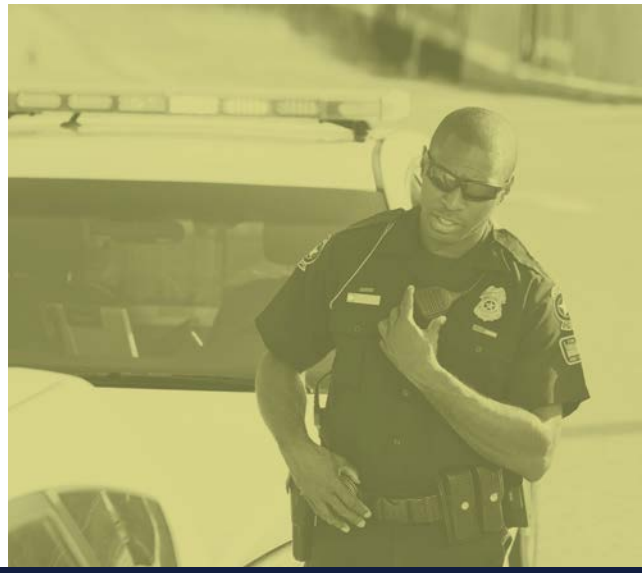
first responder beware®



Natural Gas Safety for First Responders

SMUD®

Firefighters, police, and EMTs are typically first on the scene in an emergency and face the greatest risk from natural gas leaks and fires.

Understanding the potential dangers and dealing with them correctly makes everyone safer.

This program is designed to supplement, not replace, your department's standard operating procedures (SOPs).

Natural Gas Safety Basics

- Properties of Natural Gas
- The Natural Gas Delivery System
- Pipeline Locations
- Preventing Natural Gas Ignition
- Responding to Natural Gas Emergencies
- Indoor Natural Gas Leaks
- Outdoor Natural Gas Leaks
- Natural Gas Fires




Properties of Natural Gas

- **Natural gas is lighter than air.**
  - It will follow the path of least resistance and will rise.
  - When underground or in enclosed spaces, gas will move laterally or **migrate**.
- **Chemical additives produce the familiar sulfur-like smell of natural gas.**
- **Even the smallest flame or spark** can ignite leaking natural gas.
- Natural gas will only ignite when the volume of gas in air is **between 5% and 15%**.
  - At concentrations below about 5% or above 15% volume in air, natural gas will not burn.
- **Burning natural gas will not explode.**
- **Natural gas is nontoxic** but can displace oxygen in confined spaces, creating an asphyxiation hazard.
- **Liquefied gases have different properties** than natural gas.

The Natural Gas Delivery System

- **There are three types of lines in the natural gas network.**

	Transmission Pipelines	Main Lines (Distribution Lines)	Service Lines
SIZE (diameter)	up to 4 feet	2 to 20 inches	¼ inch to 1 inch
PRESSURE	**400 to 1,000 psi**	less than 100 psi	same as main lines
OPERATED BY	interstate or intrastate pipeline companies or local utilities	local natural gas utilities	local natural gas utilities
LOCATION INFORMATION Note: Landscaping and/or erosion can change depth of lines.	"right-of-way" corridors; marked with transmission line markers	about 2 feet below ground	up to 2 feet below ground

- **Natural gas in transmission pipelines may not yet be odorized**, especially in areas of low population density.
- **Between service lines and individual structures are service meters.**
  - Different structures use different types of meters.
- **The size of a pipe is NOT a reliable indicator of the gas pressure**.

Pipeline Locations

- **High-visibility markers** indicate the general location of SMUD's high-pressure natural gas pipelines.
- For security purposes, **these markers do not show the exact location,** path, or depth of gas pipelines in the area.
- **If you notice any type of suspicious activity near a pipeline marker,** call the number listed on the marker to report it. Call this number as well if you notice a damaged marker.
- The approximate locations of natural gas transmission pipelines are available on the National Pipeline Mapping System (NPMS) website: **https://www.npms.phmsa.dot.gov**.

Preventing Natural Gas Ignition

- **Avoid turning electrical equipment or devices on or off in the vicinity of a leak.** Even the smallest flame or spark can ignite leaking natural gas and cause an explosion.
- **Use intrinsically safe radios and flashlights** for the duration of any incident response.
- **Do not use garage door openers,** light switches, doorbells, or electrical devices or appliances, as any of these could create a spark.
- **Take steps to eliminate sources of static electricity:** Do not step on doormats, rub hands, or shuffle feet.

Responding to Natural Gas Emergencies

- When called for a gas leak or fire or if you smell gas at an incident scene, **assume there's danger.**
- **Contact SMUD.** Provide clear directions and a clear path to the incident site.
- **Immediately evacuate** the area.
- **Be alert for migrating gas.**
- **Secure the area to prevent others from entering**. Reroute traffic if necessary.
- **Park emergency vehicles away and upwind. Do not park:**
  - Over manholes or storm drains
  - Under overhead utility lines

first responder beware

Responding to Natural Gas Emergencies

- **NEVER handle relief valves or underground natural gas pipeline valves.**
- If you have been trained to do so, **you may shut off gas ONLY at an aboveground service valve before the meter or at appliance supply lines.**
  - A 1/4 turn of a gas meter valve will shut off the gas service.
  - Use the same technique at an appliance supply line.

