
- (C) (B) – (0.264<sup>2</sup>) = \_\_\_\_\_
- (D) (C) / 0.016<sup>3</sup> = \_\_\_\_\_
- (E) 40% + (D) = \_\_\_\_\_ Percent Total Facility Credit (up to maximum of 100%)

1. The phosphorus pollutant loading rate for the James River Basin from the City’s municipal separate storm sewer system (MS4) permit issued by the Virginia Department of Environmental Quality.
2. 0.264 is the result of equation (B) for a 15% Facility Efficiency ensuring that equation (D) results in a value of zero for a 15% Facility Efficiency.
3. 0.016 is a “distribution factor” to ensure that Facility Efficiency values between 15% and 70% result in equation (D) between 0% and 60%.

## Credit Example 1

### Condition of Development (COD) Stormwater Management Facility



**Total Impervious Area = 15,120 SF**

**$15,120 \text{ SF} / 500 \text{ SF} = 30.24$**

**Property Billing Units (BU) = 31**

**Pre-Credit Annual Fee = (31 x \$1.20 per BU x 12 months) = \$446.40**

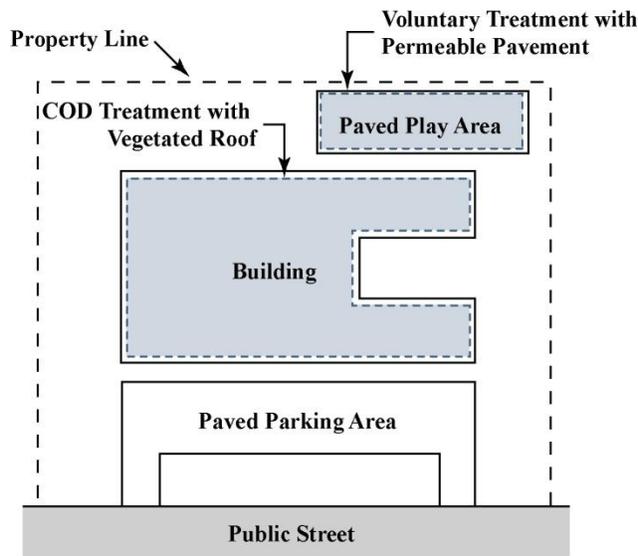
**Impervious Area Treated (Building Rooftop Only) = 7,980 SF**

### Condition of Development Credit Examples

Facility Installation Date	Percent Credit	Percent Credit x Impervious Area (SF) Treated	Adjusted Impervious Area	Adjusted Billing Unit	Post-Credit Annual Fee
Pre-July 1, 2009	20%	$7,980 \times 20\% = 1,596$	$15,120 - 1,596 = 13,524$	$13,524 / 500 = 27.05 = 28$ BU	$28 \times \$1.20 \times 12 = \$403.20$ (\$43.20 Fee Reduction)
Post-July 1, 2009 & Pre-July 1, 2014	30%	$7,980 \times 30\% = 2,394$	$15,120 - 2,394 = 12,726$	$12,726 / 500 = 25.45 = 26$ BU	$26 \times \$1.20 \times 12 = \$374.40$ (\$72.20 Fee Reduction)
Post-July 1, 2014	40%	$7,980 \times 40\% = 3,192$	$15,120 - 3,192 = 11,928$	$11,928 / 500 = 23.86 = 24$ BU	$24 \times \$1.20 \times 12 = \$345.60$ (\$100.80 Fee Reduction)

## Credit Example 2

### Voluntary and Condition of Development (COD) Stormwater Management Facility



**Total Impervious Area = 15,120 SF**

**15,120 SF / 500 SF = 30.24**

**Property Billing Units (BU) = 31**

**Pre-Credit Annual Fee = (31 x \$1.20 per BU x 12 months) = \$446.40**

**Impervious Area Treated by Voluntary Facility (Paved Play Surface) = 2,800 SF**

**Impervious Area Treated by COD Facility (Building Rooftop) = 7,980 SF**

### Voluntary and Condition of Development Credit Example

Voluntary Facility Installation Date	Percent Credit	Percent Credit x Impervious Area (SF) Treated	Impervious Area Reduction (SF)
After July 1, 2009	88.4% (see calculation below)	2,800 x 88.4% = 2,475	2,475

#### Voluntary Credit Calculation (After 7/1/2009)

- (A) Facility Efficiency for Level 1 Permeable Pavement (per Virginia BMP Clearinghouse) = **59%**
- (B) Facility Efficiency of **59%** / 100 x 1.76 = **1.038**
- (C) **1.038** - 0.264 = **0.774**
- (D) **0.774** / 0.016 = **48.4**
- (E) 40% + **48.4** = **88.4%** Total Facility Credit

COD Facility Installation Date	Percent Credit	Percent Credit x Impervious Area (SF) Treated	Impervious Area Reduction (SF)
After July 1, 2014	40%	7,980 * 40% = 3,192	3,192

#### Adjusted Stormwater Utility Fee Calculation for COD and Voluntary Facilities

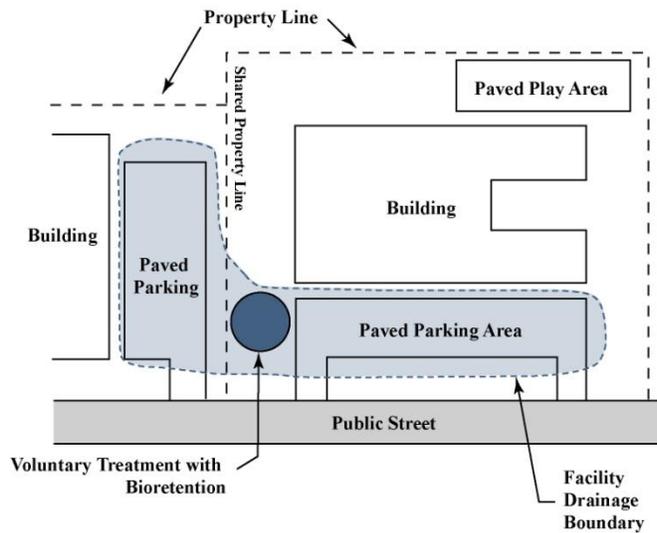
Adjusted Impervious Area (SF): 15,120 (pre credit) - 2,475 (voluntary reduction) - 3,192 (COD reduction) = 9,453

Adjusted Billing Units: 9,435 / 500 = 18.9 = 19 BUs

**Adjusted Annual Stormwater Utility Fee: 19 BU x \$1.20 x 12 = \$273.60 (\$172.80 Fee Reduction)**

### Credit Example 3

#### Voluntary Onsite and Offsite Stormwater Management Facility



**Total Impervious Area = 15,120 SF**

**15,120 SF / 500 SF = 30.24**

**Property Billing Units (BU) = 31**

**Pre-Credit Annual Fee = (31 x \$1.20 per BU x 12 months) = \$446.40**

**Impervious Onsite Area Treated by Voluntary Facility (Parking Lot) = 4,340 SF**

**Impervious Offsite Area Treated by Voluntary Facility (Parking Lot) = 4,560 SF**

#### Voluntary Onsite and Offsite Credit Example

Voluntary Facility Installation Date	Percent Credit	Percent Credit x Impervious Area (SF) Treated	Impervious Area Reduction (SF)
Onsite After July 1, 2009	100% (see calculation below)	4,340 x 100% = 4,340	4,340
Offsite After July 1, 2009	100% (see calculation below)	4,560 x 100% = 4,560	4,560

#### Voluntary Credit Calculation (After 7/1/2009)

- (A) Facility Efficiency for Level 2 Bioretention (per Virginia BMP Clearinghouse) = **90%**
- (B) Facility Efficiency of **90%** / 100 x 1.76 = **1.584**
- (C) **1.584** - 0.264 = **1.32**
- (D) **1.32** / 0.016 = **82.5**
- (E) 40% + **82.5** = **122.5%** = **100%** Total Facility Credit

#### Adjusted Stormwater Utility Fee Calculation for COD and Voluntary Facilities

Adjusted Impervious Area (SF): 15,120 (pre credit) - 4,340 (voluntary onsite reduction) - 4,560 (voluntary offsite reduction) = 6,220

Adjusted Billing Units: 6,220 / 500 = 12.4 = 13 BUs

**Adjusted Annual Stormwater Utility Fee: 13 BU x \$1.20 x 12 = \$187.20 (\$259.20 Fee Reduction)**

## How do I apply?

A **Credit Application Form** must be submitted and approved by the City to receive a credit. To be eligible for a credit, a stormwater management facility must have an agreement in place that will allow the City access to inspect the stormwater management facility. The following documentation is required:

1. **Credit Application Form** – see back of this manual.
2. **Drainage Area Map** – show property lines, impervious areas, facility drainage area boundaries, and the total impervious cover served by the facility.
3. **Facility Description** – include the type of facility, date of installation, and the percent pollutant removal efficiency based on information from the Virginia Stormwater BMP Clearinghouse or other state approved guidance documents.
4. **Operation and Maintenance Plan** – provide a brief summary of how the facility will be operated and maintained to ensure it continues to function as designed. Include an annual routine maintenance schedule. Include any modifications or repairs that have occurred from installation to the time of application.
5. **Photos** – provide a date-stamped image or images showing the facility within one month of the application date.
6. **Stormwater Facility Maintenance Agreement** – provide a copy of the agreement that allows the City access to the site.
7. **Stormwater Management Facility Inspection Form** – see back of this manual; the form must be prepared by or under the guidance of a professional engineer, licensed landscape architect, or other professional acceptable to the City. The form must verify the drainage area map and state that the facility is functioning as designed and will be adequately maintained.

The image shows a sample of the "Credit Application Form". The form is titled "Credit Application Form" and contains several sections for data entry:

- Applicant Name:** A blank line for the applicant's name.
- Property Information:** Fields for Owner, Street, City, State, ZIP Code, and Date.
- Mailing Address (if different from property address):** Fields for Street, City, State, ZIP Code.
- Email Address:** A blank line for the applicant's email.
- Phone Number:** A blank line for the applicant's phone number.
- Stormwater Management Facility Description:** A large text area with instructions: "Include type of facility, date(s) of installation and pollutant removal efficiency from the Virginia BMP Clearinghouse, Recommendations of the Expert Panel to Define Minimum Removal Rates for Urban Stormwater Retention Ponds, or other state-approved design guidance (provide documentation to support the determined pollutant removal efficiency). Attach additional information if necessary." Below this is a large empty box for the description.
- Amount of impervious area credit to be subtracted from the total impervious area of the property (use the Credit Calculation Form):** A blank line for the credit amount.

At the bottom of the form, it says "Stormwater Utility Fee Credit Program" and features a logo for "GREEN RESOURCES PROTECTION FUNDATION".

Once a credit has been approved, the property owner will remain eligible for the credit as long as all conditions of the maintenance agreement are met and the facility passes periodic inspections by City staff. If the property owner fails to submit required documentation or correct deficiencies within the time specified by City staff, the facility will no longer be eligible for credit. If this occurs, the property owner will be required to reapply through the initial credit process.

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# Important Resources and Links

## General Information and Assistance

- Charlottesville Water Resources Protection Program  
[www.charlottesville.org/wrpp](http://www.charlottesville.org/wrpp)
- Virginia Department of Environmental Quality Stormwater Program  
[www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx](http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx)

## Stormwater Management Facility Standards

- Virginia Stormwater BMP Clearinghouse  
<http://vwrrc.vt.edu/swc>
- Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects  
<http://chesapeakestormwater.net/bay-stormwater/baywide-stormwater-policy/urban-stormwater-workgroup/retrofits/>

# Credit Application Form

**Applicant Name:**  **Date:**

**Property Information:**

Owner   
Street   
City, State, ZIP Code

**Mailing Address: (if different from property address)**

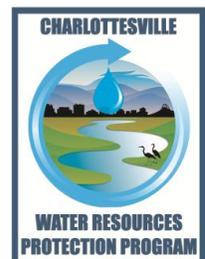
Street   
City, State, ZIP Code

**Email Address:**  **Phone Number:**

**Stormwater Management Facility Description**

Include type of facility, date(s) of installation and pollutant removal efficiency from the Virginia BMP Clearinghouse, [Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects](#), or other state-approved guidance documents (provide documentation to support the determined pollutant removal efficiency). Attach additional information if necessary.

**Total amount of impervious area to be subtracted from the fee calculation for the property (provide the sum of all included Credit Calculation Forms):**



**The following supporting documentation and materials must accompany this application**

- Drainage Area Map**
- Operation and Maintenance Plan**
- Copy of Stormwater Facility Maintenance Agreement**
- Photograph of the Stormwater Management Facility** – The photo should be no more than one month old.
- Stormwater Management Facility Inspection Form**

**Owner Certification and Inspection Agreement**

- I am the property owner or I am duly authorized to act on behalf of the property owner, I have reviewed the information contained in this application and the supporting documentation, and to the best of my knowledge believe that it is true and accurate.
- I commit to maintaining the stormwater management facility in good working condition.
- I authorize the City or its representative to enter on my property for the sole purpose of inspecting the stormwater management facility.
- I understand that if an inspection by the City indicates that the facility is not properly maintained, that the facility will no longer be eligible for credit if deficiencies are not corrected within the time-frame provided by City staff.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

*This form and all supporting documentation and materials should be submitted to:*

*City of Charlottesville  
Water Resources Protection Program  
305 4th St NW  
Charlottesville, Virginia 22903*

<i>Internal Use Only:</i>	
<i>Facility ID#</i>	<i>Review Date:</i>
<i>Reviewer:</i>	<i>Approval Date:</i>
<i>Notes/Conditions:</i>	

# Credit Calculation Form

Stormwater Management Facility Description:

**Property Information:**

Owner

Street

City, State, ZIP Code

**Complete one form for each stormwater facility on the property. A single facility may be built as a condition of development but voluntarily sized to treat additional on-site or off-site impervious area beyond minimum regulatory standards.**

<b>COD or Voluntary Credit Fixed Percent</b>	<b>Voluntary Credit On-Site – Variable Percent</b>	<b>Voluntary Credit Off-Site – Variable Percent</b>
(A) Impervious Area Treated: <input type="text"/> SF	(A) Impervious Area Treated: <input type="text"/> SF	(A) Impervious Area Treated: <input type="text"/> SF
(B) Percent Credit from Credit Level Table: <input type="text"/> %	(B) Percent Credit from Credit Level Table or Voluntary Facilities Calculator: <input type="text"/> %	(B) Percent Credit from Credit Level Table or Voluntary Facilities Calculator: <input type="text"/> %
(C) Impervious Area Credit = (A) x (B) = <input type="text"/> SF	(C) Impervious Area Credit = (A) x (B) = <input type="text"/> SF	(C) Impervious Area Credit = (A) x (B) = <input type="text"/> SF
<b>Add Columns 1, 2, and 3 for the Total Impervious Area Credit:</b>		<input type="text"/> SF

**Credit Calculator for Post-July 1, 2009 Voluntary Water Quality Facilities**

- (a) Facility Efficiency Must be 15% or Greater
- (b) Facility Efficiency of  / 100 \* 1.76 =
- (c) (b) – (0.264) =
- (d) (c) / 0.016 =
- (e) 40% + (d) =  Percent Total Facility Credit

See the Virginia BMP Clearinghouse, [Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects](#), or other state-approved guidance document for pollutant removal rates.

