CHESAPEAKE *RiverWise* COMMUNITIES

Alliance for the Chesapeake Bay

United States Environmental Protection Agency

National Fish and Wildlife Foundation NFWF

Chesapeake Bay Program
A Watershed Partnership

Chesapeake Bay Stewardship Fund

Acknowlegements

The Alliance would like to thank all of our partners as well as many non-governmental organizations and local government entities who directly or indirectly contributed to the development of this manual. This program and manual could not have been designed if not for the strong, collaborative partnerships we hold with the Reedy Creek Coalition and the D.C. Department of the Environment. Due to our "Curb the Flow" work with the Reedy Creek Coalition and the RiverSmart Homes program in D.C., we have been able to learn many lessons, refine our implementation processes, and develop program guidance that we now share with all who seek support and information when developing a residential BMP program. Additionally, as a Bay-wide convener, organizer and technical advisor for the Chesapeake Watershed Forum and the Chesapeake Stormwater Partners Retreat, our work has been informed and refined by lessons-learned and innovative solutions reported by many other governmental and non-governmental agencies. Likewise, our RiverWise Communities Program partners, listed below, have our gratitude for their assistance with refining our program and developing this manual.

Alliance for the Chesapeake Bay Interns 2012 - 2015
Center for Watershed Protection
Chesapeake Stormwater Network
George Mason High School
Hanover-Caroline Soil and Water Conservation District
Howard County
Louis Berger
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INTRODUCTION
Stormwater & Reducing Impact

In addition to building coalitions for conservation, the Alliance coordinates a broad range of on-the-ground restoration programs. The Alliance's signature BayScapes program, now almost 20 years old, gives homeowners and businesses the information they need to develop landscapes that conserve water, prevent pollution, and create wildlife habitat. The Alliance works with landowners and municipalities to sustain healthy forests and plant trees along streams and rivers - among the most cost effective ways to reduce the flow of pollution into local streams and, ultimately, the Chesapeake Bay. The Alliance has been a leader in the development of functional landscapes like rain gardens, now a staple of many local programs to reduce stormwater from homes, businesses, and other properties.

The Alliance specializes in getting results while training others to continue this work in their local communities. Our restorative programs range from planting trees in an urban center to managing large-scale stream restoration projects, but they are designed to involve and support local governments and watershed groups. All this and the work of many other government and non-government organizations (NGOs) informed the development and refinement of the RiverWise Communities Program and this manual.

Aside from runoff from agricultural lands, stormwater runoff from developed land is one of the largest sources of nonpoint source pollution in the Chesapeake Bay watershed. As our communities grow and prosper, we develop the land by building beautiful homes, shopping centers, and businesses to accommodate the increasing needs of the public. While this growth is positive for the economy and adds many desired amenities, it comes at the expense of our natural environment, with increased flooding and erosion, loss of wildlife habitat, and reduced water quality. Removing the cleansing "sponge-like" functionality of our forests and natural spaces and replacing them with concrete or other impervious surfaces speeds up the flow of rainfall over the land.

In urban and suburban communities rainwater flows over the land or through stormwater pipes and directly to the nearest creek, stream, river, bay or ocean with no treatment. Some older urban areas manage stormwater runoff in combined sewer systems (CSS) and when heavy rains occur, raw sewage and stormwater mix, overwhelming the pipes in the sewer system. This water then surges into nearby water bodies without ever getting cleaned up. The result of this combined sewer overflow (CSO) is a deluge of toxic chemicals, bacteria, sediment, and nutrients entering our waterways, which consequently changes our watersheds from beautiful scenic havens to smelly, raging chocolate colored rivers.

Environmental organizations, state agencies, and localities have worked to reduce human impacts on the environment for decades in response to federal laws that require safe, swimmable, fishable waterways. Over the years, it has become increasingly clear that in addition to upgrading water treatment plants and installing best management practices on farms and newly developed land, we must also take action to control and reduce stomwater in our already developed suburban and urban areas. Increasingly local governments are installing "green streets" and other green infrastructure or low impact development type stormwater management practices on public properties to meet federal water quality standards and reduce localized flooding in the Chesapeake Bay and local waterways; however, in order to meet their water quality standards there is a need for private property owners to do their part. Collectively our actions on our properties and within our communities can have a significant impact on local streams and rivers. In recent years local governments and many NGOs have been working to develop various educational and assistance-based stewardship programs that help engage, educate, and motivate citizens to take action on their own properties and within their communities to reduce their harmful impacts on the environment and local water quality. There are many programs designed to "Reduce Your Carbon Footprint" or "Reduce Your Nitrogen Footprint". Most of these programs target actions that help reduce energy or water consumption, reuse rain water, increase wildlife habitat, reduce fertilizer use, replace turf or hardscapes with native plantings and other pervious surfaces, and prevent pollution from getting into nearby waterways by installing practices that control stormwater runoff. The Alliance has worked collaboratively with numerous organizations to promote these behaviors, as have many other local and regional government and NGO organizations throughout the Chesapeake Bay Watershed.

Over the years, through numerous regional and local stakeholder meetings and annually, at the Chesapeake Watershed Forum and the Chesapeake Stormwater Partner's Retreat, the Alliance has worked with partners like the Chesapeake Stormwater Network and the Chesapeake Funders Network to convene and share experiences, innovative ideas, and resources. In 2013, with funding from the National Fish and Wildlife Foundation, the Campbell Foundation, and many others, the Alliance and Wetlands Watch, along with other RiverWise Partners and the Institute for Environmental Negotiation planned and co-hosted the Collaborative Summit on Protecting Water Quality though Actions on Urban-Suburban Properties.

From all of these events and partner studies we found that all programs that seek to increase awareness and environmental stewardship share common features in order to successfully motivate people to do their part - to adopt and maintain more environmentally and water friendly landscapes and stormwater best management practices on their own properties and in their communities.

The findings also indicate that many of these programs share the same barriers to success. The Alliance saw a need to organize and share resources with other governments and NGOs through development of the Chesapeake

According to a study conducted by American Rivers and Green Jobs for All, major barriers to implementation of green infrastructure commonly reported by localities and NGOs include:

- Insufficient financial resources and staff capacity (to implement programs and practices)
- Lack of consistently trained and certified green infrastructure practioners (to properly design, install, and maintain practices)
- Lack of awareness and poor public perception of green infrastructure practices (to accept, support, adopt, and maintain practices)

From: "*Staying Green: Strategies toImprove Operations and Maintenance of Green Infrastructure in the Chesapeake Bay Watershed*." (April 2013)

RiverWise Communities Program and this manual. In doing so, we hope to assist others in refining existing or building new successful and effective local voluntary stewardship and stormwater BMP incentive programs. We expect the need to increase as more local watershed groups and local governments seek to increase the use of, and/or maintain, new practices on private property.

The Alliance for the Chesapeake Bay has worked with local communities for over forty years, helping them reach their stream cleanup, restoration, and protection goals. Like many other groups and local governments in the Bay Region, most recently, our efforts have focused on the implementation of local stormwater best management practices (BMPs) that control and clean up polluted stormwater runoff. We have implemented projects in Maryland, Pennsylvania, Virginia and the District of Columbia that have engaged the public in voluntary actions at home. The RiverWise Program is designed to ensure that the methods we use, and the practices we promote and recommend to others are based on sound science and are consistent with local, statewide, and federal protocols so that pollution reductions achieved can be counted toward the collective effort of restoring our waterways, from local streams all the way to the Chesapeake Bay.

The suite of tools and resources used in our systematic approach to development and refined through the Chesapeake Riverwise Communities Program, are shared in this manual. This manual is designed to be used to inform and support the development, or refinement, of your own local organizations and/or associated efforts.

The RiverWise program was designed as a holistic approach that addresses not just stormwater, but wildlife diversity, habitat, and behavioral habits that support a healthy ecosystem. Success can only be met by installing BMPs that are (1) highly functional and suitable for the site and property owner landscaping habitats and needs, (2) attractive to and valued by the property owner, (3) beneficial for both stormwater management, humans, and wildlife, (4) consistent with applicable BMP design criteria, and (5) designed, reviewed, approved, inspected, and maintained for prolonged functionality. To achieve this, the program has numerous components that are organized and carried out in a logical order:

- Program design, management, marketing, and sign-up
- Property Assessment
- BMP design
- BMP installation
- BMP inspection
- BMP maintenance
- Long-term BMP verification

In this manual, a recommended process for developing a comprehensive watershed protection program is provided, including appropriate methods to:

- Engage a local community
- Train volunteers and staff
- Conduct property assessments for stormwater, habitat, and wildlife

- Define, install and verify stormwater best management practices
- Establish an incentive program
- Track and report pollution reductions to local and state officials

While there are many detailed layers to this program, additional resources are provided throughout the manual for your reference. We encourage you to customize the resources provided to meet your unique program goals and needs and continue to research each topic further on your own, as many of the resources and programs continue to evolve and may not be adequately addressed here. This manual will strengthen and complement existing programs and also act as a framework for local governments and other NGOs to develop similar programs to restore water quality and habitat in their regions.

What are the common features of a successful and collaborative stewardship program?

- The program is organized around a watershed management and restoration plan on the subwatershed level. This structure promotes solutions that focus on local priorities and areas of concern by neighborhood.
- Collaboration, Partnerships, and Protocol were established to reduce costs, increase efficiency, identify and respond to overlapping goals, ensure that BMPs are designed, installed, and maintained to specifications, and track BMPs installed. In addition, regional messages, and efforts are synchronized with local community-level efforts and priorities.
- By recruiting and organizing community leaders as Watershed Stewards to work within their own communities, the program applies community-based social marketing techniques that rely on trusted advisors, peer pressure, and social diffusion to increase the likelihood of people to adopt new environmentally-friendly behaviors and install and maintain BMPs on private property.
- Provide incentives and assistance to promote the identification of site-specific areas of concern, recommend appropriate BMPs, and ensure that BMPs are dependably installed and maintained.
- Promote State- and EPA-approved BMPs that provide locality-specific solutions and have readily available standards and protocols for site analysis, design modifications, installation, reporting, and maintenance for urban stormwater retrofits.
- Utilize a combination of funding mechanism including in-kind volunteer labor and partnerships with non-profit, grant-funded organizations.
- Work with the private sector and support a growing market for trained professionals and BMP supplies and suppliers.
- Develop and sponsor hands-on workshops and comprehensive training programs for local stormwater and landscape professionals, do-it-yourself, and Watershed Stewards.
- Create a data management plan to locate, track, analyze, and report select BMPs to demonstrate regulatory compliance, assess program impacts, and satisfy funding source reporting requirements.

From "Reducing Nutrients on Private Property: Evaluation of Programs, Practices, and Incentives". Available at: *http://www.hrpdcva.gov/uploads/docs/16A_Reducing%20Nuttrients%20on%20Private%20Property.pdf*

CHAPTER 1

Getting Started & How to Engage Communities

Section 1.1: Influencing Behavior

Section 1.2 Social Media

Section 1.3: Door to Door and Group Outreach

Section 1.4: Community Newsletters

Effectively engaging the public is the most crucial element for any program's success. How do we effectively engage people in this day and age of super-technology, when we are all bombarded by messages, media, and the compelling requests to do more with our time than ever before? We found that a variety of approaches are necessary, and some of the most effective methods are traditional, tried, and true approaches. However, taking advantage of new technology has also played a strong role in our success. In this Chapter, we will discuss the different methods we employed.

Section 1.1: Influencing Behavior

Before implementing any type of project or program that relies on engaging the public, it is important to take the time to figure out how to describe and promote your program, to whom you want to promote it, and why you are promoting it to them. Essentially, engaging the public in any effort requires the same process as developing an advertising campaign. You must know your product, make it attractive, and persuade people to accept it by helping them understand why it is beneficial.

In the case of the Alliance's approach to marketing RiverWise Communities, we found that we needed to use a variety of approaches. We used everything from traditional outreach methods (e.g., door-to-door, group presentations, newsletters) to tapping the multitude of social media outlets.

Regardless of the outreach tools selected, RiverWise community initiatives have succeeded in large part because we worked with local partners to understand knowledge and perceptions about yard care and stormwater pollution BEFORE encouraging the adoption of alternative landscaping practices. It is a critical step in a process known as *social marketing*, whereby techniques used to sell products in commercial markets are used to influence behaviors that help solve social problems.

When people are being asked to change their behavior, they need to know the benefits and costs of that change. The key is to find ways to make the benefits of change attractive enough, and the costs of change low enough, that people are willing to do something different and new – that is, form a new set of habits. In other words, you must determine what incentive will have the greatest influence to accomplish long-term behavior change.

For some of your organizations, this effort may already be inherent in what you do. The Alliance has traditionally worked in communities that have requested help in changing behaviors and knowledge levels to positively impact their environment and, more specifically, the water quality in their local watershed. As a result, it was easy to learn how to incentivize behavior change and adoption of the RiverWise practice, because we knew what our audience wanted. In cases where this is not already apparent, it is important to use a more deliberate approach. The following information will provide an overview of the key components to a social marketing campaign, but for more information we recommend checking out the Community Based Social Marketing resources available at *www.socialmarketingservice.com*

Identify the Behavior Change (New Behavior) Desired

What is the goal of your program? What practices need to be implemented to achieve your goals? The Alliance's goal was to help their partners reduce stormwater that was polluting local streams and reduce localized flooding that caused soil erosion and property damage. It is important to take the time to understand the issues that need to be addressed and the best methods for solving those

problems so you can clearly promote ("market") the desired behavior change. As we worked with our partners we asked ourselves the following questions:

Q: What problem needs to be solved?

A: Flooding and pollution in Reedy Creek

Q: What will help solve the problem?

A: Controlling stormwater by using methods to absorb or collect it will reduce the volume reaching Reedy Creek.

Q: Are there specific actions that individuals can take to help solve the problem?

A: Install rain gardens, rain barrels, and conservation landscaping, plant trees, reduce impervious surfaces, and replace impervious surfaces with pervious surfaces.

You will notice in Section 1.2 when using Social Media most people respond to emotional (belief) posts more than fact based (knowledge) posts. These objectives are not necessarily independent of one another, and developing both will motivate the largest portion of your target audience. Your knowledge and belief objectives for your audience will also influence the creation of your talking points in, as outlined in Section 1.3.

Identify Your Target Audience

Once the problem is understood and actions are identified, it is important to evaluate who is likely to take action first. The Alliance partnered with the Reedy Creek Coalition and was able to work with the leaders of the Coalition to better understand the community and how to best engage them. The leaders of the Reedy Creek Coalition agreed to reach out to their neighbors through a door-to-door campaign and by holding community clean up events, stream walks, and watershed bicycle tours. Through these combined efforts, they were able to learn more about those living in the watershed and develop a target audience to engage in the program. Once we understood who the target audience was, we knew we had a core base of residents who would likely participate in the program. From there, word of mouth tends to increase momentum, as neighbors and friends begin asking what they are doing, why they are doing it, and how to get involved.

The Alliance's approach has always been to work where there is interest and need. It is fair to say that nearly 100 percent of the community work the Alliance does is done by request. This greatly increases our level of success, and we strongly recommend this approach. Trying to reach out to a community that you do not know and that does not know you is incredibly difficult. It is likely to require at least a year of initial effort just to introduce your organization to the community and build trust between the community and your organization. This will mean asking for opportunities to make presentations at local civic and/or homeowner associations, writing newspaper articles, and canvassing neighborhoods to introduce your organization. This must be done *before* beginning to discuss behavior change objectives relative to your program. Trust and strong relationships are paramount to any successful effort, so the process of building this type of relationship cannot be

overlooked. Together, we gave local presentations, wrote newsletter articles, and canvassed the neighborhood, along with Coalition members' support, to ensure that we engaged as many in the community as possible.

Develop Process for Understanding Barriers to Adopting New Behavior

Once you know your target audience, you will have a wealth of information available to you and it is important to use that information to shape how you message your program. The best messages can be formed if you first take the time to understand why people are not already doing what your program is asking them to do. This is also referred to as "barriers and competition".

Barriers are defined as anything that keeps people from voluntarily changing their behavior. Competition is defined as the current counter-productive behavior (or any outside influence supporting it) preferred by your target audience or the general public. An example of a barrier might be cost, or lack of understanding why the new behavior is worthwhile, or lack of skill to take on the new behavior. You can begin to understand barriers by interviewing members of your target audience. This can be done in person at a community meeting, by email, or using online survey tools such as Survey Monkey. In the next section, we'll provide some example questions based on our work.

Ensure Goal for Your Target Audience Will Sustain Behavior Change

While the process of understanding your target audience along with the barriers and competition of changing behaviors may seem complicated or arduous, the effort put into this on the front end of implementing your program can save you time and money on the back end. This process will help ensure the behavior change you want to promote is achievable, desired by the community, measurable, and something that can be sustained over time. Our goal is to ensure that we create a lifelong habit, not a one-time trend. In this case, we are asking people to change the way they landscape their yards to reduce the impacts of stormwater runoff and provide habitat for wildlife. In order to do this effectively, it is important to specifically identify the behaviors you want to change. Then, survey your target audience to learn their current attitudes and behaviors, and what influences them. Figure 1.1 (on page 12) provides examples of what this might look like in a survey.

Simple 'yes' or 'no' questions provide a quick, easy way to understand individual preferences, however following them with why or why not will provide the depth of information you are seeking in order to understand the barriers to changing their behavior. Often, we learn the homeowner wants to do the right thing, but may be concerned about money or time. By understanding this, you can tailor your message to address the overarching concerns of your audience. Sometimes people won't adopt these behaviors because they truly believe that rain gardens will attract harmful insects or wildlife. This lets you know that you need to provide some sound, science-based facts to address concerns.

Understanding *why* people are doing something differently than what we would like them to do is key to implementing a successful program. In order to provide the best, most relevant, and easy to understand message, you must know there is a group of people who will listen to your message. You must understand who they are and what they need to hear in order to change habits.

Specific behaviors we would like to change are:

- Having an expansive turf lawn
- Fertilizing an expansive turf lawn in spring and fall
- Watering an expansive turf lawn with potable water
- Allowing stormwater runoff from their rooftops to drain directly to the storm drainage system (e.g., onto the driveway and down to the street) and, ultimately, a nearby stream

In contrast, behaviors we would like adopted are:

- Replace portions of the lawn with native plants and trees
- Consider installing rain gardens to capture stormwater runoff
- Consider installing rain barrels to capture rooftop runoff and use them to water gardens and lawn instead of potable water

To better understand the barriers and competition to these behaviors, we can ask our target audience:

- What is important to you in your back yard? What do you [want to] use it most for?
- How do you currently care for your yard?
- Do you fertilize? How much and when?
- Do you use a mulching lawn mower?
- Do you dispose of grass clippings or leave them?
- Do you water your lawn? How often?

As you ask these questions, you may delve deeper into understanding barriers by asking follow-up questions. Some questions could be:

- Do you like having trees in your yard? Why or why not?
- Do you like flowers and shrubs? Why or why not?
- Are you willing to reduce the size of your lawn?
- Are you willing to install and use rain barrels to collect water for your garden and yard? Why or why not?
- Are you willing to install a small rain garden to help remove pollutants from stormwater in your yard? Why or why not?

Figure 1.1. Identifying Target Behaviors and Understanding Barriers and Competition.

Developing Your Implementation Plan and Budget

Based on the established goal(s) of the program and the feedback from the target audience and, perhaps, their local community organization and/or watershed group, develop an implementation plan for your engagement effort. Start with a 1 year plan that includes activities you believe your organization can achieve within that time. This will provide an opportunity to assess progress and determine if adjustments are needed before moving on. Then, develop a longer-range plan (2-3 years).

It is important to keep your goal in mind; who is doing what within the organization, when you plan on completing it, and how much it will cost the organization. It's also important to remember that plans sometimes change due to outside forces. If that happens, be sure to go back through these steps in light of this additional knowledge.

Developing a budget is simultaneous with developing the Implementation Plan. You will need to identify all costs associated with the strategies and activities related to your program, in order to develop the budget.

For example, if your goal is to implement rain barrels in the community, consider:

- Product related cost: How much will the rain barrels for the workshop cost?
- Price related cost: How much will a homeowner or community save by using rain barrels rather than public water to water flowerbeds?
- Place related cost: How much will it cost to rent the workshop location? Does the homeowner need to hire someone to install the rain barrel?
- Promotion related cost: How much will the handouts and brochures cost? Do we need signage and displays? Can we pay for advertising in local newspapers?
- Evaluation related cost: How many volunteer hours are required to accumulate all of the needed information?
- Staff related cost: How much paid staff time will be involved?

Evaluating Program Success

Every good plan needs a way to measure progress and demonstrate that your program is successful during and following your social marketing campaign. Grant providers love to hear that you have evaluation plans so you can truly assess and report how your program is working. Evaluating your program's success will help you spread your message to an expanded target audience. Understanding the program's shortcomings will also help strengthen it in the future. We suggest the following may be a useful way to organize the evaluation part of your program:

- Inputs: What resources have been or will be allocated to the social marketing campaign or program effort? Be sure to track volunteer time, any items donated (computers, printers, services), and general office items
- Outputs: What program activities were or will be conducted to influence the target audience to perform the desired behavior (e.g. rain barrel workshops)?
- Outcomes: How did the target audience respond to the outputs that were carried out (e.g. number of homeowners that came to a rain barrel workshop who later successfully installed their rain barrel)?
- Impact: List quantifiable indicators that show levels of impact as a result of your program (e.g. approximate gallons of stormwater that are now collected in a rain barrel versus running off into the local waterway in a 1-inch storm event)

Return on Investment

Understanding the return on investment can help when explaining to funders why investing in your program is worthwhile, as well as help demonstrate success. To understand what your return on investment is, list any improvements in social and environmental conditions and assess the value of those improvements versus the money spent to achieve them (e.g. if you helped your target

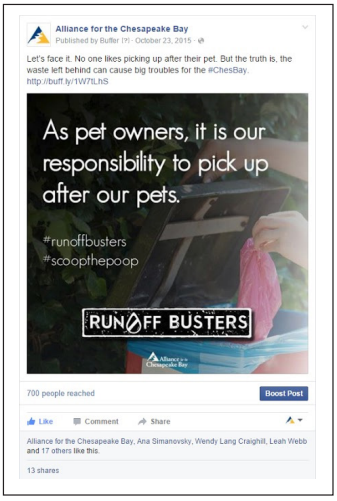
audience install 200 55-gallon rain barrels, your organization has reduced stormwater entering the local Chesapeake RiverWise Communities 14 waterway by 11,000 gallons, reducing erosion and saving homeowners money in utility fees).

We have only scratched the surface of what's involved in successful promotional strategies and social marketing campaigns. While this may seem like a complicated process, more and more funders are seeking programs that have thoughtfully developed this type of strategy. Repeatedly communicating effective messages is a well-known and proven educational tool. The recommended resources in this section will prove invaluable as you embark on marketing your own program.

Section 1.2: Social Media

Now that you have learned the process to identify behavior change goals and develop a plan to implement them, we will focus on using social media as an outreach tool to help influence behavior change. Using free social media to promote change may be a great option if your target audience has access to the internet. If your target audience has little to no internet access or experience, you may be better off going door to door (next section). The social network statistics from *Pew Research Centers* reveal important information about internet users and the social media outlets they choose. Depending on whom you are trying to engage, this is important information to know.

Facebook



While Facebook is used more than any other social media application among internet users, you may miss your target audience if you are using Facebook alone to spread your message. According to research, the average Facebook user is a 25-year old woman living in a big city with a college degree and a household income of more than $75K a year. Facebook tends to work best for an organization by using visual posts (pictures, videos, polls) along with the message to users. Typically, 1-3 posts a day is recommended. Users will typically respond most to emotional messages more than matter-of-fact messages, so remember to make your message compelling. Including photos of places that your audience may recognize or an event they may remember, in conjunction with a message that teaches them something they didn't know in a very succinct way, can be powerful. Another successful method is to use action photos showing people performing the behavior you would like to see.

Twitter

Twitter is still growing and, according to studies, tends to attract more African-American and urban residents between the ages of 18-29, and it also attracts a strong teen following. Tweets are composed in a brief news headline style that must fit within 140 characters. Hashtags (#) are used to link a tweet to a larger conversation. Since space is limited, creating hashtags that are part of your post as opposed to tag-ons at the end is an efficient use of space (e.g. "*#UsingRainbarrels* helps conserve water" instead of "Install rain barrels to help conserve water! *#UsingRainbarrels*"). Like Facebook, most users respond to emotional posts rather than posts

that are fact based. It is important to use strong call-to-action language. Including photos and links for the reader to continue researching the topics is an important detail that should not be over-looked. Twitter also has a number of features like Twitter Lists, Twitter Chats, Thunderclap, and Twibbons that can help your organization spread its message.

Pinterest

Women are about five times more likely to be on Pinterest than men, and are typically under 50 years of age with some college education and higher income. Pinterest is very visual, allowing users to "pin" or "re-pin" images and other items of interest to their pages. The pinned item allows other users to click on it to learn about the image, and users have the option to follow the original posters, which typically leads users back to the poster's website or blog.

Instagram

Instagram is another visual medium. Like Pinterest, it is all about the photo. Instagram has a diverse group of users including African-Americans, Latinos, women, and urban residents aged 18-29, along with a strong following of young adults. If you have more photos than you know what to do with, consider opening an Instagram account to highlight them.

Other social media outlets

The social media outlets just mentioned are not the only ones available. Depending on who your target audience is, you can also investigate the use of Tumblr, LinkedIn (professional), Vine, Google+, MySpace or blogs. It is important to remember is that using social media is only one component of a successful outreach campaign. This can be effective in increasing awareness and engaging your community, because it allows you to create a lot of "buzz" around your efforts. However, using social media is only as successful as you make it. It should be used consistently and frequently so people remember your efforts and achievements.

Section 1.3: Door to Door and Group Outreach

If your organization's primary way of reaching your targeted audience is the "in person" method, it is important to map out some strategies ahead of time. One of the most beneficial internal documents you can provide to your staff and volunteers is a set of talking points. Talking points are an easy way to keep everyone on track with a consistent message.

Start by developing your story. If you have already completed the Social Marketing steps above, you already have it! Key aspects of developing talking points for your story are as follows:

- Keep them simple, easy to understand, and easy to communicate verbally and in written form.
- Avoid long paragraphs; instead use bullets to communicate the main point.
- Pairing the talking points with a fact sheet can be very helpful to members when answering questions from a target audience. Use compelling images on written information and fact

sheets to make a statement, then back it up with factual information and inspiring actions. Discussing both of these resources in a staff meeting before handing them out helps to provide a full explanation of each point and allows for questions to be asked.

Next, develop a list of places to visit. With talking points and fact sheets in hand, your group can now circulate to the various community meetings that already take place. Check to see if any of the following are options in your community:

- Neighborhood Civic Meetings
- Established Environmental Groups, large and small
- Community Centers
- School Clubs and PTA Groups
- Scout Troops
- Churches
- Farmer's Markets
- Events

Take time to map your calendar events. By creating an Events Calendar, all members of your group will be aware of upcoming events, and you can ensure that assigned individuals are able to attend well in advance.

Places to advertise your program:

- Facebook
- Neighborhood Newsletters
- Neighborhood Association Meeting
- Neighborhood Activities (ie., street and stream cleanups, or walking, hiking, biking tours)
- Community Events (ie., Farmers' markets or festivals)
- Door-to-Door
- Social Media (ie., Twitter or Instagram)
- Newspaper Articles
- Word of Mouth

When attending meetings, be sure your group members bring their talking points, fact sheets, brochures, and a sign-up sheet to collect names, addresses, phone numbers, and email addresses of attendees. Be sure to post in your social media networks that you are attending these meetings.

