



**Testimony before the  
Subcommittees on Energy and Environment  
Committee on Science, Space and  
Technology  
U.S. House of Representatives**

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**Review of Federal Hydraulic Fracturing  
Research Activities**

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Good morning Chairwoman Lummis, Chairman Stewart, and Members of the Subcommittees. Thank you for the opportunity to present this testimony. I am Dr. Robin Ikeda, Deputy Director of Noncommunicable Diseases, Injury and Environmental Health at the Centers for Disease Control and Prevention (CDC). Currently, I am also serving as the Acting Director of CDC's National Center for Environmental Health (NCEH) and the Agency for Toxic Substances and Disease Registry (ATSDR).

I am pleased to represent the Department of Health and Human Services (HHS) to provide you an update on the work being done across the Department related to hydraulic fracturing. HHS serves a supporting role in providing research and technical assistance on environmental and occupational safety and health risks. While programmatic work throughout the Department related to hydraulic fracturing activities is limited, staff resources and technical expertise are provided to support scientific discourse and collaboration on a range of potential health concerns.

### Background

President Obama has made clear his commitment to safe and responsible development of our natural gas resources as part of an all-of-the-above energy plan. Our scientific experts at CDC, ATSDR, and the National Institutes of Health (NIH) are engaged in activities related to hydraulic fracturing, and I would like to start by briefly describing the missions of each HHS component. CDC/NCEH and ATSDR focus on the ways the environment influences human health. This work includes laboratory research, epidemiologic studies, community public health assessments, and protecting communities from exposures related to Superfund hazardous waste sites and other environmental hazards. Our top priority is protecting people from exposures to hazardous substances using the best available science. CDC's National Institute for Occupational Safety and Health (NIOSH) is responsible for generating new knowledge in the field of occupational safety and health and transferring that knowledge into practice to prevent work-related injury, illness, and death. To accomplish this mission, NIOSH conducts scientific research, develops guidance and authoritative

recommendations, and responds to requests for workplace health hazard evaluations. NIOSH workplace studies and investigations use a tripartite approach to keep industry, labor, and government equally informed and engaged. NIH's National Institute of Environmental Health Sciences (NIEHS) conducts basic, applied, and clinical research on the health effects of environmental exposures.

My testimony will highlight HHS activities related to hydraulic fracturing. Our work in this area can be grouped into four main categories:

1. Coordinating with Federal, State, and Local Partners;
2. Assessing the State of the Science and Soliciting Expert and Stakeholder Input;
3. Evaluating Site-Specific Health Conditions and Potential Exposures in Communities; and
4. Assessing Potential Workplace Exposures and Recommending Practical Solutions to Protect Workers.

### **Coordinating with Federal, State, and Local Partners**

The majority of our work related to hydraulic fracturing has been in collaboration with federal and state partners. For example, last year, following the President's Executive Order on safe and responsible development of unconventional domestic natural gas resources, an interagency workgroup led by a steering committee comprised of the U.S. Environmental Protection Agency (EPA), the Department of Energy (DOE), and the Department of the Interior (DOI) is working to coordinate research across those agencies related to unconventional oil and gas development. Although HHS is not a member of the steering committee, at the request of the committee, several components of HHS – NCEH/ATSDR, NIOSH, and NIEHS – have provided technical support for this initiative.

HHS also provides support to EPA's Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources. For example, ATSDR reviewed the design of

EPA's study. In addition, over the last few months at EPA's request, ATSDR provided health information to several families whose wells were sampled as part of the study.

### **Assessing the State of the Science and Soliciting Expert and Stakeholder Input**

CDC, ATSDR, and NIH/NIEHS are identifying ways to better understand health concerns potentially related to natural gas extraction activities. In April 2012, CDC/ATSDR and NIH/NIEHS participated in a meeting convened by the National Academy of Sciences' Institute of Medicine to better define environmental and public health research needs and responses in the area of hydraulic fracturing. In May 2012, CDC and ATSDR co-hosted a meeting with George Washington University to bring together experts from industry, academia, and government to discuss scientific gaps in understanding of health concerns potentially associated with natural gas extraction.

