

Safety First, Fracking Second

Drilling for natural gas has gotten ahead of the science needed to prove it safe

SCIENTIFIC AMERICAN | By The Editors | Wednesday, October 19, 2011 | 23

A decade ago layers of shale lying deep underground supplied only 1 percent of America's natural gas. Today they provide 30 percent. Drillers are rushing to hydraulically fracture, or "frack," shales in a growing list of U.S. states. That is good news for national energy security, as well as for the global climate, because burning gas emits less carbon dioxide than burning coal. The benefits come with risks, however, that state and federal governments have yet to grapple with.

Public fears are growing about contamination of drinking-water supplies from the chemicals used in fracking and from the methane gas itself. Field tests show that those worries are not unfounded. A Duke University study published in May found that methane levels in dozens of drinking-water wells within a kilometer (3,280 feet) of new fracking sites were 17 times higher than in wells farther away. Yet states have let companies proceed without adequate regulations. They must begin to provide more effective oversight, and the federal government should step in, too.

Nowhere is the rush to frack, or the uproar, greater than in New York. In July, Governor Andrew Cuomo lifted a ban on fracking. The State Department of Environmental Conservation released an environmental impact statement and was to propose regulations in October. After a public comment period, which will end in early December, the department plans to issue regulations, and drilling most likely will begin. Fracking is already widespread in Wyoming, Colorado, Texas and Pennsylvania.

All these states are flying blind. A long list of technical questions remains unanswered about the ways the practice could contaminate drinking water, the extent to which it already has, and what the industry could do to reduce the risks. To fill this gap, the U.S. Environmental Protection Agency is now conducting comprehensive field research. Preliminary results are due in late 2012. Until then, states should put the brakes on the drillers. In New Jersey, Governor Chris Christie set an example in August when he vetoed a bill that would permanently ban fracking, then approved a one-year moratorium so his state could consider the results of federal studies. The EPA, for its part, could speed up its work.

In addition to bringing some rigor to the debate over fracking, the federal government needs to establish common standards. Many in the gas industry say they are already sufficiently regulated by states, but this assurance is inadequate. For example, Pennsylvania regulators propose to extend a well operator's liability for water quality out to 2,500 feet from a well, even though horizontal bores from the central well can stretch as far as 5,000 feet.

Scientific advisory panels at the Department of Energy and the EPA have enumerated ways the industry could improve and have called for modest steps, such as establishing maximum contaminant levels allowed in water for all the chemicals used in fracking. Unfortunately, these recommendations do not address the biggest loophole of all. In 2005 Congress—at the behest of then Vice President Dick Cheney, a former CEO of gas driller Halliburton—exempted fracking from regulation under the Safe Drinking Water Act. Congress needs to close this so-called Halliburton loophole, as a bill co-sponsored by New York State Representative Maurice Hinchey would do. The FRAC Act would also mandate public disclosure of all chemicals used in fracking across the nation.

Even the incomplete data we now have suggest specific safety measures. First, the weakest link in preventing groundwater contamination is the concrete casing inside well bores [see "The Truth about Fracking," by Chris

Mooney]. Inspection of casings should be legally required. Second, the toxic fluid that is a major by-product of fracking is routinely stored in open pits, which can overflow or leach into the soil. It should be stored in tanks instead. Third, gas companies should inject tracers with the fracking fluid so inspectors can easily see whether any of the fluid ends up in the water streaming from residents' faucets. Finally, companies or municipalities should have to test aquifers and drinking-water wells for chemicals before drilling begins and then as long as gas extraction continues, so changes in groundwater are obvious.

It is in the industry's interest to accept improved oversight. Public opinion is turning against fracking. That is unfortunate, because more natural gas could benefit everyone. With basic precautions, we can enjoy both cleaner energy and clean water.

Permanent Address: <http://www.scientificamerican.com/article.cfm?id=safety-first-fracking-second>