Any email addresses collected should be added to a master email list. You can create one using an excel spreadsheet. Send the people who gave you their information a quick "thank you" email and let them know they have been added to your email list. You can do this using a standard free Gmail account or free email marketing program for non-profits, such as *Vertical Response.*

Neighborhood newsletters and blogs are an effective, inexpensive, often free way of promoting your message. Be sure to first determine whether the newsletters or blogs will be reaching your target audience. Send your article photos and information to the appropriate contact person. This can provide the newsletter editor or blogger with enough information to determine if you are a good fit for them. However, don't be discouraged if you are not a good fit. Ask them if they can recommend a better home for your article that you may not be aware of. Neighborhood newsletters are almost always searching for ideas, stories, and events. The following list identifies some typical places to locally advertise your program.

CHAPTER 2
Best Management Practices

Section 2.1: Residential Stormwater BMPs

Section 2.2: Selecting BMPs for your Program

Section 2.3: Overview of Common Residential BMPs

Section 2.1: Residential Stormwater BMPs

In the years to come, Stormwater Best Management Practices (BMPs) on individual residential lots will become more commonplace and crucial weapons in the arsenals of stormwater practitioners everywhere. These BMPs will be instrumental in achieving water quality goals. They may be just as important as a way to connect the public to their local streams and the Chesapeake Bay, demonstrating that anyone can make a difference and, if we are to make a difference, it will take action from everyone.

There are many reasons one might install a BMP on an individual residential lot. One reason is that regulatory requirements for new construction often require BMPs to treat stormwater following land development. As time goes by, regulations are focusing more and more on treating stormwater locally, in micro-watersheds, instead of consolidating stormwater and treating it in a massive detention or retention stormwater management pond. A second reason is to install one or more retrofit BMPs [i.e., install a BMP(s) on an existing established residential lot where stormwater previously was not addressed]. This may be done to meet Municipal Separate Storm Sewer System (MS4) requirements, improve water quality in a local waterway, or as a volunteer citizen stewardship effort.

The following is a list of stormwater BMPs that are appropriate for residential use.

- Rain barrels (or rainwater harvesting)
- Rain gardens
- Permeable hardscapes
- Downspout disconnection
- Impervious cover removal and conversion to conservation landscaping
- Tree plantings
- Conservation landscaping (i.e. BayScapes)
- Urban nutrient management plan
- Infiltration trench

Section 2.2: Program BMP Selection

Stormwater BMPs can be as simple as planting a tree or as complicated as installing a permeable pavement system. It is crucial to remember that homeowners will be maintaining these BMP's over the years, not contractors who specialize in stormwater management maintenance practices. In order to have a successful residential BMP, it must be correctly located, designed, and installed, and proper maintenance must be conducted over the life of the BMP. The first step in designing an effective non-regulatory BMP program is selecting the BMPs to be included in the program. Consider the following variables when selecting BMPs:

Geographic location

Choose BMPs that meet site constraints of the residential area where you will be working. For instance, if you are working strictly in urban areas, you will want to consider BMPs that are smaller and can impact impervious surfaces (such as rain gardens and permeable pavers). If your program area includes suburban and rural areas, larger BMPs such as dry swales and riparian buffers may be possible. Climate should also be taken into consideration, since conditions will vary greatly within the watershed. For example, while warm coastal regions rarely experience harsh winter conditions, colder mountain regions should account for low temperature, snow, and road salt when selecting BMPs and plant species.

Geologic location

Geologic location may play an even greater role than geographic location. High water tables, karst terrain, variations in soil type, and bedrock depth may become huge challenges, depending on location. It is highly recommended that you talk to local and state stormwater practitioners about the appropriate BMPs for your area. Just because a certain BMP is getting great results in one area doesn't mean the same will occur in another. Remember that BMPs are designed to infiltrate in order to clean stormwater, so this must be geologically feasible.

Incentive structure

If your program offers an incentive for installing BMPs on residential lots, the incentive structure may influence the choice of BMPs for the program. For example, if the incentive is based on a partnership with a local nursery, BMPs that are plant-based would be your best bet. If the incentive structure is a cost-share program, the cap of the cost-share might determine which BMPs will be chosen. If the average cost of the installation of a given BMP is $5,000+ and the incentive will only cover up to $500 of that cost, most homeowners will not be willing to bear the remainder of the cost. You may be able to offer design or installation assistance or other technical advice for the project. If you have the resources, you may even offer an additional financial incentive, as long as such assistance is provided equitably among the program's clients (to maintain good will for the program). It will be important to work with BMPs that can be installed within the economic boundaries of the program, rather than doggedly supporting BMPs that are too expensive or difficult to install in the particular area.

Locally accepted BMPs

Many cities and states already have lists of locally accepted BMPs they know, through previous experience, are the highest functioning BMPs to use in the area. Finding the list of these BMPs and choosing from them will save you resources and keep you from choosing a signature practice not on the local list from which you may never get a pollution reduction credit. To identify these BMPs, you can contact your locality's utility, stormwater, or environmental department.

Section 2.3: Overview of Common Residential BMPs

There are a number of residential BMPs being used throughout the Bay watershed. For the Chesapeake RiverWise Communities program, we have focused on the following: rain gardens, tree plantings, permeable hardscapes, rainwater harvesting, and BayScapes (i.e. conservation landscaping). In this section, we provide an overview of these practices. For details on design, installation, and maintenance, you can refer to the Center for Watershed Protection's "*Residential Stormwater BMP Design Manual*". The Alliance's *Reduce Your Stormwater webpage* has additional information and sources on many of these BMPs.

Rain Gardens

A rain garden's appearance is similar to other flower gardens—but under the surface, it collects and treats rainwater. By mimicking the natural treatment of stormwater provided by forests and meadows, these gardens are highly efficient at treating stormwater runoff and removing common pollutants such as pet wastes, fertilizers, and household chemicals.

An installed rain garden resembles a shallow depression in the landscape, planted with a mix of native plants that attract wildlife, while filtering pollutants. By accepting stormwater runoff from the roof, driveway, and/or parking lot, the rain garden allocates the water to growing your garden instead of flowing out into the street and stormwater drainage system.

Contrary to the name, rain gardens are typically dry throughout the year. During installation, soil preparation methods ensure a higher infiltration rate, usually through removal of clay, and adding soil amendments, as well as a bottom layer of gravel.

Purpose & Benefits

- Highly efficient infiltration of runoff
- Habitat for butterflies and other wildlife
- Can save homeowner money
- Adds significantly to property value and appearance
- Efficient water pollution treatment

Tree Planting

Planting native trees and shrubs helps restore a portion of your property to its original forested condition, which is good for property value, wildlife, the local watershed and the bay. Additional gardening and mulching around these tree plantings can reduce the area of lawn needed to be mowed.

Native bare root trees and shrubs can be purchased and shipped from the Department of Forestry for under $3.00 each. These trees are relatively small, but are the best adapted for your region, and are grown in their native soils and climate.

Tree Placement

Consider the size of the tree at maturity when deciding where to plant. *https://www.dom.com/library/domcom/pdfs/customer-service-shared/tree-trimming-shared/tree-trimming.pdf*

Trees should be located away from all public utilities (above and below ground), with exception to small trees under utility lines. Contact Miss Utility (1-800-552-7001) to have the property marked prior to planning and installation. Contact a local arborist regarding other tree planting questions or concerns.

How to Plant

- Spring and early fall are generally the best planting seasons, giving the tree time to root and acclimatize before the extreme weather conditions of summer or winter.
- A dibble bar may be used for efficient bare root and tree seedling planting

For more information on how to plant balled and burlapped, container-grown, and bare root trees, go to *dof.virginia.gov/tree/care/how-to-plant.htm*

Purpose & Benefits

- Increase stormwater infiltration by intercepting rainfall and runoff
- Reduces property erosion with deep structural roots
- Regulate climate changes, such as providing shade and cooling in the summer
- Adds significantly to property values
- Filters air and water pollution
- Can grow fruit or health products for homeowners
- Attractive for home landscaping
- Promotes psychological health

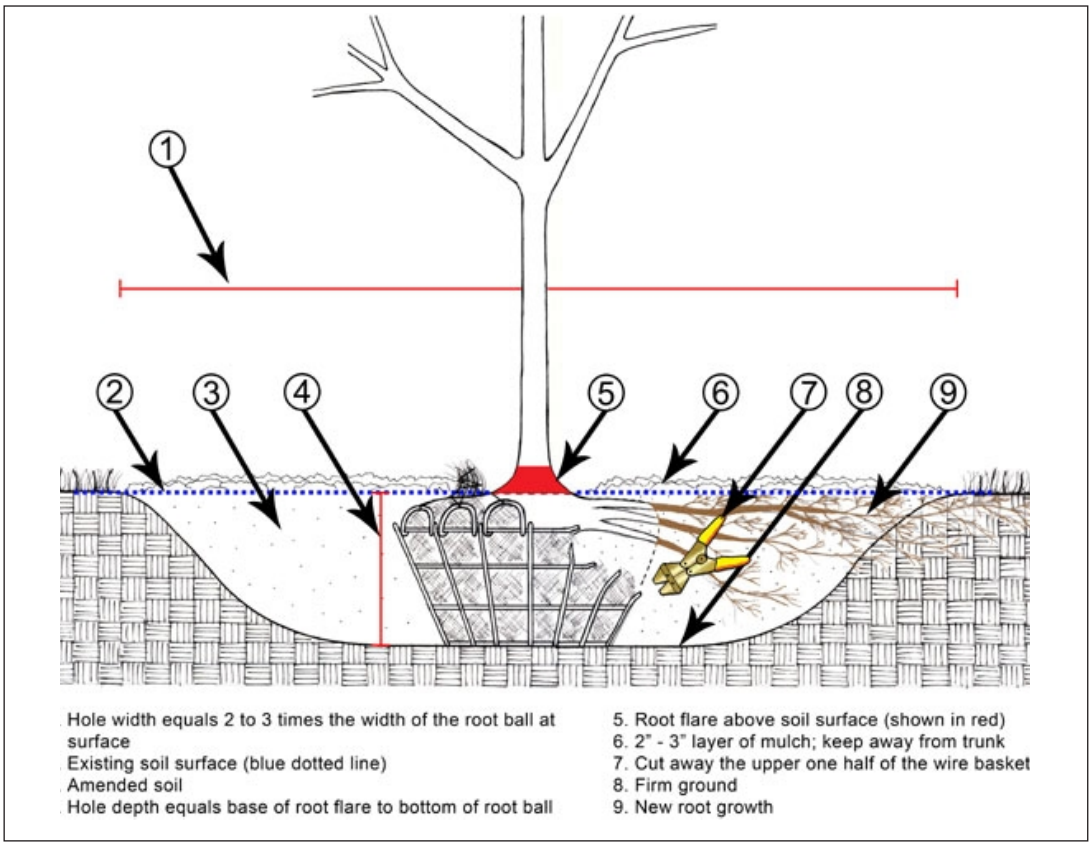
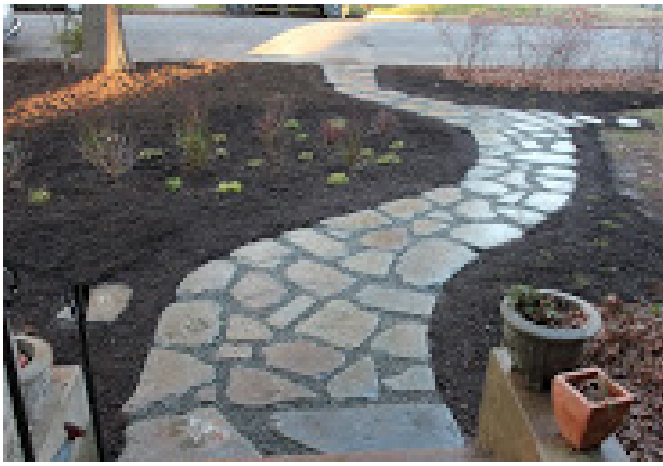


Figure 2.3. How to plant a tree. Source: http://wildwoodri.com/plants/how-to-plant/

Permeable Hardscapes



Permeable hardscaping is a beneficial alternative to traditional impervious paving materials such as concrete or asphalt. While impervious surfaces promote stormwater runoff that picks up pollutants and debris, permeable hardscapes allow water to immediately percolate through the material and into the ground. They can be used in a wide range of settings, from a simple pathway or small patio up to a large parking lot. The market for these materials has grown, resulting in some attractive and cost-effective options available for small projects.

Purpose & Benefits

- Reduce stormwater runoff
- Effectively rehydrate adjacent and underlying soils
- Promote even stormwater infiltration, reducing puddling on property
- Very high pollutant removal
- Control localized drainage problems.
- Highly attractive option for walkways and driveways
- Educational opportunity in environmental stewardship

Rainwater Harvesting

Rain barrels or cisterns are advantageous tools for homeowners to collect and harvest rainwater. While they can vary in shape, size, and design, they are all easily installed for home catchment systems.

Rainfall from a portion of the roof is directed by the gutter drain system into the cistern. The water can then be used for a number of outdoor uses: watering gardens, landscaping, cleaning streets, washing cars and windows, or bathing a pet. Due to its natural composition, rainwater is generally known to perform better in gardens than municipal tap water. Some household rainwater harvesting systems are even designed to use harvested water for flushing toilets! Using rainwater in these ways can also help reduce a homeowner's monthly water bill.

Purpose and Benefits

- Reduces home runoff
- Reduces property stormwater fee
- Gardens watered with rainwater perform well
- Stores an emergency water supply in case of a drought

Conservation Landscaping

Conservation landscaping, or "BayScaping," is a landscaping method that cooperates with natural systems to reduce pollution and enhance wildlife habitat. Native plant species, which are adapted to local conditions, are used because they require less water and fertilizer than the average lawn.

A homeowner benefits by using this landscaping method because it reduces the need for external inputs to support their yard: less fertilizer, pesticides, water, and labor. There is no trade-off, since native plants provide both more wildlife habitat and more water infiltration than lawns. In yards with poor soil, compost amendments can enhance stormwater infiltration capacity of Conservation Landscapes.

A native plant guide for Conservation Landscaping is available at:

http://www.nativeplantcenter.net/guides/chesapeakenatives.pdf

Before

After

Purpose and Benefits

- Native plants will attract native wildlife and butterflies
- Slows down and filters pollution
- Adds beauty to a home landscape
- Native plants will attract beneficial wildlife, helping deter pests
- Less long-term inputs (e.g. mowing, water, fertilizer, etc)
- Requires minimal maintenance

CHAPTER 3
Assessments

Section 3.1: Intro to Watershed Protection Assessments

Section 3.2: Pre-Assessment Questionnaire

Section 3.3: The Assessment

Section 3.4: Assessment Report

Section 3.5: Assessment Follow Up

Section 3.6: Assessment Progress Tracking

Section 3.1: Introduction to Watershed Protection Assessments

Watershed protection assessments are a key component of the Chesapeake RiverWise Communities program. These assessments take a holistic look at residential properties to:

- Gauge stormwater runoff, wildlife habitat, and homeowner behaviors
- Provide site-specific recommendations to reduce environmental impacts and restore local watersheds.

Four main goals of the assessment process

1. ***Educating homeowners:*** Most homeowners do not realize their property conditions and landscape habits contribute to polluted stormwater runoff. Others may be aware, but may not know what they can do to help prevent polluted stormwater runoff. The watershed protection assessment provides an opportunity to educate homeowners through one-on-one interaction and to share this information.
2. ***Identifying structural BMP implementation opportunities:*** As part of the assessment process, assessors are looking at all the property's characteristics to determine which BMPs are suitable for the site. Assessors should be trained to make sound recommendations regarding BMP placement. Common structural BMPs include rain gardens, rain barrels, BayScapes (Conservation Landscaping), impervious surface removal, and adding or enhancing pervious surfaces.
3. ***Identifying behavior change BMP opportunities:*** Homeowners make choices regarding their lawn mowing frequency, fertilizer usage, disposal of grass clippings and leaves, and other landscaping habits that can contribute to stormwater pollution. The assessment process helps identify these behaviors and provides recommendations to homeowners about changes they can make to help reduce their stormwater impacts. These recommendations also focus on increasing wildlife habitat and native plant diversity.
4. ***Providing entrance into incentive programs, such as cost shares, rebates, or stormwater fee reductions:*** The RiverWise program provides opportunities for homeowners that participate in the assessment process to apply for incentives such as cost-share funds or rebates to help lower the cost of implementing the recommended structural BMPs on their property. Sometimes this kind of economic and technical assistance makes the difference for a homeowner choosing whether or not to participate in the program. Potential incentive programs are outlined in Chapter 4 of this manual.

The RiverWise assessment process provides a chance to communicate the importance of controlling stormwater runoff to homeowners and encourage stormwater BMP implementation. We also use this opportunity to educate homeowners about the importance of using native plants and increasing wildlife habitat, and to collect information from the homeowner: first, when they sign up for an assessment to learn about their habits, and later when we meet with them on their property to learn about property conditions.

To initiate the process, the homeowner signs up to have an assessment conducted and fills out the pre-assessment questionnaire. The sign-up can be through an online form (preferable), email, or telephone.

To conduct the assessment and make sound recommendations, the assessor should be someone who is trained to identify appropriate BMPs and their locations, and communicate stormwater issues to homeowners. This may be a paid staff person employed by a locality, state government, or a watershed organization. Volunteers and interns can also be trained to be assessors. Using volunteers or interns also helps relieve the burden on permanent staff when there are limited resources. Chapter 6 identifies tips for providing training to assessors. If using volunteers, it is preferable to provide some oversight by permanent staff, which can include accompanying the volunteer on the first few site visits and/or reviewing the assessment reports before they are sent to the homeowners.

The assessor takes the following steps:

1. Schedules an appointment with homeowner.
2. Gathers information needed for the assessment.
3. Fills out the assessment form during the appointment.
4. Generates a report to give to the homeowner.
5. Follows up with the homeowner to answer any questions about the report recommendations and discuss incentive program opportunities and enrollment.
6. Sends out a follow-up survey a few months later to gather information about BMP implementation, behavior change, and program satisfaction.

Section 3.2: Pre-Assessment Questionnaire

The purpose of the pre-assessment questionnaire is to gather information about the homeowner's habits, knowledge, and behaviors related to stormwater runoff and environmental impacts. A pre-assessment questionnaire provides a baseline that can be compared with information gathered later to gauge behavior changes and the effectiveness of the program.

The pre-assessment questionnaire also allows the assessor to gather information about habits and site conditions that may not be easily detected during the on-site assessment (e.g., how often the homeowners water their lawn or garden). Furthermore, the pre-assessment questionnaire can be used as a tool to educate homeowners about which landscaping and outdoor yard habits are best for reducing stormwater runoff and improving wildlife habitat. For example, during an online pre-assessment, the homeowner would answer the question and then could be given the "right answer" and a short explanation.

The information gathered should include (but may not be limited to) the following:

- ***Landscaping habits:*** This includes mowing frequency and blade height setting, lawn and garden watering schedules, fertilizer usage, pesticide and herbicide usage, use of a lawn service, and soil testing.
- ***Outdoor habits:*** These habits include car washing, oil changes, winter de-icing, household cleaner purchases and disposal, and cleaning up after pets.
- ***Knowledge assessment:*** This includes asking the homeowner what they consider the most important environmental issue and what contributes to poor water quality in their neighborhood.
- ***Behavior change:*** This is a measure of willingness to change behaviors for a positive impact on water quality and wildlife. You can use a sliding scale to assess how willing the homeowner is to install a certain BMP or change their landscaping practices.
- ***Homeowner's needs and concerns***: This seeks out why the homeowners decided to request an assessment and whether there are any particular areas on their property they already know they want addressed. Areas of ponding, unusually dry or bare areas, and areas where there is active erosion should all be noted.
- ***Local Codes and Ordinances***: This reveals other useful data, such as homeowner association (HOA) covenants and neighborhood demographics. For example, if a certain HOA covenant prevents rain barrels from being placed in the front yard, the assessor should account for that when providing recommendations.
- ***Site conditions***: There may be site conditions that are difficult to identify visibly while on a site. For example, an abandoned underground oil tank may have a significant leak that can potentially be fixed. Other site conditions may include the site's location within a combined sewer overflow (CSO) area or homeowner knowledge of other environmental concerns on the property.

Useful Websites and Tools

- ***Local government websites:*** Many local governments will have valuable property information on their websites. Some of these tools include property sketches, critical resource protection information, impervious surface descriptions, and more. This information can be directly entered into the assessment report. This should be done before the visit.
- ***GIS databases:*** Some local governments have GIS databases on their websites with valuable information such as soils data, topographic information, and high-quality aerial imagery.
- ***Google Earth:*** Google Earth can provide additional supplemental information such as aerial photography and measuring tools you can use before the site visit. Then you can confirm the mapping measurements during the site visit.
- ***Site plans:*** Ask the homeowner if they have civil engineering or architectural drawings of the property. These drawings can provide you with hydrologic and site design information, including scaled measurements.
- ***USDA Web Soil Survey:*** *(http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)*

See Appendix 3A for a sample pre-assessment questionnaire. The easiest way to gather this information is to set up an online questionnaire. An online survey allows the homeowner to quickly answer many of the questions needed to conduct a successful assessment. While online questionnaires speed up the process, they also allow the assessors to import the data into a database such as Access or Excel which, if set up correctly, will help track behavior change when compared to the post-assessment data (see Section 3.5). An online survey form can be created using a number of different programs. The following are some online survey tools that can be used:

- JotForm *(www.jotform.com)*
- Survey Monkey *(www.surveymonkey.com)*
- Google Forms *(www.google.com/forms/about/)*

Section 3.3: The Assessment

After the homeowner signs up for the assessment and fills out the pre-assessment questionnaire, the assessor should set up an appointment for a site visit. The assessor should schedule a time when the homeowner is available to meet, since the site visit is a good opportunity for one-on-one education. Summer and winter are generally the best seasons to schedule assessments, because this can coincide nicely with the following fall and spring plantings and lawn maintenance. However, do not delay responding to a homeowner just to align the process in this manner. It is critical to have prompt, frequent communication to keep the homeowner interested.

Before the appointment, the assessor should gather some basic information about the property to determine lot size, property type, location of impervious surfaces and their area, proximity to local water bodies and other critical areas, and general watershed information. An aerial view of the property and any other characteristics that may influence BMP implementation are helpful. Some of this data may be available through parcel information provided on local government websites. Google Earth/Maps and Bing Maps provide free aerial views of the property that can be printed, if GIS software or other local mapping tools are unavailable. The assessor should also review the pre-assessment questionnaire answers and have a list of questions ready for the homeowner, if any of the survey answers need to be clarified during the on site visit.

For the site visit, the assessor fills out the property assessment form (see Appendix 4B). The assessor should bring multiple copies of the aerial photo and/or parcel diagram to notate various kinds of data and observations at a spatial scale. For the RiverWise Program we use an iPad and the PDF Expert app, which helps to streamline the assessment process. The app provides tools to fill in data, takes pictures, and draws recommended BMPs on the property photos and parcel diagrams. The data gathered during the assessment should include the following:

- ***Downspouts:*** Note the number of downspouts and whether they are connected or disconnected from the storm system (if they drain onto a paved driveway or go into the ground, they are likely connected to the storm system).

- ***Impervious surfaces:*** Measure the area of each impervious surface, including the house, walkways, driveways, patios, and any other areas where water does not infiltrate into the ground. If using data collected before the site visit, confirm that those numbers correspond with the site conditions. The best way to collect this data on-site is with a measuring tool, such as a measuring wheel. Some surfaces, such as gravel areas, should be verified as pervious or impervious while on-site. If the assessor is unsure, the general rule of thumb is to mark the area as impervious (because over time, the surface will become more compact and thus, more impervious).
- **Soil information:** The assessor can use a soil probe to determine the soil profile, including of the soil type. This, along with assessing the compaction of the soil, will help identify whether or not stormwater infiltrates through the soil, especially in grassy areas.
- ***Property conditions related to stormwater conveyance***: The assessor should note the direction and severity of any slopes, locations of eroded areas, locations of swales, ditches, drain inlets or outfalls, and the location and types of any existing BMPs.
- ***Information about vegetation:*** Identify the major invasive, native, and non-native plants on the property and whether there are layers of vegetation (e.g., tall trees with high canopies, understory trees, shrubs, and perennial flowers). The assessor should also note grouping of plants since, along with multiple layers of vegetation, they often provide the best habitat for wildlife.
- ***Solar exposure:*** The solar exposure on the property is important for identifying which native plants will work best when installing rain gardens and BayScapes.
- ***Utility locations:*** Note the location of utility lines, both overhead and underground, including power lines, gas lines, cable and telephone lines, water lines and sewer lines. These should be avoided when determining new BMP locations. Not all utilities will be visible during the assessment. BMP locations should be noted as "suggested" until utilities can be located and you can confirm that placement will not interfere with underground lines.
- ***Infiltration Test:*** If a site has specific locations where infiltration BMPs (e.g., rain gardens, dry wells, or permeable pavers) will be installed, the assessor should try to conduct an infiltration test on the site. This test will take at least an hour with the right tools (e.g., an infiltrometer). If the assessor does not have time to conduct the test during the site visit, the homeowner or a contractor can conduct the test to determine if the recommended location of the BMP will be suitable.

During the site visit, the assessor should also draw a rough sketch of the property (See Fig. 3.3), indicating impervious surfaces, slopes, existing vegetation, utility lines, downspout

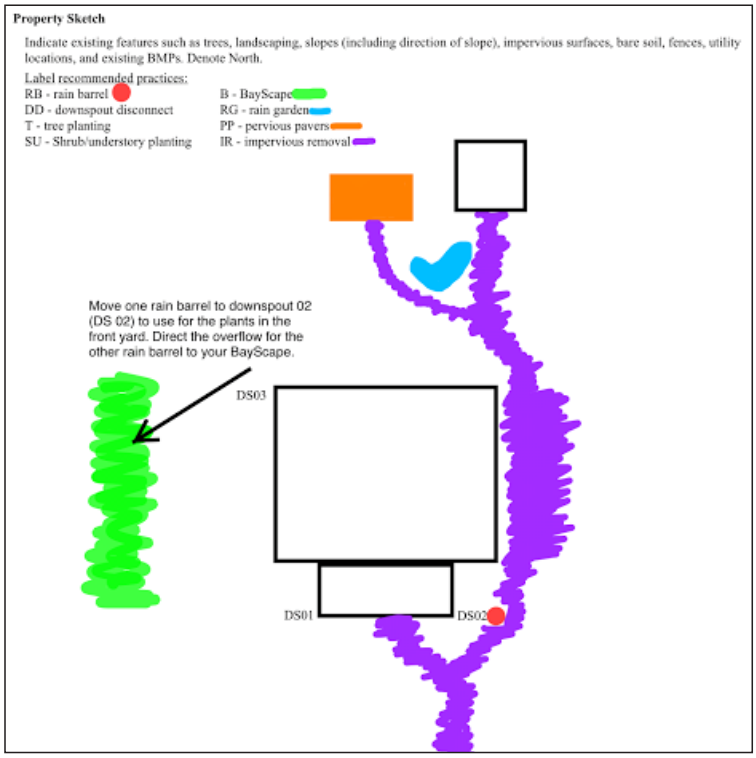


Figure 3.3. An example of a property sketch indicating site conditions and identifying appropriate BMPs.

locations, and recommended locations for structural BMPs. Most importantly, pictures of potential BMP locations should be taken. The pictures can be imported into the report and used to identify which BMPs are most appropriate to recommend. Taking pictures from consistent angles and the exact same perspectives will help the homeowner understand where you are recommending specific BMPs to be placed. When monitoring the installation and verifying the function of the BMPs in the future, you can take pictures from the same angles and perspectives, which will help show the beneficial changes in the environment.

