

Where Does My Toilet Water Go?

A guide to
understanding your
septic system

Toilet water goes to the septic system, of course, but where is your septic system and what exactly do septic systems do?

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Why Maintain Your Septic System?

Septic systems have a limited lifespan. Just as the roof on your home may need to be replaced every 20 to 30 years, so may your septic system. However, you can prolong the life of your septic system and protect your investment by performing proper maintenance. This includes inspecting the baffles each year to ensure they are intact and checking the sludge levels to see if the septic tank needs to be pumped. This is similar to changing the oil in your car every 3,000 to 5,000 miles. Changing the oil

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Why maintain your septic system? Cont.

removes the build-up of sediments that can decrease the performance of the engine. Pumping your septic tank is very similar. It removes the build-up of sediments that reduce the performance of the tank and lead to failure of the leach field. (*Know Your Septic Tank*. Ohio Department of Health Bureau of Environmental Health, Columbus, Ohio.) This routine maintenance can save you thousands of dollars when compared to the price of a new system. Also, when your leach field fails, wastewater from your house travels to the nearest body of water. Please help us protect our water resources--maintain your septic tank!

How Do I Find My Septic Tank?

If you do not know where your septic tank is located, there are a few things you can do to try and locate it.

1 If your septic system was installed after 1953, you may be able to get a copy of the septic permit at the Darke County Health Department. Many permits have drawings showing the location of the system.

2 Determine the direction that the sewer line goes out of the home. The sewer line can be located in the basement or crawl space. It is usually the largest diameter pipe made of plastic or cast iron. Once the sewer line is located, run a flexible wire through the sewer line from the last opening in the house. Start digging where the wire stops.

3 With a metal rod or probe, start probing in the soil 10 to 15 feet out from the foundation of the home in the same direction that the sewer line left the basement.

4 On older homes, you may be able to locate the sewer vent pipe on the top of your home and go straight out about 5 to 15 feet and begin to probe.

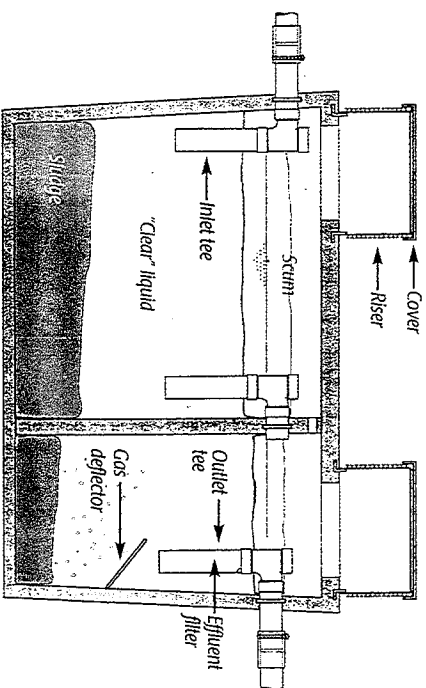
How do I find my septic tank? Cont.

A metal detector may be of assistance in finding the septic tank since most concrete septic tanks contain metal reinforcing rods or other metal parts. The tank is usually not buried any deeper than two to three feet. If you have a leach field, you can often see evidence of it because the grass is frequently greener above that area. This is because of the nitrogen in the wastewater. Once you have found the system, place risers on the inlet and outlet lids to your septic tank and prepare a drawing of where your septic system is located so it can easily be found in the future.

Primary Treatment: Your Septic Tank

Household wastewater first flows into the septic tank where it should stay for at least a day. In the tank, heavy solids in the wastewater settle to the bottom forming a layer of sludge. Grease and light solids float to the top forming a layer of scum. The sludge and scum remain in the tank where naturally occurring bacteria work to break them down. The bacteria cannot completely break down all of the sludge and scum

however, and this is why septic tanks need to be pumped every 3 to 5 years. Pumping your septic tank is probably the single most important thing you can do to protect your system.

