

# OVERVIEW AND CARE MANUAL FOR ON-LOT WASTEWATER TREATMENT SYSTEMS

Dear Snyder County Resident and Proud Owner of an On-lot Wastewater Treatment System (more commonly known as a septic system):

Many people with on-lot wastewater treatment systems, especially people moving in from more urban areas, don't know where their septic system is located, how the system works, how to maintain that system, or why such maintenance is important. This informational packet will tell you how to protect your system, your health and water quality.

A properly functioning on-lot wastewater treatment system protects human health and water quality. If your system is not working properly (or even fails) it is highly likely that you are contaminating ground and surface water supplies. In short, you may be polluting your, and your neighbor's, drinking water! Wastewater contains numerous pathogens (viruses and bacteria) that are harmful to human health. Your wastewater also contains nutrients such as nitrogen and phosphorus, which have been shown to be major contributors to the pollution entering the Chesapeake Bay, your regional watershed.

A properly functioning septic system not only keeps pathogens and nutrients out of surface and groundwater supplies but spares homeowners from very expensive repair or replacement costs.

Please read on to determine how your septic system works and how you can take care of the system to protect your health, the health of your neighbors, and our local and regional environment.



## **Snyder County Conservation District**

**10541 Route 522, Middleburg, PA 17842**

**Phone: 570-837-3000, FAX: 570-837-7300**

**Website: [www.snyderconservation.org](http://www.snyderconservation.org)**

*If you have questions or concerns, feel free to contact the  
Snyder County Conservation District or your local sewage enforcement officer.*

## ***WHERE IS YOUR WASTEWATER GOING?***

When you wash your dishes, flush the toilet, shower or bathe, or use a clothes washer, where does that water go ?

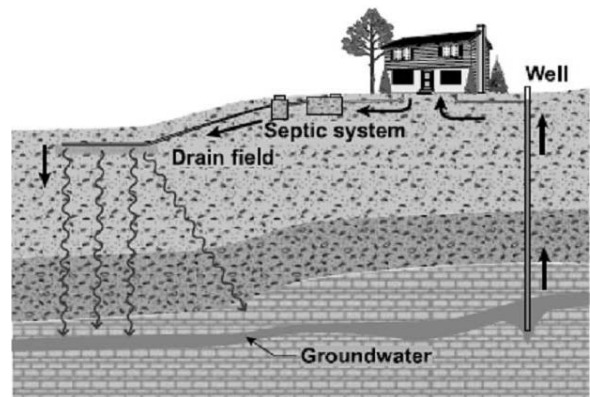
If you live in rural area, then you are like roughly half of Snyder County residents who have an “on-lot wastewater treatment system,” more commonly known as a septic system. Your wastewater is treated (hopefully) in your own yard, thus the term “on-lot.” If you have a fairly new home, you’re probably familiar with the part of your septic system known as the “sand mound.”

Here are important things to know about your septic system:

- 1) It is designed to protect human health.
- 2) It is designed to clean the water that you have used and return that water to the environment to be used again.
- 3) It is a living system— it only functions because of the work performed by organisms living in different portions of the “system” and can be damaged by what goes down your drains.
- 4) “What goes in is what comes out,” so it’s critical to be aware of what goes into your system, as toxic material could wind up in your groundwater.
- 5) The septic system requires your care and maintenance to operate properly.
- 6) It can (and probably will) fail if neglected, which will lead to expensive repairs or replacement and probable contamination of groundwater (well/spring water).

