CleanScapes

Keep the Rain, not the runoff!

Residential Best Management Practice (BMP) Incentive Program Criteria

clean H2OWARD
Howard County Stormwater Solutions

LIVE GREEN Howard County

Howard County Office of Community Sustainability, 410-313-0678
CleanScapes Program, www.cleanwaterhoward.com

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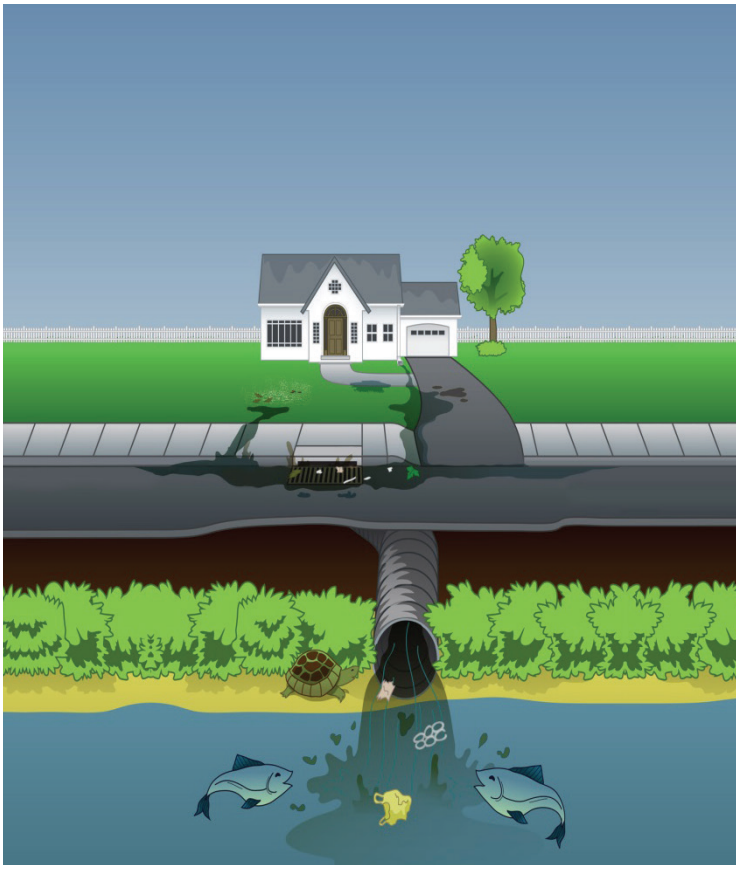


Think about your car before and after a rain storm. It looks cleaner, doesn't it? All of the dirt, oil, and road pollution that used to be on your car washed down the street and likely went down a storm drain without treatment. Now all of the things that you didn't want on your car are in local water bodies. The same process happens with your house and driveway, although you might not have noticed it. Stormwater runoff is responsible for 20% of water pollution to the Chesapeake Bay. As you might guess, this has reduced the health of our local waterways including the Patuxent River and the Patapsco South Branch. You can stop runoff in its tracks by installing a stormwater Best Management Practice (BMP). If you choose to install a BMP, we will thank you for your efforts by issuing you financial incentives: credits toward the annual Watershed Protection Fee and reimbursements. We recommend that you familiarize yourself with these requirements before installing a BMP. Underlined words in this guide are defined in the "definition of terms" section.

Why are the requirements so specific?

The first inch of rainfall or "first flush" washes most of the pollutants off of impervious (hard) surfaces; we hope that your practices will capture this first inch and filter out the pollutants before they can negatively impact local water.

Specific equations are used to calculate the amount of runoff that comes off of an impervious surface during the first inch of rainfall. This is where we get the number in the "volume (ft3)" column—it is the amount of water that your practice must be able to hold to capture and treat that very important first inch of rainfall. We will show you examples of how to calculate the volume yourself and how to make sure that your practice has the right measurements to hold that volume in Appendix B.

Don't worry, if you have questions about calculations in this guide or figuring out your drainage area, you can always email cleanwaterhoward@howardcountymd.gov for help! Read on for the types of practices that are eligible for incentives and how to meet the requirements.

Rain Gardens:

Rain garden at Franciscan Friars

Rain gardens are gardens filled with native plants and absorbent soil that are shaped to collect and filter water when it rains. Rain gardens are not only beautiful and attractive to local wildlife, but can also help solve drainage and pooling problems in your yard.