# Stormwater Management Facility Inspection Form

**Applicant Name:**  **Date:**

**Property Information:**

Owner   
 Street   
 City, State, ZIP Code

**Stormwater Management Facility Description:**

**Impervious Area Draining to the Facility:**  **SF**

**Year Built:**  **City ID (if known):**

<b>General Condition:</b>	Yes	No	N/A
Is the primary outfall pipe/ ditch clear and functioning?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the inflow pipes/ ditches clear and functioning?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the water quality pool at the correct height (if present)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are water quality pool control weirs, pipes, etc. working properly (if present)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are emergency overflow devices clear and functional (if present)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the structure clear of sediment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the structure clear of trash?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is vegetation being managed in a manner appropriate to the facility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Certification**

*This certification must be made by a licensed professional engineer, landscape architect, or other professional accepted by the City.*

- Based on a visual survey of the above facility conducted on \_\_\_\_\_, I certify that the facility is currently functioning as designed.
- I certify that the total impervious cover served by the facility and the accompanying Drainage Area Map are true and accurate.

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Qualification

\_\_\_\_\_  
Address

\_\_\_\_\_  
Phone

\_\_\_\_\_  
Email

# SINGLE-FAMILY RESIDENTIAL CREDIT MANUAL



Department of Water Resources  
525 Taylor Street  
Lynchburg, VA 24501

434.455.4250

[www.lynchburgva.gov/stormwater](http://www.lynchburgva.gov/stormwater)

## WHY IS STORMWATER IMPORTANT

**S**tormwater runoff is the water that flows off roofs, driveways, parking lots, streets and other hard surfaces during rain storms. Stormwater runoff is also the water that flows off grass surfaces and wooded areas that is not absorbed into the soil. Runoff that is not absorbed into the ground flows into ditches, culverts, catch basins and storm sewers and typically does not receive any treatment to remove pollutants before entering our local creeks and streams.

Water from rain or melting snow either seeps into the ground or flows across the ground, ultimately making its way into streams, creeks, and other water bodies. On its way, this runoff can pick up many natural and man-made substances that can pollute local water bodies. Examples of common pollutants include fertilizer, pesticide, pet waste, sediment, oil, salt, trace metals, grass clippings, leaves, and litter. Polluted runoff can be generated anywhere people use or alter the land, such as farms, yards, roofs, driveways, parking lots, construction sites, and roadways.

### BENEFITS OF A STORMWATER UTILITY

A stormwater utility is based on the premise that the urban drainage system is a public drainage system, similar to water or wastewater systems. When a demand is placed on these systems, the user pays. Stormwater runoff needs to be managed just as any other process in the City is managed, such as the water, sewer, roadway, or solid waste systems.

Management is essential to protect the quality of our natural watercourses as drinking water supplies and for recreational activities such as swimming, fishing and boating. Stormwater also needs to be managed to ensure that during storm events that stormwater runoff does not flood or erode private property or otherwise put public safety or private property at risk.

A typical city block generates more than 5 times the runoff of a woodland area of the same size



## WHAT IS THE COST TO THE CUSTOMER

Parking lots, rooftops and driveways can't absorb water, so it moves quickly over these surfaces into nearby storm sewers and streams. A greater flow of water –i.e. a greater demand—is placed on the urban drainage system. So, the more paved – or “impervious”—surfaces there are on your property, the greater the demand on the system.

For single-family residential properties, the fee is based on square footage of impervious surface. These properties are placed in three categories based on total impervious area.



Tier	Impervious Area	Fee
Small	1,300 sq. ft. or less	\$2
Medium	1,301 to 4,300 sq. ft.	\$4
Large	4,301 sq. ft. or more	\$6.40

### HOW CAN I EARN A CREDIT?

Residents that implement stormwater best management practices (BMPs) to reduce the stormwater rate or volume flowing from their properties to the storm system or surrounding bodies of water, can qualify to receive a reduction in their stormwater fee.

If approved, each device will earn the property owner a credit of 20% of the stormwater utility fee, up to a maximum credit of 50% of the fee. No property owner shall receive a credit of greater than 50% of the fee.

The City shall affirm or deny credit applications and reapplications within 45 days of submittal. Any credit denial shall include comments from the City indicating what modification the applicant can make in order to achieve acceptance of the credit or shall include a statement that the credit application as submitted must be restructured significantly to achieve approval. Property owner can submit a BMP design for approval prior to construction. Credit will not be applied until the BMP has been constructed and the construction has been approved.

- ◆ The **maximum** credit a homeowner can receive is **50%**.
- ◆ Credits are valid for **three years**
- ◆ Proper installation and maintenance is required to continue receiving the credit.



## APPROVED BMPs

### Rain Garden

A rain garden is a landscaped area in a depression designed to capture and filter stormwater runoff from an impervious surface.



#### Design Requirements

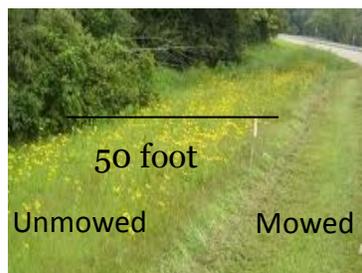
At least 50% of a property's impervious surface area must drain to the rain garden. The rain garden must be designed according to either:

- Virginia Department of Conservation and Recreation - Stormwater Design Specification No. 9 – Bioretention
- Virginia Department of Conservation and Recreation - Minimum Standard 3.11 – Bioretention Basin Practices

If 90% of a property's impervious surface area drains to a rain garden, double credit may be given up to the maximum amount. Include mosquito prevention and overflow controls.

### Vegetated Filter Strip

Vegetated filter strips are runoff flow paths of dense turf, meadow grasses, trees or other vegetation with a minimum slope to treat runoff from roof downspouts.



#### Design Requirements

- At least 50% of the property's roof area drains to vegetated filter strips.
- Downspout discharge must be dispersed using splash block.
- Filter strips are fully vegetated with no bare soil or mulch.
- Minimum flow length of 50 feet with slope of 5% or less.

### Rain Barrel/Cistern

Temporary storage of stormwater runoff can reduce peak runoff volumes and can result in reduced overall stormwater volumes by discharging

runoff over less saturated soil, thereby allowing greater infiltration and evaporation of runoff to occur. Other comparable configurations may be approved with appropriate detention time, volume, and release rate calculations.



In order to be effective, empty storage space must be available when rain falls. Therefore, the rain barrel or other storage device must empty itself within 4 to 48 hours of the end of rainfall. If the property owner wishes to save rainfall for use in gardening or other non-potable uses, additional storage for such uses may be installed. However, stormwater utility credit is granted only for storage that empties itself.

#### Design Requirements

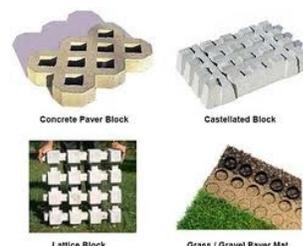
- At least 50% of a property's roof area must drain to a rain barrel or other self-emptying storage device.
- At least one gallon of storage must be provided for every three square foot of roof area. (stores one half inch of rain)
- Must drain in no less than 24 hours and no more than 4 days after each rainfall event.
- Overflows from storage must be directed to appropriate outlets or areas and away from neighboring properties, sidewalks, steep slopes or retaining walls.

### Pervious Pavement

Pervious pavements are designed to allow infiltration of stormwater through the surface into the soil below where water is naturally filtered and pollutants are removed. Pervious pavements may include paving blocks, grid pavers, pervious concrete, or pervious asphalt. Gravel is not considered pervious and is not eligible for a credit.

#### Design Requirements

- At least 1000 square feet of pervious pavement must be installed.
- Stone reservoir must be at least 10 inches deep at all points.



## How do I apply?

All applicants must complete a Single-Family General Application and include a picture of the Best Management Practice. Applications must be submitted with all required documentation, including photos, to the address below.

Once the Department of Water Resources has received your application, an administrative completeness review will be conducted. If the application is not complete, the Department will contact the applicant and may request additional information necessary to complete the application.

Once a complete application has been received the Department will review all documentation and the applicant will be notified in writing when an application is approved or denied. If an application is denied, the applicant can file appeal to the Department of Water Resources.

The appeals form, credit application and manual can be found at the website below:  
<http://www.lynchburgva.gov/stormwater>

### Application checklist:

- 1) Install your selected Best Management Practice.
- 2) Complete the Single-Family General Application.
- 3) Include pictures of each Best Management Practice installed.
- 4) Review your application.
- 5) Submit application to the address below.

City of Lynchburg  
 Department of Water Resources  
 Attn: Stormwater  
 525 Taylor Street  
 Lynchburg VA 24501

## RAIN GARDEN — DESIGN REQUIREMENTS

**RAIN GARDENS** are landscaped areas built in a depression that are designed to capture and filter stormwater runoff from a roof or other impervious surface. The plants and soil in a rain garden provide an easy, natural way of reducing the amount of stormwater runoff.

**20%  
Credit**

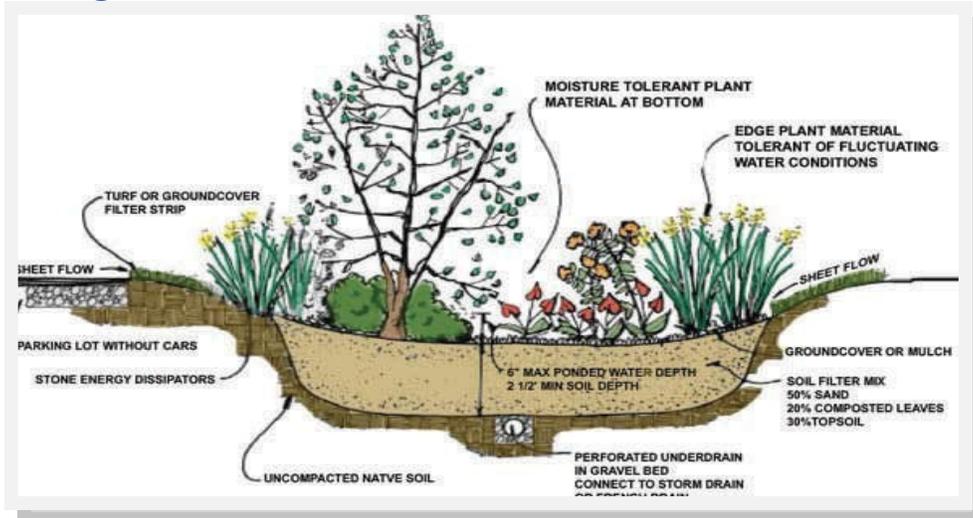


### Installation standards

To obtain a single family residential property credit for a rain garden the following standards and requirements must be met:

- At least 25 % of the property's roof area or equivalent impervious surface must drain to the rain garden.
- The rain garden must be sized and constructed according to the Virginia Department of Forestry Rain Gardens Technical Guide. Any alternate design must be pre-approved.
- Overflows must be directed to appropriate outlets or areas and away from neighboring properties, sidewalks, steep slopes or retaining walls.

### Rain garden cross section



### Maintenance guidelines

1. Rain gardens must be maintained annually to ensure continued function. Maintenance includes weeding, checking for erosion and other tasks listed in the Rain Garden Technical Guide.
2. The property owner is responsible for maintaining the rain garden. The credit renewal process will require documentation that the rain garden continues to function as approved.



**Include a photo of  
the rain garden  
with your  
application!**

## ON SITE STORMWATER STORAGE

**ON-SITE STORMWATER STORAGE STRUCTURES** can include rain barrels, cisterns other devices as approved by the City of Lynchburg Stormwater Utility. These structures collect and capture rooftop rainwater that would otherwise drain directly to the stormwater system or streams. The collected rainwater can be used to water plants, trees or lawns during dry periods.

**20%  
Credit**

### RAIN BARREL

A rain barrel is composed of a 40-55 gallon barrel or drum with some type of diverter or connection from a downspout, a spigot or hose to drain the barrel and some type of overflow mechanism. Any openings to the air should be screened to keep debris and insects out.



An overflow mechanism must be provided so that when the rain barrel is full, excess water can flow back into the downspout and then to a storm drain or onto a landscaped area.

