

Methane is the primary component of natural gas. It is a colorless, odorless, and tasteless greenhouse gas. Methane is emitted into the air during the extraction and transportation of coal, natural gas, and oil from the ground. It is also emitted from livestock and decaying organic waste in landfills and marshes. It is slightly soluble in water.

HOW DOES METHANE GET INTO MY BODY?

You breathe in methane. You may also ingest it by drinking contaminated water or eating foods prepared with contaminated groundwater.

WHAT CAN METHANE DO TO ME?

Methane does not accumulate in the body. It is rapidly expelled by breathing, urinating, and flatulence. However, when methane is present at high concentrations in the air, it displaces oxygen and can cause symptoms of oxygen deprivation or asphyxiation. It also poses a serious explosion risk. Contact with refrigerated liquefied gas or compressed gas containing methane may cause frostbite.



WHAT ARE THE ENVIRONMENTAL REGULATIONS FOR METHANE?

Methane concentrations between 5% to 15% by volume in the air are potentially explosive. The National Institute for Occupational Safety and Health (NIOSH) recommends a maximum safe methane concentration in air of 1,000 parts per million (0.1%) during an 8-hour workday due to oxygen displacement and potential for asphyxiation.

Water concentrations of methane around 28 mg/L pose a potential explosion risk. Above this concentration, methane is no longer soluble in water and off-gases into the air. The Pennsylvania Department of Environmental Protection (DEP) has set a methane contamination action level of 7 mg/L. Above this level, DEP follows up with homeowners to reduce methane in the water supply or wellhead. A [Penn State University study¹](#) of 233 water wells throughout the Marcellus shale region of Pennsylvania found detectable methane in 24% of water wells before nearby oil and gas drilling began. However, only 2% of wells contained dissolved methane above 10 mg/L, and less than 1% were above 28 mg/L.

Pennsylvania's [Statewide Fixed Station Groundwater Quality Monitoring Network²](#) samples 22 groundwater wells located in 21 counties twice a year for many chemical constituents, including methane.

WHAT CAN I DO?

- Because of its explosive nature, efforts should be made to avoid buildup of methane in the air.
- Install a gas leak detector in your home.
- Test well water for methane.
- If your water is high in methane, install a vent on your wellhead and consider installing water treatment.
- If you experience dizziness, difficulty breathing, or rapid heartbeat that you think may be related to loss of oxygen, go outside, and call 911.

If you have questions or concerns about methane, please contact the Division of Environmental Health Epidemiology at dehe@pa.gov or 717-787-3350.

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¹ https://www.rural.palegislature.us/documents/reports/Marcellus_and_drinking_water_2012.pdf

² <https://pa.water.usgs.gov/projects/groundwater/gwmn/>