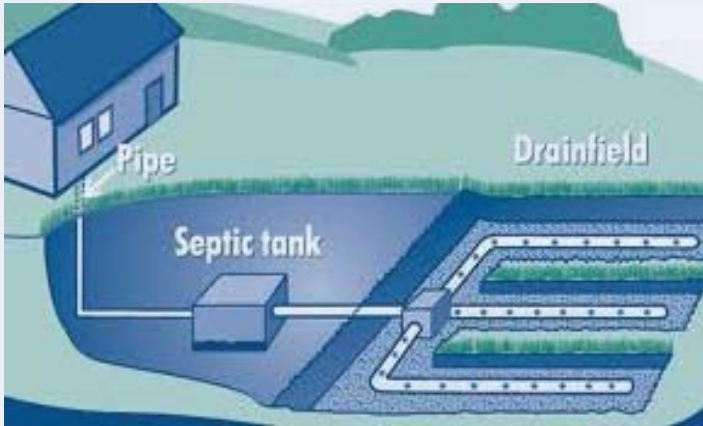


Homeowner's guide to septic system maintenance



This booklet is a product of the
Lower Meramec Planning Effort

Lower Meramec
Watershed

Brush, Fox and LaBarque, Hamilton and Kiefer,
Grand Glaize and Fishpot Watersheds in the Lower Meramec River,
in Franklin, Jefferson and St. Louis Counties



EAST-WEST GATEWAY
Council of Governments

Creating Solutions Across Jurisdictional Boundaries



In the summer of 2010 East-West Gateway Council of Governments embarked on a study of selected subwatersheds of the Lower Meramec River—tributaries entering the Meramec between Pacific and Valley Park.

The study found that overall, approximately 12 percent (about 6,000) of the housing units in the study area use Individual Sewage Disposal Systems to treat household sewage. It is estimated that between 30 and 50 percent of these systems could be malfunctioning, creating a threat to human health and possibly polluting both surface and ground water.

This booklet is intended to provide you with basic information on the proper design, installation, use and maintenance of your septic system. Additional resources are listed at the end of this booklet that you can access to learn more about the proper use and maintenance of septic systems.

About this booklet

Individual Sewage Disposal Systems, commonly known as septic systems, are designed to hold, treat, and dispose of household wastewater. Properly sited, designed, constructed, and maintained, septic systems can provide an efficient wastewater treatment alternative to public sewer systems. On the other hand, systems that are not properly installed and regularly serviced, are a health risk to you, your pets and wildlife. Inadequately treated sewage allows bacteria, viruses, and other disease-causing pathogens to enter surface and ground water. Drinking water contaminated with sewage can cause health problems such as dysentery, hepatitis, shigellosis, diarrhea, nausea, and cramps. Wet areas, where sewage reaches the surface, provide breeding grounds for mosquitoes, creating a nuisance and the possibility of spreading mosquito-borne diseases.

In the *National Water Quality Inventory: 1996 Report to Congress*, state agencies designated the top 10 potential contaminant sources that threaten their ground water resources. The second most frequently cited contamination source was septic systems. The report states that *“improperly constructed and poorly maintained septic systems are believed to cause substantial and widespread nutrient and microbial contamination to ground water.”*

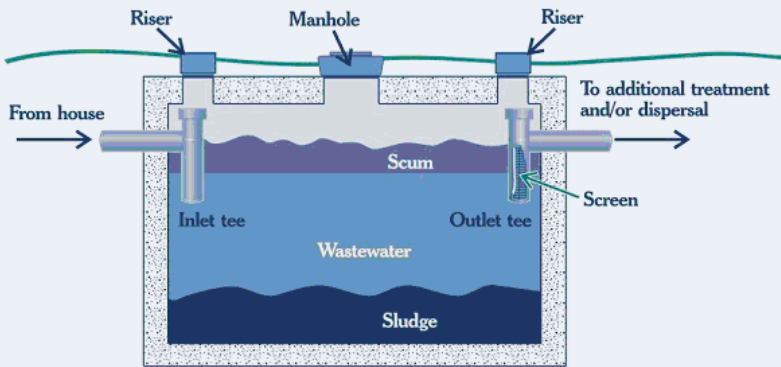
Poorly performing septic systems can also pollute our streams. This increases the cost of treating our water to make it safe to drink, makes streams unsafe for recreational use and degrades aquatic life.

The “Lower Meramec River Source Water Protection Strategy Exchange Report,” completed in July 2009, identifies septic tank failure and storm water runoff as major contributing factors to poor water quality and concludes:

The primary problem to be addressed by any actions taken with respect to the Lower Meramec River Tributary (LRMRT) Watersheds is the same problem that all watersheds face—the natural functions and benefits of a watershed become significantly degraded when combined with human influence and development.

