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CARE AND MAINTENANCE OF YOUR HOME SEPTIC SYSTEM

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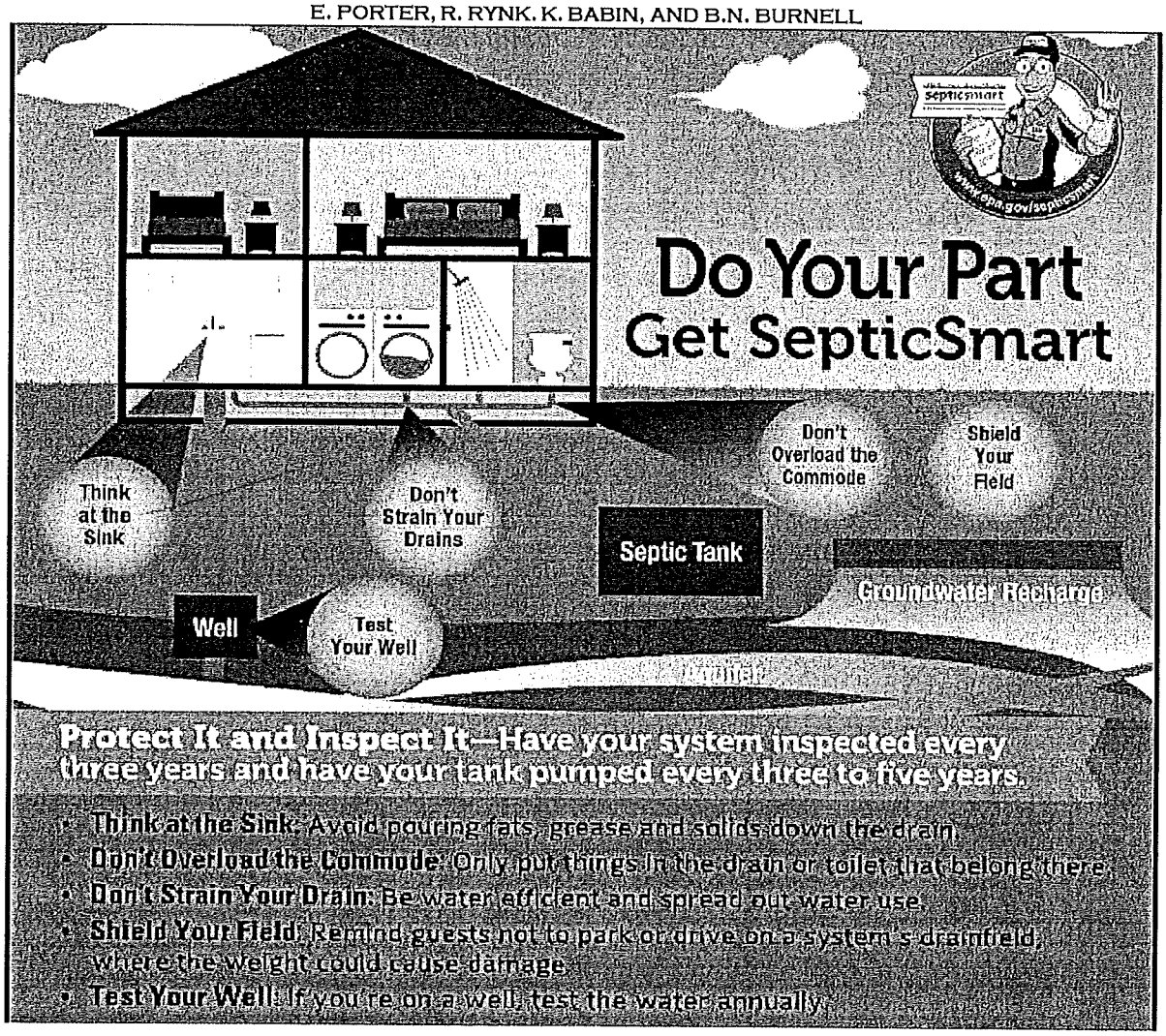


