SEPTIC SYSTEMS & GROUNDWATER PROTECTION

HOW SEPTIC SYSTEMS WORK

The most commonly used wastewater system for private homes is the conventional septic tank and drainfield. The septic (Figure 1) tank is a specially built container, usually barrel or box shaped, placed under the ground. Its function is to hold the sewage long enough to allow solids to settle. The solids gradually accumulate in the bottom of the tank, forming a "sludge," while some lighter solids float in the surface, forming a greasy scum.

The wastewater (effluent) coming out of the septic tank may contain potentially disease-causing pollutants and microorganisms. The effluent is passed on to the absorption field through a connecting pipe or distribution box; the absorption field is also known as soil drainfield, disposal field, or leachfield. The drainfield consists of a series of gravel-filled trenches containing perforated pipes. The liquid waste is carried through the pipes and discharged into the soil below the ground. While the liquid seeps through the soil, natural chemical and biological processes treat the waste so that it no longer represents a hazard to human health. Ultimately, the treated liquid combines with groundwater.

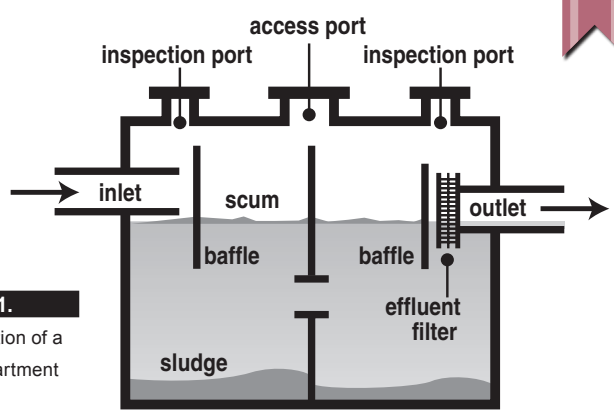

FIGURE 1.
Cross-section of a two-compartment septic tank

SEPTIC SYSTEM COMPONENTS & INSTALLATION

A conventional septic system (Figure 2) has three main components:

- septic tank
- absorption field (drainfield), and
- surrounding soil

According to environmental protection regulations effective in the state of New Mexico as of September 2005, to install a liquid waste system the homeowner must obtain a permit from the New Mexico Environment Department. NMED is the state agency responsible for assuring proper system location to protect environmental quality and public health. The permit can be obtained from any Environment Department office. NMED charges a $100 permit fee for a residential system construction.

To protect public health and groundwater quality, NMED has regulations governing the siting of individual liquid waste systems. For instance, specific distances must separate waste disposal fields from private water wells, watercourses, and water supply pipes. Disposal fields must have a minimum depth of soil between them and groundwater or bedrock. Other restrictions may apply depending upon soil types and lot characteristics.

