



**Targeted Constituents**

● Significant Benefit      ◐ Partial Benefit      ○ Low or Unknown Benefit

○ Sediment	○ Heavy Metals	○ Floatable Materials	◐ Oxygen Demanding Substances
● Nutrients	● Toxic Materials	○ Oil & Grease	○ Bacteria & Viruses
			○ Construction Wastes

**Description**

Prevent or reduce the discharge of pollutants from sprinklers and landscaping water in order to protect natural streams and creeks. Runoff is reduced by decreasing the flow rate, applying water in a more controlled manner, and by closely monitoring sprinklers.

**Approach**

During dry summer months in the Knoxville area, it is not unusual to go a few weeks without rainfall. Many homes and businesses determine that watering lawns and other vegetation is a necessity. In addition to lawns and trees, water is needed for golf courses, flower and vegetable gardens, nurseries and landscaped parking lot islands.

Pollution occurs when landscaping water produces runoff to the storm drainage system. Typical pollutants include herbicides, pesticides, fertilizers and mulch. In addition, most watering is done with chlorinated utility water. Chlorinated water must not be discharged to Knoxville's natural creeks and streams because it kills aquatic life. Runoff from several overwatered lawns will kill fish and other aquatic organisms in a small creek. Overwatering is more likely to occur during the dry summer periods, which is when streams have lower flows and the chlorine dosages have more effect.

Due to federal mandates, the City of Knoxville adopted the Stormwater and Street Ordinance to prohibit all discharges of chemicals, manmade materials and soils (see RH-01, Non-Stormwater Discharges to Storm Drains) into streets, ditches, storm drains, and natural streams. This prohibition includes chlorinated water, any soil or mulch, chemicals such as fertilizers and pesticides, and nutrients such as fertilizer and lime. In addition to being toxic, these substances also change the pH and turbidity of natural streams and creeks. Damage from toxic materials is not necessarily immediate but can take months or years to accumulate.

**Guidelines**

- Avoid discharging water onto impermeable surfaces such as paved driveways, roads and parking lots. Direct water onto soil and lawns by using a correctly sized sprinkler with the right spray pattern. Sprinklers can be selected for round areas or long areas, with adjustable patterns, timers, and other settings at a reasonable cost.
- Do not use more water than the plants and soil can absorb. Slowly watering plants at a rate that allows water to soak into the soil is much healthier for vegetation. Excess water damages the lawn or landscaped area by washing away the nutrients and soil. Lower the flow rate and increase watering time as necessary to avoid discharging water to the stormwater drainage system.
- Monitor watering activities and correct as necessary. Stop watering as soon as runoff leaves the landscaped area, which indicates saturated conditions. Adjust sprinklers to

cover all areas evenly; use a variety of sprinkler patterns as needed.

- Do not leave watering activities unattended. Unfortunately, many businesses feel that sprinklers are best operated overnight when the establishment is closed. Watering will be effective for a few hours, but the ground usually becomes saturated by nightfall. Afterwards, the sprinkler system is ineffective and almost all of the chlorinated water goes directly to the stormwater drainage system.
- Use herbicides, pesticides and fertilizers responsibly in accordance with manufacturer's instructions. Do not overapply these hazardous materials; this would be the equivalent of pouring toxic chemicals directly into the natural streams and creeks. Herbicides and pesticides should be applied after rainfall or watering occurs, and a dry period of a few days is expected. Fertilizer and lime may be applied prior to light watering.
- Construct a small berm, depression area or curb on the lower side of landscaped areas. Minor grading modifications can also be performed to allow excess water to collect and soak into the soil, instead of being wasted in the storm drains. Use native trees and shrubs when possible; native vegetation is usually more resistant to drought than ornamental trees.
- If possible, avoid using chlorinated water for landscaping. Use rain barrels, cisterns, ponds or other methods for capturing stormwater. Or, allow chlorinated water to stand in an open container for a day or so, prior to being used for landscaping irrigation. Chlorine naturally escapes from chlorinated water as a gas, at a rate that is subject to temperature, sunshine and wind conditions. A simple swimming pool test kit can be used to detect chlorine. Once the dechlorination time has been established, further use of the chlorine test kit is usually not needed.

**Maintenance**

Monitor watering operations closely. Adjust watering rates and patterns to avoid runoff to storm drainage systems, curb inlets, ditches, natural creeks and streams, ponds, wetlands, etc. Repair damaged or incorrectly installed sprinklers. Repair leaking hoses and valves.

**Limitations**

- Extra effort and attention is required to monitor landscape watering. Sprinklers and other equipment should have the correct size and configuration to accomplish the intended purpose without overwatering.
- Berms, curbs or other grading modifications will require additional space for ponding water. Berms and grading modifications may affect the symmetry of landscape designs in very minor ways.

**Related BMPs**

Other topics and aspects of landscape irrigation and lawn watering are included in these related BMPs:

- AM-01 (Employee Training) - with a table for waste disposal alternatives
- AM-13 (Pesticides, Herbicides, and Fertilizer Use)
- ES-07 (Mulch)
- ES-10 (Trees, Shrubs and Vines)
- RH-01 (Non-Stormwater Discharges to Storm Drains)

**References**

**32, 103** (see BMP Manual Chapter 10 for list)