FRACKING UP AND FIGHTING FOR THE PUBLIC'S DRINKING AND AQUIFER WATERS

"ProPublica" News Articles on Hydraulic 'Fracking' Gas Drilling Controversies in the United States, July 2008 to September 2010

As reported by:
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Compiled by Will Koop, B.C. Tap Water Alliance, September 26, 2010 (updated)
website:www.bctwa.org/FrackingBC.html

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July 22, 2008. *New York's Gas Rush Poses Environmental Threat.*
www.propublica.org/feature/new-yorks-gas-rush-poses-environmental-threat-722

July 22, 2008. *New York State Tightens Drilling Controls*.
www.propublica.org/article/new-york-state-tightens-drilling-controls-722

July 23, 2008. *Governor Signs Drilling Bill But Orders Environmental Update*.
www.propublica.org/article/governor-signs-drilling-bill-but-orders-environmental-update-723

July 24, 2008. *Despite New York's Order for Environmental Review, Gas Drilling May Proceed*.
www.propublica.org/article/despite-new-yorks-order-for-environmental-review-gas-drilling-724

August 6, 2008. *Fractured Relations - New York City Sees Drilling as Threat to its Water Supply*.
www.propublica.org/feature/natural-gas-drilling-watershed-806

September 9, 2008. *N.Y. Plans to Consider Law Limiting Natural Gas Drilling*.
www.propublica.org/article/nyc-considers-law-limiting-natural-gas-drilling-909

November 13, 2008. *Buried Secrets: Is Natural Gas Drilling Endangering U.S. Water Supplies?*
www.propublica.org/feature/buried-secrets-is-natural-gas-drilling-endangering-us-water-supplies-1113

November 20, 2008. *New Mexico Battles Feds to Stop Gas Drilling Near an Aquifer*.
www.propublica.org/article/new-mexico-battles-feds-to-stop-gas-drilling-near-an-aquifer-1120

November 25, 2008. *NYC Wants Consultants to Probe Effect of Gas Drilling on Drinking Water*.
www.propublica.org/article/nyc-wants-consultants-to-probe-effect-of-gas-drilling-on-drinking-water-112

December 16, 2008. NYC: *Gas Drilling Will Raise the Cost of Water by 30 Percent*.
www.propublica.org/article/new-york-city-calls-gas-drilling-effects-crippling-1216

December 21, 2008. *How the West's Energy Boom Could Threaten Drinking Water for 1 in 12 Americans*
www.propublica.org/feature/how-the-wests-energy-boom-could-threaten-drinking-water-for-1-in-12-america

December 29, 2008. *Where Things Stand: Environmental Pitfalls of Drilling for Natural Gas in the U.S.*
www.propublica.org/feature/where-things-stand-environmental-pitfalls-of-drilling-for-natural-gas-in-th

January 12, 2009. *Setting the Record Straight on Hydraulic Fracturing*.
www.propublica.org/feature/setting-the-record-straight-on-hydraulic-fracturing-090112

April 22, 2009. *Colorado Study Links Methane in Water To Drilling.*
www.propublica.org/feature/colorado-study-links-methane-in-water-drilling-422

April 26, 2009. *Officials in Three States Pin Water Woes on Gas Drilling.*
www.propublica.org/feature/officials-in-three-states-pin-water-woes-on-gas-drilling-426

April 30, 2009. *16 Cattle Drop Dead Near Mysterious Fluid at Gas Drilling Site*.
www.propublica.org/article/16-cattle-drop-dead-near-mysterious-fluid-at-gas-drilling-site-430

May 22, 2009. *EPA Administrator Forecasts Potential Shift on Bush-Era Drilling Loophole*.
www.propublica.org/article/epa-administrator-forecasts-potential-shift-on-bush-era-drilling-loop-522

May 26, 2009. *Natural Gas Politics*.
www.propublica.org/feature/natural-gas-politics-526

June 3, 2009. *Natural Gas Drilling Debate Heats Up*.
www.propublica.org/article/natural-gas-drilling-debate-heats-up-603

June 5, 2009. *Industry Defends Federal Loophole for Drilling Before Packed Congressional Hearing*.
www.propublica.org/feature/industry-defends-federal-loophole-for-drilling-before-hearing-605

June 9, 2009. *FRAC Act—Congress Introduces Twin Bills to Control Drilling and Protect Drinking Water.*
www.propublica.org/feature/frac-act-congress-introduces-bills-to-control-drilling-60

July 6, 2009. *The Story So Far: Gas Drilling's Environmental Threat*.
www.propublica.org/feature/the-story-so-far-gas-drillings-environmental-threat

July 8, 2009. *Energy Industry Sways Congress With Misleading Data.*
www.propublica.org/feature/energy-industry-sways-congress-with-misleading-data-708

July 13, 2009. *Democrats Call for Studies as Industry Assails Proposals to Regulate Hydraulic Fracturing*.
www.propublica.org/feature/democrats-call-for-studies-industry-assails-proposals-regulate-fracking-713

July 29, 2009. *Inhofe Defends Hydraulic Fracturing on Senate Floor*.
www.propublica.org/feature/inhofe-defends-hydraulic-fracturing-on-senate-floor-729

July 31, 2009. *Water Problems From Drilling are More Frequent than PA Officials Said*.
www.propublica.org/feature/water-problems-from-drilling-are-more-frequent-than-officials-said-731

August 4, 2009. *More Gas Contamination Affects Pennsylvania Residents*.
www.propublica.org/feature/more-gas-contamination-affects-pennsylvania-residents-804

August 25, 2009. *EPA: Chemicals Found in Wyo. Drinking Water: Might be from Fracking.* www.propublica.org/feature/epa-chemicals-found-in-wyo.-drinking-water-might-be-from-fracking-825

September 21, 2009. *Frack Fluid Spill in Dimock Contaminates Stream, Killing Fish*. www.propublica.org/feature/frack-fluid-spill-in-dimock-contaminates-stream-killing-fish-921

September 23, 2009. *DEP Issues Citation to Pennsylvania Driller as a Third Spill Occurs*. www.propublica.org/feature/dep-issues-citation-to-pennsylvania-driller-as-a-third-spill-occurs-923

September 25, 2009. *Pennsylvania Orders Cabot Oil and Gas to Stop Fracturing in Troubled County*. www.propublica.org/feature/pennsylvania-orders-cabot-to-stop-fracturing-in-troubled-county-925

September 30, 2009. *New York State Paves Way for Gas Drilling with Release of Environmental Review.* www.propublica.org/feature/new-york-state-paves-way-for-gas-drilling-with-release-of-review-930

October 2, 2009. *Gas Execs Call for Disclosure of Chemicals Used in Hydraulic Fracturing*. www.propublica.org/feature/gas-execs-call-for-disclosure-of-chemicals-used-in-hydraulic-fracturing-102

October 3, 2009. *With Natural Gas Drilling Boom, Pennsylvania Faces an Onslaught of Wastewater.* www.propublica.org/feature/wastewater-from-gas-drilling-boom-may-threaten-monongahela-river

October 7, 2009. *Gas Drilling Vs Drinking Water: New York City Consultant's Report Sets Stage for Fight with Albany*. www.propublica.org/feature/gas-drilling-vs-drinking-water-new-york-city-fight-with-albany

October 8, 2009. *Company Won't Drill in NYC Watershed.* www.propublica.org/feature/company-says-nyc-watershed-more-important-than-profit-from-a-gas-well-1028

October 22, 2009. *New York Drilling Study a Step Forward*. www.propublica.org/feature/new-york-drilling-study-a-big-step-forward-1022

October 23, 2009. *New York City Hints at Anti-Drilling Stance*. www.propublica.org/feature/new-york-city-hints-at-anti-drilling-stance-1023

October 29, 2009. *Feisty Audience Tackles Natural Gas Drilling Report*. www.propublica.org/feature/feisty-audience-tackles-natural-gas-drilling-report-1029

November 3, 2009. *Does Chesapeake's No-Drilling Pledge Do Enough to Protect NYC's Watershed?* www.propublica.org/feature/does-chesapeakes-no-drilling-pledge-do-enough-to-protect-nycs-watershed-110

November 4, 2009. *Public Gets More Time to Comment on New York's Gas Drilling Plans.* www.propublica.org/article/public-gets-more-time-to-comment-on-new-yorks-gas-drilling-plans

November 6, 2009. *Pennsylvania Tells Drilling Company to Clean Up its Act*. www.propublica.org/feature/pennsylvania-tells-drilling-company-to-clean-up-its-act-1106

November 9, 2009. *Is New York's Marcellus Shale Too Hot to Handle?* www.propublica.org/feature/is-the-marcellus-shale-too-hot-to-handle-1109

November 10, 2009. *Congress Tells EPA to Study Hydraulic Fracturing*. www.propublica.org/feature/congress-tells-epa-to-study-hydraulic-fracturing-hinchey-1110

November 11, 2009. New Yorkers Tell State Enviro Department: 'No Fracking Way'. www.propublica.org/feature/new-yorkers-tell-dec-no-fracking-way-1111

November 11, 2009. *ProPublica's Abrahm Lustgarten on the Brian Lehrer Show.* www.propublica.org/feature/propublicas-abrahm-lustgarten-on-the-brian-lehrer-show

November 20, 2009. *Pa. Residents Sue Gas Driller for Contamination Health Concerns*. www.propublica.org/feature/pa-residents-sue-gas-driller-for-contamination-health-concerns-1120

December 14, 2009. *Underused Drilling Practices Could Avoid Pollution.* www.propublica.org/feature/underused-drilling-practices-could-avoid-pollution-1214

December 15, 2009. *Colorado Towns Take Extra Measures to Protect Their Water from Gas Drilling*. www.propublica.org/feature/colorado-towns-take-extra-measures-to-protect-water-from-gas-drilling-1215

December 24, 2009. *New York City Calls for Ban in Watershed, Rejects State Study*. www.propublica.org/feature/new-york-city-calls-for-drilling-ban-in-watershed-rejects-state-study-1224

December 27, 2009. *In New Gas Wells, More Drilling Chemicals Remain Underground.* www.propublica.org/feature/new-gas-wells-leave-more-chemicals-in-ground-hydraulic-fracturing

December 29, 2009. *Drilling Wastewater Disposal Options in N.Y. Report Have Problems of Their Own.* www.propublica.org/feature/drill-wastewater-disposal-options-in-ny-report-have-problems-1229

December 30, 2009. *State Oil and Gas Regulators Are Spread Too Thin to Do Their Jobs.* www.propublica.org/feature/state-oil-and-gas-regulators-are-spread-too-thin-to-do-their-jobs-1230

December 31, 2009. *Natural Gas Drilling: What We Don't Know.* www.propublica.org/feature/natural-gas-drilling-what-we-dont-know-1231

February 19, 2010. *Congress Launches Investigation into Gas Drilling Practices*. www.propublica.org/article/congress-launches-investigation

February 22, 2010. *Gas Drillers Plead Guilty to Felony Dumping Violations*. www.propublica.org/article/gas-drillers-plead-guilty-to-felony-dumping-violations/

March 18, 2010. *EPA Launches National Study of Hydraulic Fracturing*. www.propublica.org/article/epa-launches-national-study-of-hydraulic-fracturing/

April 7, 2010. *Broad Scope of EPA's Fracturing Study Raises Ire of Gas Industry*. www.propublica.org/article/broad-scope-of-epas-fracturing-study-raises-ire-of-gas-industry/

July 2, 2010. *A Fracking First in Pennsylvania: Cattle Quarantine*. www.propublica.org/article/a-fracking-first-in-pennsylvania-cattle-quarantine/

July 12, 2010. *For Gas-Drilling Data, There's a New Place to Dig*. www.propublica.org/article/for-gas-drilling-data-theres-a-new-place-to-dig/

July 15, 2010. *Drilling Company says it will List Hazardous Chemicals Used in Fracking*. www.propublica.org/article/drilling-company-says-it-will-list-hazardous-chemicals-used-in-fracking/

July 20, 2010. *Information from Gas-Drilling Companies isn't Coming Easily, Congressmen Say*. www.propublica.org/article/information-from-gas-drilling-companies-isnt-coming-easily-congressmen-say/

July 29, 2010. *Drilling Accountability Bill Would Regulate Fracturing Too*. www.propublica.org/article/drilling-accountability-bill-would-regulate-fracturing-too/

August 2, 2010. *Why Gas Leaks Matter in the Hydraulic Fracturing Debate*. http://www.propublica.org/article/why-gas-leaks-matter-in-the-hydraulic-fracturing-debate/

August 4, 2010. *New York State Passes Temporary Ban on Hydraulic Fracturing*. http://www.propublica.org/article/new-york-senate-passes-temporary-ban-on-hydraulic-fracturing/

August 5, 2010. *Drilling Industry and Gubernatorial Candidates Move to Weaken Some State Regulations*. www.propublica.org/article/drilling-industry-and-gubernatorial-candidates-move-to-weaken-some-state-re/

August 27, 2010. *What You Need to Know about Hydrofracking*. www.propublica.org/article/what-you-need-to-know-about-hydrofracking/

September 1, 2010. *Feds Warn Residents Near Wyoming Gas Drilling Sites Not to Drink Their Water*. http://www.propublica.org/article/feds-warn-residents-near-wyoming-gas-drilling-sites-not-to-drink-their-wate

September 8, 2010. *Do 'Environmental Extremists' Pose Criminal Threat to Gas Drilling?* http://www.propublica.org/article/do-environmental-extremists-pose-criminal-threat-to-gas-drilling

September 14, 2010. *Wyoming Fracking Rules Would Disclose Drilling Chemicals*. http://www.propublica.org/article/wyoming-fracking-rules-would-disclose-drilling-chemicals

P.S. There are public comments attached to the articles in the website addresses above.

New York's Gas Rush Poses Environmental Threat

by Abrahm Lustgarten, ProPublica - July 22, 2008 1:42 pm EST

On May 29 New York state's top environmental officials assured state lawmakers that plans to drill for natural gas near the watershed that supplies New York City's drinking water posed little danger.

A survey of other states had found "not one instance of drinking water contamination [1]" from the water-intensive, horizontal drilling that would take place across New York's southern tier, the officials told lawmakers in Albany.

Credit: New York State Department of Environmental Conservation

Reassured, the legislature quickly approved a bill to speed up the permitting process for a huge influx of wells that could bring the state upwards of $1 billion in annual revenue. Gov. David Paterson has until Wednesday to decide whether he will sign the bill, and the state's Department of Environmental Conservation, or DEC, says drilling permits could be approved in as little as 12 weeks.

But a joint investigation by ProPublica and New York City public radio station WNYC [2] found that this type of drilling has caused significant environmental harm in other states and could affect the watershed that supplies New York City's drinking water.

In New Mexico, oil and gas drilling that uses waste pits comparable to those planned for New York has already caused toxic chemicals to leach into the water table at some 800 sites. Colorado has reported more than 300 spills affecting its ground water.

DEC officials told ProPublica and WNYC they were not aware of those incidents, even though some of the information could have been found through a rudimentary Internet search. The officials couldn't say for sure how New York would dispose of the millions of gallons of hazardous fluids that are byproducts of this type of drilling, and they learned only recently that the new drilling techniques would pump trace amounts of toxic chemicals into the ground. Four days after one interview, the DEC drafted a letter [3] to the drilling companies, asking for detailed information about the type and amount of chemicals they will use.

With energy prices at record highs -- natural gas prices are twice what they were in January -- difficult-to-reach deposits of oil and gas in the United States are becoming commercially viable. At least nine companies have been locking up leases in New York, Pennsylvania and Appalachian states for drilling rights to the Marcellus Shale, a gas-rich rock layer that dives 7,000 to 9,000 feet beneath the earth's surface. Some geologists predict it could meet the entire nation's natural gas needs for more than two years.

But the extraction of natural resources from sensitive areas creates new problems for individual states, which bear the primary responsibility for protecting their environments. Some have created, or are in the process of creating, new regulations. Others, like New York, are just coming to grips with the potential impact of the drilling boom that may be headed their way.

New York's existing laws have served it well for the most part. Since 1963 the state has permitted more than 13,000 gas wells with few problems.

"When we say we are going to protect the environment, you don't have to trust us, you don't have to believe us," said Val Washington, deputy commissioner of remediation and materials management. "But look at our track record. I think it's pretty good."

However, the Marcellus development will be far more complicated than any previous drilling operations in the state. It will involve deeper, horizontal wells, possibly thousands of them. Each could suck up, and later spit out between 1 million and 5 million gallons of water -- hundreds of times the amount used by a conventional well. That would place a significant burden on New York's watersheds, including those that feed New York City's reservoirs and farmland in Chemung, Tioga, Broome, Delaware and Sullivan Counties.

Some of the regional DEC offices that would oversee the Marcellus wells have no experience with gas drilling at all. Yet New York officials said they see little reason to update their generic 1992 environmental impact statement, which was drafted long before this form of drilling, called horizontal hydraulic fracturing [4] or hydrofracking, was feasible on such a large scale.

"There is a little bit of learning curve...and that is where the concern falls," said William Kappel, a hydrologist with the U.S. Geological Survey in Ithaca, N.Y. "The tremendous amounts of water used for these processes -- where are you going to get it and what are you going to do with that?"

DEC officials could not answer those questions. They also acknowledge that they don't track the process drillers use to dispose of "produced water," as the gas and oil industry refers to its waste.

The DEC says the issue of drilling in the Marcellus has come on fast. "It wasn't until last fall that we were really hit with the realization of what was happening," said Washington. "We heard about the leases down on the southern frontier, and it's been fairly recent, so we have our own work to do."

Understanding the Geology

The gas in the Marcellus is held in tiny pockets, like bubbles in a brick of Swiss cheese. To extract it, a mixture of water, sand and chemicals is shot into the earth with such explosive force that it fractures the rock, releasing the bubbles to the surface. Along with the gas comes most of the water that was shot down the well. But by the time the water re-surfaces, it is also laden with natural toxics from the shale layer below -- hydrocarbons, cancer-causing compounds including Benzene, Toluene, Xylene, and even radioactivity from uranium ore.

An open well pit in Susquehanna County, Pa., holds the sediment from a freshly-drilled well. (Credit: Edward Marritz)

Waste water from the Marcellus formation may turn out to be slightly cleaner than that from other formations, early trials indicate, because it contains fewer of the naturally occurring toxins. But the U.S. Department of Energy lists produced water from gas drilling as among the most toxic of any oil industry byproduct, and when the water returns to the surface, it must be dealt with as toxic industrial waste. According to a 2004 report [5] from Argonne National Laboratory prepared for the energy department, "Studies indicate that produced waters discharged from gas... platforms are about 10x more toxic than the produced waters discharged from oil platforms."

In most states the tainted water produced by gas drilling is injected back into the ground in areas where solid rock layers keep it isolated from people or their drinking water. But the geology in New York and Pennsylvania is different, and the water will be discharged into an ecosystem where it might wind up coming out of New York City's taps.

DEC's current regulations require only that produced waste be treated before being discharged back into rivers. Agency officials said the water would be shipped to Pennsylvania and treated in specialized plants there. But an executive for three of the Pennsylvania plants told ProPublica and WNYC that New York officials hadn't talked to him about the Marcellus wells. He said his plants don't have the capacity to accept wastewater from New York.

"Don't bet on it," said Paul Hart, president of Hart Resource Technologies, which owns and operates three of the region's five facilities, and whose phone number was given to ProPublica by New York DEC. Hart said his company can't even build plants fast enough to handle Pennsylvania's drilling expansion.

An executive with another plant said DEC had talked to him about taking some of the waste water, but he too had serious concerns about how New York will deal with a huge quantity of waste.