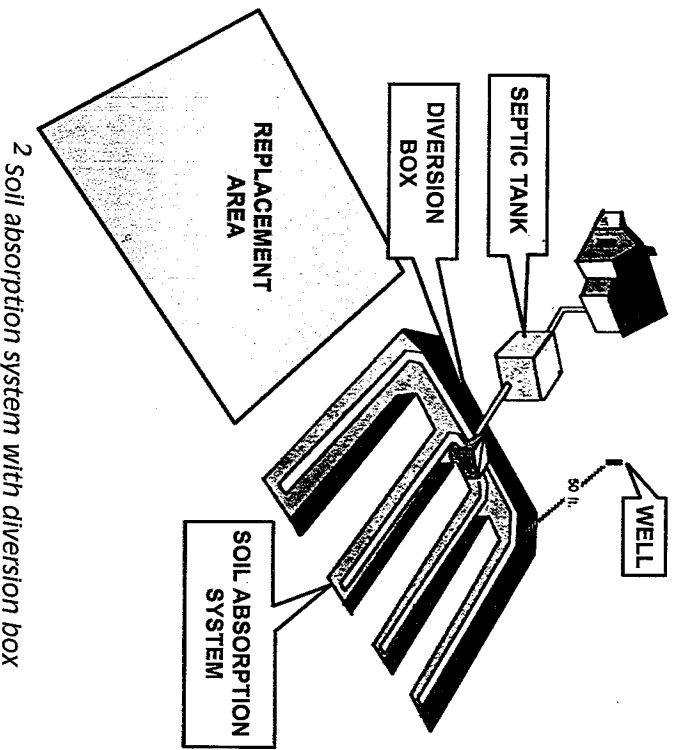


1 Cross section of septic tank

Secondary Treatment

After the septic tank effluent flows out of the septic tank it should receive secondary treatment. In order for a system to be considered a "functioning" system, it must have secondary treatment. Primary treatment only helps settle solids; it does not remove bacteria and other pollutants. Many systems that were installed in the past consist only of a septic tank that discharges directly into a field tile. This type of system needs to be upgraded to include secondary treatment. The most common type of secondary treatment is the soil absorption system or the leach field. However, other types include subsurface sand filters, mound systems and drywells.

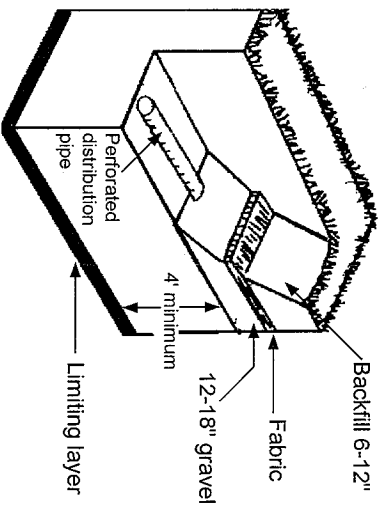
The Soil Absorption System, or Leach Field



2 Soil absorption system with diversion box

Soil absorption system or leach field, Cont.

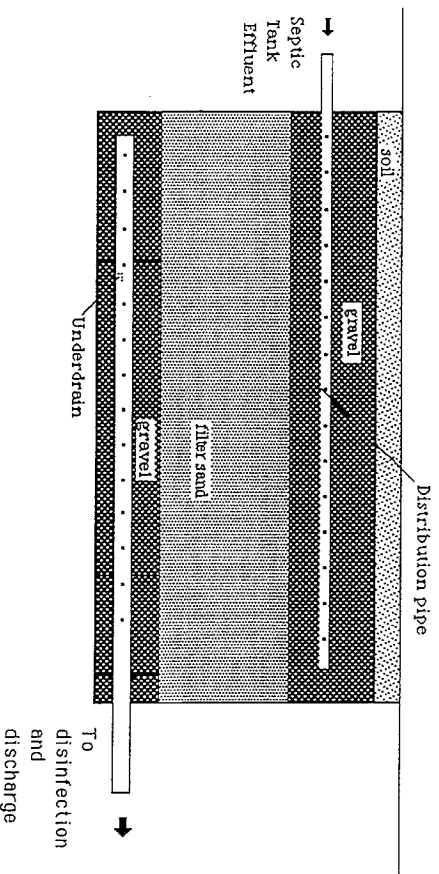
When wastewater leaves a septic tank too soon, solids can be carried with it to the leach field. Leach fields provide additional treatment of the wastewater by allowing it to trickle from a series of perforated pipes, through a layer of gravel, and down through the soil. The soil acts as a natural filter and contains



3 Trench soil absorption system

organisms that help treat the waste. Solids can damage the leach field by clogging the small holes in the leach field pipes and surrounding gravel. In addition, some systems have a flow diverter which may be used to alternate field usage between two leach beds.

