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Digging up Dirt on Septic Systems

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Erma Bombeck made readers chuckle with her book *The Grass is Always Greener Over the Septic Tank*, but real estate professionals know that rural wastewater systems are no laughing matter.

Picture this scenario: city dwellers find their dream home in the country and make an offer. The vacant home passes inspection, and the happy homeowners move in. Soon after, however, they notice the plumbing drains slowly. When they wash clothes, water backs up. An investigation reveals a failed septic system, and the homeowner has to install a new system at substantial expense.

The problem escaped detection during the inspection because the system was unused while the home sat empty, thus eliminating overflow, the most direct evidence of system failure. The understandably upset homeowners look to the inspector and the real estate agent for relief.

While there is no guaranteed way to keep this uniquely rural nightmare from occurring, licensees can protect themselves and their clients by learning something about the installation, operation and inspection of septic systems. Educating prospective buyers on these issues may prevent unexpected difficulties after a sale.

According to the Bureau of the Census, Texas had more than 1.2 million septic systems in 1990, disposing of millions of gallons of wastewater generated in rural homes daily. An

average three-bedroom home produces approximately 240 gallons of wastewater each day. Through bacterial action, these systems biodegrade solid wastes and filter or treat the remaining water to eliminate contaminants before they reach nearby wells, lakes and streams.

Conventional Septic Systems

A conventional septic system consists of one or more tanks connected to a home on one side and a leaching system on the other. A sewer line conveys wastewater from the house into the septic tank, where bacteria break down biodegradable solid matter, leaving a sludge of indigestible solids at the bottom of the tank.

Lighter, nonbiodegradable solids, such as grease, generally form a scum on the surface of the wastewater in the tank. The wastewater then flows into a drain field that diffuses the wastewater into the soil. The soil in the drain field filters the effluent, removing contaminants remaining in the water.

The system normally contains baffles designed to control the flow through and out of the tank and to allow bacteria time to complete their task. The baffles trap solid waste in the septic

tank, allowing only liquid effluent to pass into the drain field where final filtering occurs.

Although there are many types of drain fields, most consist of a system of perforated sewer pipes placed in a bed of gravel covered with soil. The soil must allow for passage of air and water to ensure removal of contaminants from the effluent.

To keep septic systems functioning properly, experts recommend having the tank pumped periodically to remove the sludge at the bottom of the tank. Pumping a 500-gallon tank typically costs from \$150 to \$200.

Septic systems fail when conditions prohibit efficient functioning of the tank or drain field. Too much wastewater can cause the septic tank to overflow, discharging undigested solids into the drain field. A large volume of solids can overtax a system as well. Poor soil conditions can decrease the effectiveness of the drain field. For example, tightly packed clay soils lack the leaching characteristics needed, and extremely rocky soils drain too quickly. Rainy weather that keeps the soil saturated for long periods also negatively affects drain field operation. These conditions frequently allow contaminants to escape into the water table.

System failures produce a variety of symptoms. Homeowners may notice slow-draining plumbing. Drain problems that continue after removing clogs signal septic system failure. In some cases, system failure may even result in sewage backing up into the drains.

A second indicator of failure is backup or overflow of sewage above the drain field during large-volume discharges, like those generated by washing machines. When a system has failed, nearby community storm drains may emit foul odors. Homeowners, homebuyers, licensees and inspectors should be alert for these symptoms. A failed system generally requires extensive repairs; in some cases, the entire system must be replaced.

Aerobic Septic Systems

Rural homeowners can install aerobic systems in situations not conducive to conventional septic systems. Aerobic septic systems require less space. They also produce much cleaner effluent, frequently eliminating the need for a drain field.

Aerobic systems provide a highly oxygenated environment for bacteria by stirring or aerating wastewater. Many systems do this by bubbling compressed air into the tank. This infusion promotes rapid and complete decomposition of organic matter. Some aerobic systems use chlorine to disinfect effluent, which is then sprayed or dripped onto the lawn.

Aerobic septic systems are more complicated than conventional systems and consequently require more maintenance. To keep these systems operating properly, the Texas Natural Resources Conservation Commission (TNRCC) requires system owners to maintain and test systems and report results periodically. In most counties, homeowners are required to sign a maintenance contract with a TNRCC-designated service representative. In counties with fewer than 40,000 residents,

homeowners can choose to perform these functions themselves if they undergo approved training. Most opt for the maintenance contract.

The increased complexity and intensive maintenance of aerobic systems make them more expensive to operate than conventional systems. Maintenance contracts typically range between \$150 and \$200 per year. However, special circumstances can elevate the cost substantially.

Permits and Installation

Since 1989, installers of most septic systems are required to obtain a permit from TNRCC or a local TNRCC-authorized agent. Authorized agents are normally counties, but can be cities, river authorities or other agencies. TNRCC can identify which authority issues permits for a specific location. Real estate professionals should make an effort to get to know the local permitting authorities and what regulations apply in their area. The county health department may be another source of information on septic system regulation.