What is a Septic System and Why Do I Have One?

Individual sewage disposal systems, commonly called septic systems, treat sewage from homes. Such systems are not connected to a municipal or sewer district wastewater treatment plant. For the purpose of this document, individual sewage disposal systems include sewage flows of less than 3,000 gallons per day consisting of a septic tank and a subsurface infiltration system (drainfield).



Your Septic System Is Your Responsibility!

Did you know that as a homeowner you're responsible for maintaining your septic system? If properly designed, constructed, and maintained, your septic system can provide long-term, effective treatment of household wastewater. If your septic system isn't maintained, you might need to replace it, costing you thousands of dollars. A malfunctioning system can pose a health threat to people and pets, pollute streams, contaminate groundwater, and lower the value of your home. If you are considering buying a home that has a septic system, before buying make sure the system is inspected by a septic treatment professional who can determine whether or not the system has the capacity to meet the needs of your family.

Just because you don't receive a sewer bill, don't assume your sewage treatment is provided to you for free. You are, in effect, a sewage treatment operator, taking on the responsibility, much like operators of a sewer district or municipally owned wastewater treatment plant, to provide for the proper treatment of your sewage. There is a cost to provide this service. Therefore, it is smart to pay a "fee" to yourself to create a fund to pay for the necessary maintenance, pumping and possible repair or replacement of your system.

Why Should You Maintain Your Septic System?

Maintaining your septic system will save you money. Failing septic systems are expensive to repair or replace, and poor maintenance is often the culprit. Having your septic system inspected is a bargain when you consider the cost of replacing the entire system. An unusable septic system or one in disrepair will lower your property's value and could pose a legal liability.



Septic tank pump-out.

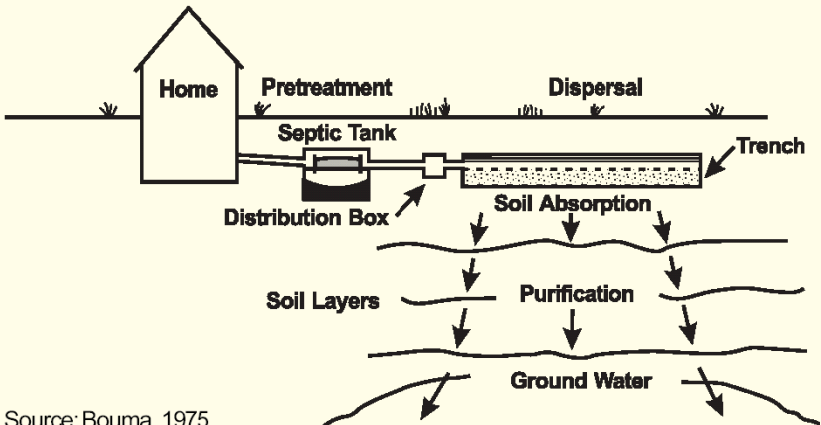
Other good reasons for proper treatment of sewage include preventing the spread of infection and disease and protecting our creeks and streams. Typical pollutants in household wastewater are nitrogen, phosphorus, and disease-causing bacteria and viruses. Nitrogen and phosphorus are nutrients that can cause unsightly algae blooms and lower stream oxygen levels, adversely affecting plant and animal life. Excessive nitrate-nitrogen in drinking water can cause pregnancy complications, as well as methemoglobinemia (also known as blue baby syndrome) in infancy. Disease-causing bacteria and viruses can cause infectious diseases through direct or indirect body contact or ingestion of contaminated water. If a septic system is working properly, it will effectively remove most of these pollutants.

How Does Your Septic System Work?

A typical septic system has four main components: a pipe from the home, a septic tank, a drainfield, and the soil. Microbes in the soil digest or remove most contaminants from wastewater before it eventually reaches groundwater.

The septic tank is a buried, watertight container typically made of concrete, fiberglass, or polyethylene. It holds the wastewater long enough to allow solids to settle out (forming sludge) and oil and grease to float to the surface (as scum). It also allows partial decomposition of the solid materials through the biological digestion activity of naturally occurring microorganisms. This critical step in sewage treatment can be hampered by the use of non-biological products in your drain system. (See the Septic Tank Killers and Cloggers section of this booklet for products to avoid putting down drains and toilets.) Compartments and a T-shaped outlet in the septic tank prevent the sludge and scum from leaving the tank and traveling into the drainfield area. Screens in the outlet of the tank are also recommended to keep solids from entering the drainfield. Newer tanks generally have risers with lids at ground level to allow easy location, inspection and pumping of the tank.

The wastewater exits the septic tank and is discharged into the drainfield for further treatment by the soil where microorganisms in the soil provide final treatment by removing harmful bacteria, viruses, and nutrients.



Source: Bouma, 1975.