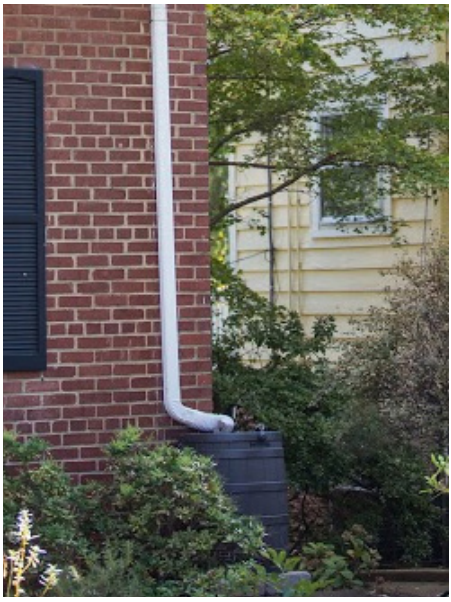
Section 3.4: Assessment Report

Next, the assessor will use the information gathered during the site visit to generate a report to provide to the homeowner. The report should include a cover page of recommendations, observations, and a site sketch. For the RiverWise Program, the assessment form that is filled out on-site with the PDF Expert app is set up to also serve as the report (See Appendix 3B). The assessor needs to keep a copy of the report for the organization's records. Here is a list of potential recommendations along with tips for making these recommendations:

1. Structural Best Management Practices (BMPs - see Chapter 2 for more details)

A. Rain Barrel

- Recommend if there is an area to use the water collected by a rain barrel. This practice is only effective when the homeowner has a regular use for the collected rainwater (watering borders and gardens, washing cars, etc.)
- Determine if a single barrel or multiple barrels would be best, considering the size of the areas draining to the rain barrels.



B. Downspout Disconnection

- Determine if a downspout is connected to an off-site drainage conveyance by pipe or discharge to an impervious surface that flows to the conveyance.
- When disconnecting the downspout, consider the possibility of basement or foundation flooding, yard flooding, and erosion. Always ensure water isn't ponding near the foundation and is directed away from the house.

C. Rain Garden

- Ask the question: *"Will this fix a ponding or flooding issue or will it act as a practice that collects runoff leaving the property?"* The purpose of a rain garden is to collect runoff for treatment in order to improve water quality, not to fix a flooding issue on the homeowner's property.
- Locate the rain garden to capture the runoff before it enters a nearby ditch, storm sewer inlet, or stream. Determine if the rain garden location will have a feasible outlet location.
- Make sure the location is 10 or more feet from adjacent properties, basements and foundations. Do not direct runoff onto a neighbor's property.

D. Tree Planting

- The most important thing to consider when recommending the spot to plant a tree is the mature size of the tree, its impact on overhead and underground utilities, and its potential effect on the aesthetic value of the home when the tree is mature.

- Consider what type of canopy cover would be most appropriate for the area.
- Consider what type of soil conditions are needed for the tree species you are recommending. Trees need specific environments in order to thrive, but they are one of the most cost-effective practices used to reduce stormwater runoff.
- Plant native tree species to provide food and habitat for local wildlife.

E. BayScape

- BayScapes can act as an excellent buffer to treat and reduce stormwater and provide wildlife habitat. The location should intercept stormwater runoff before it reaches an impervious surface that will carry the water to a stream or stormwater inlet.
- Bayscaping is an appropriate practice in ponding or flooding areas. Usually soggy areas have poor infiltration rates or a high water table and are not suitable for a rain garden. Deep roots of native plants in a BayScape will help absorb excess water and eliminate ponding issues.
- Consider placement in areas void or lacking wildlife habitat.
- BayScapes are most beneficial when used to reduce lawn size because it also reduces chemical fertilizer applications and mowing. Locate BayScapes to complement existing gardens and provide habitat to wildlife rather than replacing an existing garden with a BayScape.

F. Permeable Pavers

- Pavers should be placed where they can collect clean rain water, such as drainage from rooftops, to reduce the chance of the pavers being clogged by sediment or dirt.
- Permeable pavers should be located on relatively flat areas and should be replacing an impervious surface such as a patio, driveway or walkway.
- Do not locate pavers within 10 feet of a home foundation or basement. The stormwater that is collected and stored in these systems could cause foundation damage.

G. Impervious Surface Removal

- If the property has any impervious area the homeowner is not using (such as excess parking), recommend the removal of the impervious material to decrease runoff.
- When recommending impervious removal, be sure to also recommend amending the soil and planting a BayScape.

2. Behavior Change BMPs

A. Lawn Care

- Set lawnmower blade height to 2.5 – 4 inches above the ground surface. Taller grass slows the rate of runoff and will produce a deeper, denser root system. This reduces the need for fertilizer applications, creates a healthier lawn faster, and reduces long-term costs.
- Conduct a soil test to determine fertilizer needs.
- If using fertilizer, use slow release fertilizer in small amounts, and only fertilize in the fall.
- Leave grass clippings and leaves on the lawn or sweep them into vegetative beds. Do not

sweep them into streets or storm drains. To reduce the amount of grass clippings, switch to the use of a mulching lawnmower (or add the mulching attachment to the homeowner's existing lawnmower). Leaves and grass clippings act as mulch, trapping moisture and fertilizing the lawn and plant beds.

- Nutrient management plan: A nutrient management plan provides directions to the homeowner regarding how to maintain a healthy lawn while minimizing fertilizer and other nutrient inputs and their associated costs. It may be possible for the homeowner to obtain a nutrient management plan or credit toward the cost of obtaining one through an online application in some jurisdictions. This would be a good opportunity to enroll participants or provide resources to the homeowner.
- More practices can be found at *www.stormwater.allianceforthebay.org and at http://chesapeakestormwater.net/bay-stormwater/baywide-stormwater-policy/urban-stormwater-workgroup/urban-fertilizer-management/*

B. Yard Waste Management

Source: https://www.flickr.com/photos/29388462@N06/4093068316/in/album-72157622651386861/

- Pick up pet waste on a regular basis, especially before rain events. Pet waste left on the lawn can be washed off into nearby streams, causing pollution of local waterways. Pet waste contains bacteria and other pathogens that can cause illness in humans if they come into contact with contaminated streams.
- Wash your car on your lawn so water is absorbed and does not runoff into storm drains or nearby waterways. Consider using biodegradable detergents.
- Avoid using herbicides and pesticides. Plant beneficial plants and herbs that will attract wildlife predators of nuisance pests, such as mosquitos or ticks. For a list of recommendations: *www.nps.gov/plants/pubs/chesapeake/pdf/chesapeakenatives.pdf.*
- Many insects are harmless to people and play an important role in maintaining a healthy lawn or garden ecosystem. However, if there is a problem, then identify the exact pest you have. Consult an expert, since there are many non-chemical alternatives to controlling pests, commonly known as "Integrated Pest Management," or "IPM." Pesticides can infiltrate into groundwater, contaminate drinking water supplies, and severely harm downstream ecosystems if applied incorrectly or unnecessarily. They can also be absorbed into garden vegetable tissue, presenting potential harm when consumed.
- Store all chemicals in a weather proof and leak proof shelter. Do not store paint, gas, oil, fertilizers, etc. on a patio or in your yard. Weathering of containers due to exposure to the elements will cause them to leak, allowing chemicals to get into waterways during storms or filter through the soil into groundwater.

C. Water Use Management

- Use soaker hoses or drip irrigation to target watering and avoid over-watering.
- Water early in the morning or late in the evening to reduce water loss from evaporation, which is more likely to happen in the heat of the day.
- Water thoroughly, making sure plenty of water gets to plant roots.
- One longer watering session per week is better than several short sessions.

Identifying High Priority Sites and Practices

When preparing the report and providing recommendations, the assessor should also include notes about positive aspects of the property and acknowledge any positive homeowner habits. Depending on the needs of the organization or locality performing the assessments, rankings can be used to identify priority sites or practices. These priority rankings could be based on proximity to critical water bodies, amount of runoff leaving property, severity of erosion and other environmental impacts from the property, and other priorities. One example of a priority ranking system is the Center for Watershed Protection's Pollution Severity Index and Restoration Opportunity Index for their Neighborhood Source Assessment, found in the Urban Subwatershed Restoration Manual Series Manual 11: Unified Subwatershed and Site Reconnaissance: A User's Manual (*http://www.cwp.org/online-watershed-library/cat_view/64-manuals-and-plans/80-urban-subwatershed-restoration-manual-series*), which could be adapted to the RiverWise assessment format.

Along with the report (and/or during the assessment), the assessor can provide additional educational materials to the homeowner. For example, the Reedy Creek Coalition provides a packet that includes a watershed report card, a BayScapes guide, a rain barrel brochure, information on upcoming events, and additional printed resources. If there is an incentive program, the assessor should provide to the homeowner information regarding eligibility and the enrollment process (See Chapter 4 for Incentive Program information).

The report should be returned to the homeowner within a week following the on-site assessment (ideally sooner – within a day or two, if using an iPad). It can be sent via email, if the homeowner's email address is available. If not, the report should be mailed or hand-delivered. It is important to offer to review the report with the homeowner and/or provide your contact information so the homeowner can contact you when questions arise.

Section 3.5: Assessment Follow Up

The assessor should follow up with the homeowner to answer any questions about the report recommendations and incentive program enrollment, if applicable. This can be done in person, by phone, or by email, preferably within a couple of weeks of the assessment (again, the sooner the better, in order to maintain the homeowner's interest). If the assessor assigned to the homeowner is not available to do follow-up, then another staff person or intern should conduct the follow-up, rather than delay it for too long.

A follow-up survey sent a few months later can provide valuable information regarding BMP implementation and behavior change (see Appendix 3C for a sample Post-Assessment survey). The RiverWise Communities follow-up survey focuses on the following:

- The assessment process: questions to determine the homeowner's satisfaction with the process, assessors, and information received

- The incentive program: questions to determine the homeowner's satisfaction with the incentive program process as well as the "approved contractors" used to install the practices recommended under this program
- Knowledge and behavior change: questions to assess whether or not the homeowner's knowledge has increased regarding stormwater runoff issues, how to reduce runoff, and how to contribute to improving local watershed habitat; homeowner's willingness to implement or continue to implement practices and change habits also assessed

Section 3.6: Tracking

It is important to track the assessment process in order to make sure each step is being completed in a timely manner. Gathering all the data into one tracking sheet can also help with managing the assessment assignments, reporting to funders, or publicizing the status of the program.

There are a variety of methods for tracking sign-ups, assessment appointments, report follow-ups, enrollment in incentive programs, etc. The two most commonly used methods are as follows:

1. Tracking cover sheet on every report/assessment copy
2. Excel or Access database (RiverWise example is in Appendix 3D)

Tracked Information Should Include:

- Owner's name, address, and contact information (telephone and email)
- Assessor's name(s)
- Watershed address
- Locality
- Dates for each step:
- Received sign-up and pre assessment survey answers
- Initial contact for appointment
- On-site assessment date
- Report sent to homeowner
- Follow-up call/email
- Homeowner enrolls in financial incentive program
- Paperwork received
- BMPs to implement
- Implementation date
- Post-assessment survey distributed and completed

CHAPTER 4
Incentive Programs

Section 4.1: Types of Incentives

Section 4.2: Components of an Incentive Program

Section 4.3: Tips and Lessons Learned

Incentive programs are a great tool for promoting voluntary BMP implementation. These programs can be shaped in a variety of ways, including (but not limited to) the following:

- Providing the public with technical information and advice that's easy to understand
- Recognizing voluntary efforts
- Conducting audits or assessments and providing recommended actions
- Offering utility fee credits or partial payments for the installation of various practices

Federal and state governments have found that offering incentives in the form of partial payments to install practices is very effective. For example, the Virginia Agricultural Cost-Share Program is a successful incentive program which leverages resources offered by the federal and state governments to help local Soil and Water Conservation Districts encourage farmers to install practices on their farms that protect water quality, while helping farmers pay the costs of those practices. Virginia, Maryland, and Pennsylvania all have similar programs that leverage federal and state funds and are administered at the state level. For the purposes of the Chesapeake RiverWise Communities program, this chapter will discuss a variety of options for incentive programs that focus on reducing stormwater pollution on suburban-urban residential properties.

Section 4.1: Types of Incentives

This section will cover three main incentive types that can be effectively used in RiverWise communities programs: (1) Financial, (2) Recognition, and (3) Technical Assistance (see Appendix 4A for a list of programs in the Chesapeake Bay watershed). Financial-based programs provide cost-share or credits for implementing BMPs. Recognition-based programs often include providing flags, signs or placards to homeowners identifying their property as environmentally friendly, holding garden/block parties, and awarding discounts at local retailers. Technical assistance incentives include providing residential watershed assessments, landscape design pallets, and other resources. When developing an incentive program, it is most important to know your target audience and what they need or what will provide the greatest benefit to them, in order to motivate them to take action.

Financial Incentives

A cost-share program covers some of the costs of installing certain BMPs while, in most cases, the beneficiary property owner is responsible for the remaining costs. There are several different cost-share structures that can be used to implement a RiverWise Incentive Program, as outlined in Table 4.1.

Table 4.1. Incentive Program Cost-Share Options

Structure	Description	Example Program
Percentage	Example: Homeowner pays 75% of the cost, while the funding entity pays 25%.	Arlington Stormwater Wise, Chesapeake RiverWise Communities
Caps	Homeowner pays a nominal enrollment fee. Funding entity pays 100% of the costs associated with a BMP as long as it is under a certain cap. The cap could also be based on a per property basis.	RiverSmart Homes
$ per sq ft treated	Funding entity pays a certain dollar amount per square foot of impervious surface that is treated. For example, $1.25 per square foot of impervious treated for a rain garden.	RiverSmart Rebates
Materials only	Homeowner pays design and installation costs or does the design and installation. The funding entity pays for materials via invoice from the contractor or invoice/reimbursement request from the property owner.	

Though this table provides a framework of varying cost-share structures, it is important to remember that any one of these examples may be adjusted to your program's specific needs and circumstances. Some structures can be combined; for example, Chesapeake RiverWise Communities provides a 75% cost-share of up to $1,500 for installation of a rain garden, combining the percentage and cap structures. Teaming up with local partners, such as watershed groups or interested businesses can significantly drive down the property owner's final costs.

Many localities provide credits against stormwater utility fees for homeowners who implement BMPs to reduce and/or treat stormwater runoff. Check with your local government, Soil and Water Conservation District, or local watershed organization to find similar programs in your region. The following are links to some example programs from across the Chesapeake Bay watershed:

- Lynchburg, VA: *http://www.lynchburgva.gov/stormwater-credit-program*
- Richmond, VA: *http://www.richmondgov.com/PublicUtilities/StormwaterCredits.aspx*
- Charlottesville, VA: *http://www.charlottesville.org/Index.aspx?page=2308*
- DC - RiverSmart Rewards: *http://green.dc.gov/riversmartrewards*
- Montgomery County, MD: *http://www6.montgomerycountymd.gov/dectmpl.asp?url=/content/dep/water/credits.asp*

Recognition Incentives

Recognizing homeowners for doing their part to restore and protect local waterways is another great incentive. Forms of recognition can be "member cards", yard flags, and decals. Recognition can also be a way to promote the program and BMP implementation to neighbors and the rest of the community. As part of the recognition, one could provide discounts to local nurseries to encourage continued implementation of practices. Many nurseries will provide discounts on plants and even plant "palettes" if a customer provides information verifying that they are a participant. As you may increase sales by directing traffic to the nursery, they may offer wholesale or discounted prices to program participants.

Example of recognition programs include:

- RiverHero Homes: *http://www.jrava.org/what-we-do/river-hero/*
- Pearl Homes: *http://www.lynnhavenrivernow.org/Pearl-Homes.aspx*
- River Star Homes: *http://www.elizabethriver.org/RiverStars/default.aspx*

Technical Assistance

Some property owners may have the financial resources to implement a practice but do not have the technical expertise, so the process may seem overwhelming to them. Provision of technical assistance can be an incentive for these homeowners to bridge the gap and install BMPs. This type of assistance can come in the form of RiverWise Assessments (see Chapter 3), a service that provides valuable information and can improve the homeowner's environmental awareness and lead to cost savings. Workshops focused on BMP design and installation and native plant selection are also valuable tools for homeowners. Design and/or construction assistance may be enough to gain a project commitment. Other homeowners may only need help in designing a landscaping feature and choosing a plant palette, so providing the homeowner with a BayScape plan and options for choosing appropriate plants can help as well.

Section 4.2: Components of an Incentive Program

Set Program Goals

Before you begin marketing your incentive program, you must determine what the goals of your program are, and what resources are available to help reach these goals. Clearly-defined program goals will result in clearly-defined project selection criteria. If you know that you want to control stormwater volume, but limited financial resources, it will be more cost efficient to focus on runoff reduction practices (e.g., rainwater harvesting, bioretention/rain gardens, etc.), than removing impervious pavement and installing pervious paving systems; paving systems

are not only expensive to install, but would require additional demolition funds, resulting in higher maintenance costs. Two common approaches to selecting projects are:

1. ***First-Come/First-Served:*** The easiest method is to allow all property owners with a property assessment to enroll in the financial incentive program on a first-come/first-served basis. This method is best used where all potential projects are seen as equally beneficial in achieving environmental goals.

2. ***Rank and Prioritize:*** This method may be more appropriate where your program values certain project types or geographic locations more than others or there are limited funds and high demand. After conducting the assessments, prioritize each project according to how well each contributes to the overall program goals and notify the homeowner that their property is eligible for the incentive program.

Prioritizing projects is not as easy as the first-come/first-serve method but it offers an approach that will result in the largest water quality improvement impact for your dollar. Suggested prioritization variables include (but are not limited to):

- Proximity to a stormwater conveyance system or surface water body
- Priority watersheds (such as those with impacted waters or identified in local restoration plans)
- Homeowner actions (invasive species removal, signing a pledge, etc.)
- Approximate runoff reduction
- Amount of impervious surface treated
- Slope severity
- Erosion potential
- Habitat improvement
- Neighborhood density

Your organization should choose the variables most important for your program and use them to rank each property. In the RiverWise Program, we take into account the property's contribution to stormwater pollution and wildlife habitat.

Identifying BMP Locations – Watershed Protection Assessment *(See Chapter 3)*

For most financial incentive programs, a watershed protection assessment should be completed before enrollment. The assessment educates the homeowners, gives them an understanding of the various practices and where they may be located, and familiarizes them with your program. It will also provide recommendations regarding which BMPs are appropriate for their property. Chapter 3 provides complete guidance regarding assessment protocols.

Enrollment

Staying organized regarding homeowner enrollment and progress throughout the project is vital to the success of the program. Many components of enrollment will be covered within this section but, as technology changes, so should your approach. In Chapter 1 (Engaging Communities), we discuss

what form of marketing works well for specific types of people. Getting to know the community where you are working will help you choose the right tools to reach them.

Since location is so important when installing stormwater practices, it is useful to develop a strategic approach to enrollment well in advance. There are many ways to promote your program and increase enrollment, so knowing your constituents is the first step to success. Once you know the target audience you are trying to enroll in the program, you can customize your efforts to meet the audience's needs.

Enrollment Forms

To enroll in the incentive program, whether it's a financial incentive or recognition program, you should get the homeowner to submit two forms to your organization to show a commitment to installing and maintaining the BMPs on the property. These forms include:

1. ***Enrollment Form:*** For a financial incentive program, the enrollment form would include a list of the practices the program approves and payment information regarding enrollment fees. Consider charging a "buy-in" fee (or deductible) for the homeowner to install the stormwater BMPs on the property. This enrollment fee provides a couple of benefits:
    - a way to ensure an "investment" from the participants, which can have a positive impact regarding long term maintenance.
    - can generate revenue to support program administration.

    For a recognition program, property owners should provide documentation of their BMP implementation (structural or behavioral BMPs). The necessary documentation (photos, site sketch, plans, etc.) is specified by the organization managing the recognition program.

2. ***Partnership/maintenance agreement:*** To ensure cooperation of the property owner and continued functionality of the structural BMP, a partnership and maintenance intent agreement must be signed by the property owner and submitted to your organization. A maintenance agreement is a contract between the property owner and your organization that spells out the responsibilities of all of the parties involved. Your organization should verify that the homeowner clearly understands all maintenance responsibilities and provides the necessary resources to accomplish them. This agreement should be reviewed carefully with the homeowners to make sure they understand their commitment and responsibilities. See Appendix 4B for an example agreement.

Maintenance Agreements

Maintenance of the installed practices is essential for long lasting, functional BMPs. If the BMP is not maintained, there is a strong likelihood that the BMP will fail to function, which can harm local water quality as well as cause other problems for the homeowner. For this reason, you should have the homeowner submit a signed maintenance agreement for the practices involved before any funds are allocated to the project (see enrollment forms). You should also provide a maintenance schedule and associated resource list that clearly explains the property owner's responsibilities. Maintenance agreements are the insurance policy for your water quality investment.

Investing thousands of dollars in a permeable paver system that fails within a year is a poor allocation of funds, and could reflect poorly on your organization.

A maintenance agreement also gives the program organizers the legal ability to act if a property owner is negligent in maintaining the BMP(s). It also is important to develop a plan if the maintenance agreement is not followed and you must take action. Other issues to address in the plan include how to provide continuity of responsibility when the property changes hands, and how far will your organization go to pursue a breach in the maintenance agreement. These kinds of concerns must be considered before the program becomes operational, and the specific considerations will be unique to each individual program.

The maintenance agreement will most likely be required by local government stormwater management programs, if the BMPs are reported to meet pollution reduction targets required by the States and the USEPA. For example, localities operating under Municipal Separate Storm Sewer System (MS4) permits may already have or may be developing Stormwater Utility Programs that charge property owners a fee to cover the costs of cleaning up stormwater. However, many localities are offering reductions in that fee if the property owner voluntarily reduces impervious surface or otherwise treats stormwater. However, they want evidence that the property owner is correctly maintaining the practices they've installed. These maintenance agreements will, therefore, be useful to the organization running the incentive program, to the homeowner, and to the locality. See Appendix 4B for the RiverWise Maintenance Agreement.

Plan Submission and Review

A plan and an estimated budget prepared by the homeowner or contractor should be submitted for review by the organization before project funding is awarded. The plan should show the BMP specifications and its location. Recommendations of practices covered under the financial incentive program should be provided during the assessment, so the plan preparers can take advantage of incentive opportunities.

To help simplify and streamline plan submission, we recommend using a design guide for the BMPs. Design guides help designers and homeowners determine the correct sizing of BMPs and standardizes associated calculations for easier and more efficient review and reporting. The Center for Watershed Protection's "*Residential Stormwater BMP Design Manual*" provides general design information for residential BMPs. Other sources of design guidance include the Chesapeake Stormwater Network's *Homeowner Guide for a Bay-Friendly Property* and the Virginia Conservation Assistance Program's *Implementation and Design Manual*. For our RiverWise program, we have also

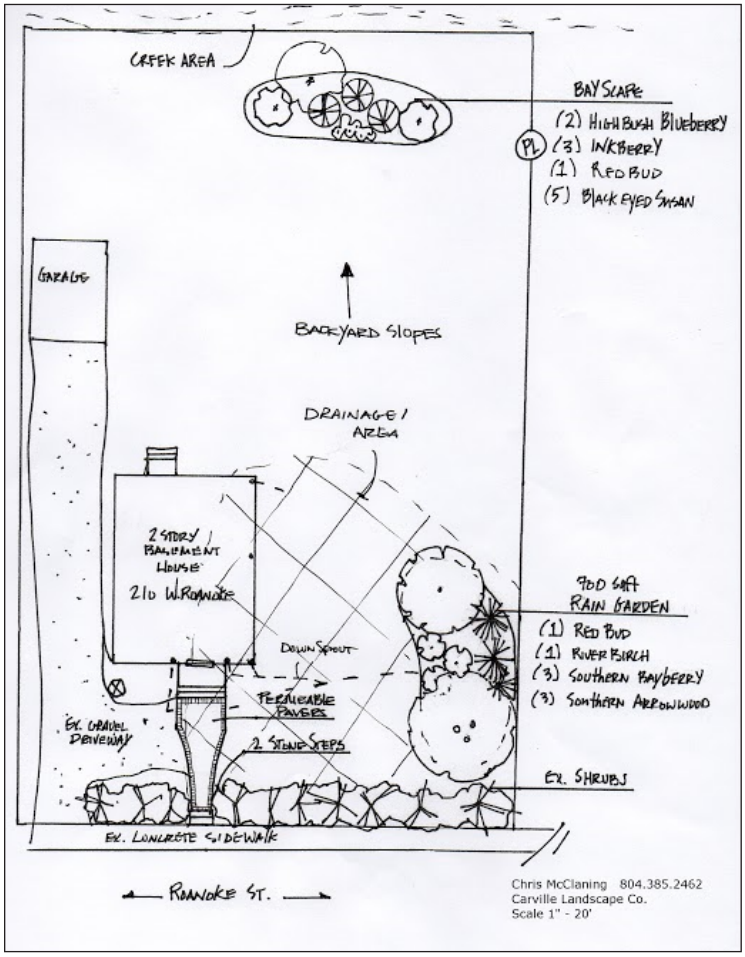


Figure 4.2. An example of a planting plan, included in the site plan, showing the BMP location and plant options.

developed a homeowner rain garden calculation worksheet and standardized BayScapes design templates to help streamline the design process *(Appendix 4D and Appendix 4E)*.

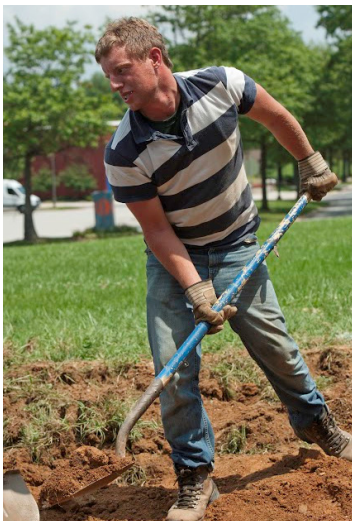
It is very important to study these plans carefully, since improperly placing BMPs can lead to property damage, basement flooding, right-of-way disruptions, or other unintended consequences. Consider developing a plan review checklist and guidelines to ensure that plans are checked thoroughly, consistently, and efficiently.

When reviewing the plan, make sure all BMPs follow the applicable design guidelines. Most inconsistencies are spotted during the plan review process. Taking the time to review the plan, correct errors and educate the homeowner or contractor before any earthwork is done will avoid costly mistakes and problems during construction. Upon verifying that the plans are consistent with the program guidelines and requirements, your organization should provide written approval to schedule project implementation. This series of checks and confirmations will help ensure program success.

Installation

Some incentive programs may require professional or certified contractors to install BMPs, while other programs may offer to finance the cost of materials but not labor. Other financial incentives reward homeowners who install BMPs themselves. Some combination of these methods may be the winning formula but, in the end, the program requirements should be based on the complexity of the projects, funding available for contractors, installation demands of specific BMP types, and the abilities of the targeted audience. Your financial incentive program will determine which groups are ultimately responsible for installation.

1. ***Homeowner installation / "DIY":*** The long term success of the installed BMPs is directly tied the continual maintenance and care of the practices. Homeowners who install their own practices are more likely to achieve a sense of personal connection to the project, leading to long term behavioral change and commitment to maintenance. Homeowner installation is much cheaper than hiring private contractors, which will save your program money and increase the number of BMPs your program can install. If you elect to incentivize "do-it-yourself" installations, your organization should provide technical assistance throughout the construction process. Some homeowners may opt to hire a contractor at their own expense, at which point your organization should provide recommendations. The downside to this method is a lack of quality control and installation timing and scheduling.



Homeowner DIY Installation

Volunteer Installation

2. ***Volunteer / organizational installation:*** Some residential BMP programs are organized so the sponsoring organization installs the BMPs. In this case, financial incentives are often directed toward BMP installation materials. Recruiting volunteers and interns will help make this process faster and provide a multitude of educational opportunities. From an organization's perspective, this method provides the best quality control of both the process and the BMP going in the ground. However, resource availability may be a limiting factor.