Care and maintenance of septic systems

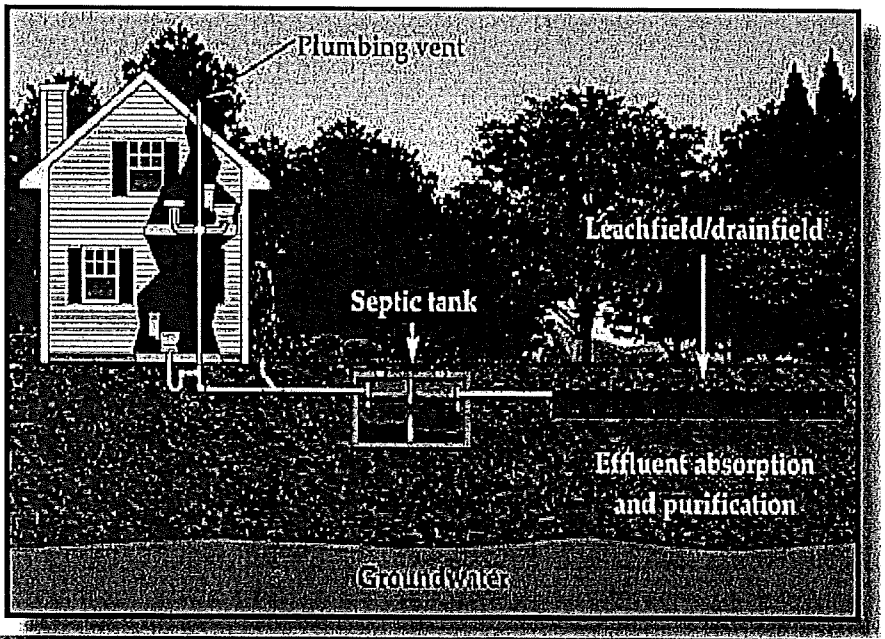
Introduction

One-third of our nation's population lives beyond the reach of a public sewer system. These households rely on "on-site" septic systems to safety dispose of household wastewater. Well designed and operated home septic systems can be effective, efficient, and environmentally sound. Without proper use and maintenance, however, these systems can break down.

The main causes of septic system failures are:

- Infrequent septic tank pumping
- Overuse of water, especially from leaky faucets or continuously running toilets
- Improper construction
- Overuse of garbage disposals
- Damage from excavation or from vehicles driving over the system
- Undersized septic tanks and drainfields

Figure 1.
Primary sources of household wastewater



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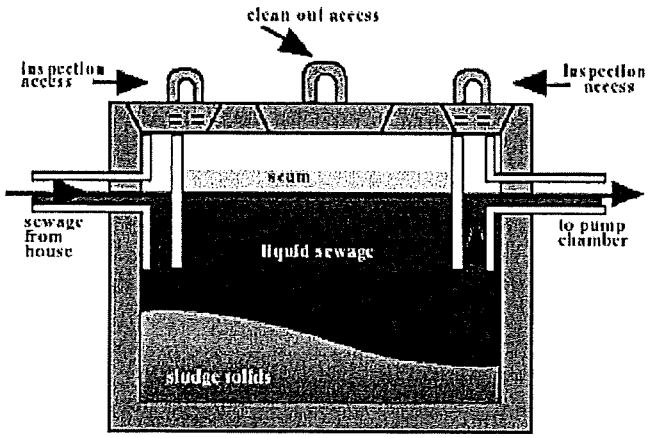
How a septic system works

Septic systems dispose of household sewage, or wastewater, generated from toilet use, bathing, and kitchen and cleaning activities (fig.1). Wastewater carries all those thing that "go down the drain," such as human waste, dirt, food, paper, soap, detergents, and cleaning products. It contains dissolve nutrients, household chemicals, grease, oil, microorganisms (including some that cause disease), and solid particles.

Figure 2.
Typical household septic tank

The septic system's purpose is to remove these contaminates and then discharge treated wastewater to the soil without harming either human health or the environment. A septic system consists of an underground, watertight tank, or "septic tank," and a drainfield.

Septic Tank



A septic tank (fig.2) has 3 main functions:

1. To remove as many solids as possible from household wastewater before sending the liquid, known as "effluent," to the drainfield
2. To decompose solids in the tank
3. To store solids that do not decompose

When raw wastewater enters the tank, heavy solids in the wastewater sink to the bottom of the tank as sludge. Light solids, such as grease and paper, float to the surface as scum. Baffles or tees keep the solids from leaving the tank and entering the drainfield. The longer the wastewater remains in the tank, the more time there is for solids to separate out.

