

# Frequently Asked Questions About Sanitary Sewer Smoke Testing

## **Why would someone put smoke into the sewer pipes?**

The purpose of smoke testing is to find potential points of infiltration and inflow of rain water and ground water in the sanitary sewer collection system. Excessive infiltration and inflow can result in high sewage flow that exceed the hydraulic capacity of the sewer pipes, potentially causing backup of sewage into basements.

## **What's Infiltration and Inflow?**

Infiltration is ground water that enters the sanitary sewer system through cracks and/or leaks in the sewer pipes and manholes

- Typically caused by age related deterioration
  - Loose and leaking joints
  - Poor design
  - Deficiencies inherent to the best available technology at the time the sewer pipe was installed
  - Installation error
  - Pipe damaged by tree roots and other activities

Inflow is storm water that enters into the sanitary sewer systems at points of direct connection

- Sump pump discharge to the floor drain
- Foundation drains and tile line connections to the sanitary sewer system
- Roof drains, down spouts and storm water intakes connected to the sanitary sewer
- Wet basement seepage running to the floor drain

## **How does smoke testing work?**

During smoke testing, field crews install a mechanical blower on top of a manhole to force air and artificial smoke into the sanitary sewer system. Under pressure the artificial smoke will fill the sewer main, service lines and the plumbing within buildings. Artificial smoke will blow out of the sewer system at the roof vent on top of buildings and at locations where infiltration and inflow may be entering the sanitary sewer collection system. Smoke coming from the sewer system at any location other than roof vents indicates a location where surface water or ground water may be entering the sanitary sewer.

## **What are the benefits of smoke testing the sanitary sewer lines?**

Smoke testing is an efficient and cost effective way to locate and identify where infiltration and inflow may be entering the sanitary sewer system collection system. Eliminating sources of infiltration and inflow from the sanitary sewer collection system helps to reduce the cost to operate and maintain the sanitary sewer system; reduces the potential for the backup of sewage into basements; reduces the need to bypass sewage from the collection system and extends the life of the wastewater treatment system.



The smoke testing may also help identify plumbing leaks in buildings. Sewer gases can be toxic, causing health problems and in extreme cases, even death. Therefore, fixing any deficiencies in household and business plumbing is strongly recommended.

**Is someone starting fires in the sewer lines?**

No. The artificial smoke is created by a chemical reaction where the visible portion is mostly atmospheric moisture. The smoke is not hot, varies in color from white to gray, and contains no explosive materials.

**Where will the smoke appear?**

If the plumbing system in each building is up to code and functioning properly and the sanitary sewer collection system has no defects, the only place we should see smoke is at the sewer vent on your roof and possibly at some manhole covers in the street. If the smoke is seen anywhere else, a potential source of infiltration and inflow has probably been discovered.

**Will smoke get into my house?**

The artificial smoke should not get into your house if your plumbing is installed and functioning properly and provided the sewer drain traps are filled with water.

Since plumbing fixtures in your home or business are connected to the sanitary sewer system, there is the potential for the artificial smoke to enter if the plumbing system is not functioning properly. Some circumstances where the artificial smoke could enter your home include:

- The sewer venting system in your building is inadequate, defective or improperly installed.
- The traps under sinks, tubs, basins, showers and other drains are dry, defective or improperly installed.
- The pipes, connections or seals in the wastewater drain system in and/or under your building are broken, damaged and defective, have plugs missing or are improperly installed.
- The sump pump is connected to the sanitary sewer system.

Please run water down all of your drains to ensure that the trap is not dry. Dry traps are most commonly found in basement fixtures and floor drains that are seldom used. It is important to maintain water in all of the traps at all times so that sewer gases are not allowed to enter your home or business.

**What does it mean if smoke enters my house?**

If smoke enters your home during the test, it may indicate there are deficiencies in the plumbing that may allow potentially dangerous sewer gas to enter.

**How is a plumbing "trap" supposed to work?**

The "gooseneck" or "snake" section of your drain pipe is the "trap." The trap allows water to fill that section of the pipe completely. Since vapor and gas cannot travel through water unless under pressure, the trap effectively creates a barrier keeping gas in the downstream portion of the sanitary sewer system from entering your home. The vent on your plumbing system - the pipe that protrudes above the roof of the building - prevents the sewer gas from becoming pressurized and allows the gas to escape outside the building. The plumbing traps and sewer vents function together to keep potentially harmful sewer gases from entering your structure. If there is no water in the trap, the trap will not function properly. It is recommended that water be poured into building drains and fixtures on a routine basis.