In October 2012, NIH/NIEHS partnered with the North Carolina Environmental Health Collaborative in a summit to bring together diverse stakeholders interested in exploring the public health implications and prevention of potential adverse public health impacts associated with hydraulic fracturing.

While NIEHS has no programs or activities specifically focusing on unconventional oil and gas research, NIEHS provided \$129,000 of funding in FY 2013 to the University of Rochester, in partnership with the University of North Carolina and the University of Cincinnati, for a one-year project to help understand the information needs among various health professionals, government officials, and communities related to health and hydraulic fracturing in New York, North Carolina, and Ohio.

### **Evaluating Site-Specific Health Conditions and Potential Exposures in Communities**

Broadly, ATSDR's site-specific activities focus on identifying whether health hazards exist from exposures to hazardous substances in air, water, soil, and biota. Typically,

this work has been done at the request of EPA and/or state agencies and often relates to designated Superfund sites. If public health risks are identified, then ATSDR makes recommendations that individuals, organizations, or government agencies can take to protect public health. ATSDR also follows up with local residents to make sure they understand the findings and steps they can take to protect their health. In the last two fiscal years, ATSDR completed more than 300 health consultations, of which approximately one percent examined health concerns potentially related to natural gas development activities.

I will briefly summarize the site-specific assessments in areas with ongoing natural gas development. It is important to note that none of these sites are currently part of EPA's Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources.

The first five assessments were based on environmental sampling collected by EPA or state agencies:

- Dimock, Pennsylvania - At the request of EPA, in 2011, ATSDR reviewed data and supported an EPA "Do Not Use Until Further Notice" action for private wells because of levels of bacteria, methane, and other harmful substances. ATSDR also recommended additional water sampling. Currently, ATSDR is reviewing EPA's 2012 private well sampling from the area to assess the potability of the drinking water.
- LeRoy, Pennsylvania – At EPA's request, in 2011, ATSDR evaluated data collected from seven private drinking water wells following a well-head blow out at a nearby gas well. Based on these data, ATSDR found that levels of salts and other substances in one well and levels of arsenic in another well could pose a health hazard. ATSDR did not attempt to conclusively attribute the presence of chemicals detected in the private wells at this site to a definitive source. While ATSDR can recommend additional sampling to better characterize exposures or protective health actions, ATSDR recognizes the expertise and authority of EPA

and state environmental agencies to determine both the preferred sampling protocols and the sources of contamination. Water treatment systems have since been installed in the homes served by these wells.

- Pavillion, Wyoming – At the request of EPA, in 2011, ATSDR reviewed drinking well water data and confirmed a potential public health hazard due to high concentrations of organic and inorganic chemicals. ATSDR will review additional EPA sampling data and will continue to support EPA’s community education and engagement activities.
- Medina, Ohio - At the request of EPA, in 2011, ATSDR reviewed EPA sampling data and identified a public health hazard due to levels of methane capable of causing an explosion in private drinking water wells. While the source of the methane was unknown, ATSDR recommended that a leaking abandoned natural gas well nearby be sealed because it represented an explosive hazard. ATSDR also recommended that residents vent their water well heads and enclosed spaces where water is used in the home and that additional air and water sampling be conducted.
- Garfield County, Colorado - In 2008 and 2010, at the request of the Garfield County Public Health Department, ATSDR and the State of Colorado examined volatile organic compounds (VOCs) and other contaminants in ambient air. Insufficient information was available to determine if these exposures posed a health risk because toxicity reference values do not exist for more than 60 of the ambient air contaminants measured.

While ATSDR has relied on existing data to conduct the site activities mentioned above, ATSDR has measured contaminants at two sites with limited available data:

- Posey County, Indiana – At the request of Indiana’s Department of Environmental Quality, ATSDR has been working with the Indiana Department of

Environmental Management (IDEM) and USGS to determine whether exposures from potentially contaminated drinking water wells pose a health concern.