Note that "volume (ft3)" refers to the maximum volume of stormwater runoff which can be contained in the ponding area. Volume can be measured by multiplying the ponding depth, by the ponding area. See Appendix B for help calculating this figure.

The drainage area must be impervious surface which is directed to the rain garden for treatment. Rain gardens must drain within a reasonable time (24-48 hours) to be considered for credit and reimbursement.

Rain gardens are eligible for reimbursement of 50% of the cost incurred up to $1,200. Your rain garden must meet the following criteria to be considered for credit and reimbursement:

Rain Garden Minimum Requirements:

Best Management Practice (BMP)	Lot size/type	Drainage Area (ft^2)	Volume (ft^3)	Other Conditions	Eligible for Credit and Reimbursement?	Reimbursement Cap
Rain Garden	Condominium or Townhouse	250	14.84	Rain garden must not contain design flaws, fail to treat water quality, or create drainage problems.	Yes	$1,200
	Single Family Home on ¼ acre or less	500	29.96			
	Single Family Home on Greater Than ¼ Acre	1000	59.37			

What does this mean for me?

Let's say you live in a single family home on 0.20 acres (less than ¼ acre). The landscaper that you found using the list in Appendix C has directed 500 square feet of roof top (this is your drainage area) into your rain garden. The garden's ponding area, or the bowl-shaped area of your garden, is 6 inches deep and 10 feet by 6 feet. This would put you at 30 ft3 of volume in the ponding area, which is just above our minimum of 29.96 ft3. So, your rain garden would be eligible for reimbursement and credit. You saved receipts, took pictures before, during, and after your project to include with your application. See appendix B for more help with sizing and calculations.

Rain Barrels/Cisterns:

Rain barrels and cisterns are large storage containers, often attached to downspouts, which collect precipitation during storms. This will slow the flow of stormwater that would otherwise be coming very quickly off of your roof. The collected water can be used to water lawns and gardens (even your rain garden!).

Rain barrels are eligible for reimbursement of 50% of the cost incurred up to $500. Your rain barrel must meet the following criteria to be considered for credit and reimbursement:

Rain barrel/cistern Minimum Requirements:

Best Management Practice (BMP)	Lot Size/Type	Drainage Area (ft^2)	Volume (gallons)	Other Conditions	Eligible for Credit and Reimbursement?	Reimbursement Cap
Rain Barrel	Condominium or Townhouse	250	250	None	Yes	$500-maximum reimbursement is $1/gallon stored
	Single Family Home on ¼ Acre or Less	500	296			
	Single Family Home on Greater Than ¼ Acre	1000	592			

What does this mean for me?

Let's say you live in a single family home on 0.15 acres (less than ¼ acre). Your roof is 1000 square feet and you have 4 downspouts; so, each downspout drains 250 square feet of rooftop. You have connected 3 55-gallon rain barrels at two of your downspouts. So, you can store 330 gallons (6 barrels x 55 gallons each) of water (volume) coming from 500 square feet of roof (drainage area) and are eligible for reimbursement and credit. You saved receipts, took pictures before, during, and after your project to include with your application. You spent $400—we would reimburse you $200. See appendix B for more help.

Conservation Landscaping:

Conservation landscapes are gardens that have de-compacted, amended soil and are mostly (if not entirely) filled with native plants. These gardens allow for stormwater infiltration and treatment, and can be an alternative for lots that are not quite right for a rain garden. For example, a conservation landscape may be an alternative method when soil does not percolate enough to allow a rain garden to drain or if tree roots prevent full digging and amending depth necessary for a rain garden.Conservation landscapes are eligible for reimbursement only. Conservation landscapes may receive reimbursement of 50% of the cost incurred up to $750. Your conservation landscape must meet the requirements below to be eligible for reimbursement.

Conservation Landscape Minimum Requirements:

Best Management Practice (BMP)	Lot Size/Type	Drainage Area (ft^2)	Volume (ft^3)	Other Conditions	Eligible for Credit and Reimbursement?	Reimbursement Cap
Conservation Landscape	Condominium or Townhouse	250	14.84	• Must have 2 – 3" ponding • 75% native plants (# of plants, not size of each, cost, or coverage area). • Replacement of turf, invasive species, or impervious surface only • No plants invasive to Maryland • 9" soil de-compaction, and amendment • Minimum 2" of mulch at initial planting (maintain mulch coverage in future only in areas where there is no ground cover) • 250 ft^2 minimum of conservation landscaping. • Must drain within 24-48 hours • Planting density to assume full coverage of landscaped area after a maximum of 5 years.	Yes	$250-$750; Maximum Reimbursement is $1/ft^2$
	Single Family Home on ¼ Acre or Less	500	29.95			
	Single Family Home on Greater Than ¼ Acre	1000	59.37			

What does this mean for me?

