Site Selection and Design of a Conservation Landscaping Workshop

Final Products for Task 56 of NOAA Grant #NA13NOS4190135

Northern Virginia Regional Commission
April 2015

This project was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through FY 13 Task 56, Grant # NA13NOS4190135 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. This report satisfies the deliverable requirements set forth for FY13 Task 56, NOAA Grant # NA13NOS4190135
1 Introduction

As development continues to increase in Northern Virginia, important native plant communities and habitats that support wildlife and provide valuable ecosystem services are becoming fragmented, depleted, and altered. Maintaining intact, connected natural areas and areas that serve as stepping stones between large, intact habitat cores is essential for basic ecosystem and watershed services, such as clean air and water and sustaining biodiversity.

Since 2010, the Northern Virginia Regional Commission (NVRC) has been engaged in a series of projects, studies, and efforts related to helping the region identify green infrastructure or conservation corridors, and promote the use of native plants in the urban and suburban landscape. These efforts have been funded in part by the National Oceanic and Atmospheric Administration (NOAA) through the Virginia Coastal Zone Management Program (VCZMP). This work resulted in three Conservation Corridors reports which identify a network of the most regionally-significant and ecologically-sensitive open and forested green spaces across the region as well as an on-going native plant campaign known as Plant NoVA Natives.

These reports have laid the foundation for NVRC to continue working to provide technical assistance to local governments working to implement green infrastructure projects and utilize more native plants in the landscape. This project reinforced and expanded upon the efforts of the Plant NoVA Natives Campaign and the Conservation Corridors Project by demonstrating an on-the-ground application of these two projects.

Additionally, an issue that was identified during the Collaborative Summit to Protect Water Quality through Actions on Urban-Suburban Properties held in Williamsburg in February 2013, was the lack of landscape industry professionals that were knowledgeable about native plants and qualified to implement conservation landscaping practices such as rain gardens, bio-swales, conversion of turf into native plantings, pervious pavement, buffer plantings, and rain barrels. In light of the recent development of local stormwater incentive programs that encourage homeowners to construct and maintain voluntary stormwater management techniques on their own property, there was a need to educate landscape industry professionals and the general public about conservation-based landscaping practices. Local governments in Northern Virginia have repeatedly expressed the need for trusted and skilled contractors who will properly design, install, and maintain these practices so that they are functional as well as beautiful.

This project also served as an opportunity to promote the use of native plants so that these small landscape practices could serve as stepping stones and facilitate movement of wildlife across the vast suburban lawn-dominated areas that dominate the regional landscape between large patches of intact habitat cores. This concept not only allows for more connectivity for wildlife but also
provides water and air quality benefits, as well as social and economic benefits such as improved aesthetics and time and cost savings through reduced landscape maintenance.

The funding received for this project allowed NVRC to form a collaborative workgroup and host a hands-on technical workshop for landscape professionals to learn how to design and build conservation landscaping practices, illustrate the importance of native plants, and select a site for restoration that will restore a missing connection in part of a larger greenway, and help to re-create ecosystem functions in a developed area.

The selection of the site and installation of the demonstration landscape will not only provide a model for maintaining the balance between conservation and development interests in the Northern Virginia coastal region, but also offer an opportunity to educate industry professionals about how environmentally sensitive landscapes can reduce polluted runoff, conserve water and benefit wildlife habitat.

This report satisfies the deliverable requirements set forth for FY13 Task 56, NOAA Grant # NA13NOS4190135, which are summarized below:

Product #1: Workgroup Outcome Report
Product #2: Site Selection Analysis and Report
Product #3: Conservation Landscaping Technical Design Workshop
Product #4: 306A Documentation

2 Project Summary

2.1 Workgroup Outcome Summary

NVRC engaged a multi-disciplinary work group of watershed specialists and engineers from local and state governments and from conservation organizations in the region to collaborate on a training workshop and select a site for restoration. Stakeholders in the workgroup included Arlington County, Northern VA Soil and Water Conservation District, George Washington University, Chesapeake Stormwater Network, Wetlands Watch, Chesapeake Conservation Landscaping Council, and City of Falls Church.

This workgroup met three times to develop the goals of the workshop, identify the target audience, develop the agenda and associated presentations, compile training materials, develop an advertising strategy and select the site.

Since three of the participating jurisdictions either offer an incentive program for residents in the form of grants or tax credits or encourage their private property owners to voluntarily implement
stormwater management techniques, it was decided that the goals of the training should be to develop a cohort of landscape professionals who can:

- Design plans for homeowner best management practices (BMP’s) in accordance with local jurisdiction criteria;
- Install homeowner BMP’s in the residential landscape;
- Identify and select native plants for conservation landscapes, riparian buffer plantings, rain gardens, and tree plantings;
- Maintain residential BMP’s in accordance with local requirements;
- Add to the list of qualified professionals who can work with homeowners in Northern Virginia; and
- Assist clients in understanding the role of practices in reducing stormwater pollution and utility fees if applicable

It was also decided that the agenda should contain an overview of the various incentive programs and the target audience should be landscape professionals or stormwater inspectors. These planning meetings resulted in a document titled “Scope of Work for Residential BMP Training for the Landscape Professional, Part 1”. This document can be found in Appendix A. Members of the workgroup also helped to advertise and implement the workshop. The workshop advertisement can also be found in Appendix A. Information about the workshop was posted on the NVRC website [https://www.novaregion.org/index.aspx?NID=1311](https://www.novaregion.org/index.aspx?NID=1311). Although the workshop was free, participants were required to register in advance through the NVRC website. A list of registered participants is included in Appendix A.

### 2.2 Site Selection and Analysis Summary

The goal of this deliverable was to select a turf or hardscape area and restore it using native plants and the eight elements of conservation landscaping to enhance the regions green corridors by restoring a degraded connection and re-creating ecosystem functions in a developed area.

A site located in the City of Falls Church at the corner of South Maple Ave. and Route 29 was selected for restoration for a variety of reasons (Figure 1).
Figure 1. Location of site selected for restoration at corner of South Maple Ave and Route 29

The small, city-owned parcel had previously been paved and the City had recently removed the pavement and put down mulch and grass seed. Where vegetation was growing on the site, it was dominated by alien invasive plants such as winged euonymous and Japanese honeysuckle (Figure 2).
The parcel is located in the 100 ft. Resource Protection Area of an impaired stream (Tripps Run). Tripps Run, a Potomac River tributary, is impaired for aquatic life - benthic macroinvertebrates. The benthic impairments are related to a combination of stressors including, elevated nitrate and total nitrogen concentrations, flashy flows, channel modifications, and sediment.

The site also provides an excellent example of how to enhance the green infrastructure of an urban landscape. The site is adjacent to Cavalier Trail Park which has a native pollinator garden (Figure 3) and provides additional connection to an established trail along Tripps Run that was planted with native plants almost thirty years ago (Figure 4).
Figure 3. Native Plant Butterfly Garden at Cavalier Trail Park

Figure 4. Existing native plant trail and greenway that restoration site will connect to
The demonstration site will not only enhance and enlarge the adjacent park and trail, but will also capture and treat runoff from the neighboring paved parking lot and provide more connectivity for wildlife. The workgroup decided that the installation of a rain garden, conservation landscaping, and a trail connection at the site will reduce runoff volume that contribute to flashy flows as well as reduce the nitrogen, phosphorous, and sediment load that enters Tripps Run.

The site is also highly visible from the roadway and is a prime location for educational signage. Plus the City offered to provide $7,000 in matching funds, install an irrigation system, and maintain the site in accordance with their maintenance standards.

For these reasons, the workgroup agreed that this site was the best candidate to demonstrate how to connect green infrastructure corridors, utilize native plants in a conservation landscaping, and provide water quality benefits to streams in an urban area.

2.3 Conservation Landscaping Technical Design Workshop Summary

NVRC coordinated with the workgroup to design the agenda and conduct the workshop. The Conservation Landscaping Workshop was divided into two parts. Part 1 took place on July 16 at the Fairfax County Herrity Building located at 12055 Government Center Parkway, Fairfax, VA 22035 from 9:30 am – 2:30 pm. Part 1 of the workshop focused on how to select and design conservation landscape practices for homeowners in Northern Virginia. The target audience for the workshop was landscape professionals (designers, architects, contractors), stormwater BMP inspectors, or general public that have a strong background in gardening/landscaping but wanted to learn more about creating a habitat and stormwater friendly landscape. Forty-two landscape professionals and municipal stormwater inspectors attended the workshop.

Part 2 of the workshop which was funded under Task 57 of NOAA Grant # 13NOS4190135 was scheduled for October 8, 2014. The second part of the workshop was focused on installation and maintenance and contained a hands-on learning component. The final report for Part 2 will be developed in November of 2015.

Since Arlington County, Fairfax County, and the City of Falls Church all have unique incentive programs for their residents to install various conservation landscaping practices or stormwater best management practices (BMP’s), the first portion of the workshop consisted of an overview of each of these programs and why they were developed. A representative from Falls Church explained their incentive program for property owners to reduce their stormwater fees by removing turf or hardscape and installing rain gardens or conservation landscaping and went through their credit manual. Arlington County staff presented on their program called Stormwater Wise Landscapes that provides grants to homeowners to install residential scale BMP’s on their property and Fairfax County staff presented an overview of their forthcoming incentive program.
The second portion of the workshop consisted of a presentation from the Chesapeake Stormwater Network on how to design, construct, and maintain a variety of BMP practices at a homeowner’s property. The textbook for this portion of the class was ‘Homeowner Guide For a More Bay-Friendly Property’ [http://chesapeakestormwater.net/2013/04/homeowner-bmp-guide/](http://chesapeakestormwater.net/2013/04/homeowner-bmp-guide/).

The third portion of the workshop was presented by an instructor from the George Washington University Landscape Architecture program. This presentation focused on native plants and the principles of Conservation Landscaping as well as design recommendations.

Finally, NVRC led participants through a hands-on design exercise to apply what they learned and design a landscape for the selected site in Falls Church.

The presentations from the workshop are included in Appendix B. At the end of the workshop, participants were asked to fill out an evaluation form so that future efforts can improve and represent the needs of the community. The evaluations are included in Appendix B.

### 2.4 306 A Documentation Summary

Construction projects using CZM funding are required to obtain 306A Clearance. Since the second portion of this project involved installation of plants, it was considered construction. Because 306A projects are federally funded actions, NOAA is subject to the requirements of the National Environmental Policy Act (NEPA) for these projects. Completion of the 306A checklist on each 306A project meets these NEPA requirements.

The 306A checklist was completed in consultation with the VA CZM project manager for this project. By completing the checklist, we determined if there were any potential environmental, cultural and social impacts of the project.

In addition to the checklist, NVRC submitted a Scope of Work to the Virginia Coastal Zone Management Program and received approval, obtained State Historic Preservation Officer Clearance from the Virginia Department of Historic Resources, obtained clearance from VA Natural Heritage Program, and secured the legal paperwork showing that the property for the proposed project is publicly owned.

The completed the 306A documents for the selected site are attached as Appendix C.
Appendix A

Scope of Work for the Training

Registration List
SCOPE OF WORK FOR CONSERVATION LANDSCAPE TRAINING PART I
RESIDENTIAL BMP TRAINING FOR THE LANDSCAPE PROFESSIONAL

Goals:

Develop a cohort of landscape professionals who can:

- Design plans for homeowner BMP’s in accordance with local jurisdiction criteria
- Install homeowner BMP’s in the residential landscape
- Identify and select native plants for conservation landscapes, riparian buffer plantings, rain gardens, and tree plantings
- Maintain residential BMP’s in accordance with local requirements
- Add to the list of qualified professionals who can work with homeowners in Northern Virginia
- Assist clients in understanding the role of practices in reducing stormwater pollution and utility fees if applicable

Audience:
The target audience for this workshop are landscape professionals (designers, architects, contractors), stormwater BMP inspectors, or general public that have a strong background in gardening/landscaping but would like to learn more about creating a stormwater friendly landscape.

Target number: approximately 30-40 landscape professionals

Advertising:
Invitations will be extended to APLD, ASLA, VNLA, Virginia Society of Landscape Designers, GWU’s Sustainable Landscape program graduates?, landscape professionals who have worked with Arlington Stormwater Wise landscapes and Falls Church program, NVRC Plant NoVA Natives Community Leaders Program, NVCC Horticulture Program, CCLC members

Partners will post the workshop advertisement on website and send out to listserves.

Working Agenda:
1. Welcome and Introduction (Corey Miles, NVRC– 2 Minutes) 9:30

2. Why are local governments investing in residential landscapes? Case Study
   Overview of Falls Church and Arlington County Incentive Programs (Aileen Winquist and Jason Widstrom) 9:32 – 10:10

   2.1. Brief explanation of why local governments are investing in residential landscapes for stormwater management and local examples
   2.2. Falls Church program
   2.3. Arlington program
   2.4. Fairfax program
   2.5. Prince William
3. Homeowners Guide to BMP’s (Chesapeake Stormwater Network – Use Guide to Homeowner BMP as text for this section) 10:10 – 12:00

3.1. What is a Homeowner BMP

3.2. Selected practices in detail
   3.2.1. Conservation Landscaping
      3.2.1.1. Eight Essential Elements of Conservation Landscaping (will provide slides to Cecilia and Tom)
   3.2.2. Rain Gardens
   3.2.3. Tree Planting
   3.2.4. Cisterns and Rain Barrels
   3.2.5. Permeable Hardscapes
   3.2.6. Impervious Cover Removal
   3.2.7. Bay-Friendly Lawn Care
   3.2.8. Riparian Buffer Planting

BREAK 12:00 – 12:45

3.3. Spotlight on selected Native Plants for Conservation Landscapes (if the Native Plants for Northern VA Guide is ready than we will use it as a text for this section) 12:45 – 1:15
   3.3.1. Herbaceous Perennials
   3.3.2. Grasses
   3.3.3. Vines
   3.3.4. Shrubs
   3.3.5. Trees

4. Site Design and Planning (Aimee Vosper, NVRC Landscape Architect) 1:15 – 2:30
   4.1.1. Hands on design exercise for site selected for Part 2:
   4.1.2. Site constraints
   4.1.3. Budget
   4.1.4. Landscape Plan Preparation

Dates and Locations:
Dates and Locations are as follows:

Part 1

July 16 9:30 am – 2:30 pm

Fairfax County Herrity Building
12055 Government Center Parkway, Fairfax, VA 22035
Room 107
9:30 am – 2:30 pm
Part 2: Maintenance and Installation:

October 8, 2014

Location and other details TBD

**Equipment Needs:**
- Laptop (NVRC will provide - presenters will make arrangements with Corey to load presentation on laptop in advance of class)
- A/V Equipment – NVRC has a projector but no amplification

**Materials for Participants:**
- Homeowners BMP Guide by CSN – CSN can provide a few copies, NVRC can provide a few copies,
- Native Plants for Northern Virginia Guide (if it is ready) – NVRC will provide
- Arlington Stormwater Wise Landscapes – Arlington will provide
- Falls Church Stormwater credit criteria – Falls Church will provide
- List of native plant vendors in Northern VA – NVRC can provide with partner input
- List of other reference materials – NVRC can provide with partner input
- Comment: The RiverWise Guide may be available

**References for Training Materials:**
- Native Plants of Northern Virginia Guidebook
- Regional Market Research Survey – Amplitude Research
- Homeowner BMP Guide by CSN
- Eight Essential Elements of Conservation Landscaping by the CCLC
The Northern Virginia Regional Commission is hosting a FREE two workshop series for landscape professionals on residential stormwater management practices. These FREE workshops are for landscape designers, architects, engineers, installers or inspectors who would like to learn about the landscape practices being promoted by local governments such as rain gardens, conservation landscapes, rain barrels, and tree planting. To learn more or to register visit the website: Residential Stormwater Best Management Practices Workshop page [http://www.novaregion.org/index.aspx?NID=1311](http://www.novaregion.org/index.aspx?NID=1311)

Best Management Practices are land-management and landscaping practices that control stormwater and erosion by capturing and/or encouraging runoff from rooftops and pavement to infiltrate into the ground. Local city and county government are promoting these practices because they reduce flooding and the amount of polluted runoff that flows into local waterways during rainstorms. This series of two workshops will provide introductory information to landscape professionals on residential-scale best management practices to reduce stormwater runoff and prepare landscape professionals to offer design, installation, and maintenance services to clients.