3. ***Professional contractor:*** Paying for a professional contractor to install the BMP(s) may cost your organization the most money, but it will save your organization time and result in professionally installed BMPs. Some contractors may provide reduced costs with assurance that your organization will be a returning customer for the duration of your program. However, you will want to do a reference check via other watershed/conservation organizations in your area to determine which contractors have sufficient experience and whether they may have associated certifications to do this kind of work. Soon there will be a Chesapeake Bay Landscaping certification program (www.chesapeake landscape.org/our-programs/landscape-professional-certificate).

While piloting the RiverWise program, we used two different methods to identify and hire contractors, and we found both to be effective. One method requires contacting sources such as landscaper associations for lists of local contractors, then inviting those contractors to a workshop. The workshop is an opportunity to inform potential contractors of our program's process expectations. They can then decide if they want to be a "RiverWise contractor." Those who agree are placed on a list for assignment to enrolled homeowner properties. See Appendix 4F for the forms we used to enroll contractors in our program.

The second method we used was to issue a request for bids in order to find a qualified contractor who could install BMPs at a low cost. The selected contractor would be used for all enrolled properties. While both methods worked, the latter method was used for a smaller number of installations, since only one contractor was used.

These three options must be weighed when choosing the financial incentives that are most appropriate. The incentives should reflect your organizational goals and available resources. Regardless of the approach, it is essential to help homeowners form a cognitive connection between their land and their watershed to ensure long term success of the project.

Inspection and Verification

Whether a homeowner is installing a rain garden for the first time or it is the fiftieth installation by a contractor, it is important to check on the project as it is being installed. Confirm that financial incentives have been used appropriately. While installing stormwater BMPs is not overly technical, they do need to be installed according to plans and specifications. One mistake can lead to a failing BMP, resulting in additional costs for the property owner and the program organization, not to mention an unsatisfied homeowner and a tarnished reputation for the program. Once the plan has been approved, a qualified staff member or organization representative should inspect the project during and after installation. Requesting advanced notice of project installation at the time of plan approval is a good way to determine when to schedule inspections. Once the final inspection has determined everything was done properly, recognition incentives can be distributed as promised.

Long-term inspection and verification protocols are outlined in Chapter 5. These protocols will help determine the effectiveness of the incentives and success of your program. This follow-through will also provide insight regarding needed changes to improve the program.

Section 4.3: Tips and Lessons Learned

Program Education

The keys to a high functioning program are education, communication, and understanding. Both the homeowner and the contractor must know exactly what the financial incentive will cover and understand the environmental purpose of the project and the overall program. Preparing written guidelines will help educate program participants and provide records for future reference. A strong financial incentive structure and open communication with participants will help streamline funding administration. Inform homeowners about exactly how much they will contribute to installation costs, before they agree to participate. Please see the RiverWise Financial Incentive Program Guidance provided in Appendix 4C.

Contractor Tips

Installing the stormwater BMPs on a residential property can be very labor and time intensive. A trained contractor has the skills and equipment to design and install the practice correctly and efficiently; however, the cost of the project can go up dramatically, compared with the cost of homeowners installing the practice(s) themselves. Here are some tips for working efficiently and effectively with contractors:

- Issue a request for qualifications/bids to see which contractors are qualified and interested in doing the work.
- Contractors with a background in erosion and sediment control and/or stormwater management should be sought out, if affordable.
- Interview prospective contractors and be selective. Program participation is not for all contractors. Ask contractors why they want to be involved in your program. Work with contractors having shared interests with your program.
- Work with contractors who have a demonstrated history of doing similar work, have a proven track record, and are trained and/or certified designers and installers of the proposed BMPs.
- As necessary, train contractors on your program requirements and purpose.
- Schedule pre-construction meetings between the property owner and the contractor to explain the construction process, the homeowner responsibilities, and the contractor responsibilities. Someone from your organization should attend, if possible.
- Talk to contractors frequently during project installations, and make site visits to see their work and ensure it is being done correctly.
- Ensure *contractors are doing what the property owners want, consistent with their agreement with your organization, NOT simply what is good for the contractor's bottom-line.

  *For tips on training contractors, refer to Chapter 6.

Contractor Assignment

If necessary, your organization my assign specific properties and projects to different contractors. This can facilitate scheduling and the flow of the program during an installation-heavy period. If using this approach, project costs must be standardized between contractors so the homeowners are confident they are receiving a fair and equitable price from whichever contractor is providing

services to them. It is up to your organization to determine costs after inquiring amongst all contractors involved.

If contractor costs exceed the incentive cap, require the contractor to specify pricing before installation begins. Any difference between the cost and available funding will have to be paid by the homeowner, if they agree to do so. A homeowner should be willing to invest in their project; however, specific costs should be discussed at the very beginning to avoid cancellations late in the process that result in wasted resources for all parties involved.

Project Scheduling

Most of the practices used on residential properties have planting materials as a design component of the BMP. The successful long-term function of practices is directly related to the condition of plants. For this reason it is best to schedule your project implementation and assessments seasonally. Although it is possible in the southern end of the Chesapeake Bay Watershed to plant in winter, plants have a better chance of survival if planting occurs in fall and early spring. Fall planting gives plants time to establish deeper root systems before the heat of their first summer, limiting stress on the plant. Fall plantings may not provide instantaneous aesthetic value, but they will have a high rate of survival. Spring is also a great time to plant because folks are in the mood to garden and many plants are flowering, showing the homeowner and neighborhood the beauty of the BMP. Avoid summer planting since plants are most stressed by drought and heat at that time of year. If your project is funded by a grant, schedule your installation during seasons that will help plants survive and thrive. Regardless of when plants are installed, it is necessary to water and care for them during the first full year. Be sure homeowners understand the care and watering needed to ensure the survival of their new plants.

CHAPTER 5
Verification

Section 5.1: Why Verify?

Section 5.2: Verification Methods

Section 5.3: Personnel

Section 5.4: Frequency

Section 5.5: Project and Tracking

Section 5.1: Why Verify?

Remember that the ultimate goal behind implementing homeowner BMP programs is to improve local water quality and watershed health. Ensuring the practices and behavior changes produced as a result of your program are maintained over time will validate your organization's efforts and be useful in securing funding for future efforts. BMP performance verifications confirm that the BMPs have been properly installed and continue to function correctly. There are a number of methods to verify BMPs. The technique used for your program will depend on your organization's available resources and the outcome(s) you desire from the verification process.

There are two verifications associated with the acceptance, long-term functionality, and crediting of residential BMPs. The test is whether or not a BMP passes a list of visual indicators shown in Tables 5.1-5.10.

BMP Initial Verification

This verification is performed to initially verify that the BMP was installed correctly, is in the correct location, meets or exceeds the BMP design standards, and will function as designed. Inspection should occur shortly after installation is complete, and ideally during a runoff producing rain event. This method confirms the BMP functions correctly.

BMP Performance Verification

This verification is performed periodically to ensure the BMP still exists and is still providing the pollutant reduction it was originally designed to achieve. Although the average frequency for this inspection is 5 years, the frequency can range greatly and is better described in section 5.4 of this chapter.

There are several reasons a residential stormwater BMP needs to be verified. If a locality or watershed organization offered incentive money for the BMP installation, they need to confirm that the proper practice was installed in the correct location, per the design, and is functioning properly before the incentive reimbursement is provided to the property owner. The entity financing the project needs to verify that their funding was used consistently with the funding agreement.

Verification is also necessary in localities that require a stormwater utility fee but offer credits (fee reductions) for BMP projects. Programs may offer utility fee credits to property owners for reducing and/or treating the stormwater on their property. These projects help localities meet their state and federal stormwater permit requirements. To receive credits, or a reduction in the utility fee, the installed BMP must be verified and reported to the locality to ensure it meets the BMP design and installation specifications and continues to function as designed, along with any other requirements the locality mandates.

If the practice meets the verification minimum standards during the BMP's Initial Verification, the locality can report the BMP and its associated pollutant removals for credit toward state/local Chesapeake Bay TMDL pollution reduction targets and MS4 permit requirements. Some of the information required for reporting may include the BMP classification, geographic location, contributing drainage area, and year of installation. (USWG, "Final Recommended Guidance for Verification of Urban Stormwater BMPs," January 6, 2014).

After the BMP is reported, it assumes a pollutant load reduction and is maintained until the BMP Performance Verification is conducted after 5 years (or perhaps less, depending on the locally established schedule). During the BMP Performance Verification, if the BMP meets visual indicators

showing it is still achieving the prescribed pollutant removal, the information is documented by the watershed organization or locality and may be transmitted to the state stormwater BMP reporting entity. This information can therefore be submitted to the Chesapeake Bay Program for credit toward implementing practices that help the state meet TMDL Phase II Watershed Implementation Plan requirements. For more information on the Chesapeake Bay TMDL and related requirements, visit http://www.epa.gov/chesapeakebaytmdl.

If the BMP Performance Verification determines the BMP is no longer functioning as intended or removing the prescribed pollutant load, the inspector should provide the owner directions for necessary maintenance or rehabilitation of the BMP. A reasonable time-frame should be assigned to accomplish the corrective action. Following the corrective action, an additional BMP Performance Verification will document that the BMP is again functioning per design, and the BMP can continue to receive the load reduction or credit originally assigned. If corrective action is not taken in the given time-frame, the BMP forfeits the assigned pollutant reduction credit and the inspection results are reported to the correct reporting entity. Corrective action at a later date may be reported, and the BMP may once again receive the credit.

Section 5.2: Verification Methods

Verification methods will depend on your program needs. For instance, a locality seeking stormwater reduction credits in the Chesapeake Bay Program Model may desire a more thorough verification process that may include on-site inspections during construction, photo documentation, a BMP Initial Verification, and periodic BMP Performance Verifications over the life of the BMP. Alternatively, a non-profit with fewer resources, simply attempting to improve local water quality, may only require post-installation photos with specific quantifiable measurements included. Regardless of method, it is important to verify that a BMP was installed correctly and the information gathered/reported is consistent from project to project.

BMP inspection and verification can be done by anyone with proper training. The remainder of this section describes the main criteria to be checked for various homeowner BMPs following installation. It is best to complete the post-construction BMP Initial Verification following a storm event, so any functional problems can be observed with the BMP under operational conditions.

As you verify each practice, record the Initial Verification and Performance Verification processes for reporting and tracking purposes. The criteria for each BMP can be organized as a form to be completed by an inspector or volunteer, enabling a quick and thorough inspection. Chesapeake RiverWise Communities has created a number of verification forms that can be filled out on a tablet computer or as hard copy forms (Appendix 5A provides an example).

There are many examples of BMP Performance Verification forms in the Bay region. In some cases a photograph with visual indicators will be enough to verify the BMP is still in place and functioning. These photos should be of the visual indictors listed below and should also include a date and location. It can be useful to use a whiteboard within the photograph to document site specifics. It is always helpful to take photos of the given BMP from the same distance and angle over time to give perspective and show BMP transformations.

The verification process should answer the following questions (USWG, "Final Recommended Guidance for Verification of Urban Stormwater BMPs," January 6, 2014):

- Does the practice still exist? If it still exists, does it still capture runoff from the intended drainage area and land condition?
- Does the practice still operate to reduce runoff as originally designed?
- Does the BMP's maintained condition still support its pollutant reduction function?

We recommend that you customize the verification criteria to match your specific program needs. For example, you may not need to show proof of soil amendments under the BayScape visual indictor criteria if the information is used by a locality and soil amendments are not required. Alternatively, if your program offers financial incentives like Chesapeake RiverWise Communities, and the program funds soil amendments, inspection should verify that soil amendments were incorporated correctly.

Programs with sufficient resources may be able to send a volunteer, intern, or paid employee to continually verify functionality. Continued, periodic inspection is the preferred method, providing a greater level of trust in data collected. This method ensures personnel can follow the verification process described in Section 5.2 above, in addition to verifying in the field that practices are being properly maintained by caring for vegetation, removing of trash and debris, unclogging infiltration practices, and addressing any other problems that arise.

If the on-site verification method is used, contact the homeowner to request access to the property. Access rights can be inserted into the signed maintenance agreement, but contacting the homeowner before a site visit is always an appropriate courtesy and is strongly recommended.

Verification Tools and Equipment
Survey equipment
Measuring tape or wheel
Ruler and/or yard stick
Shovel
White board and dry erase
Digital camera
Plant ID sheet
Site plan/design and plant list

BMP Initial Verification Visual Indicators

Table 5.1. BMP Initial Verification Visual Indicators: Trees & Shrubs

Trees and Woody Shrubs		
#	Visual Indicator	Description
1	Species	Verify the trees and shrubs installed are the same variety shown on the plan.
2	Quantity	The number of plants should match the design and plant order.
3	Size	Check the tree or shrub in diameter, height, or pot size (gallons) to determine if the appropriate sizes of trees and shrubs were planted.
4	Location	Are the plants in the location specified on the plans?

Figure 5.1. BMP Initial Verification Visual Indicators Present: 1, 2, 3, and 4

Table 5.2. BMP Initial Verification Visual Indicators: BayScape

BayScape (Conservation Landscaping)		
#	Visual Indicator	Description
1	Plant species	Confirm the variety of plants specified within the planting scheme were planted (many programs may require that native plants are used).
2	Plant quantity	Count the number and variety of plants within the practice. In some instances it may be appropriate to check plant survival at the end of the growing season.
3	Plant size	Determine if the plants used within the BayScape are representative of the size plant specified within the design criteria. Pot size, height, diameter and caliper are all used to determine size.
4	Area(ft^2) of the bed	Measure the square footage of the BayScape.
5	Bed location	Verify the Bayscape is located in the area agreed upon.
6	Mulch layer depth	Confirm a mulch layer of 1”-3” is present.
7	Depth of bed (if applicable)	BayScapes have the capability to remove a significant amount of runoff from overland flow. Sinking a BayScape a few inches can result in increased runoff reduction.
8	Soil amendments present (if applicable)	If soil amendments were specified within a plan, are there signs that amendments were added? It may be easiest to ask for a receipt verifying purchase of the amendments.

Figure 5.2. BMP Initial Verification Visual Indicators Present: 1, 2, 3, 4, 5, and 6

Table 5.3. BMP Initial Verification Visual Indicators: Rain Barrel

Rain Barrels		
#	Visual Indicator	Description
1	Quantity & Location	Verify that the rain barrels specified on the plan are located at the correct downspouts.
2	Connected & Functional	Check the connection to determine if each barrel is connected, includes all of the parts, and is properly functioning.
3	Size	Rain barrels can fill up quickly. This can be determined by the size of the rain barrel and roof drainage area to it. Verify the volume of the system.
4	Functional overflow	Overflow to a vegetated area away from the home's foundation should be in place and functioning.

**Rain barrels should only be verified or inspected during the growing season. In most cases the rain barrel should be disconnected before the first frost to prevent winter damage.*

Figure 5.3. BMP Initial Verification Visual Indicators Present: 1, 2, 3, and 4

Table 5.4. BMP Initial Verification Visual Indicators: Permeable Pavement/Pavers

Permeable Pavement Pavers		
#	Visual Indicator	Description
1	Size and location	Verify that the pre-existing materials at the specified location were removed and the new PP system (ft^2) size is correct.
2	Clean water connection	Determine if downspout(s) specified in the plan are connected correctly to the PP system.
3	Depth of system*	Verify through on-site inspection or photos that the excavated depth of the PP system meets design standards.
4	Base stone depth and *composition	Check the size of washed stone and stone depth for each layer of the stone reservoir.
5	Pavement/Paver material	Check the surface materials used to determine if the correct material was used and installed correctly.
6	Paver gap width (if applicable)	Measure the width between the paver gaps to verify the pavers are spaced correctly.
7	Flow Test	Run a flow test or "flood" the system to verify the PP system infiltrates water effectively.

**If the inspector or volunteer is unable to be available during construction of the permeable pavement/paver system, the buried stone layers and depths may be verified by photo documentation.*

Figure 5.4-1. BMP Initial Verification Visual Indicators Present: 1, and 3

Figure 5.4-2. BMP Initial Verification Visual Indicators Present: 1, 5, and 6

Figure 5.4-3. BMP Initial Verification Visual Indicator Present: 7

Table 5.5. BMP Initial Verification Visual Indicators: Rain Garden

Rain Gardens (RG)		
#	Visual Indicator	Description
1	RG Location	Verify that the RG location is correct as described in the plan and will receive runoff from the intended contributing drainage area.
2	Soil media depth	It is recommended to check the depth of the RG before the soil media is installed. Also check the soil media depth of the RG to ensure it meets the required design criteria.
3	Size (Surface Area or SA)	The SA of the rain garden is determined based on the area draining to the rain garden. It is important to confirm the correct RG SA was installed, as it will determine the treatment volume and pollutant removal of the practice.
4	Ponding Depth	Confirm the ponding area of the RG by measuring the height between the top of the mulch layer or surface of the RG and the lowest point of discharge from the RG.
5	Side slope, mulch, and media erosion	After monitoring the performance of the RG, inspect the side slopes, mulch, and soil media for erosion. If erosion is found initially, it most likely will not stop on its own and no solution to the erosion may be needed.
6	Soil media composition	Verificaton of the RG soil media can be completed in a number of ways, based on the programmatic preference: 1. Check receipts of materials used in the soil media. 2. Take a soil sample. 3. Conduct an on-site visual and texture analysis.
7	Mulch layer	Confirm a 1”-3” mulch depth within the RG.
8	Overflow	Verify that an overflow is in place and is constructed per the design.
9	Inlet	Verify the inlet to the RG is stabilized with the planned material (stone, sod, etc.), is in the correct location and is not eroding.
10	Plant species, size, and quantity.	Please use Visual Indicators 1, 2 and 3 in the BayScape table above.
11	Piping size and placement[1]	Confirm the correct type and size pipes are/were installed correctly per the plan.
12	Stone sub-base[2]	Verify that the stone sub-base layer was installed with clean stone of the correct size at the required depth.
13	As-built completion	It may be required to complete an as-built plan after completion of the RG. See the RG as-built worksheet in Section 5.5 below
14	Standing Water	Check two days after a large rain event to ensure that no standing water is present in the RG.

[1]If the Rain Garden includes an underdrain or piping system bringing water to the rain garden.

[2]Only applicable if the rain garden is designed to include a stone layer.

NOTES: Either conduct an inundation test, or wait until after the first runoff producing rain event to conduct a final inspection or performance verification. Also, iIf the inspector or volunteer is unable to visit the-site for verification, photos containing relevant information can be submitted as a substitute.

Figure 5.5-1. BMP Initial Verification Visual Indicator Present: 9

Figure 5.5-2. BMP Initial Verification Visual Indicators Present: 2, 3, and 11

Figure 5.5-3. BMP Initial Verification Visual Indicators Present: 1, 3, 4, 5, 7, 8, 9, and 10

Figure 5.5-4. BMP Initial Verification Visual Indicator Present: 14

BMP Performance Verification Visual Indicators

Table 5.6. BMP Performance Verification Visual Indicators: Tree and Woody Shrubs

Trees and Woody Shrubs		
#	Visual Indicator	Description
1	Species	Verify the trees and shrubs installed are the same varieties shown on the plan.
2	Quantity	The number of plants should match the design and plant order.

Figure 5.6. BMP Performance Verification Visual Indicators Present: 1 and 2

Table 5.7. BMP Performance Verification Visual Indicators: BayScape

BayScape		
#	Visual Indicator	Description
1	Plant species	Confirm the variety of plants specified within the planting scheme were planted (many programs may require that native plants are used).
2	Condition, Cover and maintenance	Are the plants being maintained, thinned and pruned? Do they provide the cover originally planned for?
3	Area(ft^2) of the bed	Measure the square footage of the BayScape.
4	Bed location	Verify the Bayscape is located in the area agreed upon.
5	Mulch layer depth	Confirm a mulch layer of 1”-3” is present.
6	Depth of bed (if applicable)	Verify that the depth of the bed has not been filled in and still exists.

Figure 5.7.a. BMP Performance Verification Visual Indicators Present: 1, 2, 3, 4, and 5

Figure 5.7.b. BMP Performance Verification Visual Indicators Present: 1, 3, 4, 5, and 6

Table 5.8. BMP Performance Verification Visual Indicators: Rain Barrel

Rain Barrel		
#	Visual Indicator	Description
1	Quantity & Location	Verify that the correct number of rain barrels is connected at the correct downspouts, as specified.
2	Connected & Functional	Check the connection to determine if it is installed correctly, includes all of the parts, and is properly functioning.
3	Size	Verify the volume of the system.
4	Functional overflow	Verify that an overflow to a vegetated area away from the home's foundation is in place and functioning properly.

NOTE: Rain barrels should only be verified or inspected during the growing season. The rain barrels should be disconnected before the first frost to prevent winter damage.

Figure 5.8-1. BMP Performance Verification Visual Indicators Present: 1, 2, 3, and 4

Figure 5.8-2. BMP Performance Verification Visual Indicators Present: 1, 2, 3, and 4

Table 5.9. BMP Performance Verification Visual Indicators: Permeable Pavement/Pavers

Permeable Pavement/Pavers (PP)		
#	Visual Indicator	Description
1	Size and location	Verify that the installed materials still exist in the specified location and the PP system (ft^2) size is correct.
2	Clean water connection	Determine if the downspout(s) connection is still in place and maintained.
3	Pavement/Paver material replacement	If there is damage to the surface materials, has that damage been repaired?
4	Maintenance	Is the practice being maintained per the maintenance schedule provided?
5	Flow Test	Conduct a flow test or "flood" the system to verify the PP system infiltrates water effectively.
6	Ponding	Check for ponding on the surface of the system (an indication of clogging).

Figure 5.9. BMP Performance Verification Visual Indicators Present: 1, 2, 3, 4, and 6

Table 5.10. BMP Performance Verification Visual Indicators-Rain Garden

Rain Gardens (RG)		
#	Visual Indicator	Description
1	Size and location	Is the rain garden still in place with the designed surface area?
2	Caking	Is sediment caking on the surface, restricting infiltration?
3	Ponding Depth	Verify that the ponding depth meets the design criteria and has not been filled.
4	Side slope, mulch, and media erosion	Check the RG for erosion and take appropriate measures to stabilize the practice.
5	Mulch layer	Confirm that a 1”-3” mulch depth exists and is not clogged with sediment or subject to sediment “caking”
6	Overflow	Verify that an overflow is in place and is constructed per the design.
7	Inlet	Verify the inlet to the RG is stabilized and the RG is still positioned to collect runoff from the intended contributing drainage area.
8	Condition, Cover and maintenance	Are the plants being maintained, thinned and pruned? Do they provide the cover originally planned for?
9	Downspout connection and piping	Confirm that the downspouts are still directing the intended drainage to the RG and the associated piping, and underdrain are still in place and functional.
10	As-built completion	It may be required to complete an as-built during the periodic verification process.

Figure 5.10-1. BMP Performance Verification Visual Indicators Present: 2 and 8
Source: CSN, Bioretention Illustrated, July 30, 2013

Figure 5.10-2. BMP Performance Verification Visual Indicators Present: 2, 5, and 8

Section 5.3: Personnel

Another important component of the verification process is the personnel and resources required to conduct the work. Some programs may use volunteers such as Master Gardeners to verify the BMPs, while others may have sufficient staff resources to do the job. Both personnel methods have advantages and disadvantages, and the choice should be determined by organizational resources available.

At this time there is no Chesapeake Bay watershed-wide training certification that qualifies an individual to verify residential BMPs. There are a number of local and watershed training programs that cover what is necessary to conduct the verification. Those training programs include:

- Chesapeake RiverWise Communities, Contractor and Inspector Training
- Watershed Stewards Academy
- Virginia DEQ Stormwater Management Inspector Certification (*http://www.deq.virginia.gov/ConnectWithDEQ/TrainingCertification.aspx*)

Any of these training programs provide verifiers with the tools and information to take reliable measurements and collect consistent data. Your organization may conduct additional training to be confident that the Performance Verifications will meet both quality assurance and quality control (QA/QC) standards.

Many volunteers are highly skilled, retired engineers, landscape architects, and environmental scientists, or have significant knowledge of natural resources and make excellent candidates to conduct thorough inspections. With quality training and oversight, volunteers can be an excellent resource for a program. Other programs may rely on paid employees to conduct verifications, providing a higher level of accountability, trust, and assurance. Often, the best solution may be a combination of both. One paid employee can oversee and train a workforce of experienced volunteers and, together, they can accomplish much more than working independently.

Section 5.4: Frequency

BMP verification is not a one-time task. Following an initial inspection during construction and the BMP Initial Verification (discussed in Section 5.2 of this chapter) the BMP will need to be monitored and maintained for the life of the practice. After a certain number of years, depending on the purpose of the practice, the BMP will need to be verified routinely. If at some point the BMP is not verified or is observed to be not functioning correctly, the credited pollutant reduction may be nullified.

Every 3-10 years (a maximum of 5 is recommended) each BMP should undergo a BMP Performance Verification. The frequency of verification will depend on the program. A Phase 1 MS4 community may be required to report the BMP verification every 5 years. On the other hand, a local watershed group may want to conduct the Performance Verification every year or may be able to do so only every ten years. First determine why you are conducting the verification, and then you can best determine what frequency is most appropriate and allocate

your resources accordingly. Make sure to check with your locality for up-to-date approved methods and guidance for BMP verification. Also, you can visit the Chesapeake Stormwater Network's Urban Stormwater Work Group web page for the latest information about BMP credits and verification (see www.chesapeakestormwater.net/urban-stormwater-workgroup).

Section 5.5: Project Tracking

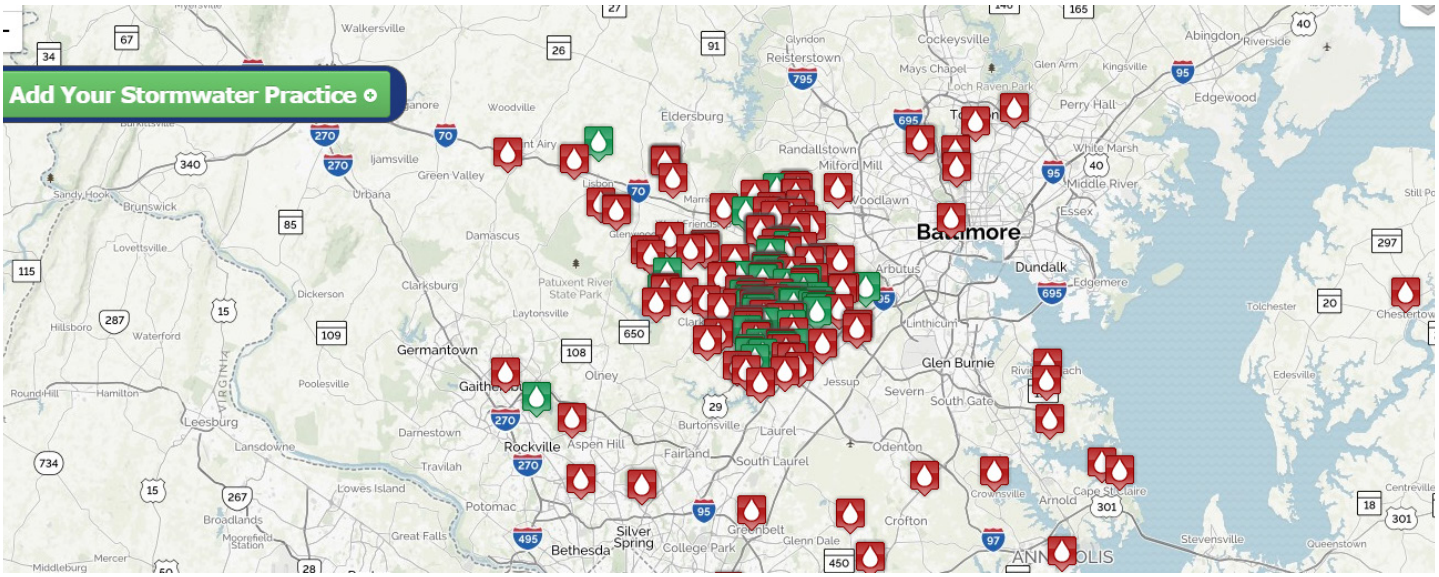
Stormwater runoff from private properties remains one of the most difficult and expensive sources of Chesapeake Bay pollution to control. Small-scale residential stormwater BMPs are most often voluntarily installed by property owners but are rarely effectively tracked at the local level by county and/or municipal agencies. Under the current Chesapeake Bay TMDL, water quality treatment practices must be counted and tracked to receive a nutrient and sediment reduction credit. However, few incentives have been provided to support investment in these small-scale, non-permitted stormwater BMPs. The ability to count, track, certify and aggregate these BMPs will validate additional quantifiable water quality benefits across the watershed.