Let's say you live in a single family home on 0.6 acres (greater than a ¼ acre). Your roof is 4000 square feet and you have 4 downspouts; so, each downspout drains about 1000 square feet of rooftop. You planted a conservation landscape to catch the runoff from one of these downspouts, or 1000 square feet drainage area. You planted a 500 square foot conservation landscape using native plants that you found using the materials in Appendix C. You also added compost (soil amendment) and de-compacted the soil with a tiller, improving the landscape's drainage and nutrient filtration. You would have installed a rain garden, but tree roots keep you from digging to the depth needed to plan one. You saved receipts, took pictures before, during, and after your project to include with your application. You spent $1,000; we would reimburse you 50% of that, or $500.

Pavement Removal:

Pavement removal is the direct removal of an impervious surface. This removal will help to slow down and spread out runoff if replaced with an appropriate alternative, like a conservation landscape or a rain garden.

Pavement removal is eligible for reimbursement of 50% of the cost incurred up to $1200. Please note that projects started after August 1, 2016 cannot receive reimbursement for both pavement removal and the practice that replaces the pavement (e.g. pavers, conservation landscape, etc.).

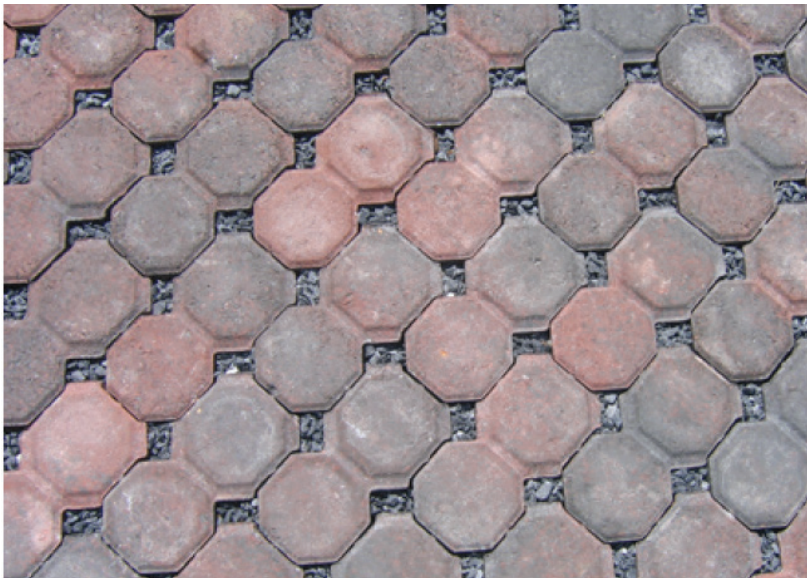
Pavement Removal Minimum Requirements:

Best Management Practice (BMP)	Lot Size/Type	Drainage Area (ft^2)	Volume (ft^3)	Other Conditions	Eligible for Credit and Reimbursement?	Reimbursement Cap
Pavement Removal	Condominium or Townhouse	250	n/a	Must return area to a natural planted state, or cover with permeable hardscaping (must meet criteria in permeable hardscaping section); minimum removal of 100 ft^2	Yes	$600-$1,200
	Single Family Home on ¼ Acre or Less	500				
	Single Family Home on Greater Than ¼ Acre	1000				

What does this mean for me?

Let's say you live in a single-family home on 0.2 acres (less than ¼ acre). You removed your 500 square foot patio and replaced it with a conservation landscape. You chose to be reimbursed for the cost of hiring a contractor to remove the patio, rather than the conservation landscape. You cannot be reimbursed for both. You saved receipts, took pictures before, during, and after your project to include with your application. You paid $800 to have the patio removed; we would reimburse you $400 . You will also receive a credit for the hard surface you removed.

Permeable Hardscapes:



Permeable hardscapes are a more environmentally-friendly option for driveways and sidewalks in comparison to traditional pavement options, such as asphalt or concrete. Permeable hardscapes help runoff to gradually re-enter the water table through several inches of gravel below the surface and are carefully designed to prevent compaction. We do not recommend installing this practice on your own; please contact a certified professional if you are interested in this practice.

