



Rainwater: Your Liquid Asset

A Home Stormwater Exercise

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What is stormwater runoff?

Stormwater runoff is rainwater that does not soak into the surface on which it falls, but rather runs along the surface downhill. It is commonly associated with urban areas because of the increase in impervious surfaces (rooftops, driveways, roads), which impedes water from infiltrating (or soaking into) the ground. Stormwater picks up and carries pollutants, like sediment, trash, toxins, nutrients and pathogens, to our streams and rivers. Excess stormwater also can result in flooding and damage to municipal infrastructure, such as roadways, greenways and sanitary sewers.

Where does it come from?

The amount of stormwater produced during a rainfall depends on many factors, including the extent of impervious surface, topography, amount of vegetation and soil types. For example, soils that are primarily composed of clay and become compacted due to human activity are nearly as impenetrable to stormwater as asphalt!

The flowpaths of stormwater through communities are influenced primarily by the lay of the land and how local municipalities and property owners route it. Stormwater flows downhill, following the path of least resistance and, from your home, may be routed over roads, across neighbors' properties, and through

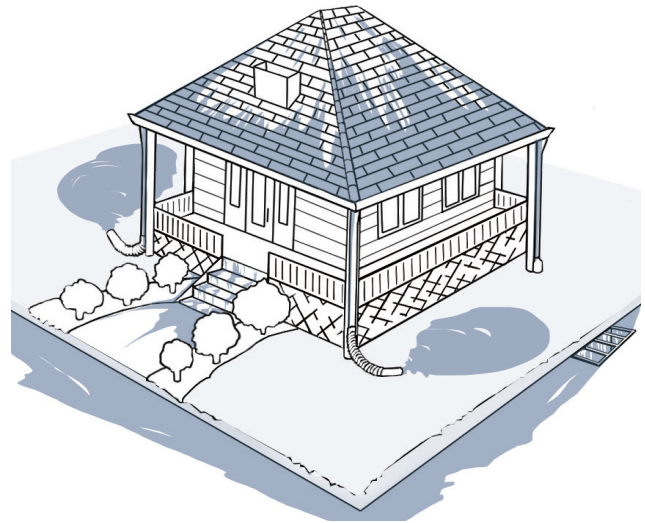


Illustration Credit: Katie Walberg

Example of stormwater flow on a property

ditches to drainage pipes that empty into a creek. As it makes this journey, stormwater connects one property owner to the next and ultimately connects each parcel of land — and the activities occurring on it — to a local waterway.

STORMWATER FACTS

Pet waste that is not properly collected and disposed of can become a primary source of pathogens in our waterways. Such pathogens can include bacteria (e.g., *E. coli*, *Salmonella spp.*), parasites (e.g., *Giardia*), and viruses.

Warm water holds less oxygen than cold water; thus, water run off from roofs and driveways during hot summer months can be hazardous to aquatic life.

An average dog produces about a 1/4 lb. of waste per day.

Due to impervious surfaces like pavement and rooftops, a typical city block generates 5 times more runoff than a woodland area of the same size.³

Significant improvement in water quality can increase market value by 15% for properties bordering a water body.¹

A primary pollutant of TN waterways is sediment or soil.

The higher the turf cutting height, the more extensive the root systems. Deep roots help to hold soil in place and prevent erosion.

A marginal reduction in flooding increases floodplain property values by up to 5%.¹

How should it be managed?

Effective home stormwater management can create a positive ripple effect, providing benefits for you (the homeowner), your neighbors and your community. Best management practices (BMPs) include those that slow the velocity of stormwater flow and allow for its infiltration into the soil as well as those that facilitate its capture and reuse. For the homeowner, there are aesthetic, financial and environmental benefits of applying stormwater BMPs. For example, stormwater can be redirected to attractive rain gardens for added curb appeal or contained in rain barrels, saving dollars and conserving water resources. These practices also can help your neighbor by reducing stormwater flow onto their property and the community by reducing waterway pollution and preventing localized flooding.

Home Stormwater Mapping Directions

A home stormwater mapping exercise can help you determine the stormwater BMPs that may be appropriate for your property. First, walk around your yard while it's raining and observe. What happens when a raindrop hits a surface or object on your property? Does it get intercepted, soak in or run off? What influences where rainwater flows, and how does it impact your yard? It may be necessary to observe several rainfalls of various intensities to effectively assess the stormwater flowpaths on your property.