In an effort to promote greater engagement in Bay restoration by property owners, the Chesapeake Bay Program's Urban Stormwater Work Group approved a streamlined verification procedure for these non-permitted BMPs. The basic premise is to simplify the property owner's BMP reporting process, while still retaining a high degree of quality assurance regarding the installation of each BMP being certified by a designated third party or a local government following installation. The Stormwater Management and Restoration Tracker (SMART), developed by the University of Maryland Sea Grant Extension Watershed Protection and Restoration Program and the Center for GIS at Towson University, provides the needed mechanisms to track, certify, and report progress on these small-scale, non-permitted BMPs.

SMART is an interactive, web-based mapping, tracking and reporting tool that provides a credible and certifiable way to account for 15 small-scale practices that can be implemented by property owners (see www.extension.umd.edu/watershed/smart-tool). The tool allows individuals to upload their BMP data to a local website, where the data are tracked, checked and certified by trained volunteers. SMART incorporates all approved nutrient and sediment reduction information provided by the Chesapeake Bay Program's Water Quality Goal Implementation Team, in order to calculate and report individual and aggregate reductions for each BMP tracked. This reporting ability allows for the adoption of small-scale BMPs into the formal accounting of nutrient and sediment reductions

of local TMDL/Phase II WIP, NPDES and MS4 permit requirements and could potentially result in considerable quantifiable cost-savings for local governments.

While small-scale stormwater BMPs may only have a minimal effects on nitrogen, phosphorus and sediment pollution, total pollution reductions can become substantial when these actions are multiplied over hundreds or thousands of properties. SMART empowers property owners to report stormwater practices and reinforces positive behaviors by providing a forum for their beneficial actions. When accessed, the web-based map depicts the many stormwater BMPs being installed in neighborhoods and across the state. Additionally, it provides images and information about installed stormwater practices, to educate and inspire property owners without stormwater BMPs on their property to take action along with their neighbors.



CHAPTER 6

Delivering a Successful Program through Training

Section 6.1: Program Roles

Section 6.2: Training Program Components

The key to a successful voluntary stormwater BMP program is having a team of well-trained assessors, designers, inspectors, installers, program managers, and other individuals who work toward the program's objectives. As stormwater BMP retrofitting is becoming more commonplace and nutrient reduction credits are being allocated to BMPs at the residential scale, the demand for a unique kind of training (beyond state level regulatory training) is increasing. Local government officials, landscape designers and contractors, volunteers, non-profit employees and others will all need to be trained for this growing activity.

This chapter will discuss the elements we have found necessary to effectively train those involved in the implementation of your homeowner stormwater BMP program. Every team member must know how the program is structured and the core elements of each component, even though their individual roles and expertise within the program will vary. Each member of the program team should be trained to carry out tasks efficiently and effectively to ensure consistency of program execution.

Section 6.1: Program Roles

The distribution of responsibility for each role within the program will vary from one program to another. Some programs may have different individuals leading each specific component of the program, while other programs may rely on one individual to guide all efforts and delegate when needed. The program workloads can be broken into four specific roles:

Program Administrator

The program administrator (often called the project "lead") is typically a Program Manager for a non-profit, local government, watershed organization, Soil & Water Conservation District, or other interested entity. This person will wear a number of hats within the program, depending on the size of the organization and program team. The program administrator understands the program's structure and carries out (or instructs others to carry out) numerous tasks, including but not limited to the following:

- Managing financial incentive details
- Delivering payments
- Scheduling assessments (this responsibility can be shared with the assessor)
- Tracking stormwater nutrient and volume reductions
- Conducting training sessions
- Reviewing plans, etc.

The program administrator must address any new or unfulfilled responsibilities presented while the program is underway, to keep things running smoothly.

Assessor

A volunteer, a non-profit or government employee, or anyone else with sufficient training may serve as an assessor for the program. The assessor's main roles include the following:

- Conducting the on-site assessment
- Making BMP recommendations
- Helping to determine BMP sizing requirements
- Educating property owners
- Scheduling assessments, and maintaining the assessment database

Designer/Installer

The designer/installer group may consist of landscape architects, engineers, landscape contractors, work force training groups, homeowners, watershed organization employees, or other individuals trained in BMP construction and design. This group must know how to conduct a project from concept to a finished, functional stormwater BMP. Provide general program background information to this group, along with specific training on BMP function, placement, design, installation, and maintenance.

Inspector/Verifier

The inspectors/verifiers will most likely be local government or watershed organization employees, but may also be third parties and volunteers. This role focuses on the back end of the project. They need to know exactly how the BMPs function, how they are designed, and how they should be installed and maintained. Experience with the materials used in the BMPs, phasing of construction, and the protocols needed to diagnose BMP failure and recommend solutions are also important for effectively fulfilling this role.

Section 6.2: Training Program Components

Depending on the complexity of your program, several sessions may be needed to train your partners about programmatic needs, processes, and requirements. The audience will vary dramatically when it comes to their levels of experience and their various program roles (as outlined in the previous section). To more effectively train staff and partners, the RiverWise Communities training program is delivered in two components targeting four specific groups, based on the program roles described in the previous sections.

The first training component is "classroom" training, focusing on providing knowledge, skills and tools needed to succeed in the program. The second component is "in the field" training. This should be devoted to showing trainees exactly what it takes to get the job done. The two components are equally important, since some individuals thrive in a "classroom" setting while others learn best through "hands-on" experience in the field.

When conducting training sessions, be sure to consider your audience and the program roles they fill, and adjust the lessons you are conveying for the specific audience at hand. For example, if you are presenting BMP design to an assessor, your objective is to emphasize details that would determine if a BMP is right for a specific area (e.g., sizing, depth requirements, slope, soil type, etc.). Your assessors should be able to recommend proper size and location of BMPs on homeowners' properties. The same topic, when presented to a group of designers and installers, would be expanded upon to include specific design and construction criteria. Emphasize training topics appropriate for the audience's program roles to ensure that the audience stays engaged and is not overwhelmed with unnecessary information.

The following training program is consistent in structure, regardless of the audience (assessor, inspector/verifier, and designer/installer). Though subject matter should not change, the level of depth for each topic should be adjusted based on the specific audience.

Classroom Presentations

Computer presentation programs such as PowerPoint and Prezi offer a great way to deliver your message in a concise, organized, and engaging manner. Usually this component of the training can be completed in 4-6 hours. This time is used to give your trainees the knowledge base to be successful in the field. The RiverWise Communities training program focuses on five elements of a successful program, as follows:

1. Organization and Program Background

It is important to communicate your organization's mission. Participants may not fully understand your mission or how the program fits into larger organizational goals, such as watershed nutrient reduction goals identified in the locality's Watershed Implementation Plans (WIP) that address the Chesapeake Bay TMDL.

Trainees should be inspired to participate in the program regardless of their role. Defining why the program exists, why it is important to your organization and the community, and why the attendees are essential to its success will motivate participation in the program. After you have explained the "why" to the attendees, then you can address "how" they will get the job done and "what" they will have to do to be successful.

2. Hydrology

The second presentation segment focuses on hydrology and the importance of stormwater BMPs for water quality and stormwater management. Terminology and definitions that support the BMP section of the training should be provided here. If the community has any regionally-specific hydrological characteristics, such as karst areas or combined sewer overflows, this is an ideal opportunity to explain them. Define all relevant terms and spell out acronyms for your audience, to make sure they fully understand the topic.

Stormwater volume reduction, pollution removal, and other factors contributing to stormwater management issues should be emphasized, so the audience fully understands the purpose of and need for BMPs. Photos and maps of locally impacted or impaired streams should be included to support your message. It is important to provide an introduction to basic hydrologic principles such as peak flow rate and pre-development vs. post-development impacts. Educating your audience about these basic principles strengthens your message about "why" your community needs to better manage stormwater runoff and establishes a solid foundation for the BMP training to follow.

3. Stormwater BMPs

- Some programs may choose to use the same information for all of the audience groups for consistency, though as previously stated, a customized approach is often a more effective training method. In either case, BMPs should be presented one at a time, with all of the associated criteria covered. Once the following five sections (function, placement, design, installation and maintenance) are covered for one BMP, move onto the next BMP.

BMPs should be presented one at a time, with all of the associated criteria covered. Once the five sections are covered for one BMP (e.g., rain barrel), move onto the next BMP.

A. Function

Demonstrate what the BMP is, why it is important, and how it functions. Every participant in the program should have this basic knowledge as a foundation for their work. Cover general information, such as how the BMP provides habitat, controls stormwater volume and velocity, and also reduces stormwater pollution.

Key Lessons

Why: Illustrate why the BMP is essential. Does it remove impervious surfaces? Maybe it filters water or even provides habitat.

How: What makes this BMP a good choice, and how does it collect water? Describe how the BMP provides a benefit.

Variations: Show different versions of the BMP and describe what sets them apart. Photos and videos of functioning BMPs will help convey your message.

B. Placement

BMP placement is one of the most important components of the presentation for the assessor, designer, and installer audiences. Proper placement is critical for the BMP to function properly, achieve a positive environmental impact, and eliminate any potential liability for property damage. Identifying proper BMP placement is perhaps the most important project role for the assessor. Proper BMP placement should be covered in detail for assessors and designers, and this section should address safety considerations, long-term implications, offsets, environmental concerns, and hydrologic effectiveness.

Key Lessons

Planning: Specify how to plan for long-term success and understand the unique restrictions of a BMP. For example, show pictures of the progressive growth of a BayScape and emphasize avoiding practices that will have long-term negative implications (e.g. planting trees under utility lines or installing a rain garden next to a foundation or retaining wall).

Placement: BMPs should be placed where they have the greatest environmental benefit. Focusing on issues such as cost of installation and localized flooding can be emphasized here. Explain why concerns such as high water tables and low infiltration rates can have an impact on BMP placement, and suggest alternative strategies if these problems exist.

rates can have an impact on BMP placement, and suggest alternative strategies if these problems exist.

Restrictions: BMPs should only be installed in ideal conditions, and there are various placement restrictions for each type of BMP. Make sure to clearly illustrate these restrictions and the reasons for them. This may be the most important section of the entire presentation, since BMPs installed improperly may cause flooding and have safety concerns and legal implications.

C. Design

The BMP design section of the presentation should be adapted to individual audience groups. While many details should be provided to the design/installer sector, these groups are likely to already have a working knowledge of the terminology and practices. Other audience groups will only need to have a conceptual understanding of BMP design; for them, this topic can be addressed more broadly. All program-acceptable design standards and specifications should be presented to the designer/installer group.

Individual(s) responsible for reviewing the plans and cost estimates (likely the program administrator) must understand all design requirements. The program administrator should know the details of all components of the program and also have in-depth knowledge of the BMP standards and specifications.

For the designers/installers, you may consider presenting a hypothetical project that they need to work through while in the classroom. Provide conceptual site plans and ask the audience to draw designs and call out specifications. If your organization uses design templates or worksheets, they should be provided.

Assessors will need to know general sizing requirements to quickly estimate and recommend BMP placement in the assessment report. They also should be able to explain the concept to property owners and know what standards and specifications apply to specific BMP designs.

Verifiers/inspectors should also be trained about your program's BMP design standards. This group must know the material specifications, general sizing, depth, and shape of the BMPs, because all components of the BMPs will have to be inspected. Therefore, this information will need to be presented in this section. Soils, plants, stone types, mulch, organic media mix and other materials should be described so the inspector can verify correct material use and conditions.

Key Lessons

Origin of design standards/specifications: Identify the source of the standards and specifications used in your presentation.

Sizing: Provide the sizing requirements and walk through an example for every BMP that requires specific sizing.

Materials: Specify the materials that must be used. It may be useful to offer advice about how to obtain certain materials, and specifically identify materials not

to be used. Some of the materials you should cover include clean stone, clean fill for embankments, paver/pavement products, and soil media characteristics for rain garden.

BMP sketches and cross-sections: Show the audience what the final product should look like, and show cross-sectional views of the BMPs for better explanation.

Design tips: Since every site is different, not every BMP can be installed in exactly the same manner. Describe design variations that address extenuating circumstances, such as internal storage layers in rain gardens, "piggy backing" rain barrels, and using underdrain systems with permeable pavers.

Plan requirements: When presenting to designers, detail exactly what will be required for plan submission. Provide the plan review checklists.

D. Installation

Although each of audience groups should have general understanding of installation procedures, the designer/installer and verifier/inspector audiences should be provided detailed information. The program administrator needs to know enough to monitor the general pulse of all activity in the field. The assessor only needs to know enough to describe the installation process to the homeowner. However, the designer/installer and verifier/inspector groups will need to know exactly what it will take to get the practices in ground correctly, safely, and efficiently.

All necessary permits and erosion and sediment control measures must be in place prior to project installation. Provide a description of these requirements to enable installation of the practices without regulatory issues and undesired environmental impacts. Research your local and state land disturbance thresholds for erosion and sediment control and stormwater management permitting. Although many of the projects will likely fall under the land disturbance thresholds, some may not, and there may be other local requirements for plan review or permits that the project installation team should be aware of.

Key Lessons

Pre-installation checklist: Describe tasks that must be completed before the installation of the practices, such as marking of underground utility lines and delivery of supplies.

Excavation technique: Describe the best techniques for excavation and site work. This can include suggestions regarding equipment selection, berm installation, disposal of excess excavated material, compaction avoidance, soil scarification, and other installation techniques.

Materials installation: Describe the technique used to install the BMP materials, such as permeable pavers, stone reservoirs, trees/shrubs/mulch, rain garden soil media mix, and underdrain systems.

Cleanup: During the cleanup phase, it is essential to test the BMPs, if possible. Newly planted vegetation should be watered, bare areas should be seeded or mulched, soil surfaces should be cleaned of weeds and trash, and erosion and sediment control materials should be removed.

E. BMP Maintenance

The homeowner will likely be responsible for long-term maintenance of the BMP(s) installed on the property. A maintenance agreement will be signed and Performance Verifications will be conducted to ensure the BMPS continue to function properly. Each of the trainee audiences should emphasize the importance of long-term maintenance to the homeowners. Without long-term maintenance, the individual practices will fail, and that will reflect poorly on your overall program. Trainees should understand BMP maintenance and must be trained in appropriate ways to present this information to the homeowner.

Key Lessons

Responsibilities: Clearly communicate to the homeowners the maintenance responsibilities associated with every practice installed.

Frequency: Provide a monthly or seasonal maintenance checklist detailing when to perform each maintenance task.

Tips: Provide the homeowner with tips for maintaining the BMPs, such as watering techniques and identifying useful tools and equipment and information about how to use them.

4. *Program Implementation*

There are certain components of the Chesapeake RiverWise Communities program or other similar programs that should be discussed in further detail at this point. All audience groups should understand these program specifics in order to provide consistent communication to homeowners, expedite project approval and installation, and achieve efficient implementation of the long term vision of the program.

Key Lessons

Incentive structure: Programs incentives will vary in details and may be basic or complex. Provide trainees with all relevant details regarding the incentive structure for the BMPs and the supporting documentation.

Plan Submittal: Describe the requirements for plan submittal and the expected turn-around time. Describe specific plan formatting that you would prefer to receive.

Reimbursement: Describe how the homeowner/contractor will be reimbursed and what documents must be submitted to obtain reimbursement. Indicate the expected turn-around time for reimbursement.

Inspection/Verification: Every project should be inspected on-site or photo-documented at critical stages of construction. Describe when these inspections will take place and, if they will be verified in the future, who will do that and how often will it be done.

5. ***Property Assessment***

The final component of the presentation is the assessment section. This section is most important for the Assessor audience, since the other groups may only need a basic working knowledge of assessment techniques and tools. Assessors will need to be trained to understand nuances of assessments, assessment software and tools, and assessment documentation. Further details about assessments are found in Chapter 3 of this manual.

Follow-up: Describe how you expect the program staff to follow-up after the property owner receives the assessment.
(See Appendices 6A & B for the Chesapeake RiverWise Training Powerpoint presentations).

Key Lessons

Hard copy versus Electronic: There are multiple assessment formats used from program to program, and each format may require specific hardware and software. However, some formats may be involve simple printed paper forms. Explain your format and review any hardware and software required to successfully implement the program.

Pre-assessment set-up: Many steps must be taken before the site assessment happens. Scheduling the assessment, downloading aerial photography to insert into the assessment form, completing research about the property conditions, and gathering assessment tools are just some of the pre-assessment items that should be part of your routine.

Tools: Identify and describe the optional tools used during the assessment.

Property assessment: Although the field exercise will be the most informative description of specific site assessment technique, it is useful to present examples of the site characteristics to look for in the field. Show photographic examples of what assessors should look for.

Software example: The Chesapeake RiverWise Communities assessment process uses a tablet computer-based form to be filled out in the field during the assessment. of the trainer should describe the software used, explain the forms used, and describe how to fill in information, in order to save time and confusion in the field.

Completion: Explain that the assessment should be completed, reviewed and returned within a short time. Describe your program's expectations.

Field Presentations

The second phase of training and is the field component. Field training should be conducted shortly after classroom training, so you may relate the classroom material to on-site practice. Field exercises will likely have the greatest impact on trainees. Providing time to demonstrate certain tools and practices is essential.

The content of the field training will most likely change from one group to another. The assessors should work through the assessment form and techniques while the designers/installers and inspectors/verifiers will review installed BMPs and BMPs currently under construction. Plan a site visit to a BMP installation site if possible, so the trainees can gain real-world perspective and experience. The following is a description of field training content for specific audiences. The program administrator should have training in all components of field work to assist each group as needed.

1. ***Assessor***
   Conduct a "mock assessment," just as it would be done on a site. Assign someone to act the role of the homeowner in this exercise.

Key Lessons

Addressing the homeowner: Set an example of courtesy and professionalism. Ask permission to take pictures. Also, explain your concepts simply, assuming the homeowner may be unfamiliar with the terms and concepts of the program. Use the assessment process as an opportunity to educate and engage the homeowner.

Filling in the form(s): If you are using a tablet computer, have the assessor can download the form and supporting application before the training day. Once in the field, the assessor can fill in the form as the assessment progresses. Afterward, have the group compare notes and forms.

Plants: Identify as many plants on the site as possible. Be sure to identify any invasive species to be removed. Identify native plants that are well-established; this will help the designer pick an appropriate plant palette.

Site conditions: Thoroughly describe any site conditions that will impact the project design. It is imperative to show the assessors how to determine drainage areas. This can be accomplished by using measuring tapes, measuring wheels, and other surveying tools. The measuring tape can also be used to measure tree diameters and accomplish a variety of other site measurements, such as impervious surface dimensions. Tools such as infiltrometers, soil probes, and soil penetration testers all help determine soil conditions and infiltration rates. A compass will help you determine site solar exposure conditions.

Homeowner stewardship: The level of existing homeowner stewardship is something can inquire about in a pre-assessment questionnaire and can confirm on-site. Look at tree health, grass height and vigor, garden maintenance, etc.

BMP placement: Describe the steps you would take to determine the proper BMP location and take measurements to establish proper BMP sizing. Demonstrate how you would use a survey tool to identify micro-drainage areas. Discuss strategies and site constraints.
Photos: Photos are a critical component of the assessment report and pre-installation documentation. Many software apps will let you add photos directly to the report. Think about what angle and distance will give the best representation of the project because taking photos from a consistent angle and distance is best for documenting the project over time. Photograph anything that raises concern. Additionally, having photographs of plants that you could not identify in the field allows you to complete the site's survey of existing vegetation at a later time.

2. ***Designer/Installer***
   If time allows, it is important to show designers and installers BMPs under construction and/or previously constructed BMPs.

   Key Lessons

   Choose the right location: It is important to visit the right site for the specific audience being trained. Sometimes it is best to choose a training workshop location based on the proximity to interesting BMPs or projects.

   Show a variety of BMPs: The more BMPs you can see the better, so choose site that are close together or that may have more than one BMPs onsite. It is also beneficial to show various stages of construction, start with a site with no BMPs, then BMPs currently under construction or recently constructed, and end with a fully established BMP if possible. This way trainees understand the entire process and what it takes to complete a project.

   Show problem sites: If it is possible, show the trainees BMPs that have maintenance problems or were not constructed or installed correctly. Sometimes it is easier to learn from things that did not work out correctly than from things that did.

3. ***Verifiers/Inspectors***
   Verifiers and inspectors will need to see a wide range of BMPs and different stages. They will also need to practices filling the verification forms out and taking corresponding photos.

   Key Lessons

   Choose the right location: It is important to visit the right site for the specific audience being trained. Sometimes it is best to choose a training workshop location based on the proximity to interesting BMPs or projects.

   Show a variety of BMPs: The more BMPs you can see the better, so choose site that are close together or that may have more than one BMPs onsite. It is also beneficial to show various stages of construction, start with a site with no BMPs, then BMPs currently under construction or recently constructed, and end with a fully established BMP if possible. This way trainees understand the entire process and what it takes to complete a project.

   Construction materials: If possible, show the trainees examples of construction materials used for the various BMPs within your program. For example, using clean stone rather than unwashed stone is critical to the long term functionality of permeable pavers. Showing the trainees a variety of failing BMPs will expose them to common mistakes that they can watch for in the future.

   Complete inspection form: Have the trainees practice completing an inspection form with associated photos. Make sure to take photos from consistent angles that are not only good at showing the issues but will be a good vantage point for showing corrective action

   Show problem sites: If it is possible, show the trainees BMPs that have maintenance problems or were not constructed or installed correctly. Sometimes it is easier to learn from things that did not work out correctly than from things that did.

REFERENCES

Social Networking Resources

Pew Research Center, Section 2.2: *http://www.pewinternet.org/2013/05/21/teens-social-media-and-privacy/*

Vertical Response, Section 2.3: *http://www.verticalresponse.com/*

Assessment Resources

Jotform, Section 4.2: *http://www.jotform.com/*

SurveyMonkey, Section 4.2: *https://www.surveymonkey.com/*

Google Forms, Section 4.2: *http://www.google.com/forms/about/*

Web Soil Survey, Section 4.3: *http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm*

Urban Stormwater Verification, Section 4.4: *http://www.chesapeakebay.net/channel_files/18547/attachment_d--uswg_urban_bmp_verification_principle_and_practices_110912.pdf*

Native Chesapeake Plants, Section 4.4: *http://www.nps.gov/plants/pubs/chesapeake/pdf/chesapeakenatives.pdf*

Center for Watershed Protection's Pollution Severity Index and Restoration Opportunity Index, Urban Subwatershed Restoration Manual 11, Sect.ion 4.4: *http://cwp.org/online-watershed-library/cat_view64/80-urban-subwatershed-restoration-manual-series*

Financial Incentives

Lynchburg, VA: *http://www.lynchburgva.gov/stormwater-credit-program*

Richmond, VA: *http://www.richmondgov.com/PublicUtilities/StormwaterCredits.aspx*

Charlottesville, VA: *http://www.charlottesville.org/Index.aspx/?page=2308*

DC- RiverSmart Rewards- *http://green.dc.gov/riversmartrewards*

Montgomery County, MD: *http://www6.montgomerycountymd.gov/dectmpl.asp?url=/content/dep/water/credits.asp*

Recognition Incentives

RiverHero Homes: *http://www.jrava.org/what-we-do/river-hero/*

Pearl Homes: *http://www.lynnhavenrivernow.org/Pearl-Home.aspx*

River Star Homes: *http://www.elizabethriver.org/RiverStars/default.aspx*

Verification

Chesapeake Bay TMDL: *http://www.epa.gov/chesapeakebaytmdl/*

Residential Stormwater BMPs

Native Plant Guide: *http://www.nativeplantcenter.net/*

Bioretention Illustrated, CSN, 2013: *http://chesapeakestormwater.net/bay-stormwater/urban-stormwater-workgroup/urban-bmp-verification/*

APPENDICES

3A RiverWise Pre-Assessment Questionaire

3B RiverWise Assessment Form

3C RiverWise Post-Assessment Survey

3D Sample Tracking Sheet

4A Chesapeake Bay Watershed Residential BMP Incentive Programs

4B RiverWise Maintenance Agreement

4C RiverWise Financial Assistance Program

4D RiverWise Rain Garden Calculation Worksheet

4E RiverWise Planting Templates

4F RiverWise Contractor Enrollment Forms

5A RiverWise Residential BMP Verification Form

APPENDIX 3A

RiverWise Pre-Assessment Questionaire

RiverWise Pre-Assessment Questionnaire & Registration Form

Please complete this questionnaire to Sign Up for a RiverWise Watershed Protection Assessment. Questions are related in some way to watershed protection and water quality. This information will help us determine how you can best reduce your impact on your watershed.

Full Name *

Prefix | First Name | Last Name

Address *

Street Address

Street Address Line 2

City | State / Province

Postal / Zip Code | Country (Please Select)

Primary Phone Number *

Area Code - Phone Number

Alt. Phone Number

Area Code - Phone Number

E-mail *

Preferred Method of Contact:

- ◯ Email
- ◯ Phone

Are you the property owner?

- ◯ Yes
- ◯ No, I rent.

How did you hear about this program?

- ◯ Neighborhood Meeting
- ◯ Neighborhood Newsletter
- ◯ Social Media
- ◯ Volunteer Event
- ◯ Word of Mouth

Please choose the answer that most closely describes your practices. You are welcome to provide additional comments or explanations.

If you have a basement, is there flooding during a heavy rain?

- ◯ Yes
- ◯ No
- ◯ N/A

If yes, do you use a sump pump?

- ◯ Yes
- ◯ No
- ◯ N/A

Do you have flooding or channeling of stormwater on your property? If so, where?

Is there an oil tank on your property?

- ◯ Yes
- ◯ No
- ◯ Unsure

If yes, is the oil tank in use?

- ◯ Yes
- ◯ No

Do you use a lawn service for lawn care?

- ☐ Yes
- ☐ No

During the late spring when the grass grows most quickly, the lawn is usually mowed:

- ◯ Once a week
- ◯ Once every two weeks
- ◯ Never

Mower blades are at the:

- ◯ Highest setting
- ◯ Medium setting
- ◯ Lowest setting
- ◯ Unsure

Grass clippings are:

- ◯ Left on the lawn
- ◯ Composted
- ◯ Bagged and Discarded
- ◯ Other

Watering

Please check all that apply.

	Lawn	Garden	Landscaped Areas
I water on a regular schedule	☐	☐	☐
I water only when the weather is very hot and very dry	☐	☐	☐
I water when it has not rained for a couple of weeks	☐	☐	☐
I water frequently, but for a short time	☐	☐	☐
I water frequently, but for a long time	☐	☐	☐
I use a sprinkler to water	☐	☐	☐
I use a soaker hose to water	☐	☐	☐
I water by hand with a garden hose	☐	☐	☐
I water by hand with a watering car	☐	☐	☐
I have an automatic sprinkler system to water	☐	☐	☐
I use tap water to water	☐	☐	☐
I use rain water from a rain barrel (other collection device) to water	☐	☐	☐

Other

FERTILIZERS, HERBICIDES, PESTICIDES, and FUNGICIDES

Please check all that apply.