Subsurface Sand Filters

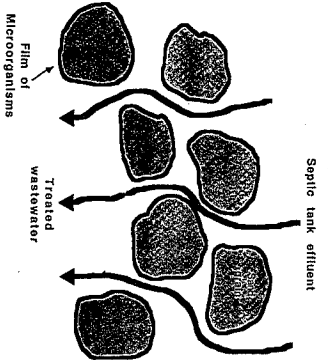


4 Cross section of a subsurface sand filter

Subsurface sand filters, Cont.

Drywells

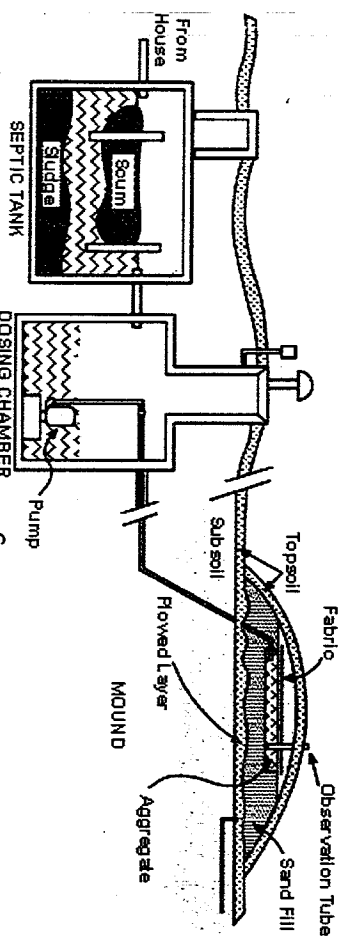
After effluent leaves the septic tank, it can be applied to a subsurface sand filter. A subsurface sand filter consists of a bed of sand buried below the ground. Effluent is distributed onto the sand through distribution pipes laid above the sand in a bed of gravel. The sand naturally cleans the wastewater, and treated wastewater goes to a collection tile located in a bed of gravel below the sand filter. The waste is then discharged off-lot through a tile.



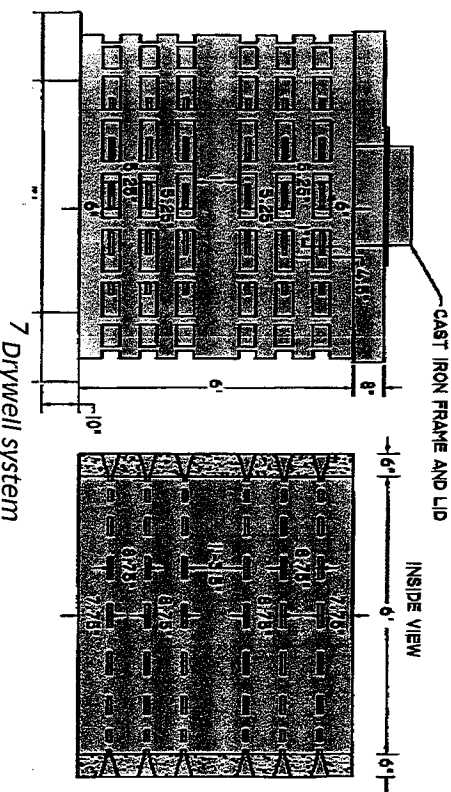
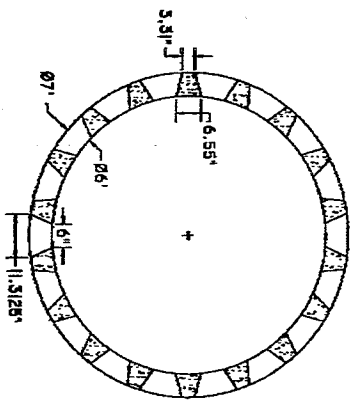
5 Detail of sand grains in a sand filter

Mound Systems

Whereas a subsurface sand filter is located below ground, a mound system is located above ground. Mound systems can be used where the water table is high or the soil is too shallow or tight to provide adequate treatment. They are "elevated absorption beds" that use sand fills to partially treat wastewater before it reaches the natural soil. A dosing tank is present to pump effluent to the mound where effluent flows through a sand layer. Most of the pollutants are removed from the wastewater in this sand layer. After the wastewater flows through the sand layer it enters the natural soil, which removes the remainder of the pathogens.