Treating the Water

The challenges New York faces in controlling drilling's effect on its water are illustrated by what is happening at Tamarac Swamp, a state-protected ecological area.

Owners of this state-protected wetland near Oxford, N.Y. learned that a water services company was withdrawing water for use in a nearby gas drilling operation. New York does not uniformly regulate water withdrawals for industrial use and does not have a comprehensive plan to provide the millions of gallons

of water needed for proposed drilling of the Marcellus Shale. (Credit: Lori Zunno)

The swamp sits on a quiet rural road brimming with oaks and maples, outside Oxford, N.Y., about a 45-minute drive from Binghamton. Last year, Oklahoma City-based Chesapeake Energy, the nation's third largest gas producer, approached the sprawling wetland's owners with an offer to lease drilling rights for $75 an acre, a bargain compared to today's asking prices of $2,500.

The Zunno family declined Chesapeake's offer, intending to preserve the wetland instead. But last month the family spotted a tanker truck from another drilling company. Its long septic hose was draped over the side of the public roadway, draining water from the Zunno's culvert. Lori Zunno said a well had been built on a neighbor's land and its operator had sent contractors in search of water for the drilling.

"We can't even build within 100 feet of [the swamp] so I don't understand why they can take septic trucks and pump it out," Zunno said.

Zunno filed a complaint with the DEC, but she said no one seemed to know who was responsible for protecting her land, or what, if anything, the tanker company had done wrong. "They don't even know their own rules -- what's regulated and what's not," she said. "There was such a lack of knowledge on their part about what could be done. There is no clear cut 'you cannot take water from this spot.'"

It turns out that the withdrawals from the Zunnos' property should be regulated by the Susquehanna River Basin Commission. But Zunno didn't know that. And neither did three DEC officials, who didn't mention the Susquehanna commission before they declined to comment on the Zunnos' complaint.

The Susquehanna commission and the neighboring Delaware River Basin Commission both require permits for regular or large water withdrawals, but New York does not regulate surface water extraction in other parts of the state. Anyone can take water from, say, the Hudson River, according to DEC's regional captain for law enforcement in the Zunnos' part of the state. When it comes to smaller water resources such as the Tamarac swamp, state law says only that wetlands cannot be drained.

Scientists and local land owners fear thousands of small water sources such as the Tamarac will be tapped to support the drilling industry, legally or illegally. The concern is that lots of small withdrawals will have a large impact.

"It's not clear to me that there is any group who is looking at the overall impact of withdrawing the amount of water that might be required for the hydrofracking. Who is looking at the broader picture?" said Susan Riha, director of the New York State Water Resources Institute [6], a federally funded study group at Cornell University.

Riha is especially concerned about the limitations of the DEC's Environmental Assessment Form [7], a crucial environmental impact document that drilling companies must file to get a permit. It doesn't ask where drillers plan to get their water and only asks for a vague estimate of how much they plan to use.

“Looking at that short form, I was shocked,” Riha said. “It seems like we would have some procedures in place to put some pressure on the gas drilling operators to show that they are taking all possible steps to mitigate environmental impacts.”

DEC officials acknowledged the gaps. “You’re getting into the concept of cumulative impacts,” said James Tierney, assistant commission for the division of water. “One water withdrawal may not have an impact, but 50 would have a huge impact. We’re trying to figure it out.”

This issue alone, says Riha, is reason enough under the State Environmental Quality Review Act, which mandates impact evaluations, to order a supplement to the 1992 environmental impact statement the DEC is still using.

Scientists are also concerned about chemicals added to the water to prevent corrosion in the drill bits, lubricate the drilling and keep the drilling mud, as the mixture is called, at the right consistency to coax out gas.

Bradley Field, the director of New York’s Division of Mineral Resources, recently became aware of the chemicals added to drilling fluid. He has not decided whether his division will require well operators to name their chemical additives in order for their applications to drill in the Marcellus to be approved. (Credit: Abrahm Lustgarten/ProPublica)

As recently as last month, Bradley Field, the DEC’s director of the division of oil and minerals -- the agency responsible for overseeing resource extraction in the state -- appeared unaware of these additives. At a meeting with conservation advocates and state legislators he said drilling fluids contained nothing more than water and sand, according to Roger Downs, a conservation associate with the Sierra Club’s Atlantic Chapter.

DEC has since adjusted its stance.

“They add chemicals, we know they do that,” said Tierney, the water division official, in a meeting July 7. “We don’t know exactly what they are.”

In part that’s because the industry views its chemical recipes as trade secrets, akin to the formula for Coke or Pepsi, and federal laws exempt the oil and gas industry from disclosing those recipes to the public. For the most part, states have learned about the chemicals by analyzing waste pits and the contaminated ground water around them.

Tracking Down the Chemicals

In 2004 Theo Colborn, a respected scientist who specializes in the health effects of low-dose chemical exposure and opposes gas drilling, began investigating the makeup of drilling fluids. She was spurred by the story of a Colorado resident who suspected her cancer was tied to water contamination from a nearby gas well.

To figure out what was in the water, Colborn collected shipping manifests that trucks must carry when they haul hazardous materials for oil and gas servicing companies. When an accident occurred -- a well spill in Colorado, or an explosion at a drilling site in Wyoming -- she took water and soil samples and tested them for contaminants.

Colborn's list eventually grew to nearly 200 chemicals, from suspected cancer-causing compounds like Benzene to a compound called 2-BE, which she told Congress [8] causes adrenal tumors and other human health problems.

Her findings are supported by studies in New Mexico, Wyoming and Texas. Tests done [9] by the New Mexico Office of Oil Conservation on mud and water from two gas drilling pits found Benzene, Toluene, Naphthalene and other substances.

In the Barnett Shale in Texas -- the formation geologists consider most similar to the Marcellus Shale -- the state has overseen the cleanup of radioactive material dredged up at hundreds of gas sites.

In Wyoming, where natural gas development has occurred on a large scale, the Environmental Protection Agency recently raised flags about one of the state's biggest gas fields, the Pinedale anticline, where a large drinking water aquifer appears to have been contaminated. In a letter circulated to drillers there this summer, the EPA wrote that it found Benzene and other compounds in more than a third of groundwater samples tested. "Such impacts are environmentally unsatisfactory," the letter said.

Credit: New York State Department of Environmental Conservation

Val Washington, the New York DEC official, insisted New York can handle such problems.

"This is not New Mexico, this is not Colorado, this is New York," said Washington. "Out of 13,000 wells that we have permitted, we have not, for example, had a single ground water problem with any of them."

In conversations with ProPublica, DEC officials repeatedly downplayed the importance of the chemical additives. They make up just a tiny fraction of a percent of the fluids, Field said, because 99.4 percent is water and sand. But the remaining six-tenths of one percent of two million gallons of drilling water still equals 10,000 gallons of toxic chemicals -- and that's just for one well.

When pressed on whether New York would require the names of those chemicals as a prerequisite for approving an application in the Marcellus, Field said, "I don't know. We'd have to take a look. I can't say for sure right now."

Asked why he might not require the names, he replied, "Because it would be a departure from how we typically do this. I haven't really come to terms with that just yet."

Hart, the Pennsylvania treatment plant executive, said the last time he talked with a DEC representative, the caller, whose name he couldn't remember, displayed a general lack of understanding of water issues and didn't have a clear grasp of waste water disposal alternatives.

"He did not understand the variations of the different chemicals and the potential for contamination," Hart said. "Now with the Marcellus they are just completely unprepared for it. What I really think they are waiting for is the industry to make recommendations. I don't think they are going to be proactive."

DEC's recent letter [3] drafted to the gas industry asked for exhaustive data and information that closely adhered in both substance and actual language to questions posed by ProPublica and WNYC. It gave the companies four and a half weeks to comply with the request. But it did not make compliance a condition for drilling.

For now, DEC's officials are asking their critics to have faith.

"If there is any doubt in anybody's mind that we are going to proceed with these applications without full protection and consideration for the environment, they are just wrong," Washington said. "It may be that the applicants down the line are going to have to wait a long time for their permits. There are some things to sort out here."

Jonathan Sidhu and Allison Battey contributed to this report.

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Tags: Drilling, Marcellus Shale, Natural Gas

New York State Tightens Drilling Controls

by Abrahm Lustgarten, ProPublica - July 22, 2008 9:27 pm EST

New York state will require drilling companies to disclose all chemicals used to exploit natural gas deposits in upstate New York. That's according to Judith Enck, deputy secretary for the environment for Gov. David Paterson.

Enck made the announcement in an exclusive interview [1] with WNYC radio, just hours after the release of ProPublica's [2] and WNYC's [3] joint investigation into the state's regulatory and environmental oversight of the gas industry in New York.

Credit: New York State Department of Environmental Conservation

The investigation found that state environment officials were slow to learn that toxic chemicals were part of the gas drilling process and that those chemicals are typically held as competitive trade secrets by industry. It also found that the state doesn't have a comprehensive plan for supplying the vast quantities of water needed for drilling or treating that water once it is mixed with the chemicals.

Today's announcement by Enck marks a departure for state officials. When questioned over the past month by WNYC and ProPublica, officials at the state Department of Environmental Conservation repeatedly declined to say whether they would require disclosure of the chemicals involved in the drilling.

It remains unclear how the drilling companies would deal with the millions of gallons of waste water the wells would produce. Treatment plants would need to know the identities of any contaminants in order to remove them fully from water before discharging it back into the state's rivers.

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Tags: Drilling, Hydraulic Fracturing, Marcellus Shale, Natural Gas

Governor Signs Drilling Bill But Orders Environmental Update

by Abrahm Lustgarten, ProPublica - July 23, 2008 4:57 pm EST

Credit: Office of the New York State Governor

Governor David Paterson signed a bill this afternoon to streamline the application process for drilling in New York's Marcellus Shale, but he also ordered the state to update its 1992 generic environmental impact statement in the process.

The directive comes one day after the release of a joint investigation by ProPublica [1] and WNYC radio [2] into the state's regulatory and environmental oversight of the gas industry. The report found that the state was relying on a 16-year-old environmental review and had not addressed the large quantities of water needed for the drilling, or the treatment of that water as toxic waste.

In a release [3] that accompanied the announcement of the bill's signing, Department of Environmental Conservation commissioner Pete Grannis promised that "DEC will be vigilant in ensuring environmental safeguards. Water protection will be a top priority."

"The update will examine potential impacts from new horizontal drilling techniques, including potential impacts to groundwater, surface water, wetlands, air quality, aesthetics, noise, traffic and community character, as well as cumulative impacts. The update will occur as part of a public process that ensures that concerns raised by residents who could be affected by drilling activities are heard and considered.

"In addition, DEC is reviewing a variety of other areas, including staff resources, existing regulations, jurisdiction over water withdrawals, permit application fees and procedures, and legal and regulatory compliance, that could be implicated by increased drilling activity."

There's more to say about what this all really means, so check back for developments tomorrow.

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Tags: Drilling, Hydraulic Fracturing, Marcellus Shale, Natural Gas, Water

Despite New York's Order for Environmental Review, Gas Drilling May Proceed

by Abrahm Lustgarten, ProPublica - July 24, 2008 10:02 am EST

Gov. David Paterson's executive order [1] for an updated environmental review for gas drilling in New York could take 12 months to complete, but that doesn't mean drilling in the Marcellus Shale can't begin in the meantime.

Bulldozers and diggers prepare a meadow for drilling in Susquehanna, Pa. (Credit: Edward Marritz)

"The announcement of the preparation of a supplemental environmental impact statement does not necessarily freeze drilling," said Judith Enck, the deputy secretary of the environment in the governor's office. "He understands that there are potential economic benefits to upstate New York in terms of job creation and expansion of the tax base. He also thinks that if drilling goes forward he wants it to happen in the most protective way possible."

The bill the governor signed into law on Wednesday did not rule on whether or not drilling can proceed -- drilling is already allowed in New York -- but is more akin to a zoning regulation. It simplifies the drilling permit application process by standardizing the above-ground spacing between wells and their below ground horizontal reach, rather than leaving those decisions to be made on a case-by-case basis.

A joint investigation by ProPublica [2] and WNYC radio [3] this week into regulatory and environmental oversight of the gas industry found the state was relying on a 16-year-old environmental review and had not addressed the gathering of large quantities of water used for drilling, or the treatment of that water as toxic waste.

When he signed the bill, the governor ordered an update to the 1992 generic environmental impact statement, which he recognized did not address the horizontal drilling technology [4] that will be used to extract natural gas from the Marcellus Shale, a rock formation that lies 7,000 to 9,000 feet below the southern part of New York state. That review, Enck told ProPublica, will begin with a series of public meetings and information gathering across the state's southern tier in spring 2009, and result in a new supplemental draft by the following fall.

That process will start the clock ticking for the drilling industry, which has made large investments in land leases that expire in about five years.

Tom West (Credit: Abrahm Lustgarten/ProPublica)

"Environmental impact statements tend to take some amount of time, probably longer than the industry is going to be willing to wait for them," said Tom West, president of The West Firm, a lobbying group that represents most of the major gas companies interested in the Marcellus Shale. West says the industry supports a comprehensive environmental review, but needs to move through its exploration phase towards real production at the same time. "What would be nice if it works out is some of these exploration wells get drilled in the meantime, while the GEIS is being assembled."

One possible kink is that a fresh environmental review could call into question the very spacing bill the governor signed this week, and that leaves environmental groups skeptical of the fine line the state is walking.

"It's a bit of a piecemeal approach, and it's too bad because this is a comprehensive problem," said Wes Gillingham, program director for Catskill Mountainkeeper, an environmental group that opposes drilling. Gillingham says the governor's comments still don't directly address what drilling could mean for the New York City watershed and the city's drinking water. "Approving this bill...is creating more questions."

Along with the environmental review, Gov. Paterson called for an assessment of staffing and enforcement capabilities at the state Department of Environmental Conservation, a reexamination of jurisdiction over water withdrawals and an evaluation of the overall existing environmental regulatory structure as it relates to drilling.

Asked whether the governor's requests will translate into action, Enck was firm.

"I think when the governor asks you to do something it's never informal," she said.

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Tags: David Paterson, Drilling, Marcellus Shale, Natural Gas

Fractured Relations—New York City Sees Drilling as Threat to Its Water Supply

by Abrahm Lustgarten, ProPublica - August 6, 2008 7:30 am EST

New York City officials have demanded a ban on natural gas drilling near upstate reservoirs because they fear the drilling could contaminate the city's drinking water.

The Ashokan Reservoir is part of the city's Catskill water supply system. (Credit: Jim McKnight/AP Photo)

They've asked the state Department of Environmental Protection to establish a one-mile protective perimeter around each of the city's six major Catskill reservoirs and connecting infrastructure -- a buffer that would put at least half a million acres off-limits to drilling. They also want to wrest more regulatory control from Albany.

New York is one of just four major cities in the United States with a special permit allowing its drinking water to go unfiltered, and that pristine water comes from a network of reservoirs and rivers in five upstate counties. If the special permit was revoked, the city would have to build a treatment facility that could cost nearly $10 billion, said Walter Mugden, a senior official at the U.S. Environmental Protection Agency. That's roughly what the state estimated it would earn from gas development over the next decade.

In a letter [1] (PDF) from the city Department of Environmental Protection to state officials, obtained by ProPublica, commissioner Emily Lloyd said she was not satisfied with the state's assurances that the environment would be protected from drilling in the Marcellus Shale, a layer of rock that dives up to 9,000 feet below much of the Appalachian east, including south central New York state and the 2000-square-mile watershed.

The letter doesn't offer any specifics on how drilling might taint the city's water or explain the basis for the one-mile buffer, but it made clear that as guardians of New York's water, city officials view drilling as a serious threat to the tap water supply for nine million downstate residents. It could involve thousands of gas wells producing billions of gallons of toxic wastewater.

"If you are ranking areas of concern that need extremely careful protection [the New York watershed] would have to be at the top of anybody's list," Mugden said. "More than half the state...depends on that watershed on a daily basis."

Commissioner Emily Lloyd expressed her dissatisfaction with state officials' assurances that the city's watershed would be protected from drilling in the Marcellus Shale in a letter obtained by ProPublica. (Credit: Edward Reed)

Lloyd asked that a state, city and federal working group be formed to reassess regulations in the watershed and to recognize it "as a unique resource requiring special protection." She called for the city to be given a say in the state's permit review process, and for the public to be allowed to comment on each well's permit, something that is not guaranteed now.

The Marcellus Shale is among several large new gas reserves in the United States that have become economically viable in a time of record oil and gas prices. Terry Engelder, a geologist at Penn State University, believes it could meet all the nation's natural gas needs for two years. The Department of Environmental Conservation, which oversees exploration, has estimated that Marcellus development could add as much as a billion dollars a year to the state's anemic economy.

Still, the environmental consequences of developing Marcellus wells on a large scale could be severe. Getting the gas involves a process called hydrofracking [2], or shooting millions of gallons of water and drilling chemicals at explosive pressure deep underground to break up the rock, and drilling the Marcellus would require more water than most other types of drilling. The identity of the chemicals, which are sometimes toxic, is protected as a trade secret, making it difficult to assess how wastewater can be safely treated and discharged. Drilling in other states has resulted in more than a thousand wastewater spills that have affected drinking water.

An investigation last month [3] by ProPublica and WNYC public radio found that New York state had not adequately assessed the environmental risks and did not have a complete regulatory structure in place to determine where the immense amounts of water used would come from, or how it would be disposed of after it was used. It found that New York state did not know the chemical contents of the drilling fluids that industry would use, and was not aware of the level of contamination in other states.

Last week Gov. David Paterson ordered the DEC [4] to update the 16-year-old environmental impact assessment it was relying on and pledged to require the industry to disclose the chemicals it uses. But he did not promise to stop drilling from going forward in the meantime.

Lee Fuller, vice president of government relations for the Independent Petroleum Association of America, said the city's worries are unfounded because the wastewater will be managed and is regulated under state law. "I don't see this hypothetical risk to New York's drinking water as realistic at all," he said.

The city was not brought into the gas drilling conversation until mid-July, even though state officials had been working on the issue for seven months. The city sent a letter to state officials raising concerns about a new well-spacing bill that was before the governor, and Lloyd requested special consideration for the watershed a few days later.

Both the state and the city have tried to keep their negotiations private. A DEC spokesman said the agency works closely with the city, and the city responded in kind.

“DEC has given us every assurance we have asked for,” Lloyd said through a spokesperson Friday, “...that the environmental review will be very stringent, that we will be at the table throughout the process, and that protecting water quality is their first priority as well as ours.”

Councilman James Gennaro, chairman of the city’s Environmental Protection committee, is calling for a moratorium on drilling in the Catskill watershed. (Credit: John Smock/AP Photo)

James Gennaro, a New York City councilman and chairman of the city’s committee for environmental protection, wants the city to go further. He is calling for a complete moratorium on drilling anywhere in the Catskill watershed, which provides 90 percent of New York City’s water and also makes up the heart of the Marcellus deposit. He said he will ask the EPA to conduct its own study of the threat drilling poses to the city’s drinking water.

“I just don’t think it’s a proper activity for an area which is the city of New York’s most precious capital asset,” he said. “I think it poses a risk. I think they are going to say quite candidly that it is a problem. Let the federal government go on record.”

The face-off pits the city’s interests against the broader economic needs of the state, so its solution may not be simple, according to Eric Goldstein, an attorney with the Natural Resources Defense Council. Gas leases are selling for as much as $3,000 an acre in parts of the state with stagnant economies.