Part I of the training includes a classroom overview of local incentive programs available for homeowners, an overview of commonly used best management practices, a session on using native plants, and hands-on design exercise for a site that will be constructed during the second session.

Part II includes a classroom session geared towards maintenance of these practices and a hands-on field experience building one or more of these practices.

The target audiences for these workshops are landscape designers, architects, engineers, inspectors, or installers who would like to learn more about the practices that are currently being promoted by local governments, how to incorporate native plant species into these practices, and how to maintain them in the typical residential landscape.
Certificate of Completion: Attendees who attend both training days will receive a Certificate of Completion from the Northern Virginia Regional Commission, certifying attendance at the full program.

Registration includes the following workshop materials:


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**To Register:**


**Dates and Locations are as follows:**

Part I: July 16, 2014  
Fairfax County Herrity Building  
12055 Government Center Parkway, Fairfax, VA 22035  
Room 107  
9:30 am – 2:30 pm

Part II: October 8, 2014  
Fairfax County Herrity Building  
12055 Government Center Parkway  
Fairfax, VA 22035  
Room 107  
9:30 am – 2:30 pm

Lunch will **not** be provided. There is a cafeteria on site where attendees may purchase lunch.

Workshops are offered in partnership with the Virginia Coastal Zone Management Program, City of Falls Church, Arlington County, Northern Virginia Soil and Water Conservation District, and Wetlands Watch.
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Appendix B

Presentations from the Training
StormwaterWise Landscapes
Arlington County, VA

Aileen Winquist
awinquist@arlingtonva.us

http://environment.arlingtonva.us/stormwaterwise/
About StormwaterWise Landscapes

• Sustainable stormwater incentive program for Arlington private property owners.

• Pilot year – 2012
• HOA program - 2014

• Reimbursement/matching grant program

• An education and outreach initiative

• MS4 permit requirement

• 40-60 residential participants, 5 HOAs
Why StormwaterWise Landscapes?

- Arlington’s impervious cover is 50% privately owned
- Expectations/requests from residents
- Northern Virginia Rain Barrel Program & survey results
- Increase capacity of conservation landscaping industry
- Opportunity for outreach
- MS4 Permit requirement
- Staff & expertise available
Show Me the Money

• Fiscal agent – Arlingtonians for Clean Environment (ACE)

• Sole source agreement and MOU

• $80,000 NFWF grant for 2013-14

• County Stormwater Fund (tax)

  • 2012 Budget - $44,000; Actual - $19,177
  • 2013 Budget - $112,000; Actual - $70,697
  • 2014 Budget - $114,500

• 3 staff, 30% FTE??, 1 Ipad

http://environment.arlingtonva.us/stormwaterwise/
# How Does StormwaterWise Work?

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<td>January 1 - February 15</td>
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<tr>
<td>Site assessments</td>
<td>March-April</td>
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<td>Property owner selects practices</td>
<td>End of May</td>
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<td>Project plan submitted</td>
<td>End of June</td>
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<td>Projects installed</td>
<td>November 1</td>
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<td>Inspections</td>
<td>Through early December</td>
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<td>Reimbursements</td>
<td>Through early January</td>
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<td>Second Round</td>
<td>July to following June</td>
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http://environment.arlingtonva.us/stormwaterwise/
How do we help property owners?

• Site assessment by County staff
• Fact sheets and on-line resources for practices
• A “living” list of area contractors
• Ongoing technical and moral support
• Interim and final deadlines
• Reimbursement grant

http://environment.arlingtonva.us/stormwaterwise/
2014 Practices

Reimbursement is 50% of the project cost or the incentive, whichever is less.

- Cisterns*: $500
- Conservation landscaping
- Rain gardens
- Pavement removal
- Green roofs*: $2000
- Pervious surfaces
- Rain gardens: $750 ($3/sf)
- Pavement removal: $1500

*Green Home Choice construction projects only

http://environment.arlingtonva.us/stormwaterwise/
Lessons Learned

- Staff time is the largest cost.
- Practices are expensive!
- Drainage problems and property improvement motivated both participation and follow-through.
- Financial resources, family concerns and bewilderment are obstacles.
- Connecting with qualified contractors is difficult.

http://environment.arlingtonva.us/stormwaterwise/
For Further Questions Contact

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Aileen Winquist  
703-228-3610  
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Fairfax County Incentive Program

Lily Whitesell
Northern Virginia Soil and Water Conservation District
City of Falls Church
Stormwater Utility Fee Credits Manual

Version 1.0 — February 5, 2014

The City of Falls Church is committed to the letter and spirit of the Americans with Disability Act. To request a reasonable accommodation for any type of disability call 703-248-5030. (TTY 711)
Table of Contents

Stormwater Overview - 3
Stormwater Utility Fee - 4
  • What is the purpose of the fee?
  • How is the fee calculated?
  • Is there anything I can do to reduce my bill?
Credit Program
  • What are the eligibility requirements? - 6
  • How much credit can I get? - 6
  • Stormwater Management Facility Credit - 7
  • Credit for Off-Site Impervious Surfaces - 7
  • Stormwater Detention Credit - 7
  • Stormwater Pollution Prevention Practices - 7
  • Can credits be combined? - 8
  • Definitions - 8
  • How do I apply? - 9
  • Calculation Form - 10
  • Example Calculations Form - 11
Important Resources - 12
Credit Application Forms
  • Credit Application (SW1) - 13
  • Residential SWPPP (SW2) - 15
  • Residential SWPPP Toolbox - 17
  • General SWPPP (SW3) - 19
  • General SWPPP Toolbox - 21
Maintenance Agreement - 23
Inspection Form (SW4) - 26
Renewal Form (SW5) - 27
Stormwater Overview

Stormwater is rainwater that does not soak into the ground but instead, runs off buildings, streets, parking lots, and other surfaces. Stormwater is collected in gutters, storm drain inlets, and pipes and into the City's storm drain system. This water is untreated before flowing into either Tripp’s Run or Four Mile Run—tributaries of the Potomac River. The City’s stormwater runoff eventually reaches the Chesapeake Bay.

The Falls Church Department of Public Works (DPW) manages, maintains, and repairs the City's stormwater system, which includes 140,000 linear feet of storm drain, 1,400 appurtenances, and 8,100 feet of stream channel in the Four Mile Run and Tripp's Run watersheds.

Much of the City's stormwater system was installed as the City grew during the 1930s through the 1960s, which was prior to any flood and stormwater regulations. As the City increased in density, the stormwater infrastructure became overwhelmed with additional runoff from impervious surfaces. Today, many of these stormwater pipes are beyond their expected life span and in some locations have failed or are near failing. As we see with some regularity, flooding occurs in areas due to undersized or broken stormwater pipes. City staff estimates roughly $20 million will be needed in the next 10 years to solve drainage problems and replace aging stormwater infrastructure.

Polluted runoff is the number one cause of water pollution in Northern Virginia. The same rain that washes streets, yards, and parking lots clean is sending chemicals, germs, and trash down the drain. All of the storm drains in the City of Falls Church lead directly to streams and rivers.

The Chesapeake Bay watershed remains on the EPA’s impaired waters list, therefore, Falls Church, like every jurisdiction in Virginia, is now facing a state/federal mandate aimed at restoring the Chesapeake Bay called the Chesapeake Bay Total Maximum Daily Load (TMDL). A TMDL is also commonly referred to as a pollution diet. In this case, the Chesapeake Bay TMDL sets a limit on the amount of phosphorus, nitrogen, and sediment (measured in pounds) that enters our streams on an annual basis. In 2012, the City was given numerical targets it must achieve by 2028 with specific milestones along the way.
Stormwater Utility Fee

What is the purpose of the fee?
The Stormwater Utility Fund was created in order to give the stormwater management program a stable and dedicated source of revenue. The revenue generated by the utility fee can only be used for the stormwater management program—both operating and capital budget. It will fund such things as construction materials and equipment, contracted services, state stormwater permit fees, and city staff who will clean, repair, design, and oversee capital improvement projects.

How is the fee calculated?
The Stormwater Utility Fee is a fee for service, therefore all properties are charged regardless of their tax status. The fee is based on how much impervious surface (roof, driveway, walkway, patio, etc.) your site has. It is determined by 200 square feet increments to account for variability and minor inaccuracies in mapping. Each increment is called a “billing unit” and fractions are rounded up to the next whole unit. The number of billing units are then multiplied by the rate set by City Council, which is $18.00 per 200 sq.ft. The infographic on the next page provides an example of the fee calculation.

Is there anything I can do to reduce my fee?
Yes, there are two ways. First, you can remove impervious surface from your property resulting in a direct reduction of your fee if it results in a reduction of billing units. Second, you can participate in the Stormwater Utility Credit Program by installing and maintaining a stormwater management facility on your property and/or performing activities outlined in the Stormwater Pollution Prevention Plan included in this document.
Calculating stormwater fees

An example house in Falls Church has a total impervious surface of 2,250 square feet (e.g., roof area, driveway, sidewalks, and patio). To calculate the corresponding stormwater fee:

- **Impervious area:**
  - 1,100 sq. ft. for roof
  - 750 sq. ft. for driveway
  - 300 sq. ft. for patio
  - 100 sq. ft. for sidewalk
  - **2,250 sq. ft. total impervious area**

- **Divide** the impervious area by 200
  (2,250 ÷ 200 = 11.25)

- **Round the result** to the next highest whole number
  (round 11.25 up to 12)

- **Multiply by $18** to calculate the total annual fee
  (12 x $18 = $216)

---

**Cistern:** An underground tank that collects runoff from impervious areas could earn up to a 70% reduction in impervious area.

**Sidewalk:** 100 sq. ft.

**Reduction:** Using permeable pavers rather than concrete earns a 40 sq. ft. reduction (40%) in impervious area.

**Roof:** 1,100 sq. ft.

**Planting a tree could help earn a 10% credit.**

**Driveway:** 750 sq. ft.

**Rain garden reduction:** Collects runoff from the driveway, for a 300 sq. ft. reduction (40%) in impervious area.

**Installing a rain barrel could help earn a 10% credit.**

**Patio:** 300 sq. ft.

**Reduction:** Using permeable pavers rather than concrete earns a 120 sq. ft. reduction (40%) in impervious area.

**Off-site reduction:**
Adding a rain garden or other stormwater facility that collects and treats off-site stormwater can earn up to a 70% reduction in impervious area.

---

**Stormwater credits**

The City's stormwater credit policy provides up to 95% off the stormwater utility fee by adding property improvements, such as cisterns, rain gardens, and permeable surfaces. Credits are cumulative.

Voluntary water quality improvements can earn up to a 40% reduction in impervious area while improvements required as a condition of development can earn up to 20% reduction in impervious area.

An additional 10% to 30% percent can be earned by providing water quantity improvements that store stormwater runoff.

A 10% credit can be earned by performing stormwater quality improvement activities like planting trees and installing rain barrels.

Visit the City's website at [www.fallschurcva.gov/Stormwater](http://www.fallschurcva.gov/Stormwater) for more details about the Stormwater Utility Fee Credits Manual.

---

**To calculate fee reduction:**

- **Add** the impervious area draining to a facility, or multiple facilities
  (100 sq. ft. + 750 sq. ft. + 300 sq. ft. = 1,150 sq. ft.)

- **Multiply** the impervious area by reduction percentage (voluntary, 40%)
  (1,150 sq. ft. x 0.40 = 460 sq. ft.)

- **Subtract** the result from the original impervious surface
  (2,250 sq. ft. – 460 sq. ft. = 1,790 sq. ft.)

- **Divide** by 200 and round to the highest number
  (1,790 sq. ft. ÷ 200 = 8.9, rounded up to 9)

- **Multiply** by $18 to find the modified fee ($18 x 9 = $162)

- **Annual stormwater fee with credits reduced to $162**
Credit Program

What is a credit?

A credit is a reduction in impervious area due to implementation of a stormwater management facility or a Stormwater Pollution Prevention Plan. A credited area is subtracted from a property’s total impervious area prior to calculating the fee for the stormwater utility. Stormwater management facilities are given credits because, when operated and maintained properly, they reduce the quantity and improve the quality of stormwater runoff. This in turn reduces the need for capital investment in new infrastructure. In order to participate in the program an application must be submitted to the City and renewed on a yearly basis using the Credit Renewal Form. Credits are calculated by summing impervious areas draining to the facility and then multiplying by an assigned percentage. That total is then deducted from the original square feet of impervious surface. If billing units are decreased then it will result in a reduced fee. See page 16 for an example calculation.

What are the eligibility requirements?

For a new or existing facility to be eligible for credit, the following requirements must be met:

- For facilities built before July 1, 2014, they need to have been designed, installed, and accepted by the City in accordance with the technical standards required by the City at the time of construction. For facilities built July 1, 2014, and after, the technical standards are those contained in the Virginia Stormwater BMP Clearinghouse (http://vwrrc.vt.edu/swc/) or other state-approved design guidance documents.
- The facility needs to have a signed and recorded maintenance agreement with the City. The city may require an existing maintenance agreement to be updated to meet current standards for maintenance and inspections.
- The facility needs to currently function as designed. Functionality will be verified through periodic City inspections and through any reporting requirements contained in the maintenance agreement.
- If a facility fails a City inspection or the owner fails to submit maintenance documents as required in the maintenance agreement, the City will withdraw the credit if corrective actions are not taken within the time specified by the City.

To be eligible for an Individual Residential or General SWPPP credit, the following requirements must be met:

- The credit can only be applied to on-site areas.
- Choose from a “toolbox” of options and follow the requirements for each practice.

How much credit can I get?

There are multiple practices available to receive a credit toward the utility fee. The maximum a site can achieve is 95%. The amount of credit given depends on several factors—the type of facility, area treated and/or captured, and if a facility was built voluntarily or requirement as part of a development. The impervious area treated by the facility is the only area that is eligible for the discount, not the entire impervious surface of the property.
Stormwater Utility Fee Credit Opportunities

**Stormwater Management Facility Credit**
For a facility that was a condition of development the maximum credit that can be received is 20%. For a facility that was voluntarily installed the maximum credit that can be received is 40%. The policy of the City Council is to maintain the percent credit for a voluntary stormwater management facility for a minimum of 15 years. For a facility that provides detention for off-site stormwater and/or on-site stormwater in excess of City of Falls Church code requirements the maximum credit is 30%.

**Credit for Off-site Impervious Surfaces**
Credit may be applied to off-site impervious areas that are not currently served by a structural stormwater management facility that are within the public right-of-way (e.g., City streets) provided that the facility has been approved by the Director of Public Works. The Director of Public Works will only approve a facility for off-site treatment credit if at his discretion it is determined that the stormwater management benefits achieved are in the best interest of the City. If you are interested in this opportunity please contact Public Works in advance.

**Stormwater Detention Credit**
The City will provide up to 30% credit against the stormwater utility fee for stormwater detention above that required in Chapter 35 “Stormwater” of the City Code. The credit applies only to the impervious areas draining to the stormwater detention facility. Once the Director of Public Works has determined that any statutory requirements have been met, the following credits will be available:

- 10% credit for detention of stormwater resulting from a once inch rainfall or greater and less than two inches.
- 20% credit for detention of stormwater resulting from two inches of rainfall or greater and less than three inches.
- 30% credit for detention of stormwater resulting from rainfall of three inches or greater.

The policy of City Council is to maintain the percent credit for a detention facility installed in accordance with this section for a minimum of 15 years.

**Stormwater Pollution Prevention Practices**
The City will provide a 10% credit against the stormwater utility fee for a property owner who implements a Stormwater Pollution Prevention Plan (SWPPP) that meets the requirements of this section. SWPPP credits may not be applied to off-site areas. Two categories of SWPPP credits are available:

- **Individual Residential SWPPP Credit** - This credit is available to any individual residential property owner, including single family detached homes, townhomes, duplexes, and condominium owners if they are separately billed the utility fee.

- **General SWPPP Credit** - This credit is available to all property owners, regardless of land use.

To receive the SWPPP credit, the property owner may choose from the “tool-box” of potential practices described below (see page with each practice worth a designated number of points). A property owner achieving 10 points or more will receive the SWPPP credit of 10% off the annual stormwater fee.
Can credits be combined?