	Lawn	Garden	Landscaped Areas
I use chemical fertilizers if indicated by soil testing	☐	☐	☐
I use chemical fertilizers on a regular basis	☐	☐	☐
I use "Weed & Feed" products	☐	☐	☐
I use chemical fertilizers for certain plants	☐	☐	☐
I do not use fertilizers	☐	☐	☐
I use only organic materials (manure, compost, leaves mowed in)	☐	☐	☐

Comment/Other:

Please check all that apply.

	Lawn	Garden	Landscaped Areas
I use pesticides/fungicides occasionally	☐	☐	☐
I use pesticides/fungicides only when there is a significant problem	☐	☐	☐
I use pesticides/fungicides to keep plants looking their best	☐	☐	☐
I use pesticides/fungicides only after the problem has been identified	☐	☐	☐
I use pesticides/fungicides regularly to prevent potential problems	☐	☐	☐
I use herbicides only to eliminate invasive plants	☐	☐	☐
I never use pesticides/fungicides on my...	☐	☐	☐
I never use herbicides on my...	☐	☐	☐

Comment/Other:

Do you (or your lawn service) take into account the weather forecast for rain in deciding when to apply fertilizers, pesticides or herbicides?

◯ Yes ◯ No ◯ Unsure

◯ N/A - These products are not used.

Autumn leaves are:

☐ Left where they fall
☐ Used as mulch or compost
☐ Bagged and discarded
☐ Mowed and left on the lawn
☐ Raked into the street for pickup by the city

Other:

Washing the car:

◯ I go to a commercial car wash
◯ I wash the car in the yard
◯ I was the car in the street or driveway
◯ I let rain showers wash the car
◯ N/A

Changing the car's oil:

◯ I take my car to a business to have its oil changed.
◯ I change my car's oil myself and recycle the old oil.
◯ I change my car's oil myself and put the old oil in the trash.
◯ I change my car's oil myself and pour the old oil in yard or street.
◯ N/A

Purchasing Habits

When purchasing household cleaners and chemicals:

- ☐ I choose the product that will have the least environmental impact.
- ☐ I choose the product that will do the job quick and easy.
- ☐ I choose the least expensive product.
- ☐ I make my own cleaning products.
- ☐ I use the products my family used while I was growing up.
- ☐ I buy antibacterial products.

What is important to you when purchasing trees, shrubs, or flowers?

☐ Low Maintenance	☐ Plants on Sale	☐ Should not be an invasive species
☐ Should not need fungicides or insecticides	☐ Curb appeal (Pretty, color, etc.)	☐ Tough, easy to grow
☐ Native species preferred	☐ Popularity in the neighborhood	☐ Provides food and shelter for wildlife

Disposing of household cleaners, chemicals, paint, etc.

- ☐ I research to determine appropriate disposal methods and dispose of appropriately
- ☐ I put everything in the trash
- ☐ I pour it down the drain, in the yard or storm drain

Other:

Dog Feces

If you have a dog, how do you clean up their feces....on walks?

- ☐ Bag it and put it in the trash
- ☐ Bury it
- ☐ Put it where it won't get stepped on
- ☐ Leave it where it lands
- ☐ I don't have a dog.

If you have a dog, how do you clean up their feces....in your yard?

- ☐ Bag it and put it in the trash
- ☐ Bury it
- ☐ Put it where it won't get stepped on
- ☐ Leave it where it lands
- ☐ I don't have a dog.

What environmental issue do you consider the most important locally?

- ☐ Pesticides
- ☐ Insecticides
- ☐ Fungicides
- ☐ Dog Feces
- ☐ Over Fertilization
- ☐ Algal Blooms
- ☐ Air Quality
- ☐ Decrease in Native Habitat
- ☐ Invasive Species
- ☐ Trash/Litter

Comment/Other:

Urban landscapes have significant impact on water quality, either positive or negative. How willing are you to put some time and effort into watershed friendly landscaping?

	1	2	3	4	5	
Not Willing	○	○	○	○	○	Very Willing

Which practice(s) are you interested in for your property?

- ☐ Rain Garden
- ☐ BayScapes
- ☐ Native Tree Planting
- ☐ Native Shrub Planting
- ☐ Rain Barrel(s)
- ☐ Pervious Pavers

Are you interested in volunteering in any of the following activities/events?

- ☐ Tree Plantings
- ☐ Tree Maintenance
- ☐ Trash Pickups
- ☐ Stream Walks
- ☐ Storm Drain Marking
- ☐ Helping at Workshops
- ☐ Joining the monthly meetings
- ☐ Writing articles for the local papers
- ☐ Writing articles for our blog
- ☐ Taking pictures for articles
- ☐ Videotaping interviews

Other:

An Alliance Team Member will be contacting you to to set up a date and time soon.
Thank you!

APPENDIX 3B

RiverWise Assessment Form

Alliance for the Chesapeake Bay

RiverWise COMMUNITIES

Chesapeake RiverWise Communities
Property Assessment

Name _____ Assessment # _____

Address _____ Assessment Date _____

Email _____ Conducted by _____

Phone _____ Watershed _____

TMDL ☐ _____

The following pages are the results of your **Chesapeake RiverWise Communities Property Assessment**. This report summarizes our observations and explains the recommendations for your property. We have suggested different stormwater Best Managment Practices (BMPs), which are drainage techniques and site designs that will substantially reduce stormwater runoff and pollution. Please review this summary and let us know if you have any questions regarding the recommendations.

Recommendations

☐ **Rain barrel(s) [RB]** (help collect water for later use and reduce runoff from the roof of your house)

Location(s) _____

☐ **Downspout disconnection [DD]**

Location(s) _____ See "Downspout" Section on pg. 3 for specific recommendations for each downspout.

☐ **Tree planting [TP]** (the most effective stormwater BMP. Plant a native variety to provide habitat and food for wildlife.)

Location(s) _____ Sun Exposure _____ Species _____

Mature Size(s): Tall (60ft+) ☐ Med (40-60ft) ☐ Small (20-40ft) ☐

Location(s) _____ Sun Exposure _____ Species _____

Mature Size(s): Tall (60ft+) ☐ Med (40-60ft) ☐ Small (20-40ft) ☐

☐ **Rain garden [RG]** (bowl shaped garden with deep loose soil and native plants that soak up water during rain events)

Location _____ Sun Exposure _____

Estimated pervious drainage (sq ft.) _____ Est. impervious drainage (sq ft.) _____ Estimated total drainage area (sq. ft.) _____

☐ **BayScape [B]** (landscaping area that replaces lawn with native plants that help soak up water)

Location _____ Sun Exposure _____ Approx. size (sq ft.) _____

☐ **Permeable hardscape [PH]** (alternative to impervious surfaces that allows water to seep through and soak into the ground underneath)

Location _____ Est. drainage area (sq ft) _____ Approx. size (sq ft) _____

☐ **Impervious surface removal [IR]** (removal of surfaces such as driveways and walkways)

Location _____ Approx. size (sq ft) _____

Your property contributes stormwater pollution to local waterways: ◯ Significantly ◯ Somewhat ◯ Not at all

Your landscaping habits are "unfriendly" to wildlife: ◯ Significantly ◯ Somewhat ◯ Not at all

Property Information

Property type Institution (school, church, business)

Basement: ☐ Yes ☐ No

Downspouts:

ID #	Disconnected or Connected	If disconnected, drains to:	Recommendation(s)
☐	◯ Disconnected ◯ Connected		☐ Rain barrel ☐ Rain garden ☐ BayScaping ☐ Other _____
☐	◯ Disconnected ◯ Connected		☐ Rain barrel ☐ Rain garden ☐ BayScaping ☐ Other _____
☐	◯ Disconnected ◯ Connected		☐ Rain barrel ☐ Rain garden ☐ BayScaping ☐ Other _____
☐	◯ Disconnected ◯ Connected		☐ Rain barrel ☐ Rain garden ☐ BayScaping ☐ Other _____
☐	◯ Disconnected ◯ Connected		☐ Rain barrel ☐ Rain garden ☐ BayScaping ☐ Other _____
☐	◯ Disconnected ◯ Connected		☐ Rain barrel ☐ Rain garden ☐ BayScaping ☐ Other _____
☐	◯ Disconnected ◯ Connected		☐ Rain barrel ☐ Rain garden ☐ BayScaping ☐ Other _____

Soils and Slopes (evidence of poor infiltration and runoff)
Check all that apply:

- ☐ Compacted soils
- ☐ Mostly clay soils
- ☐ Standing water
- ☐ High water table (applicable in coastal areas)
- ☐ Eroded areas
- ☐ Steep slopes (note location & direction on sketch)

Percentage of property that is impervious (approx.) ☐

Notes ☐

Vegetation/Landscaping (check all that apply):

Positive aspects:

- ☐ Mature trees
- ☐ Vegetative layers
- ☐ Larger group plantings
- ☐ Appropriate use of mulch
- ☐ Native plants (list below)
- ☐ Plants that provide food for wildlife

Negative aspects:

- ☐ Invasive species (list below)
- ☐ No layers, little variety
- ☐ Non-native species (list below)
- ☐ Poor mulching practices
- ☐ Evidence of damage to plants

Canopy cover:

- ◯ 0 - 25%
- ◯ 25 - 50%
- ◯ 50 - 75%
- ◯ 75 - 100%

Vegetative Cover (%) ☐

Lawn size (sq ft) ☐

Native ☐ **Non-Native** ☐ **Invasive** ☐

Sun exposure

Notes ☐

Property Sketch

Indicate existing features such as trees, landscaping, slopes (including direction of slope), impervious surfaces, bare soil, fences, utility locations, and existing BMPs. Denote North.

Label recommended practices:

RB - rain barrel
DD - downspout disconnect
TP - tree planting
B - BayScape
RG - rain garden
PH - permeable hardscape
IR - impervious removal

Thank you for taking time to participate in the Chesapeake RiverWise Communities program.
We truly value your support of the Alliance for the Chesapeake Bay.
Your involvement is important in helping us to engage local communities, connect people, and heal the land.
For any questions and follow-up, please contact us at 804-775-0951.

APPENDIX 3C

RiverWise Post-Assessment Survey

RiverWise Post-Assessment Questionnaire

Survey Name: ReedyCreek/RiverWise Post-Questionnair
Response Status:
Filter: None

Briefly state why you decided to sign up for a Reedy Creek Watershed Protection Audit.

Please choose the response that best reflects your experience with the sign-up and pre-audit questionnaire process.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	N/A
Signing up for the audit on the Reedy Creek Coalition website was simple.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
I received a timely confirmation email after signing up.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Scheduling of the audit took place in a reasonable timeframe.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
I would prefer an online pre-audit questionnaire over the printed/email questionnaire.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%

Were you present for the audit?

	Number of Response(s)	Response Ratio
Yes	0	0%
No	0	0%
Other	0	0%
No Responses	0	0%
Total	0	100%

Please select the responses that best reflect your experience. "Practices" are defined as rain barrels, rain gardens, BayScapes, pervious pavers, native tree and shrub plantings.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	N/A
I found the auditors to be professional.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
I found the auditors to be knowledgeable when answering my questions.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The auditors were able to clearly explain how the program worked.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
I was familiar with the practices promoted in the program before the audit.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
I have a greater understanding of the practices because of the audit.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The Information Packet I recieved was useful.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
A group workshop would have been helpful in understanding the program and the practices.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The information presented to me during the audit prompted me to make changes in the	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%

If you received an Information Packet from the auditors, which (if any) brochures/handouts were most helpful in the understanding of the program and practices?

Audit ReportPlease select the responses that best reflect your experience regarding the written Audit Report. "Practices" are defined as rain barrels, rain gardens, BayScapes, pervious pavers, native tree and shrub plantings. Comments are welcome but optional.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	N/A
Questions I asked were adequately answered in the audit report.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
I received my audit report in a reasonable time frame after the audit.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The audit report encouraged me to install the recommended practices.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The audit report provided useful information.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The report helped me understand the function of the practices.	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%

The audit and the information provided improved my knowledge regarding:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	N/A
The importance of keeping rainwater on my property	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The impact of storm water runoff on water quality	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Ways to reduce runoff on my property	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Ways I can reduce pollutants	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Environmentally friendly gardening practices	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%

For you, what was the most useful part of the audit report (if any)?

Check any appropriate items below if you have made changes or still plan to make changes as a result of your audit.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Have Done	Plan To Do	Unable To Do	N/A
Reducing impervious surfaces	0 0%	0 0%	0 0%	0 0%
Reducing lawn	0 0%	0 0%	0 0%	0 0%
Installing rain barrels	0 0%	0 0%	0 0%	0 0%
Disconnecting downspouts	0 0%	0 0%	0 0%	0 0%
Creating a rain garden	0	0	0	0

Creating a rain garden	0% 0	0% 0	0% 0	0% 0
Other methods of retaining storm water on property	0% 0	0% 0	0% 0	0% 0
Reducing pollutants from fertilizers, pesticides, and herbicides from entering stormwater	0% 0	0% 0	0% 0	0% 0
Planting one or more trees	0% 0	0% 0	0% 0	0% 0
Increasing number of native plants on property (BayScaping)	0% 0	0% 0	0% 0	0% 0
Removing invasive/alien plants	0% 0	0% 0	0% 0	0% 0

Please check the practices, if any, that were installed by yourself (via reimbursement).

	Number of Response(s)	Response Ratio
BayScaping	0	0%
Permeable Pavers	0	0.0%
Rain Garden	0	0.0%
Rain Barrel(s)	0	0%
Woody trees/shrubs	0	0%
No practices were installed by myself.	0	0%
Total	0	100%

Please check the practices, if any, that were installed by a contractor.

	Number of Response(s)	Response Ratio
BayScaping	0	0%
Permeable Pavers	0	0%
Rain Garden	0	0%
Rain Barrel(s)	0	0%
Woody Trees/Shrubs	0	0%
No practices were installed by a contractor	0	0%
Total	0	100%

Did you take advantage of the Financial Incentive Program (FIP)?

	Number of Response(s)	Response Ratio
Yes	0	0%
No	0	0%
No Responses	0	0%
Total	0	100%

What were the barriers that prevented you from taking advantage of the program? Select all that apply.

	Number of Response(s)	Response Ratio
I did not understand the program.	0	0.0%
I did not have the time to fill out the forms.	0	0.0%
I did not feel I had the financial resources at this time.	0	0%
I did not feel this was important.	0	0.0%

I never received an audit report.	0	0.0%
Other	0	0%
Total	0	100%

Please choose the answer that represents your opinion regarding your experience with the Financial Incentive Program (FIP).

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Disagree	Slightly Disagree	Neutral	Slightly Agree		Agree
I would have installed the recommended practices without a financial incentive	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The structure of the financial incentive was fair (i.e. the cost share amount provided covered	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
I would have been just as willing to participate in the program if I were required to pay 25%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The instructions of how to apply for the financial incentive were easy to follow	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
The FIP forms were easy to fill out	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
A workshop would have been helpful in understanding the financial incentive forms	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
If the only option provided were to receive a reimbursement for materials, I would still participate	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
I recieved confirmation of my forms being recieved in a timely manner	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%

Did you work with a contractor?

	Number of Response(s)	Response Ratio
Yes	0	0%
No	0	0%
No Responses	0	0%
Total	0	100%

Which contractor(s) did you work with?

Please answer the following questions concerning the contractor used for the practices.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree
I found the contractor(s) to be professional.	0 0%	0 0%	0 0%	0 0%	0 0%
I found the contractor's estimate to be reasonable.	0 0%	0 0%	0 0%	0 0%	0 0%
I found the contractor to be timely in their work.	0 0%	0 0%	0 0%	0 0%	0 0%
I am satisfied with the final projects installed by the contractor.	0 0%	0 0%	0 0%	0 0%	0 0%
I would have preferred to choose my own contractor.	0 0%	0 0%	0 0%	0 0%	0 0%
I would recommend my contractor to a friend.	0 0%	0 0%	0 0%	0 0%	0 0%

Since you participated in this program, do you feel you have greater knowledge in...

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree
Stormwater	0 0%	0 0%	0 0%	0 0%	0 0%
Water Quality	0 0%	0 0%	0 0%	0 0%	0 0%
Native Habitat (plants, wildlife)	0 0%	0 0%	0 0%	0 0%	0 0%
Local Streams, Rivers, and the Chesapeake Bay	0 0%	0 0%	0 0%	0 0%	0 0%
Watershed	0 0%	0 0%	0 0%	0 0%	0 0%
Impervious Surface	0 0%	0 0%	0 0%	0 0%	0 0%
Semi-Impervious Surface	0 0%	0 0%	0 0%	0 0%	0 0%
BayScaping	0 0%	0 0%	0 0%	0 0%	0 0%
Alien and Invasive plants	0 0%	0 0%	0 0%	0 0%	0 0%
RainGardens	0 0%	0 0%	0 0%	0 0%	0 0%

Please choose the answer that represents your opinions concerning your overall experience with the program.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree
I would recommend this program to a friend.	0 0%	0 0%	0 0%	0 0%	0 0%
The program changed my conservation efforts at home.	0 0%	0 0%	0 0%	0 0%	0 0%
I will share this new information with others.	0 0%	0 0%	0 0%	0 0%	0 0%
I am satisfied with the entire program.	0 0%	0 0%	0 0%	0 0%	0 0%

Additional comments or suggestions concerning any area of the program.

APPENDIX 3D

Sample Tracking Sheet

Sample RiverWise Tracking Sheet

C	P	U	Asmnt #	Pre-Asmt Received	Homeowner's Name	Address	County	Zone (Map)	Email	Phone	How did they hear about us?	Owner Requested
	1		JR-1	1/1/2014	Jane Doe	123 Avenue Street	Chesapeake	1	jdoe@email.com	804-555-1234	newsletter	1/1/2014
1			JR-2									
1			JR-3									
		1	JR-4									
1			JR-5									
1			JR-6									

TOTALS		
C	*P*	*U*
4	*1*	*1*

Assigned Assessor	Assessor Name(s)	Assessment Date	Report to Homeowner	Time (Days) from Audit	Recommended Practices						Incentive Program Enrollment Date	Project Completed Date	Post Assmt Survey Date
					Rain Barrels	Trees	BayScape	Rain Garden	Pervious Pavers	Impervious Removal			
1/3/2014	John/Amy	1/8/2014	1/9/2014	1	yes	yes	yes	no	no	yes	1/15/2014	2/28/2014	4/1/2014

APPENDIX 4A

Chesapeake Bay Watershed Residential BMP Incentive Programs

Chesapeake Bay Watershed Residential BMP Incentive Programs

Organization	Program	Website	BMP	Incentive Program
VIRGINIA				
Alliance for the Chesapeake Bay	Chesapeake RiverWise Communities	https://allianceforthebay.org/our-work/healing-the-land/riverwise-communities/	Rain Barrels	$1/gallon up to $250.
			Tree Planting	75% of cost per tree.
			Rain Garden	75% of costs up to $1,500.
			BayScapes (conservation landscaping)	75% of costs up to $1,500.
			Impervious Removal	$2/sq ft.
			Pervious Surfaces	75% of costs up to $3,000.
James River Association	River Hero Homes	http://www.jamesriverhero.org	Rain Barrels, rain gardens, conservation landscapes, behavior changes, etc.	Recognition program offering discounts at local garden centers, garden flag, and invitation to annual recognition event
Arlington, VA	StormwaterWise Landscapes	http://environment.arlingtonva.us/stormwaterwise/	Conservation Landscape	$3/sq ft up to $750. Minimum of 150 sq ft.
			Pervious Pavers	50% of project cost up to $2,000. Additional $1,500 if signed maint agreement. Minimum of 150 sq ft.
			Impervious Removal	50% of project cost up to $1,500. Minimum of 150 sq ft.
			Rain Garden	50% of project cost up to $1,500. Minimum of 150 sq ft.
			Rain Barrels	Offered at discounted rate at workshops.
Elizabeth River Project	River Star Homes	http://www.elizabethriver.org/#!river-star-homes/czow	Behavior changes, BMPs	Recognition program offering yard flag, packet of information, invitation to special events.
James City County	Clean Water Heritage	http://www.jamescitycountyva.gov/cleanwater/index.html	Neighborhood BMPs such as tree plantings	$2,000 rebate for installation, repairs, or inspection assistance
			Rain Garden	$8/sq. ft. rebate through the Turf Love program.
Virginia Soil and Water Conservation Districts	Virginia Conservation Assistance Program	http://tjswcd.org/vcap.php	Impervious Removal	$2.50/sq. ft. of impervious removed. Maximum of $15,000.
			Turf to Natives	$75/1000 sq. ft. for conversion to meadow or forest. $250/1000 sq ft for conversion to landscaping shrubs/trees.
			Rain Garden	75% of total costs up to $2,000. Must be maintained for 10 yrs.
			Rain Water Harvesting	$2.00/gallon of storage up to $12,000. Must store at least 250 gallons.
			Permeable Pavers	50% up to $3/sq. ft., max $12,000. 1/2 acre or less.
MARYLAND				
Blue Water Baltimore	Blue Water Audit	http://www.bluewaterbaltimore.org/take-action/water-audit (NOTE: program is now closed.)	Downspout Disconnection	Free disconnection, materials, and labor
			Green Roof	$2/sq. ft. of green roof
			Impervious Removal	$0.75/sq. ft. of hardscape removed
			Rain Barrel	Free installation labor
			Cistern	$0.50/gallon
			Rain Garden	$0.50/sq. ft. of impervious area to rain garden
			Conservation Landscape	$0.50/sq. ft. of landscaping. Minimum of 200 sq ft.
			Tree Planting	Recommendations for species and services
			*rebates will not exceed 50% of the total project cost. Limited to $2,000 per household or $6,000 per institution.	

Chesapeake Bay Watershed Residential BMP Incentive Programs

Organization	Program	Website	BMP	Incentive Program
Montomery County	RainScapes Rewards Rebate	http://www.montgomerycountymd.gov/dep/water/rainscapes-rebates.html	Conservation Landscape	$2.00/sq ft.
			Pervious Pavers	$4.00/sq ft or $1,200 (whichever is greater). If roof piped into project, then roof area included in sq ft calculation.
			Rain Barrel	$1.00/gal. Max $250. Minimum 200 gallons.
			Rain Garden	$5.00/sq ft w/ 1' soil depth. $7.00/sq ft with 2' soil depth. $9.00/ sq ft with 3' soil depth. OR $1,200 (whichever is greater).
			Tree Canopy	Up to $200.00 per tree.
			Impervious Removal	$2.00/sq ft if replacing with sod. $4.00/sq ft if replacing with conservation landscaping.
PENNSYLVANIA				
Conewago Creek	Conewago Creek Initiative	http://www.conewagoinitiative.net/practices/home/stormwater-incentives-program	Rain gardens, bioswales, riparian buffers, rain barrels, native meadows, etc.	Cost-Share paid upon verification of install with 80% of design and install costs up to $5,000
Little Conestoga Partnership	Healthy Watershed Stormwater Incentives Cost Share Program	http://www.littleconestoga.org	Rain Gardens	Eligible BMPs are cost shared at 80% of cost up to $5,000. Forest Riparian Buffers are cost shared at 100%.
			Forest Riparian Buffers	
			Tree Plantings	
			Native Meadows	
			Pervious Pavers	
			Rain Barrels	
			Cisterns	
DISTRICT OF COLUMBIA				
District Department of the Environment (DDOE)	RiverSmart Homes	http://green.dc.gov/riversmarthomes	*New enhancements can receive up to $1,200 for:*	*With a Copayment of:*
			Rain Barrel	$45
			BayScape	$100
			Rain Garden	$75
			Shade Tree	$50
	RiverSmart Rebates	http://green.dc.gov/service/riversmart-rebates	*Rebates for:*	*Amount back:*
			Rain Garden	$1.25/sq. ft with a maximum of $1,000
			Permeable Pavers	
			Impervious Removal	
			Rain Barrel	$1.00/gallon stored up to $500.

Appendix 4B

RiverWise Maintenance Agreement

CHESAPEAKE RIVERWISE COMMUNITIES FINANCIAL INCENTIVE PROGRAM MAINTENANCE AGREEMENT

The Alliance for the Chesapeake Bay (Alliance) has grant funding to install BayScaping, rain gardens, and trees as a part of their Chesapeake RiverWise Communities.

_____ at _____
(Name of Property Owner) *(Address of Property Owner)*
has had their property assessed by the Alliance and has voluntarily agreed to participate in this program.

For the purposes of this agreement, the Best Management Practices (BMPs) are defined as follows:

- "BayScaping" is defined as: An area that is landscaped using native plants from the mid-Atlantic region that are suitable to the site conditions. The BayScaped area will be designed to use plants adapted to the site's environmental conditions so that they will require little to no watering, fertilizer, or pesticides once established and, when possible, will provide habitat and food for wildlife. The BayScaped area will include a variety of plants and plant heights, plants with deep roots, and a layer of mulch to encourage storm water retention and uptake.
- "Rain garden" is defined as: An area that is designed to accept storm water from a rooftop or other impervious surface and allow it to infiltrate into the ground. The rain garden is designed to accept rain water from a point and, during large rain events, to accept overflow using sheet flow into the surrounding land without the use of an under drain attached to the sewer system. The rain garden is landscaped with native plants from the mid-Atlantic region that are adapted to be occasionally inundated with water.
- "Tree Planting" is defined as: The installation of trees from an approved native species list that follow the selection and installation guidelines provided.

Responsibilities of the Alliance for the Chesapeake Bay:

1. Educate property owners about the Chesapeake RiverWise Communities program
2. Meet with property owners to ensure they understand the project and the maintenance required with it
3. Ensure the homeowner's proper use and maintenance of rain gardens, BayScape gardens, and trees, and monitor these installations for not less than six months and up to one year.
4. Oversee contractor's work to install the selected BMP.

Responsibilities of the Property Owner:

1. Allow access to the site by Alliance representatives
2. Locate any surface or subsurface property conditions such as pipes, cables or other obstructions or hazards on the property
3. Allow photos to be taken before, during, and after installation of all projects to be used at the discretion of the Alliance
4. Allow Alliance representatives access to the rain gardens, BayScape gardens, rain barrels, and/or tree plantings for up to one year after installation to inspect for proper maintenance
5. Consider allowing access to property for pre-scheduled watershed friendly garden tours or displaying a sign on their property upon completion of installation explaining the landscape feature installed, their benefit to water quality, and that they were funded through grant funding
6. Maintain the BMPs, including adequate watering of any installed plants and weeding at least four times a year (see *Care Instructions*) so the BMPs continue to function properly
7. If unsure of proper maintenance of the installed BMPs request technical assistance from the Alliance
8. Promptly give notice to the Alliance and the contractor of observed installation defects

The responsibilities and obligations of the Owner shall constitute a covenant running with the land, and shall be binding upon all subsequent owners, their administrators, executors, assigns, heirs and any other successors in interest so long as they own the Property or any portion thereof served by the Facilities. Notwithstanding the foregoing, it is understood and agreed that any liability arising during the period of time when any such Owner owns the Property, or any portion thereof, shall remain a personal liability of such Owner.

Financial Obligation of the Property Owner:
The Financial Incentive Program provides you with a cost-savings but is not free-of-charge. So that property owners have some ownership of the landscaping work, the Alliance requires them to pay a $25 enrollment fee.

Indemnification
The Property Owner agrees to indemnify and hold harmless the Alliance for the Chesapeake Bay and all of its officers, agents and servants against any and all claims of liability or lawsuits arising from or based on, or as a consequence of or result of, any act, omission or default of Alliance employees, in the performance of activities through the Chesapeake RiverWise Communities program.

