

Hydraulic Fracturing and Environmental Public Health

Hydraulic Fracturing ('Fracking'), like all industrial processes, has the potential to have a lasting impact on health, the environment, and communities. It is important to consider these consequences and ensure that systems are in place to minimize potential impacts. Possible health effects, as noted in recent news articles, include those related to increased diesel truck traffic (e.g., air pollution, accidents, noise), surface and ground water contamination, as well as occupational health exposures. This webinar explored this complex issue, considered the concerns expressed by communities, and highlighted current activities as a way of increasing our understanding of research and communication gaps. This webinar featured presentations by Jill Kriesky and Roxana Witter.



Jill Kriesky, Ph.D., is the senior project coordinator for the Center for Healthy Environments and Communities in the Environmental and Occupational Health Department in the Graduate School of Public Health at the University of Pittsburgh. She focuses her research on the effects of Marcellus Shale natural gas drilling on the environment, human health, and communities in southwestern Pennsylvania. Kriesky opened her presentation by describing the unconventional natural gas drilling, or fracking, process and the potential link between fracking and public health issues. Because drilling activities often begin before exposure information is available, it is difficult to establish a cause and effect relationship between fracking and adverse health impacts even though multiple pathways to negative health outcomes exist. Exposures to the chemicals used and released in the drilling process occur through the contamination of water, air, and soil. There is genuine concern surrounding the potential for these chemicals to cause adverse health outcomes such as asthma, heart disease, diabetes, and metal health problems. Additionally, noise issues, safety concerns, and other community changes related to the drilling process can contribute to increased stress on residents and the community. She closed by stating that development of the natural gas drilling industry is ahead of exposure research, warranting the need for more studies on the impact of drilling on the environment, human health, and public health as a community. She recommended that people who wanted more information visit FracTracker.org, an online tool for scientists and citizens to share data, articles, and experiences about natural gas drilling in their communities.



Roxana Witter, M.D., is an assistant research professor in the Department of Environmental and Occupational Health in the Colorado School of Public Health. She is also co-program director for the Occupational and Environmental Medicine Residency, and co-course director of the Environmental and Occupational Interdisciplinary Symposia Unit in the Colorado School of Public Health. Her research focuses on understanding the physical, psychosocial, and community health impacts of natural gas drilling. Witter spoke about a Health Impact Assessment she conducted to determine the impacts of a proposed natural gas project on Battlement Mesa, a community in western Colorado. She briefly addressed chemical exposures but focused on non-chemical stressors which can have adverse effects on physical, psychosocial, and community health. Industrial activities increase noise



PEPH Webinar Series

The Partnerships for Environmental Public Health (PEPH) Program established the PEPH Webinar series to promote interactions among PEPH grantees and to increase awareness of common issues and approaches. The webinars facilitate consideration of emerging issues. While the primary audience is grantees within the PEPH network, anyone interested in environmental public health is welcome to register.

If you have any questions about this webinar or future webinars please contact Justin Crane (cranej2@niehs.nih.gov, 919-794-4702).

production and traffic, which can negatively affect cardiovascular health and safety risks within the community. Additionally, she emphasized how changes in community demographics can be a potential source of stress for residents. Concerns over these changes can cause psychosocial stress which may have adverse effects on the cardiovascular, immune, and nervous systems, as well as on mental health. Witter closed by saying a transparent and comprehensive planning process that addresses demographic changes, adapts best management practices, and encourages local involvement can help mitigate community impacts and protect public health.

During the question and answer session, participants focused on the following themes.

For Kriesky:

Independent chemical testing of water and evidence of groundwater contamination. Kriesky responded that drilling companies acquire the property rights and restrict access to the land on which fracking ponds are established. She is not aware of cases where environmentalists or public health officials have been allowed to independently sample and test fracking pond water for chemicals. There is evidence of groundwater contamination; Kriesky referenced a situation in Demock, Pennsylvania where groundwater contamination has been documented, and there are a number of ongoing studies to determine the source of contamination.