The Stormwater Management Facility Credit and the Stormwater Detention Credit are cumulative if a facility or combination of facilities provides treatment to stormwater from the same area of impervious cover. The 10% credit for an approved SWPPP is applied to the whole stormwater utility fee prior to the application of the credit for structural stormwater management facilities. The maximum amount of credit that can be achieved for stormwater generated on-site is 70% (e.g. 30% for water quality, 30% for water quantity, and 10% for SWPPP).

In addition, a property owner may, in accordance with the requirements of the credit policy, apply credits for structural stormwater management facilities that control stormwater from impervious areas within the public right-of-way (e.g. City streets) to achieve effective credit of greater than 70%.

However, in all cases the maximum credit that can be achieved for any one property shall be 95%.

Definitions

**BMP** - Best Management Practice; refers to structural and non-structural practices that are employed to reduce the adverse impact of development on stormwater run-off quality

**detention facility** - a system which provides temporary storage of stormwater runoff with a designed release of the stored runoff over time to manage the discharge volume, rate, pollutant loading and/or velocity.

**drainage map** - a to-scale map showing property lines, impervious areas, stormwater management facility drainage area boundaries, and the total impervious cover draining to the facility

**maintenance agreement** - a document that allows the City access to the site and establishes enforceable maintenance and reporting requirements

**nutrient management plan** - a set of conservation practices designed to use fertilizer and/or manure to effectively provide needed nutrients while protecting water quality

**stormwater management facility** - a structural or non-structural practice intended to manage the volume, rate, and quality of stormwater runoff; e.g. rain garden, detention facility, pervious pavers, etc.

**Stormwater Pollution Prevention Plan (SWPPP)** - a plan that utilizes Best Management Practices (BMPs) to minimize stormwater pollution
How do I apply?

An application form must be submitted by the owner of the stormwater management facility or his/her legal agent and approved by the City to receive a credit. The form must be received prior to January 1 of any given year to be considered for credit in the upcoming stormwater utility billing cycle. Credits will not be pro-rated. Special exceptions may be made by the Director of Public Works for the first year of credit implementation. The following documentation will be required:

On-Site Stormwater Management Facility: Form SW1 and Documents Listed Below
Off-site Stormwater Management Facility: Form SW1 and Documents Listed Below
Stormwater Detention Facility: Form SW1 and Documents Listed Below
Individual Residential SWPPP - Form SW2 and Toolbox
General SWPPP - Form SW3 and Toolbox

Stormwater Structural Facility Requirements:

<table>
<thead>
<tr>
<th>Application Form</th>
<th>This form is provided at the end of this packet and on the City’s website.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area Map</td>
<td>This is a to-scale map showing property lines, impervious areas, stormwater management facility drainage area boundaries, and the total impervious cover draining to the facility. The property owner should check with the Department of Public Works to determine whether this information is already on file with the City.</td>
</tr>
<tr>
<td>Stormwater Management Facility Description</td>
<td>This should reference type, date of installation, and any other details to be considered with respect to pollutant removal.</td>
</tr>
<tr>
<td>Narrative of Maintenance and Repairs</td>
<td>This is a history of facility maintenance and repair activities. Include an annual routine maintenance schedule. Include any modifications or repairs that have occurred from installation to the time of application.</td>
</tr>
<tr>
<td>Photos</td>
<td>Provide at least two date-stamped images showing the facility within one month of the application date.</td>
</tr>
<tr>
<td>Stormwater Facility Management Agreement</td>
<td>Include a copy of the agreement that allows the City access to the site and establishes enforceable maintenance and reporting requirements.</td>
</tr>
</tbody>
</table>

Mail application and all applicable documents to:

City of Falls Church
Department of Public Works
Attn: Stormwater Utility
300 Park Avenue, Suite 100W
Falls Church, VA 22046
Credit Calculation Form

Billable Area & Initial Fee

A _______________ Enter (on-site) Total Billable Impervious Area

B _______________  \[ B = \frac{A}{200} \] Round to next highest whole number. Enter Billing Units

C _______________  \[ C = B \times 18 \] Enter Initial Annual Stormwater Utility Fee

Reduction for Condition of Development SWM Facility

D _______________ Enter Impervious Area Draining to Condition of Development SWM Facility

E _______________  \[ E = D \times 0.20 \] Enter Impervious Area Reduction for Condition of Development SWM Facility

Reduction for Voluntary SWM Facility

F _______________ Enter (on-site & off-site) Impervious Area Draining to Voluntary SWM Facility

G _______________  \[ G = F \times 0.40 \] Enter Impervious Area Reduction for Voluntary SWM Facility

Reduction for Detention Facility

H _______________ Enter (on-site & off-site) Impervious Area Draining to Detention Facility

I _______________  \[ I = H \times 0.10 \] for stormwater detention volume of 1.00-1.99 inches

\[ H \times 0.20 \] for stormwater detention volume of 2.00-2.99 inches

\[ H \times 0.30 \] for stormwater detention volume of 3.0 inches or greater

Enter Impervious Area Reduction for Detention Facility

SWPPP Adjustment

J _______________  \[ J = (A) \times 0.10 \]

Calculating your Final Adjusted Annual Stormwater Utility Fee

K _______________  \[ K = E+G+I+J \] Enter the Total Impervious Area Reduction

L _______________  \[ L = A-K \] Enter the Adjusted Billable Impervious Area

M _______________  \[ M = \frac{L}{200} \] Round to next highest whole number. Enter the Adjusted Billing Units

N _______________  \[ N = M \times 18 \] Enter the Adjusted Annual Stormwater Fee

O _______________  \[ (C) \times 0.05 = \] Minimum Stormwater Fee

P _______________ Final Adjusted Annual Stormwater Utility Fee = (N) or (O), whichever is greater
Example Calculation Form

Billable Area & Initial Fee

A  2250 Enter (on-site) Total Billable Impervious Area

B  12  B = A ÷ 200 Enter Billing Units

C  216  C = B x $18 Enter Initial Annual Stormwater Utility Fee

Reduction for Condition of Development SWM Facility

D __________ Enter Impervious Area Draining to Condition of Development SWM Facility

E __________ E = D x 0.20 Enter Impervious Area Reduction for Condition of Development SWM Facility

Reduction for Voluntary SWM Facility

F  1150 Enter (on-site & off-site) Impervious Area Draining to Voluntary SWM Facility

G  460  G = F x 0.40 Enter Impervious Area Reduction for Voluntary SWM Facility

Reduction for Detention Facility

H __________ Enter (on-site & off-site) Impervious Area Draining to Detention Facility

I __________ I = H x 0.10 for stormwater detention volume of 1.00-1.99 inches

       H x 0.20 for stormwater detention volume of 2.00-2.99 inches

       H x 0.30 for stormwater detention volume of 3.0 inches or greater

Enter Impervious Area Reduction for Detention Facility

SWPPP Adjustment

J __________ J = (A) x 0.10

Calculating your Final Adjusted Annual Stormwater Utility Fee

K  460  K = E+G+I+J Enter the Total Impervious Area Reduction

L  1790  L = A-K Enter the Adjusted Billable Impervious Area

M  9  M = L ÷ 200 Round to next highest whole number. Enter the Adjusted Billing Units

N  162  N = M x $18 Enter the Adjusted Annual Stormwater Fee

O  11  (C) x 0.05 = Minimum Stormwater Fee

P  162 Final Adjusted Annual Stormwater Utility Fee = (N) or (O), whichever is greater
Important Resources

- Chesapeake Stormwater Network
  [http://chesapeakestormwater.net/be-bay-friendly/](http://chesapeakestormwater.net/be-bay-friendly/)

- City of Falls Church Department of Public Works
  [www.fallschurchva.gov/Stormwater](http://www.fallschurchva.gov/Stormwater)

- City of Falls Church Neighborhood Tree Program

- EnviroScape Program, NVSWCD
  [www.fairfaxcounty.gov/nvswcd/enviroscape.htm](http://www.fairfaxcounty.gov/nvswcd/enviroscape.htm)

- Northern Virginia Soil & Water Conservation District (NVSWCD)

- Permeable Pavement state standards
  [http://vwrrc.vt.edu/swc/NonProprietaryBMPs.html](http://vwrrc.vt.edu/swc/NonProprietaryBMPs.html)

- Rain Gardens Technical Guide, Virginia Department of Forestry

- Virginia Department of Environmental Quality

- Virginia Stormwater BMP Clearinghouse
  [http://vwrrc.vt.edu/swc](http://vwrrc.vt.edu/swc)
City of Falls Church CREDIT APPLICATION FORM  

Applicant Name: Date:  

Email: Phone #:  

Property Information:  
Owner:  
Street:  
City, State, ZIP Code:  

Mailing Address (If different from property address):  
Street:  
City, State, ZIP Code:  

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 Nutrient Removal Rates for Urban Stormwater Retrofits Projects, or other state-approved design guidance (provide documentation to support the determined pollutant removal efficiency). Attach additional information if necessary.  

☐ Voluntary Stormwater Management Facility  
☐ Condition of Development Stormwater Management Facility  
☐ Off-site Stormwater Management Facility  
☐ Stormwater Detention (circle one): 1-1.99 inches  2-2.99 inches  3 inches or greater  

Total Amount of Credit:_______________  

Final Adjusted Annual Stormwater Utility Fee:_______________  
(Use Credit Calculation Form)
Credit Application Form cont.

☐ I certify that the above information, to the best of my knowledge and belief, is true, accurate and complete.

☐ I certify that practices installed on my property for which I am taking credit are functioning as intended and are being maintained in accordance with guidance provided by the City.

☐ I certify that I have received proper authorization from my homeowners or condominium association for the practices installed, if applicable.

☐ I agree that City staff may have access to my site for the sole purpose of verifying these practices. Should City staff find a deficiency, I also understand that I must correct the deficiency in the time frame provided by the City and that if corrective action is not taken in a timely manner, that I will no longer be able to take credit for the practice.

Signature_________________________________________  Date______________

Official Use Only:

Facility ID # ___________________________  Review Date: ______________

Reviewer: _____________________________  Approval Date: ______________

Comments:
City of Falls Church RESIDENTIAL SWPPP APPLICATION FORM (Form SW2)

Applicant Name: Date:

Email: Phone #:

Property Information:

   Owner:
   Street:
   City, State, ZIP Code:

Mailing Address (If different from property address):

   Street:
   City, State, ZIP Code:

<table>
<thead>
<tr>
<th>Watershed Stewardship Activity</th>
<th>Date</th>
<th>Hours</th>
<th>Total Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hour = 1 point)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Rain Barrels - include a picture of new barrels installed this year |
| (1 rain barrel = 2 points) |
| Year Installed | Capacity | # Installed |
| Total Points: | Total Barrels: | |

| Rain Garden |
| (5 points for ≥ 50 SF, 10 points for ≥ 100 SF) |
| Area | City Approval Date |
| Total Points: | Total Area: | |

| Tree Planting |
| (1 tree = 2 points) |
| # of Trees | City Approval Date |
| Total Points: | Total Trees: | |

| Conservation Landscaping |
| (Each 100 SF = 3 points) |
| Area | City Approval Date |
| Total Points: | Total Area: |
Residential SWPPP Application Form cont.

<table>
<thead>
<tr>
<th>Downspout Disconnection</th>
<th>Year Disconnected</th>
<th>City Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 disconnection = 1 points; No credit for disconnection &gt; 5 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Permeable Pavers</th>
<th>Area</th>
<th>City Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5 points for ≥ 250 SF, 10 points for ≥ 500 SF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Area:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| No Fertilizer Pledge | | |
|----------------------|-------------|
| (Yes = 1 point) | I pledge that I will not apply commercial fertilizer on my property during the credit year. |
| Total Points: | | |

<table>
<thead>
<tr>
<th>Green Streetscape</th>
<th>City Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Points (Provided by City):</td>
<td></td>
</tr>
</tbody>
</table>

**Total Residential SWPPP Points:__________ (minimum of 10 points needed)**

- [ ] I certify that the above information, to the best of my knowledge and belief, is true, accurate and complete.
- [ ] I certify that practices installed on my property for which I am taking credit are functioning as intended and are being maintained in accordance with guidance provided by the City.
- [ ] I certify that I have received proper authorization from my homeowners or condominium association for the practices installed, if applicable.

I agree that City staff may have access to my site for the sole purpose of verifying these practices. Should City staff find a deficiency, I also understand that I must correct the deficiency in the time frame provided by the City and that if corrective action is not taken in a timely manner, that I will no longer be able to take credit for the practice.

Signature__________________________________________ Date____________________

**Official Use Only:**

Facility ID # __________________________ Review Date: ________________

Reviewer: __________________________ Approval Date: ________________

Comments:
**Individual Residential SWPPP Credit Toolbox**

A property owner achieving 10 points or more will receive the SWPPP credit of 10% off the annual stormwater fee. The following table presents practices and requirements for obtaining points toward the individual residential SWPPP credit. Refer to Important Resources for cited technical manuals and specifications. All credits, except where noted, are ongoing provided that the property owner maintains the practice and submits an annual Residential SWPPP Application Form.

<table>
<thead>
<tr>
<th>Practice</th>
<th>Description</th>
<th>Points</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watershed Stewardship</td>
<td>Participate in a City-sanctioned volunteer event, including but not limited to stream clean-ups, storm drain stenciling projects, adopt-a-highway, and tree planting. Refer to the City’s webpage for a list of sanctioned events.</td>
<td>1 point per hour volunteered. Multiple members of a household may participate and accumulate points.</td>
<td>Indicate hours worked on Residential SWPPP Application Form.</td>
</tr>
<tr>
<td>Rain Barrels</td>
<td>Install a rain barrel with a capacity of at least 50 gallons to capture stormwater from a downspout. Construction and installation guidance provided on the Northern Virginia Soil and Water Conservation District web page.</td>
<td>2 points for each rain barrel that captures stormwater from a separate downspout.</td>
<td>Verify size and number of barrels on the Residential SWPPP Application Form. Include picture(s) with the initial application. Verify continued maintenance using the Residential SWPPP Application Form.</td>
</tr>
<tr>
<td>Rain Garden</td>
<td>Install a rain garden that meets the requirements of the Virginia Department of Forestry Rain Gardens Technical Guide or the Northern Virginia Soil and Water Conservation District Rain Garden Design and Construction Guide.</td>
<td>5 points for a rain garden covering 50 square feet or more. 10 points for a rain garden covering 100 square feet or more.</td>
<td>Verify continued maintenance using the Residential SWPPP Application Form.</td>
</tr>
<tr>
<td>Tree Planting</td>
<td>Plant a tree through the City’s Neighborhood Tree Program or privately plant a tree with approval from the City Arborist.</td>
<td>2 points per tree</td>
<td>The City Arborist must review and approve the type of tree and placement prior to planting. Verify continued maintenance using the Residential SWPPP Application Form.</td>
</tr>
</tbody>
</table>


**Individual Residential SWPPP Credit cont.**

<table>
<thead>
<tr>
<th>Conservation Landscaping</th>
<th>Convert turf grass to conservation landscaping in accordance with requirements of the Homeowner Guide for a More Bay-Friendly Property published by the Chesapeake Stormwater Network.</th>
<th>3 points for every 100 square feet of conservation landscaping that replaces turf.</th>
<th>City staff must be contacted to approve the design and inspect the final result. Verify continued maintenance using the Residential SWPPP Application Form.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downspout Disconnection</td>
<td>Disconnect downspouts that currently drain to a public street or other impervious area. The downspout must be redirected to a pervious area that will not cause erosion or flooding problems.</td>
<td>1 point per disconnected downspout. Credit available for 5 years after disconnection.</td>
<td>City staff must be contacted to approve the disconnection and ensure that it will not cause erosion or flooding. Verify continued disconnection using the Residential SWPPP Application Form.</td>
</tr>
<tr>
<td>Permeable Pavers and Porous Pavement</td>
<td>Replace traditional driveway, patio, or other impervious areas with permeable pavers or porous pavement in accordance with state standards.</td>
<td>5 points for 250 square feet or greater; 10 points for 500 square feet or greater.</td>
<td>City staff must be contacted to approve the design and inspect the final result. Verify continued maintenance using the Residential SWPPP Application Form.</td>
</tr>
<tr>
<td>No Fertilizer Pledge</td>
<td>Sign a pledge to not apply fertilizer to your lawn or landscaped areas.</td>
<td>1 point</td>
<td>Sign statement using the Residential SWPPP Application Form.</td>
</tr>
<tr>
<td>Green Streetscape</td>
<td>Allow the City to install stormwater management techniques as part of the streetscape in front of your home.</td>
<td>Number of points at the discretion of the DPW Director.</td>
<td>Requirements at the discretion of the DPW Director.</td>
</tr>
</tbody>
</table>
Applicant Name:  
Date:  

Email:  
Phone #:  

Property Information:  

Owner:  
Street:  
City, State, ZIP Code:  

Mailing Address (If different from property address):  

Street:  
City, State, ZIP Code:  

<table>
<thead>
<tr>
<th>Watershed Stewardship</th>
<th>Activity</th>
<th>Date</th>
<th>Hours</th>
<th>Total Hours:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hour per employee = 0.5 point)</td>
<td>Total Points:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rain Barrels</th>
<th>Year Installed</th>
<th>Capacity</th>
<th># Installed</th>
<th>Total Barrels:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- include a picture of new barrels installed this year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Divide 5 by total number of downspouts. The resulting fraction is the number of points per rain barrel)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tree Planting</th>
<th># of Trees</th>
<th>City Approval Date</th>
<th>Total Trees:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 tree = 2 points)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conservation Landscaping</th>
<th>Area</th>
<th>City Approval Date</th>
<th>Total Area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Each 100 SF = 3 points)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Street Sweeping</th>
<th>Total Times Swept</th>
<th>Total Materials Swept (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&lt; 26x a year = 10 points)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General SWPPP Application Form cont.