### ***THE SEPTIC SYSTEM: How it Works...***

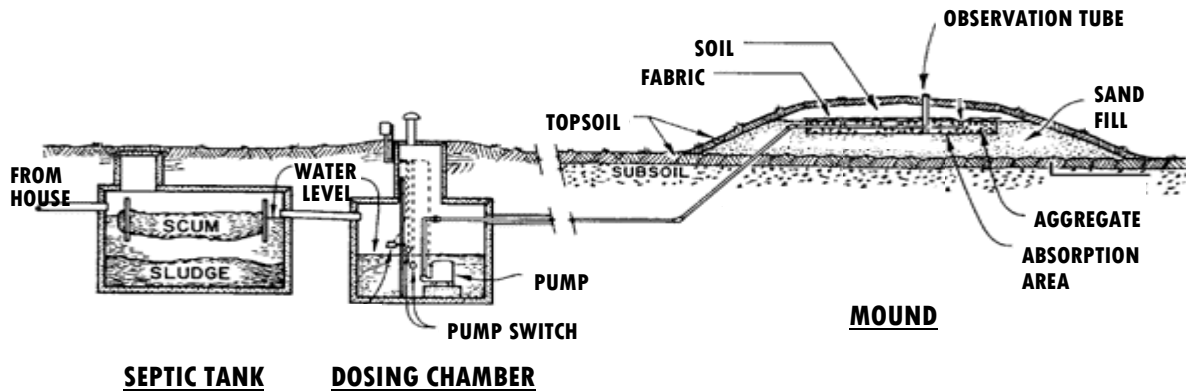
A septic system is a wastewater treatment and disposal system. Its purpose is to separate household wastewater into a solid and liquid phase, and perform a certain amount of treatment and purification of those wastes prior to their disposal. While there are several types of “on-site” wastewater treatment systems, most of them work in similar ways. The typical septic system consists of two main parts: the **septic tank** and the **absorption** (or leach) **field**.



In most homes, your “used” water (shower/tub, toilet, sink, washing machine, etc.) should flow out into a buried collection tank in your yard, usually referred to as a **septic tank**. Here, material such as grease, fat and soap suds form what is called a “scum” layer. This material accumulates over time and the scum layer thickens. Heavier material sinks to the bottom of the tank where various microorganisms (bacteria) decompose some of this material. However, some things are not easily decomposed and, along with accumulated dead bacteria, form a sludge layer (the solids) that builds up on the bottom of the tank.

Between the scum layer and the sludge layer is a layer of water with relatively few solids. This water, the sewage effluent, flows out of the tank and into a system designed to clean and treat the wastewater. Typically the septic tank has a baffle or tee at the outlet to help prevent scum and sludge from flowing out with the wastewater. Most new systems have, or can be retrofitted with, a “septic tank filter” which is attached to the outlet pipe. This provides a relatively inexpensive means of preventing solids discharge to the leach field/sand mound.

While the scum and sludge hopefully stay in the tank, the remaining cloudy liquid (effluent) passes out into another treatment area. The effluent still contains many pathogens (disease causing organisms) and other pollutants, such as nutrients, and potential toxins. So, whatever went down your drains that did not float or sink in the septic tank is still in that wastewater! Most new systems in Fulton County use what’s commonly known as a “sand mound” to further process the wastewater.

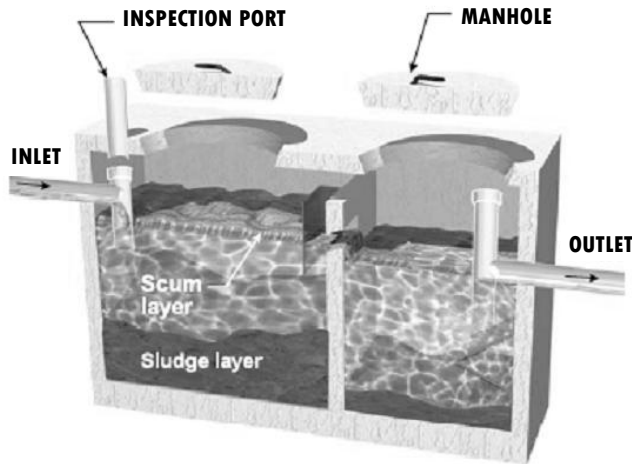


From the septic tank, the wastewater typically passes into a dosing chamber (pump chamber). This is another tank which collects the effluent and contains a pump which uses pressure to evenly distribute the wastewater into a distribution system in the sand mound. The dosing chamber and pump typically are connected to an alarm which alerts you to any malfunction or problem with the dosing system.

