

## Septic Systems

### Lesson Description

Homeowners who rely on septic systems for domestic wastewater disposal often are unfamiliar with maintenance needs. Use of household hazardous chemicals, excess usage of garbage disposals, irrigating on top of the leach field, and other practices will affect the function and longevity of septic systems. Regular pumping is essential to maintain septic systems in good working order.

### Lesson Objectives

1. Understand the parts of a septic system.
2. Learn how the septic system works.
3. Understand common causes of septic system failure.
4. Develop and apply a management plan to maintain the septic system.



## Module 3, Lesson 3

### Septic Systems

#### Activity Sheets

1. Septic System Assessment Activity Sheet
  - Assessment 1 – Septic ZSystem Design and Maintenance
  - Assessment 2 – Onsite System Maintenance
  - Assessment 3 – Septic or Sewage Inputs
2. Septic System Maintenance Record Activity Sheet

#### Supplemental Handouts

Inspecting Your Septic Tank, WSU Clark County Extension  
Landscaping Your Drainfield, WSU Clark County Extension  
Septic Tank Additives, WSU Clark County Extension  
Septic System Maintenance, Clark County Public Health  
Inspector, Pumper, Designer & Installer Contacts, Clark County Public Health

#### Other Activities You Can Do:

1. Fill out the Septic System Assessment Activity Sheet. Assess your septic system for risk of failure. Brainstorm things you can do to lower, minimize or eliminate risk of septic system problems or failure.
2. Find your septic tank and leach field. Map their locations on the septic system maintenance record form. Determine when your tank was last pumped. If needed, schedule pumping and record the pumping date on the Septic System Maintenance Record Activity Sheet provided.
3. Pick at least five practices from each of the water saving tips sheets that you will apply on your property to conserve water.
4. Inventory household products. Read labels to determine if products are potentially damaging to septic systems. Dispose of toxic products appropriately.



## Water Saving Tips – Indoor Water Use Information Sheet

*From Water, Use It Wisely, [www.wateruseitwisely.com](http://www.wateruseitwisely.com)*

- When washing dishes by hand, don't let the water run while rinsing. Fill one sink with wash water and the other with rinse water.
- Run your washing machine and dishwasher only when they are full and you could save 1000 gallons a month.
- Use the garbage disposal sparingly. Compost instead and save gallons every time.
- Keep a pitcher of water in the refrigerator instead of running the tap for cold drinks, so that every drop goes down you not the drain.
- Wash your produce in the sink or a pan that is partially filled with water instead of running water from the tap.
- When you shop for a new appliance, consider one offering cycle and load size adjustments. They are more water and energy-efficient than older appliances.
- Time your shower to keep it under 5 minutes. You'll save up to 1000 gallons a month.
- Install low-volume toilets.
- If your shower can fill a one-gallon bucket in less than 20 seconds, then replace it with a water-efficient showerhead. They're inexpensive, easy to install, and can save your family more than 500 gallons a week.
- Put food coloring in your toilet tank. If it seeps into the toilet bowl, you have a leak. It's easy to fix, and you can save more than 600 gallons a month.
- Plug the bathtub before turning the water on, then adjust the temperature as the tub fills up.
- Designate one glass for your drinking water each day. This will cut down on the number of times you run your dishwasher.
- When doing laundry, match the water level to the size of the load.
- Teach your children to turn the faucets off tightly after each use.
- Turn off the water while you brush your teeth and save 4 gallons a minute. That's 200 gallons a week for a family of four.
- Install an instant water heater on your kitchen sink so you don't have to let the water run while it heats up. This will also reduce heating costs for your household.
- Insulate hot water pipes so you don't have to run as much water to get hot water to the faucet. This will also save energy!
- Collect the water you use for rinsing produce and reuse it to water houseplants.
- Grab a wrench and fix that leaky faucet. It's simple, inexpensive, and can save 140 gallons a week.