Septic systems installed before 1989 normally do not have state-issued permits. A septic system for one single-family home situated on more than ten acres can qualify for an exemption from the permitting process if the installation



A PRETREATMENT TANK is lowered during installation of an aerobic septic system. The main treatment tank is at right.

meets certain requirements. Locating two or more homes on a single tract eliminates the exemption for all homes.

When septic systems fail, TNRCC or authorized agents ask the homeowner to fix the problem. Remedies can range from waiting for cessation of heavy rains, to installing more field lines, to having the tank pumped or installing a new system. If the homeowner does not respond, the matter normally proceeds to a justice of the peace court or can be referred to TNRCC for administrative action.

Educating Buyers

Licensees selling homes with septic systems may benefit from educating prospective buyers on three fronts.

First, city dwellers frequently do not understand the differences between city sewer systems and rural septic systems. Unlike city sewer systems, which do not restrict the amount of wastewater a household produces, rural septic systems are designed to

Comparison of Aerobic and Conventional Septic Systems

System Type	Advantages	Disadvantages
Aerobic	Initially less costly in heavy clay soils Handles wastewater more efficiently Works well in all soils	Continual, costly maintenance contract Requires chlorine chips Constantly uses power
Conventional	Little maintenance No chlorine required Does not use power	Initially more expensive in heavy clay soils Often "sluggish" in wet weather Functions poorly in compact soils



A LASER LEVEL is used to ensure the excavation is level before installing tanks.

accommodate the specific volume of wastewater a home is expected to generate. Rural residents generally learn to adjust their activities to limit the amount of wastewater flowing into the septic tank to avoid causing the system to overflow.

City dwellers who move to the country, however, often continue to use the same volume of water they used in the city. An increase in the number of residents living in the home is similarly hard on the system, as is introduction of certain materials into the wastewater stream (ground solids from a garbage disposal, hair, coffee grounds, dental floss, disposable diapers, kitty litter, paper towels, fats or oils, chemicals or unnecessary solids). Such overuse or misuse of the system can cause it to fail.

To keep a septic system functioning at maximum efficiency, users also should:

- refrain from driving cars and other heavy vehicles over absorption fields,
- not plant trees or shrubs in or near the absorption field,
- not cover the absorption field with pavement or concrete,
- divert surface drainage away from the absorption field and

For More Information

On-Site Wastewater Treatment Systems: Selecting and Permitting
<http://agpublications.tamu.edu/pubs/eng/b6077.pdf>

TNRCC On-Site Sewage Facility Program
<http://www.tnrcc.state.tx.us/enforcement/csd/ics/index.html#sewage>

Your Home Septic System
http://edis.ifas.ufl.edu/BODY_SS115

The Home Buyer's Guide to Septic Systems
<http://www.inspect-ny.com/septic/buyguide.htm>

- drain laundry wastewater directly on the soil. Unless local regulations prohibit it, state laws permit owners to drain laundry water outside the septic system as long as the wash does not contain fecal matter, as it would if diapers are laundered.

Second, buyers are not accustomed to, and therefore do not expect, the typical expenses associated with operation or repair of septic systems. System installation, operation and repair costs vary widely depending on local conditions, ranging to as much as several thousand dollars. These costs, particularly if they come on top of closing and moving costs, can wreak havoc on a homeowner's budget. Encountering these unanticipated expenses can transform happy clients into irate ones. Licensees may find themselves in the line of fire if they fail to warn homebuyers of potential problems.

Finally, buyers often do not understand the difference between a permit inspection done when a septic system is installed and the property inspection done during the course of a real estate sale. A TNRCC-designated representative inspects septic systems during installation to ensure that they are installed according to state standards, as required by Chapter 336 of the Texas Health and Safety Code.

By contrast, the inspection conducted during a pending sale is not required by TNRCC or any governmental agency, but is required by lenders. This inspection consists of an evaluation of all aspects of the home being purchased. An inspector typically verifies that plumbing drains properly and that the drain field shows no visible overflow. As previously discussed, however, in homes vacant for an extended period, the system might appear to function normally when in fact it is failing. Because of this, inspections for a real estate sale are essentially valid only on the day on which they are performed. Buyers should understand that a system passing inspection today may not be sound tomorrow.

Buyer Protection

While there are no guarantees, buyers can at least ask sellers some pointed questions to gather the information needed to make a sound buying decision. For conventional systems, ask:

- When was the tank pumped out last? As a rule, tanks should be pumped every three to five years for optimal functioning.
- Was the system issued a permit? Systems installed before 1989 do not have permits.
- Where is the system located? If the owner does not know where the tank is located, the buyer can assume that it has not been pumped out for some time.

If the tank has not been pumped recently, requiring the seller to have it pumped as a condition of sale could save headaches and cash in the future.

For aerobic systems, prospective buyers should ask:

- How have the state's maintenance requirements been met (through a maintenance contract or owner-performed maintenance)?
- If the system is under a maintenance contract, is that contract transferable?
- If the system is under the mandatory two-year warranty, is the warranty transferable?

For both conventional and aerobic systems, buyers should ask about the system's designed capacity. If the seller does not know, the permitting authority may have helpful records.

These steps may not eliminate future problems, but they should help sales agents, buyers and sellers minimize potential conflicts. ♣

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