<table>
<thead>
<tr>
<th>Pet Waste Stations</th>
<th># Installed</th>
<th>City Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5-10 points; determined by DPW Director)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Points (provided by City staff):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Certified Nutrient Management Plan</th>
<th>Year Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>(10 points)</td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SWPPP for High Risk Facilities</th>
<th>Year Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>(10 points)</td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Watershed Education Credit</th>
<th>Year Implemented</th>
<th># of Participating Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>(All students participate at least once a year = 8 points)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Points:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total General SWPPP Points:__________ (minimum of 10 points needed)

☐ I certify that the above information, to the best of my knowledge and belief, is true, accurate and complete.

☐ I certify that practices installed on my property for which I am taking credit are functioning as intended and are being maintained in accordance with guidance provided by the City.

☐ I certify that I have received proper authorization from my homeowners or condominium association for the practices installed, if applicable.

I agree that City staff may have access to my site for the sole purpose of verifying these practices.

☐ Should City staff find a deficiency, I also understand that I must correct the deficiency in the time frame provided by the City and that if corrective action is not taken in a timely manner, that I will no longer be able to take credit for the practice.

Signature_________________________________________ Date____________________

Official Use Only:

Comments:

Facility ID #_________________________ Review Date:______________

Reviewer:_________________________ Approval Date:______________
**General SWPPP Credit Toolbox**

A property owner achieving 10 points or more will receive the SWPPP credit of 10% off the annual stormwater fee. The following table presents practices and requirements for obtaining points toward the general SWPPP credit. Refer to *Important Resources* for cited technical manuals and specifications. All credits, except where noted, are ongoing provided that the property owner maintains the practice and submits an annual General SWPPP Application Form.

<table>
<thead>
<tr>
<th>Practice</th>
<th>Description</th>
<th>Points</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watershed Stewardship</td>
<td>Participate in a City-sanctioned volunteer event, including but not limited to stream clean-ups, storm drain stenciling projects, adopt-a-highway, and tree planting. Refer to the City’s webpage for a list of sanctioned events.</td>
<td>0.5 point per employee hour volunteered.</td>
<td>Indicate hours worked on General SWPPP Application Form.</td>
</tr>
<tr>
<td>Rain Barrels</td>
<td>Install a rain barrel with a capacity of at least 50 gallons to capture stormwater from a downspout. Construction and installation guidance provided on the Northern Virginia Soil and Water Conservation District web page.</td>
<td>Divide 5 by total of number downspouts. The resulting fraction is the number of points per rain barrel that captures stormwater from a separate downspout.</td>
<td>City staff must approve the placement and maintenance plan for the rain barrels. Verify size and number of barrels on the General SWPPP Application Form. Include picture(s) with the initial application. Verify continued maintenance using the General SWPPP Application Form.</td>
</tr>
<tr>
<td>Tree Planting</td>
<td>Plant a tree through the City’s Neighborhood Tree Program or privately plant a tree with approval from the City Arborist.</td>
<td>2 points per tree.</td>
<td>The City Arborist must review and approve the type of tree and placement prior to planting. Verify continued maintenance using the General SWPPP Application Form.</td>
</tr>
<tr>
<td>Conservation Landscaping</td>
<td>Convert turf grass to conservation landscaping in accordance with requirements of the Homeowner Guide for a More Bay-Friendly Property published by the Chesapeake Stormwater Network.</td>
<td>3 points for every 100 square feet of conservation landscaping that replaces turf.</td>
<td>City staff must be contacted to approve the design and inspect the final result. Verify continued maintenance using the General SWPPP Application Form.</td>
</tr>
<tr>
<td>General SWPPP Credit cont.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Street Sweeping</strong></td>
<td>Sweep all surface parking areas using a vacuum sweeper at least 26 times per year.</td>
<td>10 points.</td>
<td>Verify frequency of sweeping and total materials swept using the General SWPPP Application Form.</td>
</tr>
<tr>
<td><strong>Pet Waste Stations</strong></td>
<td>Install pet waste stations, including bags, a receptacle, and the waste collection schedule.</td>
<td>5 to 10 points</td>
<td>Credit at the discretion of the Director of DPW based on an evaluation of the area to be considered and the severity of pet waste as a localized water quality problem. Number and placement of stations to be determined collaboratively with final approval by City staff. Verify continued maintenance using the General SWPPP Application Form.</td>
</tr>
<tr>
<td><strong>Certified Nutrient Management Plan</strong></td>
<td>Nutrient management plan developed by a state-certified nutrient management planner.</td>
<td>10 points.</td>
<td>Provide the City with a copy of the certified nutrient management plan. Verify continued application of the plan using the General SWPPP Application Form.</td>
</tr>
<tr>
<td><strong>Stormwater Pollution Prevention Plan for High Risk Facilities</strong></td>
<td>Adopt and implement a SWPPP in accordance with the requirements established in <a href="#">9VAC25-151-80</a> (industrial stormwater permits). The facility must meet the definition of a “high risk facility” in the City’s Municipal Separate Storm Sewer System (MS4) permit.</td>
<td>10 points.</td>
<td>Provide the City with a copy of the adopted SWPPP. Verify continued implementation using the General SWPPP Application Form.</td>
</tr>
<tr>
<td><strong>Watershed Education Credit</strong></td>
<td>(available to non-governmental pre-school or elementary schools) Incorporate watershed education into pre-school or elementary school curriculum. Eligible programs include the Northern Virginia Soil and Water Conservation District EnviroScape model and other City-approved programs.</td>
<td>8 points if the program is designed to ensure that each student participates in the watershed education program at least once during a typical tenure at the school.</td>
<td>City staff must be contacted to approve the curriculum. Verify continued implementation using the General SWPPP Application Form.</td>
</tr>
</tbody>
</table>
STORM WATER DETENTION AND BMP MAINTENANCE AGREEMENT

THIS AGREEMENT made and entered into this ____day of ________________________, 20____, by and between ________________________________, hereinafter called the “Landowner(s),” or “GRANTOR(S),” and the CITY OF FALLS CHURCH, Virginia, hereinafter called the “City,” or “GRANTEE”; WITNESSETH, that

WHEREAS, the Landowner(s) is/are the owner of certain real property, more particularly described as ____________________________________________, as recorded by deed in the land records of ________________, Virginia, in Deed Book _____, Page _____, hereinafter called the “Property”; and

WHEREAS, the Landowner(s) is/are proceeding to build on and develop the Property; and

WHEREAS, Grading Plan/Site Plan # _______________________, by _____________________________, dated __________, hereinafter called the “Plan,” which is expressly made a part hereof, as approved or to be approved by the City, provides for detention of storm water and/or mitigation of polluted storm water run-off (BMP)¹ within the confines of the property; and

WHEREAS, the City and the Landowner(s) agree that the health, safety, and welfare of the residents of the City of Falls Church, Virginia, require that on-site storm water detention and/or BMP facilities, including but not limited to infiltration trenches, rain gardens, porous pavers, sand filters vortexes, and check dams, be constructed and maintained on the property; and

WHEREAS, the City requires that on-site storm water detention and/or BMP facilities, as shown on the Plan, be constructed and adequately maintained by the Landowner(s);

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site storm water detention and/or BMP facilities shall be constructed by the Landowner(s) in accordance with the plans and specification identified in the Plan or issued by the manufacturer, as applicable.

2. The Landowner(s) shall maintain the storm water detention and/or BMP facilities as shown on the Plan in good working order per manufacturer’s specification and acceptable to the City.

¹BMP—Best Management Practice; refers to structural and non-structural practices that are employed to reduce the adverse impact of development on storm water run-off quality.
3. The Landowner(s) hereby grants permission to the City, its authorized agents and employees, to enter upon the Property and to inspect the storm water detention and/or BMP facilities whenever it deems necessary. Whenever possible, the City shall notify the Landowner(s) prior to entering the Property.

4. In the event the Landowner(s) fails to maintain the storm water detention and/or BMP facilities, as shown on the Plan, in good working order per manufacturer’s specification and acceptable to the City, the City may enter upon the Property and take whatever steps it deems necessary to maintain said storm water detention and BMP facilities. This provision shall not be construed to allow the City to erect any structure of a permanent nature on the land of the Landowner(s). It is expressly understood and agreed that the City is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.

5. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any fund in performance of said work for labor, use of equipment, supplies, material, and the like, the Landowner(s) shall reimburse the City upon demand, within ten (10) days of receipt thereof for all costs incurred by the City hereunder.

6. It is the intent of this Agreement to insure the proper maintenance of on-site storm water detention and/or BMP facilities by the Landowner(s); provided, however, that this Agreement shall not be deemed to create or effect any additional liability of any party for damage alleged to result from or be caused by storm water drainage.

7. The Landowner(s), its executors, administrators, assigns, and any other successors, in interest, shall indemnify and hold harmless the City and its agents and employees for any and all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the City from the construction, presence, existence or maintenance of the storm water detention and/or BMP facilities by the Landowner (s) or the City.

8. In the event a claim is asserted against the City, its agents or employees, the City shall promptly notify the Landowner(s), and the Landowner(s) shall defend, at his/her own expense, any suit based on such claim. If any judgment or claims against the City, its agents or employees, shall be allowed, the Landowner(s) shall pay all costs and expenses in connection herewith.

9. This agreement shall be recorded among the land records of Arlington County, Virginia, and shall constitute a covenant running with the land, and shall be binding on the Landowner(s), its administrators, executors, assigns, heirs and any other successors in interest.
Maintenance Agreement cont.

WITNESS, the following signatures and seals:

GRANTOR #1:  

(Signature)  

(Seal)  

(Name of Corporation, if applicable)  

(Print name)  

(State or place of Incorporation, if applicable)  

>Title, if applicable)  

COMMONWEALTH OF VIRGINIA  

CITY OF FALLS CHURCH  

NOTARY PUBLIC:  
The foregoing instrument was acknowledged before me  Notary #___________  
this _______day of ____________________, 20______  

My Commission expires:  

[NOTARY SEAL]  

(Signature of Notary)  

(Date)  

GRANTOR #2:  

(Signature)  

(Seal)  

(Name of Corporation, if applicable)  

(Print name)  

(State or place of Incorporation, if applicable)  

>Title, if applicable)  

COMMONWEALTH OF VIRGINIA  

CITY OF FALLS CHURCH  

NOTARY PUBLIC:  
The foregoing instrument was acknowledged before me  Notary #___________  
this _______day of ____________________, 20______  

My Commission expires:  

[NOTARY SEAL]  

(Signature of Notary)  

(Date)
City of Falls Church FACILITY INSPECTION FORM (Form SW4)

Applicant Name: ___________________________ Date: ___________________________

Property Information:
   Owner: ___________________________
   Street: ___________________________
   City, State, ZIP Code: ___________________________

Stormwater Management Facility Type: __________________________________________

Impervious Area Draining to the Facility: __________________________________________

Year Built: ___________________________ City ID: ___________________________

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

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 ___________________________
Applicant Name: Date:

Email: Phone #:

Property Information:

Owner:
Street:
City, State, ZIP Code:

Mailing Address (If different from property address):

Street:
City, State, ZIP Code:

I certify that my ____________________________  (type of facility)
is in good working order and has been maintained.

_________________________________________
Printed Name Date

________________________________________
Signature

Official Use Only:

Facility ID # _____________________________ Review Date: _______________
Reviewer: _____________________________ Approval Date: _______________

Comments:
SWCDs are local, independent public agencies

Work with landowners to implement conservation practices

Offer technical assistance, workshops, environmental education

Partner and work with County government, businesses, residents, volunteers, students
Helpful Resources

Rain Garden
Design and Construction
A Northern Virginia Homeowner’s Guide

Solving Drainage and Erosion Problems
A Guide for Homeowners

Residential
Low Impact Landscaping

Northern Virginia
Soil & Water Conservation District
Northern Virginia Soil and Water Conservation District (NVSWCD)

Working for clean streams and protected natural resources in Fairfax County

Announcements

- **2014 Native Seedling Sale - Order Now.** Winterberry, persimmon and indigobush are among this year’s bee-friendly seedlings.
- **Scholarship and Youth Conservation Camp applications available for high school students.**
- **Plant Northern Virginia Natives.** New campaign and resources to help you find beautiful and hardy native plants for your home.
- **Get the Latest on the Lake Rehabilitation and Dredging Projects** at Lake Barton, Huntsman Lake, Woodglen Lake and Royal Lake.
- **Where Does Drinking Water Come From?** Learn more about how local drinking water is handled - from the Potomac and Occoquan Rivers to your faucet.
- **Rain Barrel Workshop and Volunteer Stream Monitoring** events will help you get ready for spring.
- **Additional Announcements**

Technical Information/Services

- Drainage & Erosion on Private Property
- Pond Management
- Rain Gardens & LID Practices
- Soils Information
- Stream Restoration & Stabilization
- Suburban Horse Farm Mgmt

Stewardship & Education Opportunities

NVSWCD offers many stewardship and education opportunities. We encourage you to get involved:

- Conservation in the Community
- For Students & Teachers
- Volunteer

[Images and icons related to the above sections]
Drainage and Erosion Problems Are Common in Urban and Suburban Communities
Common Solutions

Problems:

* Concentrate the flow
* No quality, quantity benefit
* Ineffective in dealing with large volumes
* Maintenance intensive
* Outfall limitations
* Can be very expensive
Compare and Contrast

Demand for aesthetic, effective way to address drainage and erosion problems on private property
Upcoming Fairfax County Incentive Program

- Pilot program to work with homeowners associations in 2014-2015
- Expand to work with homeowners
- Details forthcoming, but similar to other programs
Streamside Riparian Buffers
(Specialized Conservation Landscaping)

Lily Whitesell
Northern Virginia Soil and Water Conservation District
Where Are You In the Watershed?

At a high point, near a watershed divide?
At a low point, near the stream, pond, or lake?
Somewhere in the middle?
Drainage to Floodplain
Riparian Buffer Considerations

Is a floodplain a good place for a rain garden?

NO!

Floodplains typically have high water table and are not suitable for infiltration practices.
Standing water is usually **NOT** a good location for a rain garden.
Rain gardens often fail if the soil inside the rain garden does not have infiltration capacity.

Examples of failed rain gardens.
Alternative: Riparian Buffer Planting

- Use Conservation Landscaping Principles
- Trees, shrubs and herbaceous plants slow runoff, uptake water and nutrients, prevent erosion
- Provides water quality and habitat benefit along sensitive ecological corridors
Riparian Buffers in Agriculture

- Riparian buffer planting already encouraged in agriculture
- Targets for protecting areas along streams included in Bay program
- Minimum width 35 feet in CREP program
Riparian Buffer Considerations

Do You Have a Resource Protection Area (RPA)?

