

## Natural Gas Answers to Frequently Asked Questions

**1. What is natural gas and where does it come from?**

Natural gas is a mixture of gaseous hydrocarbons that occur naturally in the earth. Methane is the primary constituent of natural gas. Natural gas can originate from organic material buried in soil or glacial deposits, organic-rich rocks such as the Ohio Shale Formation, or may be trapped in oil and gas reservoirs deep beneath the surface of the earth.

**2. How do I know if I have natural gas in my ground water supply?**

Methane is colorless and odorless. Therefore, it is unlikely that you'll be able to detect the presence of natural gas through your sense of smell. Signs that methane gas may be present in ground water include popping or spurting of water at the tap or gurgling noises at the well casing. Bainbridge Township firefighters and Division of Mineral Resources Management (DMRM) staff are equipped with portable instruments that can detect the presence of natural gas. The DMRM will inform you if detectable concentrations of natural gas are measured during our visit to your home.

**3. Why does DMRM pump my water well during the monitoring process?**

When a well is pumped and the height of the column of water declines, water pressure is reduced, and natural gas, otherwise not apparent, may be released.

**4. If I have natural gas in my water supply, does it mean that it came from an oil and gas well?**

Not necessarily. Natural gas occurs naturally, and is common in water wells in Geauga County, specifically in water wells that are drilled to the Ohio shale, a gas-bearing formation that is below the deepest fresh-water aquifer, the Berea Sandstone. The DMRM is conducting an investigation to determine which water wells have been affected by oil and gas operation(s).

**5. What are the health risks associated with drinking well water that contains natural gas?**

According to the Agency for Toxic Substances and Disease Registry, ingestion of water containing natural gas does not pose a direct health threat. Methane does not have any known toxic, poisonous, or cancer-causing properties. There are no known adverse health effects associated with drinking or bathing with well water that contains methane. However, if your well has been disconnected and then reconnected, because natural gas was detected in your water well, or you are receiving bottled water, the DMRM recommends that you not drink your well water until you receive the results of water quality tests, including coliform bacteria tests being completed by the Geauga County General Health District (GCGHD). Prior to deciding to resume use of your well water for drinking purposes, the DMRM recommends that you consult with the GCGHD and/or your personal physician.

**6. What health or safety risks are associated with the use of well water that contains natural gas?**

Running tap water in your home can allow dissolved natural gas to exsolve (come out of solution as gas bubbles) and increase the level of natural gas in the air within your home. Natural gas cannot explode unless it reaches a concentration that is 100 percent of the Lower Explosive Limit (LEL) in the room, and has a source of ignition. The primary danger is when the natural gas accumulates at combustible or explosive levels in confined spaces. Areas of concerns are basements, utility rooms and bathrooms where large quantities of water are used.

**7. Under what circumstances would my water well be disconnected from my house?**

Any well that has a sufficient concentration of dissolved methane to exceed 10% LEL in a confined space (room), should be disconnected until the concentration of natural gas diminishes.

**8. How should I respond to the natural gas measurements provided by DMRM, or my house methane detector?**

When DMRM representatives visit your home, they will pump your well and measure methane concentrations at the well vent, and directly at the cold and hot water taps. This screening process tells us whether gas is present at detectable levels in the ground water being pumped from your water well at a specific time and day. These readings do not-indicate whether gas is accumulating in a room at dangerous levels.

If a DMRM representative detects the presence of gas in the running water, he/she will then measure the concentration of methane in the room (basement, kitchen, garage, utility room, etc.). This reading will indicate whether the emission of gas from the running water is accumulating in the room at potentially dangerous levels.

The DMRM recommends the following actions in response to LEL measurements within rooms:

% LEL Range	Action
1-4	No immediate action necessary
5-9	Increase ventilation, continue to monitor to see if the % LEL continues to rise
10-19	Shut off water; and monitor to see if % LEL continues to rise
20+	Keep water shut off. Increase ventilation; Evacuate the premises; Call the Fire Department for an inspection (440) 543-9873; Notify DMRM at (330) 896-0616

**9. What should I do if my natural gas alarm is triggered?**

If you have a natural gas monitor it is generally set to provide an audible alarm when the concentration of methane extends ten percent of the LEL in the room. If you hear the alarm, shut off your running water, ventilate the room, and watch the digital reading on the monitor to see if the concentration diminishes. If the digital reading continues to increase beyond 20% LEL, the DMRM recommends that you evacuate the premises and notify the Fire Department and DMRM.

**10. If my water well has been disconnected, under what circumstances would it be re-connected?**

When over the course of several weeks of monitoring, DMRM finds the following:

- No observable or audible evidence of gas in your well; and,
- Gas readings are less than ten percent of the LEL in your well vent; and
- Gas readings are less than four percent at the running tap water;

Once the above criteria are met, the DMRM considers it safe for you to reconnect your water supply.

**11. Once my water well has been reconnected, how can I be sure that I'm safe?**

The best way to ensure your safety is to continue to operate the methane detection system(s) in rooms where you run large quantities of water, particularly hot water (basements, utility rooms, kitchens, or bathrooms).

**12. Will the natural gas eventually dissipate?**

If your water well had natural gas in it before December 15, 2007, your well will likely continue to emit natural gas from time-to-time in the future. If the gas in your water well was caused by the local oil and gas well operation, the DMRM expects that the gas will eventually dissipate.

**13. Why has the natural gas problem lasted so long?**

There are a variety of geologic factors that control the dissipation of gas. While DMRM has asked Ohio Valley Energy (OVE) to pump specific water wells to accelerate the process, the DMRM cannot predict how long it will take before gas completely dissipates.

**14. If symptoms of natural gas re-appear after my well has been reconnected, what should I do?**

If signs of natural gas re-occur (e.g. the audible alarm on your natural gas monitoring system is triggered, spurting water, gurgling noises at the well casing, etc.) immediately notify the Bainbridge Fire Department at (440) 543-9873 and the DMRM at (330) 896-0616. The DMRM will immediately require OVE to disconnect your water well and re-install a storage tank as temporary water supply.

**15. If natural gas is a persistent problem in my water well (unrelated to the December 15 incident), are there systems available to remove methane from ground water prior to pumping it into my house?**

If you have natural gas in your well water, the best course of action is to vent the well to allow gas to safely escape into open air. A water well professional could also advise you regarding methods to vent your pressure tank. If your water well is located indoors, your well should be equipped by a licensed professional with a sealed cap and a vent pipe that extends through the wall to the exterior of your house.

**16. Where can I find information on licensed water well professionals in this area?**

You can find a directory of licensed water well professionals listed by county at the Ohio Department of Health website:

(<http://www.odh.ohio.gov/odhPrograms/eh/water/water1.aspx>)

**Additional Resources:**

For additional information on methane in ground water wells, we recommend the following sources:

US Geological Survey. 2006. *Methane in West Virginia Ground Water*. USGS Fact Sheet 2006-3011, 6 pp. <http://pubs.water.usgs.gov/fs2006301>

Keech, D. K. and M. S. Gaber. 1982. "Methane in Water Wells." *Water Well Journal* Feb. 1982:33-36. <http://www.seagrant.umn.edu/groundwater/pdfs/Methane.pdf>

To learn more about the proper maintenance of your private water well, consult this web site: <http://www.sir.cas.psu.edu/water>

If you have additional questions, please call Marlene Hall, with the DMRM's Uniontown office at (330) 896-0616. She will refer your questions to the appropriate party.