

NATURAL RESOURCES

Methane Found in Well Water Near Fracking Sites

In a study of 68 private drinking water wells in northeastern Pennsylvania and New York, methane contamination rose sharply with proximity to natural gas drilling and hydraulic fracturing (“fracking”) sites.¹ The average methane concentration in shallow groundwater in active drilling areas fell within the defined action level (>10 mg/L but <28 mg/L) for hazard mitigation recommended by the U.S. Department of the Interior, and the maximum (64 mg/L) was well beyond that threshold, according to the report. However, the researchers found no evidence of fracturing fluids. Principal investigator Robert B. Jackson of Duke University says fracking has been conducted in the sampled region since about 2008. The team sampled the water supplies in 2010.

The researchers measured concentrations of gases and certain isotopes of carbon in methane and other hydrocarbons to distinguish the ancient thermogenic gas stores sought in drilling operations from methane generated by microbial degradation of organic matter. The closer the well was to an active drilling site, the more likely it was the methane detected was thermogenic.

Flammable levels of natural gas are common in water supplies, and explosions—even reports of flammable drinking water—have occurred near fracking sites, says Abraham Lustgarten, a reporter for ProPublica who has investigated gas drilling across the United States. But no peer-reviewed studies have investigated health effects of chronic ingestion of small amounts of methane, Jackson says.²

John Hanger, a former head of the Pennsylvania Department of Environmental Protection (DEP), blames poor gas well construction or design, not fracking, for methane contamination noted to date.

He says repairs or plugging of gas wells eliminated contamination in 14 of 19 previously contaminated water wells tested in 2010 by the DEP. But Jackson maintains fracking cannot be ruled out as a cause, given the high pressures used in the practice.

Just how likely are leaks? Based on a non-peer-reviewed survey of the five states that systematically report incidents at wells where fracking occurs and where complaints have spurred inspections, Ronald E. Bishop, a lecturer in chemistry and biochemistry at the State University of New York, Oneonta, estimates nearly 2% of such gas wells may end up contaminating groundwater with fracking fluids.³ Bishop says 50% of new natural gas wells recently inspected in Quebec leaked methane.⁴

Hanger says Pennsylvania has enacted strict standards for design, construction, and materials used in gas wells, which became effective in February 2011.⁵ The state also requires testing, monitoring, and disclosure of chemicals used in fracking. But Amy Mall, a senior policy analyst with the Natural Resources Defense Council, says state fracking regulations vary widely, and a federal law passed in 2005 exempts fracking from the Safe Drinking Water Act and companies from disclosing chemicals used during the process.

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REFERENCES

- Osborn SG, et al. Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing. *Proc Natl Acad Sci USA* 108(20):8172–8176 (2011); doi:10.1073/pnas.1100682108.
- Jackson RB, et al. Research and Policy Recommendations for Hydraulic Fracturing and Shale-Gas Extraction. Durham, NC: Center on Global Change, Duke University (2011). Available: <http://tinyurl.com/6kep5fp> [accessed 17 Jun 2011].
- Bishop RE. Chemical and Biological Risk Assessment for Natural Gas Extraction in New York. Oneonta, NY: State University of New York College at Oneonta; Cooperstown, NY: Sustainable Otsego (28 Mar 2011). Available: <http://tinyurl.com/5wp4ybg> [accessed 17 Jun 2011].
- Re: Réponses aux questions DQ28 (1-5) [in French]. Letter from Jean-Yves Laliberté to Monique Gélinais. 7 December 2010. Available: <http://tinyurl.com/5tun62v> [accessed 17 Jun 2011].
- Commonwealth of Pennsylvania. The Pennsylvania Code. Title 25: Environmental Protection, Chapter 78: Oil and Gas Wells. Mechanicsburg, PA: Fry Communications, Inc.; Madison, WI: Legislative Reference Bureau. Available: <http://tinyurl.com/69qfaws> [accessed 17 Jun 2011].

Study to Assess Health Effects of Railyard

In June 2011 California’s South Coast Air Quality Management District announced the launch of a two-year study on the Burlington Northern Santa Fe railyard in San Bernardino, a major transportation hub for the Los Angeles–Long Beach port complex. The study, to be conducted by Loma Linda University, will examine respiratory diseases and cancer among 1,200 children and adults in communities surrounding the railyard. A 2008 California Air Resources Board health risk assessment suggested the San Bernardino facility had the worst health impact on surrounding communities of any railyard in California.⁶

Elders Volunteer for Fukushima Daiichi Plant Cleanup

Retired engineer Yasuteru Yamada received more than 300 responses when he solicited elderly colleagues to volunteer to help stabilize and clean up the



Several projects in California seek to reduce the community health impacts of railyards.

Fukushima Daiichi nuclear plant damaged by the 11 March 2011 Tohoku earthquake and tsunami.⁷ Yamada, a cancer survivor, says elders should lead these efforts because of their accumulated experience and because their advanced age means the adverse effects of radiation exposure

will have less time to manifest. Yamada’s Skilled Veterans Corps is expected to receive governmental approval to help at the damaged plant.

REFERENCES

- Zimmerman E. Blue Goo Sucks Up Toxic Waste. CNN Money.com, Tech section, Innovation Nation subsection (25 May 2011). Available: <http://tinyurl.com/42zwt7q> [accessed 20 Jun 2011].
- Skai Ventures. CBI Polymers [website]. Honolulu, HI: Skai Ventures (2011). Available: <http://tinyurl.com/5sewopu> [accessed 20 Jun 2011].
- NTP. Report on Carcinogens, Twelfth Edition, 2011. Research Triangle Park, NC: National Toxicology Program, Public Health Service, U.S. Department of Health and Human Services (2011). Available: <http://tinyurl.com/6446t85> [accessed 20 Jun 2011].
- IARC. IARC Classifies Radiofrequency Electromagnetic Fields as Possibly Carcinogenic to Humans [press release]. Lyon, France: International Agency for Research on Cancer (31 May 2011). Available: <http://tinyurl.com/3sya7sy> [accessed 20 Jun 2011].
- ITU. ITU Sees 5 Billion Mobile Subscriptions Globally in 2010. Strong Global Mobile Cellular Growth Predicted across All Regions and All Major Markets [press release]. Barcelona, Spain: International Telecommunication Union. Available: <http://tinyurl.com/3pxwnfs> [accessed 20 Jun 2011].
- Castaneda H, et al. Health Risk Assessment for the BNSF San Bernardino Railyard. Sacramento, CA: Stationary Source Division, California Air Resources Board, California Environmental Protection Agency (11 Jun 2008). Available: <http://tinyurl.com/6ckw4kw> [accessed 20 Jun 2011].
- Tamura H. Elderly ‘Suicide Corps’ May Get Nod for Fukushima Mission. Asahi Shimbun, online edition (25 May 2011). Available: <http://tinyurl.com/6cbax4j> [accessed 20 Jun 2011].