

Frequently Asked Questions

About Septic Systems

What is the purpose of a septic system?

The purpose of a septic system is to properly treat and dispose of the sewage that comes from the house. "Treat" means to kill all harmful pathogens, which include bacteria, viruses, parasites, helminth worms, and all manner of things that can harm you. "Dispose" means that the wastewater goes where you won't see it again.

What does a septic system consist of?

A septic system usually consists of two parts: the tank and the leaching device.

What function does the tank perform?

The tank is designed to be a sludge trap. It simply keeps the solid stuff that you put into it from your toilets, sinks, showers, and tubs from getting into the leach field. It does this by holding it back the solids for a period of time while letting the liquid pass through. There are baffles in the tank which slow down the movement of solids. Usually, the solids drop to the bottom of the tank, except for the materials that are lighter than water, which float to the top. In tanks manufactured since 1961, there are two compartments. These compartments ensure that what doesn't get trapped in the first compartment will be held back in the second one. Over time, bacteria work on the solids to break them down into tiny pieces. The liquid containing the tiny pieces of solids is called *effluent*. Effluent leaves the tank and must be disposed of in a leaching device. Effluent is more than 99% water.

What is a leaching device?

A leaching device is a contrivance that is built into the soil. It utilizes the properties of the soil to both kill pathogens (treatment) and to disperse the water into the soil.

How does soil kill pathogens?

Soil destroys pathogens by a combination of ways. The soil can act as a filter to strain out the pathogens. There are also chemical and biological actions performed on the pathogens to dispose of them.

How does soil disperse water?

Water usually moves through the soil in a downward movement due to gravity. Eventually the water combines with either a surface or subsurface body of water. A portion of the water may be taken up by plants and moved upward. The plants then use the water to grow.

What are limiting factors of soil?

There are many limiting factors of soils. Soil is located at the very top of the ground. It usually ranges in depth from 12 inches to 36 inches. Below the soil is geologic material. One such material is glacial till. Glacial till goes by many other names, such as clay or hardpan. Glacial till does not absorb an appreciable amount of water, and therefore cannot treat, nor dispose of sewage effluent. Other limiting factors include a high water table and fractured bedrock.

What is a high water table?

It is a situation in which the soil is saturated with water. It can either be seasonal, such as in the winter and spring, or permanent, which means it occurs year round. It is easy to tell the difference. You can dig a hole in the ground and observe the water level over a period of a year. Soils with a seasonal or permanent water table are usually dark gray or black.

What is the problem with a high water table?

In order to kill pathogens, the soil must be dry. Studies have shown that bacteria can travel greater distances in wet soils. This can and does contaminate water supplies. Wet soils cannot disperse water very well. If the soil is already saturated with water, it is very difficult to force more water (i.e., the effluent) into it.

What about bedrock?

Rock has fractures in it. Fractures are large cracks between the rock. These fractures and cracks permit effluent to go around the rocks and into the underlying water without being treated. You may end up with untreated sewage effluent in the water supply if the leaching device is directly over the fractured bedrock.

How far away from the bedrock must the effluent be to receive proper treatment?

There must be a minimum of four feet between the bottom of the leaching device and the bedrock. The pathogens in the effluent are usually killed within eighteen inches after leaving the leaching device.

What are leaching devices?

Leaching devices are typically trenches that are dug into the soil. The trench is usually filled with gravel and a pipe is laid near the top of the gravel in order to disperse the effluent throughout the soils so that the effluent can come into contact with the soil, where it can be treated and dispersed. The trenches are usually fairly shallow, maybe only 24 inches deep, and the pipe is only 6 to 8 inches below the ground. However, in some cases, the top of the trench may be at the top of the ground (called an at-grade system), or above the ground (called an above-grade system), and in still other cases the entire leaching device, even the bottom of the trench, is several feet above ground (Wisconsin Mound). All leaching devices rely on the same principal: the soil is the treatment and dispersal medium.

Why build a leaching device shallow or on top of the ground?

In some locations, the underlying limiting factors, such as the water table, the bedrock, or the glacial till, none of which is capable of treating sewage, is too close to the surface to use conventional below ground trenches. Raising the leaching device higher is a way to gain distance between the effluent and the part that does not treat sewage.

What is a drywell?

