

Pipeline



Small Community Wastewater Issues Explained to the Public

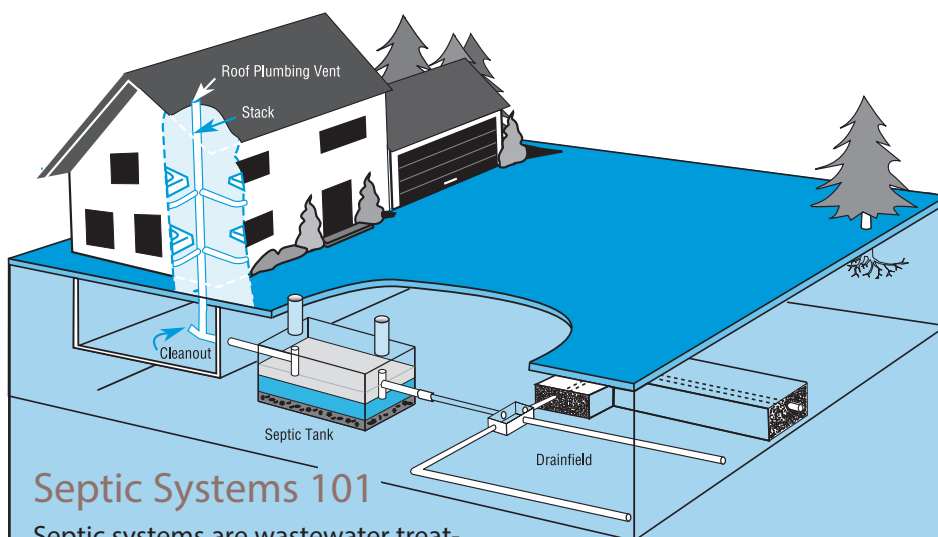
Septic Systems and Source Water Protection

Homeowners Can Help Improve Community Water Quality

If your home has a septic system, you are no doubt aware that this is a common way to treat residential wastewater. In fact, septic systems and related forms of treatment that experts call decentralized wastewater treatment systems (septic systems, private sewage systems, onsite sewage disposal systems) are some of the most common waste dispersal methods in the country.

According to the U.S. Environmental Protection Agency (EPA), decentralized wastewater treatment systems collect, treat, and release about four billion gallons of effluent per day from an estimated 26 million homes and businesses. The percentage of homes and businesses served by these systems varies from state to state, from a high of about 55 percent in Vermont to a low of about 10 percent in California. Nationwide, approximately 40 percent of the new homes being built will rely on some kind of onsite system to treat wastewater. (Ground Water Report to the Nation: A Call to Action, 2007)

As the owner of an onsite wastewater system, you may not be aware that you play an important role in protecting your community's water quali-



Septic Systems 101

Septic systems are wastewater treatment systems that collect, treat, and disperse of wastewater generated by your home or business. The wastewater is treated onsite, rather than collected and transported to a centralized community wastewater treatment plant.

A typical septic system consists of two main parts: a septic tank and a soil absorption system, also known as a drainfield, leachfield, or disposal field. Underground pipes connect the entire system.

The septic tank is a buried, watertight container usually made of concrete, fiberglass, or polyethylene. It holds the wastewater long enough to allow the solids to settle out and the fats, oil, and grease to float to the surface. It also allows partial decomposition of the solid materials. Effluent from the middle layer flows out to the drainfield for further treatment in the soil.

Septic systems can contribute to source water contamination for various reasons including improper location of the system, poor design, faulty construction, incorrect operation, and poor or no maintenance of the system.

By following the basic recommendations previously mentioned, you can help ensure that your system continues to function properly.

As many of us migrate further from central cities and occupy homes served by decentralized treatment systems, septic system care is more important than ever. By keeping your onsite system in top working condition, you can save money, increase the value of your home, and also feel good that you've

ty. Source water—streams, lakes, rivers, or groundwater—is, as the name suggests, the source of our drinking water, whether we get it from a local water district treatment plant or from a privately owned well. To maintain the most pristine water quality possible, we need to consider the activities that take place in the source water area and make sure that their environmental impacts on nearby waterways are minimal.

