Hydrofracking in Maryland



Is it an environmental and public health concern?

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Hydraulic Fracturing

• "Hydraulic fracturing or fracking is a means of natural gas extraction employed in deep natural gas well drilling.

Once a well is drilled, millions of gallons of water, sand and proprietary chemicals are injected under high pressure into each well, usually several times.

• The pressure fractures the shale and props open fissures that enable natural gas to flow more freely out of the well.

• For each frack, 80-300 tons of chemicals may be used, including volatile organic compounds (VOC's) such as benzene, toluene, ethylbenzene and xylene.

Waste Pit of Hydro-Fracking Drilling Slurry



Information Gap

- Lack of systematic health impact assessments.
- Lack of health status studies before and during gas development.
 - Information needed to assess toxicity risks- toxicological characteristics of industry products and wastes, and accurate exposure data is usually not available
- Lack of standard methods for prevention and mitigating social impacts.
 - There is limited knowledge about extent, locations rate of development challenging local effects and cumulative effects of environmental impact over time.



American Nurses Association

• House of Delegates "energy" resolution, 2012

"Nurses' Role in Recognizing, Educating, and Advocating for Healthier Energy Choices"

• Resolved: the American Nurses Association will collaborate with others in calling for a national moratorium on new permits for unconventional oil and natural gas extraction (fracking) throughout the country until human and ecological safety can be ensured.

Air Emission Sources from Fracking

Diesel Exhaust & Flaring



Image: Ihup.edu



www.marcellus-shale.us





Groundwater Contamination Issues

- Methane, fracking fluids, wastewater
 - Methane migration to groundwater supplies
 - Accidental chemical spills, illegal dumping
 - Leaking wastewater holding pits

Methane hazards

- At 5% forms explosive mixture with air
- Odorless, requires methane detectors
- Effects of methane in drinking water known

• Other chemical contaminants

• Benzene, xylenes, gasoline range organics, and diesel range organics

300,00 gallons of "flowback" water was intentionally dumped into a "mixed hardwood forest".

4,000 gallon spill from leaky joints in a wastewater pipeline



Illegal Dumping in West Virginia/Wastewater spill in Pennsylvania's Cross Creek



What Chemicals are Associated with Fracking And What is the Health Impact

• Fracturing fluid chemicals :

•In 944 products, 632 chemicals identified of which "75% of these chemicals could affect skin, eyes and other sensory organs, and the respiratory and gastrointestinal system" (Colborn, T., Kwaitkowski, C., Schultz, K., 2011).

Degradation products:

oNaturally occurring materials in the geologic formation (e.g. metals, NORM- naturally occurring radioactive material) that are mobilized and brought to the surface during the hydraulic fracturing & Bachran, M. 2011



Health Impact Study

- Residents closest to well pads have higher risks for respiratory and neurological effects based on their exposure to air pollutants.
- Residents living close to natural gas well are at higher excess lifetime risk for cancer than residents who live farther from the wells.
- Health effects from noise- noise induced hearing loss (worker), sleep disturbance, increased blood pressure, decreased task performance, annoyance and irritability.

Boom Bust Effects

Social Issues

- Community stress
 - ↑ vulnerability to psychiatric problems
 - × Depression
 - × Anxiety
 - × Mental stress
 - ↑vulnerability to physical illness and disease
 - × Increase in STDs
 - Chlamydia rates doubled in Battlement Mesa, CO
 - o ↑crime

Healthcare Infrastructure

- ↑emergency response in rural areas
- ↑psychological, psychiatric problems
- ↑unknown physical health problems
 - Lack of transparency in drilling chemicals used
 - Lack of understanding environmental interactions
 - Lack of research on low-dose chronic exposures

On the Job Exposure

2008: Worker doused in fracking chemicals exposed emergency department nurse Cathy Behr who then became critically ill and nearly died





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