The historic upstate-downstate friction can be attributed at least in part to the controversy over New York City’s acquisition of the watershed lands in the early 1900s, Goldstein said. “Those were pure eminent domain takings; thousands of residents were moved, towns were relocated, cemeteries dug up and bodies reinterred. Obviously some tensions have remained.”

Goldstein said New York City may have the law on its side, because public health code gives it the power to set and enforce any pollution controls in the watershed. But unilateral action would be a last resort. Instead, the city is more likely to search for a cooperative solution that leaves the door ajar for upstate economic growth while still saving the city’s water.

“You could say that from a legal standpoint they have authority,” Goldstein said. “How and whether they might choose to use it is another question.”

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N.Y. Plans to Consider Law Limiting Natural Gas Drilling

by Allison Battey, ProPublica - September 9, 2008 9:35 am EST

Assemblyman James Brennan, inset, plans to introduce a bill in the state's legislature that would permanently ban drilling in New York City's watershed. (Credit: Wikimedia Commons)

New York City officials seeking a moratorium on natural gas drilling in the city's watershed have found an ally in the state legislature.

Assemblyman James Brennan, who represents part of Brooklyn, announced Thursday that he will introduce a bill in next year's session that would permanently prohibit drilling in the city's watershed. Brennan's proposal is in line with that of city councilman James Gennaro, who called for such a moratorium in July and will hold a hearing [1] on the issue Wednesday at City Hall. The New York City Department of Environmental Protection proposed its own conditions in a July letter [2] (PDF) to the state, calling for a one-mile protective barrier around each of the city's reservoirs.

Brennan spokeswoman Lorrie Smith said the assemblyman expects his bill to face opposition and sees it as a starting point for negotiations.

This is the second time that Brennan has called for such a moratorium. In June, he introduced a bill that would have placed a two-year, statewide moratorium on the issuance of permits for new wells and mandated that the state Department of Environmental Conservation (DEC) complete a new environmental impact statement for the drilling in that time. In July, Governor Paterson ordered [3] a supplemental environmental impact statement to update a 16-year-old study when he signed a bill authorizing revised well-spacing regulations, but Smith said Paterson didn't go far enough.

"That's all fine and good," Smith said. "But it doesn't absolutely prevent permits from being issued and drilling from taking place."

So far, no drilling companies have applied for permits to drill in the New York City watershed, according to the DEC.

Brennan worries that drilling in the New York City watershed might contaminate the water supply that serves more than half of the state's population, Smith said.

A ProPublica investigation [4] of the gas drilling process and horizontal hydraulic fracturing, the water-intensive drilling technique proposed for wells in the Marcellus Shale, found more than 1,000 instances of water contamination in western states. The DEC says there have been no instances of contamination in New York state.

Assemblyman William Parment, who sponsored the July well-spacing bill and represents an upstate district that has already seen gas drilling, thinks Brennan's bill is a "grand gesture" that may make a little headway because of the recent controversy around drilling but is unlikely to actually pass.

"The presumption that somehow DEC is going to allow an activity that will endanger the water supply of 8 or 9 million people is, I think, farfetched, Parment said. "I guess you have to trust in somebody, and we've basically authorized DEC to supervise this activity. My experience with them is that they have been good stewards."

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Buried Secrets: Is Natural Gas Drilling Endangering U.S. Water Supplies?

by Abrahm Lustgarten, ProPublica - November 13, 2008 1:00 pm EST

Nov. 19: This post has been corrected [1].

A drill rig near the town of Pinedale, Wyo. (Credit: Abrahm Lustgarten/ProPublica)

In July, a hydrologist dropped a plastic sampling pipe 300 feet down a water well in rural Sublette County, Wyo., and pulled up a load of brown oily water with a foul smell. Tests showed it contained benzene, a chemical believed to cause aplastic anemia and leukemia, in a concentration 1,500 times the level safe for people.

The results sent shockwaves through the energy industry and state and federal regulatory agencies.

Sublette County is the home of one of the nation's largest natural gas fields, and many of its 6,000 wells have undergone a process pioneered by Halliburton called hydraulic fracturing [2], which shoots vast amounts of water, sand and chemicals several miles underground to break apart rock and release the gas. The process has been considered safe since a 2004 study [3] (PDF) by the Environmental Protection Agency found that it posed no risk to drinking water. After that study, Congress even exempted hydraulic fracturing from the Safe Drinking Water Act. Today fracturing is used in nine out of 10 natural gas wells in the United States.

Over the last few years, however, a series of contamination incidents have raised questions about that EPA study and ignited a debate over whether the chemicals used in hydraulic fracturing may threaten the nation's increasingly precious drinking water supply.

An investigation by ProPublica, which visited Sublette County and six other contamination sites, found that water contamination in drilling areas around the country is far more prevalent than the EPA asserts. Our investigation also found that the 2004 EPA study was not as conclusive as it claimed to be. A close review shows that the body of the study contains damaging information that

wasn't mentioned in the conclusion. In fact, the study foreshadowed many of the problems now being reported across the country.

The contamination in Sublette County is significant because it is the first to be documented by a federal agency, the U.S. Bureau of Land Management. But more than 1,000 other cases of contamination have been documented by courts and state and local governments in Colorado, New Mexico, Alabama, Ohio and Pennsylvania. In one case, a house exploded after hydraulic fracturing created underground passageways and methane seeped into the residential water supply. In other cases, the contamination occurred not from actual drilling below ground, but on the surface, where accidental spills and leaky tanks, trucks and waste pits allowed benzene and other chemicals to leach into streams, springs and water wells

It is difficult to pinpoint the exact cause of each contamination, or measure its spread across the environment accurately, because the precise nature and concentrations of the chemicals used by industry are considered trade secrets. Not even the EPA knows exactly what's in the drilling fluids. And that, EPA scientists say, makes it impossible to vouch for the safety of the drilling process or precisely track its effects.

"I am looking more and more at water quality issues…because of a growing concern," said Joyel Dhieux, a drilling field inspector who handles environmental review at the EPA's regional offices in Denver. "But if you don't know what's in it I don't think it's possible."

Of the 300-odd compounds that private researchers and the Bureau of Land Management suspect are being used, 65 are listed as hazardous by the federal government. Many of the rest are unstudied and unregulated, leaving a gaping hole in the nation's scientific understanding of how widespread drilling might affect water resources.

Abrahm Lustgarten/ProPublica

Industry representatives maintain that the drilling fluids are mostly made up of non-toxic, even edible substances, and that when chemicals are used, they are just a tiny fraction of the overall mix. They say that some information is already available, and that releasing specific details would only frighten and confuse the public, and would come at great expense to the industry's competitive business.

"Halliburton's proprietary fluids are the result of years of extensive research, development testing," said Diana Gabriel, a company spokeswoman, in an e-mail response. "We have gone to great lengths to ensure that we are able to protect the fruits of the company's research…. We could lose our competitive advantage."

"It is like Coke protecting its syrup formula for many of these service companies," said Scott Rotruck, vice president of corporate development at Chesapeake Energy, the nation's largest gas driller, which has been asked by New York State regulators to disclose the chemicals it uses.

Thanks in large part to hydraulic fracturing, natural gas drilling has vastly expanded across the United States. In 2007, there were 449,000 gas wells in 32 states, thirty percent more than in 2000. By 2012 the nation could be drilling 32,000 new wells a year, including some in the watershed that provides drinking water to New York City and Philadelphia [4], some five percent of the nation's population.

The rush to drill comes in part because newly identified gas reserves offer the nation an opportunity to wean itself from oil.

Natural gas, as T. Boone Pickens said recently, is "cleaner, cheaper… abundant, and ours." Burning gas, used primarily to heat homes and make electricity, emits 23 percent less carbon dioxide than burning oil. Gas is the country's second-largest domestic energy resource, after coal.

The debate over water arises at a critical time. In his last days in office President George W. Bush has pushed through lease sales and permits for new drilling on thousands of acres of federal land. President-elect Barak Obama has identified the leasing rush as one of his first pressing matters and is already examining whether to try to reverse [5] Bush's expansion of drilling in Utah.

State regulators and environmentalists have also begun pressing the gas industry to disclose the chemicals they use and urging Congress to revisit the environmental exemptions hydraulic fracturing currently enjoys.

But in the meantime, the drilling continues.

In September, the Bureau of Land Management approved plans for 4,400 new wells in Sublette County, despite the unresolved water issues. Tests there showed contamination in 88 of the 220 wells examined, and the plume stretched over 28 miles. When researchers returned to take more samples, they couldn't even open the water wells; monitors showed they contained so much flammable gas that they were likely to explode.

'Big Wyoming'

News that water in Sublette County was contaminated was especially shocking because the area is so rural that until a few years ago cattle were still run down Main Street in Pinedale, the nearest town to the gas field. The county is roughly the size of the state of Connecticut but has fewer people than many New York City blocks. With so little industry, there was little besides drilling that people could blame for the contamination.

"When you just look at the data…the aerial extent of the benzene contamination, you just say...This is huge," says Oberley, who is charged with water study in the area. "You've got benzene in a usable aquifer and nobody is able to verbalize well, using factual information, how the benzene got there."

Sublette County, Wyo. (Credit: Abrahm Lustgarten/ProPublica)

Other signs of contamination were also worrying residents. Independent tests in several private drinking wells adjacent to the anticline drilling showed fluoride -- which is listed in Halliburton's hydraulic fracturing patent applications and can cause bone damage at high levels -- at almost three times the EPA's maximum limit.

"We need the gas now more than ever," says Fred Sanchez, whose water well is among those with high levels of fluoride. But gazing off his deck at the prized trout waters of the New Fork River, he wonders whether drilling has gone too far. "You just can't helter skelter go drilling just because you have the right to do it. It's not morally right to do it. There should be some checks and balances."

Further east, in the town of Clark, the Wyoming Department of Environmental Quality found benzene in a residential well after an underground well casing cracked. In Pavilion, another small town, a series of drinking water wells began running with dark, smelly water, a problem a state official speculated might be linked to drilling nearby.

"There is no direct evidence that the gas drilling has impacted it," says Mark Thiesse, a groundwater supervisor for the Wyoming DEQ. "But it sure makes you wonder. It just seems pretty circumstantial that it's happening."

On federal land, which is where most of the Sublette County wells are located, the BLM governs leasing and permitting for gas development, with secondary oversight from the state and only advisory input from the EPA. When the contaminated water results were first reported, both the BLM and the state downplayed their significance.

The EPA's regional office in Denver sharply disagreed. But because it has only an advisory role in the federal review process, and hydraulic fracturing is exempted from the Safe Drinking Water Act, there was little the EPA could do. It rebuked the BLM in a strongly worded letter and gave the development plans in Sublette County a rare "unsatisfactory" rating. It also recommended that the project be stopped until further scientific study could be done.

The BLM, backed by a powerful business lobby, ignored that recommendation. Why do a study if you can't prove something is wrong, industry argued.

Drilling operators said the benzene came from leaky equipment on the trucks that haul water and waste to and from the drill sites -- and in one or two cases, EPA scientists say that was likely. One theory put forth by the BLM blamed the benzene contamination on malicious environmentalists "hostile to gas production," an accusation the agency later said it had no evidence of.

Thiesse, the DEQ supervisor, recounted a meeting where the debate dwindled down to semantics: "I called it contamination, and somebody said is it really contamination? What if it's naturally occurring?"

Leaky equipment on trucks was one reason put forth by drilling operators for benzene contamination. Above, trucks are seen hauling water and waste to and from drilling sites. (Credit: Abrahm Lustgarten/ProPublica)

The industry insisted, as it has for years, that hydraulic fracturing itself had never contaminated a well, pointing to an anecdotal survey done a decade ago by the Interstate Oil and Gas Compact Commission, a coalition of state regulatory bodies and, again, to the 2004 study by the EPA [3] (PDF).

"You have intervening rock in between the area that you are fracturing and the areas that provide water supplies. The notion that fractures are going to migrate up to those shallow formations -- there is just no evidence of that happening," says Ken Wonstolen, an attorney representing the Colorado Oil and Gas Association who has worked with the petroleum industry for two decades. "I think fracturing has been given a clean bill of health."

A flurry of mail from industry representatives to the BLM said the sort of study the EPA wanted would needlessly slow production. "BLM's restrictions on drilling in the Intermountain west have seriously reduced the supply of natural gas reaching consumers," wrote the American Gas Association.

Washington leaned down on Pinedale too. The message, according to Chuck Otto, field manager for the BLM: Make this happen by November. The 4,400 new wells were approved in September without any deadline for cleaning up the contamination or further research. State regulators told ProPublica that hydraulic fracturing was not even considered as a possible cause.

"The BLM looks at it more as a business-driven process," Otto said. "It's not like I have Vice President Cheney calling me up and saying you need to get this done. But there definitely is that unspoken pressure…mostly from the companies, to develop their resources as they'd like to see fit…to get things done and get them done pretty fast."

A Compromised Study

The 2004 EPA study [3] (PDF) is routinely used to dismiss complaints that hydraulic fracturing fluids might be responsible for the water problems in places like Pinedale. The study concluded that hydraulic fracturing posed "no threat" to underground drinking water because fracturing fluids aren't necessarily hazardous, can't travel far underground, and that there is "no unequivocal evidence" of a health risk.

But documents obtained by ProPublica show that the EPA negotiated directly with the gas industry before finalizing those conclusions, and then ignored evidence that fracking might cause exactly the kinds of water problems now being recorded in drilling states.

Buried deep within the 424-page report are statements explaining that fluids migrated unpredictably -- through different rock layers, and to greater distances than previously thought -- in as many as half the cases studied in the United States. The EPA identified some of the chemicals as biocides and lubricants that "can cause kidney, liver, heart, blood, and brain damage through prolonged or repeated exposure." It found that as much as a third of injected fluids, benzene in particular, remains in the ground after drilling and is "likely to be transported by groundwater."

The EPA began preparing its report on hydraulic fracturing in 2000, after an Alabama court forced the agency to investigate fracturing-related water contamination there under the Safe Drinking Water Act. Political pressures were also mounting for the agency to clarify its position on

fracturing. The 2001 Energy Policy, drafted in part by the office of Vice President Dick Cheney, a former Halliburton CEO, noted that "the gas flow rate may be increased as much as 20-fold by hydraulic fracturing." While the EPA was still working on its report, legislation was being crafted to exempt hydraulic fracturing from the Safe Drinking Water Act.

Before that happened, however, the EPA sought an agreement with the three largest hydraulic fracturing companies, including Halliburton, to stop using diesel fuel in fracturing fluids. Diesel fuel contains benzene, and such a move would help justify the report's conclusion that no further studies were needed.

Signs put in all directions to drilling sites in Wyoming. (Credit: Abrahm Lustgarten)

"Our draft is pending release," a senior EPA official wrote to Halliburton's counsel in an August 2003 e-mail. "It would certainly strengthen our preliminary position not to continue studying the issue…if the service companies were able to remove diesel all together, or even move in that direction."

In a subsequent meeting, an EPA official's handwritten notes show that a Halliburton attorney asked federal officials, "Are we willing to entertain regulatory relief in other areas; eg: fewer inspections?"

"Willing…," was the reply from Tracy Mehan, then the EPA's assistant administrator for water.

A Halliburton spokesperson declined to comment on this exchange.

The diesel agreement [6] (PDF) was signed. But according to the EPA, it isn't legally enforceable and the agency hasn't checked to see if diesel is still being used. Furthermore, the agreement applies only to fluids used in a specific kind of gas drilling, not all drilling across the United States.

Mehan did not return calls for comment about his negotiations. Roy Simon, associate chief of the Drinking Water Protection Division's Prevention Branch at EPA headquarters in Washington says the "EPA still stands by the findings outlined in the (2004) report."

But one of the report's three main authors, Jeffrey Jollie, an EPA hydrogeologist, now cautions that the research has been misconstrued by industry. The study focused solely on the effect hydraulic fracturing has on drinking water in coal bed methane deposits, typically shallow formations where gas is embedded in coal. It didn't consider the impact of above-ground drilling or of drilling in geologic formations deep underground, where many of the large new gas reserves are being developed today.

"It was never intended to be a broad, sweeping study," Jollie says. "I don't think we ever characterized it that way."

Nevertheless, a few months after the report's release, the sweeping 2005 Energy Policy Act was passed. Almost no attention was paid to the three paragraphs that stripped the federal government of

most of its authority to monitor and regulate hydraulic fracturing's impact on the environment. By default, that responsibility would now fall to the states.

"That pretty much closed the door," said Greg Oberley, an EPA groundwater specialist working in the western drilling states. "So we absolutely do not look at fracking...under the Safe Drinking Water Act. It's not done."

Waste Hazards

On April 30, 2001 a small drilling company now owned by the Canadian gas company Encana fractured a well at the top of Dry Hollow, a burgeoning field in western Colorado that has seen one of the fastest rates of energy development in the nation.

The well sat at the end of a dirt drive among pinion pines and juniper at the crest of a small mesa overlooking the Colorado River. It was also less than 1,000 feet from the log farmhouse where Larry and Laura Amos lived.

As usual that day, water trucks lined up like toy soldiers on the three acre dirt pad cleared for drilling just across the Amos' property line. They pumped 82,000 gallons of fluids at 3,600 pounds of pressure thousands of feet into the drill hole.

Suddenly the Amos' drinking water well exploded like a Yellowstone geyser, firing its lid into the air and spewing mud and gray fizzing water high into the sky. State inspectors tested the Amos well for methane and found lots of it. They did not find benzene or gasoline derivatives and they did not test fracking fluids, state records show, because they didn't know what to test for.

The Amoses were told that methane occurs naturally and is harmless. Inspectors warned them to keep the windows open and vent the basement, but they were never advised to protect themselves or their infant daughter from the water. It wasn't until three years later, when Laura Amos was diagnosed with a rare adrenal tumor, that she started challenging the state about the mysterious chemicals that might have been in her well.

Misted waste fluid rises from waste pits at a Wyoming well site. (Credit: Abrahm Lustgarten/ProPublica)

Much of what is known about the makeup of drilling fluids comes from the personal investigations of Theo Colborn, an independent Colorado-based scientist who specializes in low-dose effects of chemicals on human health and has testified before Congress [7] (PDF) on drilling issues. Although she opposes drilling, her research is referenced by scientists at the EPA, at the United States Geological Survey and at state-level regulatory agencies and is widely believed to be the most comprehensive information available.

Spurred by reports of water contamination in Colorado, Colborn painstakingly gathered the names of chemicals from shipping manifests that trucks must carry when they haul hazardous materials for

oil and gas servicing companies. Whenever an accident occurred -- a well spill in Colorado, or an explosion at a drilling site in Wyoming – she gathered the data that became available after water and soil samples were tested for contaminants, adding the results to her list.

Industry officials say they use such tiny amounts of chemicals in the drilling – of the million or so gallons of liquid pumped into a well, only a fraction of one percent are chemicals – that they are diluted beyond harmful levels. But on some fracturing sites that tiny percentage translates to more than 10,000 gallons of chemicals, and Colborn believes even very low doses of some of the compounds can damage kidney and immune systems and affect reproductive development.

In Garfield County, there were signs this was already happening. Animals that had produced offspring like clockwork each spring stopped delivering healthy calves, according to Liz Chandler, a veterinarian in Rifle, Co. A bull went sterile, and a herd of beef cows stopped going into heat, as did pigs. In the most striking case, sheep bred on an organic dairy farm had a rash of inexplicable still births -- all in close proximity to drilling waste pits, where wastewater that includes fracturing fluids is misted into the air for evaporation.

Among Colborn's list of nearly 300 chemicals -- some known to be cancer-causing -- is a clear, odorless surfactant called 2-BE, used in foaming agents to lubricate the flow of fracking fluids down in the well. Colborn told Congress in 2007 [7] that it can cause adrenal tumors.