Protect Your Septic System

1. Inspect your system on a regular basis and pump as necessary.
2. Use water efficiently. The more water a household conserves, the less water enters the septic system. Efficient water use can improve the operation of the septic system and reduce the risk of failure.
3. Don't dispose of cooking oils and grease or household hazardous wastes in sinks or toilets.
4. Care for your septic tank and drainfield. Do not drive or park vehicles or heavy equipment over your septic tank or on or near your drainfield. Locate drainfields away from trees and plant only grass over and near your drainfield to avoid damage from tree roots.

How to Maintain Your Septic System

Inspect and Pump Before Problems Arise

You should have a typical septic system inspected by a professional at least every three years and your tank pumped as recommended by the inspector. The frequency of pumping is dependent upon the size of the tank, household size and the degree of diligence in properly using the system. The U.S. Environmental Protection Agency recommends that if the bottom of the scum layer is within six inches of the bottom of the outlet tee or the top of the sludge layer is within 12 inches of the outlet tee, your tank should be pumped. Use of a garbage disposal can significantly increase pumping frequency. Alternative systems with electrical float switches, pumps, or mechanical components need to be inspected more often. Some local governments specify by ordinance or code the frequency of inspection of alternative or more sophisticated systems.

Use Water Efficiently

Average indoor water use in the typical single-family home is about 70 gallons per person per day. Dripping faucets can waste about 2,000 gallons of water each year. Leaky toilets can waste as much as 73,000 gallons each year. The more water a household conserves, the less water enters the septic system, thereby improving system performance. Some tips to reduce water usage:

- Fill the bathtub with only as much water as you need
- Turn off faucets while shaving or brushing your teeth
- Run the dishwasher and clothes washer only when they're full
- Make sure all faucets are completely turned off when not in use
- Maintain your plumbing to eliminate leaks
- Install low-flow aerators in the faucets in your kitchen and bathroom
- Replace old dishwashers, toilets, and clothes washers with new, high-efficiency models

Flush Responsibly

Dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, medicine (both liquid and pill form), pet hair and human hair, and other kitchen and bathroom items can clog and potentially damage septic system components. Flushing household chemicals, gasoline, oil, pesticides, antifreeze, and paint can stress or destroy the biological treatment taking place in the system and can result in water contamination.



How to Safeguard Your Drainfield

- Plant only grass over and near your septic system. Roots from nearby trees or shrubs can clog and damage the drainfield.
- Don't drive or park vehicles or heavy equipment on any part of your septic system. Doing so can compact the soil in your drainfield and damage the pipes, tank, or other septic system components.
- Keep downspout drains, basement sump pump drains, and other rainwater or surface water drainage systems away from the drainfield. Flooding the drainfield with excessive water slows down or stops treatment processes which can cause plumbing fixtures to back up.



Typical drainfield installation.



Septic effluent discharging to surface.



Overflowing septic tank.



The high level of tank contents indicate that the tank has backed up.

What Are the Signs of Trouble?



While the most obvious signs of a malfunctioning sewer line or septic system are when sewage backs up out of a floor drain, the toilet overflows or drains are sluggish, there are others: sewage odors either indoors or outdoors, sewage surfacing in the yard, or wet or damp spots on the surface of the drainfield area. The problem could originate in the sewer line to the tank, the tank itself, or the drainfield. You may choose to troubleshoot your problem yourself. In some cases, the homeowner does not know the exact location of the septic system or have an accurate sketch to follow to locate the tank and drainfield. The two Web links below describe the process to use to locate system components. After you have located the system, be sure to make and save a drawing indicating their location for future reference. Two online sites that may help guide you are:

<http://extension.missouri.edu/publications/DisplayPub.aspx?P=EQ401>
and

<http://www.ruralhometech.com/SepticSystems/tabid/71/Default.aspx>.

The diagnosis of and the remedy to a problem is often beyond the capability of a homeowner and it is recommended that you obtain the services of a licensed and bonded professional contractor to help ensure that the problem is properly diagnosed and fixed right. Your local government building department or health department may be able to provide you with a list of service providers.

Some problems can be quite costly to repair and could even require the entire replacement of the system. If you are faced with this situation, before proceeding with the work you should contact the Metropolitan St. Louis Sewer District (MSD) if your property is located within MSD's service area (St. Louis County east of Highway 109 and the City of St. Louis) or your local government service area and explore with them the possibility of connecting your sewer to a central sewer collection system. If the connection to a central system is financially feasible, it could provide a better long-term solution to handle your household sewage.



In the past, steel septic tanks coated with a bituminous material were installed in some areas. These tanks are prone to rusting out or failure of the tank's baffles. If your tank is made of steel and is failing, the solution will most likely entail the replacement of the tank with a concrete or other approved material septic tank.