Bacteria decompose the organic solids that collect in the tank. Solids that do not decompose accumulate in the tank and eventually must be pumped out.

Each time raw wastewater enters the tank it forces an equal amount of effluent into the drainfield (fig.3). The typical drainfield is a series of perforated plastic pipes, usually placed in gravel-filled trenches and covered with at least 1 foot of solid soil. Microorganisms in the drainfield treat the effluent, which still contains suspended solid particles, dissolved contaminants, and disease-causing organisms.

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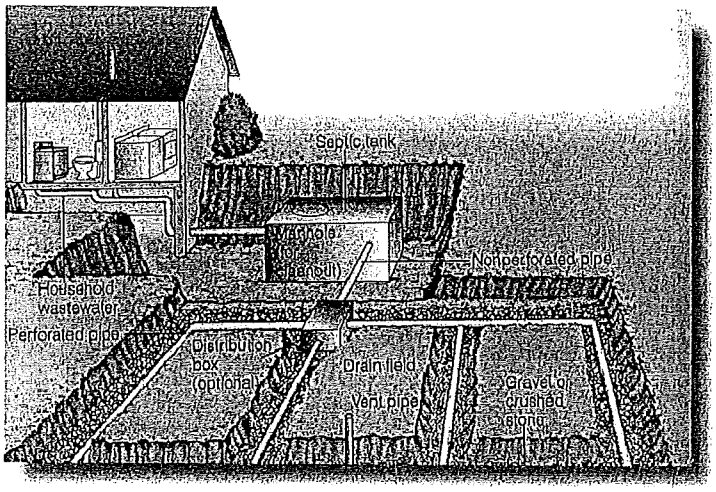
Drainfield

Figure 3.
Typical trench-type household septic tank



The drainfield's functions are:

- To disperse the septic tank effluent over a large area of soil without allowing it to rise to the ground surface
- To filter out and retain solids, nutrients, bacteria, and other organism contained in the effluent
- To provide suitable conditions for soil microorganisms to decompose the solids and nutrients in the effluent
- To evenly distribute the treated water to the soil around the drainfield

Because microorganisms in the drainfield need oxygen to decompose solids and nutrients, the drain field needs to "breathe." When the drainfield is saturated with water, oxygen cannot reach the microorganisms.

The drainfield can also malfunction if too many solids pass from the septic tank into the drainfield. Under these conditions the drainfield becomes overloaded and clogged and eventually fails.

For the drainfield to operate properly, the effluent must drain through the system at a moderate rate--not so fast that it passes to groundwater before it is treated, yet not so slowly that the drainfield remains saturated for long periods of time. In the worst case of slow drainage, untreated effluent rises to the ground surface. To avoid these problems, the drainfield must be located in suitable soil and be large enough to disperse the effluent.

For more detailed explanation of how a septic system works, obtain a copy of "A Homeowner's Guide to Septic Systems", available from your local health department on the web at www.state.id.us/ or the Idaho Division of Environmental Quality www.deq.idaho.gov.

Care and maintenance of septic systems

Everyday care of your system

Take these precautions to keep your septic system working effectively.

Watch what you put down the drain

- Keep out items that do no easily decompose. These include coffee grounds, cooking fats, sanitary napkins, disposable diapers, cat litter, plastics, and cigarette butts. They fill the septic tank rapidly, decreasing its efficiency and increasing the need for pumping. Remember that the septic system is intended to treat wastewater, not garbage.

- Avoid putting napkins or paper towels in the toilet. Additives that strengthen or soften these paper products can slow their decomposition.

- Toilet paper is ok. Studies have shown that most toilet paper brands decompose readily regardless of their color or number of plies. To be certain, choose products labeled "safe for septic system" or carry the "NSF" mark of the National Sanitation Foundation.

- Do not dump grease down the drain. It can build up in the tank and plug the inlet.