Laura Amos, who suffered from such a tumor, pressed Encana on whether the compound had been used to fracture the well near her house. For months the company denied 2-BE had been used. But Amos persisted, arguing her case on TV and radio. In January 2005, her lawyers obtained documents from Encana showing that 2-BE had, in fact, been used in at least one adjacent well.

"Our daughter was only six months old when fracturing blew up our water well," Amos wrote in a letter to the Oil and Gas Accountability Project [8], an anti-drilling group. "I bathed her in that water every day. I also continued breast-feeding her for 18 more months...If there was a chemical in my body causing my tumor, she was exposed to it as well."

In 2006, Amos stopped talking to the media after she accepted a reported multi-million settlement from Encana. The company was fined $266,000 for "failure to protect water-bearing formations and…to contain a release of (gas production) waste." Yet investigators also concluded, without further explanation, that hydraulic fracturing was not to blame.

Asked about the Amos case and the rash of complaints in the area, an Encana spokesman said the company disagreed with the state's judgment on the Amos case and emphasized that there was no proof that fracturing had caused the explosion. Environmentalists had created a climate of fear in the community, he added.

"The concerns residents have expressed -- and some of them are legitimate and heartfelt concerns -- a lot of them are out of misinformation," said Doug Hock. "Just because chemicals are used at a site does not create risk. We have a proven process that helps us ensure that there are no pathways."

'The Tipping Point'

In the past 12 months a flurry of documented incidents has made such reports harder to dismiss.

"We've kind of reached the tipping point," says Dhieux, the EPA inspector in Denver. "The impacts are there."

In December 2007, a house in Bainbridge, Ohio exploded in a fiery ball. Investigators discovered that the neighborhood's tap water contained so much methane that the house ignited. A study [9] released this month concluded that pressure caused by hydraulic fracturing pushed the gas, which is found naturally thousands of feet below, through a system of cracks into the groundwater aquifer.

The raised platform used by Encana at some of its drill sites helps to protect the underlying landscape. (Credit: Abrahm Lustgarten/ProPublica)

In February a frozen 200-foot waterfall was discovered on the side of a massive cliff near Parachute, Colo. According to the state, 1.6 million gallons of fracturing fluids had leaked from a waste pit and been transported by groundwater, where it seeped out of the cliff. In a separate incident nearby in June, benzene was discovered in a place called Rock Spring. Three weeks later a rancher was hospitalized after he drank well water out of his own tap. Tests showed benzene in his water, and the Colorado Oil and Gas Conservation Commission cited four gas operators, not knowing which one was responsible for the spill. Colorado state records show more than 1,500 spills since 2003, in which time the rate of drilling increased 50 percent. In 2008 alone, records show more than 206 spills, 48 relating to water contamination.

As more contamination cases are documented, state governments and Washington are being pressured to toughen oversight. One aim is to institutionalize the precautionary measures some companies are already experimenting with.

When ProPublica visited an Encana drilling operation in Pinedale, for example, the company was placing its drill rigs on raised platforms to protect the underlying landscape and using rubber pools to catch spilled fluids before they could seep into the soil. Drilling companies in New Mexico have begun storing waste in enclosed steel tanks rather than open pits.

Such efforts can add 10 percent to drilling costs, but they also dramatically lessen the environmental risks, an Encana employee said.

State regulators and Washington lawmakers though are increasingly impatient with voluntary measures and are seeking to toughen their oversight. In September, U.S. Congresswoman Diana DeGette and Congressman John Salazar, from Colorado, and Congressman Maurice Hinchey, from New York, introduced a bill that would undo the exemptions in the 2005 Energy Policy Act.

Wyoming, widely known for supporting energy development, has begun updating its regulations at a local level, as have parts of Texas.

New Mexico has placed a one-year moratorium on drilling around Santa Fe, after a survey found hundreds of cases of water contamination from unlined pits where fracking fluids and other drilling wastes are stored. “Every rule that we have improved...industry has taken us to court on,” said Joanna Prukop, New Mexico’s cabinet secretary for Energy Minerals and Natural Resources. “It’s industry that is fighting us on every front as we try to improve our government enforcement, protection, and compliance…We wear Kevlar these days.”

The most stringent reforms are being pursued in Colorado. Last year it began a top-to-bottom re-write of its regulations, including a proposal to require companies to disclose the exact makeup of their fracking fluids -- the toughest such rule in the nation.

Cathy Behr (Credit: Abrahm Lustgarten/ProPublica)

In mid-August, the Colorado debate intensified when news broke that Cathy Behr, an emergency room nurse in Durango, Colo., had almost died after treating a wildcatter who had been splashed in a fracking fluid spill at a BP natural gas rig. Behr stripped the man and stuffed his clothes into plastic bags while the hospital sounded alarms and locked down the ER. The worker was released. But a few days later Behr lay in critical condition facing multiple organ failure.

Her doctors searched for details that could save their patient. The substance was a drill stimulation fluid called ZetaFlow, but the only information the rig workers provided was a vague Material Safety Data Sheet, a form required by OSHA. Doctors wanted to know precisely what chemicals make up ZetaFlow and in what concentration. But the MSDS listed that information as proprietary. Behr’s doctor learned, weeks later, after Behr had begun to recuperate, what ZetaFlow was made of, but he was sworn to secrecy by the chemical’s manufacturer and couldn’t even share the information with his patient.

News of Behr’s case spread to New York and Pennsylvania, amplifying the cry for disclosure of drilling fluids. The energy industry braced for a fight.

“A disclosure to members of the public of detailed information…would result in an unconstitutional taking of [Halliburton’s] property,” the company told Colorado’s Oil and Gas Conservation Commission. “A number of studies have concluded there are no confirmed incidents of contamination of drinking water aquifers due to stimulation operations…EPA reached precisely this conclusion after undertaking an extensive study.”

Then Halliburton fired a major salvo: If lawmakers forced the company to disclose its recipes, the letter stated, it “will have little choice but to pull its proprietary products out of Colorado.” The company’s attorneys warned that if the three big fracking companies left, they would take some $29 billion in future gas-related tax and royalty revenue with them over the next decade.

In August, the industry struck a compromise by agreeing to reveal the chemicals in fracturing fluids to health officials and regulators -- but the agreement applies only to chemicals stored in 50 gallon drums or larger. As a practical matter, drilling workers in Colorado and Wyoming said in interviews that the fluids are often kept in smaller quantities. That means at least some of the ingredients won't be disclosed.

"They'll never get it," says Bruce Baizel, a Colorado attorney with the Oil and Gas Accountability Project, about the states' quest for information. "Not unless they are willing to go through a lawsuit. When push comes to shove, Halliburton is there with its attorneys."

Asked for comment, Halliburton would only say that its business depended on protecting such information. Schlumberger and BJ Services, the two other largest fracturing companies, did not return calls for comment.

Lee Fuller, vice-president for government relations at The Independent Petroleum Association of America, said the oil and gas industry's reluctance to release information about drilling chemicals is to be expected. "These operations are ones where companies have spent millions of dollars," he says. "They are not going to want to give up that competitive advantage. So I would fully expect that they will try to protect that right as long as they possibly can."

Allison Battey, Kristin Jones and Jonathan Sidhu contributed to this report.

Correction: This article previously stated that Theo Colborn collected and tested water and soil samples. Rather, she did not do that work herself but compiled such information from other organizations and agencies that did.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [10].

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Tags: Colorado, Drilling, Natural Gas, Water, Wyoming

New Mexico Battles Feds to Stop Gas Drilling Near an Aquifer

by Abrahm Lustgarten, ProPublica - November 20, 2008 10:15 am EST

Otero Mesa (Credit: Steve Capra/New Mexico Wilderness Alliance, AP Photo)

New Mexico officials say a gas drilling proposal on federal lands threatens a pristine aquifer that could someday provide drinking water to 15 million households, but the state's protests have met with resistance from the federal office administering the project.

The Bureau of Land Management, which governs development on the 20 percent of New Mexico's lands owned by the federal government, approved drilling on the Otero Mesa, a 1.2 million acre wilderness grassland in southern New Mexico, earlier this month. Because the BLM relied on decade-old data in a four-year-old environmental review, neither the Environmental Protection Agency nor the state's environment departments were involved in the decision.

"The likelihood of contamination is just not there, that's our perspective," said Bill Childress, district manager for the BLM in Las Cruces, N.M.

But state officials in New Mexico's Department of Energy Minerals and Natural Resources say the BLM ignored evidence of unique risks in that area. They want the BLM to conduct a supplemental environmental impact statement, which, under federal law, would then require an EPA review.

In a sharply worded letter [1] (PDF) from New Mexico Gov. Bill Richardson's Office of Energy Minerals and Natural Resources to the BLM, Secretary Joanna Prukop wrote that the BLM's review "fails to go beyond the preliminary discussion of soil contamination and provide any substantive discussion regarding the unique geology of the basin -- specifically the fractured, limestone character that renders the groundwater in the basin particularly vulnerable to contamination."

Prukop's office is seeking an additional scientific review and a 30-day public comment period, which it says the BLM skipped. Last week the BLM agreed to hear additional testimony from protesting parties, including the state.

The situation in New Mexico illustrates the often confusing overlap of federal and state oversight in protecting the environment from the harmful side effects of energy exploration [2].

The drilling industry is exempted from many major federal environmental statutes, including the Clean Water Act, the Safe Drinking Water Act, the Superfund law and the Toxic Release Inventory, which requires disclosure of hazardous waste.

Because of these exemptions, the lion's share of environmental oversight falls on the states. But in places like the Otero Mesa, says the BLM's Childress, states "don't have authority to prevent a decision carte blanche on federal land -- we use our federal authority."

In New Mexico, the state's Oil Conservation Division oversees gas and oil wells. But on federal land that agency's authority "is limited pretty much to how to manage that well and how engineers design it, how we deal with the waste, the whole pit process," Prukop told ProPublica. "Do we have authority to protect all aspects of the environment? No."

New Mexico has some of the most stringent regulations for oil and gas drilling in the country, and Prukop thinks they're sufficient to protect the water beneath the Otero Mesa. But she still expects a lengthy fight. The BLM's plan indicates that the gas company hoping to drill on the property will use an open waste pit for drilling fluids, something New Mexico doesn't allow.

"Should they (the driller) choose to continue to ignore that requirement, and should the BLM allow them to go forward, the state will have to decide what to do," Prukop said. "We'll have to sue...shut them in."

The issue arises at a time of increased scrutiny of natural gas drilling, which pumps potentially hazardous chemicals deep into the ground in a process called hydraulic fracturing [3], a standard procedure that uses high pressure fluids to break apart rock and release gas. The drilling fluids are not only shot underground but can end up in surface spills and in waste pits. In New Mexico alone, a review of waste pits at oil and gas sites found some 400 cases of contamination that affected groundwater, officials there said.

A provision in the 2005 Energy Policy Act exempted hydraulic fracturing from compliance with the Safe Drinking Water Act. Companies like Halliburton had been lobbying for such a reprieve since the early 1990s, when an Alabama court ruled that the EPA had to oversee contamination of water wells around gas drilling in that state. To get the exemption, industry convinced Congress that hydraulic fracturing was safe and that ample state laws existed to oversee the gas drilling industry.

"Our view was that hydraulic fracturing was effectively regulated by the states under their current authority," said Lee Fuller, vice president of government relations for the Independent Petroleum Association of America. Fuller argues that more federal regulations would be an unnecessary burden on business. "The risk is well controlled, therefore there was no need to change the regulatory process from what has been underway for 50 years."

In New Mexico the industry's exemptions have helped push the EPA to the sidelines as the Otero Mesa project moves ahead.

"EPA does not deny that oil and gas can result in [complaints of water contamination]," said Roy Simon, associate chief of the EPA's Drinking Water Protection Division's Prevention Branch in Washington, D.C., when asked about contamination incidents across the country. "However, addressing these types of complaints, including hydraulic fracturing and its associated fluids (other than diesel fuel), is beyond the authorities of the Safe Drinking Water Act."

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Tags: Drilling, Hydraulic Fracturing, Natural Gas

NYC Wants Consultants to Probe Effect of Gas Drilling on Drinking Water

by Abrahm Lustgarten, ProPublica - November 25, 2008 11:50 am EST

Owners of this state-protected wetland near Oxford, N.Y. learned that a water services company was withdrawing water for use in a nearby gas drilling operation. (Credit: Lori Zunno)

As we have been reporting [1] for the past several months, public officials are increasingly concerned about the energy industry's push to drill for natural gas. Today New York City and state politicians called for [2] (PDF) the state Department of Environmental Conservation to hire an outside consultant to evaluate the impact gas drilling could have on the city's watershed [3], and to hold public hearings in New York City and in the watershed region.

New York City and state officials have expressed concerns in recent months about how plans to drill for gas in the formation called the Marcellus Shale might affect the rivers and upstate reservoirs that feed drinking water to nine million New Yorkers. The drilling process involves the use of potentially hazardous chemicals [4] and raises issues about how those fluids would be disposed of and how the environment would be protected against spills.

The letter [5], sent to DEC Commissioner Pete Grannis by City Councilman James Gennaro and state Senator Thomas Duane, says the city and its water-supplying region have been excluded from a series of public meetings DEC is holding on the issue around the state. No meetings are planned either in New York City or in the heart of the watershed itself, according to Gennaro.

Gennaro, who chairs New York City's Environmental Protection Committee, is calling for a complete ban on drilling in the watershed. At stake, he says, is the unique permit from the federal government that allows the city to operate without a water filtration plant. Gennaro estimates that constructing a plant and its associated systems would cost the city some $20 billion -- a sum that would offset even the best estimates for income from gas, and that appears untenable as New York battles one of its worst financial crisis in history.

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Tags: Drilling, Marcellus Shale, Natural Gas, New York City, Water

NYC: Gas Drilling Will Raise the Cost of Water by 30 Percent

by Abrahm Lustgarten, ProPublica - December 16, 2008 12:21 pm EST

The Ashokan Reservoir is part of the city's Catskill water supply system. (Credit: Jim McKnight/AP Photo)

Using some of the strongest language yet regarding the impacts that natural gas drilling in New York state could have on New York City's drinking water supply, the city's chief accountant warned [1] state officials that drilling could have "crippling implications" for the city's water system.

City Comptroller William Thompson wrote State Department of Environmental Conservation officials Monday following a city council hearing about the threats upstate drilling might pose for the city [2]. Thompson warned that drilling near the Catskill reservoirs that provide some nine million people with drinking water could degrade the water quality enough to force the city to build a new $10 billion water treatment plant. New York City is currently one of just four cities in the U.S. that the EPA allows to provide residents water without any filtration. If that permit is revoked, New York would have to borrow the money for the plant and, Thompson warned, city residents would pay a 30 percent water increase just to cover the interest payments.

Thompson's letter [1], and the City Council's hearings, follow a series of stories by ProPublica that detail a pattern of water contamination [3] from gas drilling in seven states. We have also raised questions about New York state's regulatory preparedness [4] for gas drilling. After those stories were published, New York began a fresh environmental review and has held a series of public hearings across the state.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [5].

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Tags: Drilling, Natural Gas, New York, New York City

How the West's Energy Boom Could Threaten Drinking Water for 1 in 12 Americans

by Abrahm Lustgarten, ProPublica and David Hasemyer, *The San Diego Union-Tribune* - - December 21, 2008 11:23 am EST

Dec. 22: This post has been corrected [1].

*This story was co-published with the [2]*San Diego Union-Tribune [2] *and also appears in that newspaper's Dec. 21, 2008 issue.*

Lake Powell, the Colorado's River largest reservoir (David McNew/Getty Images)

The Colorado River, the life vein of the Southwestern United States, is in trouble.

The river's water is hoarded the moment it trickles out of the mountains of Wyoming and Colorado and begins its 1,450-mile journey to Mexico's border. It runs south through seven states and the Grand Canyon, delivering water to Phoenix, Los Angeles and San Diego. Along the way, it powers homes for 3 million people, nourishes 15 percent of the nation's crops and provides drinking water to one in 12 Americans.

Now a rush to develop domestic oil, gas and uranium deposits along the river and its tributaries threatens its future.

The region could contain more oil than Alaska's National Arctic Wildlife Refuge. It has the richest natural gas fields in the country. And nuclear energy, viewed as a key solution to the nation's dependence on foreign energy, could use the uranium deposits held there.

But getting those resources would suck up vast quantities of the river's water and could pollute what is left. That's why those most concerned are water managers in places like Los Angeles and San Diego. They have the most to lose.

The river is already so beleaguered by drought and climate change that one environmental study called it the nation's "most endangered" waterway. Researchers from the Scripps Institution of Oceanography warn the river's reservoirs could dry up in 13 years.

The industrial push has already begun.

In the eight years George W. Bush has been in office, the Colorado River watershed has seen more oil and gas drilling than at any time in the past 25 years. Uranium claims have reached a 10-year high. Last week the departing administration auctioned off an additional 148,598 acres of federal land for gas drilling projects outside Moab, Utah.

As still more land is leased for drilling and a last-minute change in federal rules has paved the way for water-intensive oil shale mining, politicians and water managers are now being forced to ask which is more valuable: energy or water.

“The decisions we are making today will be dictating how we will be living the rest of our lives,” said Jim Pokrandt, a spokesman with the Colorado River Conservation District, a state-run policy agency. “We may have reached mutually exclusive demands on our water supply.”

Some experts and officials say the economic and ecological importance of the Colorado is just as vital to American security as the natural resources that can be extracted from around it.

“Without (the Colorado), there is no Western United States,” said Jim Baca, who directed the Bureau of Land Management, or BLM, in the Clinton administration and says the agency’s current policy is narrow-sighted. “If it becomes unusable, you move the entire Western United States out of any sort of economic position for growth.”

Balancing that risk with the need for energy is complicated, because scientific understanding of the Colorado is limited and no single agency manages the river as a national resource.

The Interior Department, which includes the BLM, oversees where the water goes, but not how it is kept clean. The EPA is charged with maintaining water quality, but it can’t control who uses it and doesn’t conduct its own research. Furthermore, the EPA delegates much of its authority to the states that the river runs through, and the federal, state and local authorities in charge of separate aspects of the river don’t always coordinate or cooperate.

“I don’t know that there is, quite honestly, anyone that looks at an entire overview impact statement of the Colorado River,” said Robert Walsh, a spokesman for the Bureau of Reclamation, which governs the allocation and flow of the southern part of the waterway.

Desolation Canyon, Utah. (Ray Bloxham/SUWA)

Oil and natural gas drilling in Colorado already require so much water that if its annual demand were satisfied all at once, it would be the equivalent of shutting off most of Southern California’s water for five days. If Colorado’s oil shale is mined, it would turn off the spigot for 79 days.

Although company executives insist they adhere to environmental laws, natural gas drilling has led to numerous toxic spills across the West. According to the Environmental Protection Agency, mining has contaminated four out of 10 streams and rivers in the West. Similarly, mining has topped the government’s list of the most polluting industries for the past decade, and new mine problems continue to arise today.

Industry representatives and the Bush administration say breaking America’s dependence on foreign oil makes using all available energy resources here at home a priority.

“I believe this country needs to offer domestic resources to be energy independent,” said Tim Spisak, a senior official who heads the BLM’s oil and gas development group. “The way to do that is to responsibly develop public resources on our lands.”

Critics of Bush’s energy policies said they favor business interests at a time when climate change demands a fundamental shift in the way the nation values water. They also complain that the administration doesn’t grasp the West’s looming water problem.

