

Pipeline

Small Community Wastewater Issues Explained to the Public



Quality Control for Homeowners

Regrettably most homeowners don't give much thought to their septic systems—let alone controlling the quality of the installation process—until there's a problem. If homeowners gave some thought to quality control during installation of their treatment system, they could save themselves a lot of future headaches.

Quality control is usually associated with engineering and manufacturing, where *quality control* and *quality engineering* are terms that are used to describe how products or services are designed and produced to meet or exceed customer requirements. In septic system installation, quality control means that you can assure that your system is properly installed so that it remains reliable.

"You think about quality in every other area of the construction of your home," says Zane Satterfield, engineering scientist with the National Environmental Services Center (NESC). "Why not give the installation of the septic system equal attention?"

Why do systems fail? According to the U.S. Environmental Protection Agency (EPA), most septic system failures are related to inappropriate design, improper installation, and poor maintenance.

Inappropriate design usually means that the wastewater system that was installed isn't appropriate for the site conditions. Conventional soil-based systems (with a leach or drain-field) are installed at sites with slow draining or shallow soils, excessive slopes, or high groundwater tables.

Improper installation means that a system was installed in a way that caused it to not func-



Communication between you and the contractor is essential to your getting what you want.

tion properly. For instance, improperly installed pipes may settle at odd angles and leaky joints might develop, or the drainfield may be in a site where the soils are impermeable to work properly and wastewater pools on the ground rather than filtering through the soil.

Improper maintenance means that the owner did not adequately maintain the system once it was installed—not pumping it out on a suitable schedule or flushing inappropriate items down the drain or toilet, such as grease or items that will not biodegrade and thus



Problems with this West Virginia septic system have been going on for more than two years. During this time, the system has remained uncovered, creating much distress for the homeowners.



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affect the performance in the septic tank or the permeability of the soil absorption field.

All of these conditions could lead to septic system failures and water resource contamination. The most serious problems could involve pollution of surface waters and groundwater with disease-causing pathogens and nitrates.

How to Avoid Problems

Satterfield notes that these kinds of problems not only harm the environment, they also cost homeowners time and money. A failing system may be unusable until it's repaired. With no way of disposing of wastes, homeowners may find living in their homes too difficult. And the cost of system repairs may only be the tip of the iceberg. Fines may be levied against homeowners with failing systems that have contaminated the environment.

“By the time any of these troubles surface, the contractor could be long gone,” says Satterfield. “It’s best to make sure the system is installed right to begin with. That’s why assuring quality control of the installation process is important. The most important thing you can do during the installation of your system is to be educated about the process and to be onsite to watch it happen.”

Matt Barbur, a septic system owner in Wheeling, West Virginia, says he wishes he would have educated himself before he had his system installed. Over the past two years, Barbur has been fighting a drainfield that won't do its job. Ponding water and surfacing raw sewage have become a nuisance and a health hazard. He notes that the price of fixing the problem is almost as much as the cost of the original installation.

“When I had my house built two years ago, I knew a lot about the home contracting part of the job, but I didn't really know anything about the septic

Choosing a Contractor *Shop smart...*

The best contractor may not be the lowest bidder.

1. Interview several contractors and solicit bids.
2. Find a contractor that is a certified installer.
3. Make sure they are bonded and carry insurance.
4. Ask for references.
5. Evaluate all aspects of the bids, including scope of work, warranties, references, time frames, and price.
6. Try to anticipate problems and inconveniences and come up with an agreement about how to handle these concerns before work begins.
7. Obtain a written contract that includes: price, payment terms, sales tax, permit fees, the specific



Source: Adapted from Washington State's Department of Labor and Industries "Hiring a Contractor" fact sheet. Publication F625-084000[11-2006]. www.Contractors.LNI.wa.gov

work to be performed, materials to be used, warranties, and payment schedules. Also include change order processes, final review, and sign off procedures.

Be wary of contractors who:

1. Provide credentials that cannot be verified.
2. Offer a special price only if you sign up today.
3. Only accept cash.
4. Refuse to provide a written contract.
5. Ask you to get the permits.
6. Offer exceptionally long warranties.
7. Can only work on weekends or after hours.
8. Make you an offer too good to be true.

system. I didn't think I needed to," says Barbur "I assumed that the contractor would do a good job and everything would work out okay But I found out that you should never assume anything Even if the contractor says he has years of experience, don't make any assumptions."

Be There for the Installation

Barbur says that if he had it all to do over again, the one thing he would have done differently is he would have been there during the installation—especially the "perc" test.