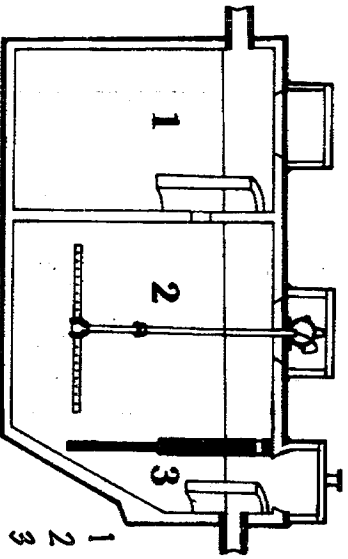
6 Mound system components



Drywells are located below the ground surface and follow the septic tank. They are large concrete cylinders with many holes that allow the wastewater to leach into a bed of gravel that is placed around the cylinder. Once the effluent leaches through the bed of gravel, it is treated by the surrounding soil. Drywells are typically used on small lots where there is no outlet tile.

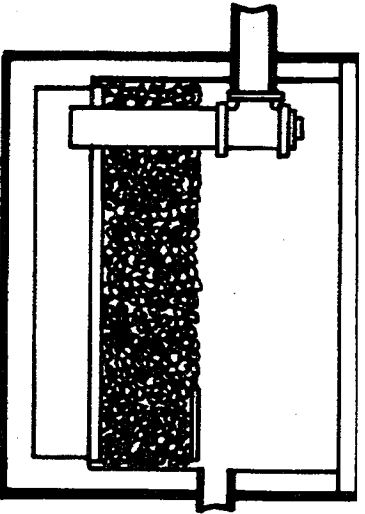
The Aerobic Sewage Treatment System, or Aeration System

An aeration system is another type of septic system that consists of both primary and secondary treatment. This type of wastewater system has a motor that draws air into the system and circulates the waste. The air is used by specific kinds of bacteria (aerobes) to purify the wastewater, hence these systems are properly referred to as Aerobic Sewage Treatment Systems. When the system is operating properly, the treated effluent should be clear and odorless. Some systems have an upflow filter following the third compartment of the aeration system. This provides additional treatment for your wastewater.



8 Cross-section of an aeration tank

- 1 Settling Compartment
- 2 Aeration Compartment
- 3 Clarifier Compartment



9 Upflow filter

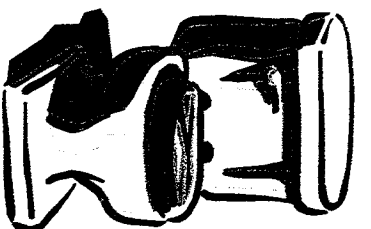
Do Not Flush!

Cigarette Butts



Condoms

Coffee Grounds



Dental Floss

Kitty Litter

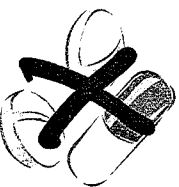
Tamppons

Fat, Grease, or Oil

Disposable Diapers

Paper Towels

Hazardous Chemicals
Such As:



Medications

Sanitary Napkins



Paints
Varnishes
Thinners
Waste Oils
Pesticides

Warning:

Be sure to exercise appropriate caution when inspecting a septic tank. Never allow anyone to inspect a septic tank alone or go down into a septic tank. Toxic gases are produced by the natural treatment processes in septic tanks and can kill in minutes - even just looking in the tank can be dangerous (Pipeline, Fall 1995).