“When Lake Mead goes dry, you cut off supply to the fifth largest economy in the world,” said Patricia Mulroy, general manager of the Southern Nevada Water Authority, referring to the reservoir that sits behind the Hoover Dam and controls water flow to the Southwest’s cities. She points out that while some dispute the timing of Lake Mead’s demise, no one says it won’t happen.

“We’ve ignored the need to adapt,” Mulroy said. “We’ve never looked at what the secondary impact of, say, an energy decision is.”

Both the U.S. House and Senate are considering bills that would require better management of the nation’s water quality and water assets. But the bills focus more on the threat of climate change than the threat of industrial development. A growing number of water professionals say even a congressional act isn’t enough to clarify the government’s responsibility. They want the president to appoint a new national water authority -- or even a cabinet-level water czar.

“If you are really going to deal with water, the nation needs to deal with it in a far more comprehensive manner,” said Brad Udall, director of the National Oceanic and Atmospheric Administration’s water assessment program at the University of Colorado. “We can’t afford to play around with potentially damaging activities.”

The Southern Nevada Water Authority, the state of Arizona and the Metropolitan Water District, which governs the water supply to Los Angeles and San Diego, have implored Bush’s Interior to proceed with caution as it races in these last days to develop mining, gas and oil near the river.

“We have other sources of power,” said Jeffrey Kightlinger, MWD’s General Manager. “We don’t have other sources of water.”

Hot Water

One of those alternative sources of energy is uranium, which is essential to the production of nuclear energy. In the last six years, new uranium mining claims within five miles of the river have nearly tripled, from 395 to 1,195, according to a review of BLM records by the Environmental Working Group, a Washington-based policy organization.

Although few of those claims will actually be mined, mining has a track record of contamination that alarms water officials dependant on the river. The Metropolitan Water District points to a 16 million ton pile of radioactive waste near Moab as a warning of what can happen when mining isn’t carefully controlled.

The pile sits on the banks of the Colorado at the site of a mill that once processed uranium for nuclear warheads. The plant closed in 1984, but the Grand Canyon Trust estimates 110,000 gallons

of radioactive groundwater still seep into the river there each day. The U.S. Department of Energy decided in 2000 to move the pile away from the river. But the planning was so complicated and the cost so high -- estimates top $1 billion -- that the first loads of waste won't be hauled off until next year.

The mill site in Moab, Utah (Nuclear Regulatory Commission)

The industry says the Moab case is an outdated blight from the distant past.

"What gets my ire up is when we get compared to stuff that happened in the 60s. There is no argument from us now about being careful... with an eye to preserving the environment," said Peter Farmer, CEO of Denison Mines, a Canadian company that operates seven U.S. mines as well as the nation's only operating uranium mill in Blanding, Utah.

Denison recently spent more than $5 million to triple-line a waste pit and outfit it with leak detection sensors. It's cheaper to pay up front, Farmer says, than to clean up later.

Roger Haskins, a specialist in mining law at the BLM, agrees that concerns over mining are overblown. He says landmark environmental regulations in the 1970s prepared the industry for the 21st century. While it's still easy to stake a mining claim, projects must now undergo extensive environmental review before they can be turned into mines.

"Whatever happens out there is thoroughly manageable in today's regulatory environment," Haskins said.

Scientists say some degree of pollution is inevitable, because mining sometimes uses toxic chemicals like cyanide. It also exposes naturally toxic metals that would otherwise remain deep underground.

Drilling for uranium creates pathways where raw, radioactive material can migrate into underground aquifers that drain into the river. Surface water can seep into the drill holes and mine shafts, picking up traces of uranium and then percolating into underground water sources. The milling process itself creates six pounds of radioactive and toxic waste -- including ammonia, arsenic, lead and mercury -- for every ounce of uranium produced.

"There has to be some impact to downstream water. Whether or not we can measure -- that is the question," said David Naftz, a hydrologist at the U.S. Geological Survey in Salt Lake City who studies uranium mining.

Naftz has documented dangerous levels of uranium near waste dumps at more than 50 separate test sites in Utah. While much of the mining happens in high, dry places where contaminants don't easily seep into surface water, he says periodic storms can still wash them into the river.

“What we’ve done is kind of upset the geochemical equilibriums in these basins by taking these ores and exposing them to conditions on the surface,” he said. “The question is, how long is it going to take to transport them down to water systems?”

Pollution problems with gold, copper and other mines also challenge the assertion that technology and better regulation have eliminated the environmental risks.

One study compared the EPA’s environmental impact statements for 25 sites to what really happened after mining took place. Water at three quarters of the mines was found to be contaminated, even though the mines used technology and techniques that the EPA had said would keep the environment clean, according to the research done for the Earthworks by Jim Kuipers, an environmental engineer in Butte, Mont. and Ann Maest in Boulder, Colo.

At least four large mines that operated as recently as the 1990s -- long after new regulatory standards were put in place -- have caused so much contamination that the EPA designated them as priority Superfund cleanup sites. One rendered a 20-mile stretch of a Colorado River tributary completely dead.

“Promises are made and promises are broken,” said Roger Clark, who is director of the Grand Canyon Trust’s air and energy program and has been monitoring the rise in mining claims near the Grand Canyon. “This is not something we can sit back and take industry’s word for.”

Clark, who explored the Colorado River as a Boy Scout and later as a river guide, already has seen signs of the park’s decline. On a recent hike along the Grand Canyon’s rim, he passed a stream whose water he drank freely as a boy. Now it’s marked with a sign saying, “Drinking and bathing in these waters is not advisable.” The Park Service posted the same warning along five other canyon streams that feed into the Colorado, because high concentrations of uranium have leached into the water, likely from old mines.

In June, the House Natural Resources Committee invoked a rarely-used authority to force the Bush administration to make one million acres of public land adjacent to the park ineligible for exploration. Two months later, though, Interior Secretary Dirk Kempthorne allowed some 20 new claims in the area by deciding that the committee’s move violated executive authority.

Secret Chemicals

In the last decade, a pattern of contamination has also emerged in places where natural gas drilling has intensified. If drilling increases substantially across Colorado, Wyoming and Utah, it could also imperil the river.

A waste pit at a natural gas drilling site (Abrahm Lustgarten/ProPublica)

Most wells rely on a process called hydraulic fracturing [3], which requires as much as two million gallons of water plus small amounts of often-toxic chemicals for a single well. The waste water then sits in open pits until it is treated, recycled or disposed of.

In February a waste pit high on a mesa overlooking the town of Parachute, Colo. sprang a leak, allowing some 1.6 million gallons of fluid to soak into the arid earth. According to state records, the spill migrated underground until it seeped from a cliff side and froze into a gray pillar of ice more than 200 feet tall. When it melted, the fluids dripped into the torrid currents of Parachute Creek and finally dumped into the Colorado River.

Although the number of gas drilling accidents in the upper Colorado River watershed is small relative to the amount of drilling, they have begun adding up. Colorado state records show that of some 1,500 spills in drilling areas since 2003, more than 300 have seeped into water. In one case last summer a truck carrying drilling fluids crashed into the Colorado, where it remained partially submerged for more than three weeks.

In neighboring Wyoming, the BLM found a 28-mile-long plume of benzene contamination in an aquifer beneath a gigantic gas field. The aquifer is near a tributary to the Green River, which in turn flows into the Colorado.

Doug Hock, a spokesman for the Canadian gas company Encana, which drills in Colorado and Wyoming, says that while there will always be spills, the fears of pollution are exaggerated. Encana uses steel and concrete casing around its drill pipes, lines its waste pits and, increasingly, cleans its waste water and re-uses it inside its wells.

“We have put in place safeguards to protect the water,” Hock said. “There is always a balance -- this country has a great demand for energy.”

But because the energy industry has been exempted from so many federal environmental regulations during the Bush administration, it’s difficult to assess the industry’s true impact on the river.

The mix of chemicals used in hydraulic fracturing is held as proprietary competitive information by the industry and kept secret from even the EPA. Scientists say that without knowing the specific ingredients in the mix, they don’t know what compounds to test for after a spill and can’t check to see if they’ve reached the river.

The 2005 Energy Policy Act exempted hydraulic fracturing from the Safe Drinking Water Act. Also exempted from federal control and water protection laws are the drilling industry’s construction activities, including the sediments and dust produced from thousands of miles of road building, site grading and the drilling itself, even though that debris often ends up in waterways.

“We have seen an explosion in drilling, and at the same time we have seen a weakening of the federal standards under which drilling occurs,” said Dusty Horwitt, an analyst with the Environmental Working Group.

Given the relaxation in regulatory authority, the development may be out-pacing scientists’ ability to measure the implications.

In August drilling companies bid on 55,000 acres of federal parcels atop the Roan Plateau, a cherished wilderness area in central Colorado that drains into the Colorado River. A September report from the University of Colorado Denver predicted that in 15 years Garfield County, a western drilling area bisected by the river, will have 23,000 wells, six times what is has now, based on permit applications already filed with the state.

The push to drill continued last week, when the BLM opened 148,598 more acres of federal land near Moab to drilling. Quarterly lease sales in that area during the last two years were typically about 75,000 acres.

“It seems reckless,” said Bill Hedden, director of the Grand Canyon Trust. Near his home outside Moab, natural gas drilling rigs may soon be visible through Delicate Arch, the wind-hewn bridge of rock at Arches National Park that graces Utah’s license plate.

“We Americans have tried to export a lot of our problems off to the boondocks -- but in this case the boondocks is the watershed and the problem is coming right back to us,” Hedden said.

According to Spisak, the BLM official in charge of drilling, the Maob sale is the result of “pent up build-up” in the cue of requests the agency is handling. Companies that want to drill on federal land ask the BLM to consider listing that land for a future lease sale. Over the past few years, Spisak said, environmental organizations have challenged some of the listings the BLM approved, delaying their sale. Now the agency is catching up.

“We are required to push them forward,” Spisak said. “It’s due to pressures of prices and industry, and we are responding to the market demand.”

An Unprecedented Demand

Colorado River (Flickr User: WisDoc)

No project poses a greater threat to the Colorado River -- or better represents the choice between water and energy -- than mining for oil shale.

In mid November the BLM quietly approved a rule change that paved the way for extracting oil from rock deposits in Colorado and Utah, smack in the heart of the river’s watershed. If the vast deposits are mined to their potential -- and it could be a decade before any of the projects go forward -- the reserves could help the United States make a significant leap towards energy independence.

Getting oil from the shale, if researchers can find a reliable way to do it on a large scale, would be astronomically expensive. It might also require more water than the Colorado River can provide.

A recent study for the state of Colorado estimates that if the oil shale industry takes off in northwest Colorado, the region’s energy industry will need at least 15 times as much water as it uses now. In

30 years, the report predicts, the energy industry in the upper Colorado River basin would stop the river's entire flow for nearly six weeks if it used the water all at once.

"It would take every bit of water rights that we currently have plus more," said Scott Ruppe, general manager of Uintah Water Conservancy District in northeastern Utah.

Counties across the Western states are apportioned a limited quota of water rights that can be used for industry, farming, or municipal use, he explained. Using Colorado River water for oil shale means less water for urban growth, agriculture and personal use. It means trading fresh fruit and vegetables – not to mention green lawns -- for energy.

"It just comes down to how needy the nation is for energy," he said. "If energy is short then some of the other concerns might get pushed aside."

These stark choices have driven Congress to begin examining the water problem in the absence of leadership from the White House. One of the bills that has been written would, if passed, direct the Interior Department to undertake the kind of comprehensive inventory of the nation's water quality and supply that critics say is missing.

It will be up to the Obama administration, though, to ultimately decide the nation's priorities. The appointment of Colorado Sen. Ken Salazar to head the Interior Department will inject a unique understanding of western water issues into Washington politics. Salazar is a long-time rancher and a former water attorney.

The new administration could temper some of Bush's decisions by limiting mining claims in sensitive areas, refusing to finalize leases sales that haven't been signed, and rigorously enforcing existing environmental regulations. It also could try to reverse some of the rules the Bush administration has issued to speed development, although that will be difficult.

Obama's greatest opportunity to address the conflict between water and energy may lie not in undoing policies from the past, but in looking to the future.

"The administration has an opportunity to start thinking about water as a national resource," said Nevada's Mulroy. "We have no rear view mirrors anymore."

Correction: This post originally stated that the Bureau of Land Management had auctioned off 359,000 acres of land for natural gas drilling near Moab Utah. In fact, as a result of protests over that lease sale, the BLM made a last minute change to the total amount and auctioned 148,598 acres of land on Dec. 19, 2008. This story also refers to a study comparing real pollution at 25 mines to that anticipated by the EPA. That study was commissioned by Earthworks, not the Environmental Working Group, and was authored by James Kuipers and Ann Maest.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [4].

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Tags: Colorado River, Drilling, Hydraulic Fracturing, Natural Gas, Water

Where Things Stand: Environmental Pitfalls of Drilling for Natural Gas in the U.S.

by Abrahm Lustgarten, ProPublica - December 29, 2008 1:18 pm EST

Editor's note: As part of our year-end coverage, we're checking in on the latest on each of our in-depth stories.

Abrahm Lustgarten/ProPublica

Drill, baby, drill. That clarion call to develop energy here on U.S. soil rallied fervid support in the past year when substantial natural gas deposits were identified from Connecticut to Louisiana -- anything but your typical drilling states.

Since burning gas emits 23 percent less greenhouse gas than burning oil, finding new resources here at home targets two important priorities: climate change and energy independence.

But it turns out drilling for gas may not be as clean as burning it. And it may come at the expense of another vital resource: water.

Last summer, ProPublica began an investigation [1] into the environmental safety of the drilling boom. That investigation has led to a series of articles, published in the *Albany Times Union* [2], *Scientific American* [3], *BusinessWeek* [4], the *Denver Post* and the *San Diego Union-Tribune* [5]. We found that the processes that make all this new drilling possible can -- if not carefully studied and rigorously regulated -- have disastrous effects [6].

All this gas -- much of which lies as far as 13,000 feet underground in tightly packed sand and rock layers -- has become accessible because of an innovative technology developed by Halliburton called hydraulic fracturing, which shoots vast amounts of fluid underground to break up the rock and release that gas.

"Hydrofracking" uses toxic chemicals -- their identities are protected as business trade secrets -- and can create hazardous waste that needs to be carefully treated or disposed of. The Environmental Protection Agency has declared fracturing safe, and as a result the drilling processes are exempted from many of the federal environmental laws created to safeguard public water -- including the Safe Drinking Water Act.

But ProPublica found that drinking water supplies -- streams and aquifers and even residential wells -- had been contaminated in at least 1,000 cases across the country [6] where there has been intensive drilling. We also discovered that the scientific study done by the EPA was incomplete and based in large part on the input of companies including Halliburton [6], with which the EPA negotiated before publishing its findings.

Now lawmakers in several states and in Washington are taking an array of actions aimed at tightening industry oversight. In New York state, Gov. David Paterson placed a moratorium on drilling and ordered his environment department to re-examine drilling's impacts and hold public hearings across the state. New York City [7] has become an outspoken opponent to drilling because it could occur within the city's watershed. New York's City Council has held two emergency hearings to discuss the matter.

In Washington, several members of Congress have introduced a bill that would reverse the gas industry's exemptions from environmental protection laws, and subject it to the same federal oversight that other industries face.

In Colorado and New Mexico -- where drilling is most intense and where much of the contamination has been documented -- state officials are rewriting their own laws for the gas drilling industry. They are addressing everything from the secrecy of the chemicals used in fracturing to the laws mandating that waste is properly treated.

Since ProPublica began exploring the costs of gas drilling, the subject has prompted [8] headlines [9] across the nation, especially as the outgoing Bush administration moved to open up still more lands across the country to drilling before January.

This month, ProPublica extended its series -- now more than 10 articles -- with an examination of how energy developments [10] in the Western United States may affect the Colorado River, the drinking water source for one in 12 Americans and much of Mexico. That story broadened the discussion of the trade-offs of energy development and found that scientists and water managers who depend on the river's water are alarmed by the lack of planning for the river, and that governance of the river is haphazard and inconsistent. Two [11] bills [12] now before Congress would create a central water authority and begin to address these issues.

Decisions on these issues are very much in flux. In 2009, several pieces of federal legislation addressing hydraulic fracturing, water and energy exploration will come up for a vote. The incoming Obama administration will also have to decide how to proceed with dozens of energy exploration projects across the country. Last week, 58 members of Congress wrote [13] (PDF) to the president-elect urging him to reverse many of President Bush's rules and recent decisions regarding gas and oil drilling in the West.

It remains to be seen [14] what the new administration can do legally, or even what form its domestic energy policy will take.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [15].

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Tags: Drilling, Hydraulic Fracturing, Marcellus Shale, Natural Gas

Setting the Record Straight on Hydraulic Fracturing

by Abrahm Lustgarten, ProPublica - January 12, 2009 6:16 pm EST

Abrahm Lustgarten/ProPublica

In his Jan. 10 column [1] in the *Rocky Mountain News*, Independence Institute [2] analyst David Kopel significantly misstates the record on the environmental risks posed by the gas drilling technique known as hydraulic fracturing.

Using carefully culled quotations and selected statistics, Kopel asserts “indisputably false facts” in ProPublica’s reporting.

In fact, it is his column that is indisputably misleading.

Kopel quoted a press spokesperson for New Mexico as saying the state had never compiled “numbers about groundwater contamination from hydraulic fracturing” -- the actual forcing of water into rock. He cites a similar remark from a Colorado official.

These are classic examples of framing a precisely tailored question to elicit a misleading response, much as the tobacco industry used to ask scientists whether smoking could be conclusively identified as a cause of lung cancer.

Here are the facts.

State and federal officials have identified what several said was an alarming pattern of water contamination in and around drilling sites across the country. Until ProPublica began asking questions last year, few environmental officials had examined what role hydraulic fracturing may have played in this contamination.

Colorado records [3] (PDF) cite some 1,500 cases from 2003 to 2008 in which drilling companies reported a hazardous spill, with 300 instances leading to what state officials determined was a measurable impact on water supplies. A tally of Colorado data was performed by the advocacy group Oil and Gas Accountability Project [4].

In New Mexico, Mark Fesmire, director of the Oil and Gas Conservation Division, said his state had documented some 800 cases in which water has been contaminated by oil and gas operations, half of them from waste pits that had leaked chemicals into the ground.

As ProPublica has reported, it’s difficult for scientists to say which aspect of drilling -- the hydraulic fracturing, the waste water that accidentally flows into the ground, the leaky pits of drilling fluids or the spills from truckloads of chemicals transported to and from the site -- causes such pollution.

Here's why: The industry has adamantly refused to make public the ingredients of the chemicals it forces into the ground and later stores in the waste pits near drilling sites. Scientists say that information is crucial to tracing the source of pollution. Without those data, environmental officials say they cannot conclude with certainty when or how certain chemicals entered the water.

Ask officials in New Mexico and Colorado: Are there any cases in which we can prove beyond a reasonable doubt that hydraulic fracturing caused water contamination? Answer: No, we've never studied that question.

Ask those same officials: Are there hundreds of cases of water contamination in drilling areas, the vast majority of which use hydraulic fracturing? Answer: Yes.

The drilling industry, echoed by Kopel, cites three documents when asserting the environmental safety of hydraulic fracturing. They are a 2004 EPA study [5] (PDF), a 2002 survey of state agencies [6] (PDF) by the Interstate Oil and Gas Compact Commission and a similar survey in 1998 by the Ground Water Protection Council [7] (PDF).

In its Nov. 13 article [8], ProPublica detailed flaws in the EPA study and reported that the two surveys were "anecdotal," meaning that they included none of the basic data required to qualify as a scientific study. The "results" were drawn from questionnaires sent to state officials. ProPublica did misstate the date on one of these surveys, referring to it as more than a decade old when it had been published in 2002.