Unfortunately, EPA research

shows that one of the biggest causes of pollution to our waterways is septic systems that are not working as they should.

When a septic system is not properly maintained or fails, untreated domestic wastewater can reach the source water. Bacteria and viruses from human waste can cause dysentery, hepatitis, and typhoid fever and the cumulative effect of numerous failing septic systems can become a major source of pollution. And, the more polluted the source water, the more costly it is to clean for human consumption.

able diapers, tampons, condoms, paper towels, cat litter, or cigarettes into the system. These items quickly fill your septic tank with solids, decrease the system's efficiency, and will require it to be more frequently pumped. Trash flushed down the toilet can also clog the pipelines, causing wastewater to back up into your home.

- Avoid dumping grease or fats down the kitchen drain. They solidify and the accumulation may contribute to plumbing and system blockages.
- Keep paint, varnish, thinners, oil, photographic solutions, pesticides and other hazardous chemicals out of your system. Even in small amounts, these items can destroy the biological digestion taking place in your septic system. Do not flush unused medicines. Check with your local health department for disposal recommendations for your area.
- The use of garbage disposals is discouraged. If you have a garbage disposal, use it sparingly. Garbage disposals add unnecessary solids and nutrients to the system.
- Do not drive over the system or the drainfield. This can compact the soil and break the piping of the system.
- Redirect surface water flow away from your system.
- Plant a 'green belt' or grassy strip between the drainfield and the shoreline if near a water body.
- Periodically check for signs of system failure: areas in the yard that remain moist during dry weather or patches of lush grass or plant growth. If you see signs of failure, schedule an inspection immediately.

Most typical septic systems should be inspected every two

Maintenance Pays

Of course, the best way to deal with a broken septic system is to not let it get broken in the first place. Since it can be difficult for homeowners to know if their systems are slowly failing (as defined by each state), you can greatly reduce that likelihood, and gain peace of mind, simply by having your system regularly pumped and inspected. This preventative measure costs thousands less than does the cost of repairing or replacing a non-functioning system. (See the sidebar on the next page for a suggested pumping schedule.)

The following tips will also help maintain a healthy septic system:

- Do not use caustic drain cleaners on clogged pipes. Instead, use boiling water or a drain snake to open clogs.
- Conserve water to avoid hydraulic overloading of the system. Repair leaky faucets and toilets. Use low-flow fixtures.
- Use bathroom cleaners and laundry detergent in moderation. (Find recommended cleaning products in the NESC brochure titled "Alternative Household Cleaners." Find how to order info on page 8.)
- Your septic system is not a trash can. Do not flush dispos-



Pipeline is published by the

National Environmental Services Center
at West Virginia University,

P.O. Box 6064, Morgantown, WV 26506-6064

Pipeline is funded by a \$3 million grant from the U.S. Environmental Protection Agency (EPA). *SMART About Water* is being orchestrated by West Virginia University's National Environmental Services Center (NESC) in partnership with the Rural Community Assistance Partnership (RCAP). The program is designed to provide training and technical assistance about source water and wellhead protection planning to small and rural communities during 2008 and 2009, and will focus on untreated wastewater from failing septic and sewer systems, the largest contributor to water quality degradation.

William (Bill) Hasselkus — *Project Officer*
Municipal Support Division,
Office of Wastewater Management

National Small Flows Clearinghouse
West Virginia University, Morgantown, WV

Dr. Gerald Iwan — *Executive Director*
Mark Kemp-Rye — *Int. Communications Director*
Marilyn Noah — *Writer/Editor*
Jennifer Hause — *Technical Advisor*
Zane Satterfield — *Technical Advisor*
John Fekete — *Senior Project Coordinator*
Jamie Bouquot — *Graphic Designer*

Permission to quote from or reproduce articles in this publication is granted when due acknowledgement is given. Please send a copy of the publication in which information was used to the *Pipeline* editor at the address above. Some images in this issue © 2005-2008, www.clipart.com and www.photos.com.