Contractor installing a concrete tank to replace the failing steel tank.

Septic Tank Killers and Cloggers—A Summary

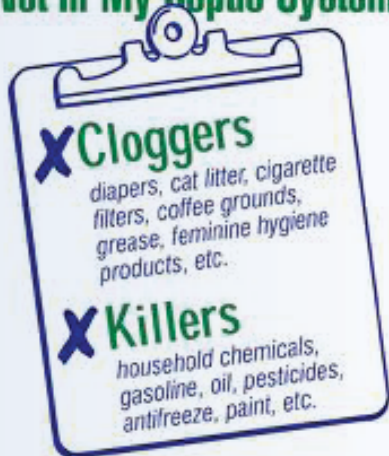
Killers:

- Concentrations of bleach and other bacteria-killing products
- Household chemicals, gasoline, oil, pesticides, antifreeze, paint, etc.
- Prescription and over-the-counter drugs in any form—pill, liquid or patch
- Caustic- or acid-based drain cleaning products

Cloggers:

- Diapers
- Cat litter
- Cigarette filters
- Coffee grounds
- Cooking oil and grease
- Hair, both pet and human (to the extent possible)
- Feminine hygiene products
- Condoms
- Plastics and other inorganic items
- Q-Tips
- Makeup pads and sponges

Not in My Septic System!



Helpful Tips

One of the most important practices you can follow to maintain septic system performance and possibly lower maintenance costs is to minimize the amount of water discharged into your plumbing drainage system and also to spread out over time water-using activities such as laundry and baths or showers.

Thinking about a home addition? A home addition may trigger the need to increase the capacity of your septic tank. Ask your local government's building department if your planned addition will require you to install a larger tank before you begin the design of it. Keep in mind that you cannot build over any part of your septic system and that you also need to maintain a work area in and around the tank and drainfield for the potential operation of a backhoe and other heavy equipment. Also, heavy equipment and delivery vehicles should not be driven over the area in or close to your drainfield. Doing so could destroy the functionality of your system.

- Don't plant vegetables close to your septic system.
- Put cooking oil and grease in a can or jar, wipe out greasy skillets and pans and dispose of in the trash.
- If you are not composting your food scraps, consider bagging them in the freezer until trash day.
- Avoid using products that contain phosphate.
- Make sure that water from downspouts does not discharge onto or toward your drainfield. Your yard should be contoured so that excess rain water or snow melt does not flow toward your drainfield.
- Unused or expired medications should not be disposed of by discarding into your sewer system. If you have medications that you want to dispose of, ask local pharmacies if they participate in a take-back program. Also, you can contact your local government or solid waste management district and ask if medications are accepted during local household hazardous waste collection events. If you cannot find a source to accept your medications, see <http://water.epa.gov/scitech/swguidance/ppcp/upload/ppcpflyer.pdf> for steps to follow for household disposal.

Web Resources For Owners of Septic Systems

Homeowner's Guide to Septic Systems: Describes how a septic system works and what you can do to help systems treat wastewater effectively.

http://www.epa.gov/owm/septic/pubs/homeowner_guide_long.pdf

Septic Tank/Absorption Field Systems: A Homeowner's Guide to Installation and Maintenance: This document includes detailed information on how to measure the scum and sludge layers—critical information in determining when your septic tank should be pumped. It also has a troubleshooting section that describes common problems and their possible causes and remedies.

<http://extension.missouri.edu/publications/DisplayPub.aspx?P=EQ401>

Homeowner Septic System Checklist: Worksheet for homeowners to keep track of septic system inspections and maintenance.

http://www.epa.gov/owm/septic/pubs/septic_sticker.pdf

Onsite Wastewater Treatment Systems: Homeowner's Guide to Evaluating Service: This guide aims to help homeowners who are seeking services from maintenance providers of onsite wastewater treatment systems. This includes definitions of common terms used in service contracts, types of service contracts available and factors to consider when choosing a service provider.

http://www.nesc.wvu.edu/pdf/ww/septic/epa_service_contracts.pdf

Decreasing Water Use in the Home: This site provides you with practical ways to save water and provides information resources to help people use water more efficiently. <http://www.epa.gov/watersense>

Helpful Tips and Information For Home and Business Owners: This site contains very helpful information on how to dispose of kitchen generated waste, alternative cleaning products, utility/laundry room tips and additional tips on best practices for septic system owners.

<http://www.wastewatereducation.org/homecare.html>

U.S. Environmental Protection Agency Region 7 through the Missouri Department of Natural Resources has provided partial funding for this project under the American Recovery and Reinvestment Act of 2009. Section 604(b) of the Clean Water Act.



Missouri Department
of Natural Resources



Lower Meramec Watershed Partners supporting development of this project:



Missouri Department
of Natural Resources



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