

SEPTIC SMARTS

Save big money by understanding how a septic system works—and what can go wrong.

A well-designed, properly installed septic system can last for decades—or fail in just a few years. It's up to you.

Maintaining a healthy septic system isn't all that expensive, but you could easily spend tens of thousands to dig up and replace a septic system that has totally failed. As the old saying goes, an ounce of prevention is worth a pound of cure.

Good maintenance starts with understanding how a septic system works and how it can fail. Let's take a look underground and see what's supposed to happen in a well-functioning septic system. After that, I'll show you why things go wrong and give you some pointers for keeping your system in top shape.

by **Jim vonMeier**

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Regular "pumping" removes sludge and scum from the tank.

HOW IT WORKS

It's a cafeteria for bacteria

Bacteria are what makes a septic system work. They break down waste, leaving water clean enough to safely percolate down into the earth. The whole system is designed to keep bacteria healthy and busy. Some live in the tank, but most do their work in the drain field.

1. All waste flows to the septic tank.

2. Watery waste, called "effluent," fills most of the tank. Anaerobic bacteria begin breaking down the organic material in the effluent.

3. A layer of sludge falls to the bottom. Sludge is composed of inorganic solids and the byproducts of bacterial digestion.

4. A layer of scum floats to the top. Scum is primarily composed of fats, greases and oils.

5. A filter prevents most solids from entering the outlet pipe.

6. Effluent flows to the drain field.

7. Holes in the drain field pipe allow effluent to seep into surrounding gravel.

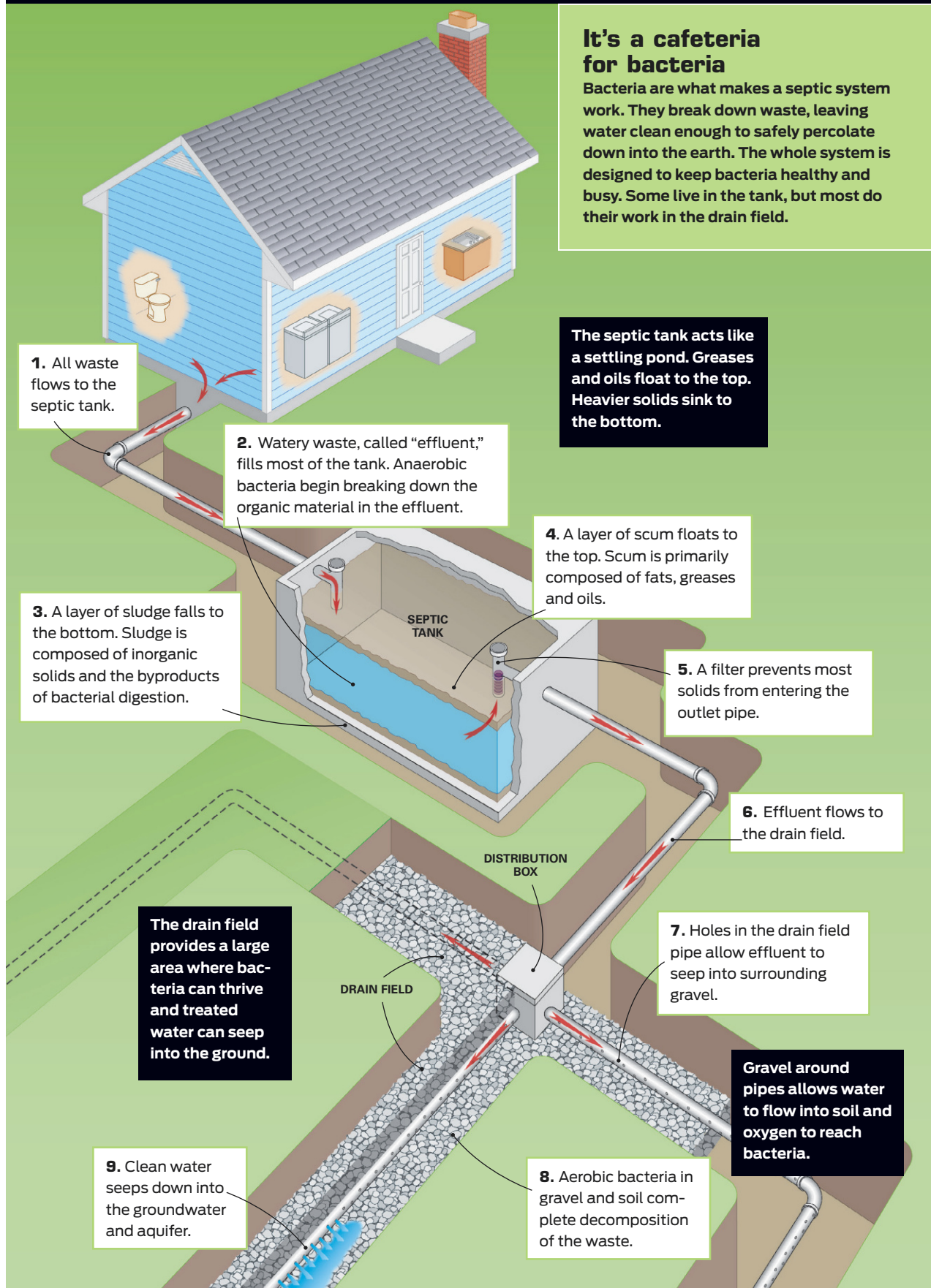
Gravel around pipes allows water to flow into soil and oxygen to reach bacteria.

