Spills, Accidents Make Water Monitoring Essential in Drilling Areas

by Sue Smith-Heavenrich
Broader View Weekly, March 17, 2011

Most people, when they hear the name Dimock, think immediately of contaminated drinking water wells. Two years ago faulty cement casings led to the contamination of water wells in one part of town. But the impact of drilling goes far beyond that, Victoria Switzer told a small crowd in Binghamton on Monday night, March 14.

Residents often don't even know about spills nearby. Switzer related one incident when drilling mud spilled into a small stream that crosses her seven-acre wooded plot. "We found out about it months later," she said. "My children could have been playing by the water and we would never have known about the danger."

Switzer is one of the residents living in Dimock's "affected area" – it's an official designation by the PA Department of Environmental Protection (DEP), she said. After her neighbor's well exploded, Switzer and others noticed methane in their water. She showed a graph plotting the peak methane levels in the groundwater that she and her neighbors depended on for drinking, cooking and washing.

Cabot Oil and Gas, the company responsible for the gas wells, supplied affected homes with drinking water, filling large plastic containers called "buffaloes" and providing bottled water for drinking. But the families continued using their well water for other things. Then, 15 months later, in April 2010, Switzer noticed that her groundwater looked "soapy". She asked an independent lab to run tests and the results showed ethylene glycol, propylene glycol and toluene present in her well.

"I was lucky that I tested my water before they began drilling," Switzer said, so she had data to back up her assertions that prior to the explosion her water was methane-free. Water tests don't stop contamination, but they provide evidence that, in the case of Dimock residents, was needed to compel the gas company to provide drinking water.

The problem, Switzer says, is that we can't live on bottled water for the rest of our lives, and the PA DEP isn't forcing the gas company to provide a permanent solution to the neighborhood's water woes. "Cabot boasts that they created 400 jobs in Susquehanna County," Switzer said. "Twelve of those are people who deliver our water."

Inadequate Treatment Facilities

Residents in Pittsburgh were told to drink bottled water when, in August 2008, the Monongahela River became overloaded with dissolved solids from drilling and mine wastes. Recent media coverage on radioactivity and other pollutants in Pennsylvania's rivers has state and federal regulators taking a closer look at how drilling waste is treated.

At the heart of the problem is how to dispose of the millions of gallons of returned fracking fluid (flowback) and fluids produced from gas production (brines). While some drillers have been hauling truckloads of waste to out-of-state underground injection wells, others have been trucking their waste to publicly owned wastewater treatment plants.

Drilling waste fluids can make up close to 40 percent of the wastewater intake for treatment plants. But most wastewater treatment facilities are not designed to treat fluids that contain high levels of salts, heavy loads of dissolved solids, and radioactive elements like radium. Instead of settling into the muck and sludge left at the treatment plant, these pollutants are discharged in the effluent and end up in the drinking water supply of people downstream.

Horizontal slickwater hydro-fracking is not yet allowed in NY, but Marcellus waste has made its way into regional waters, says Walter Hang of Toxics Targeting. Using Freedom of Information

requests Hang uncovered data showing that in April 2009 the Cayuga Heights sewage treatment plant accepted 3 million gallons of drilling waste. Despite tests showing that levels of dissolved solids, cadmium, copper and radon exceeded pre-treatment requirements, the sewage treatment facility accepted the drilling waste. The radiation and other pollutants were discharged into the south end of Cayuga Lake, only a mile from the intake for the drinking water plant.

Volunteers Monitor Local Watershed

As drilling companies ramp up their exploitation of local gas reserves, wastes spilled during transport or accidents at the drill site may pollute local rivers and streams. The only way to prevent degradation of freshwater sources is to have a good monitoring system in place.

At least that's what Autumn Stoscheck thought last spring when she proposed baseline monitoring of the rivers and streams that make up the local watershed. Twenty-five community members – known as the Cayuta-Catatonk Water Watchers – participated in training and then, on Super Bowl Sunday, headed out with water test kits in hand to collect their first watershed-wide data.

Steve Penningroth, director of the Community Science Institute in Ithaca, helped develop the monitoring program. Volunteers conduct five measurements: water temperature, pH (acidity), conductivity, hardness and dissolved oxygen. These serve as the best "red flag" indicators of potential problems resulting from drilling accidents, Penningroth said. They also detect changes in water quality at a price volunteers can afford.

Conductivity is one of the best indicators of a change in water chemistry, Penningroth explained. The test is easy enough – just hold the conductivity meter in the river. The hard part is calibrating the instrument before heading out to the field, a task that requires a keen eye and a very tiny screwdriver.

The level of dissolved oxygen indicates the demand for oxygen by microorganisms in the water. It's a good way to monitor long-term and cumulative impacts on a stream, says Penningroth. But it means filling and capping the sample bottle below the surface of the water that, in winter, means pulling plastic bags over mittens. Dissolved oxygen tests also require titration – adding a specific number of drops of a chemical reagent until there's a color change – and that takes a steady hand.

With two sampling expeditions under their belts, the CCWW volunteers are ready to begin monitoring the watershed in earnest. Penningroth and his lab will continue to support the volunteers with training, calibrating test standards, reviewing data and running lab tests on split samples.