The sand mound is a drainfield raised above the natural soil surface. This increases the depth of treatment zone. The mound usually consists of a sand fill that contains a gravel-filled bed and a network of small diameter pipes (containing many small holes), called the distribution system. The effluent is pumped from the dosing chamber through the mound’s distribution system in controlled, low-pressure doses. These doses distribute the effluent evenly throughout the mound. The effluent flows out of the distribution pipes and trickles through the gravel bed into the sand layer. Some treatment occurs in the sand layer as large particles are filtered out and some pathogens are destroyed. The remaining treatment occurs in the underlying natural soil layer where the soil and the life contained within it further treat the effluent. The soil filters smaller particles. Under ideal conditions, the soil retains some of the nutrients, including most of the phosphorus and some forms of nitrogen. It removes some chemicals and acts as a site for pathogens to be deactivated.

## ***HOW TO CARE FOR YOUR SEPTIC SYSTEM***

A properly designed septic system will have a septic tank large enough to accumulate solids for several years. As the level of solids (sludge) rises in the tank, the wastewater has less time to settle properly and suspended solid particles flow into the absorption field. Likewise, if the scum layer builds up too much, it could also flow out into the leach



field. If the tank is not periodically pumped out, these solids will eventually clog the pipes and/or soil pores in the absorption (leach) field to the point where a new sand mound will be needed.

Although some septic systems fail because of improper siting and design, the most common reason for early failure is improper maintenance and care by the homeowner (system user).

**Septic systems were never intended for a lifetime of use without**

**maintenance. Your on-site wastewater treatment system is a living system and needs to be treated as such in order for it to effectively treat wastewater. Likewise, it needs to be properly maintained, which means periodically having a certified septage hauler pump out the scum and sludge.**

Often, we have heard people say “well, I’ve lived here more than 10 years and I’ve never had my tank pumped and I’ve never had any problems.” These homeowners have two choices: have their tank pumped immediately, or continue to neglect the septic system and face the inevitable cost of a system repair or replacement. You **must** maintain your septic system! You cannot ignore your system and expect it to function properly. Think of it like the oil in your vehicle – you can ignore changing the oil for a long time, but eventually that neglect will ruin the engine. Even if your septic system doesn’t show physical signs of a system failure such as a wet yard, foul smells, sluggish drains, or sewage flowing back into your house, you may still be contaminating groundwater. **That’s your drinking water!** Paying to have your tank pumped out every few years is far cheaper and less harmful to human health and water quality than waiting until the system fails.

**Two factors affect how often you should have your septic tank pumped.** Whether you need to have your tank

pumped every year, once every five years, or some other time interval is affected by these factors. **The first factor** is the tank’s size or capacity. Septic systems are typically sized based upon the number of bedrooms in a home. If you’ve added on to your home, if more people are living in the home than when the system was installed, or if new high water use appliances or technologies such as a hot tub or whirlpool bath are now in use, then

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***How do you avoid contaminating groundwater and surface water, avoid system repair and replacement costs, and protect human health and the environment? You do this by properly caring for and maintaining your septic system.***

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the capacity may be too small. The more people using a system, the faster the solids will accumulate in the tank, and the more frequently the tank will need to be pumped. Also, the additional surge of water from hot tubs and whirlpool baths may wash solids out of the tank and into the absorption field. An inspection can determine whether the system is of adequate capacity to handle the volume of solids and flow from the number of people in the household and types of appliances used. A larger capacity system provides better treatment and requires less pumping. To schedule an inspection, contact your sewage enforcement officer.

**The second factor** is the volume of solids in the wastewater. If you have a garbage disposal, for example, you will have to pump out your tank more frequently than persons disposing of their food wastes through other means. The use of a garbage disposal may increase the amount of solids in the septic tank by as much as 50 percent. Excessively soiled clothes may add solids to your septic tank. Likewise, disposing of anything non-biodegradable down your drains will add to solids build-up.

A specific determination of when to pump out solids from the septic tank can be made by having the depth of solids and level of scum buildup in the septic tank checked periodically. Periodic pumping is only one of the ways to maintain your system and ensure that it functions properly for years.

What you put into your septic system will have a direct effect on whether or not you have a healthy, long-lasting and trouble-free system. Your septic tank is not a “dispose-all.” It is a living system that relies on the beneficial organisms living in the septic tank and the soil for proper operation.