ALLIANCE FOR THE CHESAPEAKE BAY:

ACCEPTED BY: _____

SIGNATURE: _____

DATE: _____

PROPERTY OWNER:

ACCEPTED BY: _____

SIGNATURE: _____

DATE: _____

APPENDIX 4C

RiverWise Financial Assistance Program Guidance

Chesapeake RiverWise Communities
Financial Incentive Program
Rebate Guidelines

Rebate Structure:

- For installation of rain barrels, you will receive $1 per gallon up to $250. r
- For the installation of trees, you will received 75% of the cost of the tree.
- For installation of a rain garden, you will receive 75% of costs up to $1,500 for reimbursement of your material expenses.
- For installation of a BayScape, you will receive 75% of costs up to $1,500 for reimbursement of your material expenses.

Steps to Complete *Before* Project Construction:

- ❑ Put together a Site Design for project construction and estimated project cost (please see Site Design Guidelines for your project type(s))
- ❑ Submit your Site Design to the Alliance for the Chesapeake Bay.
- ❑ Take *Before* pictures (digital)
- ❑ Sign and submit the *Maintenance Agreement*

You will receive a pre-construction approval form to begin construction (if your project needs revisions you will be notified). **Construction must be completed within 4 months of the date of the Pre-Construction approval notification.** Once the work is completed the Alliance for the Chesapeake Bay at 804-775-0951 and schedule a post construction inspection.

Please note that you may be able to receive a credit on your City of Richmond stormwater utility bill for implementing some of these practices on your property. According to the website (http://www.richmondgov.com/dpu/StormwaterCredits.aspx), rain barrels and rain gardens are eligible as long as they meet certain criteria. BayScapes may also be eligible for the "vegetated filter strip" practice credit if they meet the City's criteria. Please see the Single-Family Residential Manual (http://www.richmondgov.com/dpu/documents/SWcreditmanual.pdf) for installation criteria and application guidelines.

Alliance for the Chesapeake Bay

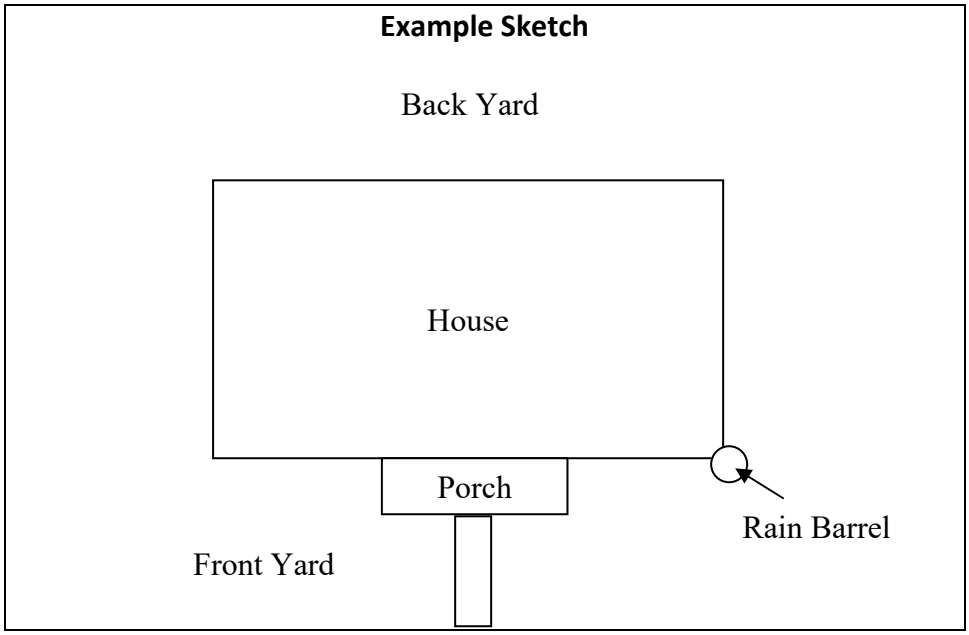
Chesapeake RiverWise Communities
Financial Incentive Program
Rebate Guidelines

Site Design Guidelines Checklist for Rain Barrel Installation

Please use the Alliance's "Rain Barrels: Capturing and Using Roof Runoff" for installation tips. Please email a document that includes the following Site Design Specifications for pre construction approval.

The Site Design Specifications:

- ❑ Square footage of roof going to rain barrel
- ❑ Simple sketch showing placement of rain barrels
- ❑ Estimated project cost



Alliance for the Chesapeake Bay

Chesapeake RiverWise Communities
Financial Incentive Program
Rebate Guidelines

Site Design Guidelines Checklist for Native Tree and Woody Shrubs Plantings

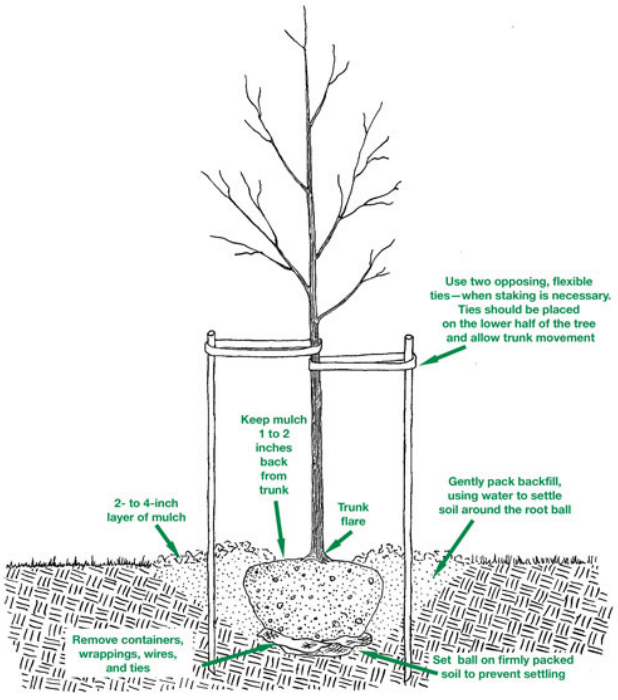
Please email a document that includes the following Site Design Specifications for pre construction approval. Once approved follow the installation tips below for planting.

The Site Design Specifications:

- ❑ Simple sketch showing placement of trees
  - Tree placement:
    - Tall trees (60 ft or more at maturity) should be placed at least 35 feet from buildings
    - Tall trees should be placed at least 65 feet from utility lines
    - Medium trees (40 ft at maturity) should be placed at least 15 feet from utility lines
    - Small trees (20 ft at maturity) may be placed under utility lines
  - Trees should be located away from all public utilities (above and below ground), with exception to small trees under utility lines (see note above). Contact Miss Utility (1-800-552-7001) to have property marked prior to planning and installation.
  - Consider the size of the tree at maturity when deciding where to plant. Please contact local arborists with concerns.
- ❑ Plant list with quantity, size, and species (common & scientific name)
  - Trees and woody shrubs must be native species. You can use the following sites to search for native plant ideas:
    - http://www.nativeplantcenter.net
    - http://www.dcr.virginia.gov/natural_heritage/np.shtml
  - Only container trees or bare root seedlings are permitted (no balled and burlapped trees).
- ❑ Estimated cost

Installation Tips:

- Remove grass from the area where the tree is to be planted
- Trees should only be planted from October to March
- Planting:
  - Trees and shrubs in pots should be planted according to the directions at: http://www.treesaregood.com/treecare/tree_planting.aspx
  - Bare root seedlings are planted as follows:
    - Dig a hole wider, but not deeper, than the roots.
    - Place the seedling in the hole so that it is at the same depth it was planted at the nursery; be sure all roots point down.
    - Fill in with the soil that came from the hole and pack it firmly.
- Water thoroughly.
- Mulch with shredded bark or wood chips. The mulch should be 2-3 inches deep and extend to the dripline of trees and never touch the trunk of the tree.



- Do not fertilize and do not use soil amendments when planting the tree.

Alliance for the Chesapeake Bay

Chesapeake RiverWise Communities
Financial Incentive Program
Rebate Guidelines

Site Design Guidelines Check list for BayScapes

Please use the Alliance's "BayScapes: Homeowner's Guide to Designing Your Property" publication to help you with placement and design. Please email a document that includes the following Site Design Specifications for pre construction approval.

The Site Design Specifications:

- ❑ Please prepare a simple sketch of the Site Design
  - Include dimensions, rough outline of BayScapes garden, and location descriptors (front, back, side yard)
  - Must replace existing lawn area or bare soil areas and encompass a minimum of 120 square feet (justification for size constraints must have prior approval from the Alliance)
  - Native plant material must total at least 34 gallons for 120 square feet (size of perennials can be substituted at a 2 quart: 1 gallon equivalency)

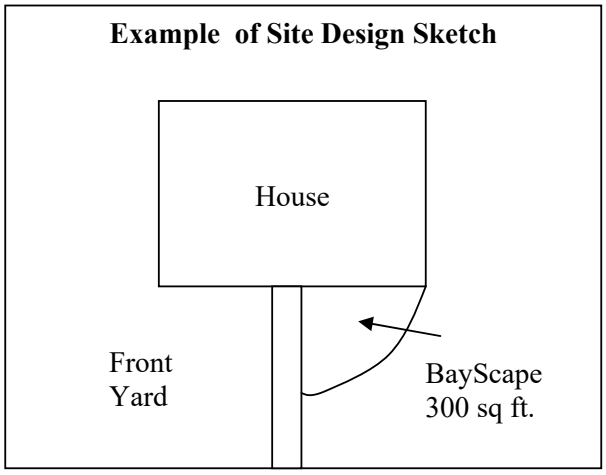
- ❑ Plant list with quantity, size, and species (common & scientific name)
  - Must be native species. You can use the following to search for native plant ideas:
    - http://www.nativeplantcenter.net
    - http://www.dcr.virginia.gov/natural_heritage/np.shtml
    - The plant list on the back of the BayScapes publication.

- ❑ Mulch Source and Type (must be 2"-3" of dense material like wood chips or shredded hard wood)

- ❑ Contact Miss Utility (1-800-552-7001) to have property marked prior to planning and installation.

- ❑ Estimated project cost

Example of Site Design Sketch



Note: You may be able to receive a credit on your stormwater utility bill if your BayScape meets the criteria for vegetative filter strips. To qualify, the following criteria must be met:

- 50% of roof area must drain to vegetated area
- Must be at least 50ft long.
- Runoff from downspouts must be dispersed using a splash block.

For more information, visit: http://www.richmondgov.com/PublicUtilities/StormwaterCredits.aspx

Alliance for the Chesapeake Bay

Chesapeake RiverWise Communities
Financial Incentive Program
Rebate Guidelines

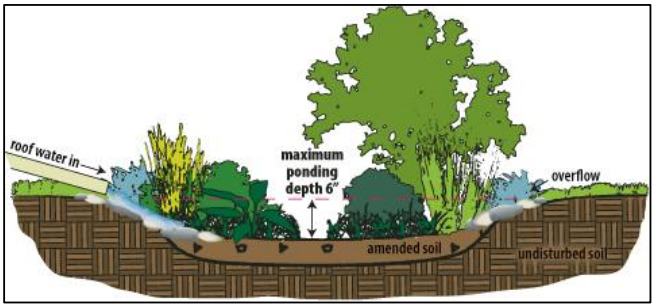
Site Design Guidelines Checklist for Rain Garden Installation

Please use the for design and installation tips. Please email a document that includes the following Site Design Specifications for pre construction approval, including the Rain Garden Calculation worksheet.

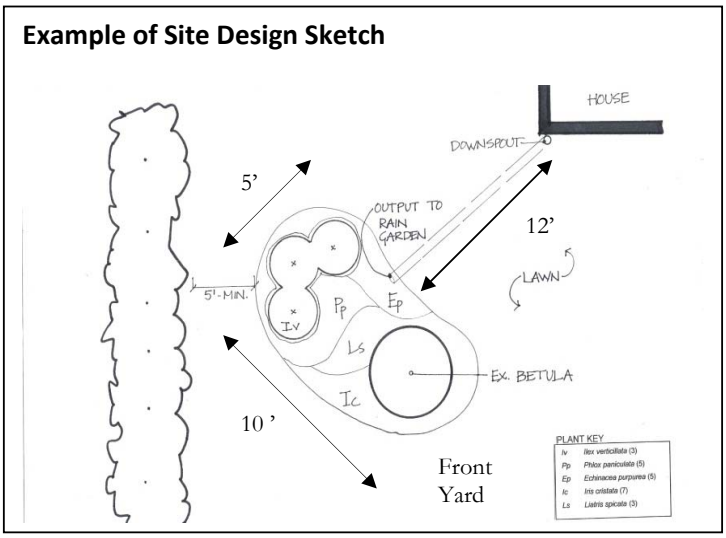
The Site Design Specifications:

- ❑ Use the Rain Garden Calculation Worksheet (on next page) to determine size of rain garden based on amount of runoff treated.
- ❑ Please prepare a simple sketch of the Site Design (use space on Calculation worksheet)
  - Include dimensions, rough outline of rain garden, distance from any structures, and location descriptors (front, back, side yard), and overflow area
  - Must be at least 10' from any foundation.
- ❑ Plant list with quantity, size, and species (common & scientific name)
  - Must be native species. You can use the following to search for native plant ideas:
    - http://www.nativeplantcenter.net
    - http://www.dcr.virginia.gov/natural_heritage/np.shtml
    - The plant list from the "Native Plants for Rain Gardens" publication
- ❑ Soil Mix Source (must be 50% sand, 25% topsoil, and 25% compost)
- ❑ Mulch Source and Type (must be 2"-3" of dense material like wood chips or shredded hard wood)
- ❑ Contact Miss Utility (1-800-552-7001) to have property marked prior to planning and installation.
- ❑ Estimated project cost

For installation tips, please see: VA Department of Forestry Rain Garden Technical Guide (http://www.dof.virginia.gov/mgt/resources/pub-Rain-Garden-Tech-Guide_2008-05.pdf



Example of Site Design Sketch



Rain Garden Calculations Worksheet

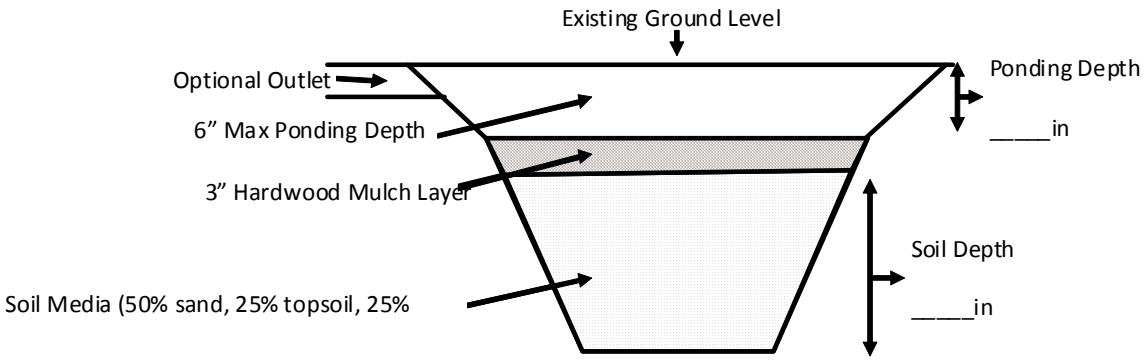
Drainage area to Rain Garden:
Roof area= _____ ft^2
+
Yard area= _____ ft^2
=
Total area (TA) = _____ ft^2

Rain Garden surface area:
5% of TA
.05 X _____ ft^2= _____ ft^2

Site Design Sketch

Design Tips:

- Locate outside the dripline of trees and away from utilities.
- If slope allows, create a stabilized outlet (emergency spillway).
- More clay, less infiltration = deeper soil mix.
- Less clay, more infiltration = shallower soil mix layer.
- Ponding area above the mulch layer should be between 3 to 6".
- If the down spout drains directly into the Rain Garden install 3ft^2 of fist sized stone.
- No underdrain required.



APPENDIX 4D

RiverWise Rain Garden Calculation Worksheet

Rain Garden Calculation Worksheet

Address: Homeowner : Date:

_____ _____ _____

_____

Drainage area to Rain Garden:

Roof area= _____ft^2

+

Yard area= _____ft^2

=

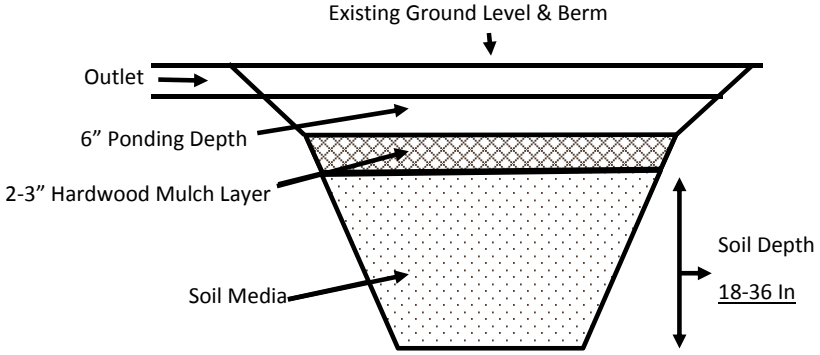
Total area (TA) = _____ft^2

Rain Garden surface area:

5% of TA

.05 X _____ft^2= _____ft^2

Rain Garden surface area=____ft^2

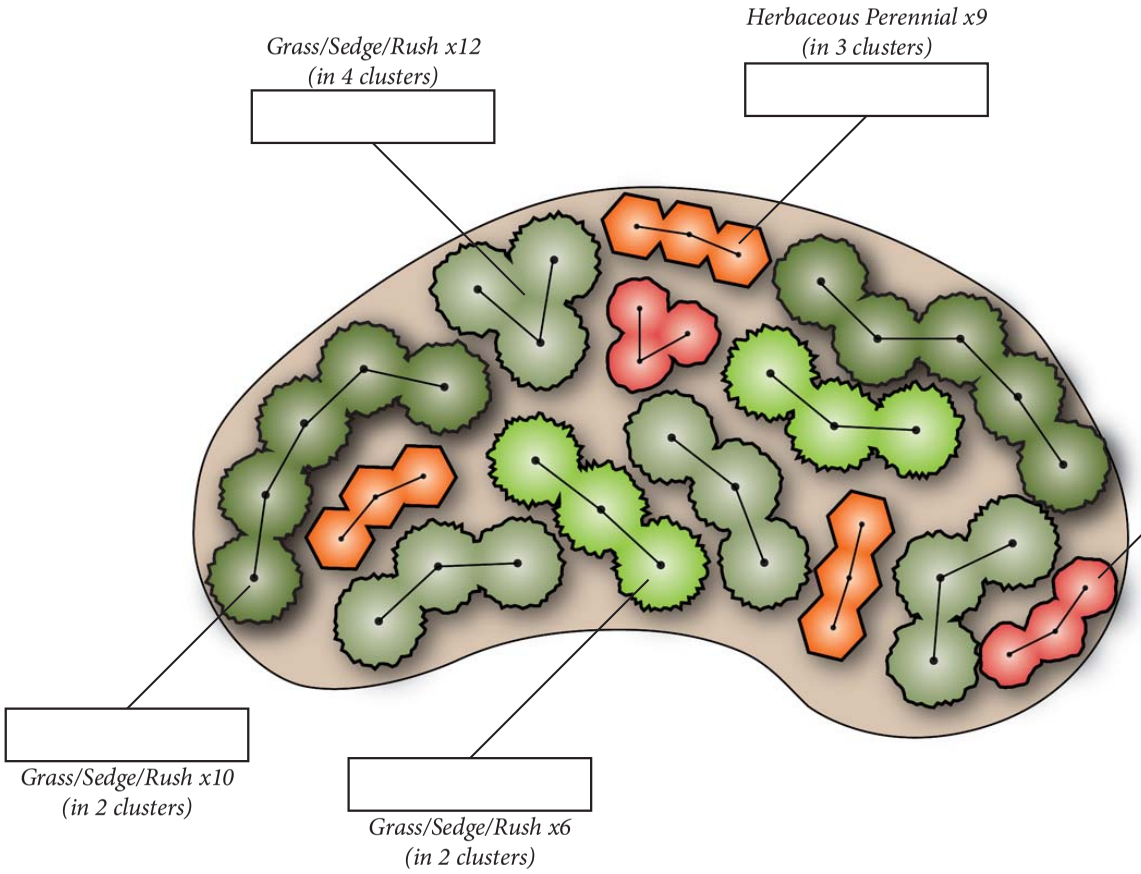


Plan Preparer
Initial_____

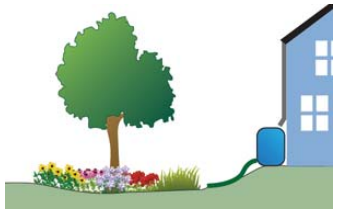
APPENDIX 4E

RiverWise Planting Templates

Simple Meadow Bayscape - 120 square feet (contained in 17 x 10.5 foot area)



Scale: 1 inch = 3 feet 0 3 6 Feet



Consider using a rain barrel to save water and water your garden during dry weather!

Average Spacing between Plants
Refer to plant nursery tags and adjust as needed

Shrubs = 30”	Grasses = 18”	Perennials = 9-12”

2 cubic feet of mulch covers ~12 square feet of the garden

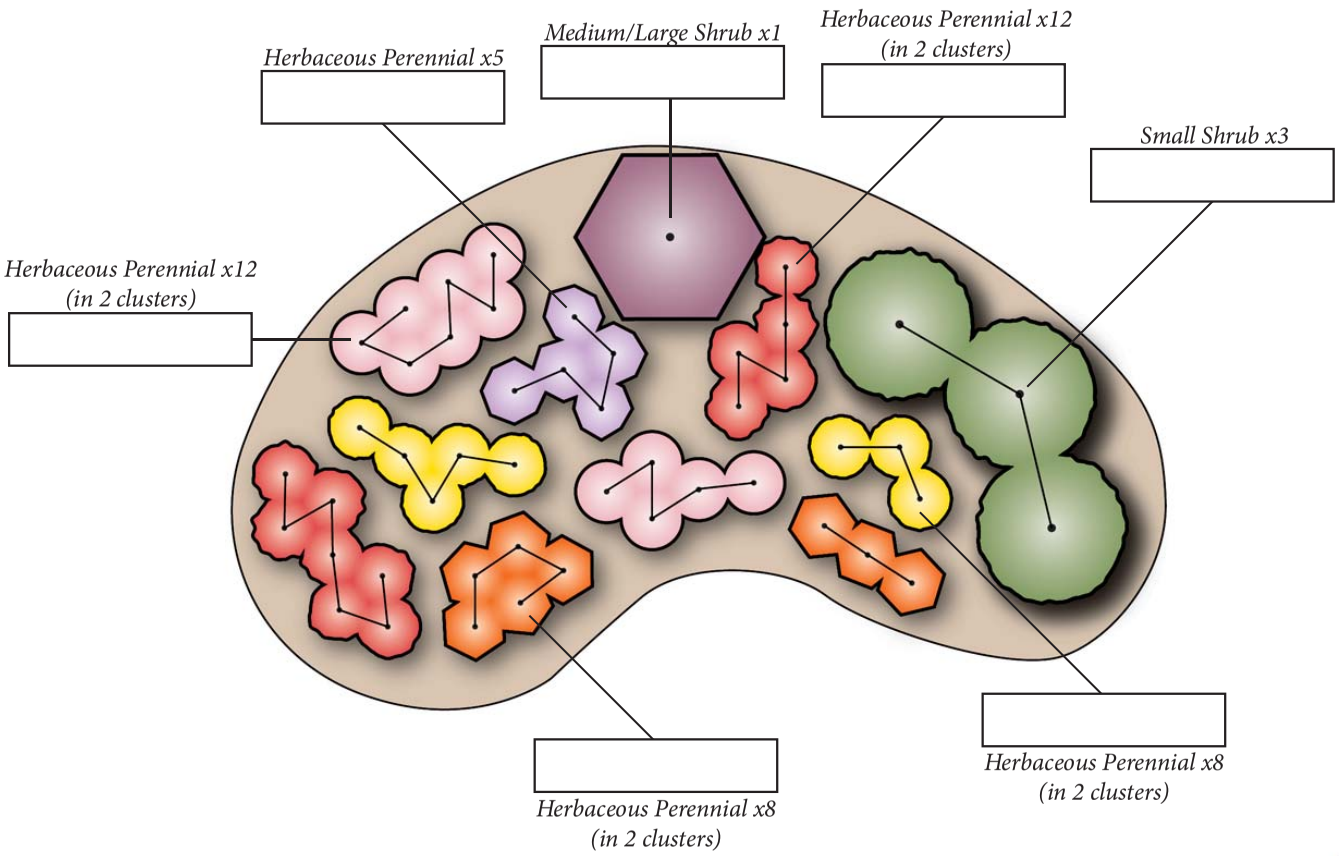
Alliance for the Chesapeake Bay
visit stormwater.allianceforthebay.org

Center for Watershed Protection

WSA
National Capital Region · Watershed Stewards Academy

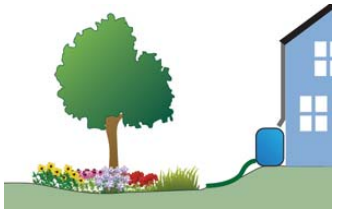
National Fish and Wildlife Foundation

Butterfly Garden Bayscape - 120 square feet (contained in 17 x 10.5 foot area)



Scale: 1 inch = 3 feet

0 3 6 Feet



Consider using a rain barrel to save water and water your garden during dry weather!

Average Spacing between Plants

Refer to plant nursery tags and adjust as needed

Shrubs = 30”	Grasses = 18”	Perennials = 9-12”

2 cubic feet of mulch covers ~12 square feet of the garden

Alliance for the Chesapeake Bay
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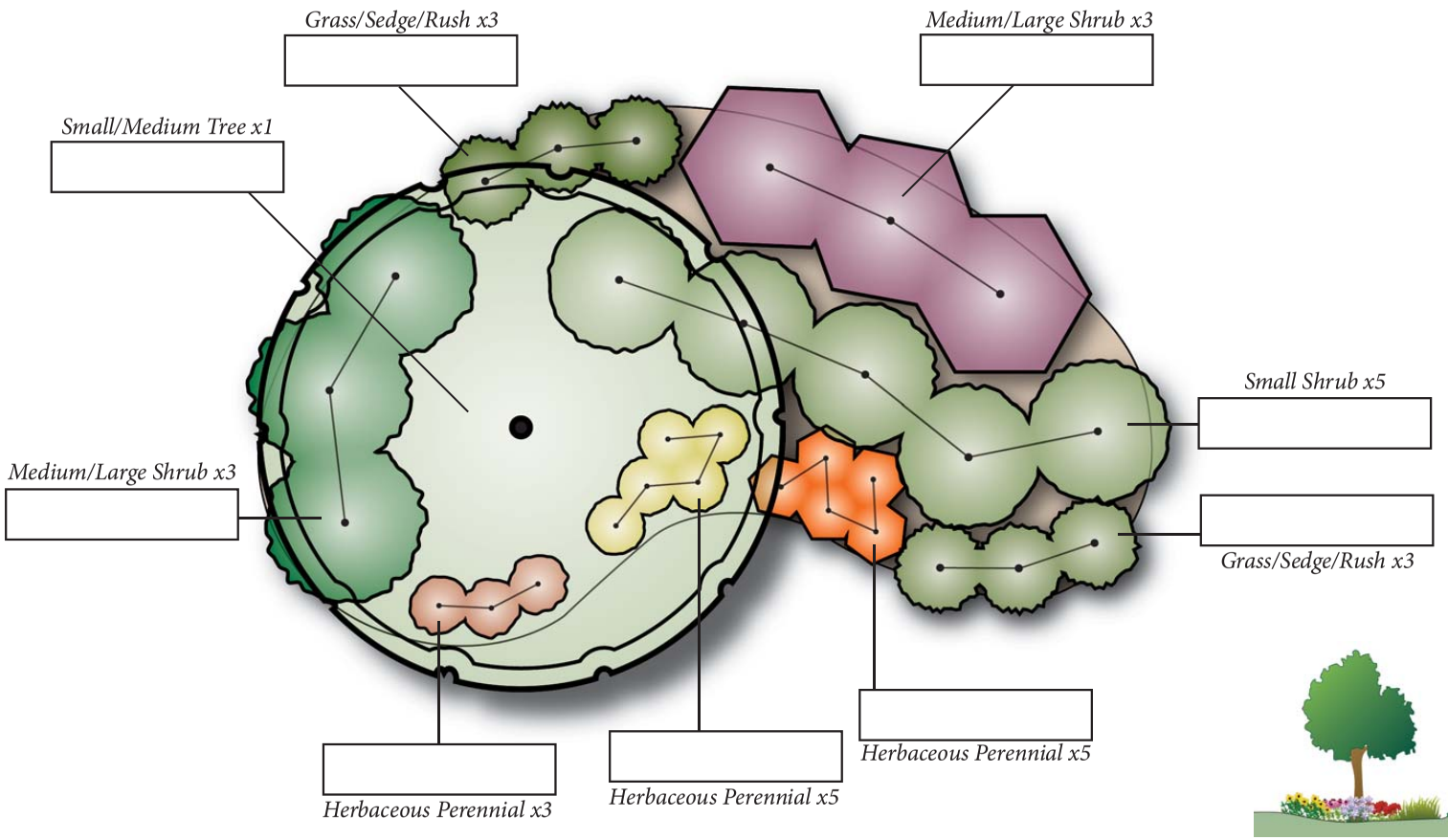
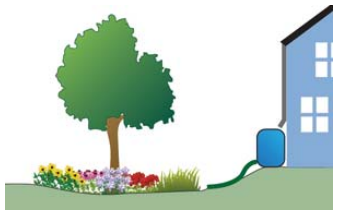
Typical Kidney Bayscape - 120 square feet (contained in 17 x 10.5 foot area)



Scale: 1 inch = 3 feet 0 3 6 Feet



Consider using a rain barrel to save water and water your garden during dry weather!

