

# Residential Stormwater Site Assessment

*Amanda Gumbert and Lee Moser, Agriculture and Natural Resources Extension*

Urban areas can impact both the quality and quantity of water in local waterways. Homeowners can help protect water resources by utilizing stormwater management practices on their property. These practices, sometimes called green infrastructure or low-impact development (LID) practices, aim to manage stormwater where it is generated instead of sending it into a storm sewer system. To select the best practices for residential settings, it is important to make a site assessment.

The features of your home and lawn can affect how water moves when it rains. The size of your roof and other impervious surfaces (e.g., driveways and sidewalks) can influence the quantity of water that will run off. Characteristics of your homesite, such as soil type, surface slope, and proximity to surface water, can influence where this runoff goes. If the water runs off your property, it can pick up debris and pollution and carry these to local streams, lakes, or rivers. Understanding the features of your homesite can help you identify ways to follow the stormwater management philosophy of “Slow it down, spread it out, and soak it in.” This ultimately means you will reduce runoff, increase infiltration, and protect local water resources.

## Assess Soil, Vegetation, and Slope

Soil plays an important role in determining if water infiltrates or moves across the ground during rainfall events. Soils have distinct properties that permit water (and potential contaminants) to percolate through soil or run off at variable rates. Soil texture is determined by the dominant particle sizes present. Soil particle sizes influence how water moves. Clay soils, which are composed of fine (very small) particles, slow the downward movement of water and sometimes stop it completely. Sandy soils allow for rapid water movement because the particle size is much larger. Silty soils occupy the middle range. The ideal soil is a mixture



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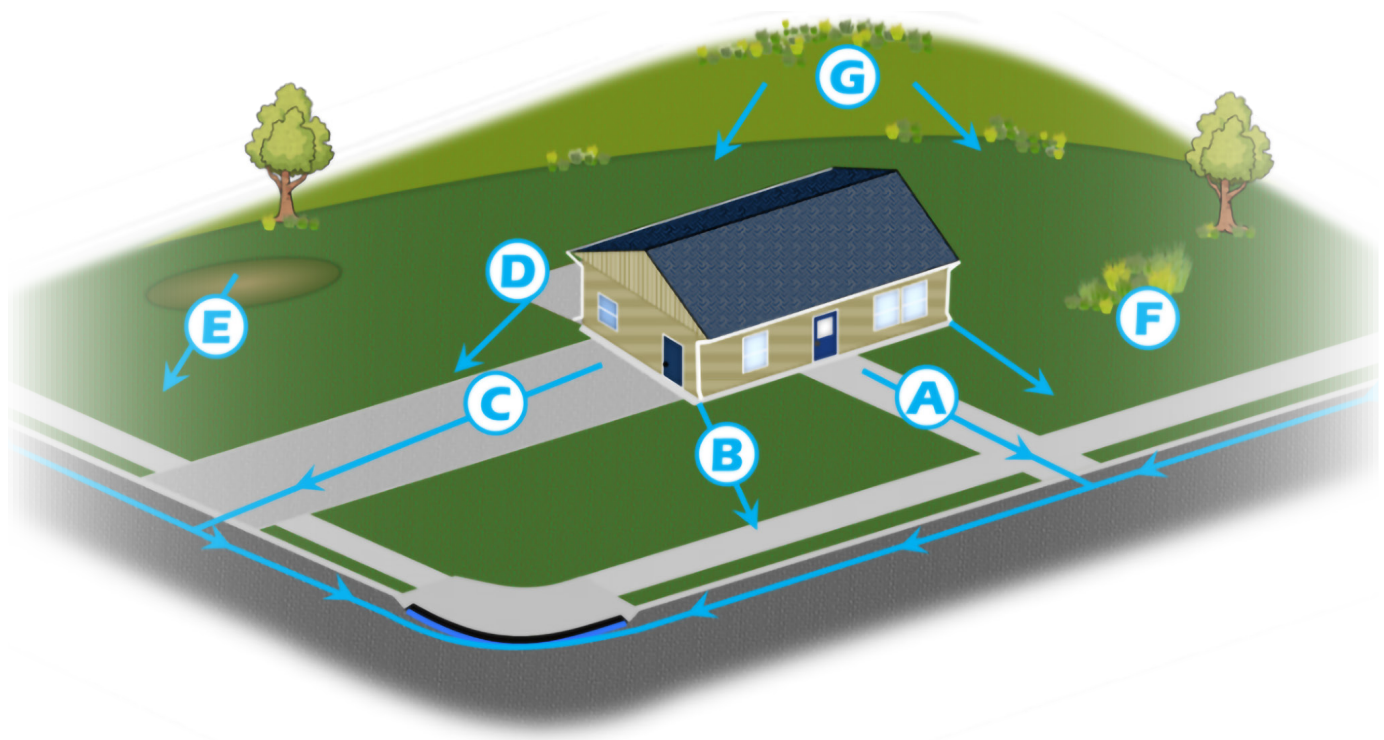
of midsize particles and fine particles, sometimes referred to as loam. This mixture allows water to infiltrate but move slowly so that potential pollutants can be filtered.