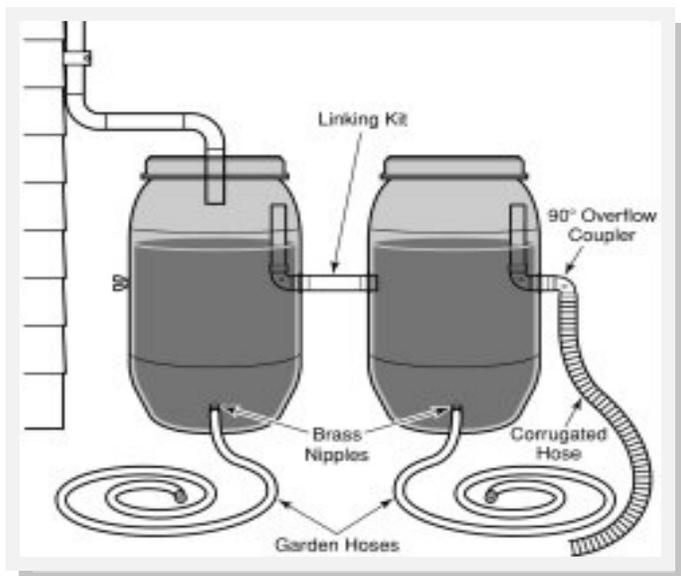
Saving water not only helps protect the environment, it saves money and energy because of the decreased demand for treated tap water. You can purchase a rain barrel or make your own. Ensure your rain barrel will meet the credit requirements on the next page.

You will need to create a plan for how you will use the water

### CISTERN

Cisterns are similar to rain barrels in function but hold larger quantities of water. They can be installed underground, at ground level, or elevated depending on the site and space constraints of the property.

A cistern should be constructed out of reinforced concrete, galvanized steel, or plastic, and should have smooth interior surfaces, be watertight, have enclosed lids and be sized according to the installation standards on the next page to manage the proper amount of runoff.



Certain design standards and guidelines must be met to obtain a SFR Credit.....

Keep reading to find out more on the next page

## ON SITE STORMWATER STORAGE, CONT...

### Installation Standards

To obtain a single family residential property credit for on-site stormwater storage the following standards and requirements must be met:

1. 50% of the property's roof area is properly connected to rain barrels or other approved storage devices that provide at least 40 gallons of storage per downspout
2. On-site stormwater storage must be completed in such a way that does not provide mosquito breeding grounds; such as making sure rain barrels are covered with a lid or screen that prevents mosquitoes from entering the storage structure.
3. On-site stormwater storage must be equipped with an overflow or bypass mechanism to divert rainwater to the storm drainage systems when storage structure is full. These mechanisms must not cause erosion, property damage or overflow onto a neighboring property.
4. On-site stormwater storage must be completely drained in no less than 24 hours and no longer than 4 days after each rainfall event.
5. All on-site stormwater storage structures must meet the local codes for downspout disconnection, property setbacks and all other applicable codes.

### Where to get a rain barrel:

You can purchase a rain barrel at most major lawn and garden centers. Call your local center to see if they carry them or if they can order one for you. There are numerous online suppliers as well.

You can also make your own rain barrel using a large trashcan, agricultural supply container, or other large container and a little ingenuity.

For further recommendations, talk to your local Soil & Water Conservation District or watershed group (see back page for contact information).

### Maintenance Guidelines

1. Clean your gutters regularly to reduce debris.
2. Clear off any screens as necessary.
3. Periodically check any hoses associated with the storage structure to clear any debris.
4. To winterize, disconnect and return the downspout to its original configuration. Remove the hoses and mesh screen and store them. Make sure to drain the container to prevent it from freezing and cracking. If possible, store it upside down, so no water or materials will be able to enter.
5. For cisterns, leave the outflow spigot fully open during frost/freezing periods and unhook the drain hose about twice a year to clean out any compacted sediment.



**Include a photo of the rain garden with your application!**

# PERVIOUS PAVEMENT

**PERVIOUS PAVEMENTS** are designed to allow percolation or infiltration of storm-water through the surface into the soil below where the water is naturally filtered and pollutants are removed. Pervious pavement may include paving blocks, grid pavers, pervious concrete, or pervious asphalt. Gravel driveways are not considered pervious and are not eligible for a credit.

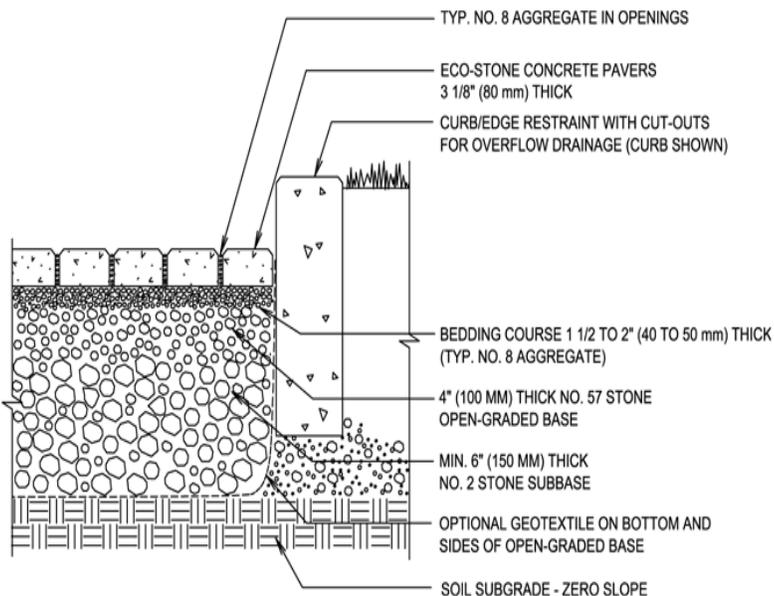
**20%  
Credit**

It is recommended that a qualified installer with knowledge of hydrology and hydraulics be consulted for applications using pervious pavement to ensure desired results. This fact sheet provides an overview of construction guidelines and research to date and is not meant to replace the services of experienced, professional installers.

## Installation standards:

To obtain a credit for pervious pavement the following criteria must be met:

- Installed for the purpose of runoff filtration.
- Area of pervious pavement is at least 1000 sq. ft.
- Stone reservoir underneath the pavement type is at least 10 inches deep at all points.
- Installation meets all local building and zoning standards for driveway installations.



## Maintenance Guidelines

1. Ensure pervious pavement system is draining and there are no visible signs of standing water on the surface.
2. Do not apply salt or sand during winter months.
3. Use a professional vacuum service annually to remove sediment accumulation and organic debris on the pavement surface.
4. Remove accumulated leaves and debris from pavement surface in the fall.

Remember to include a photo of the pervious pavement and a photo of the construction identifying the depth of stone reservoir with your application!



# VEGETATIVE FILTER STRIPS

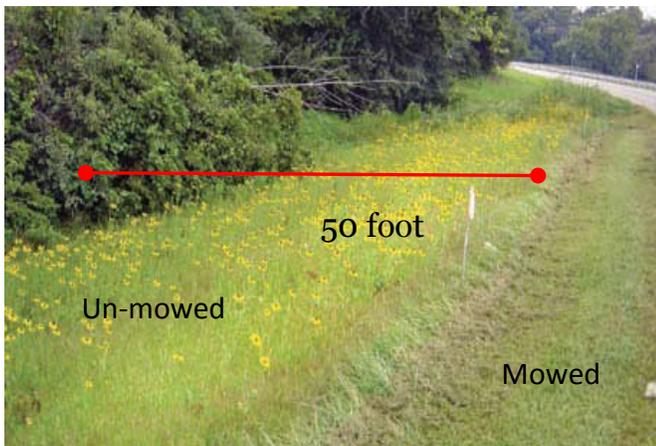
**VEGETATED FILTER STRIPS** are uniform strips of dense turf, meadow grasses, trees, or other vegetation with a minimum slope to treat runoff from roof downspouts.

**20%  
Credit**

## Installation standards:

To obtain a credit for vegetated filter strips the following criteria must be met:

- 50% of the property's roof area drains to the vegetated filter strip.
- Filter strips are fully vegetated and there are no areas of bare soil or mulch.
- Filter strips must be at least 50 feet long with slopes less than 5%.
- Runoff from roof downspouts must be dispersed using splash block.



## Maintenance guidelines:

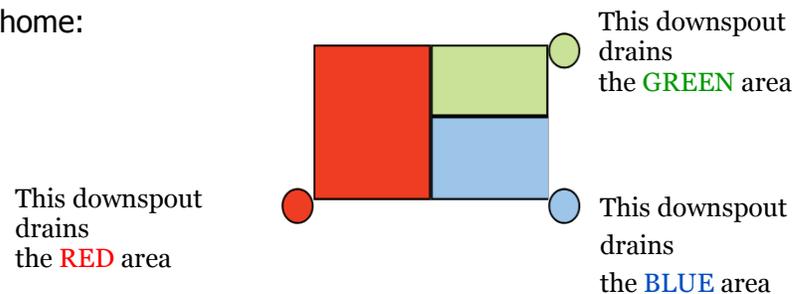
1. Clean gutters regularly to reduce debris.
2. Check the splash blocks twice a year to make sure they are not broken or damaged.
3. Maintain healthy vegetation along the filter strip.
4. Plant additional vegetation if bare soil or erosion is present.



**Include a photo of the vegetated filter strip with your application!**

The Smith's want to apply for a stormwater credit. Follow along as they decide which stormwater Best Management Practices (BMPs) will work for their property and fill out their application.

Let's look at their home:



For the Smith's to qualify for the credit either the red downspout or both the green and blue downspouts need to be connected to rain barrels. They decide to put a rain barrel on the red drain and goes to their neighborhood garden center and purchases a rain barrel kit. They attach the rain barrel to the red downspout and are now eligible for a **20% credit!**

But they are not finished! They like saving water and decide to add two more barrels and capture all the rain from their roof. They install two more rain barrels and applies for another credit. Their credit is **up to 40%!**

Lets review the Smith's situation. They have installed three rain barrels and have **qualified for 40% off their stormwater bill**. They can **earn up to 50% off** so they still have 10% more to save. What else can they do to get that last 10% credit? Their driveway and patio square footage equals 675 square feet so they don't meet the 1000 square foot installation requirement for pervious pavement.

The Smith's review their Credit Manual and discover another way to save. They like gardening, so they choose a rain garden for their next BMP. They download the *Rain Garden Technical Guide* on the Department of Forestry's website. They have already captured all of the rain from their roof, so they search for drainage from another impervious surface area where water can be captured. With a little reworking of the landscaping, they can capture the runoff from the small driveway into an appropriately sized rain garden. They fill out a third credit application for the **remaining 10% credit**.

With a little bit of research, sweat equity and planning, the Smith's have accomplished great things! They have saved water, reduced pollution and added a beautiful new garden.

Oh—and they **saved 50%** on their stormwater bill. Good job Smith family!!!

## RESOURCES

### Department of Forestry

Information on Water Quality and rain gardens  
 Rain garden Technical Guide  
<http://www.dof.virginia.gov>  
 434-977-6555

### Virginia Soil & Water Conservation District

Watershed education, low impact development information, backyard conservation, lawn and tree care tips, rain garden and rain barrel information  
<http://www.vaswcd.org>  
 804-559-0324

### Virginia Department of Conservation and Recreation

Watershed education, lawn care and pet waste information, land conservation  
<http://www.dcr.virginia.gov>  
 804-786-1712

### James River Association

9 South 12th Street, 4th Floor  
 Richmond, VA 23219  
[www.jamesriverassociation.org](http://www.jamesriverassociation.org)  
 (804) 788-8811

### Clean Virginia Waterways

Rain barrel workshops and supplies, watershed education  
<http://www.longwood.edu/cleanva>  
 434-395-2602

### Chesapeake Bay Foundation

Water Quality, Lawn care tips, Bay education,  
 rain garden & rain barrel information  
<http://www.cbf.org>  
 804-648-4011

### Alliance for the Chesapeake Bay

Bay education, Clean Stream projects, rain barrel  
 and native landscaping information  
<http://www.allianceforthebay.org>  
 804-775-0951

### Environmental Protection Agency (EPA)

Pollution Prevention  
<http://www.epa.gov/stormwater>  
 800-438-2474



Stormwater BMPs help  
 manage the quantity and  
 quality of stormwater runoff

# NON-RESIDENTIAL/MULTI-FAMILY CREDIT MANUAL



**DEPARTMENT OF WATER RESOURCES**

**525 TAYLOR STREET**

**LYNCHBURG VA 24501**

**434.455.4250**

**[www.lynchburgva.gov/stormwater](http://www.lynchburgva.gov/stormwater)**

## INTRODUCTION

On December 13, 2011 the City of Lynchburg approved the implementation of a Stormwater Utility by adopting City Code Chapter 16.3 Stormwater Utility to fund the City's stormwater management program. The ordinance provided for a stormwater fee that was subsequently approved by City Council on April 24, 2012 at a rate of \$4.00 per Single-Family Unit (SFU).

The Department of Water Resources is responsible for meeting permitting requirements of the city's Municipal Separate Storm Sewer System (MS4) permit which include erosion and stormwater controls for development and re-development, seeking out and eliminating illicit



discharges and providing public education on water quality related issues. In addition the City is responsible for the operation and maintenance of the city owned storm drainage system. This drainage system is similar to the water or wastewater systems which provide a public benefit. The stormwater fee will provide a dedicated funding source to addressing stormwater related issues such as flooding, erosion and water quality problems.



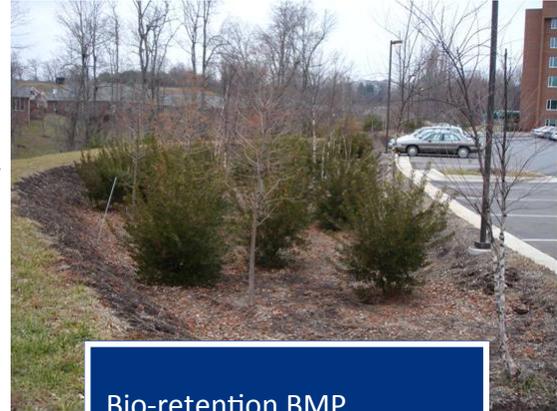
## WHAT IS A STORMWATER FEE?