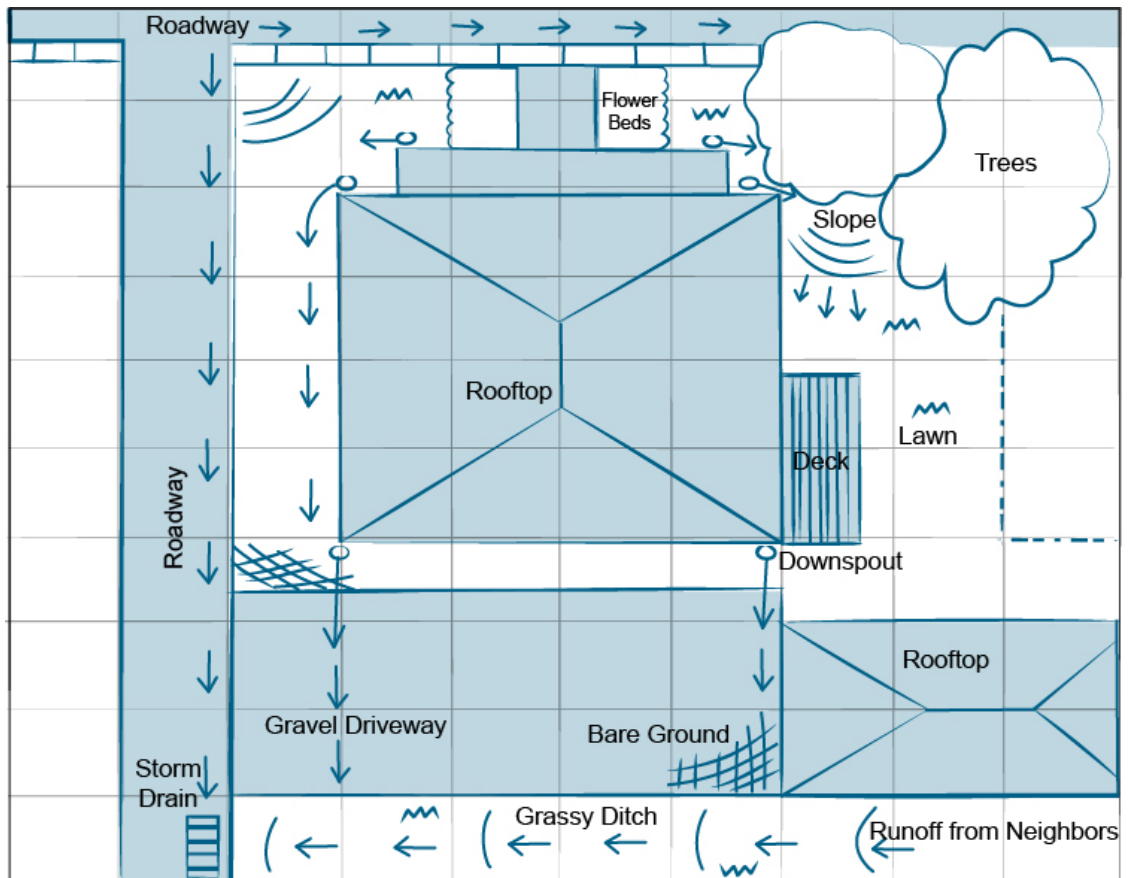
To document your observations, begin by sketching a scaled drawing of your home and its surrounding landscape on the grid provided on page 3. Include hard surfaces like driveways and sidewalks to help estimate the total amount of impervious surface on your property. Draw arrows showing rainfall flow patterns, including where runoff enters and exits your property. Include downspouts and topographic features (e.g., mounds, gullies) that influence flow. Use the symbols in the key shown below to identify the locations of these and other property features that relate to stormwater and its impacts (e.g., where erosion has occurred and where soggy soils persist).



Single family home in Knoxville, Tenn. Google Earth Image, obtained 2011.

Take advantage of technology and obtain an aerial image of your property from the Web. This image will allow you to more easily visualize your home and its surrounding landscape.