- After a service valve or appliance supply line has been closed, **do not open it under any circumstances.**
- Inform the gas utility of any valve you have closed and its precise location.

Indoor Natural Gas Leaks

- Indoor gas leaks can result from **malfunctioning gas-fed appliances.**
- **Do not open windows** until you are certain the gas supply has been shut off and ignition sources have been eliminated.
  - Ventilate structures from top to bottom.
  - Never ventilate structures with personnel inside.

Carbon Monoxide

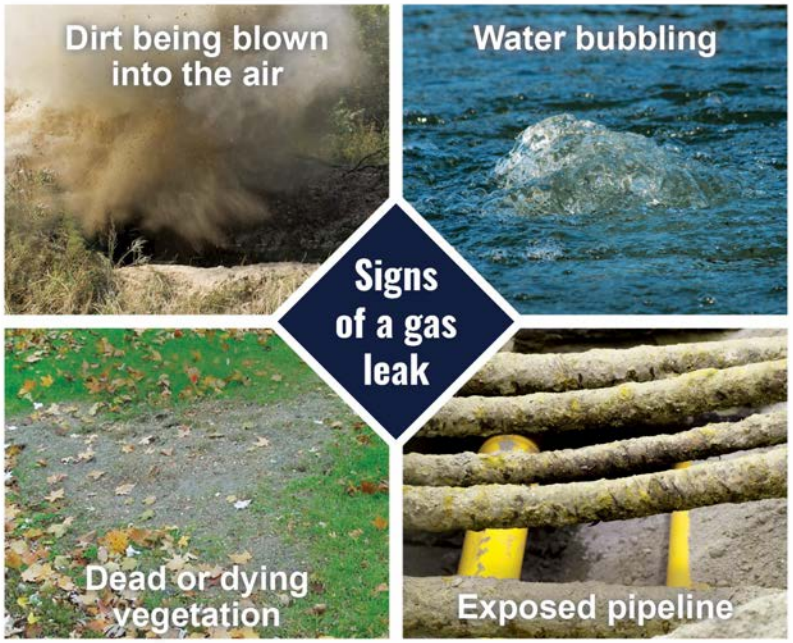
- **Understand carbon monoxide (CO) leaks:**
  - CO has no color, odor, or taste.
  - CO leaks are frequently caused when fuel-burning appliances malfunction or are used without adequate ventilation.
- **CO poisoning can look like a common illness but is deadly if untreated.**
  Know the signs:
  - Flu-like symptoms
  - Loss of consciousness
  - Lips and skin turning blue
- **Get victims outdoors immediately and seek medical attention for them.**

Outdoor Natural Gas Leaks

- Outdoor natural gas leaks are most commonly caused by **construction-related damage, cracks due to extreme weather, or pipe corrosion.**
- **Contact SMUD immediately** to shut off the gas.
- **Evacuate the area immediately.** Establish a restricted area.
- **Be alert for migrating gas.** Gas can accumulate in storm drains, buildings, and other utility lines.

Outdoor Natural Gas Leaks

- **Use your senses of sight, hearing, and smell to detect a gas leak.** Be alert for these warning signs:
  - A distinctive, sulfur-like odor
  - A hissing, whistling, or roaring sound
  - Dirt spraying or blowing into the air
  - Continuous bubbling in water
  - Dead or dying vegetation (in an otherwise moist area) over or near a pipeline
  - A damaged connection to a gas appliance
  - An exposed pipeline after an earthquake, a fire, a flood, or other disaster



Natural Gas Fires

- When responding to a fire involving natural gas, **your best and safest course of action is to let it burn.**
- **Call SMUD at 1-800-877-7683 immediately.**
- **Evacuate the area** and protect exposures.
- **Do not park emergency vehicles under overhead utility lines.**

Natural Gas Fires

- For structure fires, **shut off the gas supply only if you can safely access the meter.**
- Once the gas supply is off, **remain alert for gas migration and possible reignition.**
- **Do NOT use water to suppress a natural gas fire.** Utility personnel and the incident commander will tell you how to proceed.
- **You may use a fog spray** to cool and protect combustible exposures.
- **If you must extinguish a gas fire to rescue a victim or shut a valve,** use dry chemical extinguishers. You may use a fog spray to disperse vapors to prevent reignition.

first responder beware

Natural Gas Safety Review

- **Prevent ignition** of natural gas.
- When natural gas is involved in an emergency, **contact SMUD.**
- **Park emergency vehicles away and upwind** from the area of a natural gas emergency.
- **Evacuate the area** and be alert for migrating or accumulating gas.
- **Do not ventilate natural gas until the supply is off** and all personnel are out of the structure.
- **If you are trained to do so, shut off natural gas service ONLY at meters or appliance supply lines.**
- When natural gas is burning, **let it burn and protect area exposures.**

Additional Information

- In case of a natural gas emergency, call **911** and **SMUD** at **1-800-877-7683**.
- For additional information on gas pipeline safety, please visit these websites:
  - **smudsafety.com/firstresponder**
  - **https://www.phmsa.dot.gov**

SMUD®

first responder beware®

THANK YOU