- Land disturbance and vegetative disturbance is restricted in streamside buffer areas.
- Typically 100 feet around streams, ponds, lakes, wetlands and other water bodies.
- Before removing vegetation, you will need permission.
- Chesapeake Bay Preservation Ordinance
Resource Protection Areas: Arlington County

Search Online:

- Arlington County Resource Protection Area
- Arlington County – Chesapeake Bay Preservation Ordinance
Resource Protection Areas: Fairfax County

Search Online:
* Fairfax County Digital Map Viewer
* Fairfax County – Chesapeake Bay Preservation Ordinance
Resource Protection Areas: Fairfax County
Healthy Streams

- Native, woody vegetation
- Tree canopy to cool water
- Stable vegetated banks, floodplains free of encroachment
- Clear water
- Native flora and fauna -- abundant and diverse
- Lack of pollutants

Slide by Karen Firehock
Provide a healthy habitat
Benefits

Enhance the beauty of your property
Questions?

Contact:

Lily Whitesell
Watershed Specialist
Northern Virginia Soil and Water Conservation District

703-324-1423, TTY 711
lily.whitesell@fairfaxcounty.gov

www.fairfaxcounty.gov/nvswcd
Creating a Bay-Friendly Property

Tom Schueler & Cecilia Lane
Chesapeake Stormwater Network
Thanks to Many Partners!

- Alliance for Chesapeake Bay, National Fish and Wildlife Foundation, Center for Watershed Protection, University of MD Extension, MDE, Howard County, MD, EPA CBPO staff, Watershed Stewards Academy, and a dozen watershed groups
Chesapeake Bay Stormwater Training Partnership

Visit: www.chesapeakestormwater.net

To learn how you can have access to:
Discounted Webcasts
Free One-day design workshops
Intensive master stormwater design seminars
Direct On-site technical assistance
Self guided web-based learning modules
Practices for a “Bay-Friendly” Property
Agenda

• Designing, constructing, installing and maintaining your Rain Garden
• Conservation Landscaping
• Tree Planting
• Cisterns and Rain Barrels
• Permeable Hardscapes
• Bay-Friendly Lawn Care
Rain Gardens

• Feasibility
• Design
• Construction
• Planting
• Up-Keep

Photo Credit: John Dawson
Rain Garden Basics

Rain gardens accept runoff from a roof, driveway, or parking lot that would otherwise go to the street or storm drain. The garden has a shallow depression that allows stormwater to collect and pool. Natural soils are replaced with sandier ones to allow the water to soak into the ground instead of running “off” into the storm sewer system or stream. The garden is planted with a mix of native plants that filter out pollutants and attract wildlife.
Assessing Your Property

Step 1. Map Your Lot

- Google Earth
- http://landserver.org/
- Local online resources

<table>
<thead>
<tr>
<th>LOT COVERAGE</th>
<th>Area: Square Feet</th>
<th>% of Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Surfaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roof-tops</td>
<td></td>
<td>0%</td>
</tr>
<tr>
<td>Driveway/Sidewalk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pervious Cover</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Trees/Landscaping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lawn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>43,560 square feet</td>
<td>0%</td>
</tr>
</tbody>
</table>

Note: 43,560 square feet = one acre
Let’s do an example!

Tom has a ½ acre lot in a Bay County he wants to make a difference in the Bay so he assess his property for potential stormwater management opportunities.

Tom makes some measurements of the land cover on his property and fills in the following table:

<table>
<thead>
<tr>
<th>LOT COVERAGE</th>
<th>Area: Square Feet</th>
<th>% of Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Surfaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roof-tops</td>
<td>2,650</td>
<td>28%</td>
</tr>
<tr>
<td>Driveway/Sidewalk</td>
<td>3,500</td>
<td></td>
</tr>
<tr>
<td>Pervious Cover</td>
<td></td>
<td>72%</td>
</tr>
<tr>
<td>Trees/Landscaping</td>
<td>5,500</td>
<td></td>
</tr>
<tr>
<td>Lawn</td>
<td>10,130</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>21,780</strong></td>
<td></td>
</tr>
</tbody>
</table>

1/2 acres lot = 21,780 ft²
2,650 ft² of rooftop
3,500 ft² of driveway
5,500 ft² of existing trees
10,130 ft² of lawn

Note: 43,560 square feet = one acre
Step 2. Figure Out Your Natural Plumbing

Be a Downspout Detective - Find each of your downspouts and look down slope to see where the water goes.

Downspouts discharging near driveways are usually connected to the street, and are prime candidates for locating a rain garden.
More on Your Rain Garden potential

This downspout is too far away from any pervious areas for a rain garden, but a rain barrel might work.

This downspout is plumbed directly to the street, and would be quite easy to retrofit with a rain garden.
Some of your downspouts may already be disconnected

Runoff from these downspouts travels more than 40’ over grass which usually disconnects them unless your lawn is very steep. Disconnected downspouts are often poor candidates for a rain garden.
Step 3. Figure Out Your Other Plumbing

<table>
<thead>
<tr>
<th>State</th>
<th>Resource</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>Miss Utility of Maryland*</td>
<td>811 or 1-800-257-7777**</td>
</tr>
<tr>
<td>DE</td>
<td>Miss Utility of Delmarva</td>
<td>811 or 1-800-282-8555</td>
</tr>
<tr>
<td>DC</td>
<td>District One Call</td>
<td>811 or 1-800-257-7777</td>
</tr>
<tr>
<td>PA</td>
<td>Pennsylvania One Call System, Inc.</td>
<td>811 or 1-800-242-1776</td>
</tr>
<tr>
<td>VA</td>
<td>Virginia 811</td>
<td>811 or 1-800-552-7001</td>
</tr>
<tr>
<td>WV</td>
<td>WV811</td>
<td>811 or 1-800-245-4848</td>
</tr>
</tbody>
</table>

* For the Eastern Shore of MD call Miss Utility of Delmarva
** or use website link [http://www.missutility.net/homeowners/](http://www.missutility.net/homeowners/)

Most states have “call before you dig” rules and provide a hotline to help you locate your underground utilities.
Other Things to Look at on Your Property

- Sewage Pipe Cleanout
- Basement
- Sump Pump Discharge
- Street Right of Way
Step 4. Assess Soil Quality in Your Yard

Take a soil test in the areas of your lawn where grass doesn’t grow very well.

Click here for a list of testing labs in the Bay watershed

Do a Test Dig to See if a Rain Garden Will Work

Figure out your maximum digging depth using a post hole digger. You need a depth of 18” to 24”.

Determine the break between your topsoil layer and the underlying sub soils.
Simple Soil Infiltration Test

---

**Soil Infiltration Rate**

<table>
<thead>
<tr>
<th>Example</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depth of Hole (inches)</strong></td>
<td>24 inches</td>
</tr>
<tr>
<td><strong>Start Time</strong></td>
<td>8:15 am</td>
</tr>
<tr>
<td><strong>End Time</strong></td>
<td>8:15 pm</td>
</tr>
<tr>
<td><strong># Hours to Drain</strong></td>
<td>12 hours</td>
</tr>
<tr>
<td><strong>Infiltration Rate (inches/hour)</strong></td>
<td>24 inches / 12 hours</td>
</tr>
<tr>
<td></td>
<td>= 2 inches / hour</td>
</tr>
</tbody>
</table>

*Note: If your infiltration rate is less than 0.5 inches/hour, you will need to increase the surface area of the rain garden by 50%.*
Let’s do an example!

Tom tests his soils to see what their natural infiltration rate is. He digs a hole 24” deep and fills it with water. He notes the time he started when he filled the hole and the time at which the hole is empty.

He then fills in the yellow areas in the following table:

<table>
<thead>
<tr>
<th>Depth of Hole (inches)</th>
<th>24 inches</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Time</td>
<td>8:15 am</td>
<td>8:15 am</td>
</tr>
<tr>
<td>End Time</td>
<td>8:15 pm</td>
<td>8:15 pm</td>
</tr>
<tr>
<td># Hours to Drain</td>
<td>12 hours</td>
<td>12</td>
</tr>
<tr>
<td>Infiltration Rate</td>
<td>24 inches / 12 hours = 2 inches / hour</td>
<td>2.0</td>
</tr>
</tbody>
</table>

In this example, the soil infiltration rate is 2” per hour.

*Note: If your infiltration rate is less than 0.5 inches/hour, you will need to increase the surface area of the rain garden by 50%.
Step 5. Check Your Overhead Conditions

This guide can help you quickly figure out which tree species you want and where to plant them.

Quick shade analysis to add to your property sketch.

Step 6. Pull it all Together in a Plan

Now that you have all the basic data from your property assessment, you are ready to design and install your rain garden. Grab your calculator and tape measure, and get cracking!
Rain Garden Killers

When a Rain Garden is not Feasible

- Cannot dig to a depth of at least 18”
- Infiltration test hole fills with water
- Utility conflicts cannot be avoided
Designing Your Rain Garden

Step 1: Estimate rooftop area draining to each of your most promising downspout(s). Simply, take the total rooftop area you entered in your basic data on lot cover form, and divide by the total number of downspouts at your home:

<table>
<thead>
<tr>
<th>Total Roof Area: Square Feet</th>
<th>No. of Downspouts</th>
<th>Area Draining to Rain Garden: Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: For the most accurate estimate, you can measure the actual roof area draining to each downspout.

Step 2: Determine minimum surface area for your rain garden. Assume that the ponding area of your garden will be at least 6 inches deep, and will capture the first inch of rainfall that lands on your roof. The minimum surface area for your rain garden is computed using the following equation:

<table>
<thead>
<tr>
<th>Surface Area Draining to the Rain Garden: Square Feet</th>
<th>&quot;Engineering Factor&quot; (multiply by 0.12)</th>
<th>Minimum Surface Area for Rain Garden: Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.12</td>
<td>0</td>
</tr>
</tbody>
</table>

Note that one 4 by 8 tarp would be 32 square feet.
The engineering factor computes how much surface area is needed in your rain garden to capture one inch of rainfall that falls on your roof.
Let's do an example:

**Designing Your Rain Garden**

**Step 1:** Estimate rooftop area draining to each of your most promising downspout(s). Simply, take the total rooftop area you entered in your basic data on lot cover form, and divide by the total number of downspouts at your home:

<table>
<thead>
<tr>
<th>Total Roof Area: Square Feet</th>
<th>No. of Downspouts</th>
<th>Area Draining to Rain Garden: Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,650</td>
<td>5</td>
<td>530</td>
</tr>
</tbody>
</table>

*Note: For the most accurate estimate, you can measure the actual roof area draining to each downspout.*

**Step 2:** Determine minimum surface area for your rain garden. Assume that the ponding area of your garden will be at least 6 inches deep, and will capture the first inch of rainfall that lands on your roof. The minimum surface area for your rain garden is computed using the following equation:

<table>
<thead>
<tr>
<th>Surface Area Draining to the Rain Garden: Square Feet</th>
<th>&quot;Engineering Factor&quot; (multiply by 0.12)</th>
<th>Minimum Surface Area for Rain Garden: Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>530</td>
<td>0.12</td>
<td>64</td>
</tr>
</tbody>
</table>

*Note that one 4 by 8 tarp would be 32 square feet.*

The engineering factor computes how much surface area is needed in your rain garden to capture one inch of rainfall that falls on your roof.
Designing Your Rain Garden

Step 3. Mark out the potential surface area available for your rain garden

Bottom of hill (or property boundary)

Stake out lateral boundaries, avoiding trees, hard surfaces, and areas going uphill

Construct a soil berm if you have more than 6” of drop

5’ away from the downspout (if you don’t have a basement) or 10’ (if you do)

Measure your staked out area and make sure you have a minimum of 64ft² available

Illustration Credit: University of Wisconsin – Extension and the Wisconsin Department of Natural Resources
Designing Your Rain Garden

Step 4. Figure out how much excess fill needs to be disposed of and how much sand and mulch to order

Photo Credit: Abbey Associates, Inc.
Rain Garden Calculator

Calculator to Estimate Excess Fill and Materials to Buy

Enter the following information:
- Max Digging Depth
- Ponding Depth
- Top Soil Depth
- Subsoil Depth
- # of Inlets

And the rain garden calculator will figure out the rest for you!
Tom inputs the following into the RG calculator:

- 24" Max digging depth
- 6" ponding
- 6" of best soil
- 18" of subsoil
- 64 ft² garden area

Design Example

The calculator tells Tom the following:

- He will have about 11 wheelbarrow loads of soil to get rid of
- He will need 1 cubic yard of mulch for the bed of his garden
- He will need to order 3 tons of sand for backfilling the garden and 0.4 tons of river stone for the gardens two inlets.
Tools of the Trade

Flexible connector pipe attached to downspout
Construct Your Rain Garden

Step 1. Delineate where you plan to dig.

Step 2. Dig a shallow trench at least 1’ wide and 6” deep.

Step 3. Line the trench with plastic sheeting.

Step 4. Either bury the connector pipe in the trench or create a river stone channel.
The Two Tarp Method

**Step 5.** Time for serious digging. Separate turf from topsoil and put each onto Tarp 1.

**Step 6.** Break up compacted soil. Put the lousy soils onto Tarp 2. Keep digging to the maximum possible digging depth.

**Step 7.** Loosen the subsoil at the bottom of the rain garden to improve infiltration.
Install Berm and Overflow

**Step 8.** Install a ponding berm (optional) from your lousy soil on Tarp 2.

**Step 9.** Install a surface overflow channel.

Illustration Credit: Washington State University Extension
Finishing Touches

**Step 10.** Backfill with a 50:50 mix of sand and your good Tarp 1 topsoil until you are 6” below the grade of your lawn.

**Step 11.** Spread 2” to 3” of mulch over the surface of the bed.

**Step 12.** Dispose of fill soils elsewhere on your yard to fill holes, depressions or gullies.

*Photo Credit: Anne Guillette, Low Impact Design Studio*
Planting Your Rain Garden

Types of Rain Garden Plants:

Zone 1 - tolerate sitting in water for an extended time
Zone 2 - tolerate sitting in water for a shorter time
Zone 3 - do not like sitting in water at all

Illustration Credit: Anne Guillette, Low Impact Design Studio
Rain Garden Resources

“Appendix C” of the Bay-Friendly Property Guide has a bunch of helpful resources within the Bay watershed for planting your rain garden. Resources such as:

- Native plant vendors (retail and wholesale) in the Bay watershed
- Information for finding seeds of native plants and grasses
- Plant guides: regional, state, county and national!
- Invasive/non-native plant resources
- And more!

Click here for a list of resources on rain garden plants
Planting Design Tips

Group plants together in a series as they will have more visual impact.

Vary plant heights, textures, colors, shapes, and sizes throughout the garden. Consider the bloom time of the plants.

Your design is a “composition” – like a painting or a group of objects on a shelf.
### Sample Planting Plan

#### Part Shade / Part Sun Rain Garden

![Diagram of rain garden with plant labels]

### Plant List for a Partially Shaded Rain Garden with Perennials, Shrubs and Trees

<table>
<thead>
<tr>
<th>LABEL</th>
<th>LATIN NAME</th>
<th>COMMON NAME</th>
<th>SIZE¹</th>
<th>QTY</th>
<th>PLANTING ZONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Amelanchier arborea</td>
<td>Downy Serviceberry</td>
<td>8-10’</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>Cephalanthus occidentalis</td>
<td>Buttonbush</td>
<td>5 gal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>RP</td>
<td>Rhododendron periclymenoides</td>
<td>Pinxterbloom Azalea</td>
<td>5 gal</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>AC</td>
<td>Aquilegia Canadensis</td>
<td>Columbine</td>
<td>QT</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>AN</td>
<td>Aster novae-angliae</td>
<td>New England Aster</td>
<td>QT</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>CG</td>
<td>Chelone glabra</td>
<td>White Turtlehead</td>
<td>QT</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>CP</td>
<td>Comptonia peregrina</td>
<td>Sweet Fern</td>
<td>#1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>HM</td>
<td>Hibiscus coccineus</td>
<td>Rose Mallow</td>
<td>#1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Iris versicolor</td>
<td>Blue Flag Iris</td>
<td>#1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>JE</td>
<td>Juncus effuses</td>
<td>Soft Rush</td>
<td>#1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>LC</td>
<td>Lobelia cardinalis</td>
<td>Cardinal Flower</td>
<td>QT</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>PC</td>
<td>Polygonatum commutum</td>
<td>Solomon’s Seal</td>
<td>#1</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>RF</td>
<td>Rudbeckia fulgida</td>
<td>Black Eyed Susan</td>
<td>#1</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

1° Refers to the size of the container: gallon (#1) or quart

---

**Photo Credit:** Anne Guillette, Low Impact Design Studio

**JE:** Juncus effuses (Zones 1 & 2)

**HM:** Hibiscus coccineus (Zones 1 & 2)
Other Planting Plans

Sunny Rain Garden with Perennials

CHL: Chelone ‘Hot Lips’ (Zones 1 & 2)

LM: Liatris microcephela (Zone 2)

Photo Credit: Anne Guillette, Low Impact Design Studio
Full Shade Rain Garden

IV: Iris versicolor (Zones 1 & 2)

SL: Sisyrychium ang. ‘Lucerne’ (Zones 1, 2, & 3)

Photo Credit: Anne Guillette, Low Impact Design Studio
Rain Garden Upkeep
First Growing Season

Water your rain garden if it has been more than a week since it last rained or after very hot conditions. Give it a good soaking in the early morning or late afternoon and avoid watering in the heat of the day or too late at night.