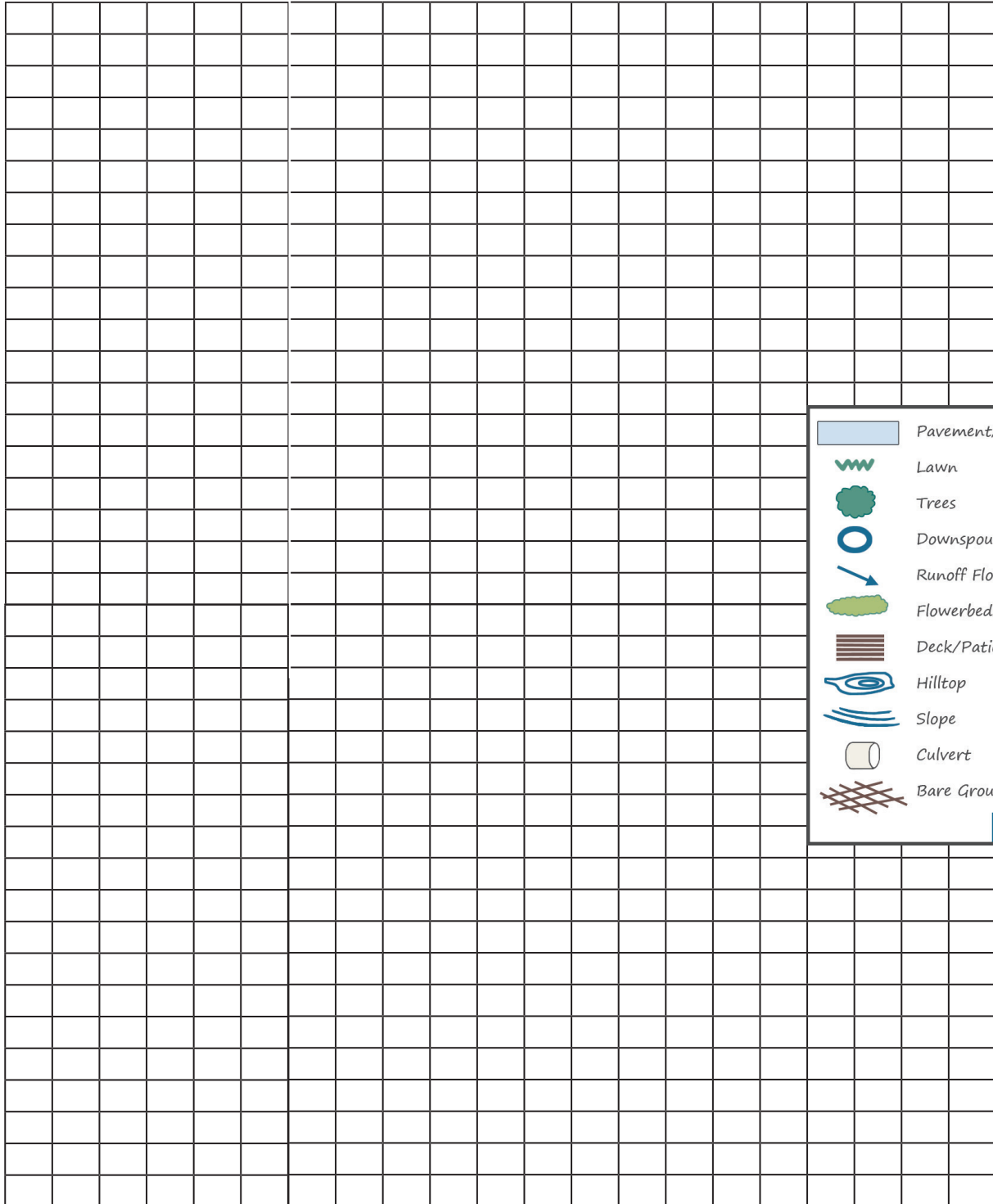
- Quick Steps**
1. Draw structures
 2. Identify key components
 3. Map runoff flow path














Example of how to illustrate your home's stormwater network and related landscape features.

Home Stormwater Mapping Worksheet

Use this grid to sketch a drawing of your home and landscape



	Pavement/Roof
	Lawn
	Trees
	Downspout
	Runoff Flowpath
	Flowerbeds
	Deck/Patio
	Hilltop
	Slope
	Culvert
	Bare Ground

