



Fact Sheet

FRACKING: Disposing of Waste Fluids

Overview of Fracking

A relatively new drilling technology — known as high-volume, horizontal hydraulic fracturing or “fracking” — now makes it possible to reach natural gas reserves that underlie much of Ohio.

This deep-shale natural gas drilling uses high-pressure injections of water, sand, and chemicals to release trapped gas. (See the fact sheet titled *Horizontal Fracking* for more overview.)

Billions of Gallons of Water that Won't be Returned



Fracking fluid "holding pond"

Ohio could see more than 4,000 “fracking” wells drilled in the next ten years. These wells are designed to release natural gas trapped deep underground by forcing water and chemicals into the shale rock formations at high pressures to crack (fracture) the rock.

It takes between 2 and 5 million gallons of water to fracture a single well one time, and each well may be fractured multiple times. Between 15% and 35% of the fluids stay underground in the well itself, while the remainder returns to the surface and must be either re-used or disposed of.

This means billions of gallons of this fluid is left underground, while tens of billions more must be either re-used or injected in deep disposal wells (called Class II injection wells).

While most industries are required to clean the water that they use and put it back into the water supply, the oil and gas industry are exempt from this practice.

With Ohio's rush to fracking, this means that billions of gallons are going underground, permanently removed from the water cycle.

Waste Fluids: Potentially Radioactive and Hazardous

The fluids used during fracturing contain many hazardous chemicals and heavy metals, including lead, cadmium, arsenic, mercury, diesel methanol, chlorinated formaldehyde, and benzene.

What's more, the fluid may become radioactive during the fracturing process.

Marcellus shale rock naturally contains radium, a radioactive material that easily dissolves into the rock formation. During the fracturing process, fracking fluids mix

with this radium-bearing formation water. Then the combination of high temperature and high pressure dissolve even more radium into the fluid.

When this mixture (called “produced water”) comes back to the surface, it has even higher concentrations of radium.

Finally, drilling fluid may be reused many times, and the radium concentration can increase with each use.

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Waste Fluids on Roads

Ohio law allows cities and municipalities to approve the spraying of “brines”—a term that includes a broad range of fracking waste fluids—on public roads to control dust or ice, without first testing for hazardous or radioactive contents.

When these hazardous or radioactive compounds contaminate water and soil, the health hazards can persist for decades. In particular, land contaminated by radium found in produced water from the Marcellus Shale can pose a threat to people working or living nearby for almost 20,000 years.

Fluids can Coat Solids, Making Them Hazardous/Radioactive



When “produced fluid” flows back to the surface after fracturing, it carries with it small pieces of shale rock that have broken off the shale formation, called drill cuttings.

These cuttings are soaked in the produced fluid that may be hazardous or radioactive. Separation technologies do not remove 100% of the fluid from the cuttings. Instead, the cuttings are still coated with the waste water when they are sent to solid waste facilities.

Currently, no agency regulates where drillers send their fracking waste, how they transport the waste to a disposal site, or how it is handled once at the site.

This waste will continue to contaminate Ohio for millennia if it is not disposed of properly. Radium continues to emit radiation for thousands of years and eventually decays into harmful radon gas that is not affected by emission control methods typically employed at a landfill.

Another problem is that the radium easily absorbs into the liquid “leachate” that collects in landfills and is sent to public water treatment facilities. Ohio’s Attorney General has declared that such water treatment facilities are not equipped to properly handle this radioactive and otherwise hazardous material.

Recommendations

- The best way to reduce these problems is to reduce the amount of waste produced. Some companies are developing ways to re-use and recycle fracking waste fluids, or using waste fluids from other processes to fracture wells. Regulators should push companies to adopt these methodologies now.
- The Ohio Department of Natural Resources (ODNR) should pass more stringent health and safety regulations for Class II injection wells. As a starting point, these rules should:
 - NOT allow injection wells to be located near drinking water capture areas or within 100-year flood plains. A spill could contaminate vital water supplies.
 - Install water quality monitoring programs around each injection well to ensure that contaminants *never* migrate to the surface.
 - Require documentation of every chemical (even trade secret chemicals) that are injected into each well so that emergency responders know how to react to a problem.
- Ohio law should be amended to prohibit spraying of fracking waste fluids on roads—or anywhere else—without first testing the fluid to ensure its safety.
- ODNR must pass protective regulations of solid waste products, including testing drill cuttings, to ensure that no radioactive materials go to regular landfills. Each applicant for a fracking permit should submit a waste disposal plan for ODNR to review to ensure that the waste is being handled responsibly.