Expect to do a bit of spot weeding in the first year.
Rain Garden Upkeep
First Winter and Start of Second Growing Season

Cut back your perennials (or wait until later in the winter so the birds can eat the seeds).

In early Spring, rake the existing mulch over the bed and make sure mulch or debris is removed from the inlet and outlet.

Possibly add more plants to fill out the rain garden.

Mulch should still be good for the year, but you may have to do a bit more weeding.

Check your gutters and downspouts to make sure they are not clogged.

Check inlet and overflow for sediment deposits.

Photo Credit: Kara Crissey, Good Earth Gardeners
Rain Garden Upkeep
Start of Third Growing Season and Thereafter

The mulch layer may be getting thin and need to be replaced.

Continue normal rain garden upkeep during the spring and the rest of the growing season.

Many rain gardens become a bit bushy as the years go by. Expect to do more weeding, thinning and pruning.

Photo Credit: Kara Crissey, Good Earth Gardeners
Troubleshooting

Too bushy or overgrown

Trim and prune the trees and shrubs or learn to love it as a privacy barrier and source of habitat.

Wetter conditions than anticipated so plants don't grow

Re-plant with more wet-footed plants like ferns, sedges and rushes (Zone 1 plants). If surface ponding persists for more than a day, you should construct a surface overflow so the rain garden can drain faster.
More Troubleshooting

Standing water or really soggy soils present several days after a storm

Install a perforated underdrain if soils are saturated all the way to the bottom.

Plants die: drier conditions than anticipated

First, check rain gutters and downspout to make sure water is getting to the rain garden. Re-plant with more drought tolerant plant species.

Photo Credit: Abbey Associates, Inc.
Troubleshooting

**Over-mulching**

Remove excess mulch so that the rain garden has a mulch layer no deeper than 2 inches. Spread excess mulch elsewhere on your yard.

**Mulch shifts or floats away after a big storm**

Simply rake the mulch back to the original depth of two inches. Place more river-stone near the inlet to reduce flow velocity into the rain garden.
Troubleshooting

**Sediment caking or erosion**

Rake or shovel out the surface sediment layer and dispose of in a planting bed. Back-fill any gullies with top-soil, re-mulch and provide some stone protection near the downspout to reduce flows.

**Deer and wildlife eating your plants**

Buy deer repellent or install guard flamingos.
Troubleshooting

Overflow channel is plugged or obstructed

Clean out the sediment, debris and mulch that are blocking the overflow channel.
Questions and Answers

Photo Credit: Jacob Bauckman, Alliance for the Chesapeake Bay
Tree Planting

Planting native trees and shrubs to restore a portion of your property to forested conditions is good for your property values, good for native wildlife, good for your local watershed, and good for the Bay.
Where Should I Plant My Trees?

- Choose an area with adequate space for future growth
- Consider the soil conditions – wet/dry, pH, and texture
- Choose native plant material when possible
- Select tree size
- Determine sun and wind conditions
- Avoid underground utilities
How Do I Plant My Trees?

Step 1: Mark where trees will be planted

Step 2: Planting:

- For larger trees, dig a hole several inches wider than root ball
- Backfill with native soil
- Apply 2-3 inches of mulch, but keep away from trunk
- Do not stomp on soil to pack it down
- Use stakes and wire for support, if necessary
- Use tree shelters or fencing to protect young trees
- Water generously
How Do I Care For My Trees?

- Deep water regularly, 1 – 2 x per week, throughout the first growing season (May to October)

- Keep lawnmowers and string trimmers away from tree

- Do not plant flowers or cultivate soil under tree

- Remove stakes and strapping after one year
How Do I Care For My Trees?

- Start annual tree inspection program
- Replace mulch as needed
- Prune trees in late winter, beginning in the 2nd growing season
- Continue watering in times of drought for 5 years after planting

Prune dead or injured branches immediately. The image above demonstrates the proper way to prune a heavy branch.
Rainwater Harvesting
(Rain Barrels, Cisterns, Tanks)

A rain barrel/cistern is a water-holding device used to collect runoff from roof downspout(s) for a specific water use such as irrigation or vehicle washing.
Rainwater Harvesting

• **Active Reuse:** The reuse of harvested rainwater for either non-potable or potable uses.

• **Passive Reuse:** Water plants in the landscape utilizing natural slope and/or gravity. Typically designed to release rainwater slowly into a landscape bed or the landscape via a soaker hose.
Sizing Your Rainwater Harvesting Device

Size according to the area of your roof: One downspout on a typical 1,000 sf house will yield approximately 75 gallons of rainfall in a ½ inch rain.

If your community has a stormwater utility fee, check to see if you are required to collect a certain amount of roof runoff to get credit for your rain barrel.

A 55-gallon rain barrel fills up fast! However you can “daisy chain” barrels together or purchase a larger rain barrel or cistern.
Placing Your Rainwater Harvesting Device

- Above ground rain barrels/cisterns are placed at the base of the downspout, around the corner, or under a deck.

- Tanks or cisterns should not be installed over utilities, easements, or other infrastructure.

- Device must be 12-18 inches above ground if utilizing gravity to drain.

- Below ground cisterns/tanks are buried below the ground.

- You will typically want to hire a rainwater harvesting professional if you are burying a cistern or tank.
Installing Your Above-Ground Rainwater Harvesting Device

1. Shorten the downspout and direct into opening of barrel with an elbow piece
2. Ensure that the device is level and stabilize the base
3. Make sure the screen or other filter is in place
4. Secure the downspout to the device
5. Attach overflow pipe and spigot

**Materials:**
- Extra gutter
- Wire mesh screen
- Lid for safety
- Overflow hose
- Metal saw
- Screws
- Level
Caring for Your Above-Ground Rainwater Harvesting Device

- Empty your device during the winter
- Keep the faucet open during times of year you don’t use rainwater
- Raise the height of the barrel so there is sufficient water pressure
- Always have the overflow going to a safe place
- Use a screen to prevent organic debris from going in the barrel
- Put a brick or rock in the bottom of the barrel to prevent it from blowing around
- Make sure your device is level and stable before it gets full and heavy
Permeable Hard-Scapes

Permeable hard-scapes are paving surfaces that capture and temporarily store stormwater by filtering runoff through holes in the pavement surface into an underlying stone reservoir. They include pervious concrete, porous asphalt, concrete grid pavers, permeable interlocking concrete pavers, and others.
Time to Replace Your Driveway?

Try permeable pavement!

Source: http://www.uni.edu/elukens/images/driveway1.jpg
Where Should I Put My Permeable Hard-Scape?

DO install where:

• Area is flat
• Drainage area onto the hard-scape is less than 2x the area of the hard-scape
• Soil has good natural infiltration (if not, use an underdrain)
Where Should I Put My Permeable Hard-Scape?

DO NOT install where:

- Slopes are greater than 5%
- Drainage area onto the hard-scape is more than 2x the area of the hard-scape
- Water table is high (must be deeper than 2 ft. below permeable hard-scape)
- Area is in 100-year floodplain
- There are many underground utilities (unless approved by utility agencies)
- There are adjacent buildings with basements and foundations
Installing Your Permeable Hard-Scape

It is strongly recommended that homeowners work with a trained and certified contractor!

Step 1: Check for existing utilities and stabilize the site
Step 2: Temporary erosion and sediment controls are needed
Installing Your Permeable Hard-Scape

**Step 3:** Avoid compaction of the bottom surface

**Step 4:** Scarify or till the native soil at the bottom to a depth of 3 to 4 inches

**Step 5:** Place filter fabric only as required by the design

**Step 6:** Moisten and spread the appropriate clean, washed stone aggregate

*Source: Chris Sonne, Civil & Environmental Services LLC*
Installing Your Permeable Hard-Scape

**Step 7:** Install paving materials in accordance with manufacturer or industry specifications

**Step 8:** Inspect the area for settlement

**Step 9:** Top the paver joints with stones (if applicable)

Above, a professional crew installs permeable concrete in a small parking lot in Crozet, VA.

*Source: Chris Sonne, Civil & Environmental Services LLC*
Caring for Your Permeable Hard-Scape

Avoid the following tasks on ALL permeable hard-scapes:

- Sanding
- Re-sealing
- Re-surfacing
- Power washing
- Storage of snow piles containing sand
- Storage of mulch or soil materials

Maintenance Frequency of Permeable Hard-scapes Based on Type of Application and Maintenance Method

<table>
<thead>
<tr>
<th>Maintenance Task</th>
<th>Type of Application</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Sweeping</td>
<td>Patio</td>
<td>Seasonally (4 X per year)</td>
</tr>
<tr>
<td>Dry Sweeping</td>
<td>Driveway</td>
<td>Monthly</td>
</tr>
<tr>
<td>Vacuum</td>
<td>Patio</td>
<td>Every 2 years</td>
</tr>
<tr>
<td>Vacuum</td>
<td>Driveway</td>
<td>Once per year</td>
</tr>
</tbody>
</table>

*This table is intended as guidance only: the frequency should be adjusted based on conditions and the surrounding land cover (e.g. pavement, turf, trees) and level of detritus and sediment on the pavement surface.*
Lawns make up a significant portion of many properties and have been shown to produce more runoff than their forested counterparts. Following are 10 tips that can make your lawn more Bay-friendly.

Click here for a report on Bay-friendly nutrient management
Do you have a high risk lawn?

Some urban lawns are more likely to export nutrients.


1. Over-fertilizing beyond state or extension recommendations
2. P-saturated soils as determined by a soil analysis
3. Newly established turf
4. Steep slopes (> 15%)
5. Exposed soil (more than 5 % for managed turf and 15% for unmanaged turf)
6. High water table (within three feet of surface )
7. Over-irrigated lawns
8. Soils that are shallow, compacted or low water holding capacity
9. High use areas (e.g., athletic fields, golf courses)
10. Sandy soils (infiltration rate more than 2 inches per hour)
11. Adjacent to stream, river or Bay (within 300 feet)
12. Karst terrain
Tip 1. Maintain Dense Grass Cover

Dense grass or plant cover helps to reduce surface runoff. Lawns with poor turf cover have a high risk for nutrient loss, especially if soils are compacted or slopes are steep.

Re-seed bare spots, add soil amendments, and spot fertilize as needed. In extreme cases, stabilize with a biodegradable erosion control cover.
Tip 2. Reduce or **Eliminate** Fertilizer

**If You Do Fertilize:**

- Apply 1/3 to 1/2 of application rate on the fertilizer bag label. Monitor how your lawn responds over next couple of months. You can always re-apply fertilizer at the smaller dose. **OR...**

- Split it into 3 or 4 small doses throughout the growing season. Apply no more than 0.9 pound of nitrogen per 1000 sq. ft. of lawn *per application*!

**More is not always better:** your lawn may look just as healthy as it does at the full application rate!
Tip 3.
Apply Fertilizer Only During Growing Season

**Never** apply fertilizers before spring green up or after the grass becomes dormant.

Highest fertilizer loss occurs in winter when grass is dormant (after ~ November).
Tip 4. Use Slow-Release Nitrogen Fertilizer

Buy slow-release fertilizer with at least 20 to 50% of water insoluble nitrogen.

Tip 5. Sweep Up Fertilizer from Paved Surfaces

Rotary spreaders can broadcast fertilizer granules onto the street or driveway where they can be washed away in the next storm.

Tip 6. Never Apply Fertilizer Within 15 Feet of Streams, Ditches or Water Feature
Tip 7. Leave clippings and mulched leaves on lawn. Keep them out of streets and storm drains.

Strive to keep grass and leaves on your lawn, and out of the street or storm drain system. And never dispose of yard waste in a ravine or near a stream.

If you rake leaves in Fall, run over them with your mower to mulch them, then add them to your compost pile to decompose.
Tip 8.
Set Mower Height at 3” or Taller

Taller grass grows deeper roots, which allows for better nutrient uptake and less lawn runoff. Deeper roots also reduce need for irrigation during times of drought, suppress weeds, and increase turf density.
Tip 9.
Use Your Lawn to Absorb Stormwater.

If you can, use a flexible pipe to direct your roof downspouts toward your lawn away from your driveway or other hard surface.

Convert your turf into a rain garden on conservation landscape to absorb water from your roof.

Photo Credit: Kara Crissey, Good Earth Gardeners
Tip 10. Consult With Your Local Extension Service Office

Many lawn care professionals can help you achieve an attractive and Bay-friendly lawn, given your type of grass, soil conditions, shading, and your landscape preferences.

Click here for a list of Bay-Friendly Lawn Care Experts
Conservation Landscapes

**Conservation Landscaping** (i.e., *Bayscaping*): Replacing turf grass with plants native to the Chesapeake Bay region. This can increase rainwater infiltration on your property and provide habitat for pollinators, birds, and other wildlife.

*Photo Credit: Anne Guillette, Low Impact Design Studio*

*Photo Credit: Kara Crissey, Good Earth Gardeners*
Where Should I Put Conservation Landscaping?

Conservation landscapes are especially good for:

- “Fertilizer-free” buffers around water features or shorelines
- Areas that capture runoff from small areas of hard surfaces (e.g., sidewalks)
- Areas next to roof downspouts

*Native plant* species are preferred, but ornamental or garden plants are acceptable.

*Photo Credit: WSA*
Other Factors to Consider

Some Key Planning Factors

- Conflicts with other uses of your property
- Solar exposure
- Windy areas
- View-sheds on your property
- Wildlife that visit your property
- Infrastructure (light poles, pipes, etc.)
- Right-of-way access
- Accessible water source
- Existing trees (stay out of the “drip line”)

Photo Credit: Suzanne Etgen, WSA
How Do I Install My Conservation Landscaping?

Choose whether you want to handle the design or hire a professional landscape engineer or landscape architect.

If you hire a designer or contractor, make sure they utilize eco-practices.

If you do the design yourself, start with the base map of your property and consider which plants will do well in different conditions of sunlight, soil, moisture, etc.
How Do I Install My Conservation Landscaping?

Visit your local nursery to see what vegetation is available. In addition to trees and shrubs, consider perennials to provide ground cover (ferns, forbs, grasses, etc.).

Consider planting a mix of:

- **Perennials:** a plant that comes back every year
- **Annuals:** a plant that lives only one year and so will have to be replanted every year
- **Deciduous Trees:** a shrub or tree that loses its leaves
- **Evergreen Trees:** a tree or shrub that holds its leaves all year

Avoid “invasive plants” that can spread and crowd out your native vegetation!

Click here for a guide on how to identify and remove these invasive spreaders.
Caring for Your Conservation Landscape

**Watering:** Water plants regularly in the first 2 – 3 months, then in times of drought.

**Weeding:** Several times throughout the year especially spring. Once your plants fill in the beds, fewer weeds will grow.

**No Pesticides:** Use only natural pest control methods (praying mantis, lady bugs, bat houses, organic chemicals).
Caring for Your Conservation Landscape

**Mulch:** Use *aged* leaf compost, straw, and/or wood mulch. Apply 3” or less to retain moisture and prevent weeds and erosion. Mulch around trees should be flush with the landscape and not piled high in “volcanoes”.

**Fall Maintenance:** Add leaf mulch around plants as fertilizer and ground cover.
Q & A
Resources

• Homeowner Guide for a More Bay-Friendly Property
• Crediting Homeowner BMPs in the Bay Model
• Verification Resources:
  – Bioretention Illustrated App
  – SMART Tool Website
• UMD Extension Bulletin: Adoption of Household Stormwater BMPs
• And lots’ more!

www.chesapeakestormwater.net
Landscape Workshop
“Bringing it all Together”
Site Design and Planning

---------
Aimee Long Vosper
Director, Planning and Environmental Services
Northern Virginia Regional Commission
---------
July 16, 2014
What have you heard?

