

Offensive Odors Don't Always Mean Septic System Failure

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Is there a bathroom in the house that family members won't use? Do unpleasant odors sometimes surround your patio?

Septic odors can occur in the house, above the tank and drain-field, or around the vent pipe. Most homeowners understand that septic systems can produce an unpleasant odor, but they are unsure when an odor is a sign of system failure.

Although prolonged odors could indicate a serious problem with your system, most odors are either naturally produced by the biological decomposition of waste in the septic system or are a result of a problem that can be easily and inexpensively corrected. In either case, call a local wastewater professional to evaluate the problem.

Odor-Producing Substances in Domestic Wastewater

Odor-producing substances found in domestic wastewater are small, relatively volatile molecules. They are the result of anaerobic decomposition of organic matter containing sulfur and nitrogen.

Although other odorants such as amines, mercaptans, indole, or skatoles may contribute to an odor, hydrogen sulfide, ammonia, carbon dioxide, and methane are the common gases generated by wastewater decomposition.

Septic Gases Can be Lethal

In confined spaces, septic gases can be irritating, toxic, and explosive. "Within the house, septic gases would likely be in minute concentrations and would only

cause headaches and nausea," said Jim Honce, president, W.S. Treatment Services Inc., Bridgeport, West Virginia. Within the septic tank, however, these gases are in concentrations high enough to cause death. This is the reason that only trained professionals should check inside the septic tank and then only when using prescribed safety measures.

Cause of Most Odors Within the House

"In my 30 years of business, I've found that septic odors in the house are caused by plumbing problems ninety percent of the time," said Paul Ashburn, president of Ashco-A-Corporation, a full-service designer, manufacturer, and installer of alternative wastewater systems in Morgantown, West Virginia. "Ninety-nine percent of the time, the plumbing problem is a dry trap," Honce said.

Wastewater Journey Through the Plumbing System

The house plumbing drainage system comprises water traps, waste pipes, and vent pipes. When water empties from sinks, toilets, tubs, and other plumbed appliances throughout the house, it enters a trap, which is a bend in the drainage pipe. Some water remains in the trap and acts as a barrier between the house and the sewer gas inside the drain network.

The septic tank and traps are vented through a large pipe, typically 4 inches in diameter, on the roof of the house. "Normally, after the wastewater has gone into the septic tank, there is a natural draw of air from the septic tank back up

through the vent, causing odors to be released outdoors, Tom Ferrero, secretary of the National Onsite Wastewater Recycling Association and secretary/treasurer of the National Association of Wastewater Transporters said. Cross breezes carry the odors away from the house.

Common Plumbing Problems

Often, odors in the house can be traced to a dry trap. "Traps become dry when the water that settles there evaporates because a plumbed appliance is not used," Honce said. "Water can also be siphoned from a trap when a full flow of wastewater enters the drainpipe." Pouring several cupfuls of water into the drain will resolve this problem.

"Modern drains are made of plastic, but before plastic, traps were made of thin chrome. It could be that an older trap has rusted out, causing a need to replace the drainpipe to the plumbed appliance," Mike Miller, president, Dale Miller and Son, said.

"A floor drain that is hidden by a covering—carpet, for instance—is more difficult to find because the homeowner doesn't even remember it was there," Ashburn said. "Before covering a floor drain, the drain should be blocked off to keep gases from venting through it."

If traps aren't the problem, odor may be entering the house because of the plumbing vent. Vents allow air to enter the system to equalize the pressure so that the wastewater can flow out. According to home remodeling guru Bob Vila, "Think of a gas can or juice can: The liquid inside cannot flow out unless a vent hole is opened to allow air in to keep it flowing. Your home vent system works by the same principle. For wastewater to move freely through the network of drainpipes and out to the sewer, there must be a way for air to get into the system. Otherwise, the drains would empty slowly, if at all."

Vent piping must have a positive slope and be kept clean from debris to work properly. "Old, cast iron vents can get encrusted, significantly narrowing the diameter of the vent pipe," Ferrero said. "You'll find leaves in the vent, and you might even find that an animal crawled in and got stuck.

"One method the homeowner might use to check for a clogged vent pipe is to run water down it from a garden hose. If the water comes back out onto the roof after a couple of minutes, it's clear that the vent is clogged.

"I had a case that was puzzling because a second story bathroom wouldn't flush only on rainy days. What I found was that the roof vent contained a pile of leaves that, when the weather was dry, air could find its way through. But when it rained, moisture got into the vent pipe, clumping the leaves, and blocking the flow of air.

"Another unusual situation is when a bathroom has been added onto a house. If the horizontal distance between the new bathroom and the roof vent is too great, the bathroom fixtures won't drain properly. Building codes should prevent this, but sometimes a homeowner will surreptitiously add a bathroom."

Downspouts should not be connected to the sewer lines. If they are, this can also cause odor problems. "I worked on a house with downspouts on lower roofs that were below dormer windows," Ashburn said. "The odor came through the downspouts and went into the dormer windows."

Water from roof drains, house-footing drains, and sump pumps should be diverted away from the septic system. Excessive water floods the system, keeping the soil in the drainfield saturated and unable to adequately treat the wastewater.

Broken Pipes

Piping could crack or break when the house settles, allowing odors to enter the house through the cracks. A wastewater professional can place a smoke bomb in the septic tank to locate the crack. Before the smoke bomb is activated, occupants and pets should leave the house, and windows should be opened for ventilation.

Weather Conditions

Homes located in valleys, forested areas, or low areas could have temperature inversions or downdrafts from surrounding hills, causing wind currents to bring the gases down to ground level instead of expelling them into the air. Extending the vent pipe can help diffuse the



odors. A vent fan, or carbon filters placed on the top of the vent will help to control the odor.

During prolonged cold periods, a plumbing vent could freeze closed, forcing odors back into the house. A jetter or warm water will open the vent.

Becoming an Odor Detective

Miller admits that locating the odor isn't easy, even for a wastewater professional. "You walk into the bathroom and smell an odor. Is it the tub, the commode, the vanity, or a cracked pipe in the wall?"

"The best way to find the odor is to use a little common sense and your nose," Miller said. "Start with the most common scenarios like dry traps. Make note of what you are doing when you smell an odor. If you get an odor when you flush a commode, for instance, it probably means that the vent is plugged."

For more information, contact Honce at (304) 842-6824; Ashburn at (304) 291-0808; Ferrero at (800) 236-6298; Miller at (717) 382-4811; and www.ext.nodak.edu/extpubs/ageing/structu/ae892-1.htm for Bob Villa's article on drainage, wastewater, and vent systems.