A stormwater fee is directly proportional to the impervious surface on the account holder's property. When a forested or grassy area is paved or replaced with an impervious material, this results in less infiltration of runoff. A larger amount of surface runoff enters the stormwater system causing an increase in demand on the drainage system. Account holders are therefore charged a fee based on the amount of hard (impervious) surface on a property.

Lynchburg measures the amount of impervious surface using the number of Single-Family Units (SFUs) per property. One SFU is equal to 2,672 square feet of impervious surface and will be charged the stormwater rate per month established by the City. The non-residential and multi-family fee is then based on the calculated number of SFUs for the existing impervious area multiplied by the SFU rate.

## WHAT IS A STORMWATER CREDIT?

Properties that install stormwater best management practices (BMPs) to reduce the stormwater volume flowing or pollutant loading from their property to the storm system or surrounding bodies of water, can qualify to receive a reduction in their stormwater fee. A BMP is an activity, measure or facility that prevents or reduces the transport of pollutants, controls stormwater volume or rate and/or limits the impacts to the storm drainage system.



Bio-retention BMP

These measures can include on-site practices such as bio-retention, vegetated swales and ponds that manage stormwater at its source. The City encourages the use of low-impact design strategies in the planning of development projects.

The stormwater credit will be based on the reduction of stormwater volume flowing from a property and can be obtained through the installation and continuing use, operations and maintenance of the BMP which is not owned or maintained by the City.

### What types of credits are available?

The table outlines the types of credits available to nonresidential and multi-family properties.

Credit Category	Commercial, Industrial	Multi-Family Residential
Stormwater Quality	✓	✓
Stormwater Quantity	✓	✓
VPDES Industrial Permit Compliance	✓	

The credit amount will be determined based on the type of BMP and percentage of the impervious area of the site that drains to the BMP. The maximum credit allowed is fifty percent (50%) of the stormwater fee for the property being served by the BMP.

The credit will be good for a period of one (1) year. The owner will be required to submit an annual renewal application and proof of inspection and maintenance pursuant to the Stormwater Management Maintenance Agreement to continue receiving the credit.

Continue reading to find out how which BMPs will earn a credit

# STORMWATER QUALITY CREDIT

A Stormwater Quality credit of up to 20% is available to applicants who have installed an approved Best Management Practice (BMP) that provides for the permanent reduction of pollutants from the stormwater runoff leaving their property. The Stormwater Utility has adopted the Virginia Department of Conservation and Recreation's guidelines for which BMPs qualify for the Stormwater Quality Credit. Providing for the reduction of phosphorus pollution will qualify for a quality credit. Both standards and specifications are acceptable to the Stormwater Utility.

The amount of credit earned by a property is determined by the type of BMP installed, the number of BMPs installed and the percentage of the impervious area on the site that drains to the BMP. The credit will apply to the percentage of the impervious surface area that is treated by the BMP. The following formula will determine the amount of credit earned by a Quality BMP:

$$\text{Credit Earned} = (20\% \text{ Credit}) * (\text{Stormwater Fee}) * (\% \text{ of impervious area treated})$$

All BMPs must be designed, constructed and maintained in accordance with the Virginia Stormwater Management Handbook which can be found at [www.dcr.virginia.gov/soil\\_and\\_water.shtml](http://www.dcr.virginia.gov/soil_and_water.shtml). Another source for acceptable design criteria is the Virginia Stormwater BMP Clearinghouse Standards and Specifications. These can be found at [www.vwrrc.vt.edu/swc/](http://www.vwrrc.vt.edu/swc/).

Approved BMPs for  
Quality credits:

Practice Number	Practice	Design Specification
3	Grass Channel	SW Handbook Min Std. 3.13, VA DCR Design Spec. No. 3
7	Permeable Paver	SW Handbook Min Std. 3.10D, VA DCR Design Spec. No. 7
8	Infiltration	SW Handbook Min Std. 3.10, VA DCR Design spec. No. 8
9	Bio-retention 1	SW Handbook Min Std. 3.11, VA DCR Design Spec. No. 9
	Bio-retention 2	
	Urban Bio-retention	
10	Dry Swale 1	VA DCR Design Spec. No. 10
	Dry Swale 2	
11	Wet Swale 1	VA DCR Design Spec. No. 11
	Wet Swale 2	
12	Filtering Practice 1	SW Handbook Min Std. 3.10, VA DCR Design Spec. No 12
	Filtering Practice 2	
13	Constructed Wetland 1	SW Handbook Min Std. 3.09 VA DCR Design Spec. No. 13
	Constructed Wetland 2	
14	Wet Pond 1	SW handbook Min Std. 3.06, VA DCR Design Spec. No. 14
	Wet Pond 2	
15	Extended Detention Pond 1 & 2	SW Handbook Min Std. 3.07 VA DCR Design Spec. No. 15
NA	Manufactured BMP Systems	SW Handbook Min Std 3.15, SW Technical Bulletin #6

# STORMWATER QUANTITY CREDIT

A Stormwater Quantity credit of up to 50% is available to applicants who have installed an approved Best Management Practice (BMP) that reduces stormwater volume. These practices reduce the demand or burden on Lynchburg’s storm sewers, the combined sewer system and our streams and rivers. The Stormwater Utility has adopted the Virginia Department of Conservation and Recreation’s guidelines for which BMPs qualify for the Stormwater Quantity Credit. Providing for the reduction of phosphorus pollution will qualify for a quality credit. Both standards and specifications are acceptable to the Stormwater Utility.

The amount of credit earned by a property is determined by the type of BMP installed, the number of BMPs installed and the percentage of the impervious area on the site that drains to the BMP. The credit will apply to the percentage of the impervious surface area that is treated by the BMP. The following formula will determine the amount of credit earned by a Quantity BMP:

$$\text{Credit Earned} = (50\% \text{ Credit}) * (\text{Stormwater Fee}) * (\% \text{ of impervious area treated})$$

All BMPs must be designed, constructed and maintained in accordance with the Virginia Stormwater Management Handbook which can be found at [www.dcr.virginia.gov/soil\\_and\\_water.shtml](http://www.dcr.virginia.gov/soil_and_water.shtml). Another source for acceptable design criteria is the Virginia Stormwater BMP Clearinghouse Standards and Specifications. These can be found at [www.vwrrc.vt.edu/swc/](http://www.vwrrc.vt.edu/swc/).

Approved BMPs for Quantity Credit:

Practice Number	Practice	Design Specification
1	Rooftop Disconnection	VA DCR Design Spec. No 1
2	Vegetated Filter	SW Handbook Min Std 3.14 VA DCR Design Spec No 2
6	Rainwater Harvesting	VA DCR Design Spec No 6
9	Vegetated Roof 1 or 2	VA DCR Design Spec No 5

## STORMWATER VPDES CREDIT

Some activities that take place at industrial facilities, such as material handling and storage, are often exposed to the elements. As runoff from rain or snowmelt comes into contact with these activities, it picks up pollutants and transfers them to the storm sewer system and ultimately into the creeks and rivers of Lynchburg. To minimize the impact of these discharges, the Virginia Department of Environmental Quality began requiring industrial facilities to register for a VPDES (Virginia Pollutant Discharge Elimination System) Stormwater General Permit.

Property owners who hold a valid and compliant VPDES Industrial Stormwater Permit and who discharge either to a stream through a private facility or to the Lynchburg storm sewer or combined sewer system are eligible to receive a 20 % credit. Documentation to receive a credit include the credit application, copy of the VPDES Industrial Stormwater Permit and copy of the Stormwater Pollution Prevention Plan (SWPPP).

# MAKING A CREDIT APPLICATION

Prior to receiving a stormwater credit the property owner must submit a completed Non-Residential/Multi-Family General Credit Application, along with supporting information (including pictures) on the design and installation of the practice(s). The property owner is responsible for making all appropriate applications prior to receiving a credit on their stormwater utility account. Application and documentation requirements include a complete application, signed Stormwater Maintenance Agreement and design calculations and construction plans.

When a credit application is received by the Department an administrative completeness review will be conducted. If the application is not complete, the Department will contact the applicant and may request additional information necessary to complete the application.

Once a complete application has been received the Department will review all documentation and the applicant will be notified in writing when an application is approved or denied within 30 days of submittal of a complete application. If an application is denied, the applicant can appeal based on the established appeals procedures.

A credit will not be applied to the Utility Billing Account until the BMP has been constructed and an inspection performed on the practice(s) implemented.

## Credit Requirements:

- \* Submit all required documentation with the application;
- \* The BMP shall remain privately owned and maintained, with the owner having sole responsibility for maintenance and upkeep;
- \* The BMP shall not become part of the Stormwater Utility;
- \* Annual renewal is contingent on the property owner submitting a Annual Stormwater Report along with the BMP Inspection Checklist pursuant to the Stormwater Management Maintenance Agreement.

Submit Credit Application and supporting documentation to the following:

City of Lynchburg  
Department of Water Resources  
Attn: Stormwater  
525 Taylor Street  
Lynchburg VA 24501

## Maintenance Requirements

In order for an applicant to continue receiving the stormwater credit each BMP(s) installed must be maintained to ensure continued function. In addition to the annual inspection and report, the applicant is responsible for having all ongoing maintenance work completed to keep the measure functional.

**BMP Inspection checklist:** Submit applicable Inspection check-list with Annual Report to receive the credit. Be sure to sign and date inspection form.

**Stormwater Annual Report:** Submit Annual Report with all supporting documentation annually to receive credit. Be sure to sign and date report.



## Restrictions on credits

**Transfer of credit:** The stormwater credit applies only to the applicant. Credits do not transfer if ownership changes. A new application must be submitted for new account holders to receive the credit.

**Local Community Requirements:** The BMP must meet all applicable City of Lynchburg building, planning and zoning code requirements.

**The credit is valid for one year.** The property must submit the renewal application to continue to receive credit. The renewal application can be completed concurrently with the Stormwater Annual Report

**Right to Inspection.** The City may inspect the BMP at any time during the year. If the BMP is not functioning as approved or has not been maintained, the City reserves the right to cancel the stormwater credit until a new application is received and the property owner proves that all maintenance work has been performed to return the BMP to a fully functional condition.

### HOAs or POAs

A Homeowners or Condominium Association can apply on behalf of its members for the Stormwater Credit. The Association must own and have legally-binding responsibility to maintain an approved BMP. The Association must document its legally binding agreement with the property owners who will be receiving the stormwater fee credit to provide funding necessary to maintain the BMP. If a credit application is approved, the credit will be applied to each account holder listed as a member of the Association whose property drains to the BMP.

# RESOURCES

**Virginia Stormwater BMP Clearing-house** Design standards and calculations  
<http://www.vwrrc.vt.edu/swc/>

**Virginia Stormwater Management Handbook** Design standards and calculations  
[http://www.dcr.virginia.gov/soil\\_and\\_water/stormwat.shtml#vswmhnbk](http://www.dcr.virginia.gov/soil_and_water/stormwat.shtml#vswmhnbk)

**The Center for Watershed Protection**  
Fact sheets, design guidance, and reference materials  
<http://www.cwp.org/>

**Low Impact Development Center**  
Fact sheets, design guidance, and reference materials  
<http://www.lowimpactdevelopment.org/>

**Chesapeake Bay Foundation**  
Rain garden, rain barrel, and native planting information.  
<http://www.cbf.org/>

**U.S. Green Building Council**  
Fact sheets, design guidance, and reference materials  
<http://www.usgbc.org/>

**Environmentally Sensitive Landscaping**  
Fact sheets, design guidance, and reference materials  
[www.epa.gov/GreenScapes](http://www.epa.gov/GreenScapes)

**Alliance for the Chesapeake Bay**  
Rain barrel and native landscaping information.  
<https://www.allianceforthebay.org/>

**Interlocking Concrete Pavement Institute**  
Fact sheets, design guidance, and reference materials  
<http://www.icpi.org/>

**Pervious Concrete**  
Fact sheets, design guidance, and reference materials  
<http://www.perviouspavement.org/>



Stormwater BMPs help manage the quantity and quality of stormwater runoff to local streams and waterways

# Stormwater Utility Fee Credit Manual



## Single Family Residential Properties



City of Roanoke, Virginia  
Department of Planning, Building, and  
Development  
215 Church Avenue, S.W., Noel C. Taylor  
Municipal Building, Room 166  
Roanoke, VA 24011

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## GLOSSARY

**Adequate Channel:** A ditch, pipe, or other stormwater conveyance that is properly sized and constructed to prevent flooding and erosion in the channel and on adjacent properties.

**BMP or “Best Management Practice”:** A control measure, activity, or facility that prevents or reduces the transport of pollutants, controls stormwater volume or rate or otherwise limits adverse impacts to the storm drainage system and receiving waters.

**Erosion:** The process of water or wind moving soil and depositing it elsewhere. Erosion is increased when vegetation is removed or an area is denuded.

**Groundwater:** Water held in soil pore spaces below ground. Groundwater can eventually flow to a drinking water well or area waterways.

**Impervious Surface:** Surfaces that do not allow water to be absorbed. Impervious surfaces include paved areas, structures, bridges, decks, and gravel. \*Note: The [Virginia Stormwater Management Handbook](#) defines gravel as impervious because once it is installed it is compacted and impedes the flow of water into the ground.

**Infiltration:** The process by which water on the ground surface is absorbed into the soil.

**Non-Single Family Residential Property:** Any property that is not a single family residential property. Types of non-single family residential or other properties include commercial, industrial, multi-family residential, and institutional properties to name a few. \*Note: Properties applying for credits for a regional BMP that serves multiple properties (single family residential or otherwise) will need to follow the rules listed in the [Commercial, Industrial, Institutional, and Multifamily Residential Properties \(Non-Single Family Residential or Other Properties\) Credit Manual](#).

**Pervious Surface:** A surface composed of material that allows water to be absorbed into the ground, reducing runoff and filtering pollutants.

**Regional BMP:** BMP that accepts and treats runoff from multiple separate properties. Regional BMPs are often owned by a Property Association or other entity responsible for regular maintenance and inspections.