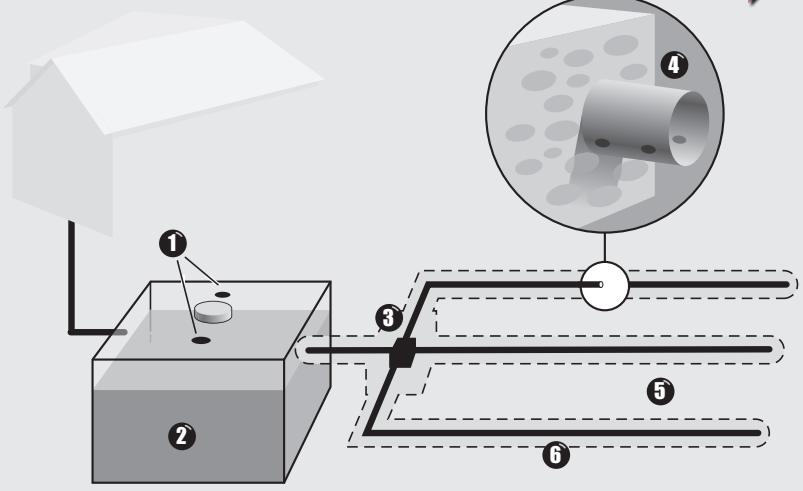

FIGURE 2.
Layout of a typical septic system

CONTRACTORS AND SELF-INSTALLERS

Most septic tank installers can provide an adequate system for a private home. Contractors can be found in the telephone book under "Septic Tanks & Systems," or check with your plumber for a recommendation. The cost of installing a septic tank and drainfield will vary depending upon specific site needs and conditions. On July 2007, NMED began offering a certification program for homeowners (self-installers), consisting of specific coursework and passing an exam. Also, as of July 1, 2007 all contractors must be certified by the department and possess a valid, New Mexico contractor's license.

MAIN CONSIDERATIONS

If you are going to use an individual liquid waste system, carefully evaluate your property for system suitability and siting choices. Groundwater quality can be threatened by the improper siting of wells and septic tanks. A percolation test on several locations may be needed to find the area best suited for the disposal field. Soil texture (e.g. sand, silt clay loam, and clays) is used to determine the appropriate size for the drainfield. NMED provides guidance for conducting said tests.

Before deciding where to place the liquid waste system, check the location of nearby wells and the depth-to-groundwater. You can find out whether your site is near a highly vulnerable body of water by checking the depth-to-groundwater online database at the NM Office of the State Engineer Website. In addition, you can contact the Liquid Waste Program staff at the NMED and read the checklist to apply for a liquid waste (septic tank) permit: *www.nmenv.state.nm.us/fod/LiquidWaste/permit.app.html*

DETECTING SYSTEM FAILURES & BEST PRACTICES

Without proper maintenance, if you have not been careful about what you have flushed into the tank, or if the absorption field has not been installed properly, the system may fail. These are several warning signs of absorption field failure:

- Obnoxious odors
- Surfacing sewage, soggy or wet spots
- A change of vegetation in the drainfield area
- Gurgling sound in the plumbing system and or slow-draining fixtures
- Plumbing or septic tank backups

DO

- Learn the location of your septic tank and drainfield. Keeping a sketch of your system with your maintenance records will come in handy during future repairs
- Have your septic system inspected annually
- Have your septic tank pumped out by a licensed contractor, approximately every three to five years, or as often as is appropriate for your system
- Keep your septic tank cover accessible for inspections and pumping. Install risers if necessary
- Call a professional whenever you experience problems with your system, or if there are any signs of system failure
- Conserve water to avoid overloading the system. Be sure to repair any leaky faucets or toilets
- Divert other sources of water, like roof drains, house footing drains, and sump pumps, away from the septic system. Excessive water keeps the soil in the drainfield from naturally cleansing the wastewater

DO NOT

- Allow anyone to drive or park over any part of the system
- Plant anything over or near the drainfield except grass. Roots from nearby trees or shrubs may clog and damage the drain lines
- Dig in your drainfield or build anything over it, and don't cover the drainfield with a hard surface such as concrete or asphalt. The area over the drainfield should have only a grass cover since the grass will not only prevent erosion but will help remove excess water
- Make or allow repairs to your septic system without obtaining the required Environment Department permit. Use licensed onsite contractors when needed
- Use septic tank additives. Under normal operating conditions, these products usually do not help and some may even be harmful to your system
- Use your toilet as a trash can or poison your septic system and the groundwater by pouring harmful chemicals and cleansers down the drain. Harsh chemicals can kill the beneficial bacteria that treat your wastewater

This poster was funded by the Environmental Protection Agency (EPA) through Cooperative Assistance Grant X4-97675201, a part of the Agency's Border 2012 Program, and through support and encouragement from the New Mexico Environment Department (NMED).

- *New Mexico Office of the State Engineer:* *www.ose.state.nm.us*
- *Environmental Protection Agency:* *www.epa.gov*

EPA NMED

NM STATE UNIVERSITY
Live, Learn and Thrive.™