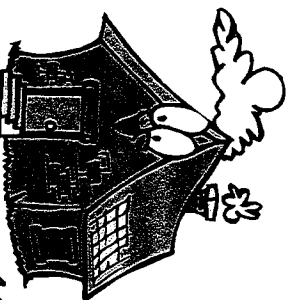
Ways to Protect Your Septic System

- ✓ Have your septic tank pumped and system inspected every 3 to 5 years by a licensed septic contractor. You can acquire a list of registered contractors from your local health department. If you have a garbage disposal, more frequent pumpings may be required.
- ✓ Learn the location of your septic system and leach bed. Keep a sketch of it handy for service visits. If your system has a flow diversion valve, learn its location, and turn it once a year. Turning your flow diverter can add many years to the life of your system.
- ✓ Divert roof drains and surface water from driveways and hillsides away from the septic system.
- ✓ Use bleach, disinfectants, and drain and toilet bowl cleaners sparingly and in accordance with product labels.
- ✓ Conserve water to avoid overloading the system. Repair leaky faucets or toilets.
- ✓ Keep your septic tank cover accessible for inspections and pumpings. Install risers if necessary.
- ✓ Plant grass over your leach field. The grass will help prevent erosion and remove excess water.

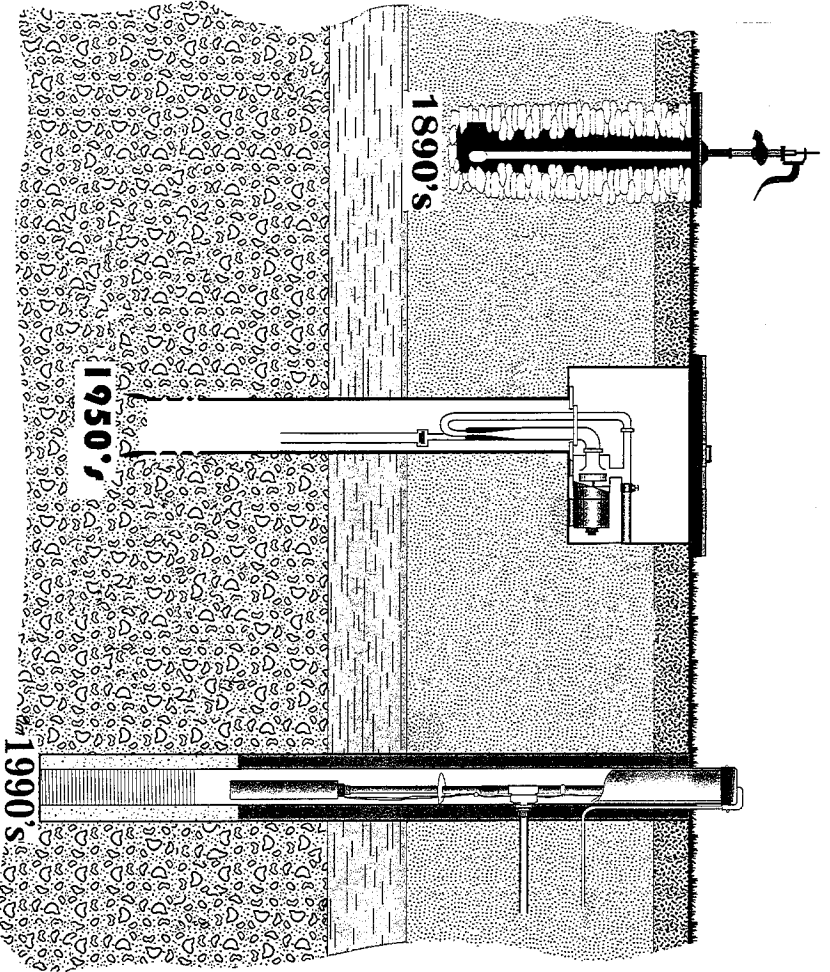
Ways to protect your septic system, Cont.

- ✗ Don't connect roof drains, water softeners or sump pumps to the septic tank.
- ✗ Do not use a garbage disposal; they will just add solids to your system.
- ✗ Never allow anyone to drive, park, or operate heavy machinery over any part of the system.
- ✗ Don't make or allow repairs to your septic system without notifying the health department. Use professional registered septic contractors when needed.
- ✗ Don't use commercial septic tank additives. These products usually do not help and some may hurt your system in the long run.
- ✗ Don't dig in your leach field, plant trees, build anything over it, or cover the leach field with a hard surface such as concrete or asphalt.

Following these recommendations can help your septic system have the longest possible life!