Permeable hardscapes are eligible for reimbursement of 50% of the cost incurred up to $1200. The installation of pavers must meet criteria defined in the Maryland Stormwater Design Manual, chapter 5 (2000). Permeable pavers must also meet the criteria below to be considered for reimbursement or credit.

Permeable Hardscapes Minimum Requirements:

Best Management Practice (BMP)	Lot Size/Type	Drainage Area (ft^2)	Volume (ft^3)	Other Conditions	Eligible for Credit and Reimbursement?	Reimbursement Cap
Permeable hardscaping	Condominium or Townhouse	250	19.79	Must have significant underground storage capacity. Minimum paved area of 100 ft^2.	Yes	$1,200
	Single Family Home on ¼ Acre or Less	500	39.58			
	Single Family Home on Greater Than ¼ Acre	1000	79.16			

What does this mean for me?

Let's say you live in a townhouse. You found a contractor from the list in Appendix D, or a search on the Interlocking Paver Institute contractor list. The contractor replaced your 250 square foot walkway (drainage area) with permeable pavers. You saved receipts, took pictures before, during and after your project to include in your application. You paid $2,000; we would reimburse you $1,000. You will also receive a credit for the amount of hard surface you replaced with pavers.

Dry Wells:

Dry wells are underground storage containers, often surrounded by gravel, that capture stormwater runoff from gutters and then gradually allow it to infiltrate into the ground water table.

Dry wells are eligible for reimbursement for 50% of the cost incurred up to $600. Only internal volume of the dry well (not the surrounding stone) will be considered toward the overall capacity. If the dry well is filled with stone, you must provide porosity of the stone.

Dry Well Minimum Requirements:

Best Management Practice (BMP)	Lot Size/Type	Drainage Area (ft^2)	Volume (ft^3)	Other Conditions	Eligible for Credit and Reimbursement?	Reimbursement Cap
Dry Well	Condominium or Townhouse	250	19.79	Demonstrate A or B Hydrologic Soil Groups or 0.52 inch per hour or higher infiltration rate within 50 feet of the proposed dry well site.	Yes	$600
	Single Family Home on ¼ Acre or Less	500	39.58			
	Single Family Home on Greater Than ¼ Acre	1000	79.16			

What does this mean for me?

Let's say you live in a single family home on 2 acres (greater than ¼ acre). Your roof is 4000 square feet; one of your four downspouts, or 1000 square feet of rooftop (drainage area), is directed into a drywell. The drywell is a cylinder 7 feet tall and 4 feet wide. So the volume that your dry well holds is 87.9 ft3 of water; this meets the criteria. You saved receipts and also took pictures before, during, and after your project to include in your application. You paid $1,000; we would reimburse you $500 against the Fee. See Appendix B for more help.

Tree Canopy:

Trees are a beautiful and habitat-building way to help improve water quality.

Tree canopy is eligible for reimbursement only. Your tree canopy must meet the requirements below to be eligible for reimbursement of up to 50% of the cost incurred up to $600.

Tree Canopy Minimum Requirements:

Best Management Practice (BMP)	Lot Size/Type	Drainage Area (ft^2)	Volume (ft^3)	Other Conditions	Eligible for Credit and Reimbursement?	Reimbursement Cap
Urban Tree Canopy	Condominium or Townhouse	250	n/a	Deciduous: minimum 2 inch caliper; Evergreen: minimum 6 feet tall. Must provide water quality treatment benefit.	Reimbursement only	$600 total; $150 per tree
	Single Family Home on ¼ Acre or Less	500				
	Single Family Home on Greater Than ¼ Acre	1000				

What does this mean for me?

Let's say you live in a single family home on 0.15 acres (less than ¼ acre). Stormwater runoff from your 500 square foot patio (drainage area) slopes toward 3 red maples, each 2 inches in caliper, which you recently planted. You saved receipts and also took pictures before, during and after your project to include in your application. You found the trees using the Green Registry referenced in Appendix C. You spent $450 on the trees; we would reimburse 50% of that, or $225.

Green Roofs:

Green roofs are vegetated roofs with soil amendment that help to treat runoff at its source. Green roofs also help to improve air quality.

If you are interested in installing a green roof, please speak with a professional. Green roofs must follow all guidelines offered in the Maryland Stormwater Design Manual, chapter 5. The maximum reimbursement for this practice is $1200, with a minimum green roof area of 300 square feet or ¼ of the roof.