KEY

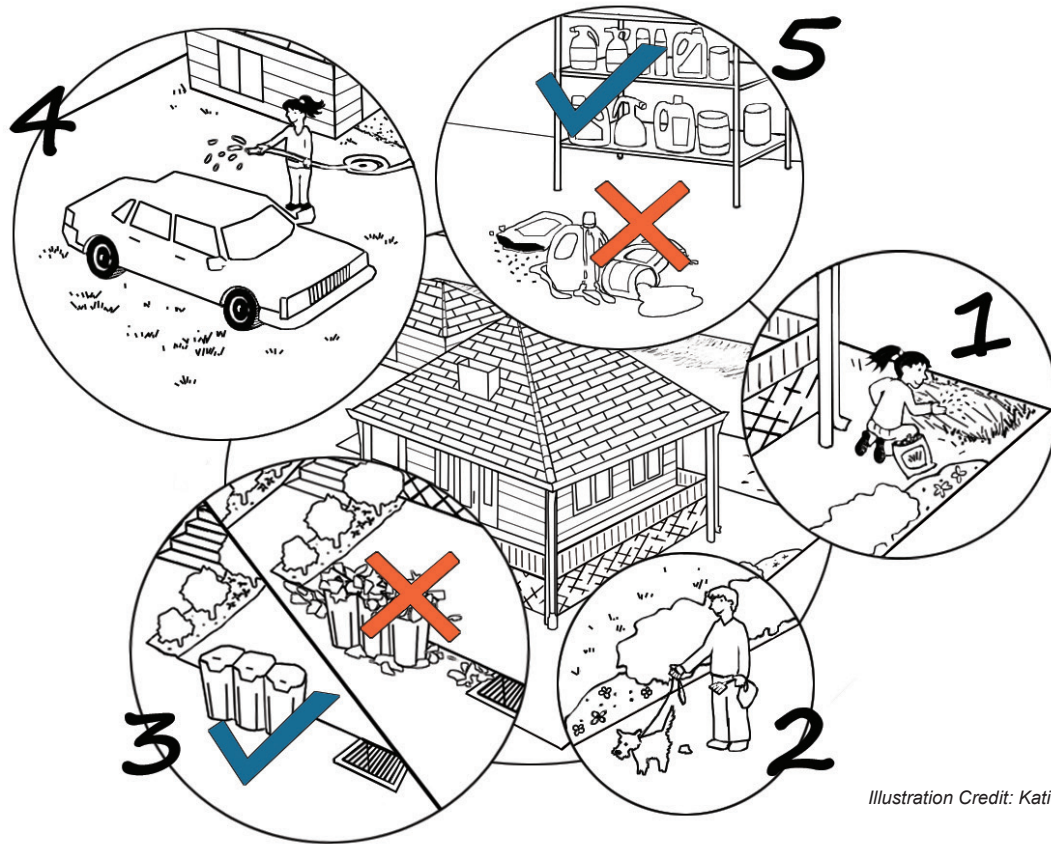


Illustration Credit: Katie Walberg

Common Stormwater Pollutants in the Home Landscape

Actions to Prevent Pollution

1. Sediment

- Seed, plant or mulch exposed soils.
- Do not blow or sweep soil and other materials into storm drains.
- Prevent home construction projects from contributing to sediment runoff by using erosion control matting or straw to cover exposed soil. For large areas of exposed soil, a silt fence may be recommended.

2. Pathogens

- Scoop the poop.
- Can the grease.
- Maintain septic systems.

3. Trash

- Tarp your truck.
- Secure your garbage cans with animal-proof covers.
- Report litter bugs (call 1-877-8-LITTER or contact your local Keep Tennessee Beautiful affiliation for information about local reporting).

4. Nutrients

- Follow fertilizer application directions and have a soil sample analyzed to determine the correct rate of application.
- Sweep up fertilizers on hard surfaces like sidewalks.
- Do not apply fertilizer to frozen ground or dormant turf.
- Do not use fertilizer as a de-icer.
- Do not place grass clippings and other organic wastes in stormwater ditch lines. Doing so contributes to local flooding and unwanted nutrients in our streams.
- Wash your car on the lawn or at a car wash.

5. Toxins

- Store hazardous wastes like pesticides in dry and contained areas.
- Follow pesticide application directions and try out nontoxic pesticide alternatives.
- Learn about “integrated pest management” strategies to apply in your yard.
- Contact your municipal solid waste department to determine the nearest facility to dispose of household toxins (e.g., partially used paints, used oils, partially used household cleaners).