Scope of FracTracker.org. Kriesky pointed out that the data tool on FracTracker.org does currently focus on Marcellus Shale drilling but is increasingly bringing in data from other regions with hopes to expand and incorporate data from around the nation. She recommended that people explore the site's comprehensive blog which collects research and publications on natural gas drilling. FracTracker.org

For Witter:

The planning process and natural gas development in Battlement Mesa. Witter responded that development has not begun in Battlement Mesa but they have supplied the county commissioners with a menu of options or recommendations to help mitigate the adverse public health outcomes linked to natural gas drilling, and the county has already approved and started increased air monitoring in the community. She also stated that though her research does not incorporate matters of environmental justice, she believes these issues need to be considered in the planning process when natural gas development is proposed for a community.

Time drilling equipment remains on a site and site restoration once drilling is completed. Witter explained that the time and equipment required for each part of the shale gas extraction process is different. The drill rigs remain on a site for only a month or two and then fracking and well development occurs. Piping and the well remain on the site throughout the production period which typically lasts 20 to 30 years. Sometimes well maintenance is required and a company will come back to "re-frack," or re-stimulate, the well. Witter stated that site restoration will not occur until after the 20-30 year production period which has not yet been reached at many sites, and has not been reached in Colorado.

Baseline health data and established trends. Witter responded that because the Battlement Mesa Health Impact Assessment was conducted before any development occurred, they were able to establish a baseline of health in the community using data from the State Health Department and the Colorado Hospital discharge set. They found Battlement Mesa to be fairly healthy compared to other Colorado communities. Witter said having this health baseline data will allow for future comparison to community health after development has occurred.

For either presenter:

Duration and impacts of noise exposure. Witter responded that the length and impact of noise exposure on people living near a well is quite variable. It will depend on the number of wells being developed on a particular well pad, the geography of the area, and the company's efforts to mitigate noise by installing noise barriers. Kriesky added that living near multiple well pads can also increase noise exposure. Noise associated with truck traffic is also an issue, so people living near hauling routes but not well pads also experience a continued source of noise.

Chemical exposure data and fracking. Kriesky responded that, as far as she knows, no one has studied specific exposures of individuals to the fracking process. Development of the natural gas industry is ahead of the exposure research, so there are reports of potential health impacts but no definitive studies to support these concerns. Witter agreed that epidemiologic studies are lacking. She added that some air monitoring data was collected at the perimeter of several well pads in Garfield County. This data was used to develop a health risk assessment which indicated the possibility for increased risks for short-term health symptoms like headaches and mucous membrane irritation. This data was provided to policy makers in Garfield County with hopes they will establish proactive policies to reduce exposure.

Source of water used in the fracking process and regional drought issues. Witter responded that companies secure rights to and purchase the water used in the fracking process. Companies working in Colorado get water from the Colorado River, and groundwater can be another source. In Colorado there are concerns about water usage and drought issues, and depending on the drilling company, 20-70% of the water may be recycled. Kriesky added that water issues will vary based on the water resources and weather conditions in an area. She referenced Susquehanna County in northeast Pennsylvania where drought-like conditions have limited the amount of water natural gas drillers can withdraw from streams.

Education and outreach for land owners affected by drilling. Kriesky referenced FracTracker.org as good resource for individuals considering leasing their land to a drilling company. She added that FracTracker is also a hub for users to locate resources that are relevant to the local issues in their community. There are also local environmental and watershed organizations that encourage and provide water quality testing, and the Sierra Club is a valuable resource on the national level. Witter added that the University of Colorado Natural Resources Law Center and the Inter Mountain Oil and Gas Best Management Practices Project are good starting places to find several resources relevant to western communities.

University of Colorado Natural Resources Law Center: <http://www.colorado.edu/law/nrlc/>

Inter Mountain Oil and Gas Best Management Practices Project: <http://outreach.colorado.edu/programs/details/id/359>