8. Aerobic bacteria in gravel and soil complete decomposition of the waste.

9. Clean water seeps down into the groundwater and aquifer.

The drain field provides a large area where bacteria can thrive and treated water can seep into the ground.

The septic tank acts like a settling pond. Greases and oils float to the top. Heavier solids sink to the bottom.



WHAT GOES WRONG

Don't abuse the system

A septic system that was properly designed and installed needs only occasional "pumping" to remove the sludge and scum from the tank. But without knowing it, you can do things that harm—or destroy—the system.

Waste that decomposes slowly (or not at all) gets flushed down drains. Cigarette butts, diapers and coffee grounds often cause problems.

If used heavily, garbage disposers can send too much solid waste into the system.

Lint from synthetic fibers flows from washing machine. Bacteria in the tank and drain field can't break it down.

Household chemicals like disinfecting cleaners and antibacterial soaps kill bacteria. Most systems can handle light use of these products, but the less you use them, the better.

Too much wastewater over a short period of time flushes out the tank too rapidly.

Too much sludge reduces bacteria's ability to break down waste. Excess sludge can also overflow into the drain field.

Sludge or scum plugs holes in the pipe.

Roots from trees and shrubs can clog and damage a drain field.

Compacted soil and gravel block seepage of effluent and deprive bacteria of oxygen. This is often caused by cars driving or parking on the drain field.

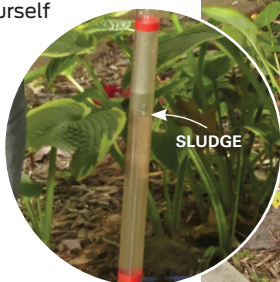
SEPTIC SOLUTIONS

Get your tank pumped...

Your tank must be pumped out regularly by a pro. Pumping removes the buildup of sludge and scum, which slows down bacterial action in the tank. Your tank may need pumping each year, but it's possible to go two or three years between pumpings, depending on the size of your tank and the amount of waste you run through the system. Ask your inspector to make a rough recommendation for how often your tank should be pumped.