ISSN 1060-0043

The contents of this newsletter do not necessarily reflect the views and policies of the U.S. Environmental Protection Agency, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

Printed on recycled paper



Estimated Septic Tank Pumping Frequencies In Years*

These figures assume there is no garbage disposal unit in use. If one is in use, pumping frequency may need to be increased.

| Tank Size (gals.) | Household Size (number of people) | | | | | |
|-------------------|-----------------------------------|------|------|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 500 | 5.8 | 2.6 | 1.5 | 1.0 | 0.7 | 0.4 |
| 750 | 9.1 | 4.2 | 2.6 | 1.8 | 1.3 | 1.0 |
| 900 | 11.0 | 5.2 | 3.3 | 2.3 | 1.7 | 1.3 |
| 1000 | 12.4 | 5.9 | 3.7 | 2.6 | 2.0 | 1.5 |
| 1250 | 15.6 | 7.5 | 4.8 | 3.4 | 2.6 | 2.0 |
| 1500 | 18.9 | 9.1 | 5.9 | 4.2 | 3.3 | 2.6 |
| 1750 | 22.1 | 10.7 | 6.9 | 5.0 | 3.9 | 3.1 |
| 2000 | 25.4 | 12.4 | 8.0 | 5.9 | 4.5 | 3.7 |
| 2250 | 28.6 | 14.0 | 9.1 | 6.7 | 5.2 | 4.2 |
| 2500 | 31.9 | 15.6 | 10.2 | 7.5 | 5.9 | 4.8 |

(Source: Pennsylvania State University Cooperative Extension Service.)

to three years but, depending on the system size and the number of people in the home, this frequency could change. Any system with mechanical parts, such as pumps and filters, should be inspected annually. If your tank has never been pumped, or is not accessible, once it is uncovered, put a watertight riser on it for future accessibility.

If your system is already failing, have it inspected by a professional and repaired or replaced as soon as possible.

A Healthy Septic System is an Investment

Your home represents a signif-

icant investment. For most of us, our house is the single biggest item we'll ever purchase and, consequently, represents a significant proportion of our net worth. Simply put: a failing septic system will lower your property value and may even make selling your home a problem. No one wants to buy a house with a stinky, soggy yard.

Functioning onsite systems, on the other hand, can add value to your home and good water quality will benefit your property value. This fact was borne out in a study conducted by Bemidji State University in Minnesota, where homes on lakes with good

water quality were more valuable and had seen their value rise more quickly than those on lakes with marginal or poor water quality. (See the sidebar on page 4 for more information about water quality and land value in Minnesota.)

As you would expect, people pay more for building sites and homes along clean stretches of water.

Another economic benefit of maintaining your onsite system is that it helps ensure the clean, safe drinking water, which is an essential ingredient of a healthy and viable community. Contamination of drinking water sources can cause a community significant expense and affect public health. Remember, it will cost you less in the long run if you can prevent contamination of your drinking water source rather than incur the high cost of treating the water or locating and developing alternate water sources. Reducing contamination to groundwater reduces the cost of drinking water.

Quality of Life

A non-working septic system can pollute your own yard and surrounding waters—like the lake where you like to put in your bass boat on a pretty Saturday morning or that rocky little creek where your grandkids like to catch crawfish. Imagine launching your boat onto a sea of green, foamy algae caused by excess nitrates in the water from a leaking septic tank. And you probably wouldn't want the kids splashing around in that creek if the water was murky from untreated sewage.

The following example describe how inadequate septic system maintenance can change the whole picture.

Shelburne Beach, Vermont, is a local swimming beach on a cen-



Water Quality Adds Value to Lakefront Property

Minnesota's 10,000 fresh water lakes are essential to the economic well-being of the state – culturally, economically, and ecologically. They are assets worthy of environmental protection. The challenge is determining the best way to protect the lake water quality with the high rate of development along their shores. Good environmental policies are more effective and less expensive than restoration efforts.