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Tags: Drilling, Hydraulic Fracturing, Natural Gas

Colorado Study Links Methane in Water to Drilling

by Abrahm Lustgarten, ProPublica - April 22, 2009 6:00 am EST

This story was co-published [1] with the Denver Post.

Abrahm Lustgarten/ProPublica

Jesse Ellsworth thought something was wrong with his water when it began to smell funny and popped out of his faucet in bursts. Then, in February, the Fort Lupton resident launched an experiment: he flipped on the kitchen tap and took a cigarette lighter to the stream. As flint sparked steel, the water lit on fire like a torch.

Ellsworth is one of at least 29 residents in small farming communities northeast of Denver who have asked either the energy companies or the Colorado Oil and Gas Conservation Commission to test for natural gas in their water wells.

Now the commission is trying to figure out how the gas got there. Are some of Weld County's 13,957 gas wells leaking methane into drinking water? Or is methane seeping into the water naturally, as it has done from time to time over the years?

So far, officials have determined that at least nine of those contamination cases are not drilling-related; they are likely the result of a water well intersecting with gas underground. But the Ellsworth's well -- which has stronger evidence tying it to drilling -- remains a mystery.

"This one I think is best characterized as an isolated circumstance," said David Neslin, director of the COGCC, "We can't, sitting here today, say 'Yes" that this is coming from somebody's gas well."

While the search for clues continues in Weld County, investigations about methane contamination in Garfield County and other parts of the country have clearly tied the contamination to energy development, strengthening arguments across the country that drilling can put drinking water at risk.

Near Cleveland, Ohio, a house exploded in late 2007 after gas seeped into its water well. The Ohio Department of Natural Resources later issued a 153-page report [2] that blamed a nearby gas well's faulty cement casing and hydraulic fracturing [3] -- a deep-drilling process that shoots millions of gallons of water, sand and chemicals into the ground under explosive pressure -- for pushing methane into an aquifer and causing the explosion.

In Dimock, Pa., where drilling recently began in the mammoth Marcellus shale deposit, several drinking water wells have exploded and nine others were found with so much gas that one homeowner was told to open a window if he planned to take a bath. In February, the Pennsylvania Department of Environmental Protection charged Cabot Oil & Gas with two violations that it says caused the contamination, theorizing that gas leaked from the well casing into fractures underground.

Industry representatives say methane contamination incidents are statistically insignificant, considering that 452,000 wells produced gas in the United States last year. They point out that methane doesn't necessarily come from gas wells -- it's common in nature and can leak into water from biological processes near the surface, like rotting plants.

The industry also defends its construction technology, saying it keeps gas and drilling fluids -- including any chemicals used for hydraulic fracturing -- safely trapped in layers of steel and concrete. Even if some escapes, they say, thousands of feet of rock make it almost impossible for it to migrate into drinking water aquifers. When an accident happens, the blame can usually be traced to a lone bad apple -- some contractor who didn't follow regulations, they say. Those arguments helped the gas drilling industry win rare exemptions from the Safe Drinking Water Act and the Clean Water Act when Congress enacted the 2005 Energy Policy Act.

Now an exhaustive examination of a methane problem on Colorado's Western Slope is offering a strong scientific repudiation of that argument. Released in December by Garfield County, the report concludes that gas drilling has degraded water in dozens of water wells.

The three-year study used sophisticated scientific techniques to match methane from water to the same rock layer -- a mile and a half underground - where gas companies are drilling. The scientists didn't determine which gas wells caused the problem or say exactly how the gas reached the water, but they indicated with more clarity than ever before that a system of interconnected natural fractures and faults could stretch from deep underground gas layers to the surface. They called for more research into how the industry's practice of forcefully fracturing those deep layers might increase the risk of contaminants making their way up into an aquifer.

"It challenges the view that natural gas, and the suite of hydrocarbons that exist around it, is isolated from water supplies by its extreme depth," said Judith Jordan, the oil and gas liaison for Garfield County who has worked as a hydrogeologist with DuPont and as a lawyer with Pennsylvania's Department of Environmental Protection. "It is highly unlikely that methane would have migrated through natural faults and fractures and coincidentally arrived in domestic wells at the same time oil and gas development started, after having been down there ...for over 65 million years."

The Garfield County analysis comes as Congress considers legislation that would toughen environmental oversight of drilling and reverse the exemptions enjoyed by the gas companies. Colorado has already overhauled its own oil and gas regulations, despite stiff resistance from the

energy industry. The new rules, which went into effect earlier this month, strengthen protections against, among other things, methane contamination.

Drinking water with methane, the largest component of natural gas, isn't necessarily harmful. The gas itself isn't toxic -- the Environmental Protection Agency doesn't even regulate it -- and it escapes from water quickly, like bubbles in a soda.

But the gas becomes dangerous when it evaporates out of the water and into peoples' homes, where it can become flammable. It can also suffocate those who breathe it. According to the Agency for Toxic Substances and Disease Registry, a part of the U.S. Department of Health and Human Services, as the concentration of gas increases it can cause headaches, then nausea, brain damage and eventually death.

The Garfield County report is significant because it is among the first to broadly analyze the ability of methane and other contaminants to migrate underground in drilling areas, and to find that such contamination was in fact occurring. It examined over 700 methane samples from 292 locations and found that methane, as well as wastewater from the drilling, was making its way into drinking water not as a result of a single accident but on a broader basis.

As the number of gas wells in the area increased from 200 to 1,300 in this decade, methane levels in nearby water wells increased too. The study found that natural faults and fractures exist in underground formations in Colorado, and that it may be possible for contaminants to travel through them.

Conditions that could be responsible include "vertical upward flow" "along natural open-fracture pathways or pathways such as well-bores or hydraulically-opened fractures," states the section of the report done by S.S. Papadopulos and Associates, a Maryland-based environmental engineering firm specializing in groundwater hydrology.

The researchers did not conclude that gas and fluids were migrating directly from the deep pockets of gas the industry was extracting. In fact, they said it was more likely that the gas originated from a weakness somewhere along the well's structure. But the discovery of so much natural fracturing, combined with fractures made by the drilling process, raises questions about how all those cracks interact with the well bore and whether they could be exacerbating the groundwater contamination.

"One thing that is most striking is in the area where there are large vertical faults you see a much higher instance of water wells being affected," said Geoffrey Thyne, the hydrogeologist who wrote the report's summary and conclusion. He is a senior research scientist at the University of Wyoming's Enhanced Oil Recovery Institute, a pro-extraction group dedicated to tapping into hard-to-reach energy reserves.

The report, referred to as the Garfield County Hydrogeologic Study, has been met with cautious silence by the industry and by its regulators.

The Colorado Oil and Gas Conservation Commission, the state's regulatory body, would not respond to questions from ProPublica because it hasn't thoroughly analyzed the data behind the November report, said its acting director, David Neslin.

Neither the Colorado Oil and Gas Association nor Encana, the Canadian energy company that drills in the study area, would comment on the Garfield County report. Both referred questions to Anthony Gorody, a Houston-based geochemist who specializes in oil and gas issues and frequently is employed by the energy industry.

Gorody dismissed the report's conclusions as "junk science."

"This is so out of whack. There are a handful of wells that have problems. These are rare events," said Gorody, president of Universal Geosciences Consulting. "They are like plane crashes -- the extent tends to be fairly limited. I do not see any pervasive impact."

Most of the methane in the study area, Gorody said, came from shallow gas-bearing rock or decaying matter near the surface -- not from the deep gas produced by the energy industry. He criticized the report's methodology, saying the way that researchers linked the stray gas with the deep gas formations was speculative at best.

Thyne, standing by his report, said researchers had traced the origin of the gas by conducting the equivalent of a forensic investigation, analyzing its isotopic signature, or molecular fingerprint. The molecular structure showed that most of it was thermogenic, meaning it matched the deeply buried deposit where gas was being drilled, called the Williams Fork Formation. A minority of the samples were difficult to identify by this method, so Thyne used another scientific process to study them. He is confident they, too, were thermogenic in origin.

In most cases, the study couldn't pinpoint the exact pathway the contaminants had used to travel a mile and a half up into the drinking water aquifer. So Thyne could only reason the possibilities.

The methane could be seeping into water wells through natural fractures, he said, or through leaks in the well casings or cement, or from the well heads.

When a pipe extends 8,000 feet below the earth's surface, he said, "there are numerous potential leak points along the way. So is it leaking at 8,000 feet and coming up a well bore, a natural fault or fracture? Or is it leaking 500 feet from the surface? We don't know."

The most plausible explanation, Thyne said, is that the same type of well casing and cementing issues that had proved problematic in Ohio and are suspected in Pennsylvania were presenting problems in Colorado too.

"The thesis is that because of the way the wells are designed they could be a conduit," said Garfield County's Jordan, who commissioned the report.

Jordan worries that the methane leaks could be a sign of worse to come.

"We suspect the methane would be the most mobile constituent that would come out of the gas fields. Our concern is that it's a sort of sentinel, and there are going to be worse contaminants behind it," she said. "It's not just sitting down there as pure CH4 (methane). It's in a whole bath of hydrocarbons," she said, and some of those "can be problematic."

Want to tell us about your own experience? Click here. [4]

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Tags: Colorado, Drilling, Methane, Natural Gas

Officials in Three States Pin Water Woes on Gas Drilling

by Abrahm Lustgarten, ProPublica - April 26, 2009 7:00 am EST

Update 6/9: Congress Introduces Twin Bills to Control Drilling and Protect Drinking Water [1]

Pat Farnelli, top left, Ronald Carter, bottom left, Richard Seymour, top right, and Norma Fiorentino, bottom right, live in Dimock, Pa. A year after Cabot Oil & Gas landmen knocked on their doors to sign drilling leases, they are finding that their drinking water now contains methane, the largest component of natural gas. (Abrahm Lustgarten/ProPublica)

Norma Fiorentino's drinking water well was a time bomb. For weeks, workers in her small northeastern Pennsylvania town had been plumbing natural gas deposits from a drilling rig a few hundred yards away. They cracked the earth and pumped in fluids to force the gas out. Somehow, stray gas worked into tiny crevasses in the rock, leaking upward into the aquifer and slipping quietly into Fiorentino's well. Then, according to the state's working theory, a motorized pump turned on in her well house, flicked a spark and caused a New Year's morning blast that tossed aside a concrete slab weighing several thousand pounds.

Fiorentino wasn't home at the time, so it's difficult to know exactly what happened. But afterward, state officials found methane, the largest component of natural gas, in her drinking water. If the fumes that built up in her well house had collected in her basement, the explosion could have killed her.

Dimock, the poverty-stricken enclave where Fiorentino lives, is ground zero for drilling the Marcellus Shale, a prized deposit of natural gas that is increasingly touted as one of the country's most abundant and cleanest alternatives to oil. The drilling here -- as in other parts of the nation -- is supposed to be a boon, bringing much-needed jobs and millions of dollars in royalties to cash-strapped homeowners.

But a string of documented cases of gas escaping into drinking water -- not just in Pennsylvania but across North America -- is raising new concerns about the hidden costs of this economic tide and strengthening arguments across the country that drilling can put drinking water at risk.

Near Cleveland, Ohio, an entire house exploded in late 2007 after gas seeped into its water well. The Ohio Department of Natural Resources later issued a 153-page report [2] (PDF) that blamed a nearby gas well's faulty concrete casing and hydraulic fracturing [3] -- a deep-drilling process that shoots millions of gallons of water, sand and chemicals into the ground under explosive pressure -- for pushing methane into an aquifer and causing the explosion.

In Dimock, several drinking water wells have exploded and nine others were found with so much gas that one homeowner was told to open a window if he planned to take a bath. Dishes showed metallic streaks that couldn't be washed off, and tests also showed high amounts of aluminum and iron, prompting fears that drilling fluids might be contaminating the water along with the gas. In February, the Pennsylvania Department of Environmental Protection charged Cabot Oil & Gas with two violations that it says caused the contamination, theorizing that gas leaked from the well casing into fractures underground.

An underground gas line in Dimock, Pa. (Abrahm Lustgarten/ProPublica)

Industry representatives say methane contamination incidents are statistically insignificant, considering that 452,000 wells produced gas in the United States last year. They also point out that methane doesn't necessarily come from gas wells -- it's common in nature and can leak into water from biological processes near the surface, like rotting plants.

The industry also defends its construction technology, saying it keeps gas and drilling fluids -- including any chemicals used for hydraulic fracturing -- safely trapped in layers of steel and concrete. Even if some escapes, they say, thousands of feet of rock make it almost impossible for it to migrate into drinking water aquifers. When an accident happens, the blame can usually be traced to a lone bad apple -- some contractor who didn't follow regulations, they say. Those arguments helped the gas drilling industry win rare exemptions from the Safe Drinking Water Act and the Clean Water Act when Congress enacted the 2005 Energy Policy Act [4].

But now an exhaustive examination of the methane problem in western Colorado is offering a strong scientific repudiation of that argument. Released in December by Garfield County, one of the most intensely drilled areas in the nation, the report concludes that gas drilling has degraded water in dozens of water wells [5] (PDF).

The three-year study used sophisticated scientific techniques to match methane from water to the same rock layer where gas companies are drilling -- a mile and a half underground. The scientists didn't determine which gas wells caused the problem or say exactly how the gas reached the water, but they indicated with more clarity than ever before that a system of interconnected natural fractures and faults could stretch from deep underground gas layers to the surface. They called for more research into how the industry's practice of forcefully fracturing those deep layers might increase the risk of contaminants making their way up into an aquifer.

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The Garfield County analysis comes as Congress considers legislation that would toughen environmental oversight of drilling and reverse the exemptions enjoyed by the gas companies. Colorado has already overhauled its own oil and gas regulations, despite stiff resistance from the energy industry. The new rules, which went into effect earlier this month, strengthen protections against, among other things, methane contamination.

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Under Pressure

The carefully documented accident in Ohio in December 2007 offers a step-by-step example of what can happen when drilling goes wrong.

A spark ignited the natural gas that had collected in the basement of Richard and Thelma Payne's suburban Cleveland home, shattering windows, blowing doors 20 feet from their hinges and igniting a small fire in a violent flash. The Paynes were jolted out of bed, and their house lifted clear off the ground.

Fearing another explosion, firefighters evacuated 19 homes in the small town of Bainbridge. Somehow, gas had seeped into the drinking water aquifer and then migrated up through the plumbing.

Gas had shown up in water in this part of Ohio in the past. In 2003, the U.S. Department of Health and Human Services investigated nearby residents' complaints of "dizziness," "blacking out," "rashes," "swelling of legs" and "elevated blood pressure" related to exposure to methane through bathing, dishwashing and drinking. That study concluded that gas in the area could migrate through underground fractures and said that "combustible gases, including methane, in private well water present an urgent public health hazard."

According to Scott Kell, deputy chief of Ohio's Division of Natural Resources, those earlier instances were determined to have had nothing to do with drilling activity. But by the time the Paynes' house exploded four years later, the Natural Resources Department had begun to aggressively monitor for gas, and this time it suspected a clearer link to drilling. It all had to do with how a well is constructed.

Called GEsford 3, this well is adjacent to Dimock resident Pat Farnelli's house. There have been complications in drilling that well, including a drill bit that clogged the well for weeks, forcing them to have to drill a new hole. That is one of the possible causes being considered for the contamination in Farnelli's drinking water. (Abrahm Lustgarten/ProPublica)

To reach natural gas, a well bore is drilled into the earth through dozens of geologic formations stacked like layers in a cake, until the bore reaches the layer holding gas. In Ohio, gas is produced from almost 3,700 feet, or three-quarters of a mile, below. In Colorado or Pennsylvania, wells can be a mile or two deep -- far below drinking water aquifers.

In many geologic regions, the deeper gas-bearing layers are under extraordinary pressure from the weight of earth and water above, but that pressure normally is contained by thousands of feet of leakproof rock that separate the gas from the surface. When a drill bit sinks down, though, the tight seal of each geologic layer is broken and the pressure is released, forcing water, gas or oil into the newly opened pathway. That's how an oil well can become a gushing geyser.

To keep the gas and drilling fluids from leaking into the natural environment, drilling companies insert as many as three concentric rings of steel pipes inside the well bore to isolate what flows through them. When the bore passes through areas where extra protection is needed -- such as drinking water aquifers -- concrete is pumped into the gap between the rings of pipe to ensure an impenetrable seal. Most states, including Ohio, require these measures in part to protect drinking water.

"That's pretty much the holy grail, good and proper cementing and casing," said Michael Nickolaus, former director of Indiana's Department of Natural Resources, Oil and Gas Division,

and special projects director for the Ground Water Protection Council, a group of scientists and state regulators that studies industries' impacts on water. Nickolaus added that if these zones are properly isolated from one another, the issue of groundwater contamination, whether from gas or hydraulic fracturing, goes away.

The investigation into the explosion at the Paynes' home found that a drilling company working nearby had failed to properly build that protective concrete casing and had continued to process the well despite warning signs that should have alerted it to stop. Six weeks before the explosion, the company, Ohio Valley Energy Systems, pumped concrete into the well casing. But it couldn't fill the gap, evidence that somewhere a crack was allowing the concrete to seep into the space between the pipes, and probably out into the surrounding earth.

If the concrete could leak, then so could drilling fluids -- or the gas itself.

A week later, "despite the fact that the cement behind the casing was insufficient by standard industry practice," according to the state's report [2] (PDF), the company began hydraulic fracturing. More than 46,000 gallons of water, sand and chemicals were pumped into the well bore with enough force to crack the rock and release the gas.

Again, the drillers saw signs of a leak in the well. The company tried to recover as much of the leaking fluid as possible, but the state report said at least 1,000 gallons of fracturing fluid, including about 150 gallons of oil, disappeared into the space between the well pipes and possibly out into the ground.

Finally, the company shut down the well. But the underlying pressurized gas formation had already been punctured, and its contents were trying to escape. The gas collected inside the well for the next 31 days, until 360 pounds of pressure built against the valve at the top. It was enough, state investigators wrote, to force the gas out of the well bore by any means it could find.

"This overpressurized condition resulted in invasion of natural gas from the annulus of the well into natural fractures in the bedrock below the base of the cemented surface casing," the report states, adding that it was the first time anything like this had been confirmed in Ohio.

Ohio Valley Energy Systems did not return calls for comment on the state's findings.

On Dec. 12, three days before the Paynes' house exploded, methane was detected in the Bainbridge Police Department's water well, 4,700 feet from the gas well in question. Two days later, nearby residents reported sediment in their water and artesian conditions in their wells, meaning the water was spurting out under pressure. By the next morning the gas -- still seeking an outlet -- had forced its way into Richard Payne's basement, where it reached a flammable concentration. All it needed was a spark.

Science Blames Drilling

Dimock resident Norma Fiorentino's drinking water well was a time bomb. On New Year's morning, her well exploded. After the blast, state officials found methane in her drinking water. (Abrahm Lustgarten/ProPublica)

As regulators in Ohio struggled to reconcile what was happening there, officials in Garfield County, Colo., were waiting for the results of the three-part, three-year study examining the connections between methane leaks and drilling there.

The report is significant because it is among the first to broadly analyze the ability of contaminants to migrate underground in drilling areas, and to find that such contamination was in fact occurring. It examined over 700 methane samples from 292 locations and found that methane, as well as wastewater from the drilling, was making its way into drinking water not as a result of a single accident but on a broader basis.

As the number of gas wells in the area increased from 200 to 1,300 in this decade, the methane levels in nearby water wells increased too. The study found that natural faults and fractures exist in underground formations in Colorado, and that it may be possible for contaminants to travel through them.