### ***PLEASE NOTE...***

- **A contractor should pump the tank contents through the manhole, usually located in the center of the tank, rather than through the inspection ports.**
- **Pumping through an inspection port could damage the baffles inside the tank. Damage to the baffles could result in the wastewater flowing directly into the absorption field without the opportunity for the solids to settle.**
- **The “septic tank filter” should be checked and cleaned.**
- **Commercial septic tank additives do not eliminate the need for periodic pumping and may be harmful to the absorption field.**
- **When the septic tank is pumped, make sure it is completely emptied. It is not necessary to retain any of the solids to restart the digestive process.**
- **You do not need biological or chemical additives for successful restart or continuous operation of your septic system, nor should you wash or disinfect the tank after having it pumped.**

## ***TIPS & PRACTICES FOR MINIMIZING MAINTENANCE COSTS, PROLONGING SYSTEM LIFE, AND PROTECTING SURFACE AND GROUNDWATER...***

- Learn the location of your septic system (tank & leach field) and keep a map of it.
- Limit the amount of water entering your septic tank to avoid overloading the system. Generally the more people, the more water will flow through the system. Too much water not only flushes solids out of the septic tank, but can also saturate the leach (absorption) field leading to hydraulic overload and improper functioning of the absorption field. This is especially likely if the weather has been wet and the leach field is already saturated.
- Divert surface water drainage away from the absorption field. Do not connect a sump pump, downspouts or other “clean” water discharges to the septic tank.
- Avoid the use of caustic drain openers and toxic cleaning compounds. Unclog drains with boiling water or a drain snake. Clean toilets, sinks, showers and tubs with mild detergent or baking soda rather than commercial bathroom cleaners.
- Minimize or avoid the use of garbage disposals. They add more solids to the system and shorten the time between pumping.
- Do not use septic tank additives, commercial tank cleaners, yeast, sugar, etc. These products are not necessary and some may be harmful to your septic system.
- Your septic system is not a trash can. Do not put disposable diapers, sanitary napkins, tampons, condoms, paper towels, plastics, cat litter, cigarettes, diaper wipes, or other solids into your septic system. These items can clog pipes, and they quickly fill the septic system with solids, decrease the efficiency, and will require that you pump out the septic tank more frequently.
- Do not put toxic substances down your drains. Keep paint, varnishes, thinners, waste, oil, photographic solutions, disinfectants, cleaning fluids, gasoline, pesticides, pharmaceuticals, or other hazardous chemicals out of your system. Even in small amounts, these items can destroy the biological digestion taking place within your system.
- Use bleach carefully. Too much can be harmful to the life in the septic system.
- Do not pour grease or cooking oil down the drain; they increase the “scum” layer in the septic tank and can plug soil pores and lead to field failure if released.
- Plant only grass over and near your septic system. Roots from nearby trees or shrubs may clog and damage the absorption field.
- Do not drive or park over any part of your septic system. This can compact the soil and crush the system.
- Direct all wastewater from your home into the septic tank. This includes sink, bath, shower, toilet, washing machine and dishwasher wastewaters. These can contain disease-causing microorganisms or environmental pollutants and need adequate treatment before entering the environment.

## ***TIPS AND PRACTICES FOR GENERAL WATER CONSERVATION...***

Water is an important natural resource, but we often take it for granted. Water is no longer the “sure thing” that it was in the past. We need to reassess our attitude about water and how to conserve it. In 1900, each of the 6 million people living in Pennsylvania used about 5 gallons of water per day. Since then, our population has doubled to almost 12 million people and our water consumption has increased to an average of 62 gallons per person per day. Our water resources are not unlimited. In many areas underground water reserves are being depleted more quickly than they can be replenished. Water conservation practices ensure that your well water supplies last as long as possible, that you avoid hydraulic overload of your septic system, and help extend limited groundwater resources.