A percolation (perc) test is simply a method of determining the soil's ability to accept water.

It is performed at the proposed location of the drainfield. Several post-sized holes are saturated with water for a period of time. The rate at which water is absorbed in the hole over a period of time determines the perc rate and what kind of soil absorption system should be installed and if additional treatment of the septic tank effluent is needed prior to final dispersal. (To make sure about "perc" test procedures in your area, consult your local health department or permitting authority)

"I could've saved a lot of time and money if I had known more about my property," he explains.

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Reprint Info

Readers are encouraged to reprint *Pipeline* articles in local newspapers or include them in flyers, newsletters, or educational presentations. Please include the name and phone number of the National Environmental Service Center (NESC) on the reprinted information and send us a copy for our files. If you have any questions about reprinting articles or about any of the topics discussed in this newsletter, please contact the NESC at (304)293-4191.

Top Ten Quality Control Considerations for Homeowners

1. Shop around for a reputable certified contractor. Ask friends and neighbors to recommend someone, or check the Yellow Pages, or Better Business Bureau in your area. Ask questions during the initial meeting. Get several estimates. The lowest estimate isn't always the best, but neither is the highest.
2. Have all of your permits in place before the job begins. Depending upon where you are located, you may need more than one permit. You may need one from the county and the city and/or your local health department or permitting authority.
3. Remember, you are the boss on this project. It's your money. It may be your responsibility if something goes wrong down the road, and retaining lawyers can be very expensive. Remember that the contractor works for you.
4. Be your own inspector. Hiring an inspector can be expensive, but if you can afford one, it may be in your best interest. However, if you can't, research what you need to know and be prepared to be there when the system is installed. The permitting authority will conduct the final inspection.
5. Communication between you and the contractor will be essential to your getting the system best for your site. Get the names of everyone involved in the installation. Know what is needed to treat and disperse the wastewater based on the site evaluation. Installation should occur in a timely manner. Your contractor shouldn't mind that you watch what's going on.
6. Get the local health department inspector involved early in the process. This person has to approve the system before it's covered. Be sure that this person is there for the final inspection.
7. When dealing with a problem, put it in writing. Some of the best tools that can be used for documentation are pencil, paper, and a daily logbook. Don't try to remember what needs to be recorded until you get back in the house. Write it down immediately and never erase. Cross out any mistakes. A good logbook has dates, times, and locations, and can be used in a court of law. But if there are erasure marks, it will most likely be thrown out. Another good idea is to note the names of the people involved or that are at the site each day. Be very specific, especially when there is a problem. It is a good idea to take pictures and videotape before, during, and after construction. Keep in mind, though, that some courts will not allow digital photos or video, so use conventional cameras if this is the case in your area.
8. Use the homeowner check list on page 5.
9. Allow the contractor to do his job, but still maintain a presence. You need to be safe, so stay out of the way of machinery—safety is a priority.
10. Make sure all bills and receipts are paid and filed. Make sure you have approved all purchases and that they have been paid for as agreed in your contract.

Source: Zane Satterfield, engineering scientist National Environmental Services Center



Do not install system in areas with a

Homeowner Checklist



- 1** Make sure the contractor saves the topsoil in an out of the way location. Topsoil will be used later when it's time to reseed the area.
- 2** Provide barriers to make sure that mud and debris do not make their way into the neighbor's yard. Make sure that grass and other shallow-rooted plants are replanted over the new system to control erosion.
- 3** Make sure the right materials are used for the system you install, such as piping, the septic tank, etc. Make sure this is the material you paid for. The local permitting official should know if the material being used is acceptable as per the current codes or regulatory requirements.
- 4** Watch out for areas of heavy vehicular traffic. Make sure that system is properly sited away from congested areas.
- 5** Make sure the contractor properly seals the tank and that it's watertight.
- 6** Watch for proper backfill and pipe bedding. No large rocks should be used or wood planks. Always ask questions if you are not sure about anything.
- 7** Make sure the contractor has allowed for proper angle of the pipes. Most systems work by gravity and it's vital that the pipe coming out of the house be higher than the pipe going into the system. Ask questions and take notes.
- 8** Make sure the contractor properly levels the tank. You can use a regular level to assure this.
- 9** Make sure the permitting authority inspects the system before it's backfilled.
- 10** Make sure the contractor includes proper compaction around the septic tank to prevent settling. Again, ask questions.
- 11** To aid in finding the septic system in the future, take measurements of key points, such as the lid location to the corner of the house.
- 12** Make sure the site is properly restored and cleaned up.

high water table.