While the overall quality of Minnesota lakes may be good, lakeshore development continues to degrade lake quality. A 2003 study, conducted by the Mississippi Headwaters Board and the Bemidji State University, investigated the effect of water quality on property values to help legislators formulate the best public policies. The quality of the surrounding water was shown to play a significant role in the price of property. Water quality was determined to have a positive relationship with property prices. In other words, the more pristine the water, the more potential homeowners were willing to pay to live there. The economic benefits of water quality were shown to be a good incentive for

tral portion of Lake Champlain in the town of Shelburne, Vermont. Bacteria leaking from residential septic systems caused excess E. coli in a nearby tributary, resulting in occasional beach closures. As a result, state officials placed the offending one-mile unnamed

tributary on its section 303(d) list for E. coli in 1998. (Section 303(d) of the Clean Water Act requires states to develop a list of waters not meeting water quality standards or having impaired uses. Listed waters must be prioritized, and a management strategy or total maximum daily load must

subsequently be developed for all listed.)

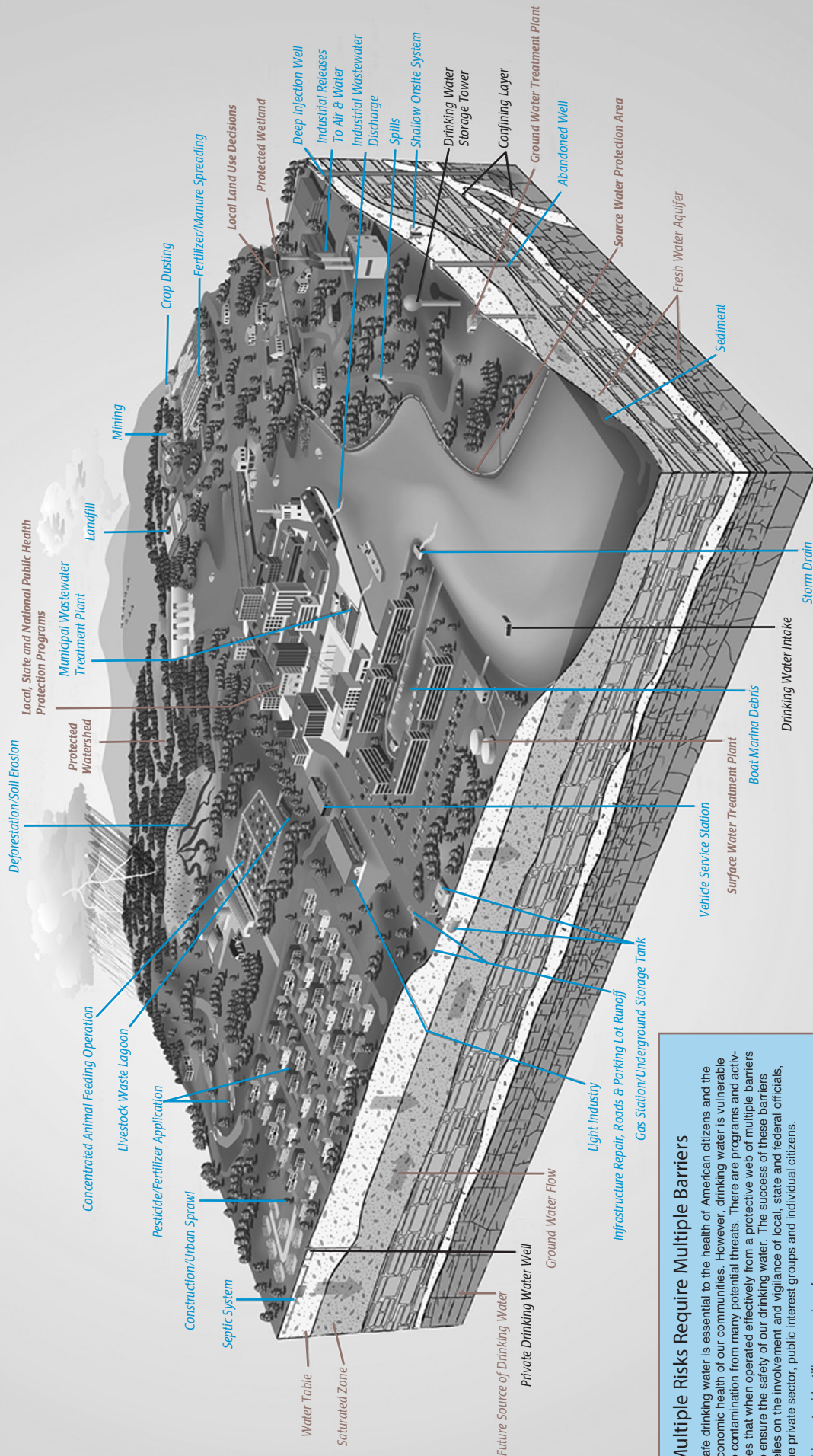
The town identified six residential septic systems along the stream as the most likely sources and local officials encouraged the homeowners to correct the deficiencies in their septic systems. Between 1998 and 2001, all six homeowners rebuilt their systems by installing new tanks and drainfields. Subsequent monitoring data showed that the stream and beach consistently met water quality standards, and the tributary was removed from the state's 303(d) list in 2004.