- Keep toxic and hazardous chemicals out of the septic system. They may harm bacteria working in the septic tank and drainfield. These chemicals include paints, varnishes, thinners, waste oils, photographic solutions, poisons, pesticides, and herbicides.

- Normal use of household bleach, cleaners, and detergents will not harm your septic system. However, do not overuse household chemicals. About 1.5 gallons of bleach. 5 gallons of household disinfectant, or 1/2 oz. of drain cleaner used in a 24-hour period will harm bacteria in the septic tank. Although the bacteria will recover eventually, the septic system will not function properly until then.

- Phosphate detergents normally do not threaten either the septic system or groundwater. However, if the septic system is too small or improperly designed or maintained, phosphorus-rich septic system effluent can reach lakes, ponds, and streams and pollute them.

- Don't dispose of water from hot tubs into the septic system. The large volume of water is too much for the septic tank and drainfield to handle properly, In addition, chlorine in the water may harm bacteria in the septic system. Drain hot tubs on to the ground (not into a storm drain) away from the drainfield.

Do Not Flush...

* *Coffee grounds*
* *Dental floss*
* *Disposable diapers*
* *Kitty litter*
* *Sanitary napkins*
* *Tampons*
* *Cigarette butts*
* *Condoms*
* *Fat, grease, or oil*
* *Paper towels*
* *Unused household cleaning solutions or pharmaceuticals*

Or hazardous chemicals such as:

* *Paints*
* *Varnishes*
* *Thinners*
* *Waste oils*
* *Photographic solutions*
* *Pesticides*

Care and maintenance of septic systems

Septic tank additives: of questionable benefit

Many septic tank additives are available. Additives are said to help septic systems work more effectively, reduce the need for pumping, or fix a malfunctioning system. While additive manufacturers, and some users, claim additives improve septic system performance, most researchers and experts think additives provide little or no benefit.

Two general groups of additives are common: chemical and biological. Chemical additives, including acids and solvents, dissolve solids trapped in the tank and unclog pipes. They are sometimes referred to as "septic system cleaners."

Biological additives contain specific bacteria and enzymes. These additives are intended to promote decomposition in the septic tank, reducing the accumulation of sludge and scum. Although biological additives may not help your system, they probably do no harm.

If you are considering using an additive, find out how it works and what chemicals it uses. Certain chemical additives can be damaging or polluting. Do not use additives that include chemicals with "chloride" or "choro" in their names or solvents such as benzene, toluene, or maphthalene.

Be suspicious of biological products who manufacturers make claims about eliminating the need for pumping. At best, some biological additives may reduce sludge levels. Pumping will always be necessary. Also, no additive can fix a system that has failed due to neglect and overloading.

Conserve water

Don't use more water than you need. Excessive water use is one of the main causes of septic system failure. When you use a large amount of water over a short period of time, the wastewater does not stay in the septic tank long enough for the solids to separate out. A large volume of water also can create mixing in the septic tank, causing solids in the tank to be flushed into the drainfield. Finally, a large volume of water may saturate the drainfield. Wastewater that passes through a water-saturated drainfield can carry disease-causing bacteria long distances, potentially contaminating ground and surface water.

Moderate use of water, spread out over time, lets the septic tank and drainfield operate as designed. Reducing the amount of wastewater entering the septic system may even increase its lifespan.

To reduce household water usage:

- Use water-saving bathroom and kitchen fixtures (faucets, shower heads, toilets).
- Run and drain appliances such as dishwashers and washing machines one at a time.
- Spread laundry over an entire week. More than two loads of wash in a day can overload your septic system.
- Fix all faucet and toilet leaks promptly.
- Direct water from downspouts and roofs away from the drainfield.
- Do not continually run water to prevent water pipes from freezing. Use other methods such as pipe insulation or electrical heating tape.

Don't overuse garbage grinders

Avoid extensive use of a kitchen garbage grinder even if the septic system is specifically designed to handle one. Garbage grinders greatly increase the amount of solids entering the septic tank. This reduces the liquid capacity of the tank, causes more solids to enter the drainfield, increases the workload on the septic system bacteria, and hastens the need for pumping.