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### Water Saving Tips – Outdoor Water Use Information Sheet

From *Water, Use It Wisely*, [www.wateruseitwisely.com](http://www.wateruseitwisely.com)

- Check your sprinkler system frequently and adjust sprinklers so only your lawn is watered and not the house, sidewalk or street.
- Avoid planting turf in areas that are hard to water such as steep inclines and isolated strips along sidewalks and driveways.
- Plant during the spring or fall when the watering requirements are lower.
- Minimize evaporation by watering during the early morning hours, when temperatures are cooler and winds are lighter.
- Use a layer of organic mulch around plants to reduce evaporation and save hundreds of gallons of water a year.
- Use a broom instead of a hose to clean your driveway or sidewalk and save 80 gallons of water every time.
- Divide your watering cycle into shorter periods to reduce runoff and allow for better absorption every time you water.
- Only water your lawn or pasture when needed. You can tell this by simply walking across your lawn. If you leave footprints, it's time to water.
- Adjust your lawn mower to a higher setting. Longer grass shades root systems and holds soil moisture better than a closely clipped lawn.
- Use porous materials for walkways and patios to keep water in your yard and prevent wasteful runoff.
- Direct downspouts and other runoff towards shrubs and trees, or collect and use for your garden.
- Install a rain shut-off device on your automatic sprinklers to eliminate unnecessary watering.
- Choose a water-efficient drip irrigation system for trees, shrubs and flowers. Watering at the roots is very effective, so be careful not to over water.
- Reduce the amount of grass in your yard by planting shrubs, and ground cover with rock and granite mulching.
- Remember to weed your lawn and garden regularly. Weeds compete with other plants for nutrients, light, and water
- Remember to check your sprinkler system valves periodically for leaks and keep the heads in good shape.
- Don't water your lawn on windy days. After all, sidewalks and driveways don't need water.
- Water your plants deeply but less frequently to create healthier and stronger landscapes.



**Septic System Assessment Activity Sheet, page 1 of 3**

**ASSESSMENT 1 – Septic System Design and Location**

	<b>LOW RISK</b>	<b>MEDIUM RISK</b>	<b>HIGH RISK</b>	<b>YOUR RISK</b>
<b>Capacity of system</b>	Tank is designed to handle more wastewater than required, based on the size of the home.	Capacity just meets load requirements, but I watch out for factors indicating system overload. Water conservation measures are taken.	Bathrooms, bedrooms, or water-using appliances are/were added without re-examining the capacity of the wastewater system.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Separation distance</b>	Drainfield is at least 100 feet from any well or surface water.	Drainfield is between 50 and 100 feet from a well or surface water	Drainfield is less than 50 feet from a well or surface water.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Age of system or holding tank</b>	System is five years old or less.	System is between six and 20 years old.	System is more than 20 years old.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Year installed</b>				
<b>Effluent filter</b>	An effluent filter is installed and cleaned regularly.	An effluent filter is installed but not cleaned often enough.	There is no effluent filter installed on the septic tank outlet.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Safety devices</b> <i>(Note: not all systems have pumps or alarms)</i>	An alarm on the pumping chamber or holding tank indicates that the tank is full or power has been cut off to the pump.		There is no alarm to indicate tank overflow or that power has been cut off to the pump.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Does not apply
<b>Backflow protection</b>	A backflow valve is installed to prevent backup during floods.		No backflow valve is installed to prevent backup during floods.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High

*Adapted with permission from Home\*A\*Syst: An Environmental Risk-Assessment Guide for the Home, NRAES-87.*



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#### ASSESSMENT 2 – On-site System Maintenance