Green Roof Minimum Requirements:

Best Management Practice (BMP)	Lot Size/Type	Drainage Area (ft^2)	Volume (ft^3)	Other Conditions	Eligible for Credit and Reimbursement?	Reimbursement Cap
Green roof	Condominium or Townhouse Single Family Home on ¼ Acre or Less Single Family Home on Greater Than ¼ Acre	300 or ¼ roof	n/a	Must be installed by certified contractor and comply with Maryland Department of Environment Stormwater Design Manual, chapter 5 (2000)	Yes	$1,200

What does this mean for me?

You spent $9,000 on a green roof installed by a certified contractor; we would award you the $1,200 maximum reimbursement. You saved receipts and also took pictures before, during, and after your project to include in your application.

Appendix A: Definition of Terms:

Berm: A mound at the edge of a rain garden which detains rain water within the ponding area for infiltration.

Impervious Surface: A hard or compacted surface which stormwater runoff cannot percolate into. Some examples of impervious surfaces include: traditional rooftops, driveways, and sidewalks.

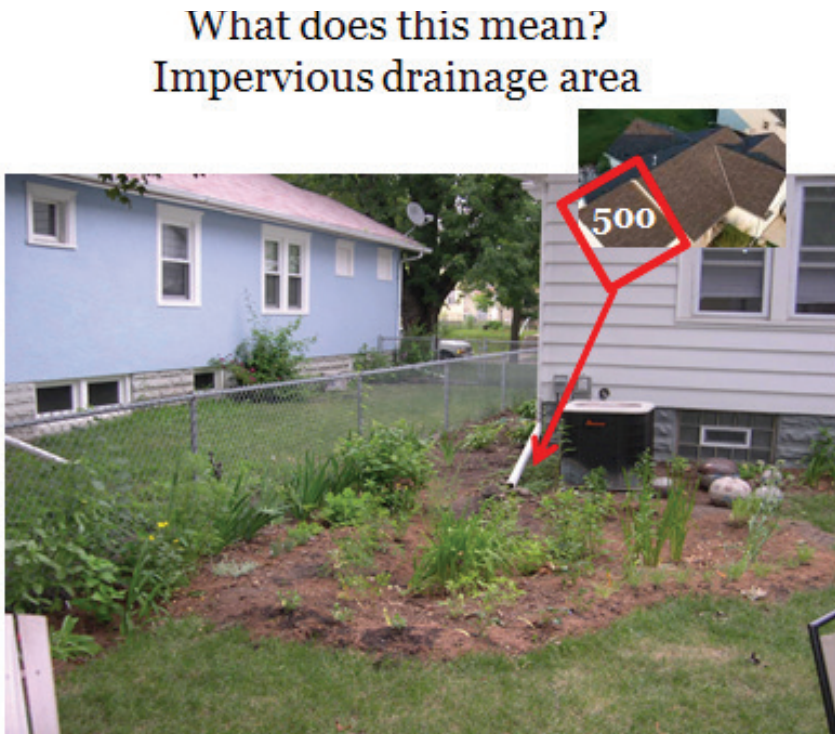
Ponding Area: The concave temporary storage area located interior to the pre-treatment area and berm of the rain garden

Ponding Depth: The depth of the ponding area, measured from the lowest point of the ponding area to the top of the berm. Ponding depth does not include amended soil depth.

Stormwater Best Management Practice (BMP): A practice, such as a rain garden, which improves water quality, often by removing sediment and excess nutrients.

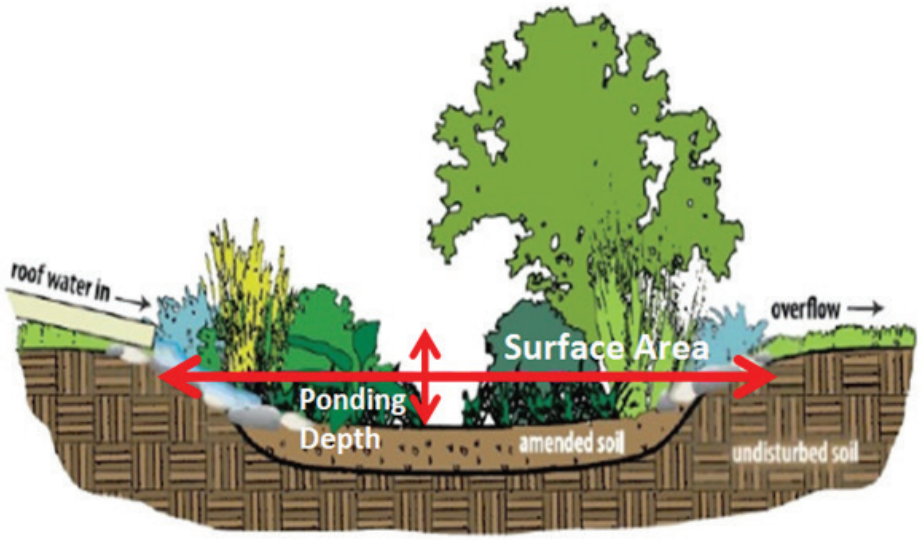
Watershed Protection Fee (WPF): Howard County, Maryland's stormwater remediation fee. The WPF is included as a line item in the County's property tax bill.