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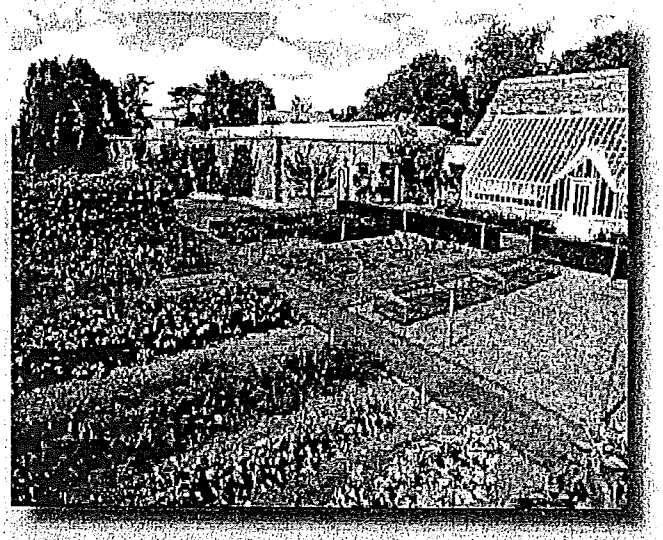
Gardeners beware

Do not plant vegetable gardens over the drainfield. There is a small but real risk that edible parts of plants may pick up contaminants or organisms from the effluent. Also, any garden that requires frequent cultivation should not be planted over the drainfield. Shallow cultivation may create a compacted layer (hardpan) beneath the garden, while deep cultivation may damage the drainfield.



Avoid physical damage to your drainfield

Don't build anything over the drainfield or areas set aside for future drainfields. This includes patios, carports, and sidewalks. Keep cars and trucks off the drain field to avoid compacting the soil. Compacted drainfield soils drain poorly, which causes the drainfield to become saturated and prevents oxygen from getting into the soil.

Trees and shrubs can be planted near drainfields. Concerns about roots plugging and damaging drainfields persist from the days when clay tile was used for drainfield pipe. Roots do not damage modern drainfields built with plastic pipe. In fact, they may help remove water and increase oxygen levels in the drainfield.

Grass is the best cover for the drainfield. However, avoid pasturing large animals over the drainfield to prevent soil compaction.

Also, never flood irrigate the drainfield area. Flood irrigation will saturate the drainfield and may cause it to fail.

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Septic system maintenance

Over time, sludge and scum collect in all septic tanks and must be pumped out. Septic tanks usually need pumping every 2 to 5 years, depending on tank size and use (table1).

The tank should be inpsected each year to determine sluge depth. Lower an 8 to 10 foot pole into the tank, passing it through the tank cover near the outlet tee. If the depth of sludge is 40% of the total liquid depth, the tank should be pumped. Keep a record of sludge depths as well as of the dates when the tank was pumped. Also, make a diagram of your septic system, including the location and depth of the septic tank, the location of the tank's inspection covers, and the boundaries of the drinfield. A detailed procedure for inspecting septic tanks is provided in "A Homeowners Guide to Septic Systems."

Table 1: Approximate number of years between septic tanks pumpings for a year-round residence without a garbage disposal

Tank size →	Number of people in household							
(gallons)	1	2	3	4	5	6	7	8
750	9	4	2.5	2	1.5	1	1	0.5
900	**11**[1]	**5**	3	2	1.5	1	1	0.5
1000	12	**6**	**3.5**	**2.5**	2	1.5	1-1.5	1
1250	15	7.5	**4.5**	**3.5**	**2.5**	2	1.5	1-1.5
1500	19	9	6	**4**	**3**	**2.5**	2	1.5
1750	22	10	**7**	5	4	**3**	**2.5**	2
2000	25	12	8	6	4.5	3.5	**3**	2.5

Source: Adapted from Septic Tank Maintenance by K. Manel, Cooperative Extension Service, Ohio State University.
Note: If a garbage disposal is used, more frequent pumping will be needed (divide the table's estimates in half). [1]Items in bold are common tank sizes for the household size. Under current Idaho rules, the minimum household septic tank size is 900 gallons.

For more information

The publication "A Homeowner's Guide to Septic Systems" contains additional information about septic system design, siting, operation and maintenance. This publication, and a great deal of other information about septic systems, is available from your local public health department and the Idaho Divsion of Environmental Quality.