Protecting Your Water Supply



10 Well designs from various eras

Just as septic waste pollutes receiving surface waters and streams, it also has the potential to pollute groundwater supplies. Water well construction and location is very important in protecting your water supply. The Private Water System Rules state that the well should be at least 50 feet from the septic system. (Ohio Department of Health, Ohio Administrative Code (OAC) Chapter 3701-28-10.) It also states that it must be at least 25 feet deep and constructed of materials that will not allow infiltration of water from the sides or from the top.

Protecting your water supply, Cont.

The picture to the left shows types of wells by their years of construction. If you have a dug well (1890's), your water system is not considered safe because it is not deep enough for the soil to provide adequate treatment and infiltration may occur from the sides. This well should be filled in to prevent children from falling in and you should have a new well drilled.

If you have a well that is located within a pit (1950's), you should be concerned. Infiltration may occur from the top of the well. If the pit holds water, the well should be altered so the well casing is extended above the ground and the pit removed and filled in with dirt. If the pit is dry, the water should be tested. If it is found to be unsafe, the well should be altered to extend the casing above the ground. If the well has no pit but is buried below the ground, the water should be tested. If the water is found to be unsafe, the well should be altered to extend the casing above the ground. Please use this information as a guide. If you are not sure what should be done, please contact the Health Department about water testing and a sanitarian will visit your home.

If you have a well where the casing is extended above the ground (1990's), you should have your water tested periodically to make sure that it is safe for drinking. Contact the Darke County Health Department to find out additional information about water testing.

Prior to any construction on a well, including drilling a new well or altering an existing well, you should contact the Health Department to learn about the requirements and restrictions.

Frequently Asked Questions

Q: How do I know if my septic system is failing?

A: You may notice slow draining sinks and toilets, gurgling sounds in the plumbing, plumbing backups, sewage odors, or wet or mushy ground.

Q: How often should I have my septic tank pumped?

A: It is recommended that the septic tank be pumped every three to five years.

Q: How long will my septic system last?

A: Underground pipes and tanks should last 20 to 30 years before they may begin to deteriorate. The system may then need to be repaired or replaced.

Q: Should my dishwasher and laundry water go into my septic system?

A: Yes. Dishwater and laundry water are known as graywater, which is different from sewage, known as blackwater. Some older homes may have separate plumbing for graywater, but all homes should have graywater and blackwater going into the septic system.

Remember, septic systems can cost over \$7,000 to install. Pumping your septic tank and preventing failure will save you money!

If you have further questions, please call the Darke County Health Department at (937) 548-4196. You can also visit our website at <http://www.darkecountyhealth.org>.

References for Diagrams

- 1 Septic Tank Diagram: "How septic systems work." Pipeline. Summer 1995; Vol. 6, No. 3.
- 2, 3 Leach Bed and Leaching Trench Components Diagram: Darke and Miami County Health Districts' Stillwater Watershed Protection Project. "Maintaining Your Wastewater System: A Guide for Homeowners."
- 4, 5 Subsurface Sand Filter Diagram and Sand Grain Detail: Mancl, Karen. "Draft: Septic Tank - Sand Filter System."
- 6 Mound System Component Diagram: Chen, Chien-Lin (Gibson), Mancl, Karen. "Mound Systems for Onsite Wastewater Treatment: Siting Design, and Construction in Ohio", Bulletin 813. The Ohio State University, 2004.
- 7 Dry Well Diagram: Robert Oldham Ltd. "Dry Well." State of Ohio Approved Specifications for Drywell for Oldham, Inc. Sidney, Ohio. 1984.
- 8, 9 Aeration Unit and Upflow Filter Diagrams: "Coate Aer: Forced Air Wastewater Treatment System." Coate Burial Vault, Inc. West Milton, Ohio.
- 10 Water Supply Diagram: State Coordinating Committee on Ground Water. "Technical Guidance for Well Construction and Ground Water Protection." State of Ohio. 2000. Adobe Acrobat file available at <http://www.dnr.state.oh.us/water/pubs/>

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Records of Maintenance

Date	Pumper/Maintenance

Date	Yearly Change of Flow Diverter Valve

Date	Registered Installer

My Septic System Diagram:

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