



Sewer Gas Guide

What is sewer gas?

Sewer gas is a complex mixture of toxic and non-toxic gases which collect in the sewage system at varying levels depending on the source. Sewer gas is formed during the decay of household and industrial waste. Highly toxic components of sewer gas include hydrogen sulfide and ammonia.

Sewer gas also contains methane, carbon dioxide, sulfur dioxide and nitrous oxides. In addition, chlorine bleaches, industrial solvents and gasoline frequently are present in municipal and privately owned-sewage treatment systems. Sewer gases are a concern due to their odor, health effects and potential for creating fire or explosions.

How are people exposed to sewer gas?

Sewer gas can enter a home through a floor drain, from a leaking or blocked roof vent pipe, or through cracks in foundations if the gases are in soil adjacent to the house. Sewer gases will be concentrated in the area they enter the home or in the lowest area of the home such as the basement. Sanitary and farm workers can be exposed to sewer gas during the cleaning and maintenance of municipal sewers, manure storage tanks and home septic tanks.



Example: Frozen vent pipe

What are some health effects?

Possible risks and health effects associated with sewer gas exposure include:

- Hydrogen sulfide poisoning. People can smell hydrogen sulfide in concentrations at very low levels and far below what could be toxic. This gas smells like rotten eggs, even at extremely low concentrations. Exposure to low levels of hydrogen sulfide can irritate eyes, cause a cough, sore throat, shortness of breath and fluid accumulation in the lungs. Other symptoms include nervousness, dizziness, nausea, headache, loss of appetite, irritability, poor memory and drowsiness. It can be difficult to detect high concentrations of hydrogen sulfide (>150 ppm) just by smelling, making this warning signal unreliable. At extremely high levels, hydrogen sulfide can cause immediate loss of consciousness and death.
- Asphyxiation. High concentrations of methane in enclosed areas can lead to suffocation since elevated levels of methane will decrease the amount of oxygen in the air. The effects of oxygen deficiency can include headache, nausea, dizziness and unconsciousness. When oxygen concentration levels less than 12 percent occur, unconsciousness and death may occur very quickly and without warning.
- Explosion and/or Fire. Methane and hydrogen sulfide are flammable and highly explosive. An ignition source such as a spark from an electrical appliance, turning on lights, matches or a cigarette lighter can cause an explosion and/or fire.

Common sources of sewer gas odors:

- **Sewer/Septic Pipe Leaks:** Have a plumber pressure test or peppermint test the sewer vent pipe to find sewer gas leaks. The gas leaks may be due to mechanical damage, rust, corroded pipes, improper sewer vent locations, pipe joint leaks, sewer pipe punctures or inadequate or missing waste pipe venting.
- **Toilet Sewer Gas Leaks:** A toilet with a bad seal can leak sewer gas due to loose anchor bolts or a worn out wax ring.
- **Drain Trap Odors:** Drain odors can be due to dry trap, trap siphonage or blocked sewer vent pipe. When a trap dries out, it can pass sewer gases back into a building. The problem may be worse in cold weather or when building vent fans are decreasing the inside air pressure. The reverse air pressure can draw gases out of drain piping into the building. To fix the problem, add water to the traps in floors, sinks or tub drains on a regular basis or add a trap primer to the system. A trap primer is a plumbing device that adds water to traps.
- **Roof Vent Pipes:** Occasionally check the roof vent pipe for blockage from debris such as leaves, bird nests, dead animals or ice. Frozen vent pipes occur when frost from moisture moves up the plumbing line above the roof from use of that drain for laundry or showering. In case of slippery conditions, caution should be taken when climbing on roofs.
- **Calm Days:** Sewer gas is heavier than air and will settle on the roof and cause intermittent sewer odors in the building, especially on calm days. Adding an odor eliminator vent stack filter will eliminate the harmful sewer odors by oxidation.
- **Partial Septic Blockage:** If a building drain, septic system or system drain field is partially blocked, it's possible that odors will be generated in or out of the building. In this case, odors often correspond to surges in system use. Odors should not correspond to cold weather, except where cold still air may permit gases to fall from a plumbing vent stack. Also, different seasonal wind patterns may cause gases to move to areas where they were not noticed in warmer weather.
- **Frozen Septic Fields:** A septic system can become frozen in prolonged, very cold weather if the system is not in regular use. If the septic field freezes and stops waste from flowing or if the septic field is totally blocked and is in failure, the entire septic system will backup when the building drains are used. Drains that backup in the lowest level of the home or basement can indicate a frozen or blocked septic system.
- **Municipal Systems:** To avoid death or serious injury, never enter a municipal sewer line, lift station, manure-storage tank or any other large storage tank without proper training and equipment.
- **Other Sulfur Type Gas Odors:** Private well water or water supplies can have a rotten egg smell if the water is contaminated with hydrogen sulfide or sulfur bacteria. For additional information on private well water, click or visit the following link: www.ndhealth.gov/wq/gw/pubs/WellDisinfection.pdf .

What should I do if I suspect a problem?

Try to follow the odor to locate the point of entry, such as a basement floor drain or a blocked vent pipe on the roof. By adding water to the floor drain or removing debris from a roof vent pipe, you may be able to prevent sewer gas from entering your home. In the unlikely event that a leak is occurring in the sewer plumbing behind a wall, a plumber may be needed to find and fix it. Some local public health departments may be able to offer home inspections to help with finding the source of the problem.

If you suspect that high concentrations of sewer gas have accumulated in an enclosed space, you should evacuate the area and contact the fire department for assistance. Avoid creating an ignition source such as a spark from an electrical appliance, turning on lights, matches or a cigarette lighter.