**Is the artificial smoke harmful?**

The "smoke" is not true smoke, but rather a mist containing a large percentage of atmospheric moisture that is highly visible at low concentrations. The artificial smoke should not harm your health or leave a fabric stain and will disappear rapidly without leaving an odor. However, since any vapor can be an irritant, direct contact with the artificial smoke may cause minor respiratory irritation in some people. Individuals with respiratory problems such as chronic asthma, emphysema or other respiratory conditions should avoid direct exposure to the artificial smoke. If the artificial smoke enters your home, it may make you cough but the smoke will not cause asphyxiation or create a fire hazard.

**What should I do if smoke gets into the house?**

- If there is heat and the smoke smells like it is coming from a fire, respond accordingly assuming you have a fire.
- Open windows to allow ventilation and note the location of the smoke emission; smoke will clear within a few minutes
- Exit the building and notify smoke testing personnel in the area.

**If the artificial smoke is not harmful, why do you recommend evacuating the structure?**

We recommend evacuating as a precautionary measure in case the smoke is due to a real fire rather than a test. In addition, the fan that is blowing artificial smoke is also blowing any sewer gases may be in the sanitary sewer collection system into your building.

**What happens if the smoke testing crew finds a faulty sewer or lack of water traps in a home?**

If smoke is seen within a house or structure, our crews will attempt to notify the homeowner that there may be potential defects in the plumbing system. However, property owners will be responsible for any repairs required on their private property plumbing system.

**How long will the testing take?**

While crews might be in your area for a few hours, each actual smoke test setup takes approximately 30 minutes to complete. Most houses will only be within the testing area for one or two tests.

**When will the smoke testing be performed?**

The sanitary sewer smoke testing will only be performed on week days between the hours of 7:00 am and 4:30 pm. Any smoke observed outside of this time frame is **NOT** artificial smoke from the sewer testing work.

**What should I do to prepare for smoke testing?**

When you receive notice that smoke testing will take place, you should:

- Check to see that all drain traps under basins, washing facilities and floor drains contain water; simply flush toilets and run or pour water into all drains, including unused fixtures and floor drains.
- If there is an individual in your home or business who has respiratory problems and/or mobility limitations, or if you have any additional questions, contact:
  - *Jim Doering, Public Works Project Coordinator at 507-430-5904*

**Do I have to be home during testing?**

No. The smoke testing crew will not need to enter your home. You are not required to allow the smoke testing crew to enter your home.



**How will I know if smoke enters my house if I am not home during testing?**

Unless you return home shortly after the completion of the smoke testing, you probably will not know if smoke entered your home. The purpose of the smoke test is to identify sources of unauthorized water entering the public portion of the sanitary sewer system. While it may be beneficial to note deficient plumbing connections on private property, this is not the main intent of the smoke test. It is the homeowner's responsibility to maintain private plumbing connections.

**Why can't you tell me in advance exactly what date my home will be tested?**

This testing cannot be conducted during rainy periods or during windy conditions, so the work can sometimes be delayed. Also, other activities within the test area may take more or less time than anticipated. The time period to complete the smoke testing will also vary based on the number of possible defects discovered and documented.

**Will rodents be smoked out?**

No. However, the smoke may detect broken building sewers where there is a potential for rodent access.

**Can the artificial smoke activate smoke alarms?**

Yes, but only if the artificial smoke enters your building. **If you have any doubts about the origin of the smoke, assume there may be fire and respond accordingly.**

**Can the artificial smoke plug the sewer?**

There is no way smoke can plug the sewer. The smoke is made up of a vaporized substance.

**What happens after the smoke testing is completed?**

A summary of the findings will be prepared and presented to the City Council. The discoveries from the smoke testing will be considered by the Council when planning future public improvement projects and when considering future policy changes focused on reducing infiltration and inflow from entering the sanitary sewer system. Depending upon the findings, some immediate actions may be initiated to mitigate sources of infiltration and inflow from the sanitary sewer collection system.