- Why local governments are investing in residential landscapes
- You are essential to help meet the goals of local government
- Understanding the initiatives, the incentives, the possibilities to include BMP’s
- Understanding the importance of native plants and conservation landscapes
Next Steps- Bringing it all together

- In the next hour:
  - Refresh our memories on the Principles of Landscape Design and Site Analysis & Planning
  - Look at Site Design in an overall context
  - Break out into groups to develop a design
  - Come back together to review the Concepts
  - Discuss next steps and the October workshop /demonstration project
The Principles of Landscape Design

Landscape Architecture

- Designing in whole, not in part
- Unity
- Simplicity
- Balance
- Color
- Natural Transition
- Line
- Proportion
- Sequence / Repetition

The Elements of Art in a work of Art

- Balance
- Emphasis
- Movement
- Pattern
- Repetition
- Proportion
- Rhythm
- Variety
- Unity
The Principles of Ecological Design

- Solutions Grow from Place
- Ecological Accounting Informs Design
- Design with Nature, not against
- Make Nature Visible
Understanding the Site

Areas of Elements

- Soil
- Microclimates
- Drainage
- Topographical features
- Existing Plant Material /Vegetation
- Existing Historical elements
- Hard features and Structures
- Walks, Paths, & Trails
- Wildlife/Ecology

- Environmental features/factors- Sun Wind Water Sources
- Precipitation/rainfall
- Hydrology/water table elevations
- Prominent Visual lines/Viewsheds & Visual Linkages
- Locally Available Resources
- Regulations
- Aesthetics
Understanding the Site

Review and Catalogue

- Site Analysis of complete area
  - Inventory the Site
  - Analyze the Site
Scale

- **Plant Selection**
  - Right plant, right place, right purpose
  - Sustainability
  - Select based on Elements of Design
  - Size, Form, Texture
  - Seasonal Interest
The Conceptal Design

- Evolves from shapes & movement developed in the site analysis
- Form follows function
Examples
Rain Gardens in Playgrounds
Determine the suite of practices that can be used on the site to make it stormwater friendly i.e. rain garden, riparian buffer planting, permeable pavement

Educational outreach? Signage?

Determine the location(s) and rough designs for the practices

How will you bring runoff to the site?

How much credit will you get in Falls Church?

How much TN and TP will be prevented from entering Tripps Run?
Time to Design!

avosper@novaregion.org
703-642-4623

www.novaregion.org
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent
   ○ Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   ○ Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   ○ Site Design and Planning Exercise

4. Please describe how today's seminar could be improved.
   More sales [circled]. Why would you have anyone want to spend the money for improvements?

5. What other environmental-related topics would you like workshops for?
   __________________________________________________________
   __________________________________________________________

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes ○ No N/A

7. Do you plan to make your clients aware of the local government incentive programs? Yes○ No

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop? Yes ○ No
   If not, why?
   __________________________________________________________
   __________________________________________________________

9. Other Comments?
   __________________________________________________________
   __________________________________________________________

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today's seminar could be improved.
   [Don't use appreciation]

5. What other environmental-related topics would you like workshops for?
   ____________________________________________________________

6. Do you have clients that are interested in installing a stormwater best management practice on their property? (Yes) (No) (N/A)

7. Do you plan to make your clients aware of the local government incentive programs? (Yes) (No)

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop? (Yes) (No)
   If not, why? ___________________________________________________

9. Other Comments?
   [Thank you]

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form on the registration table as you leave.
Thank you!
# Evaluation Form

## Residential BMP Training For The Landscape Professional

**Part 1**

1. How would you rate today’s seminar? *Circle your response.*
   - a. Excellent
   - b. Good
   - c. Fair
   - d. Poor

2. Which session(s) was most informative and useful? *Circle your answer.*
   - a. Overview of local government incentive programs
   - c. Selecting Plants and Landscape Design
   - d. Site Design and Planning Exercise

3. Which session was least informative and useful? *Circle your answer.*
   - a. Overview of local government incentive programs
   - c. Selecting Plants and Landscape Design
   - d. Site Design and Planning Exercise

4. Please describe how today’s seminar could be improved.
   - (Assume that the group has a greater level of knowledge and experience and teach to that level.)

5. What other environmental-related topics would you like workshops for?
   - 

6. Do you have clients that are interested in installing a stormwater best management practice on their property?  
   - Yes
   - No
   - N/A

7. Do you plan to make your clients aware of the local government incentive programs?  
   - Yes
   - No

8. Will you design and/or build a residential stormwater best management practice after attending today’s workshop?  
   - Yes
   - No
   - If not, why?

9. Other Comments?
   - 

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*Feel free to continue on the back of this page.*

---

*Your comments are important to us.*

*Please leave the evaluation form, on the registration table as you leave.*

*Thank you!*
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today's seminar could be improved.
   Reference for specification for each type of stormwater project

5. What other environmental-related topics would you like workshops for?

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes No N/A

7. Do you plan to make your clients aware of the local government incentive programs? Yes No

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop? Yes No
   If not, why?

9. Other Comments?

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential BMP Training For The Landscape Professional
Part 1

1. How would you rate today’s seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today’s seminar could be improved.
   For the design exercise, split up engineers and designers so the groups are well balanced.

5. What other environmental-related topics would you like workshops for?

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes No N/A

7. Do you plan to make your clients aware of the local government incentive programs? Yes No

8. Will you design and/or build a residential stormwater best management practice after attending today’s workshop? Yes No
   If not, why?

9. Other Comments?

   Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form on the registration table as you leave.
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? *Circle your response.*
   a. Excellent  
   b. Good  
   c. Fair  
   d. Poor

2. Which session(s) was most informative and useful? *Circle your answer.*
   a. Overview of local government incentive programs  
   c. Selecting Plants and Landscape Design  
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? *Circle your answer.*
   a. Overview of local government incentive programs  
   c. Selecting Plants and Landscape Design  
   d. Site Design and Planning Exercise

4. Please describe how today's seminar could be improved.  
   Stay on schedule

5. What other environmental-related topics would you like workshops for?  
   Calculating stormwater BMPs

6. Do you have clients that are interested in installing a stormwater best management practice on their property?  
   Yes  No  N/A

7. Do you plan to make your clients aware of the local government incentive programs?  
   Yes  No

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop?  
   Yes  No  If not, why?

9. Other Comments?  
   Love the Site Design/Planning Exercise component!

*Feel free to continue on the back of this page

Your comments are important to us.  
Please leave the evaluation form on the registration table as you leave.  
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent  
   b. Good  
   c. Fair  
   d. Poor  
   [Circle] Excellent  

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs  
   c. Selecting Plants and Landscape Design  
   d. Site Design and Planning Exercise  

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs  
   c. Selecting Plants and Landscape Design  
   d. Site Design and Planning Exercise  
   [Circle] Site Design and Planning Exercise  

4. Please describe how today's seminar could be improved.  
   ________________________________  
   [Handwritten] pretty good  

5. What other environmental-related topics would you like workshops for?  
   ________________________________  
   [Handwritten] INSPECTION + MAINTENANCE  

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes  No  N/A  
   [Circle] No  

7. Do you plan to make your clients aware of the local government incentive programs? Yes  No  
   [Circle] Yes  

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop?  Yes  No  
   [Circle] No  
   [Handwritten] If not, why?  

9. Other Comments?  
   ________________________________  
   [Handwritten] chairs in the van still need replaced  

Feel free to continue on the back of this page  

Your comments are important to us. Please leave the evaluation form on the registration table as you leave. Thank you!
Evaluation Form

Residential BMP Training For The Landscape Professional
Part 1

1. How would you rate today’s seminar? Circle your response.
   a. Excellent  
   b. Good  
   c. Fair  
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today’s seminar could be improved.
   More specific details for professionals

5. What other environmental-related topics would you like workshops for?
   _____________________________________________________________

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes  No  N/A

7. Do you plan to make your clients aware of the local government incentive programs? Yes  No

8. Will you design and/or build a residential stormwater best management practice after attending today’s workshop? Yes  No  
   If not, why? ________________________________________________

9. Other Comments?
   ____________________________________________________________

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today’s seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today’s seminar could be improved.

5. What other environmental-related topics would you like workshops for?

6. Do you have clients that are interested in installing a stormwater best management practice on
   their property? Yes ☐ No ☐ N/A ☐

7. Do you plan to make your clients aware of the local government incentive programs? Yes ☐ No ☐
   N/A ☐

8. Will you design and/or build a residential stormwater best management practice after attending
   today’s workshop? Yes ☐ No ☐
   If not, why?

9. Other Comments?

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today’s seminar? Circle your response.
   a. Excellent  
   b. Good  
   c. Fair  
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today’s seminar could be improved.
   Just wish we were able to complete exercise, time permitting.

5. What other environmental-related topics would you like workshops for?

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes No N/A

7. Do you plan to make your clients aware of the local government incentive programs? Yes No

8. Will you design and/or build a residential stormwater best management practice after attending today’s workshop? Yes No
   If not, why? We don’t have technical experience

9. Other Comments?
   (additional comments)

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form on the registration table as you leave.
Thank you!

Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today's seminar could be improved.
   Better coordination to prevent repetition of information

5. What other environmental-related topics would you like workshops for?

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes  No  N/A

7. Do you plan to make your clients aware of the local government incentive programs? Yes  No

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop? Yes  No
   If not, why?

9. Other Comments?

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form
Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today’s seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today’s seminar could be improved.
   This could be improved by relating new stormwater management
   program and M44 requirements.

5. What other environmental-related topics would you like workshops for?
   Nutrient credit calculation
   Stormwater runoff reduction method

6. Do you have clients that are interested in installing a stormwater best management practice on
   their property? Yes No

7. Do you plan to make your clients aware of the local government incentive programs? Yes No

8. Will you design and/or build a residential stormwater best management practice after attending
   today’s workshop? Yes No
   If not, why? Not enough knowledge and fund

9. Other Comments

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today’s seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today’s seminar could be improved.
   More space for the site design & exercise

5. What other environmental-related topics would you like workshops for?
   Stormwater management

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes  No  N/A

7. Do you plan to make your clients aware of the local government incentive programs? Yes  No

8. Will you design and/or build a residential stormwater best management practice after attending today’s workshop? Yes  No
   If not, why? Maybe

9. Other Comments?

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today's seminar could be improved.
   
   (Write comment)

5. What other environmental-related topics would you like workshops for?
   
   (Write comment)

6. Do you have clients that are interested in installing a stormwater best management practice on their property?  Yes  No  N/A

7. Do you plan to make your clients aware of the local government incentive programs?  Yes  No

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop?  Yes  No
   If not, why?
   
   (Write comment)

9. Other Comments?
   
   (Write comment)

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today's seminar could be improved.
   

5. What other environmental-related topics would you like workshops for?
   

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Circle: Yes, No, N/A

7. Do you plan to make your clients aware of the local government incentive programs? Circle: Yes, No

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop? Circle: Yes, No
   If not, why?
   

9. Other Comments?
   

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential BMP Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent
   x Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   x b. Residential Best Management Practices for Stormwater
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   x c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today's seminar could be improved.
   [Student's response]

5. What other environmental-related topics would you like workshops for?
   [Student's response]

6. Do you have clients that are interested in installing a stormwater best management practice on
   their property?  Yes  No
   [Student's response]

7. Do you plan to make your clients aware of the local government incentive programs?  Yes  No
   [Student's response]

8. Will you design and/or build a residential stormwater best management practice after attending
   today's workshop?  Yes  No
   If not, why?
   [Student's response]

9. Other Comments?
   [Student's response]

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential BMP Training For The Landscape Professional
Part 1

1. How would you rate today's seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor
   [Circle: b. Good]

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer. All were informative

4. Please describe how today's seminar could be improved:

5. What other environmental-related topics would you like workshops for?
   Restoration

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes No N/A
   [Circle: Yes]

7. Do you plan to make your clients aware of the local government incentive programs? Yes No
   [Circle: Yes]

8. Will you design and/or build a residential stormwater best management practice after attending today's workshop? Yes No
   If not, why?

9. Other Comments? Thank you.

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Evaluation Form

Residential Bmp Training For The Landscape Professional
Part 1

1. How would you rate today’s seminar? Circle your response.
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Which session(s) was most informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

3. Which session was least informative and useful? Circle your answer.
   a. Overview of local government incentive programs
   c. Selecting Plants and Landscape Design
   d. Site Design and Planning Exercise

4. Please describe how today’s seminar could be improved.
   Add more engineering principles and methods of designing
   to be focused on aesthetics

5. What other environmental-related topics would you like workshops for?
   Stormwater management; erosion control

6. Do you have clients that are interested in installing a stormwater best management practice on their property? Yes  No (N/A)

7. Do you plan to make your clients aware of the local government incentive programs? Yes  No

8. Will you design and/or build a residential stormwater best management practice after attending today’s workshop? Yes  No
   If not, why? ________________

9. Other Comments?
   ________________
   ________________
   ________________
   ________________

Feel free to continue on the back of this page

Your comments are important to us.
Please leave the evaluation form, on the registration table as you leave.
Thank you!
Appendix C

306A Documentation
July 25, 2014

RE: Joint Stormwater Project with Northern Virginia Regional Commission

I solemnly affirm upon personal knowledge that the following statements are true:

I Jason Widstrom being first and duly sworn state that:

1. I am a civil engineer employed by the City of Falls Church, Virginia and in that capacity perform research and survey of properties that are publicly owned for the purposes of construction projects.

2. The land identified for the proposed project under this CZM grant is a combination of City right-of-way, titled “Cavalier Trail,” and a parcel, with Real Property Code (RPC) 52-309-032, are owned by the City of Falls Church, Virginia and there are no encumbrances on said properties that will interfere with the proposed section 306A project.

Signed

[Signature]

Jason Widstrom, P.E.
City Engineer

Subscribed and affirmed before me this 26 day

Notary Public

[Signature]

My Commission expires:

[Stamp]

Harry F. Wells Building • 300 Park Avenue • Falls Church, Virginia 22046 • 703-248-5001 • www.fallschurchva.gov
PROJECT INFORMATION

TITLE: Proposed Rain Garden

DESCRIPTION: Design and install a rain garden to intercept stormwater runoff and help to prevent polluted runoff from entering Tripps Run. The rain garden will be excavated to a depth of approximately 24 inches and subsoil will be replaced with a mixture of sand and loam. The garden will be regraded and replanted with a diverse mix of native shrubs, perennials, and grasses to allow for runoff to pool in the depression and slowly infiltrate into the ground. A sign will be installed for public education and communication. The site is owned by City of Falls Church and the City will maintain the garden in accordance with their standards.

EXISTING SITE CONDITIONS: The site is currently mulch and grass

QUADRANGLES: Falls Church
COUNTIES: City of Falls Church
Latitude/Longitude (DMS): 38°52'46.1022"N / 77°10'45.9135"W
Acreage: 0 acres
Comments:

REQUESTOR INFORMATION

Priority: N          Tier Level: Tier II          Tax ID:

Contact Name: Corey Miles
Company Name: Northern Virginia Regional Commission
Address: 3060 Williams Drive
<table>
<thead>
<tr>
<th>Conservation Site</th>
<th>Site Type</th>
<th>Brank</th>
<th>Acreage</th>
<th>Listed Species Presence</th>
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<tbody>
<tr>
<td>GLNHR</td>
<td>NA</td>
<td>0</td>
<td>NL</td>
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</tbody>
</table>

Natural Heritage Screening Features within Search Radius

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Group Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>GRANK</th>
<th>SRANK</th>
<th>Fed Status</th>
<th>State Status</th>
<th>EO Rank</th>
<th>Last Obs Date</th>
<th>Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vascular Plant</td>
<td>American bluehearts</td>
<td>Buchnera americana</td>
<td>G5?</td>
<td>S1S2</td>
<td>H</td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td></td>
</tr>
</tbody>
</table>

Natural Heritage Resources within Search Radius

Intersecting Predictive Models

Predictive Model Results
The project mapped as part of this report has been searched against the Department of Conservation and Recreation’s Biotics Data System for occurrences of natural heritage resources from the area indicated for this project. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in Biotics files, NATURAL HERITAGE RESOURCES HAVE BEEN DOCUMENTED within two miles of the indicated project boundaries and/or POTENTIAL HABITAT FOR NATURAL HERITAGE RESOURCES intersect the project area.