**Runoff:** Precipitation that does not absorb into the ground but flows down-slope along the surface. Runoff volume, flow rate, and pollutant load increases with impervious areas.

**Sediment:** Soil and rock that is moved and deposited by water. Sediment is usually suspended in water until flow rates decrease enough that it can settle out.

**Sheet Flow:** An overland flow of water in the form of a thin, continuous film rather than concentrated into channels.

**Single Family Residential Property:** Property on which a dwelling exists which is occupied exclusively by one family for noncommercial purposes. Duplexes are included as a single family residential property for the purposes of this credit manual.

**Stormwater:** Water that originates during precipitation events. Stormwater that does not absorb into the ground becomes runoff which flows to the storm drainage system and then on to creeks and rivers.

**Stormwater Ideabook:** Guidance document prepared by the City of Roanoke to inform and encourage homeowners to implement BMPs on single family residential properties. This guide is not in full compliance with the Virginia BMP Clearinghouse and is not a design tool for projects on non-single family residential properties.

**Water Quality:** Refers to the chemical, physical, and/or biological characteristics of water.

**Water Quantity:** Refers to the flow rate or volume of runoff from a property.

Note: The definitions of terms that appear above are to facilitate your review of this Manual. Please note that these terms may also be defined by applicable laws, ordinances, rules, or regulations and are controlled by those definitions. For completed definitions of these terms under applicable laws, ordinances, rules, or regulations, please consult: The [City of Roanoke Stormwater Management Ordinance](#), the [City of Roanoke Stormwater Design Manual](#), the [City of Roanoke Stormwater Ideabook](#), and the [Virginia Stormwater Management Handbook](#).

## I. INTRODUCTION

The City of Roanoke has 13 major rivers and streams within its boundaries and seven of these are listed as impaired for water quality by the Virginia Department of Environmental Quality (DEQ). Investment needs to be made in capital improvements, system maintenance, and regulatory compliance to ensure that environmental standards are met and our valuable natural resources are protected.

Our stormwater system is aging with much of it having exceeded its useful design life of 50 years, and it has seen little investment in decades. At the same time, our impervious surface areas (paved driveways, rooftops, access roads) have increased many-fold as our city has developed into a regional center for commerce, healthcare, retail, entertainment and the arts. The City has a current backlog consisting of hundreds of stormwater projects



Trash and debris in a City storm drain.

estimated to cost tens of millions of dollars, which need to be implemented to effectively minimize flooding and control pollutants before they enter our local waterways. Combine these capital infrastructure demands with the need to provide on-going maintenance of hundreds of miles of existing stormwater pipes and the requirement to meet increasing Federal Clean Water Act stormwater permit requirements, and the City faces a significant financial challenge.



Storm drain surcharging after large storm.

City leaders recognize that stormwater management solutions range from individual citizen and business participation to large-scale stormwater projects, but any real solution will require an on-going dedicated level of funding and focused effort. To that end, in 2013, the City Council approved the

implementation of a Stormwater Utility Fee to fund the City's public stormwater management program. In May 2014, the City Council adopted the Stormwater Utility Fee Schedule.

## II. STORMWATER UTILITY FEE

Stormwater runoff is proportional to the amount of impervious surface on developed property. When a wooded or grassy area is paved or replaced with impervious material, the result is less infiltration of stormwater. Hardened or impervious surfaces such as driveways, parking lots, streets and rooftops do not allow rainfall to soak into the soil, so more of the rainfall becomes stormwater runoff and increases the demand on the system. This stormwater runoff also accumulates pollutants such as oil and grease, chemicals, nutrients, metals, and bacteria as it travels across land and discharges into our rivers and streams. Both the quantity and the quality of runoff need to be managed before discharge into local rivers and streams.

Therefore the amount of the stormwater fee is based on the amount of impervious area on each developed property in the City. The City used aerial photography and Geographic Information System (GIS) technology to identify and measure the impervious area on all developed properties in the City. The green hatched areas in the photograph below demonstrate the capture of impervious features which include rooftops, driveways, and walkways.



For billing purposes, the fee is based on each 500 square feet of impervious area identified, rounded to the nearest whole number. So for the two examples shown above, the fee for the property on the left would be based on 5 billing units (2,477 square feet divided by 500 square feet or 4.95) and the property on the right, which has almost 800 square feet less, would be based on 3 billing units (1680 square feet divided by 500 square feet or 3.3).

The monthly fee per billing unit will be phased in over three years as shown in the list below:

2014: \$0.30/Billing Unit/Month

2015: \$0.60/Billing Unit/Month

2016: \$0.90/Billing Unit/Month

The monthly fee for the two properties shown above will therefore be:

Year	Left Property Monthly Utility Fee	Right Property Monthly Utility Fee
2014	\$1.50	\$0.90
2015	\$3.00	\$1.80
2016	\$4.50	\$2.70

All developed properties, including City owned properties and properties owned by tax-exempt organizations, are subject to the fee unless such properties are expressly exempt from the fee under State Code or under the [Stormwater Utility Ordinance](#).

The fee will go into effect in July 2014 and be billed using the City’s real estate tax billing system. Any parcel owner may request a fee adjustment in accordance with [§ 11.5-9 of the Code of the City of Roanoke](#) within 30 days of receiving the bill.

### III. HOW DO I EARN A CREDIT?

The City Council acknowledged when establishing the Stormwater Utility that certain on-site stormwater management activities can reduce the impact on the public system by treating or reducing the stormwater runoff from a developed property. In order to recognize the positive impact these on-site activities can

have, single family residences that install, implement, and maintain stormwater best management practices (BMPs) that improve water quality or reduce runoff can qualify to receive a reduction in their stormwater fee. A BMP is an activity, measure or facility that prevents or reduces the transport of pollutants, controls stormwater volume or rate or otherwise limits the impacts to the storm drainage system. These measures can include on-site practices such as bioretention, vegetated swales, constructed wetlands, rain gardens and detention ponds that manage stormwater at its source.

The stormwater credit will be based on the reduction of stormwater volume and pollutants flowing from a property and can be obtained through the installation and continuing use, operation and maintenance of the BMP which is not owned or maintained by the City. The credit amount will be determined based on the type of BMP and its continued use and maintenance.

In cases where a property is served by a BMP owned by a separate entity or a Homeowners Association, the property owner may receive credit for the BMP if they provide documentation showing they share in the maintenance obligation and costs of the BMP. Please refer to the [City of Roanoke, Virginia Utility Fee Credit Manual for Commercial, Industrial, Institutional, and Multifamily Residential properties](#) for information regarding credits, applications, and requirements for these types of credit requests.

#### **IV. WHAT BMPs ARE APPROVED FOR CREDIT?**

The Level 1 and Level 2 BMPs described in the following section have all been approved for a credit to the stormwater utility fee. Selecting more than one BMP is encouraged; however, the maximum credit allowed per parcel is fifty percent (50%). Credits will not be increased for BMPs that were voluntarily installed or that accept stormwater from other properties.

For additional information on design, installation, and maintenance requirements of each of these BMPs, please refer to the [City of Roanoke Stormwater Ideabook](#) and other resources listed at the end of this manual.

The City of Roanoke also encourages the use of new and innovative stormwater management designs. The City may issue 10% credits for other BMPs not listed in this manual if the homeowner can show that the practice treats stormwater for priority pollutants including bacteria, sediment, PCBs (Poly-Chlorinated Biphenyls ), Phosphorous, or Nitrogen.

### A. Level 1 BMPs: 10% Credit

BMPs in the following list are considered “Level 1 BMPs” and will earn homeowners a 10% credit on their utility fee. These BMPs must be installed and maintained in accordance with the recommendations listed in the City of Roanoke Stormwater Ideabook.

#### Rain Barrels

A rain barrel collects and stores rainwater from roof drains that would otherwise flow to storm drains and streams. Once the rainwater is collected, it can be used to water lawns, gardens, trees, and for other non-irrigation purposes like washing your car. This collection and re-use of rainwater reduces the amount of runoff and pollutants that flow directly to the City storm drain system and eventually to our waterways.

A rain barrel is usually made of a clean, plastic 55 gallon drum with a spigot located at the bottom and an overflow mechanism to direct excess water to an appropriate area away from neighbors, sidewalks, steep slopes, and retaining walls. All rain barrel openings to the air are screened to keep insects and debris out.

#### Vegetated Filter Strip

A Vegetated Filter Strip is a vegetated buffer area that treats sheet flow from adjacent impervious surfaces by slowing down stormwater runoff and filtering out pollutants. Vegetated Filter Strips are normally composed of turfgrasses, meadow grasses, trees, and other native vegetation. Filter strips should have a relatively low slope to encourage sheet flow across the filter strip. Although these areas must be well vegetated to be effective, property owners are required to keep grass routinely maintained as specified in the Code of the City of Roanoke.

#### Grass Channel

A Grass Channel or grass swale refers to a shallow, vegetated ditch used to direct water from impervious areas to an adequate channel. Grass Channels filter and slow down runoff making it a better practice than pipes and concrete gutters for conveying stormwater runoff to storm drain



Grass channel that directs stormwater to the storm drain system. Rock check dams slow stormwater and allow for additional infiltration.

systems and creeks. When deciding if a grass channel is a good solution for stormwater treatment on your property, it is important to verify the practice is at least 10 feet down slope of your foundation and that it flows to a stabilized outlet and not toward a neighbor's property.

### **Roof Drain Disconnection**

This BMP works by eliminating any direct connections between roof drains or downspouts and the storm drain system, ditches, or waterways. Instead, roof drains are routed to discharge at ground level onto flat or gently sloped vegetated areas where infiltration can occur. To avoid any potential damage to building foundations, the altered discharge point(s) should not be closer than 5 feet from any building.

### **Lawn Maintenance BMPs**

Proper lawn maintenance can significantly improve water quality and decrease runoff from urban lawns. A few examples of ways you can improve water quality by altering your normal lawn maintenance routine include limiting fertilizer use, seeding bare areas to prevent erosion, adding soil compost amendments to improve infiltration, and picking up pet waste regularly to prevent bacteria from entering the storm drain system. To qualify for a stormwater utility fee credit, the property owner must commit to at least three of the following:

1. Grow turfgrasses adapted to the Roanoke climate.
2. Use less fertilizer.
3. Leave lawn clippings on the lawn after mowing.
4. Avoid fertilizing within 20 feet of a stream or ditch.
5. Reseed bare areas to prevent future erosion.
6. Mow grass at 3" or taller to reduce runoff.
7. Keep grass clippings and fertilizers off impervious surfaces.
8. Don't irrigate too much.
9. Till soils and amend with compost to increase infiltration.
10. Pick up pet waste regularly and dispose of appropriately.

Further information on how to implement each practice is available in the [City of Roanoke Stormwater Ideabook](#).

### **Trees**

Although most homeowners are well aware of the value of planting trees with respect to aesthetics, property values, and decreased energy costs, many do not know that planting and preserving trees can also improve water quality.

Trees intercept large amounts of rain on their surface areas (leaves, branches, and trunks) and slow down stormwater runoff on the ground. The root systems also help increase infiltration. To qualify for a stormwater utility fee credit by adding trees to your property or preserving existing trees, the homeowner must be sure to address the following:

1. Plant or preserve trees included in Table 642-1 of the City of Roanoke Zoning Ordinance and listed in the table in Appendix A.
2. A minimum tree canopy coverage of 20% is required to receive credit.
3. Trees should be placed a minimum of 10 feet from any above ground and underground utilities and structures. . Remember to call Miss Utility by dialing 811 a minimum of 3 days before starting your project to request utilities be marked. Care should also be taken in close proximity to septic drain fields
4. Trees located within the City Right of Way do not qualify for a utility fee credit.
5. Existing tree canopy on wooded lots may be determined by review of aerial photography.
6. Trees must be planted and preserved properly and in good, healthy condition to continue to receive credit.

### **Waste and Refuse Management:**

Improper waste and refuse containment and the exposure of wastes to the weather, can lead to the pollution of stormwater. For those who go the extra mile to prevent that from happening, you are eligible for a credit if your usual and customary waste management practices ensure that all wastes and refuse, including recyclables, are fully contained and stored within a roofed structure so as not to expose them to rain or other precipitation.



Trash can enclosure photograph from [www.homedepot.com](http://www.homedepot.com)

### **Traditional Septic & Alternative Onsite Sewage System Maintenance:**

A properly maintained and functioning private sanitary sewage system reduces the risk of bacterial contamination of our waters, and otherwise controls the

related threats to public health. Such systems include a standard septic tank and drain field, but may also include

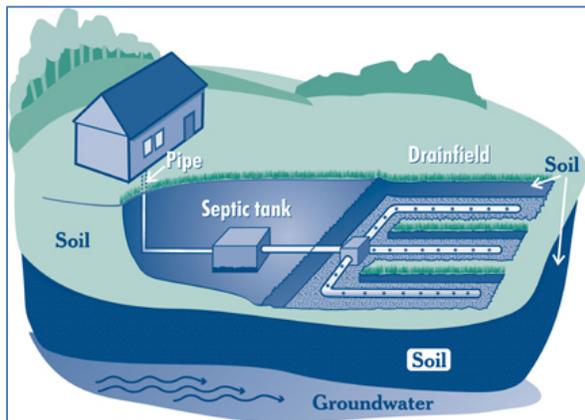


Diagram of a typical residential septic system. Graphic available at [www.epa.gov](http://www.epa.gov)

other engineered onsite wastewater management systems approved for use by the VA Department of Health and otherwise compliant with the applicable state and federal regulations.

To qualify for this credit a homeowner shall provide documentation from a licensed or permitted septic service professional attesting that:

1. Your traditional septic or alternative sanitary sewage system has been inspected and is functioning properly and;

2. Your septic tank, or other sewage solids tank, has been pumped at the appropriate interval based on your household water use, but NOT LESS THAN ONCE EVERY 5 YEARS (typically every 3-5 years).