Conditions that could be responsible include "vertical upward flow" "along natural open-fracture pathways or pathways such as well-bores or hydraulically-opened fractures," states the section of the report done by S.S. Papadopulos and Associates [6] (PDF), a Maryland-based environmental engineering firm specializing in groundwater hydrology.

The researchers did not conclude that gas and fluids were migrating directly from the deep pockets of gas the industry was extracting. In fact, they said it was more likely that the gas originated from a weakness somewhere along the well's structure. But the discovery of so much natural fracturing, combined with fractures made by the drilling process, raises questions about how all those cracks interact with the well bore and whether they could be exacerbating the groundwater contamination.

"One thing that is most striking is in the area where there are large vertical faults you see a much higher instance of water wells being affected," said Geoffrey Thyne, the hydrogeologist who wrote the report's summary and conclusion [5] (PDF). He is a senior research scientist at the University of Wyoming's Enhanced Oil Recovery Institute [7], a pro-extraction group dedicated to tapping into hard-to-reach energy reserves.

The report, referred to as the Garfield County Hydrogeologic Study, has been met with cautious silence by the industry and by its regulators.

The Colorado Oil and Gas Conservation Commission, the state's regulatory body, would not respond to questions from ProPublica because it hasn't thoroughly analyzed the data behind the December report, said its director, David Neslin.

Neither the Colorado Oil and Gas Association nor Encana, the Canadian energy company that drills in the study area, would comment on the Garfield County report. Both referred questions to Anthony Gorody, a Houston-based geochemist who specializes in oil and gas issues and frequently is employed by the energy industry.

Gorody dismissed the report's conclusions as "junk science."

"This is so out of whack. There are a handful of wells that have problems. These are rare events," said Gorody, president of Universal Geosciences Consulting. "They are like plane crashes -- the extent tends to be fairly limited. I do not see any pervasive impact."

Most of the methane in the study area, Gorody said, came from decaying matter near the surface -- not from the deep gas produced by the energy industry. He criticized the report's methodology, saying the way that researchers linked the stray gas with the deep gas formations was speculative at best.

To Dimock resident Pat Farnelli, seen here pointing to the drilling rig in her backyard, the promise of making money off her family's land came at just the right time. But perhaps not at the right price. Now she spends more than $100 of her monthly food stamp allotment to buy plastic jugs of drinking water. (Abrahm Lustgarten/ProPublica)

Thyne, standing by his report, said researchers had traced the origin of the gas by conducting the equivalent of a forensic investigation, analyzing its isotopic signature, or molecular fingerprint. The molecular structure showed that most of it was thermogenic, meaning it matched the deeply buried deposit where gas was being drilled, called the Williams Fork Formation. A minority of the samples were difficult to identify by this method, so Thyne used another scientific process to study them. He is confident they, too, were thermogenic in origin.

In most cases, the study couldn't pinpoint the exact pathway the contaminants had used to travel a mile and a half up into the drinking water aquifer. So Thyne could only reason the possibilities.

The methane could be seeping into water wells through natural fractures, he said, or through leaks in the well casings or concrete, or from the well heads.

When a pipe extends 8,000 feet below the earth's surface, he said, "there are numerous potential leak points along the way. So is it leaking at 8,000 feet and coming up a well bore, a natural fault or fracture? Or is it leaking 500 feet from the surface? We don't know."

The most plausible explanation, Thyne said, is that the same type of well casing and cementing issues that had proved problematic in Ohio were presenting problems in Colorado too.

“The thesis is that because of the way the wells are designed they could be a conduit,” said Garfield County’s Jordan, who commissioned the report.

Jordan worries that the methane leaks could be a sign of worse to come.

“We suspect the methane would be the most mobile constituent that would come out of the gas fields. Our concern is that it’s a sort of sentinel, and there are going to be worse contaminants behind it,” she said. “It’s not just sitting down there as pure CH4 (methane). It’s in a whole bath of hydrocarbons,” she said, and some of those “can be problematic.”

‘You Can’t Buy a Good Well’

When landmen from Cabot Oil & Gas came knocking on doors along the rutted dirt grade of Carter Road in Dimock, Pa., last year, they sold a promise many residents in the farming community were eager to hear: Sign a gas lease and the land might finally pay for itself.

Many of Dimock’s 1,300 residents had fallen on hard times. Approximately one in seven were out of work, and more than a few homes were perched on the precipice of foreclosure.

Cabot offered $25 an acre for the right to drill for five years, plus royalties when the gas started flowing. To outsiders it might seem a small amount, but it would make an immediate difference to people who owned fields but few other assets.

“It seemed like God’s provenance,” said Pat Farnelli, whose husband, a farmer, had taken a job as a night chef at a diner on the interstate to pay one more month’s mortgage. The day Cabot’s man showed up -- with a wide-brim hat and a Houston drawl -- the Farnellis mistook him for a debt collector. “We really were having a rough time right then -- that day. We thought it was salvation. Any ray of hope here is a big deal.”

Richard Seymour, seen here with his wife Wendy, runs a certified natural farm that ships produce across the state. His well is now running red and turbid and bubbles with so much gas that he fears he’ll lose his agricultural certification. (Abrahm Lustgarten)

That was more than a year ago, and since then Cabot -- which earned close to a billion dollars in revenue last year -- has drilled 20 wells and is producing $58 million worth of gas there annually. In its annual report, Cabot bullishly called the Dimock field a once-in-a-lifetime “game-changing event” [8] (PDF) for the company and announced it would drill 63 more wells there next year.

The wealth has begun trickling down to the residents of Dimock. A few will earn more than a half-million dollars this year, and bimonthly checks for $6,000 are not uncommon. Cabot and its

contractors also support the local economy by hiring local labor and patronizing hotels and restaurants in nearby towns.

But the water contamination is forcing the people who live there to accept a difficult compromise.

“You have to evaluate which is more important, the money or the water,” said a Dimock resident who declined to be named because he doesn’t want to antagonize Cabot, which he says will pay him more than $600,000 this year for the wells on his property. “The economy is so tough. Suppose you could stop drilling -- no one wants Cabot to go away.”

For some, though, the benefits can be easily erased.

Norma Fiorentino, whose well exploded on New Year’s morning, got just $97 in royalties in February. Now a part of her monthly $646 Social Security check goes to buy water. “You can’t buy a good well,” she said.

Down the road, Pat Farnelli spends more than $100 of her monthly food stamp allotment to buy plastic jugs of drinking water. Next door, Ronald Carter paid $7,000 to install two water treatment systems for his family, then learned they won’t remove the gas.

Cabot has begun voluntarily supplying water to at least five homes in Dimock, a gesture the company says does not mean it has acknowledged fault. “For now Cabot is simply trying to do the right thing while studies are being performed and data is being obtained,” said Kenneth Komoroski, Cabot’s spokesman.

Others have yet to get any aid.

“This isn’t something that people should be living with,” said Craig Lobins, the regional oil and gas manager for Pennsylvania’s Department of Environmental Protection. “It’s serious.”

Pennsylvania’s DEP places responsibility for the contamination squarely on Cabot.

In January the DEP blamed the company for polluting one water well. Then in late February it sent Cabot a list of violations [9] (PDF) it said led to methane seepage in other area wells. Investigators think the seepage was caused by a weakness in the well casing or an improper cementing job, much like what had been reported in Colorado and Ohio. The good news was that they found no evidence that any of the hydraulic fracturing fluids had leaked into well water.

Komoroski, the Cabot spokesman, said it’s too early to conclude the company is responsible for contaminating Dimock’s wells.

He said Cabot has hired an expert who is still investigating exactly what happened in the case.

“The DEP’s letter was premature,” Komoroski said, “It is possible that Cabot is responsible. It’s possible it is not. That’s what we hired a hydrogeologist to help us determine.”

Cabot has since cemented the entire length of its well casings in Dimock -- a safeguard similar to what has been prescribed in Ohio and Colorado -- and believes that measure, which is more extensive than state regulations require, will solve the problem.

Yet the DEP sees no need to require such precautions at all the state's wells, because what is happening in Dimock is "an anomaly."

"Last year we permitted 8,000 wells, and this may be the only incident that occurred," said the DEP's Lobins. "You can't cover every possible scenario that you could encounter out there, so when the regulations are crafted it addresses the ones that will be most protective of 99.9 percent of the wells."

Industry spokesmen also oppose making the precautionary cementing practices mandatory.

"For one thing it is very costly," said Lee Fuller, vice president of government relations at the Independent Petroleum Association of America. "At the same time if you try to put in too much cement you can risk collapsing the well. So it's drawing a balance between protecting the groundwater" and "protecting the well that you are constructing."

At the bottom of the hill on Carter Road, Richard Seymour runs a certified natural farm that ships produce across the state. His well is running red and turbid, and bubbles with so much gas that he fears he'll lose that agricultural certification. If there's a technology, like cementing, that can protect his water, then shouldn't it be required in every case, he asks?

"We feel pretty alone on this, pretty frustrated," Seymour said. "I assumed the DEP, EPA, the state -- the government -- would protect our land. We didn't know that as a landowner the burden was on us."

Want to tell us about your own experience? Click here. [10]

Want to contact the reporter directly? Click here. [11]

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [12].

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Tags: Drilling, Hydraulic Fracturing, Methane, Methane Emissions, Natural Gas

16 Cattle Drop Dead Near Mysterious Fluid at Gas Drilling Site

by Abrahm Lustgarten, ProPublica - April 30, 2009 3:00 pm EST
Jim Hudelson/The (Shreveport) Times [1]

ProPublica has been reporting for months [2] about how natural gas drilling is affecting the environment, but of all the causes for concern we've reported, here's a doozy.

Sixteen cattle dropped dead in a northwestern Louisiana field this week after apparently drinking from a mysterious fluid adjacent to a natural gas drilling rig, according to Louisiana's Department of Environmental Quality and a report in the *Shreveport Times* [3]. At least one worker told the newspaper that the fluids, which witnesses described as green and spewing into the air near the drilling derrick, were used for a drilling process called hydraulic fracturing [2]. But the company, Chesapeake Energy [4], has not identified exactly what chemicals are in those fluids and is insisting to state regulators that no spill occurred.

The problem is that both Chesapeake and its contractor doing the work Schlumberger, say that a lot of these fluids are proprietary, said Otis Randle, regional manager for the DEQ. "It can be an obstacle, but we try to be fair to everybody," he said. "We try to remember that the products they use are theirs and they need them to make a living."

Hydraulic fracturing [5] -- a process in which water, sand and chemicals are pumped deep underground at high pressure to break rock and release natural gas -- is controversial because of the secrecy surrounding the fluids and because the process is exempted from protections of the Safe Drinking Water Act and thus from regulation by the Environmental Protection Agency. Congress is currently considering legislation to address these issues out of concern that fracturing, and the fluids and waste that are part of the process, may be contaminating drinking water in several states [6].

Hydraulic fracturing has made drilling more efficient and economical [7] and has helped make vast new reserves of natural gas available across the country, including in New York, Pennsylvania, Texas, Wyoming, Colorado [8] and Louisiana.

Scientists at the EPA and the U.S. Geological Survey have told ProPublica [9] that it's difficult for them to assess the environmental risks posed by hydraulic fracturing chemicals because the companies that use them won't release the exact names and amounts of the chemicals. The energy

service companies, including Halliburton and Schlumberger, say that disclosing that information would put them at a competitive disadvantage, and they insist the fluids are safe. Some information about the materials is made available through Material Safety Data Sheets, which can provide cursory medical advice for workers exposed to the chemicals.

The drilling companies have given Louisiana's DEQ a large stack of these sheets. Randle said they contain some helpful information, but it will take the agency some time to weed through them. In the field where the cattle died on Tuesday, the DEQ [10] reports finding a white milky substance on the ground, with cattle tracks leading away to the dead animals. Randle said he is almost certain the substance is a drill fluid or fracturing fluid.

A Chesapeake Energy spokesman told ProPublica that the company is cooperating with the state and is waiting for test results to determine how the cows died. Schlumberger did not immediately return calls for comment. If we hear from the company, we'll let you know.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [11].

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Tags: Cows, Drilling, Hydraulic Fracturing, Louisiana, Natural Gas

EPA Administrator Forecasts Potential Shift on Bush-Era Drilling Loophole

by Joaquin Sapien, ProPublica - May 22, 2009 2:02 pm EST

President Obama and EPA Administrator Lisa Jackson (Lauren Victoria Burke/wdcpix.com)

Signaling the potential for an important policy reversal, Environmental Protection Agency Administrator Lisa Jackson said in a congressional hearing on Tuesday that the agency would consider revisiting its controversial position that a popular natural gas drilling technique doesn't harm groundwater.

A 2004 study [1] (PDF) conducted by the EPA concluded that hydraulic fracturing [2] -- a process that involves pummelling the earth with millions of gallons of water mixed with sand and chemicals to extract natural gas -- causes "no threat" to underground drinking water.

The study is often used by the gas industry to rebut concerns over drinking water contamination. It was also the main basis for a provision in a 2005 energy bill that exempts hydraulic fracturing from regulation under the Safe Drinking Water Act. The bill says the process is exempt because it doesn't harm groundwater. Opponents of the exemption are trying to repeal it, and a new study from the EPA would add muscle to their argument.

A ProPublica investigation [3] co-published with *BusinessWeek* [4] last November identified serious flaws in the EPA's 2004 study. We found that the agency negotiated directly with the gas industry before finalizing its conclusions and ignored evidence that the process might indeed contaminate water supplies.

Rep. Maurice Hinchey (D-NY) expressed concern [5] about these issues and recent reports of contamination near drill sites. At a House Appropriations Subcommittee on Interior hearing on Tuesday, he asked Jackson [6] whether the emerging evidence would prompt the EPA to revise its previous conclusions.

Jackson said she recognized that the current regulations restrict the EPA's ability to protect groundwater and said the issue "was well worth looking into." But she didn't say how the EPA would approach the problem or whether the 2004 study would be revised.

A spokesperson for Jackson would not elaborate on her remarks.

The statement has stirred optimism [7] among environmentalists who have been urging the EPA and Congress to repeal the exemption. They feel it's a sign that the Obama administration is willing to take a fresh look at the Bush administration's legacy on gas drilling.

"Big ships turn slowly," said Bruce Baizel, an attorney with the Oil and Gas Accountability Project [8], "but I think this is the first time EPA has acknowledged that maybe their previous conclusions were not entirely supported by sound science."

Industry representatives contend that fracturing is safe and dispute the claim that the process has been linked to water contamination. They also maintain that fracturing is best regulated by individual states, rather than the federal government.

"The EPA study is one of several studies done by a variety of different interests in the past decade, and I don't believe that there is any compelling evidence that the risk has changed since 2004," said Lee Fuller, vice president of government relations for the Independent Petroleum Association of America [9]. "The reports mentioned (in the hearing) have been analyzed to show that they are not related to hydraulic fracturing."

Write to Joaquin Sapien at joaquin.sapien@propublica.org [10].

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Tags: Drilling, EPA, Hydraulic Fracturing, Lisa Jackson, Natural Gas

Natural Gas Politics

by Abrahm Lustgarten, ProPublica - May 26, 2009 8:14 am EST

From left, former Vice President Dick Cheney, Rep. John Salazar, Rep. Diana DeGette and Sen. Bob Casey are all trying to leave their mark on how natural gas is drilled in the U.S. (Abrahm Lustgarten/ProPublica)

Four years after Vice President Dick Cheney spearheaded a massive energy bill that exempted natural gas drilling from federal clean water laws, Congress is having second thoughts about the environmental dangers posed by the burgeoning industry.

With growing evidence that the drilling can damage water supplies, Democratic leaders in Congress are circulating legislation that would repeal the extraordinary exemption and for the first time require companies to disclose all chemicals used in the key drilling process, called hydraulic fracturing [1].

The proposed legislation has already stirred sharp debate.

The energy industry has launched a broad effort in Washington to fend off this proposed tightening of federal oversight, lobbying members of Congress and publishing studies that highlight what it says are the dangers of regulation. In mid-May, the industry released a detailed report asserting that the changes in current law would cost jobs and slash tax revenues. A key advocate of past efforts to regulate gas drilling, Rep. John Salazar [2] (D-CO), has declined to support the legislation, expressing concern about how it would affect the energy companies.

However, with a strengthened Democratic majority in Congress and the party's capture of the White House in last year's election, the fracturing legislation is viewed as having its best chance at passage in years. Its House sponsor, Rep. Diana DeGette (D-CO) [3], aims to attach a bill to a larger piece of legislation with broad support -- possibly a bill on climate change or a new energy policy measure – where it would be shielded from industry resistance. On the Senate side, according to congressional staff close to the effort, Sen. Bob Casey (D-PA) [4] has a companion bill ready to follow.

The drilling process involves injecting millions of gallons of water and sand mixed with tens of thousands of gallons of chemicals -- some that are known to cause cancer -- deep into the ground, where as much as a third of those fluids typically remain after the gas is removed.

Global companies including Halliburton and Schlumberger have fought hard to shield from public view the chemical recipes they use to drill, saying that the formulas are valuable trade secrets. Scientists say that is precisely the information they need to determine if drilling caused the water pollution that has been reported in Colorado and elsewhere.

“The regulatory loophole for hydraulic fracturing puts public health at risk and isn’t justified,” Henry Waxman (D-CA) [5], chairman of the House Energy and Commerce Committee [6], which will offer the bill, said in an e-mail. “The current exemption for the oil and gas industry means that we can’t even get the information necessary to evaluate the health threats from these practices.”

The industry argues that state laws and regulators are doing an adequate job of regulating the hydraulic fracturing process, and that more layers of regulation would be burdensome and expensive.

“We don’t think the system is broke, so we question the value of trying to fix it with a federal solution,” said Richard Ranger, a senior policy analyst at the American Petroleum Institute [7]. “So proceed with caution if you are going to proceed with regulating this business because it could make a very significant difference in delivering a fuel that is fundamental to economic health.”

Proponents of regulation, including DeGette, the author of the bill, say protecting water resources is worth the slightly higher gas costs that might come with regulation, but that the industry’s assessment of those costs is dubious. The exemption, they say, has artificially lowered drilling costs because it means the companies don’t always have to follow the safest practices.

“I find it kind of a novel argument that it will be burdensome to comply with one federal law when they could potentially have to comply with 50 state laws,” she said. “I just think that they don’t want to have to do it.”

A key question for proponents and opponents alike is how strong a stance President Barack Obama’s administration will strike on this legislation. A White House spokesman said that the administration hasn’t yet taken a position.

The Safe Drinking Water Act [8], enacted in 1974, governs what chemicals can be injected underground and applies to essentially every industrial activity in the United States. It limits what levels of pollution are allowed, but then permits states to create more detailed regulations if they choose. The law also sets minimum standards for well design and other protections of health and safety.

“We are not aware of any other industries that have an exemption,” said Stephen Heare, director of the Drinking Water Protection Division at the Environmental Protection Agency [9].

As the law currently stands, the EPA is not allowed to set conditions for hydraulic fracturing or even require states to have regulations of their own.

States often look to the federal agencies for guidance on how to craft environmental rules. And hydraulic fracturing is an especially complicated process that scientists say warrants more study. The current regime leaves state agencies -- which are often understaffed and underfunded -- to do their own research and develop their own best practices, according to EPA scientists.

Natural gas, used for heating, electricity and manufacturing, supplies a fifth of the energy used in the United States and is an increasingly valued resource. According to the Energy Information Administration [10], domestic gas reserves, including those held in vast shale deposits that underlie the Appalachian states, could meet the country's natural gas needs for more than 100 years. Without hydraulic fracturing, which is now used in almost all new gas wells, much of this supply would remain beyond reach, according to the American Petroleum Institute.