- Washington County, Pennsylvania - ATSDR, EPA, and the State of Pennsylvania are collaborating on an air exposure investigation to determine if air exposures around a natural gas compressor station pose a health concern.

As requested by EPA, state agencies, and individual petitioners, ATSDR will continue to address site-specific requests to ensure that community members and partners have objective information that contributes to safe water and air.

### **Assessing Potential Workplace Exposures and Recommending Practical Solutions to Protect Workers**

NIOSH currently supports a six-year effort (2010-2016) to examine the oil and gas industry, establish a comprehensive research agenda, and evaluate worker exposures to chemicals during hydraulic fracturing. In FY 2013, NIOSH will provide \$440,000 in support of these activities.

Occupational safety hazards in the oil and gas extraction industry are well known; however, there are very few data regarding occupational health hazards during hydraulic fracturing operations. In 2008, NIOSH initiated the “Field Effort to Assess Chemical Exposures in Oil and Gas Extraction Workers” program to investigate potential workplace health hazards in this rapidly expanding industry and address the lack of information on occupational exposures associated with hydraulic fracturing.

Initial hazard assessments identified exposure to crystalline silica during hydraulic fracturing as the most significant known health hazard to workers. Silica, in combination with water and chemicals, is used as a means to hold open the fissures created by hydraulic fracturing. Millions of pounds of silica are used at each well. Through formal partnerships with several hydraulic fracturing companies, worker exposure assessments

for silica have been conducted at 11 different sites in five different states (Colorado, Texas, North Dakota, Arkansas, and Pennsylvania). At each of these sites, worker exposures to respirable crystalline silica consistently exceeded the NIOSH Recommended Exposure Limit (0.05 mg/m<sup>3</sup>) and the calculated OSHA Permissible Exposure Limit (0.98 mg/m<sup>3</sup> for samples that are 100 percent silica), in some cases by more than a factor of ten. Inhalation of fine dusts of respirable crystalline silica can cause silicosis, an incurable but preventable lung disease, as well as lung cancer. Silicosis typically develops after long periods of exposure and progresses gradually; however, rapidly fatal cases of acute silicosis resulting from very intense exposures over a short time period are well documented among sandblasters, miners, and other occupational groups.

When the silica hazard was identified, NIOSH widely communicated its findings and recommendations to industry groups, trade associations, and other federal agencies to emphasize the need to take action to control this hazard. In June 2012, NIOSH and the Occupational Safety and Health Administration (OSHA) released a joint Hazard Alert, which discussed the health hazards associated with occupational exposure to airborne silica from hydraulic fracturing. The Alert included recommendations for reducing workers' exposure levels to silica.

In an effort to limit the exposure of workers to silica, NIOSH developed and successfully tested a control technology that reduces the amount of silica dust released from sand moving machines during hydraulic fracturing operations. This technology is currently patent pending and NIOSH has received applications to license and commercialize this new technology.

NIOSH researchers will continue to partner with industry to conduct field-based exposure assessment studies to identify, characterize, and, if needed, recommend control measures. These assessments will involve evaluating exposure to potential contaminants that include benzene, other volatile organic compounds, lead, naturally occurring radioactive material, and diesel particulate matter. Other areas of research by



NIOSH concerning the Oil and Gas Extraction Industry include injuries and fatalities from falls and fires and explosions during drilling and well servicing operations and motor vehicle safety. A common thread through all of this research is collaboration with industry partners and a focus on producing practical outputs to help protect workers, including training materials and informational products.

### Conclusion

HHS maintains an unwavering commitment to ensuring the health and safety of the American people. We believe that by working with our federal and state partners, communities, and industry, we can continue to support a healthy population and a healthy environment.

Thank you for the opportunity to testify today. I look forward to answering any questions you may have.