Untreated flow from your septic system has the potential to contaminate groundwater, too. Chris Swann, a watershed planner with the Center for Watershed Protection, warns, "Septic system failure delivers a significant amount of pollutants to local water bodies, especially in coastal and lake shoreline areas. The threat of bacterial contamination becomes very important. Many reports of disease outbreaks are linked to groundwater contamination by septic system effluent." Swann stresses that improved management protocols and tougher performance standards for new development are critical to reducing the negative effects of onsite systems.

The negligent homeowner who allows his or her onsite system to contaminate the local environment can affect the entire community. Increased bacteria levels in groundwater, lakes and streams can present a public safety issue. Any contact with untreated human waste can pose a significant risk to public health. Untreated effluent from failing systems in local water bodies adversely impacts wildlife and aquatic populations.

Everyone deserves to live in a healthy environment and having your septic tank routinely

Safe Drinking Water Act – Protecting America’s Public Health



Safe Drinking Water Hotline - (800) 426-4791 | Safewater Web Site - www.epa.gov/safewater

Multiple Risks Require Multiple Barriers

Safe drinking water is essential to the health of American citizens and the economic health of our communities. However, drinking water is vulnerable to contamination from many potential threats. There are programs and activities that when operated effectively from a protective web of multiple barriers to ensure the safety of our drinking water. The success of these barriers relies on the involvement and vigilance of local, state and federal officials, the private sector, public interest groups and individual citizens.

This poster identifies examples of:

1. *Surface and groundwater sources of drinking water*
2. *Potential threats to these drinking water sources*
3. *The multiple barriers that together protect our nation's public health.*

Conserving Water Prolongs Septic System Life



Overloading a septic system can cause it to malfunction. Here are some steps to reduce water consumption in the home:

- 1 Use dishwashers and clothes washers only when fully loaded.
- 2 Take short showers instead of baths and avoid letting faucets run unnecessarily.
- 3 Replace old water fixtures with new water-efficient showerheads, faucets, and toilets. Look for the new WaterSense rating given by the EPA. This rating system helps consumers identify high-performance, water-efficient products that can reduce water use in the home and help preserve the nation's water resources. You can find EPA's WaterSense rated products at www.epa.gov/watersense/index.htm.
- 4 Repair and replace any leaking fixtures immediately. (Nearly 14 percent of the water a typical homeowner pays for is never even used—it leaks down the

pumped and inspected can help achieve the goal of a clean community.