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
<b>Maps and records</b>	I keep a map and good records of repairs and maintenance.	The location of my tank and date of last pumping are known but not recorded.	The location of my system is unknown. I do not keep a record of pumping and repairs.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Tank pumping (including holding tanks)</b>	<p>The septic tank is pumped on a regular basis as determined by an annual inspection, or about every three to five years.</p> <p>The holding tank is pumped as needed.</p>	The septic tank is pumped, but not regularly.	<p>The septic tank is not pumped.</p> <p>The holding tank overflows or leaks between pumpings.</p>	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Condition of the tank and baffles</b>	The tank and baffles are inspected for cracks; repairs are made promptly.		The condition of the tank and baffles is unknown.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Drainfield protection</b>	Vehicles and other heavy objects or activities are kept from the drainfield area.	Occasionally, the drainfield is compacted by heavy objects or activities.	Vehicles, livestock, heavy objects, or other disturbances are permitted in the drainfield area.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Diverting surface water</b>	All surface runoff is diverted away from the drainfield.	Some surface water flows into the drainfield area.	Runoff from land, rooftops, driveways, etc. flows into the drainfield.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Plantings over the drainfield</b>	Grass or other shallow-rooted plantings are over the drainfield.		Trees and shrubs are growing on or near the drainfield.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Signs of trouble</b>	Household drains flow freely. There are no sewage odors inside or outside. Soil over the drainfield is firm and dry. Well water tests negative for coliform bacteria.	Household drains run slowly. Soil over the drainfield is sometimes wet.	Household drains back up. Sewage odors can be noticed in the house or yard. Soil is wet or spongy in the drainfield area. Well water tests positive for coliform bacteria.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High

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**ASSESSMENT 3 – Septic or Sewage System Inputs**

	<b>LOW RISK</b>	<b>MEDIUM RISK</b>	<b>HIGH RISK</b>	<b>YOUR RISK</b>
<b>Solid wastes</b>	There is no garbage grinder (dispose-all) in the kitchen. No grease or coffee grounds are put down the drain. Only toilet tissue is put in the toilet.	There is moderate use of a garbage grinder, and some solids are disposed of down the drain.	There is heavy use of a garbage grinder, and many solids are disposed of down the drain. Many paper products or plastics are flushed down the toilet.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Cleaners, solvents, and other chemicals (also applies to holding tanks)</b>	There is careful use of household chemicals (paints, cleaning products). No solvents, fuels, or other hazardous chemicals are poured down the drain.	There is occasional disposal of hazardous household chemicals in the wastewater system.	There is heavy use of strong cleaning products that end up in wastewater. Hazardous chemicals are disposed of in the wastewater system.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Water conservation</b>	Only water-conserving fixtures and practices are used. Drips and leaks are fixed immediately.	Some water-conserving steps are taken (such as using low-flow shower heads or fully loading washing machines and dishwashers).	Standard high-volume bathroom fixtures are used (toilets, showers). No effort is made to conserve water. Leaks are not repaired.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
<b>Water usage</b>	Laundry and other major water uses are spread out over the week.		Several water-using appliances and fixtures are in use during a short period of time.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High

What is your overall risk? What can you improve or change to lower your risk of septic system problems or failure?

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### Septic System Maintenance Record Activity Sheet

Owner: \_\_\_\_\_

Address: \_\_\_\_\_

Type of system: \_\_\_\_\_

Tank size: \_\_\_\_\_ Date installed: \_\_\_\_\_

**SYSTEM PLOT:** *All lengths and distances measured*

On your diagram, include the location of the tank, the distribution box and pump, the leach field, any paved areas, and any structures.

#### Service Record

Date of Cleaning	Contractor's Name and Phone Number	Date Next Cleaning Due





## Septic Systems Glossary, page 1 of 2

**Aerobic:** In the presence of or requiring oxygen.

**Anaerobic (anoxic):** In the absence of oxygen.

**Bacteria:** Microscopic one-celled organisms which live everywhere and perform a variety of functions. While decomposing organic matter in water, bacteria can greatly reduce the amount of oxygen in the water.

**Best management practices (BMP):** Practices that have been determined to be the most effective, practical means of preventing or reducing water pollution from nonpoint sources.

**Biodegradable:** Capable of being broken down (decomposed) by microorganisms.

**Coliform bacteria:** A group of bacteria predominantly inhabiting the intestines of man or animal but also found in soil. While harmless themselves, coliform bacteria are commonly used as indicators of the possible presence of pathogenic organisms.

**Contaminant:** Any physical, chemical, biological, or radiological substance causing an impurity in the environment.

**Decomposition:** Breaking down into component parts or basic elements.

**Degradable:** Capable of being chemically reduced or broken down.

**Denitrification:** Biochemical conversion of nitrate ( $\text{NO}_3$ ) to  $\text{N}_2$  gas under anaerobic conditions.