You have submitted this project to DCR for a more detailed review for potential impacts to natural heritage resources. DCR will review the submitted project to identify the specific natural heritage resources in the vicinity of the proposed project. Using the expertise of our biologists, DCR will evaluate whether your specific project is likely to impact these resources, and if so how. DCR’s response will indicate whether any negative impacts are likely and, if so, make recommendations to avoid, minimize and/or mitigate these impacts. If the potential negative impacts are to species that are state- or federally-listed as threatened or endangered, DCR will also recommend coordination with the appropriate regulatory agencies: the Virginia Department of Game and Inland Fisheries for state-listed animals, the Virginia Department of Agriculture and Consumer Services for state-listed plants and insects, and the United States Fish and Wildlife Service for federally listed plants and animals. If your project is expected to have positive impacts we will report those to you with recommendations for enhancing these benefits.

**There will be a charge for this service for "for profit companies":** $60, plus an additional charge of $35 for 1-5 occurrences and $60 for 6 or more occurrences.

Please allow up to 30 days for a response, unless you requested a priority response (in 5 business days) at an additional surcharge of $500. An invoice will be provided with your response.

We will review the project based on the information you included in the Project Info submittal form, which is included in this report. Also any additional information including photographs, survey documents, etc. attached during the project submittal process and/or sent via email referencing the project title (from the first page of this report).

Thank you for submitting your project for review to the Virginia Natural Heritage Program through the NH Data Explorer. Should you have any questions or concerns about DCR, the Data Explorer, or this report, please contact the Natural Heritage Project Review Unit at 804-371-2708.
Section 306A Project Checklist

State Coastal Management Programs (CMPs) shall complete a Section 306A Project Checklist for each Coastal Zone Management Act (CZMA) section 306A project and submit it to the Coastal Programs Division (CPD), Office of Ocean and Coastal Resource Management (OCRM), National Oceanic and Atmospheric Administration (NOAA) for approval. Approval of a 306A project requires a completed checklist, signed by the CMP Program Manager and CPD Chief; title documentation and appraisal (if applicable); and other information that may be required by this checklist. These are the only documents required for CPD approval, unless otherwise notified by CPD. See CPD, Coastal Zone Management Act Section 306A Guidance (February 1999) for further information.

1. Award Number: NA13NOS4190135          State: VA

2. A. Name of Project: Site Selection and Design of a Conservation Landscaping Workshop

   B. Address or coordinates for project or, if not available, location description:

   38°52'45.74"N  77°10'45.86"W

3. Project Proponent (must be a public entity):

   Northern Virginia Regional Commission

4. Total Cost: $22,031          Federal: $12,177          State/Local Match: $9,854

I ATTEST TO THE FOLLOWING: (1) THE STATEMENTS MADE AND OTHER INFORMATION PROVIDED IN THIS CHECKLIST ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE; (2) THE PROJECT DESCRIBED IN THIS CHECKLIST IS CONSISTENT WITH CZMA SECTION 306A AND CPD'S SECTION 306A GUIDANCE; (3) THE STATE HAS ON FILE THE DOCUMENTS IDENTIFIED IN THIS CHECKLIST; AND (4) I UNDERSTAND THE CONSEQUENCES, AS DESCRIBED IN CPD'S SECTION 306A GUIDANCE, IF THE PROJECT DESCRIBED IN THIS CHECKLIST DOES NOT COMPLY WITH CZMA SECTION 306A AND CPD'S SECTION 306A GUIDANCE.

Signature of State Coastal Management Program Manager

Name of Signatory (please print or type):

Title:

Address:

Phone Number:

The signature below by the Chief, Coastal Programs Division, OCRM/NOAA, is NOAA’s approval that the applicable special award condition is satisfied and releases the federal CZMA section 306A funds for the project described in this Checklist.

Joelle Gore
Acting Chief, CPD
5. Project Eligibility:

a. 306A Objectives (Check all that apply):

   ✓ 306A(b)(1)(A) (preservation or restoration of areas designated in the state CMP)
     Identify APC or APR: __________________________

   ☑ 306A(b)(1)(B) (preservation or restoration of coastal resource of national significance or restoring or enhancing shellfish production/clutch)
     Identify coastal resource: ________________________

   ☑ 306A(b)(2) (redevelopment of deteriorating or underused urban waterfronts designated as APCs in the state’s CMP)
     Identify APC or APR: __________________________

   ☑ 306A(b)(3) (providing public access to coastal areas)

   ☑ 306A(b)(4) (development of process for aquaculture)

b. 306A Uses (Check all that apply):

   ☑ 306A(c)(2)(A) (fee simple or other interest in land)

   ✓ 306A(c)(2)(B) (low-cost construction projects)

   ☑ 306A(c)(2)(C)(i) (revitalize urban waterfronts-piers)

   ☑ 306A(c)(2)(C)(ii) (revitalize urban waterfront-shoreline stabilization)

   ☑ 306A(c)(2)(C)(iii) (revitalize urban waterfront-pilings)

   ☑ 306A(c)(2)(D) (designs and other 306A reports, including aquaculture process)

   ☑ 306A(c)(2)(E) (educational, and other management costs, including aquaculture process)

6. Project Description (briefly describe the project and project location—do not simply reference the task description from the CZM grant application):

An issue that was identified during the Collaborative Summit to Protect Water Quality through Actions on Urban-Suburban Properties held in Williamsburg in February 2013, was the lack of landscape industry professionals that were knowledgeable about native plants and qualified to implement landscaping plans that incorporate Best Management Practices on residential properties. To help fulfill the need for qualified, trained landscape professionals, the Northern Virginia Regional Commission through a grant provided by the VA Coastal Zone Management Program will host a hands-on technical workshop to educate landscape industry professionals and the general public about conservation-based landscaping practices using native plants and stormwater management.

The selection of the site and installation of the demonstration landscape will not only provide a model for maintaining the balance between conservation and development interests in the Northern Virginia coastal region, but also offer an opportunity to educate industry professionals about how environmentally sensitive landscapes can reduce polluted runoff, conserve water and increase wildlife habitat.

Participants will learn about soil amendment, site preparation, native plant identification, proper planting techniques, mulch requirements and maintenance. In addition, participants will gain hands-on experience by installing a rain garden and conservation landscape at the demonstration site. An interpretive sign will be placed at the site to provide information about the plants, the ecological benefits of the garden, and how the garden meets the principles of conservation landscaping.

The demonstration site is located next to the intersection of S Maple Ave. and S Washington St. in the City of Falls Church, VA on City owned property. It is a small parcel that is adjacent to a larger park and a native plant walking trail that follows Tripps Run. The site is located within the 100 foot Resource Protection Area associated with Tripps Run. It is currently maintained as a turf landscape. The demonstration site will not only enhance and enlarge the adjacent park and trail, but will also capture and treat runoff from the neighboring paved parking lot.

The reduction in runoff will benefit water quality in Tripps Run, a Potomac River tributary which is impaired for aquatic life - benthic macroinvertebrates. The benthic impairments are related to a combination of stressors including, elevated nitrate and total nitrogen concentrations, flashy flows, channel modifications, and
7. Public Benefit:
   a. The project (or acquisition) will be located on a property that is publicly owned or accessible via a publicly-held easement.  ☐ Yes ☐ No
   b. The project will be for public benefit.  ☐ Yes ☐ No
   c. The project will not improve private property and/or result in private or commercial gain.  ☐ Yes ☐ No

If the answer to any of the above is No, the project is not eligible for section 306A funding.

   d. The state or sub-recipient will need to secure an easement or lease to conduct the project (i.e., because the state or sub-recipient does not own the property).  ☐ Yes ☐ No

If the answer to 7d is Yes, attach a copy of the easement or lease to this checklist; if No, go on to 7e.

   What is the term of the easement or lease (provide date of expiration or specify if in perpetuity)?

   The easement or lease contains a reversionary clause.  ☐ Yes ☐ No

   e. The project will be open to the general public.  ☐ Yes ☐ No ☐ N/A

If the answer to 7e is No, the project is not eligible for section 306A funding unless access is to be limited for a legitimate reason, such as public safety, resource protection, or scientific research. Attach an explanation for why the project will not be open to the public and describe the public benefits that would be provided by the project in the absence of public access.

   f. The public will be charged a user fee to access the project.  ☐ Yes ☐ No ☐ N/A

If the answer to 7f is Yes, attach an explanation for the user fee, including the amount, whether there will be differential fees (and a justification thereof), the need for the fees, and proposed use of the revenue.

8. Involvement of Non-profit Organizations:

   The state CMP or sub-recipient will contract with a non-profit organization to complete part or all of the project.  ☐ Yes ☐ No

   If the answer to 8 is Yes, the name of the organization is:

9A. Supporting Documentation for Low-Cost Construction Projects (if your project is land acquisition, skip to 9B):

   a. A title opinion, title insurance commitment/certificate, or affidavit showing that the property on which the proposed project will be located is publicly owned, leased, or under easement in perpetuity or for the expected life of the project (at least 20 years) is attached.  ☐ Yes ☐ No

   b. The state CMP has on file a site plan for the project.  ☐ Yes ☐ No

   c. The state CMP has on file a site location map for the project.  ☐ Yes ☐ No

   (Go on to 10.)
9B. Supporting Documentation for Land Acquisition Projects:

   a. A title opinion or title insurance commitment/certificate showing that the property to be acquired is owned by the contracted seller and is free of encumbrances that could affect the future viability of the property in its intended use is attached.  ☐ Yes ☐ No ☐ N/A

   b. The State or grant sub-recipient has obtained an independent appraisal of the fair market value for the property to be purchased that was developed pursuant to CPD's Section 306A Guidance.  ☐ Yes ☐ No

10. National Historic Preservation Act and State Historic Preservation Office's (SHPO's) Clearance:

   a. The project will affect sites listed or eligible to be listed on the National Register of Historic Places or a similar State registry.  ☐ Yes ☐ No

   b. The state CMP has on file the SHPO's clearance.  ☐ Yes ☐ No

      If the answer to 10b is No, the CMP Program Manager certifies that, by signing this checklist, the State will work with NOAA to obtain SHPO/THPO clearance and that work will not begin and/or land will not be purchased until the SHPO clearance is received.

11. Flood Disaster Protection Act, Executive Order 11988 Floodplain Management, and the National Flood Insurance Program:

   a. The project involves construction, improvements, and/or land acquisition to support construction or improvements.  ☐ Yes ☐ No  (If the answer to 11a is no, go on to 12)

   b. The project will be located in a Special Flood Hazard Area (e.g., Zones A, AE or A1-30, AH, AO, AR, A99, Coastal A, V, VE or V1-30) shown on a National Flood Insurance Program (NFIP) Flood Insurance Rate Map.  ☐ Yes ☐ No

      If the answer to 11b is Yes, the zone(s) is _________  (If the answer to 11b is No, go on to 12)

      Information is generally available from local community planning or building permit departments. Flood Insurance Rate Maps are also available at https://msc.fema.gov.

   c. The community in which the project will be located is participating in the NFIP.  ☐ Yes ☐ No

      If the answer to 11c is No, the project is not eligible for section 306A funding.

      A list of participating communities is available at http://www.fema.gov/fema/csb.shtm.

      Note: A local floodplain permit may be required if the project meets the NFIP's definition of development, which is "any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials."

12. Coastal Barrier Resources Act:

   The project is located on a coastal barrier island designated as a unit of the Coastal Barriers Resources System.  ☐ Yes ☐ No

   If the answer to 12 is Yes, the unit number is _________

   If the answer to 12 is Yes and the unit number does not end in a "P" attach to this checklist a brief analysis as to how the proposed project is consistent with the three CBRA purposes: to minimize (1) the loss of human life, (2) wasteful federal expenditures, and (3) damage to fish, wildlife and other natural resources.

13. Endangered Species Act:

a. There are known listed threatened or endangered plant or animal species or their critical habitat (as defined by the Endangered Species Act) that are under the jurisdiction of the National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (USFWS) on the proposed project site.  ☐ Yes ☐ No

If the answer to 13a is Yes, attach a list of the species and/or their critical habitats as listed on the Endangered Species Webpage at http://www.fws.gov/endangered/.

b. The proposed project may have adverse effects on species listed or proposed for listing as endangered or threatened or on their designated critical habitats.  ☐ Yes ☐ No

If the answer to 13b is Yes, attach a description of the species and/or habitats affected, the adverse effects (minor and significant effects), and any coordination that has occurred between the state and the USFWS or NMFS. CPD will not approve a project that USFWS or NMFS has determined will have significant adverse effects on listed species or their critical habitat.

14. National Environmental Policy Act

a. The proposed project may significantly affect the quality of the human environment.  ☐ Yes ☐ No

b. The proposed project involves unresolved conflicts concerning alternative uses of available resources.  ☐ Yes ☐ No

c. This action may have significant adverse effects on public health and safety.  ☐ Yes ☐ No

d. This action may have highly controversial effects to the human environment.  ☐ Yes ☐ No

e. This action may have highly uncertain and potentially significant environmental effects or involve unique or unknown risks.  ☐ Yes ☐ No

f. The project may have significant adverse impacts on other natural resources not covered elsewhere in this checklist, e.g., beaches and dunes, wetlands, estuarine areas, wildlife habitat, wild or scenic rivers, reefs, or other coastal resources.  ☐ Yes ☐ No

g. The project’s effects may be individually insignificant, but their addition to effects from existing and reasonably foreseeable actions may result in cumulatively significant impacts.  ☐ Yes ☐ No

If the answer to any one subpart of 14 is Yes, then additional NEPA review and documentation may be required. Attach a description of the resource(s) affected, the nature and scope of the effects, and information explaining why the state or sub-recipient believes an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) should not be required. CPD may require additional information in cases where potential impacts are not clearly described or where probable impacts require an EA or EIS.

15. Environmental Justice:

The project will have disproportionately high and adverse human health or environmental effects on minority or low income populations.  ☐ Yes ☐ No

16. Coastal Nonpoint Pollution Control Program:

The project will employ best management practices as appropriate in conformance with the applicable State’s Coastal Nonpoint Pollution Control Program.  ☐ Yes ☐ No ☐ N/A
17. Americans with Disabilities Act:

The proposed project will be accessible to people with disabilities. ☐ Yes ☐ No ☐ N/A

If the answer to 17 is No, attach an explanation for how the project conforms with ADA requirements as described in CPD’s Section 306A Guidance. If the project does not meet the requirements, it will not be approved.

18. State and Local Laws:

The project is consistent with applicable state and local laws. ☐ Yes ☐ No

If the answer is No, the project will not be approved.

19. Tribal Interests:

a. The project is located on or will affect Tribal lands. ☐ Yes ☐ No (If No, go on to 20)

b. The project is consistent with applicable tribal laws. ☐ Yes ☐ No

If No, the project will not be approved.

20. Required permits:

Please list local, state, tribal or federal permits required for this project and the status of the permits. If the permits have not been obtained, then the state CMP Program Manager certifies, by signing this checklist, that the state CMP (or other public entity) is seeking the required local, state and federal permits and that work will not begin or land will not be purchased until the permits have been issued and received by the state CMP.

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OMB Control # 0648-0119, expires 11/30/2015. OCRM requires this information in order to adequately assess the eligibility of proposed CZMA section 306A projects. Public reporting burden for this collection of information is estimated to average 5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Coastal Programs Division, OCRM, 1305 East-West Hwy., 11th Floor, Silver Spring, Maryland 20910. This reporting is required under and is authorized under 16 U.S.C. 1455a. Information submitted will be treated as public records. Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection displays a currently valid OMB Control Number.
August 29, 2014

Corey Miles  
Northern Virginia Regional Commission  
3060 Williams Drive  
Fairfax, VA 22031

Re: NA13NOS4190135, Proposed Rain Garden

Dear Mr. Miles:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics historically documents the presence of natural heritage resources within two miles of the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR’s jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov).

Should you have any questions or concerns, feel free to contact me at 804-692-0984. Thank you for the opportunity to comment on this project.

State Parks • Soil and Water Conservation • Outdoor Recreation Planning  
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation
Sincerely,

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison