

NHDES Septic System Management for Homeowner Script

This housing development is like thousands across the country. It has the house and the yard and maybe a deck off the back. It also has something we're going to talk a lot about in the next few minutes.

All the houses in this neighborhood, and millions like it all over the country, have their very own decentralized wastewater treatment facility - Can you see it? I'm standing on it right now...it's a septic system.

These septic systems are so popular as an alternative to centralized municipal sewer systems, they treat about a quarter of all the domestic wastewater in the US. That's about 4 billion gallons ...that's billion with a "b"... of wastewater every day!

4 billion gallons of wastewater?!

Anyway, the point is, septic systems are important, and just because they are under the ground and kind-of forgotten about, doesn't mean we don't need to take care of them, 'cause if we neglect them they are very difficult to ignore once they 'act up'...I know you don't want me to show you what that looks like ...

So, let's get to know our septic system.

You know that little pipe that sticks out of the roof? That's your vent pipe. It allows air to enter and leave the system as liquid flows through the pipes. Oh, and it vents noxious gases, too.

All the various drains in the house are connected to one main exit pipe called the sewage lateral. That's the buried 4" pipe that goes from the house to the septic tank. It usually goes through the home's foundation wall, but may also go through the home's basement or crawlspace floor. Everything that goes down every drain in the house ends up in your septic tank.

Yours may be made of watertight concrete or plastic and some older ones may be made of cinderblock or steel. Regardless of what it's made of, the septic tank is where the wastewater separates into solid and liquid, and where the first stage of biological treatment occurs.

The tank will have several access hatches that allow inspection and pump-out of the tank. Typical modern septic tanks hold 1,000 or 1,500 gallons. Tanks can be connected one after another in series if the design requires.

The tank may have a single compartment or two compartments. Some two-compartment tanks may have a submersible pump in the second smaller compartment to pump liquid to the leach field if the outlet of the tank is lower than the leach field.

When all the material is sucked out of the tank during servicing, that material is what is defined as septage.

The liquid in the tank flows by gravity through a buried 4" diameter pipe called the effluent line to the distribution box. Some systems use a pump to push the effluent through a small diameter pipe to the distribution box.

Sometimes a larger wet-well that contains a submersible pump is located between the septic tank and the D-Box. This is done when placing the pump into the septic tank is not practical.

The distribution box, or D-Box, is a buried concrete or plastic watertight box with an access cover, typically about 2' wide on each side, and is used in nearly all modern septic systems.

It serves to equally distribute the liquid effluent to the different pipes in the leach field.

OK, so now that we know about the working parts of our septic system, also known as...do you remember?... a decentralized wastewater treatment facility, ok so let's take a look at what is actually happening down there.

The inlet pipe forces the wastewater to turn towards the bottom of the tank, preventing the wastewater from flowing directly across the top portion of the tank. The solids that are heavier-than-water sink to the bottom and the lighter than water solids like oil, grease and plastics rise to the top.

In between is the liquid that will become the effluent that eventually flows into the leach field. While this liquid is cleaner than the wastewater that flowed into the tank, it still contains dissolved biological matter and water-soluble chemicals.

The outlet pipe is designed so that only liquid leaves in a properly functioning tank: the top of the pipe is in the air above the grease layer, while the bottom of the pipe is in the liquid above the bottom solids layer.

For every gallon of wastewater that flows into the tank, a gallon of effluent leaves the tank. In the tank, primitive anaerobic microbes live and feed on the biological matter. These microbes don't need oxygen to live and they reduce both the volume of the settled solids and the concentration of the dissolved biological matter in the liquid.

The leach field is the most important part of a properly operating septic system, the most expensive to replace, and the one that is the easiest to damage. The reasons for this is simple: all the liquid portion of the wastewater that leaves the home must be dispersed by the leach field, or the septic tank overflows or wastewater backs up into the home; and due to the intricate design and typical location of the field, it's easy to compromise one or more of the critical design features by either improper operation or care, or by physically damaging the field by inadvertently crushing or cutting the pipes.

The leach field is typically a set of pipes with small holes in the bottom that is laid in a trench, which allows the effluent to flow into the soil after first flowing over gravel. The pipes are covered with additional gravel and finally topsoil.

The flow of the liquid down through the gravel and into the surrounding soil pulls air down into the soil, which allows oxygen-using microbes to further break down the dissolved biological matter. Further down the soil depth, where no oxygen is present, other microbes finish the biological treatment process. The soil itself also acts as a filter to remove many of the other chemicals and minerals in the effluent.

So what can you do to protect your septic system?

Well, the first thing is to know where your system is located. If you don't know, you can contact the subsurface bureau of the DES. If the system was installed after 1975, they should be able to provide drawings showing where your system's components are. If the system is older than that, there still might be enough information in the archives to help you locate the components. If you can't locate the components using drawings, you may want to contact a licensed septic system designer or installer to help you locate your system components.

It's important you know the location of your septic system in order to avoid accidentally damaging a critical component. Damage may occur by digging a hole for a post or foundation in the wrong spot.

You should never place anything on top of the leach field because it will interfere with the proper airflow into the ground. Never plant anything except grass over the leach field as roots from bushes and trees will damage the structure of the field, which could lead to failure. Never drive over the leach field. This will compact the soil and reduce the ability of the soil to accept liquid and transfer air. In severe cases the weight of the vehicle can crush the pipes. And don't pasture large animals like horses over the leachfield because over time they can compact the soil too.

In the winter, avoid removing or compacting snow cover above all parts of the septic system. Snow is a great insulator, and even though the ground can get cold, it's a lot warmer than the -20° F air temps we can get around here. Snow cover will keep the ground around the system components above freezing.

Make sure there is easy access to the covers of the septic tank and D-Box for servicing. Finally, keep the vent pipes clear. Debris and even small animals can get into the pipe, clogging it, preventing the free flow of air into and out of the system, leading to possible system back-ups.

Don't pour household hazardous waste, paints or used cooking oil down your drains. These can kill the vital microbes in the entire septic system, and in severe cases clog the leach field - leading to total system failure.

Proper understanding and care of our septic systems helps us to protect the natural water resources we're blessed with here in New Hampshire. It takes every one of us to make sure we do our part to assure this life giving resource stays clean and healthy for generations to come.