**Drainage:** Downward movement of water through the soil. When this happens quickly, the drainage is “good,” “fast,” or the soil is “well drained;” when it happens slowly, the drainage is said to be “slow,” “bad,” or soil is “poorly drained.” Plant roots need oxygen as well as water and soil that remains saturated deprives roots of necessary oxygen.

**Effluent:** Discharge or emission of a liquid or gas.

**EPA:** The United States Environmental Protection Agency.

**Gray water:** Wastewater other than sewage, such as sink or washing machine drainage.

**Groundwater:** The subsurface water supply in the saturated zone below the water table.

**Hydrologic cycle:** The movement of water in and on the earth and atmosphere through processes such as precipitation, evaporation, runoff, infiltration and combustion.

**Infiltration:** Entry of water from precipitation, irrigation, or runoff into the soil profile.

**Leaching:** The washing out or flushing of a soluble substance from an insoluble one. In high-rainfall areas, rainwater leaches good as well as harmful substances from the soil. Gardeners leach soil with water when they want to remove excess salts.

**Nonpoint source pollution (NPS):** Pollution from widespread or diffuse sources with no definite point of entry. The source is not a readily discernible point such as a discharge pipe.

**Nutrient:** That portion of any element or compound in the soil that can be readily absorbed and assimilated to nourish growing plants. Substances required by plants for growth.

**Pathogen:** Disease-causing biological agent such as a bacterium, virus, or fungus.

**Percolation:** Movement of water through soil or rock.



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**Permeability:** Capacity of soil, sediment, or porous rock to transmit water.

**Pollutant:** Any substance of such character and in such quantities that when it reaches a body of water, soil, or air, it impairs the soil, water or air's usefulness or renders it offensive.

**Runoff:** That portion of the precipitation or irrigation water which leaves property over the surface and appears in surface streams or water bodies.

**Saturated zone:** Portion of the soil or rock profile in which all pores are filled with water.

**Septic tank:** Sewage disposal tank in which a continuous flow of waste material is decomposed by anaerobic (in the absence of oxygen) bacteria.

**Softening:** Process of removing hardness caused by calcium and magnesium minerals from water.

**Soluble:** Capable of being dissolved easily.

**Toxic chemicals, toxic:** Substances that even in small quantities may poison, cause injury, or cause death when eaten or ingested through the mouth and stomach, absorbed through the skin or inhaled into the lungs.

#### Web sites for further information

Clark County Public Health, Local Information, <http://clark.wa.gov/public-health/septic/owners.html>

Washington Department of Health, Educational Resources, <http://www.doh.wa.gov/CommunityandEnvironment/WastewaterManagement/OnsiteSewageSystems/OSS/HomeownerEducation>

Online RME, Records Search (pumping/maintenance history), [https://www.onlinermc.com/\(S\(v2pqghurom4d0ott1xgtbai1\)\)/contractorsearchproperty.aspx](https://www.onlinermc.com/(S(v2pqghurom4d0ott1xgtbai1))/contractorsearchproperty.aspx)

DIY Septic Inspection Field Guide, Washington Department of Health, <http://www.doh.wa.gov/Portals/1/Documents/Pubs/337-122.pdf>

Septic Tank and Manhole Riser Installation, Thurston County Public Health, <http://www.co.thurston.wa.us/health/ehoss/pdf/RiserInstall.pdf>

Colorado State University Cooperative Extension Service Small Acreage Management, <http://www.ext.colostate.edu/sam>

Home\*A\*Syst, <http://learningstore.uwex.edu/assets/pdfs/B3583.pdf>

Ohio State University Extension Septic Tank-Mound System, <http://ohioline.osu.edu/aex-fact/0744.html>

Septic Information Web site, <http://www.inspect-ny.com/septbook.htm>

University of Minnesota, Information for Homeowners, Onsite Sewage Treatment Program (many useful fact sheets), <http://www.septic.umn.edu/owners/maintenance/index.htm>

University of Nebraska Lincoln Cooperative Extension Acreage and Small Farm Insights, <http://acreage.unl.edu/>