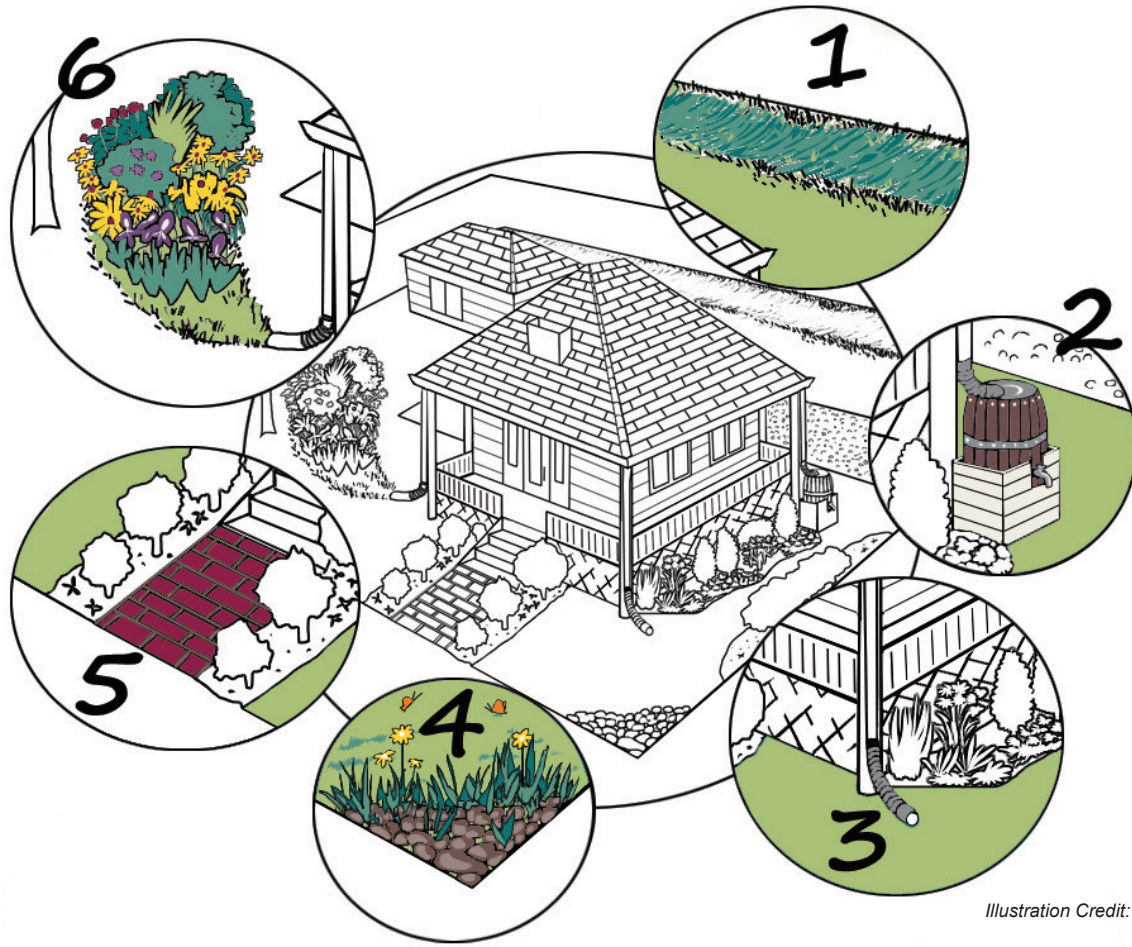


Illustration Credit: Katie Walberg

Stormwater Best Management Practices With Landscape Design

1. Grass Swales — A gently sloped grassed channel that transports stormwater while also allowing for infiltration. Many homes convey water off their property through concrete-lined or eroding ditches. These unsightly features can be replaced with grass swales, an attractive alternative that may increase curb appeal and protect our waterways by filtering out stormwater pollutants.

2. Rain Barrels — A collection system that allows for rooftop runoff reuse and reduces the volume of stormwater draining to waterways. Rain barrels come in many styles and sizes, with selections often based on desired functions and aesthetics. Rain barrels conserve water most effectively when routinely emptied and used.

3. Downspout Disconnection — A simple way to divert rooftop runoff to a permeable surface, allowing for stormwater infiltration. Many downspouts are connected to a pipe or concrete channel that carries stormwater to the stream. They can be disconnected and rerouted to drain into lawns and gardens. By stra-