Source: Zane Satterfield, engineering scientist National Environmental Services Center

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“If I could’ve seen that the soil on my lot didn’t perc well enough, I could’ve looked into whether I really wanted to build my house on this site, or whether there were other treatment systems that would’ve worked better.”

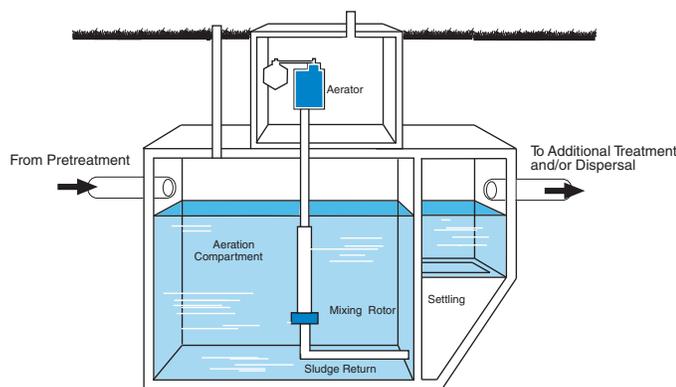
“My advice is to make time to be there, even if you have to work around your schedule, make time to be there,” he says. “And educate yourself about the kind of system you need. There are resources out there. NESCC is one of the best resources for homeowners. Become as knowledgeable as you can before you build.”

Satterfield says that a good contractor will work with you to make sure your system is the proper system for your site and is properly installed. He offers the check lists on pages 3, 4, and 5 for homeowners to use to help them make decisions.

Glossary

Alternative Septic System

A wastewater treatment system that includes components different from those typically used in a conventional septic tank and subsurface wastewater infiltration system. An alternative system is used to achieve acceptable treatment and dispersal of wastewater where conventional systems either might not be capable of protecting public health and water quality or are inappropriate for properties with shallow soils over ground water or bedrock or soils with low permeability. Examples of components that can be used in alternative systems are sand filters, aerobic treatment units (see diagram below), disinfection devices, and alternative subsurface infiltration designs such as mounds, gravelless trenches, and pressure and drip distribution.



Construction Permit

A permit issued by the designated local regulatory authority that allows the installation of a wastewater treatment system in accordance with approved plans and applicable codes.

Conventional Septic System

A wastewater treatment system consisting of a septic tank and a typical trench or bed subsurface wastewater infiltration system.

Dispersal System

A system that receives pretreated wastewater and releases it into the air, into surface or ground water, or onto or under the land surface. A subsurface wastewater infiltration system is an example of a dispersal system.

Drainfield

Shallow, covered, excavation made in unsaturated soil into which pretreated wastewater is discharged through distribution piping for application onto soil infiltration surfaces through porous media or manufactured (gravelless) components placed in the excavations. The soil accepts, treats, and disperses wastewater as it percolates through the soil, ultimately discharging to groundwater.

Percolation

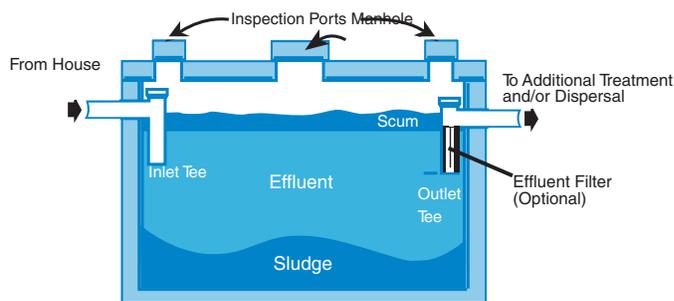
The flow or trickling of a liquid downward through a contact or filtering medium.

Permitting Authority

The state, tribal, or local unit of government with the statutory or delegated authority to issue permits to build and operate onsite wastewater systems.

Regulatory Authority (RA)

The unit of government that establishes and enforces codes related to the permitting, design, placement, installation, operation, maintenance, monitoring, and performance of onsite and clustered wastewater systems. The regulatory authority for individual septic systems is typically the local health department.



Single Compartment Septic Tank

Septic Tank

A buried, watertight tank designed and constructed to receive and partially treat raw wastewater. The tank separates and retains settleable and floatable solids suspended in the wastewater and discharges the settled wastewater for further treatment and dispersal to the environment.

Source: U.S. Environmental Protection Agency <http://cfpub.epa.gov/owm/septic/index.cfm>.