Average Spacing between Plants

Refer to plant nursery tags and adjust as needed

Shrubs = 30”	Grasses = 18”	Perennials = 9-12”

2 cubic feet of mulch covers ~12 square feet of the garden

Alliance for the Chesapeake Bay
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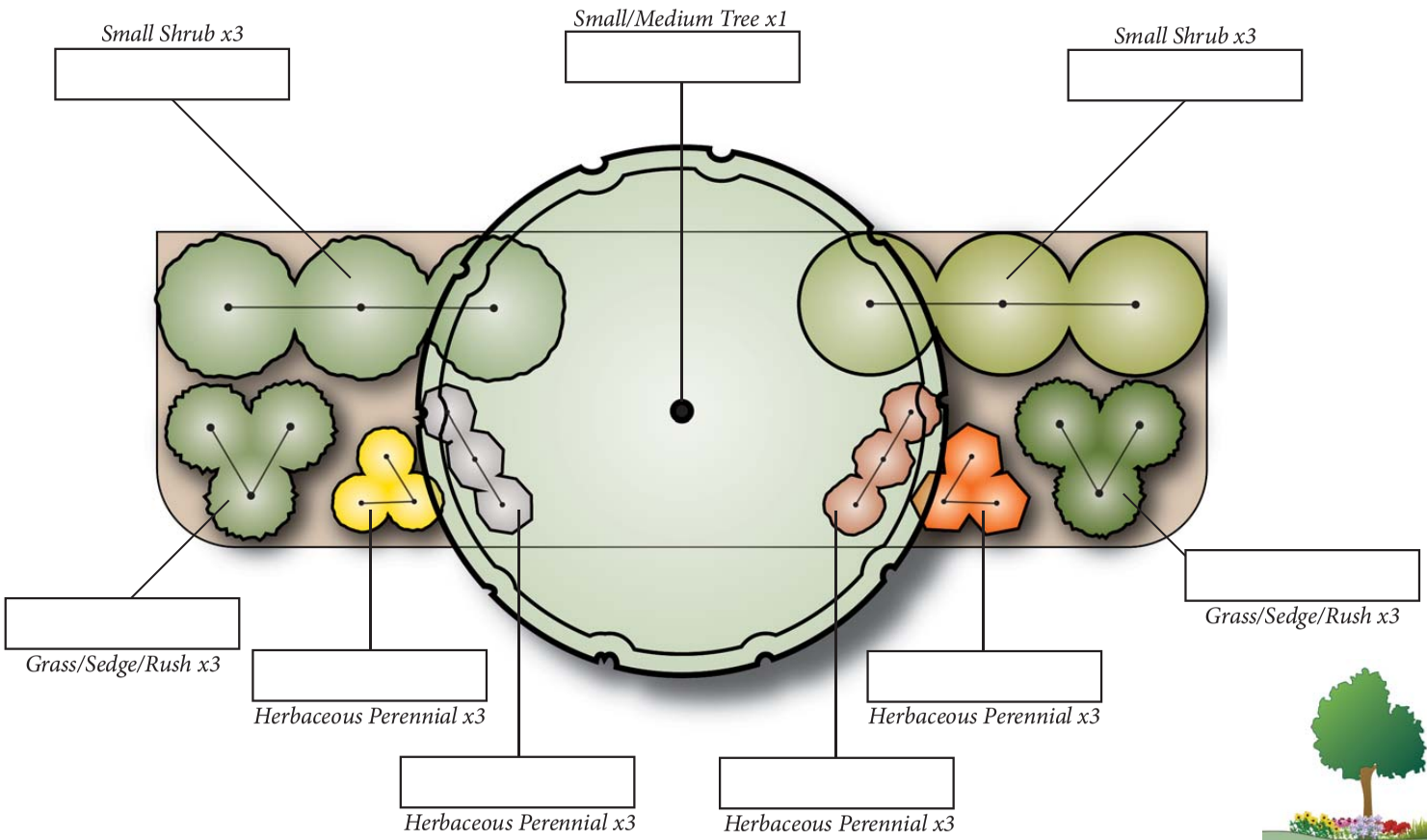
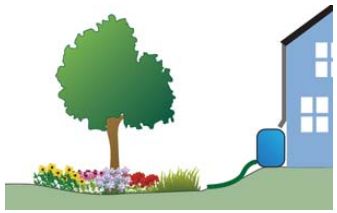
Center for Watershed Protection

WSA
National Capital Region • Watershed Stewards Academy

National Fish and Wildlife Foundation

Typical Edge Bayscape - 120 square feet (contained in 20 x 6 foot area)





Consider using a rain barrel to save water and water your garden during dry weather!

Average Spacing between Plants

Refer to plant nursery tags and adjust as needed

Shrubs = 30”	Grasses = 18”	Perennials = 9-12”

2 cubic feet of mulch covers ~12 square feet of the garden

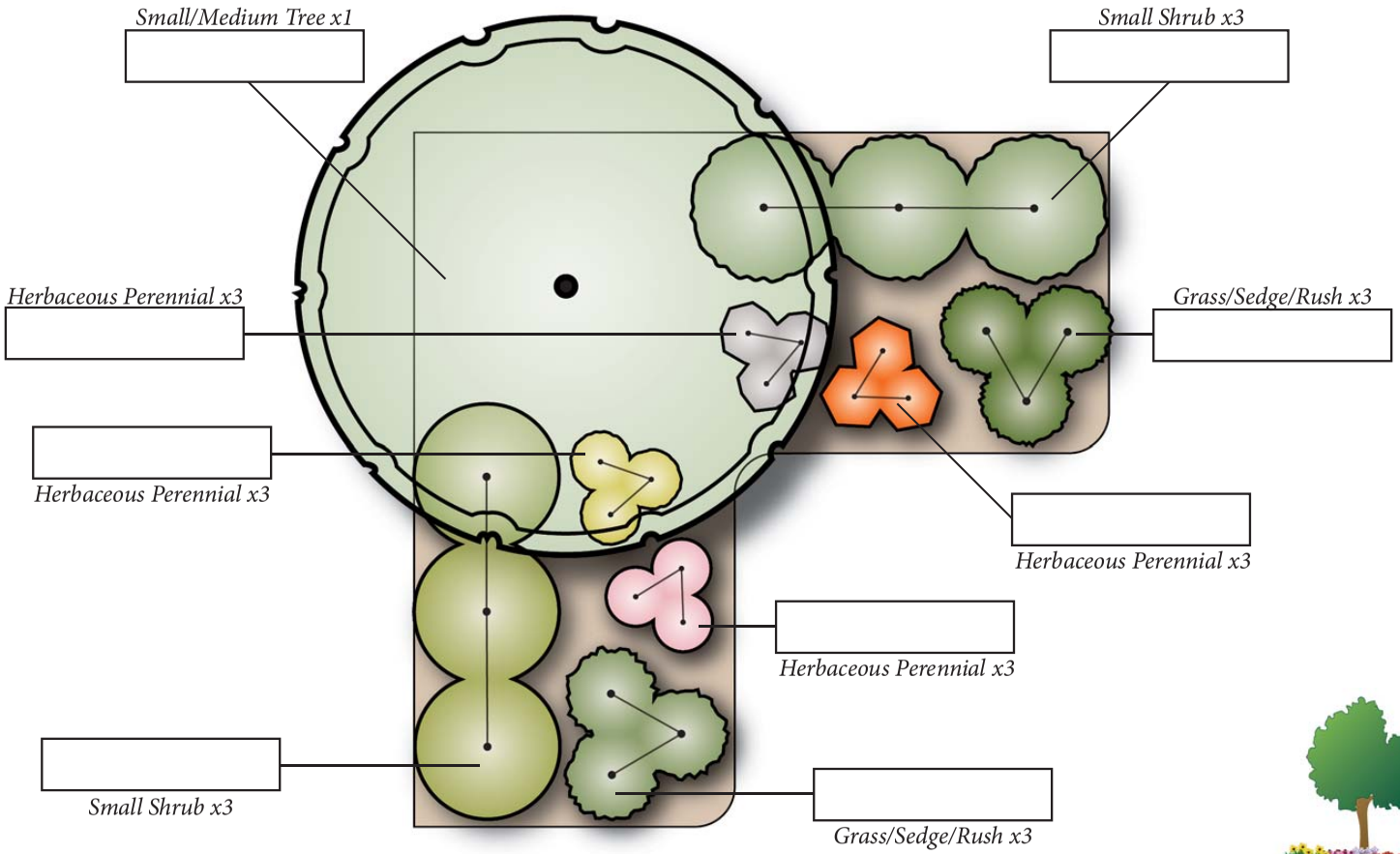
Alliance for the Chesapeake Bay
visit stormwater.allianceforthebay.org

Center for Watershed Protection

WSA
National Capital Region · Watershed Stewards Academy

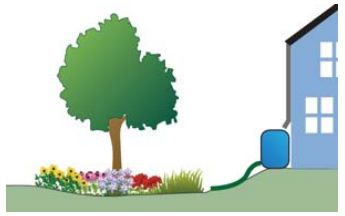
National Fish and Wildlife Foundation

Typical Corner Bayscape - 120 square feet (contained in 13 x 13 x 6 foot area)



Scale: 1 inch = 3 feet

0 3 6 Feet



Consider using a rain barrel to save water and water your garden during dry weather!

Average Spacing between Plants

Refer to plant nursery tags and adjust as needed

Shrubs = 30”	Grasses = 18”	Perennials = 9-12”

2 cubic feet of mulch covers ~12 square feet of the garden

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WSA
National Capital Region · Watershed Stewards Academy

National Fish and Wildlife Foundation

APPENDIX 4F

RiverWise Contractor Enrollment Forms

Alliance for the Chesapeake Bay

Chesapeake RiverWise Communities

CONTRACTOR QUESTIONNAIRE

Name of company: _____

Contact Person: _____

Address (Street, City, Zip): _____

Phone Number(s): _____

Email(s): _____

Which of the following best management practices (BMPs) are you interested in providing under the Chesapeake RiverWise Communities program? (*check all that apply*)

☐ Rain gardens ☐ BayScaping ☐ Replacement of impervious surface

To which of the following area(s) are you willing to travel for consultations and installation of Chesapeake RiverWise Communities Program BMPs? (*check all that apply*)

☐ City of Richmond ☐ Henrico County

From start to finish (initial consultation to completion of installation), how long do you estimate it would generally take you to complete a project?

Rain Gardens: _____ BayScaping: _____ Pervious Surface: _____

What major equipment does your company own?

What months out of the year are you able to install? Can you meet with homeowners year round?

How many total projects do you estimate your company can complete in a year?

Ideally, how many projects would you like to see grouped together for each round of installations?

PARTNERSHIP AGREEMENT FOR THE CHESAPEAKE RIVERWISE COMMUNITIES PROGRAM

Alliance for the Chesapeake Bay
&
_____

I. INTRODUCTION

The Alliance for the Chesapeake Bay ("THE ALLIANCE" or "Sub-Recipient") is overseeing and coordinating the installation of best management practices ("BMPs") which may include BayScaping, rain gardens, and replacement of impervious surface with pervious surface as a part of their Chesapeake RiverWise Communities Financial Incentive Program. _____ ("Sub-Contractor") has agreed to participate in the program by installing one or more of the above BMPs at selected properties.

A. DEFINITIONS

For the purposes of this agreement, the BMPs to be installed as part of the Chesapeake RiverWise Communities Financial Incentive Program are defined as follows:

1. "BayScaping" shall be defined as an area of lawn replaced with native plants that are indigenous to the Chesapeake Bay region prior to European settlement;
2. "Rain garden" shall be defined as a small garden landscaped with native plants (as described above) to collect, store and infiltrate stormwater runoff in its loose amended soil and strategically placed to intercept stormwater runoff until it can be fully absorbed into the ground;
3. "Pervious surface" shall be defined as any surface that permits water to soak naturally into the ground. For the purposes of this program, existing impervious surface must be removed and replaced with pervious materials to qualify for grant funding.

II. SCOPE OF SERVICES

A. REIMBURSEMENT ALLOWANCES

The BMPs are eligible for reimbursement in accordance to the following schedule:

1. Up to $1500 for installation of a rain garden (rain gardens costs shall range from $1200 - $1500 dependent upon site difficulties);
2. Up to $1200 for installation of BayScaping
3. Up to $3000 for the replacement of impervious surface with a pervious surface.

B. BMP SPECIFICATIONS

1. **Rain garden**
   a. Review the *Homeowner Audit Report* provided by THE ALLIANCE and the Reedy Creek Coalition (RCC) for recommendations regarding installation location and approximate runoff from impervious surfaces. Contact Anna Mathis at amathis@allianceforthebay.org

for a copy of the audit if necessary.

b. The rain garden location must be a minimum of 10 feet away from any existing foundation or retaining wall.

c. During the audit, soil conditions will be evaluated for infiltration with an infiltrometer. If indicated in the audit report or deemed necessary by the contractor's evaluation, existing soil should be removed and replaced with a bioretention soil mix. The bioretention soil mix ratio must be 50% sand, 25% topsoil, 25% compost/leaf mulch.

d. Permission must be granted by the homeowner for the use of herbicides including Round Up; if permission is not granted then Sub-Contractor can use a sod cutter or hand remove lawn.

e. To determine the size and depth of the rain garden, fill out the Rain Garden Calculation Worksheet.

f. The drawdown period for completed installations after any rain event must not surpass 48 hours.

g. Completed rain gardens should have a 2-3" hardwood mulch layer.

h. Native plants to the Chesapeake Bay region must be used. Some non-native, non-invasive plant exceptions may be made, but must be approved by THE ALLIANCE prior to use. Refer to the VA DOF Rain Garden Technical Guide or the Alliance's Native Plants for Rain Gardens publication for a list of recommended species.

i. Plant material must total at least 22 gallons (size of perennials can be substituted at a 2 quart: 1 gallon equivalency). Each rain garden must be a minimum of 50 square feet and have a minimum of 2-3 shrubs at 3 gallons each.

j. Excavated soil should be used in berm construction. The berm should be constructed from soil or other earthen material. Other materials (i.e. landscaping fabric or burlap) should not be used in the berm construction. The berm must be compact and level to provide sheet overflow.

k. If the additional excavated soil can stay on site and is placed on a grass or lawn area then the area must be reseeded and straw mulched; if the additional excavated soil is used to create a bed or placed on existing soil then the area must be mulched with 2-3" of hardwood mulch. If there is no suitable location on site for the additional excavated soil, then it must be hauled away.

l. Provide before, during, and after digital photos of the rain garden site. During construction photos must show depth and layers of rain garden.

m. The design/proposal must be approved by both the homeowner and THE ALLIANCE before work begins. The calculations worksheet must be submitted with a plant list (common and scientific name), estimate, and before photos.

2. BayScaping

a. Review the *Homeowner Audit Report* provided by RCC/THE ALLIANCE for recommendations regarding installation location and site information. Contact Anna Mathis at amathis@allianceforthebay.org for a copy of the audit if necessary.

b. Permission must be granted by the homeowner for the use of herbicides including Round Up; if permission is not granted then Sub-Contractor can use a sod cutter or hand remove lawn.

c. BayScape gardens must replace existing lawn area or eroded areas and encompass a minimum of 120 square feet. If the area is less than 120 square feet, justification for size constraints must be submitted to THE ALLIANCE. If approved, THE ALLIANCE will reimburse at $10 per square foot.

d. Ivy removal is not covered under the grant funding. Homeowners may elect to pay contractor as an additional service or remove themselves prior to installation.

e. Native plants to the Chesapeake Bay region must be used in creation of BayScape gardens. Some non-native, non-invasive plant exceptions may be made, but must be

approved by THE ALLIANCE prior to use. Refer to http://www.nativeplantcenter.net or http://www.dcr.virginia.gov/natural_heritage/np.shtml for a searchable list of native plants.

f. Plant material must total 34 gallons for 120 square feet (size of perennials can be substituted at a 2 quart: 1 gallon equivalency) with a minimum of 2-3 shrubs at 3 gallons each.

g. Completed BayScape gardens should have at minimum a 2-3" hardwood mulch layer.

h. The design/proposal must be approved by both the homeowner and THE ALLIANCE before work begins. A simple sketch showing the rough outline and location descriptors must be submitted with a list of native plants (quantity, size, and species), estimate, and before picture.

i. Optional items, such as stepping stone pathways, are not eligible for grant funding, but may be added at the homeowner's expense.

3. Replacement of impervious surface

a. Review the *Homeowner Audit Report* provided by THE ALLIANCE/RCC for recommendations regarding installation location and site information. Contact Anna Mathis at amathis@allianceforthebay.org for a copy of the audit if necessary.

b. An existing impervious surface, such as cement, asphalt, etc. must be removed. In some cases, bare compact soils may qualify as impervious. This will be noted in audit report, with the results of the infiltration test.

c. The homeowner may then choose to replace the impervious surface with any type of pervious material, such as gravel, pavers, porous concrete, etc.

d. Pervious paver projects must follow the City of Richmond Residential BMP pervious paver design standards or manufacturer specifications.

e. If the project involves concrete removal and no installation of new pervious pavers, the area must then be sodded, seeded and straw mulched, or prepped for a garden installation. The soil underlying the impervious surface removed must be tilled or mixed so that it is no longer compacted.

f. The design/proposal must be approved by both the homeowner and THE ALLIANCE before work begins. A sketch showing the outline and location descriptors must be submitted with information on type of pervious surface (i.e. interlocking pavers, turfstone).

C. RESPONSIBILITIES OF ALLIANCE FOR THE CHESAPEAKE BAY

1. In conjunction with RCC, educate homeowners about the Chesapeake RiverWise Communites program.

2. Obtain signed maintenance agreements, co-payments, and any other necessary paperwork from all participating homeowners.

3. Provide oversight of Sub-Contractors installing BMPs on private residential properties, including design review.

4. Fair share objectives:

Sub-Recipient agrees to comply with the requirements of EPA's Program for Utilization of Minority and Women's Business Enterprises (MBE/WBE) in procurement under assistance agreements, contained in 40 CFR, Part 33. Sub-Recipient will document its efforts to meet the federal fair share objectives for MBE and WBE participation in procurement under this Grant Agreement and submit all documentation available to DDOE.

Sub-Recipient will keep such records as are necessary to determine compliance with the fair share obligations. The records kept by the Sub-Recipient, its Sub-Contractors and Vendors will

be designed to indicate: (1) the number of minority, non-minority, and women owned businesses that applied for the contracts and/or subcontracts, and (2) the number of minority, non-minority, and women owned businesses, employed in each work classification on the project.

Definitions:

Disadvantaged Business Enterprises (DBEs) are entities owned and/or controlled by a socially and economically disadvantaged individuals as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note) (10% statute), and Public Law 102-389 (42 U.S.C. 4370d) (8% statute), respectively; a Small Business Enterprise (SBE); a Small Business in a Rural Area (SBRA); a Labor Surplus Area Firm (LSAF); or a Historically Underutilized Business (HUB) Zone Small Business Concern, or a concern under a successor program.

Minority Business Enterprises (MBEs) are entities that are at least 51% owned and/or controlled by a socially and economically disadvantaged individual as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note), and Public Law 102-389 (42 U.S.C. 4370d), respectively.

Women's Business Enterprises (WBEs) are entities that are at least 51% owned and/or controlled by women (under the 10% and 8% statutes).

5. Assist Sub-Contractors as necessary in communication with homeowners and RCC to include how the selected BMP installations meet the Chesapeake RiverWise Communities goals.
6. Maintain contact information database of sub-contractor participants and assist homeowners participating through this avenue in selection and oversight of an approved Sub-Contractor.
7. Issue payment to Sub-Contractors for completed installations per property based on above reimbursement allowances, provided that completed projects have met the required BMP specifications.
8. Coordinate inspection of installed BMPs by THE ALLIANCE staff to ensure proper installation and function of each BMP.
9. Provide instructions to homeowner for care and maintenance of installed BMP(s).
10. Complete reporting requirements as indicated by funding sources.

D. RESPONSIBILITIES OF SUB-CONTRACTOR

1. Coordinate with THE ALLIANCE to determine appropriate degree of participation within the Chesapeake RiverWise Communities Program and provide an approximate timetable for project completion.
2. Review audits provided by THE ALLIANCE/RCC to identify approved BMP(s) and location(s) for installation.
3. Meet with homeowners to discuss BMP(s) for their property and provide estimate for each service discussed. Homeowners may elect to hire Sub-Contractor to perform additional services at their own expense.
4. After collection of required paperwork by THE ALLIANCE, provide homeowner and THE ALLIANCE with a design plan for the work to be completed and allow for design changes based on homeowner's suggestions. Sub-Contractor must provide the following information to the homeowner/THE ALLIANCE with the design/proposal:
   a. Proposal to include written description of work to be performed, list of native plants proposed to be installed, including number and size of each, scientific name, and common name.
   b. Design plan showing location and size of BMPs (may be sketched or computer generated), including any associated BMP worksheets. (See checklists and worksheets for detailed specifications for each practice.)
   c. Any optional services, priced separately.

5. Locate any surface or subsurface property conditions such as pipes, cables or other obstructions or hazards on the property by calling Miss Utility before any work begins. If any hidden obstructions or other unexpected conditions arise during the installation, it will be the responsibility of the homeowner to cover any additional costs incurred.
6. Install the BMP(s) selected by the property owner which may include rain gardens, BayScape gardens, and/or replacement of impermeable surfaces with permeable surfaces.
7. Provide instructions to homeowner for care and maintenance of installed BMP(s).
8. Maintain appropriate licenses, workmen compensation, and general liability insurance not less than $1 million to cover Sub-Contractor activities on the property. Paver Sub-contractors must be ICPI certified. Installers of other pervious materials (such as porous concrete) shall provide one of the following documentation:
    a. Documentation from an accredited organization certifying the individual/company as knowledgeable and competent with the installation of this material.
    b. References for three of the most recently completed projects utilizing this material (including client name, phone number, date of installation, and address as well as photos of the completed projects).
9. Submit detailed invoices to THE ALLIANCE according to above reimbursement allowances. Invoices must be itemized to include itemized materials costs, labor rates/hour, design fees, and any other relevant project expenses. Include copies of receipts or other documentation of expenses when possible. Also submit "before" and "after" digital photos of project.
10. Agree to correct any problems identified by THE ALLIANCE staff during inspections before and after completion of project installation at no additional charge to the homeowner or THE ALLIANCE.
11. Agree and acknowledge that you as the Sub-Contractor are solely responsible for any taxes owed, if any, on the payments made payable to it under this Agreement by any taxing authority, whether federal, state or local.
12. Ensure the protection of existing public and private property including but not limited to sidewalks, pavements, landscaping, from damage using methods approved by the City of Richmond such as planking, covering, temporary cement curbs, etc., and shall be responsible for replacement of items that are damaged by work under this Grant. Sub-Contractor shall be responsible for repair or replacement of damages to sidewalks, curbs, streets, public property and public utilities as directed by the City of Richmond in accordance with the standards of the City having jurisdiction over the damaged property. Sub-Contractor shall replace cracked slabs.
13. Sub-Contractor shall clean all sediment and pollutants associated with the project off of any City right-of-way.
14. Sub-Contractor shall be responsible for obtaining any permits associated with this project by the City.
15. Sub-Contractor shall be responsible for personal injury to workmen and the public and/or property damages as a result of any negligent or other wrongful acts or omissions they cause, and shall indemnify and hold THE ALLIANCE harmless for any such injuries that are incurred during the completion of tasked projects.
16. Nothing contained in the drawings and specification shall be interpreted as making THE ALLIANCE a party to, liable for, or relieving Sub-Contractors of:
    a. Sub-Contractor's responsibility for materials delivered and work performed until completion and final acceptance;
    b. Sub-Contractor's responsibility to sustain all costs, losses, or damages arising out of the nature of the work to be done, or due to any unforeseen or usual obstructions or difficulties which may be encountered in the accomplishment of the work, or resulting from the work, or resulting from the action of the elements; and
    c. Sub-Contractor's responsibility to protect existing public and private property.
17. Prior to the start of construction work, Sub-Contractor shall work with THE ALLIANCE to provide a minimum of five (5) site condition digital photographs of adjoining private and public

property and other improvements on and around the perimeter of the project site which may be subject to damage claims.

18. In no event will the Sub-Contractor use grant funds for a purpose other than that of costs allowable for the grant project authorized by this Partnership Agreement. Sub-Contractors will ensure that its Vendors do likewise as set forth herein this paragraph.

E. INDEMNIFICATION

Sub-Contractor agrees to indemnify and hold harmless the Alliance for the Chesapeake Bay and all of its officers, agents and servants against any and all claims of liability or lawsuits arising from or based on, or as a consequence of or result of, any act, omission or default of THE ALLIANCE employees or its Sub-Contractors, in the performance of activities through the Chesapeake RiverWise Communities Financial Incentive program.

ALLIANCE FOR THE CHESAPEAKE BAY: _____

ACCEPTED BY:	ACCEPTED BY:
SIGNATURE:	SIGNATURE:
DATE:	DATE:

APPENDIX 5A

RiverWise Residential BMP Verification Form

Residential BMP Verification Form

Type of Inspection:
◯ Initial
◯ Performance

Property Owner

Address or Coordinates

Inspector Name

Date

Year of Install

Date of last verification

BMP(s) Inspected ☐ BayScape ☐ Rain Garden ☐ Permeable Hardscapes ☐ Trees ☐ Rain Barrels

Drainage Area

BMP(s) in correct location: ◯ Yes ◯ No

Corrective Action(s)

BMP materials are consistent with approved plan: ◯ Yes ◯ No

Corrective Action(s)

BMPs installed per approved plan design and specs: ◯ Yes ◯ No

Corrective Action(s)

Flood test results (only applicable for rain gardens and/or permeable hardscapes):

Results/Comments:

Performance Inspection Only:

Serves intented drainage area: ◯ Yes ◯ No

Functioning per original design: ◯ Yes ◯ No

Maintenance required: ◯ Yes ◯ No

BMPs: ◯ Pass ◯ Fail