In many residential areas, however, the topsoil or more loamy material has been removed from the naturally developed soil during construction. The removal of topsoil tends to leave more clay, which is prone to compaction and reduced infiltration, at the surface. In addition, heavy-equipment traffic can cause compaction issues even when topsoil is not removed. Avoid driving on wet soils to help prevent compaction. Lawn infiltration rates can be increased by adding organic matter to the soil. This can be accomplished by leaving grass clippings after mowing, mulching leaves in the fall, or by adding compost to the lawn and garden.

Lawns with excessive thatch, the buildup of dense roots and other organic components of the turf, can also impede

water movement into the soil profile. Dethatching can be an effective remedy in cases of moderate thatch accumulation (from one-half inch to one inch). In cases where thatch has developed in excess of one inch, renovation of the turf stand may be necessary to address water infiltration issues associated with thatch. Residential soils with water infiltration issues related to compaction or excess thatch may also benefit from aeration or coring with an aerifier.

Slope is another important factor to consider. Steep slopes can lead to fast runoff and very little infiltration during heavy rainfall. Flat, low-lying areas can often collect excess runoff and flood. Although there is little that can be done to change the slope around your home, understanding the flow of water and the underlying soils can help you identify strategies for managing residential stormwater. Steep slopes may exclude portions of your property from being utilized for certain stormwater best management



**Figure 1.** Creating a map of your homesite will help identify ways to minimize stormwater runoff. Features such as sidewalks (A), downspouts (B), driveways (C), and patios or other impervious areas (D) should be included. Also consider identifying bare soil or sparsely vegetated areas (E), densely vegetated areas that might receive runoff (F), and steeply sloping areas (G).

practices that rely on low slope and dense vegetation to create infiltration areas.

### Map Your Site

Making a map of your homesite can help you identify areas where you can minimize stormwater runoff and maximize infiltration (Figure 1). Your map should include the following features: property boundaries, house/garage/outbuilding footprints, lawn and garden areas, eroded areas, areas with steep slopes, areas where water collects during storms, driveway and sidewalk locations, nearby streams or storm drains, and any additional impervious surfaces (e.g., patios).

### Make a Plan

After you have created a map of your homesite, you can begin to identify areas for improvement. Take a walk around your house during and after a rain event. Look for areas of concentrated runoff, standing water, or eroded areas, and con-

sider what you can do to manage runoff by applying the philosophy of “Slow it down, spread it out, and soak it in.”

### Consider Your Stormwater Management Options

After making a map and identifying areas that need some improvement, you will be ready to think about stormwater management practices. Here is an overview of a few practices to consider:

#### Rainwater Harvesting

Rainwater harvesting can be as simple as installing a rain barrel on your home’s downspout (Figure 2). Rain barrels typically capture around 50 gallons of water that can be used later to water lawns and gardens. Care should be taken to prevent algae and mosquitoes. Rain barrels should be winterized in Kentucky.

#### Disconnected Impervious Surface

Redirecting stormwater from your home’s roof is a great way to reduce runoff



**Figure 2.** Rainwater harvesting with a rain barrel is a simple stormwater management practice that homeowners can install.



**Figure 3.** A downspout is directed to a small, decorative rain garden.

from your homesite. Direct downspouts toward an infiltration area like a rain garden instead of a storm drain (Figure 3).

**Bioretention/Stormwater Landscaping/  
Rain Gardens**

Bioretention or stormwater landscaping areas are often called rain gardens. These areas are designed to capture runoff water and slowly infiltrate it instead of allowing it to run off the property. Stormwater only stays in these areas for short periods of time, generally less than 48 hours. Soil type, slope, and vegetation should be considered for this practice.

**Alternatives to Impervious Areas**

The material used to create driveways, patios, and other impervious areas, along with their overall size, impacts the amount of stormwater created from the

homesite. Consider reducing the size of these areas or replacing them with permeable pavement options like aggregates, pavers, or other pervious materials.

**Get Started**

Now that you have identified stormwater management practices to install, it is time to get started. Here are a few key reminders when preparing to install stormwater management practices:

- Call 811 before breaking ground on any project that requires excavation.
- Check local laws and ordinances regarding stormwater practices for residential areas.
- Check on any neighborhood or homeowner association restrictions that may prevent or limit practices like stormwater harvesting around your home.

- Assess costs associated with the desired practices.
- Evaluate operation and maintenance considerations for any potential practices. Ensure that you are ready, willing, and able to perform all necessary operations and maintenance requirements to ensure a properly functioning stormwater best management practice.
- Check with local watershed or conservation organizations for grant or cost-share opportunities. Many communities incentivize homeowners to install stormwater practices.
- Look for “green” landscapers or infrastructure installers to help with installation.
- Talk to your neighbors about ways you can work together to increase your impact on stormwater management.

## References and Further Reading

*Aerifying and Dethatching Lawns* (AGR-54). <http://www2.ca.uky.edu/agcomm/pubs/agr/agr54/agr54.pdf>

*Building a Rain Barrel* (HENV-201). <http://www2.ca.uky.edu/agcomm/pubs/henv/henv201/henv201.pdf>

*Reducing Stormwater Pollution* (AEN-106). <http://www2.ca.uky.edu/agcomm/pubs/aen/aen106/aen106.pdf>

*Stormwater* (HENV-203). <http://www2.ca.uky.edu/agcomm/pubs/HENV/HENV203/HENV203.pdf>

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