...but don't hire a pumper until you need it

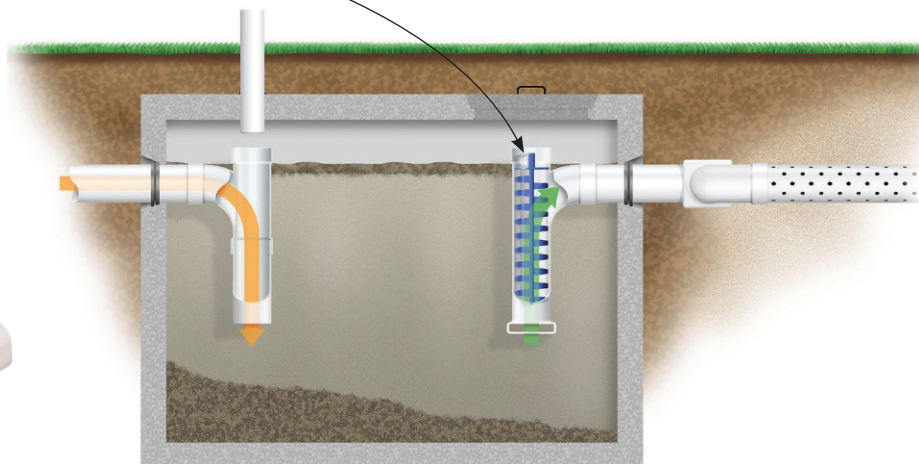
Regular inspections and pumping are critical. But if you're not squeamish, you can check the sludge level yourself with a device called The Sludge Judge. It costs \$100 to \$125 and is widely available online. Once you've determined that your tank is one-third full of sludge, call a contractor to come pump it out.



EFFLUENT FILTER

Install an effluent filter

Ask your contractor to install an effluent filter on the outflow pipe on your tank. (It will probably cost \$50 to \$100, plus labor.) This device helps prevent solids from entering the drain field and will need to be cleaned out on occasion by a contractor.



SEPTIC SOLUTIONS

Get an inspection

A thorough initial inspection by a pro will cost \$300 to \$500; after that, regular inspections cost less than \$100 each. Your pro will be able to tell you how often your system should be inspected.

Simple as a septic system may seem, evaluating its health really requires an expert. There are plenty of contractors who will gladly pump the sludge out of your tank, but in my experience many don't fully understand how a septic system works or how it should be maintained. I highly recommend looking for a contractor who has received some formal training in the science of septic systems. Some states have adopted certification programs for septic contractors—check with your Secretary of State's office to see if yours is among them.

A complete inspection will determine whether your system is up to code (many are not) and the condition of the tank and drain field. A good inspector will also be able to tell you whether your tank is large enough for your household, and the maximum volume of water you can pass through it in a day.

You may be able to improve the performance of your system by adding bacteria with a product such as RID-X. Your pro should be able to tell you if your system will benefit from this treatment.

Alternatives to a new drain field

If an inspection or sewage backup reveals that your drain field is in trouble, the ultimate solution is to replace it. The cost can be huge, however, so it's worth discussing other options with a contractor.

■ **Clean the pipes.** A contractor can clear out the drain field pipes with a rotary pressure washer. "Jetting" the pipes usually costs about \$200.

■ **Treat the system with chemicals.** Ask your contractor about treating your system with a commercial product (not a homemade one) that increases the amount of oxygen in the drain field. I recommend Septic-Scrub (arcan.com). A typical treatment costs \$500 to \$1,000.

■ **Loosen the soil.** In states where it's legal, some contractors can fracture compacted soil around the pipes by injecting high-pressure air in numerous locations around the drain field, a process called "terra-lifting." Depending on the situation, this can cost less than \$1,000 or more than \$4,000.



Protect your drain field from lint

Install a filter on your washing machine's drain. This device prevents lint from entering the system, particularly the synthetic fibers that bacteria can't digest. I've developed one of these filters myself and named it the Septic Protector (septicprotector.com). It costs about \$150, plus shipping, and includes a replacement filter.

Don't overload the system

Limit your water use. Reducing the amount of water that runs into your tank, particularly over a short period of time, will prevent the flushing of untreated waste into your drain field. You can replace old toilets with low-flow models, install reduced-flow showerheads, and simplest of all, wash laundry throughout the week rather than just on Saturday morning.

Meet the Expert

Jim vonMeier believes septic systems are the answer to America's water shortage because they deliver purified water to depleted aquifers. He travels the country advocating, lecturing and testifying on septic systems. If you have a septic system question, write to him at jvonmeier@septicprotector.com.