3. Suitable documentation must include the date of service, letterhead receipt clearly displaying the name and contact information of the permitted septic service company who has serviced your system, and the service professional's signature verifying that a system inspection and solids pump out was performed, and that the system was found to be in a satisfactory operating condition

NOTE: for all alternative onsite sewage systems (not a standard septic tank and drainfield), the service professional signing your documentation must also affix proof that they are certified in the State of VA as a Licensed Onsite Sewage System Professional.

### B. Level 2 BMPs: 25% Credit

BMPs in the following list are considered "Level 2 BMPs" because they are more complicated to install and provide greater water quantity and quality benefits than the Level 1 BMPs. Therefore, homeowners that install and maintain Level 2 BMPs are issued a 25% credit on their monthly stormwater utility fee. These BMPs must be installed and maintained accordance with the recommendations listed in the [City of Roanoke Stormwater Ideabook](#).



Pervious pavers in the City of Roanoke

## Pervious Pavements

Traditional paving materials allow stormwater to runoff rapidly. Pervious Pavements, however, are alternatives to conventional paving materials that allow for infiltration of stormwater into the soil below while still proving a rugged and durable high traffic surface. Pervious

Pavements include paving blocks, grid pavers, pervious concrete, and pervious asphalt and often include a stone reservoir under the pavement material to allow for water storage. Gravel driveways are not considered pervious and are not eligible for a credit.

## Rain Gardens

A Rain Garden is a landscaped depression designed to capture and cleanse stormwater runoff. The plants and soil in the rain garden work together to reduce runoff and remove pollutants before the stormwater discharges from the rain garden or infiltrates into the underlying soils. Rain Gardens can be attractive landscaping features when designed and maintained properly.



Single Family Residential rain garden. Photo courtesy of Gay and Neel, Inc. .

## Infiltration Practices

Infiltration Practices are typically trenches or a pit filled with specially selected and installed gravel and/or other porous media that stores stormwater in the spaces between the rocks and then allows that stored water to slowly infiltrate into the surrounding soils. Roanoke area soils are very high in clay, making it difficult and sometimes impossible to infiltrate water. In these circumstances, the infiltration practice will sometimes include a perforated drain installed at the bottom of the pit that will slowly collect the stored water and direct it to a storm drain system or creek.



Underground cistern at Fire Station #3.

## Cisterns

Cisterns are different from Rain Barrels in that they are designed to hold much larger quantities of water for re-use on the property. Cisterns reduce the amount of runoff and pollutants that flow directly to the City storm drain system and then to our waterways. Cisterns can be installed aboveground, underground, or elevated depending on the needs and constraints of your

lot. Water collected in cisterns can be used for indoor and outdoor non-potable uses including irrigation, washing cars, flushing toilets, and laundry.

## Green Roofs

A Green Roof, also known as living roof or vegetated roof cover, is a thin layer of living plants in a lightweight engineered soil medium on a roof. Precipitation is taken up by green roof plants and transpired into the air. As a result, Green Roofs direct less runoff to undersized storm drains and impaired creeks than traditional rooftops. The soil and vegetation layers also help to insulate the building and when properly maintained, can significantly increase the functional lifespan of the roof.



Green roof at City Municipal Building.

## V. HOW DO I APPLY FOR CREDIT?

Prior to receiving a credit, the property owner must submit a completed Single Family Residential Stormwater Utility Fee Credit Application, included in this manual, to the City of Roanoke Department of Planning, Building, and Development located at 215 Church Avenue, S.W., Noel C. Taylor Municipal Building, Room 170, Roanoke, VA 24011

There is no fee for a credit application. Once a complete application is submitted and approved, the credit will go into effect the calendar year after

approval of the application. A certification statement is included on the application which says the owner is promising to implement and maintain the BMP(s) in accordance with the [City of Roanoke Stormwater Ideabook and Design Manual](#).

If an application is denied, the applicant can appeal the decision to the Director of the Department of Planning, Building, and Development in writing within 30 days of the denial. The Director shall make a determination within thirty (30) days of receipt of an appeal and notify the Applicant in writing. If the Applicant is not satisfied with the response of the Director, a written appeal can be submitted to the City Manager who shall offer a final decision to the Applicant within 30 days of receipt of the written appeal.

The City may routinely inspect BMPs to verify all operation and maintenance is in compliance with City Standards. The credit will be revoked if violations are observed.

## VI. MAINTENANCE REQUIREMENTS

In order for an applicant to continue to receive a stormwater credit, each BMP installed must be maintained to ensure continued function. The applicant is responsible for having all ongoing maintenance work completed to keep the facilities functional. The City may revoke the credit if an inspection determines it is no longer properly maintained or functioning as designed. This revocation will be effective thirty (30) days after the owner is notified in writing of the deficiencies and if the problems are not resolved

## VII. RESTRICTIONS ON CREDITS

**Transfer of Credit:** The stormwater credit applies only to the applicant. Credits do not transfer if ownership changes. A new application must be submitted for new account holders to receive the credit.

**Off-Site BMP Credit:** In circumstances where an applicant is attempting to claim credit for a BMP owned by a separate entity, proof that the Applicant shares in the maintenance obligations and costs of the BMP will need to be submitted in order for credit to be applied.

**Local Community Requirements:** The BMP must meet all applicable City of

Roanoke building, planning, and other Code of the City of Roanoke requirements.

**Right to Inspect.** The City may inspect the BMP at any time during the year. If the BMP is not functioning as approved or has not been maintained, the City may revoke the stormwater credit until the property owner proves that all maintenance work has been performed to return the BMP to a fully functional condition.

*See the Code of the City of Roanoke, [Chapter 11.5 Stormwater Utility](#) for more details on the stormwater utility fee and credit program.*

---

*By the authority granted to me by City of Roanoke Code Section 11.5-1, I hereby approve and adopt this Stormwater Utility Fee Credit Manual: Single Family Residential Properties) (February 1, 2014 Version), which shall be effective July 1, 2014.*

*This 3<sup>rd</sup> day of February, 2014.*



Christopher P. Morrill  
City Manager  
City of Roanoke

**APPENDIX A: CITY OF ROANOKE SINGLE FAMILY RESIDENTIAL CREDIT APPLICATION FORM**

# Application For Stormwater Utility Credit for a Single Family Residence



Date  Credit Application No.

## Planning Building & Development

215 Church Ave., SW, Room 170

Roanoke, VA 24011

Phone: (540) 853-1090 Fax: 853-1594

[www.roanokeva.gov](http://www.roanokeva.gov)

NOTE: The City Council has authorized the City Manager to receive applications for stormwater utility fee credits prior to the effective date of the stormwater utility of July 1, 2014. Interested persons who make applications pursuant to these forms, please note that these forms may be modified in the future. Any such modification will be posted to the public.

**Complete Form & Click Here To Print**

### Parcel Information:

Tax Map Number

Parcel Address  City  State  Zip Code

### Owner Information:

Owner Name

Owner Address  City  State  Zip Code

Phone Number  email

### Type of BMP (check all that apply):

Please note the maximum credit possible per parcel is 50%.

#### Category: Level 1 (10% Credit per BMP)

<input type="radio"/> Rain Barrel	<input type="radio"/> Roof Drain Disconnection	<input type="radio"/> Waste and Refuse Management
<input type="radio"/> Vegetated Filter Strip *	<input type="radio"/> Sewage System Maintenance	<input type="radio"/> Grass Channel *
<input type="radio"/> Lawn Maintenance (list three practices to be implemented)	<input type="radio"/> Trees* (list percent of canopy provided)	
Practice 1 <input type="text"/>	Preserving Existing <input type="text"/>	
Practice 2 <input type="text"/>	Establishing New <input type="text"/>	
Practice 3 <input type="text"/>		

#### Category: Level 2 (25% Credit per BMP)

<input type="radio"/> Pervious Pavement *	<input type="radio"/> Cistern *	<input type="radio"/> Infiltration Practice *
<input type="radio"/> Rain Garden *	<input type="radio"/> Green Roof *	

\* Denotes that a site plan is required with the application.

I hereby affirm to the City of Roanoke that the BMPs as identified above has been installed or implemented on the property in conformance with the Stormwater Utility Fee Credit Manual for Single Family Residential Properties and the Roanoke Stormwater Ideabook. I further acknowledge that maintenance and implementation will be performed in accordance with the Roanoke Stormwater Ideabook. It is understood that lack of maintenance or proper installation will result in a revocation of the credit applied to the property.

Print Name  Signature

## APPENDIX B: CITY OF ROANOKE APPROVED TREE LIST

**Table 642-1. Trees: Approved Plant List, Minimum Size at Planting, 20-Year Canopy, and Suitability**

Common Name	Botanical Name	Minimum Height at Planting	Minimum Caliper at Planting	Canopy at 20 Years (sq. ft.)
<i>Evergreen Trees</i>				
Cedar, Deodar	Cedrus deodara	5'		177
Cedar, Eastern Red	Juniperus virginiana	5'		38
Cypress, Leyland	X Cupressocyparis leylandii	5'		113
Holly, American	Ilex opaca	5'		38
Magnolia, Southern	Magnolia grandiflora	5'		177
Pine, Eastern White	Pinus strobus	5'		177
Spruce, Colorado Blue	Picea pungens	5'		113
Spruce, Norway	Picea abies	5'		177
Spruce, White	Picea glauca	5'		113
<i>Large Deciduous Trees</i>				
Beech, American	Fagus grandifolia		2"	177
Beech, Copper	Fagus sylvatica cuprea		2"	177
Birch, River	Betula nigra		2"	254
Black Gum/Tupelo	Nyssa sylvatica		2"	177
Elm, Lacebark	Ulmus parvifolia		2"	254
Ginkgo (Male Variety Only)	Ginkgo biloba (Male Variety Only)		2"	133
Honey Locust, "Shademaster"	Gleditsia triacanthos, "Shademaster"		2"	314
Japanese Pagoda tree	Sophora japonica		2"	254
Japanese Zelkova	Zelkova serrata		2"	177

Linden, American	Tilia Americana		2"	314
Linden, Little Leaf	Tilia cordata		2"	177
London Planetree	Platanus acerfolia		2"	380
Maple, Red	Acer rubrum		2"	314
Maple, Sugar	Acer saccharum		2"	314
Oak, Chestnut	Quercus prinus		2"	254
Oak, Northern Red	Quercus rubra		2"	254
Oak, Pin	Quercus palustris		2"	254
Oak, White	Quercus alba		2"	254
Oak, Willow	Quercus phellos		2"	254
Redwood, Dawn	Metasequoia glyptostroboides		2"	177
Tuliptree	Liriodendron tulipifera		2"	254
<i>Small Deciduous Trees</i>				
Cherry, Comelian	Cornus mas	5'		113
Cherry, Kwanzan Flowering	Prunus serrulata 'Kwanzan'		2"	177
Cherry, Yoshino	Prunus yeodensis		2"	177
Dogwood, Flowering	Cornus florida	5'		177
Dogwood, Kouza	Comus kouza	5'		177
Goldenraintree	Koelreuteria paniculata		2"	177
Hawthorn, Washington	Crataegus phaenopyrum	5'		113
Hophombeam, American	Ostrya virginiana		2"	201
Hombeam, American	Carpinus caroliniana		2"	177
Maple, Amur	Acer ginnala		2"	113
Maple, Hedge	Acer campestre		2"	177
Maple, Japanese	Acer palmatum	5'		177
Maple, Trident	Acer buergerianum		2"	177
Myrtle, Crape	Lagerstroemia indica	5'		113
Redbud, Eastern	Cercis Canadensis	5'		177
Serviceberry	Amelanchier arborea	5'		201
Sourwood	Oxydendrum arboreum	5'		113

White Fringetree	Chionanthus virginicus	5'		113
Source for Tree Canopy Coverage at 20 Years: Virginia Nursery & Landscape Association, Inc.				
* P C B =	Suitability = Parking = Tree Buffer Yards	Key Areas Canopy	for or for	Table Street Yard Overall Trees Site

## APPENDIX C: ADDITIONAL RESOURCES

CITY OF ROANOKE STORMWATER IDEABOOK FOR HOMEOWNERS:  
<http://www.roanokeva.gov/85256A8D0062AF37/CurrentBaseLink/N29ALPE9085SSIAEN>

DEPARTMENT OF CONSERVATION AND RECREATION (DCR) MAINTENANCE CALENDAR FOR COOL AND WARM SEASON TURFGRASSES IN VIRGINIA:  
[http://www.pubs.ext.vt.edu/430/430-523/430-523\\_pdf.pdf](http://www.pubs.ext.vt.edu/430/430-523/430-523_pdf.pdf) AND  
[http://www.pubs.ext.vt.edu/430/430-522/430-522\\_pdf.pdf](http://www.pubs.ext.vt.edu/430/430-522/430-522_pdf.pdf)

DCR TIPS ON KEEPING YOUR LAWN GREEN AND VIRGINIA'S WATERS CLEAN:  
[http://www.dcr.virginia.gov/water\\_quality/documents/tipsstate.pdf](http://www.dcr.virginia.gov/water_quality/documents/tipsstate.pdf)

VIRGINIA BMP CLEARINGHOUSE: <http://vwrrc.vt.edu/swc/>

ALLIANCE FOR THE CHESAPEAKE BAY: <http://stormwater.allianceforthebay.org/>

VIRGINIA COOPERATIVE EXTENSION SERVICE VEGETATION PUBLICATIONS:  
<http://www.pubs.ext.vt.edu/category/trees-shrubs-groundcovers.html>

INTERNATIONAL SOCIETY OF ARBORICULTURE'S TREES ARE GOOD WEBSITE:  
<http://www.treesaregood.org/>

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (VDEQ):  
<http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx>

VIRGINIA DEPARTMENT OF FORESTRY: <http://www.dof.virginia.gov/>

ENVIRONMENTAL PROTECTION AGENCY (EPA): <http://www.epa.gov/>

# Stormwater Utility Fee Credit Manual

## Commercial, Industrial, Institutional, and Multifamily Residential Properties



City of Roanoke, Virginia  
Department of Planning, Building, and  
Development  
215 Church Avenue, S.W., Noel C. Taylor  
Municipal Building, Room 166  
Roanoke, VA 24011

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## GLOSSARY

**BMP or “Best Management Practice”:** Schedules of activities, prohibitions of practices, including both structural and nonstructural practices, maintenance procedures, and other management practices to prevent or reduce the pollution of surface waters and groundwater systems from the impacts of land-disturbing activities.