- The use of water conserving devices such as low-flow toilets or shower fixtures greatly reduces the amount of wastewater thus prolonging the system’s life. For example, 40-50 gallons of water are discharged into your system with each laundry load. Several loads in one day can put considerable stress on the system. A better practice would be to space your laundry washing throughout the week.
- Be certain your home uses only low-flow, high efficiency toilets. These toilets have been designed to operate efficiently while using only 1.6 gallons of water or less, compared to old toilets that used 5-7 gallons/flush.
- Repair dripping faucets and leaking toilets (flapper valves are usually the cause). Repairs can save more than 10 gallons of water per person per day. A faucet dripping at one drop per second wastes 2,700 gallons per year.
- Wash clothes and dishes only when you have a full load. When replacing an older machine, consider high efficiency models, which use an average of 30-50 percent less water and 40-50 percent less energy, saving about 9-20 gallons per washing machine cycle and 7.5 gallons per dishwasher cycle.
- Install low-flow, water-efficient showerheads and faucets and save 1 to 7.5 gallons per minute.
- Take a shorter shower and save an average of 20 gallons of water each time.
- Turning off the tap while brushing your teeth in the morning and at bedtime can save up to 8 gallons of water per day, which equals 240 gallons a month!
- If you wash dishes by hand, do not leave the faucet flowing for rinsing. Instead use a dish rack and spray device to rinse them. If you have two sinks, fill one with soapy water and one with rinse water.

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## ***We All Live Downstream***

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## ***YOU USED THE WATER, BUT WHERE DID IT ALL COME FROM?***

Most of us use groundwater, or water which comes from the saturated zone beneath the soil surface. If you have a well or a spring, you are using groundwater. Groundwater is replenished through precipitation (snow or rain). As some people have experienced directly, if we do not receive adequate precipitation, the groundwater is not adequately “recharged” and wells and springs go dry. In much of Snyder County the only water entering the county falls from the sky. So, protecting our groundwater supplies, and utilizing that water wisely, is especially critical here.

Pennsylvania does not regulate private water supplies (well or spring). Consequently, homeowners with their own private water supplies are not protected by any regulations or standards. When a new well is drilled, no state requirements for construction materials, yield or quality apply. State law does require drillers to have a valid rig permit and a Water Well Drillers License.

Groundwater is not necessarily protected from contamination by the soil layer. Water can pass through the soil with limited filtering of contaminants in many areas (for example, in areas with shallow bedrock, limestone with sinkholes or high water tables). Often, bacterial contamination of wells can be traced to improper well construction and inadequately functioning and/or failing septic systems. Yet another reason to maintain your septic system.

The PA Department of Environmental Protection (DEP) reminds us that “the best designed and properly installed on-lot sewage disposal system will still malfunction if the homeowner does not properly operate and maintain the system. In addition to requiring costly repairs, malfunctioning systems can contaminate surface and groundwaters, cause various health problems, and spread disease as well as create unsightly messes and foul odors when raw sewage surfaces or backs up into the house.” Pathogens such as bacteria or viruses can enter ground and surface water - your drinking water! Nitrogen, in high levels in drinking water, has been linked to “blue baby syndrome” (a dangerous form of anemia in infants), birth defects, and cancer. Malfunctioning septic systems can allow nutrients (such as nitrogen and phosphorus) and organic matter found in the wastewater to reach ground and surface waters. These compounds are a major contributor to the problems facing the Chesapeake Bay.

***By now, we hope that the message is clear:***

**The proper care and maintenance of your on-lot wastewater disposal system is crucial to the protection of ground and surface water quality, your family’s health, and the avoidance of costly system repair or replacement.**

If you have questions or concerns, feel free to contact the Snyder County Conservation District (570- 837- 3000) or your local sewage enforcement officer listed below: (as of May 2010)

Matt Fisher, 570- 837- 0105 or 570- 837- 4260: Adams, Center, Franklin, Jackson, Penn & Spring Townships and Beavertown, McClure & Shamokin Dam Boroughs.

W. Daniel Page & Poly Graybill, 717- 436- 2291 or 800- 639- 3461: Beaver, Chapman, Middlecreek, Perry, Union, Washington, West Beaver & West Perry Townships.

Central Keystone COG, 877- 457- 9401 or 570- 522- 1326: Monroe Township and Middleburg Borough.

*This manual was originally produced by the Fulton County Conservation District, with financial and other support provided by the Pennsylvania Association of Conservation Districts Inc. and the PA Department of Environmental Protection’s Chesapeake Bay Program and Environmental Education Program to assist county residents in better understanding and caring for their septic system. Funding for Snyder County Conservation District’s on-lot septic treatment educational and maintenance cost share program was secured from a Chesapeake Bay Special Project grant through the PA Department of Environmental Protection.*