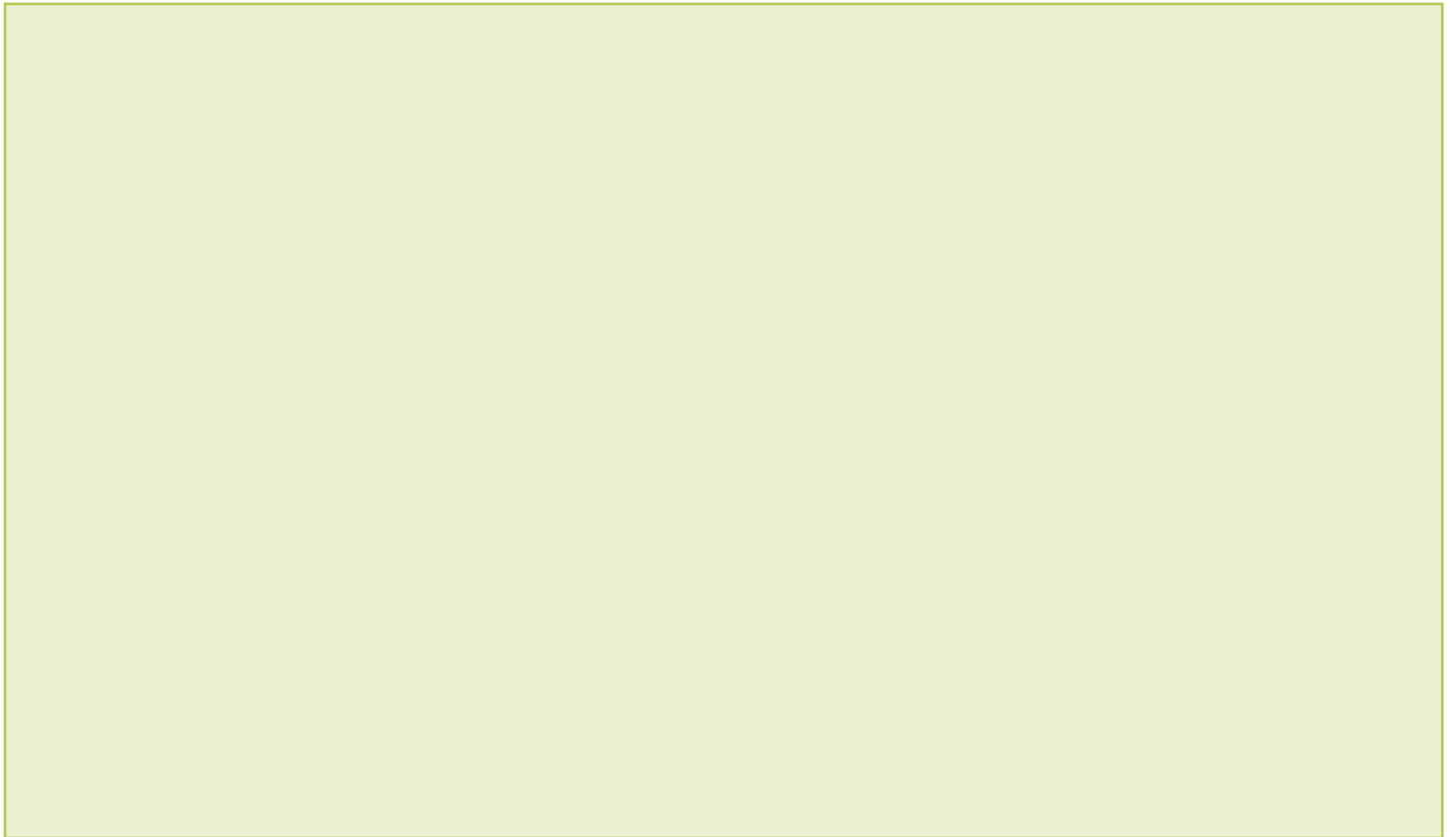
tegically directing runoff into your yard and **not** your neighbor's, you can save on irrigation costs, reduce stormwater pollution and be a good neighbor.

4. Roadside Verge — A planted or armored strip that acts as a buffer between a roadway and residential property that can absorb roadway runoff and provide wildlife habitat. A verge can be used to capture “sheet flow” runoff or small concentrated flows from curb cuts.

5. Permeable Pavement — Materials and techniques used for parking lots, sidewalks, paths, roads, driveways and decks that allow for water infiltration into the soil beneath. Examples include pervious concrete, paving stones, reinforced grass sod and other materials that allow stormwater to percolate through areas that traditionally would be impervious to the soil below.

6. Rain Gardens — Shallow, vegetated depression in the landscape designed to capture and infiltrate polluted stormwater. Rain gardens are typically 3 to 6 inches in depth and are sized to capture and drain a 1-inch rainfall in 24 hours. Rain gardens also slow down runoff, alleviating localized flooding, pollutant transport and stream channel degradation.

Home Stormwater Mapping Notes



For more information on BMPs, go to <https://tynyards.utk.edu>.

References:

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