**Erosion:** The process of water or wind moving soil and depositing it elsewhere. Erosion is increased when vegetation is removed or an area is denuded.

**Groundwater:** Water held in soil pore spaces below ground. Groundwater can eventually flow to a drinking water well or area waterways.

**Impervious Surface:** Any area improved, graded, and/or surfaced with impervious material or resulting in impervious conditions. An impervious material or condition is present when the natural infiltration of water into the soil is significantly impeded or prevented. An impervious surface includes that portion of the land surface covered by an elevated structure, such as a bridge or deck, regardless of whether the surface itself remains pervious or impervious. \*Note: The [Virginia Stormwater Management Handbook](#) defines gravel as impervious because once it is installed it is compacted and impedes the flow of water into the ground.

**Infiltration:** The process by which water on the ground surface is absorbed into the soil.

**Non-Single Family Residential or Other Properties:** Any property that is not a single family residential property. Types of non-single family residential or other properties include commercial, industrial, multi-family residential, and institutional properties to name a few. \*Note: Properties applying for credits for a regional BMP that serves multiple properties (single family residential or otherwise) will need to follow the rules listed in the Commercial, Industrial, Institutional, and Multifamily Residential Properties (Non-Single Family Residential or Other Properties) Credit Manual.

**Pervious Surface:** A surface composed of material that allows water to be absorbed into the ground, reducing runoff and filtering pollutants.

**Regional BMP:** BMP that accepts and treats runoff from multiple separate properties. Regional BMPs are often owned by a Property Association or other entity responsible for regular maintenance and inspections.

**Runoff:** Precipitation that does not absorb into the ground but flows down-slope along the surface. Runoff volume, flow rate, and pollutant load increases with impervious areas.

**Sediment:** Soil and rock that is moved and deposited by water. Sediment is usually suspended in water until flow rates decrease enough that it can settle out.

**Sheet Flow:** An overland flow of water in the form of a thin, continuous film rather than concentrated into channels.

**Single Family Residential Property:** Property on which a dwelling exists which is occupied exclusively by one family for noncommercial purposes. Duplexes are included as a single family residential property for the purposes of this credit manual.

**Stormwater:** Precipitation that is discharged across the land surface or through conveyances to one or more waterways and that may include stormwater runoff, snow melt runoff, and surface runoff drainage.

**Water Quality:** Refers to the chemical, physical, and/or biological characteristics of water.

**Water Quantity:** Refers to the flow rate or volume of runoff from a property.

Note: The definitions of terms that appear above are to facilitate your review of this Manual. Please note that these terms may also be defined by applicable laws, ordinances, rules, or regulations and are controlled by those definitions. For completed definitions of these terms under applicable laws, ordinances, rules, or regulations, please consult: the [City of Roanoke Stormwater Management Ordinance](#), the [City of Roanoke Stormwater Design Manual](#), and the [Virginia Stormwater Management Handbook](#).

## I. INTRODUCTION

The City of Roanoke has 13 major rivers and within its boundaries and seven of these are listed as impaired for water quality by the Virginia Department of Environmental Quality (DEQ). Investment needs to be made in capital improvements, system maintenance, and regulatory compliance to ensure that environmental standards are met and our valuable natural resources are protected.



Failing outlet pipe.

Our stormwater system is aging with much of it having exceeded its useful design life of 50 years, and it has seen little investment in decades. At the same time, our impervious surface areas (paved driveways, rooftops, access roads) have increased many-fold as our city has developed into a regional center for commerce, healthcare,

retail, entertainment and the arts. The City has a current backlog consisting of hundreds of stormwater projects, estimated to cost tens of millions of dollars, which need to be implemented to effectively minimize flooding and control pollutants before they enter our local waterways. Combine these capital infrastructure demands with the need to provide on-going maintenance of hundreds of miles of existing stormwater pipes and the requirement to meet increasing Federal Clean Water Act stormwater permit requirements, and the City faces a significant financial challenge.

City leaders recognize that stormwater management solutions range from individual citizen and business participation to large-scale stormwater projects, but any real solution will require an on-going dedicated level of funding and focused effort. To that end, in 2013, the City Council approved the implementation of a Stormwater Utility Fee to fund the City's public stormwater management program. In May 2014, the City Council adopted the Stormwater Utility Fee Schedule.

## II. STORMWATER UTILITY FEE

Stormwater runoff is proportional to the amount of impervious surface on developed property. When a wooded or grassy area is paved or replaced with impervious material, the result is less infiltration of stormwater. Hardened or “impervious” surfaces such as driveways, parking lots, streets and rooftops do not allow rainfall to soak into the soil, so more of the rainfall becomes stormwater runoff and increases the demand on the system. This stormwater runoff also accumulates pollutants such as oil and grease, chemicals, nutrients, metals, and bacteria as it travels across land and discharges into our rivers and streams. Both the quantity and the quality of runoff need to be managed before discharge into local rivers and streams.

Therefore the amount of the stormwater fee is based on the amount of impervious area on each developed property in the City. The City used aerial photography and Geographic Information System (GIS) technology to identify and measure the impervious area on all developed properties in the City. The green hatched areas in the photograph below demonstrate the capture of impervious features which include rooftops, driveways, and walkways.



For billing purposes, the fee is based on each 500 square feet of impervious area identified, rounded to the nearest whole number. So for the two examples shown above, the fee for the property on the left would be based on 5 billing units (2,477 square feet divided by 500 square feet or 4.95) and the property on the right, which has almost 800 square feet less, would be based on 3 billing units (1680 square feet divided by 500 square feet or 3.3). The monthly fee per billing unit will be phased in over three years as shown in the list below:

2014: \$0.30/Billing Unit/Month

2015: \$0.60/Billing Unit/Month

2016: \$0.90/Billing Unit/Month

The monthly fee for the two properties shown above will therefore be:

Year	Left Property Monthly Utility Fee	Right Property Monthly Utility Fee
2014	\$1.50	\$0.90
2015	\$3.00	\$1.80
2016	\$4.50	\$2.70

All developed properties, including City owned properties and properties owned by tax-exempt organizations, are subject to the fee unless such properties are expressly exempt from the fee under State Code or under the Stormwater Utility Ordinance.

The fee will go into effect in July 2014 and be billed using the City’s real estate tax billing system. Any parcel owner may request a fee adjustment in accordance with [§ 11.5-9 of the Code of the City of Roanoke](#) within 30 days of receiving the bill.

### III. STORMWATER UTILITY CREDIT AMOUNTS

When establishing the Stormwater Utility, the City Council acknowledged that certain on-site stormwater management activities can reduce the impact on the storm drain system by treating or reducing the stormwater runoff from a developed property. In order to recognize the positive impact that these on-

site activities can have, properties that install and maintain stormwater best management practices (BMPs) that reduce the stormwater flow rate, flow volume or pollutant load of runoff from their property can qualify to receive a reduction in their stormwater fee. A BMP is an activity, measure or facility that prevents or reduces the transport of pollutants, controls stormwater volume or rate or otherwise limits the impacts to the storm drainage system. These measures can include on-site practices such as bioretention, vegetated swales, constructed wetlands, rain gardens and detention ponds that manage stormwater at its source.

The amount of stormwater utility fee credit will be based on the reduction of stormwater volume and pollutants flowing from a property and obtained through the installation and continued use, operation and maintenance of the BMP(s) which is not owned or maintained by the City. The credit amount is determined based on the type of BMP and the percentage of the site's impervious area that drains to the BMP. The maximum credit allowed is fifty percent (50%) of the stormwater fee for the property being served by the BMP(s).



Pervious concrete installed at City of Roanoke Fire Station #3.

1. Credits for on-site stormwater management facilities are determined as follows:
  - A ten percent (10%) water quality credit is allowed if the BMP(s) provide water quality benefits in accordance with [§ 11.4-16 of the Code of the City of Roanoke](#).
  - A ten percent (10%) water quantity credit is allowed if the BMP(s) provide both stream channel erosion control benefits in accordance with [§ 11.4-17 of the Code of the City of Roanoke](#) and flood control benefits in accordance with [§ 11.4-18 of the Code of the City of Roanoke](#).
  - At the City Manager's discretion, a credit of up to five percent (5%)

may be granted in addition to that provided for standard water quality or water quantity credits, if a BMP achieves benefits above the minimum required by the [Code of the City of Roanoke](#). The stormwater criteria used for comparison is based on the standards that were applicable when the property was improved. It shall be the Applicant's responsibility to provide calculations illustrating how the facility exceeds the applicable stormwater management requirements.

- BMPs that do not meet the minimum criteria listed above may still be considered on a case-by-case basis if the Applicant can demonstrate the BMP achieves permanent reductions in stormwater runoff volumes, velocity, and/or pollutant loads.
  - If an on-site stormwater management BMP is part of a voluntary retrofit, meaning it was installed voluntarily and not as a requirement of the City or another governmental agency, the amount of credit the facility is eligible to receive shall be doubled, but in no case can it exceed 50% of the applicable fee.
2. The owner of an eligible BMP that treats off-site impervious surface, meaning the stormwater runoff that originates outside of the boundary of the subject property, may take a credit for treating the off-site impervious surface. The off-site credit amount shall be calculated in the same manner as if the BMP was located on the off-site parcel. However, in no case shall the total credit exceed the total amount of the annual stormwater utility fee charged to the parcel owner.
  3. Credits may also be provided if a property owner has an eligible Virginia Pollutant Discharge Elimination System (VPDES) Stormwater Permit. Subject to the maximum credits as described above, a ten percent (10%) credit may be allowed for any parcel, or portion of a parcel, that is subject to, and in compliance with, an individual or general VPDES stormwater permit.
  4. Regional BMPs: Credits may be provided to individual properties served by a Regional BMP. In circumstances where an applicant is attempting to claim credit for a BMP that is owned by a separate entity,

proof that the Applicant shares in the maintenance obligations and costs will need to be submitted in order for credit to be applied.

#### IV. STORMWATER UTILITY CREDIT ELIGIBILITY

In order to be eligible for a stormwater fee credit, the property owner must:

- submit a completed Commercial, Industrial, Institutional, and Multi-family Residential Credit Application Form, as provided by the City, to the Department of Planning, Building, and Development;
- have a properly executed maintenance agreement with the City in place or execute a new maintenance agreement;
- demonstrate to the City's satisfaction that the BMP is functioning as originally designed and constructed based on guidance from the [Virginia Stormwater Management Handbook](#) or from the [Virginia Stormwater BMP Clearinghouse Standards and Specifications](#) (documentation must include pictures of the exterior of the BMP);
- demonstrate with calculations and as-built drawings that the BMP met the criteria in existence at the time of construction in at least one of the following sections of the Code of the City of Roanoke:
  - (i) [§ 11.4-16, Water Quality](#); or
  - (ii) Both [§ 11.4-17, Stream Channel Erosion](#), and [§ 11.4-18, Flooding](#).

If the facility meets the criteria for both (i) and (ii) above, the applicant can qualify for up to 20% credit.

BMPs that are not listed in the Virginia Stormwater Management Handbook or the Virginia Stormwater BMP Clearinghouse may still be considered on a case-by-case basis at the discretion of the City Manager if it is demonstrated by a Professional Engineer that the facility achieves a permanent reduction in post-development stormwater flow and/or pollutant loading. The credit may be prorated based on an analysis of the benefits of the reduction.

## V. STORMWATER QUALITY CREDIT CALCULATION

A Stormwater Quality credit of up to 10% is available to applicants who have installed an approved Best Management Practice (BMP) that provides for the permanent reduction of pollutants from the stormwater runoff leaving their property. The City references the [Virginia Stormwater BMP Clearinghouse Standards and Specifications](#) for which BMPs qualify for the Stormwater Quality Credit.



Bioretention basin located in Christiansburg, VA.

Please recall that stormwater quality credits may be given when BMP(s) provide for a reduction in the amount of stormwater pollution.

As noted above, the amount of credit earned for a property is determined by the number and type of BMP(s) installed and the percentage of the impervious area on the site that drains to the BMP(s). The credit is applied to the percentage of the impervious surface area that is treated by the BMP, not the total amount of impervious area on the site. The following formula will determine the amount of credit earned by a Stormwater Quality BMP:

$$\text{Credit Earned} = (10\% \text{ Credit}) * (\% \text{ of impervious area treated}) * (\text{Stormwater Fee})$$

All BMPs must be designed, constructed and maintained in accordance with the Code of the City of Roanoke, the [Virginia Stormwater Management Handbook](#), or the [Virginia Stormwater BMP Clearinghouse Standards and Specifications](#). Prior approval of other BMPs by the City of Roanoke may also be acceptable; however, property owners wishing to access such approval must first coordinate with the Department of Planning, Building and Development by calling 540-853-1730 or via email at [planning@roanokeva.gov](mailto:planning@roanokeva.gov).

## VI. STORMWATER QUANTITY CREDIT CALCULATION



Green roof installed at City of Roanoke  
Municipal Building.

A Stormwater Quantity credit of up to 10% is available to applicants who have installed an approved Best Management Practice (BMP) that reduces stormwater flow rate and/or volume. These practices reduce the demand or burden on the City's storm sewers and reduce erosion of our rivers and streams. The City will reference the Virginia Department of Environmental Quality's guidelines for which BMPs qualify

for the Stormwater Quantity Credit. Please recall that stormwater quantity credits may be given when BMP(s) provided for a reduction in the volume or rate of stormwater flow.