Appendix B: Drainage Area and Capacity Calculations:



We aim to manage the first 1 inch of rain fall with storm water practices. The first inch of rain, or "first flush," is where the majority of pollutants come off of a hard surface. During the first inch of rainfall, 500 square feet will generate 29.96 cubic feet of water. The drainage area requirements that you see throughout this guide refer to the minimum square footage from an impervious surface, like the roof in the picture above, that must be directed to a practice, like the rain garden pictured. The rain garden or other practice must be sized to treat the impervious drainage area directed to it. The impervious drainage area that you treat using your practice can be any hard surface on your property, including: rooftop, driveway, sidewalk, patio, or deck.

How to calculate volume for your practice: rain gardens



Graphic: EMSWCD

- Surface area: 125 square feet
- Ponding depth: 4 inches
- Capacity: 125 square feet*4 inches= 41.66 CF ☑

To calculate the volume of water that a rain garden can temporarily hold, multiply the ponding depth (the average distance from the mulch at the bottom of the rain garden to the top of the berm) by the surface area (the approximate length times width). The rain garden must be able to drain this amount of water within 24-48 hours.

How to calculate volume for your practice: rain barrels and dry wells

Drainage area is determined in the same way for all practices (see above), but the volume of these items is based upon their shape. Note that the volumes required are also higher for these practices than for a rain garden. If you purchase them in a store (see Appendix D), these items will often display the volume that they can hold, making the information below unnecessary.

Volume of a cylinder: πr2h

Volume of pictured* rain barrel: πx22x3=37.68 ft3

1 cubic foot=7.48 gallons, so 37.68 ft3=281.86 gallons

π=3.14

*Not to scale

Appendix D: Other Considerations:

- Best Management Practices installed at development as part of new stormwater regulations are not eligible for credit or reimbursement (typically development 2003 and newer).
- Best Management Practices installed before November of 2011 are not eligible for reimbursement.
- Current homeowner must have installed practice to be considered for reimbursement and appropriate receipts must be provided.
- The Howard County Office of Community Sustainability retains the right to reject any BMP for credit, if it does not provide a water quality treatment benefit.
- All contractors who have not installed at least 5 reimbursed and/or credited BMPs in Howard County must submit planting plans, calculations, and profile views of their BMP designs at the time of their client's application.
- All credit applications received after April 4, 2016 will receive a percentage of credit based upon the amount of total impervious surface treated on site.
- All practices must have been installed within the last year to be eligible for reimbursement.

Please contact cleanwaterhoward@howardcountymd.gov with any questions related to this material.

Appendix D: Eco Friendly Gardening Cheat Sheet

Resources:

Do-it-yourself Installation Guide
Homeowner Guide for a More Friendly Bay
http://chesapeakestormwater.net/2013/04/homeowner-bmp-guide/

Financial Resources
Howard County's residential credit and reimbursement program
http://www.cleanwaterhoward.com/what-is-your-role/residential-properties

Additional Financial Resources (COLUMBIA ONLY)

https://www.columbiaassociation.org/wp-content/uploads/2016/04/RainGardenCostShare2013pdf.pdf

Materials-Green Registry:

Lowes (Elkridge), Sun Nurseries, and Grandfather's Garden Center

Property Stormwater Site Assessments
Howard County Watershed Stewards Academy
http://howardwsa.org/

Contractors

Rain Gardens and Conservation Landscapes

Lauren's Garden Service
www.laurensgardenservice.com
410-461-2535

McHale Landscape
www.mchalelandscape.com
301-599-8300

READY
http://ready.allianceforthebay.org/
443-518-7665

Village Gardeners
www.villagegardenerscapes.com
301-748-9872

Permeable Hardscapes

First Impression Hardscapes
www.firsthardscapes.com
410-799-0299

Rhine Lanscaping, LLC
www.rhinelandscaping.com
410-442-2445