In some instances, there is a thick deposit of dry sand and gravel in the homeowner's yard. A drywell is a special kind of leaching device that puts the effluent into the sand and gravel for treatment and disposal. A drywell typically consists of premanufactured concrete rings with holes in them. Once again, typically the rings are three feet high and six feet in diameter. Usually, two rings are used, one on top of the other. This drywell then receives effluent from the septic tank. A drywell will **ONLY** function where there is a large deposit of dry sand and gravel.

What is an aeration system?

An aeration system is a small mechanical sewage treatment plant. It relies on air being pumped into the sewage compartment in order for it to treat the sewage with air loving bacteria. These air loving (aerobic) bacteria break down the sewage and theoretically render the effluent harmless. Unfortunately, this rarely happens. Aeration systems are not typically designed to have leaching devices working with them. Partially treated sewage effluent is discharged into storm sewers, ditches, lakes and streams. In Miami County, aeration systems are not installed any longer and have not been since approximately 1995. Also, typically in Miami County, aeration systems were installed with partial leaching devices that had an overflow pipe to the nearest ditch.

What are some problems with aeration systems?

Every study published on the functioning of aeration systems that serve homeowners in the real world setting have shown that the effluent that is discharged to streams and ditches cannot meet standards. These studies have shown that aeration effluent is out of standards anywhere from between 65% to 92% of the time.

Aeration systems rely on a series of electrical components and parts which tend to wear, break, get clogged, etc.

Sometimes the system is working perfectly, but it still cannot produce an effluent that meets the state standards.

Aeration systems do not kill all viruses and bacteria. Sometimes aeration systems have tablet chlorinators on the end of them, to chlorinate the effluent in order to kill pathogens. However, homeowners typically don't operate or maintain these very well. If the effluent lacks sufficient oxygen, it can kill aquatic life in streams and often smells bad.

How can I maintain my septic system?

The only maintenance you need to do is to pump the sludge out of the tank every 3 to 5 years. A licensed septic tank pumper should do this. The list of currently maintained at the health district offices.

The only other thing to be done is that if the leaching device has an alternating valve, it should be turned to the new field on time per year.

Does water conservation make my system last longer?

Absolutely. Your septic system is designed to handle the water from a "typical household." The average family uses between 150 and 300 gallons per day. Anything you can do to cut back on water consumption will extend the life of your leaching device. As a matter of fact, if you use no water (in reality we know this is ridiculous), your leaching device will never fail. The point here is: water consumption is directly connected to system life. If houses are constructed or retrofitted with low flush toilets and low use shower heads, this is good for the system.

Another point: some systems fail due to over consumption of water. Sometimes a toilet will leak can mean an additional 100 gallons of water per day going into the system. Or sump pumps, which are not supposed to empty into the system, can saturate the system with water and cause it to fail.

Do septic tank additives help?

The purpose of the septic tank is to trap sludge and other offensive junk in the tank so that it can be held there and broken down into water-soluble parts. Most septic tank additives state that they break up sludge. This defeats the intended purpose of the tank. Many studies have been conducted of septic tank additives. None have proven to be effective. All are a waste of money.

Should I add yeast to the septic tank to help it along?

No. The septic tank receives all the bacteria it needs through its normal operation. It doesn't need any more.

Should I use white toilet paper instead of colored paper?

No. Testing has not shown white paper to be more beneficial than colored paper.

Should I use a garbage disposal?

Using a garbage disposal increases the amount of solids going into your septic tank. This then shortens the amount of time in-between septic tank pumpings. In a properly working system, the waste from the garbage disposal should not adversely affect your leaching device.

How do sewage systems go bad?

The main type of failure is caused by the leaching device. In this type of failure the sewage may surface to the ground or back up into the house. This occurs due to the soil being unable to disperse the water at the rate water is coming into the trench or device. Over time, the spaces in-between the soil particles, which the water moves through clogs up. This is called a clogging mat. Other problems may be caused by water tables, crushed pipes, improper installation, etc.

If a sanitary sewer becomes available, must I connect to it?

If the leaching system is malfunctioning, the connection must be made within 30 days. In an area with an existing sanitary sewer, connection must be made by July 1, 2002. In areas that get a new sanitary sewer, the connection must be made within 3 years after the sewer becomes available.

Do I have to abandon the old system?

Yes. Any tanks and drywells must be pumped, crushed and filled at the time the house is connected to the sewer. The plumber who makes the connection can accomplish this. Old leaching devices can be left undisturbed.