The amount of credit earned by a property is determined by the type of BMP installed, the number of BMPs installed and the percentage of the impervious area on the site that drains to the BMP. The credit will apply to the percentage of the impervious surface area that is treated by the BMP. The following formula will determine the amount of credit earned by a Stormwater Quantity BMP:

$$\text{Credit Earned} = (10\% \text{ Credit}) * (\% \text{ of impervious area treated}) * (\text{Stormwater Fee})$$

All BMPs must be designed, constructed and maintained in accordance with the Code of the City of Roanoke, the Virginia Stormwater Management Handbook, or the Virginia Stormwater BMP Clearinghouse Standards and Specifications.

## VII. VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM STORMWATER PERMIT CREDIT

Some activities that take place at industrial or commercial facilities, such as

material handling and storage, are often exposed to the elements. As runoff from rain or snowmelt comes into contact with these activities, it picks up pollutants and transports them to the storm sewer system and ultimately into the creeks and rivers in the Roanoke area. To minimize the impact of these discharges, the Virginia Department of Environmental Quality requires such facilities to register for a VPDES (Virginia Pollutant Discharge Elimination System) Stormwater Permit.

Property owners who hold a valid and compliant VPDES Stormwater Permit and who discharge either to a stream through a private facility or to the City's storm sewer system are eligible to receive a 10 % credit. In addition to submitting a credit application, documentation to receive a credit for a VPDES Permit includes a copy of the VPDES Stormwater Permit and a copy of the facility's Stormwater Pollution Prevention Plan (SWPPP).

## VIII. APPLYING FOR A STORMWATER UTILITY CREDIT

Prior to receiving a stormwater credit the property owner must submit a completed Commercial, Industrial, Institutional, and Multi-family Residential, Stormwater Utility Fee Credit Application, included in this manual, along with applicable supporting information on the design and installation of the BMP(s). The property owner is responsible for making all appropriate applications prior to receiving a credit on their stormwater utility account. Application and documentation requirements include a complete application, executed Stormwater Maintenance Agreement, inspection photographs, as-builts, design calculations, and construction plans. There is no fee for a credit application.



When a credit application is received by the City an administrative completeness review will be conducted. If the application is not complete, the City will contact the applicant and may request additional information necessary to complete the application.

Once a complete application has been received, the City will review all documentation and the applicant will be notified in writing when an application is approved or denied within 30 calendar days of submittal of a complete application. Once the credit is approved, it will go into effect the calendar year after approval of the application.

If an application is denied, the applicant can appeal the decision to the Director of the Department of Planning, Building, and Development in writing within 30 days of the denial. The Director shall make a determination within thirty (30) days of receipt of an appeal and notify the Applicant in writing. If the Applicant is not satisfied with the response of the Director, a written appeal can be submitted to the City Manager who shall offer a final decision to the Applicant within 30 days of receipt of the written appeal.

Applications for newly constructed BMPs shall not be accepted until the BMP has been constructed, inspected, and as-builts approved by the City of Roanoke.

## IX. MAINTENANCE REQUIREMENTS

In order for an applicant to continue to receive a stormwater credit, each BMP installed must be maintained to ensure continued function. The applicant is responsible for having all ongoing maintenance work completed to keep the facilities functional. The City may revoke the credit if an inspection determines it is no longer properly maintained or functioning as designed. This revocation will be effective thirty (30) days after the owner is notified in writing of the deficiencies and if the problems are not resolved.

## X. RESTRICTIONS ON CREDITS

**Transfer of Credit:** The stormwater credit applies only to the applicant. Credits do not transfer if ownership changes. A new application must be submitted for new account holders to receive the credit.

**Off-Site BMP Credit:** In circumstances where an applicant is attempting to claim credit for a BMP owned by a separate entity, proof that the Applicant shares in the maintenance obligations and costs of the BMP will need to be submitted in order for credit to be applied.

**Local Community Requirements:** The BMP must meet all applicable City of Roanoke building, planning, and other Code of the City of Roanoke requirements.

**Right to Inspect.** The City may inspect the BMP at any time during the year. If the BMP is not functioning as approved or has not been maintained, the City may revoke the stormwater credit until the property owner proves that all maintenance work has been performed to return the BMP to a fully functional condition.

*See the Code of the City of Roanoke, [Chapter 11.5 Stormwater Utility](#) for more details on the stormwater utility fee and credit program.*

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*By the authority granted to me by City of Roanoke Code Section 11.5-1, I hereby approve and adopt this Stormwater Utility Fee Credit Manual: Commercial, Industrial, Institutional, and Multifamily Residential Properties (Non-Single Family Residential or Other Properties) (February 1, 2014 Version), which shall be effective July 1, 2014.*

*This 3<sup>rd</sup> day of February, 2014.*



-----  
Christopher P. Morrill  
City Manager  
City of Roanoke

# APPENDIX A: STORMWATER UTILITY FEE CREDIT APPLICATION FOR COMMERCIAL, INDUSTRIAL, INSTITUTIONAL, AND MULTI-FAMILY RESIDENTIAL PROPERTIES

Application For  
**Stormwater Utility Credit**  
 for Commercial, Industrial, Institutional  
 and Multifamily Residential Properties



Date  Credit Application No.

**Planning Building & Development**

215 Church Ave., SW, Room 170

Roanoke, VA 24011

Phone: **(540) 853-1090** Fax: **853-1594**

[www.roanokeva.gov](http://www.roanokeva.gov)

NOTE: The City Council has authorized the City Manager to receive applications for stormwater utility fee credits prior to the effective date of the stormwater utility of July 1, 2014. Interested persons who make applications pursuant to these forms, please note that these forms may be modified in the future. Any such modification will be posted to the public.

**Complete Form & Click Here To Print**

**Parcel Information:**

Tax Map Number

Parcel Address

City  State  Zip Code

**Credit Submittal Checklist**

Completed Application     Stormwater Calculations

As-Built Drawings     Maintenance Agreement

Pictures of each BMP     VPDES Permit (if applicable)

Maintenance Cost Sharing (if applicable)     SWPPP (if applicable)

**Owner Information:**

Owner Name

Owner Address  City  State  Zip Code

Phone Number  email

**Type of BMP (list all that apply and attach additional sheets as needed):**

Water Quality BMP

BMP 1 <input type="text"/>	Impervious Surface Treated (sf) <input type="text"/>
BMP 2 <input type="text"/>	Impervious Surface Treated (sf) <input type="text"/>
BMP 3 <input type="text"/>	Impervious Surface Treated (sf) <input type="text"/>

Water Quantity BMP

BMP 1 <input type="text"/>	Impervious Surface Treated (sf) <input type="text"/>
BMP 2 <input type="text"/>	Impervious Surface Treated (sf) <input type="text"/>
BMP 3 <input type="text"/>	Impervious Surface Treated (sf) <input type="text"/>

VPDES Stormwater Permit

VPDES Permit Number

List any BMP(s) from above that qualifies as "Regional"

List any BMP(s) from above that qualifies as "Voluntary"

List any BMP(s) from above that qualifies as "Above and Beyond"

Print Name  Signature

## APPENDIX B: TYPICAL BEST MANAGEMENT PRACTICES

### A. Water Quality Best Management Practices

Water Quality BMPs - See <a href="#">Code of the City of Roanoke Section 11.4-16</a> for more details				
Vegetated Grassed Swale Bioretention Basin Water Quality Swales	Filter	Strip	Constructed Bioretention Retention Basin Rain Gardens	Wetlands Filter

### B. Stormwater Quantity Best Management Practices

Water Quantity BMPs - See <a href="#">Code of the City of Roanoke Section 11.4-17 and 18</a> for more details				
Dry Bioretention Basin Dry Wells Vegetated Buffers	Detention	Ponds	Infiltration Sand Filters Wet Detention Ponds Permeable Pavement	Trenches

Other BMPs approved by the VA BMP Clearinghouse, including manufactured and proprietary BMPs, may be approved if they meet the Code of the City of Roanoke requirements.

## APPENDIX C: PROCEDURE FOR CALCULATION OF CREDITS

For the following examples, assume a commercial property with 10,000 square feet of impervious area. To calculate the monthly utility fee, divide 10,000 square feet by 500 square feet per billing unit. This results in 20 billing units. If the rate is \$0.90/billing unit, this utility fee will be \$18.00 per month.

**A. Calculate Stormwater Quality Credit (10% credit)** – if the BMP provides water quality benefits in accordance with §11.4-16 of the Code of the City of Roanoke.

- Determine the total impervious area of the property in square feet.
- Determine the impervious area treated by the BMP in square feet.
- Divide the impervious area treated by the BMP by the total impervious area on the property - this is the proportion of the total impervious area treated by the BMP.
- Multiply the proportion of impervious area treated by 0.1 (10%) and by the Stormwater Fee to determine the monthly credit amount.

**Example:** A rain garden treats runoff from 8,500 square feet of impervious area on the property described above. Credit is calculated by dividing 8,500 square feet by 10,000 square feet, which results in 0.85 (85% Impervious Area treated). This value is multiplied by 0.1 (10%), and \$18.00 (the monthly Utility Fee) for a total credit amount of \$1.53 per month. This means the monthly bill with a 10% credit applied will be \$16.47.

**B. Calculate Stormwater Quantity Credit (10% credit)** – if the BMP provides both stream channel erosion control benefits in accordance with §11.4-17 of the Code of the City of Roanoke and flood control benefits in accordance with §11.4-18 of the Code of the City of Roanoke.

- Determine the total impervious area of the property in square feet.
- Determine the impervious area treated by the BMP in square feet.
- Divide the impervious area treated by the BMP by the total impervious area on the property - this is the proportion of impervious area treated by the BMP.
- Multiply the proportion of impervious area treated by 0.1 (10%) and by the Stormwater Fee to determine the monthly credit amount.

**Example:** A Dry detention pond treats runoff from 7,000square feet of impervious area on the property described above. Credit is calculated by

dividing 7,000 square feet by 10,000 square feet, which results in 0.70 (70% Impervious Area treated). This value is multiplied by 0.1 (10%), and \$18.00 (the monthly Utility Fee) for a total credit amount of \$1.26 per month. This means the monthly bill with a 10% credit applied will be \$16.74.

**C. Calculate credit for BMP that achieves benefits above those required by the Code of the City of Roanoke** – this credit is granted at the discretion of the City Manager. If the owner can demonstrate the installed BMPs were designed and are achieving benefits above that required in the Code of the City of Roanoke, then the credit for that facility will be increased by 5% above that calculated for applicable credits under Items A, and B above.

**D. Calculated credit for BMPs that are part of a voluntary retrofit** – this credit is targeted at property owners that install stormwater BMPs that are not required by City or State stormwater codes or regulations. If BMPs were installed voluntarily, then the credit as calculated under Items A, B, and C would be doubled.

**E. Calculate credit for parcel, or portion of a parcel, that is subject to, and in compliance with, a Virginia Pollutant Discharge Elimination System (VPDES) stormwater permit, if applicable** – this credit is granted for properties that have an approved VPDES Permit and can show proof of compliance with existing permit conditions.

- Determine the total impervious area of the property in square feet.
- Determine area subject to the VPDES permit in square feet. Determine total impervious area within the applicable permitted area.
- Divide the impervious area covered by the VPDES permit by the total impervious area on the property - this is the proportion of impervious area covered by the VPDES permit.
- Multiply the percent of impervious area covered by the VPDES permit by 0.1 (10%) and by the Stormwater Fee to determine the monthly credit amount.

**Example:** The commercial property described above has a valid and compliant VPDES Stormwater Permit for 5,000 square feet of the facility. All of this permitted area is impervious. Credit is calculated by dividing 5,000 square feet by 10,000 square feet, which results in 0.50 (50% of the Impervious Area covered by a VPDES permit). This value is multiplied by 0.1 (10%), and \$18.00 (the monthly Utility Fee) for a total credit amount of \$0.90 per month. This means the monthly bill with a 10% credit applied will be \$17.10.

**F. Calculate credit for parcel, or portion of a parcel, that is served by a Regional BMP**– this credit is granted for properties that flow to an off-site

BMP(s). The Applicant must show they share in the cost and responsibility for maintenance of the BMP in question prior to receiving credit.

- Determine the total impervious area of the Applicant's property which flows to the off-site BMP in square feet.
- Determine the total overall impervious area treated by the off-site BMP in square feet.
- Divide the Applicant's impervious area flowing to the off-site BMP by the total impervious area flowing to the off-site BMP - this is the proportion of Applicant's impervious area treated by the BMP.
- Multiply the proportion of impervious area treated by 0.1 (10%) and by the Applicant's Stormwater Fee to determine the monthly credit amount.

**Example:** A Regional Dry detention pond treats a total of 50,000 square feet of runoff from impervious areas in a business park. 5,000 square feet of impervious area comes from the Applicant's property described above. The Applicant is a valid member of the Property Association that owns and maintains the Regional Detention pond. Credit for the Applicant is calculated by dividing 5,000 square feet by 50,000 square feet, which results in 0.01. This value is multiplied by 0.1 (10%), and \$18.00 (the monthly Utility Fee) for a total credit amount of \$0.18 per month. This means the monthly bill with a 10% Regional BMP credit applied will be \$17.82.

*Note: Off-site areas may be included in your credit only if not otherwise served by a BMP. An off-site credit may result in greater than a 50% fee reduction but in no case shall result in a credit of more than 100%. In circumstances where an applicant is attempting to claim credit for a BMP that is owned by a separate entity, proof that the Applicant shares in the maintenance obligations and costs will need to be submitted in order for credit to be applied.*

## APPENDIX D: ADDITIONAL RESOURCES

VIRGINIA BMP CLEARINGHOUSE: <http://vwrrc.vt.edu/swc/>

ALLIANCE FOR THE CHESAPEAKE BAY: <http://stormwater.allianceforthebay.org/>

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (VDEQ):  
<http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx>

VIRGINIA DEPARTMENT OF FORESTRY: <http://www.dof.virginia.gov/>

ENVIRONMENTAL PROTECTION AGENCY (EPA): <http://www.epa.gov/>