Natural gas is also widely viewed as an important transitional fuel in American climate and energy policy -- emitting 23 percent less carbon dioxide per unit of energy than oil. Its development has spurred jobs and economic activity in some of the poorest and most rural parts of the U.S.

But as gas drilling has expanded, a wave of reports have emerged that the drilling is affecting water. In Colorado and Wyoming, state and federal officials have concluded that benzene and other contaminants have made their way into aquifers, streams and well water as a result of drilling accidents or spills of drilling fluids. Officials have linked methane gas in groundwater to drilling in Colorado [11] (PDF), Ohio [12] (PDF) and Pennsylvania [13]. Fracturing may or may not be to blame, EPA officials say; it's hard to tell because they don't oversee the process and can't trace chemicals that are unidentified.

"We're not talking about banning fracking here. What we're for is regulating it," said Rep. Jared Polis (D-CO) [14], a co-sponsor of the House bill, emphasizing that his hope is to give scientists the tools to measure, and to control, its impact on the environment. "Other than oil and gas companies, I am not aware of anyone that supports allowing that to continue in an unregulated way."

Even so, DeGette will need to gather support from some representatives in states that stand to reap substantial economic benefits from drilling. The retreat of Salazar, a prominent moderate whose co-sponsorship helped draw support for a similar measure in the House last year, is a warning sign that the passage is not preordained.

"I think Salazar is a very strategic target on all of this," said Sarah Tucker, an analyst for Trout Unlimited, a sportsmen's group that is lobbying for more oversight of drilling. "He is from an oil and gas district ... that gives him a lot more credibility when working on these issues. ... Those moderate Democrats are always the sticking point as to whether or not a bill actually moves."

In an e-mailed response, Salazar said he would still consider voting for the bill, but that he may pursue a compromise.

"I believe that developers may have legitimate concerns about the impact that removing the exemption may have on their ability to find and extract oil and gas," he said. "But ... the current regulatory approach is probably not sustainable and will probably need to be revised in some way."

Passing such legislation has proved difficult in the past. This year's efforts to reverse the exemptions will constitute at least the fourth effort by Democrats to shore up protections against

hydraulic fracturing since it became a focus of the White House's Energy Task Force in 2001. According to records of committee debates from 2003, the exemptions were forced through against objections, without hearings by a Republican majority and eventually tucked into the 2005 Energy Policy Act [15] (PDF). Ever since, in the face of intense lobbying, any efforts to address the topic have stalled in committee.

Last year the bill's authors, including Salazar, received a flurry of letters and phone calls urging them not to pursue the legislation. One, addressed to DeGette from Jerry McHugh, president of Denver-based San Juan Resources, said: "Now is not the time to impede development of any domestic resources. Please pull your sponsorship."

The industry has spent millions of dollars lobbying Congress on issues including fracturing since 2008, according to disclosure forms filed with Congress. Now it's circulating new research to bolster its arguments.

The industry -- which has long argued that fracturing has never been proven to have contaminated water -- points to a study published in April by the Department of Energy [16], which asserts that state laws adequately regulate hydraulic fracturing. But that report, titled "Modern Shale Gas Development in the United States: A Primer [17]" (PDF), and written by the Ground Water Protection Council [18], a broad consortium that includes industry groups, contains several questionable statements. One passage notes that "the Safe Drinking Water Act regulates the injection of fluids from shale gas activities," without mentioning that the exemptions have created significant exceptions, and that on the whole the act does not regulate all injections.

"You have very substantial economic elements that are concerned about their abilities to do whatever they want to for their own economic advantages," said Rep. Maurice Hinchey (D-NY) [19], who is also sponsoring the bill. "They are going to do whatever they can to ensure that there is not a majority of the members here voting for something like this bill."

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [20].

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Tags: American Petroleum Institute, Dick Cheney, Drilling, Energy Policy Act, Hydraulic Fracturing, John Salazar, Marcellus Shale, Natural Gas

Natural Gas Drilling Debate Heats Up

by Abrahm Lustgarten, ProPublica - June 3, 2009 3:26 pm EST

ProPublica Images

Tomorrow a House Natural Resources subcommittee will hold its first hearing of 2009 on controversial issues [1] related to the burgeoning natural gas drilling industry, which ProPublica has been covering for the last year. The committee is expected to grill a handful of state regulators and industry representatives about the environmental risks of drilling for shale gas [2] and about the use of hydraulic fracturing [3], a process in which water and chemicals are pumped underground at high pressure.

That fracturing process was exempted from federal environmental oversight in 2005 and now, amid emerging evidence that it is damaging water resources [4] across the country, Congress is preparing legislation that would reverse [1] the exemptions and require the industry to identify the toxic chemicals it pumps underground. Last week, ProPublica wrote in detail about that political effort [1].

Before the subcommittee on Energy and Mineral Resources could convene its quorum, the American Petroleum Institute gathered reporters for a conference call to explain why it is prepared to fight such legislation to the grave. Natural gas is the key to the country's energy independence, representatives of the trade and lobbying group said, adding unequivocally that hydraulic fracturing is the critical process required to get those resources.

The institute says state regulations are sufficient to keep water supplies safe and that returning authority to the Environmental Protection Agency – which the bill sponsored [1] by Rep. Diana DeGette [5] (D-CO), Rep. Jared Polis [6] (D-CO) and Maurice Hinchey [7] (D-NY) would do – amounts to a cumbersome additional layer of regulation. The API repeatedly referenced a recent study claiming that federal oversight of the drilling process would cost the industry more than $100,000 per new well and threatened that thousands of jobs would be lost if tougher regulation was passed. It maintains that fracturing has been used reliably for over 50 years, and that it's a safe technology proven not to harm water.

Asked what recent scientific studies support that notion, however, the institute's senior policy analyst, Richard Ranger, answered: "That's a good question. I'm not aware of any."

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [8].

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Tags: American Petroleum Institute, Drilling, Environmental Protection Agency, Hydraulic Fracturing, Marcellus Shale, Natural Gas, Water

Industry Defends Federal Loophole for Drilling Before Packed Congressional Hearing

by Abrahm Lustgarten, ProPublica - June 5, 2009 12:05 pm EST

Abrahm Lustgarten/ProPublica

In a packed and sometimes contentious hearing [1] on Capitol Hill Thursday, representatives of the oil and gas industry and their state regulators vigorously defended the practice of injecting toxic fluids underground without federal regulatory oversight [2].

The House Energy and Minerals subcommittee called the hearing to explore the economic and environmental risks associated with the practice, called hydraulic fracturing [3], after a string of reports of water contamination related to drilling across the country were reported by ProPublica [2]. Hydraulic fracturing is currently exempted from the Safe Drinking Water Act, but both the House and Senate are drawing up legislation that would close the Bush-era loophole and reinstate the Environmental Protection Agency's authority over the fracturing process.

The House version of the bill [4], which would also require drilling companies to disclose the names and amounts of the chemicals they inject underground, is expected to be introduced Tuesday.

In the hearing, industry-affiliated groups and an executive of Chesapeake Energy told the committee [5] (PDF) that state regulations of hydraulic fracturing are sufficient and effective and insisted that the fracturing process and the chemicals it uses are safe. They said regulating the process under the Safe Drinking Water Act would add a needless layer of regulation that would cost billions of dollars and thousands of jobs.

But a close reading of the law shows that the Safe Drinking Water Act already defers regulatory authority over oil and gas drilling to the states and that reversing the exemption in question would mainly provide a baseline for best practices and give the federal government authority to investigate contamination cases or disastrous accidents.

"I frankly think the oil and gas companies have been running a scare campaign," Colo. Representative Diana DeGette, a co-sponsor of the bill along with Maurice Hinchey (D-NY) and

Jared Polis (D-Co) , said after the hearing. “I don’t know if the oil and gas industry doesn’t understand the bill or if they are intentionally misrepresenting the bill.”

Much of the debate centered on issues unearthed in a series of articles by ProPublica [6], which has been investigating natural gas drilling for the past year. The articles focused on numerous cases of drilling-related water contamination that have been documented across the country. In most of those cases, scientists at the Environmental Protection Agency have said that their investigations were hampered because the drilling fluids are largely kept secret [7] and because the agency does not have authority to investigate whether hydraulic fracturing was indeed the cause. In one case, in Ohio, hydraulic fracturing was listed as one of the main causes leading to contamination and an explosion that ruined a house.

Among those who testified at the hearing was Scott Kell [8] (PDF), the oil and gas regulator for the state Ohio and president of the Ground Water Protection Council, whose members include both industry officials and state regulators.

Kell personally conducted the Ohio investigation that named hydraulic fracturing as a contributing factor in water contamination there, yet Kell repeated the industry position that there has never been a single case of contamination in which hydraulic fracturing was proven to be the cause. Kell also introduced letters from state regulators in Ohio, Pennsylvania, New Mexico, Alabama and Texas refuting ProPublica’s findings.

“The states have become aware of press reports and websites alleging that six states have documented over one thousand incidents of ground water contamination resulting from the practice of hydraulic fracturing,” Kell said. “Such reports are not accurate.”

In fact, ProPublica’s stories documented more than 1000 cases in which water was contaminated in the same places where fracturing takes place. In most of those cases the EPA said it was impossible to prove a link to fracturing because researchers don’t have access to the complete list of chemicals industry uses – without that list they say they can’t trace the contaminants to their source with certainty.

Officials in Colorado, where ProPublica reported that much of the contamination has occurred, did not issue such a statement refuting the articles.

When New Mexico Congressman Martin Heinrich spoke in the hearing, he sought to clarify New Mexico’s position and keep the hearing on course.

“We are trying to get at this from a standpoint of more science and less ideology; I know that’s difficult sometimes,” he said. “I would mention that while we had zero cases of usable ground water contaminated, we have a number of cases of surface water contaminated from products.”

When asked about the record of Chesapeake Energy, the nation’s largest independent gas producer, Mike John, a vice president of government relations for Chesapeake, told the committee that “I would emphasize that in my experience we have not seen any problems with hydraulic fracturing in my career.” John did not mention the recent Louisiana case in which 16 cattle died [9] after allegedly drinking spilled fracturing fluids at a Chesapeake well site – a case that is still under investigation.

The hearing descended to rancor at several points, with proponents of regulation berating the industry for fighting regulation even as it insists that clean water is a priority, and with opponents expressing frustration over what more federal oversight might mean for their state's economy, a signal that even in a Democrat-controlled Congress, legislation to regulate hydraulic fracturing may face a tough road [4].

"I am proud that I am supported by the oil and gas industry because they employ a lot of people in my state and I am going to stick up for them," said Rep. Dan Boren (D-OK). "I am sick and tired of a lot of folks in my own caucus coming after the largest employer in my state."

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Tags: Drilling, Hydraulic Fracturing, Natural Gas

FRAC Act—Congress Introduces Twin Bills to Control Drilling and Protect Drinking Water

by Abrahm Lustgarten, ProPublica - June 9, 2009 12:31 pm EST

June 10: This post has been corrected [1].

ProPublica

In a widely expected move [2] that is sure to draw the ire of the oil and gas industry, Democratic members of Congress today introduced twin bills to amend the Safe Drinking Water Act and give the Environmental Protection Agency authority over the controversial drilling process [3] called hydraulic fracturing [4].

The stand-alone bills in both the House [5] (PDF) and the Senate [6] (PDF) for the Fracturing Responsibility and Awareness of Chemicals Act -- dubbed the FRAC Act [7] (PDF) -- would also require the energy industry to disclose the chemicals it mixes with the water and sand it pumps underground in the fracturing process, information that has largely been protected as trade secrets.

The House bill [5] was introduced by Diana DeGette [2], D-Colo., Maurice Hinchey, D-N.Y., and Jared Polis, D-Colo., and will now be debated inside the House Energy and Commerce Committee. According to DeGette, the bill may proceed alone, or she could attach it to a larger piece of legislation.

“Frankly we are leaving all the options on the table for moving this bill forward,” DeGette said after hearings on the issue last week.

A matching Senate version [6] was offered by Sen. Bob Casey, D-Pa., and Sen. Chuck Schumer, D-N.Y.

Hydraulic fracturing has attracted scrutiny in the past year after a series of reports by ProPublica [8] found water contamination in areas across the country where drilling takes place. Because the fracturing process was exempted from federal water laws by the 2005 Energy Policy Act, scientists at the Environmental Protection Agency have said they can’t adequately investigate cases of pollution or determine whether fracturing might be to blame.

“Families, communities, and local governments are upset that the safety of their water has been compromised by a special interest exemption, and we join them in that frustration,” Polis said in an e-mail this morning. “The problem is not natural gas or even hydraulic fracturing itself. The problem is that dangerous chemicals are being injected into the earth, polluting our water sources, without any oversight whatsoever.”

The energy industry contends that the FRAC Act, which removes the Safe Drinking Water Act exemption, amounts to an additional layer of regulation that is unneeded and cumbersome. States do an adequate job of regulating hydraulic fracturing already, according to the Independent Petroleum Association of America, and industry research estimates that complying with federal oversight would add approximately $100,000 to the cost of each new natural gas well in the United States.

“Such action runs counter to the nation’s energy goals -- increasing the supply of American oil and natural gas -- by making it too costly to produce,” said Lee Fuller, vice president of government relations for the Independent Petroleum Association of America, in an e-mail. “Statements that hydraulic fracturing is unregulated are simply not true. It’s been regulated assiduously by the states for more than 50 years.”

It is unclear exactly how federal oversight would lead to mounting costs. EPA officials in Washington say the section of the Safe Drinking Water Act that governs the oil and gas industry allows for flexibility and already defers oversight of drilling to the states. According to the industry and a recent industry-affiliated study, most state programs already have regulations in place. In such cases, restoring the EPA’s authority could mean that the EPA approves ongoing state oversight and that little else would change.

Read the Bills: House [5] | Senate [6].

Correction: This post originally stated the House bill will be debated in the House Natural Resources Committee. It will instead be debated in the House Energy and Commerce Committee.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [9].

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Tags: Drilling, Hydraulic Fracturing, Natural Gas, Water

The Story So Far: Gas Drilling's Environmental Threat

by Abrahm Lustgarten, ProPublica - July 6, 2009 3:59 pm EST

The push to find clean domestic energy has zeroed the country in on one resource it has plenty of: natural gas. Vast deposits large enough to supply the country for decades have become the focus of a drilling boom stretching across 31 states. But water contamination has also been reported in more than a thousand cases where that drilling is taking place, raising questions about the primary drilling method being used to get to the gas.

That drilling technique, called hydraulic fracturing, shoots large amounts of water, sand and toxic chemicals into the ground to break up rock and release the gas. The Environmental Protection Agency has declared the process to be safe despite warnings from several of its own scientists that it is not. The gas companies are exempt from federal laws protecting the nation's water supplies, and are allowed to conceal the identities of their chemicals as trade secrets. Together these things have made it difficult for scientists and investigators to determine the exact cause of the contamination that is occurring in water supplies.

That's why lawmakers in Congress and in several states are pushing for deeper study of the impact of drilling and for closer oversight of the gas industry. The U.S. House and Senate are considering legislation to reverse the federal exemptions, and New York state is considering a partial ban on drilling anywhere near New York City's watershed. The industry -- in the form of millions of dollars spent on lobbying, a slew of court cases, and a robust public relations campaign -- is pushing back.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [1].

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Tags: Drilling, Hydraulic Fracturing, Natural Gas

Energy Industry Sways Congress With Misleading Data

by Abrahm Lustgarten, ProPublica - July 8, 2009 4:55 am EST

Want to listen to the story? Click here. [1]

Abrahm Lustgarten/ProPublica

The two key arguments that the oil and gas industry is using to fight federal regulation of the natural gas drilling process called hydraulic fracturing -- that the costs would cripple their business and that state regulations are already strong -- are challenged by the same data and reports the industry is using to bolster its position.

One widely-referenced study [2] (PDF) estimated that complying with regulations would cost the oil and gas industry more than $100,000 per gas well. But the figures are based on 10-year-old estimates and list expensive procedures that aren't mentioned in the proposed regulations.

Another report [3] (PDF) concluded that state regulations for drilling, including fracturing, "are adequately designed to directly protect water." But the report reveals that only four states require regulatory approval before hydraulic fracturing begins. It also outlines how requirements for encasing wells in cement -- a practice the author has said is critical to containing hydraulic fracturing fluids and protecting water -- varies from state to state.

One recommendation in that report flies in face of industry's assertion that its processes are safe: hydraulic fracturing needs more study and should be banned in certain cases near sensitive water supplies.

Hydraulic fracturing [4] -- where water and sand laced with chemicals is injected underground to break up rock -- is considered essential to harvesting deeply buried gas reserves that some predict could meet U.S. demand for 116 years.

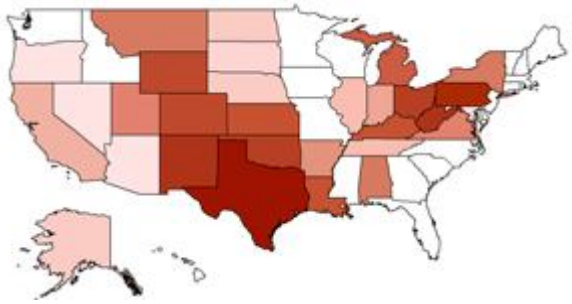
In 2005 hydraulic fracturing was exempted from the Safe Drinking Water Act, based on assurances that the process was safe. But a series of ProPublica reports [5] has identified a number of cases in which water has been contaminated in drilling areas across the country, and EPA scientists say they can't fully investigate them because of the exemption.

Now, Congress is considering legislation [6] to restore the Environmental Protection Agency's oversight of the process. And industry -- leveraging its money and political connections -- is using the recent reports to fight back [7].

Since January at least five studies [8] have been published making the case that state laws [9] (PDF) are adequate and that new regulations could hamper exploration [10] (PDF), raise fuel prices and eliminate jobs. Three of the studies were paid for by the Department of Energy and produced by consulting firms that also work with the industry. One of the DOE reports [2] (PDF) was written by the same person who authored a study for the Independent Petroleum Association of America [11] (PDF)

The industry argues [11] (PDF) that federal oversight would amount to a redundant layer of bureaucracy that is not needed because states already require the same environmental safeguards that might be required by the EPA, and that those safeguards are effective [7].

"We don't think the system is broke, so we question the value of trying to fix it with a federal solution," Richard Ranger, a senior policy analyst at the American Petroleum Institute [12], told ProPublica in May. "So proceed with caution if you are going to proceed with regulating this business because it could make a very significant difference in delivering a fuel that is fundamental to economic health."



How many gas wells does your state have? Click to find out.

[13] Industry reports [14] say that if federal regulations are applied to hydraulic fracturing, more than a third of onshore gas wells would be closed and oil and gas companies would spend $10 billion complying with the law in its first year. The federal government would lose some $1.2 billion in revenue.

But advocates for the federal legislation say the industry is misleading the public into a false choice between the economy and the environment.

"We are all for using science-based information," said Amy Mall, a senior policy analyst for the Natural Resources Defense Council [15]. "But the underlying information doesn't really tell the story they claim it does."

Nonetheless, the arguments have gained traction in Congress and have eroded support for new regulation.

Rep. Dan Boren, D-Okla., told his fellow members in a recent hearing that "these folks are laying people off -- people are hurting in my district." Rep. John Salazar, D-Colo., who sponsored legislation to regulate fracturing in 2008, but declined to add his name to this year's bill, told ProPublica that "developers may have legitimate concerns about the impact that removing the exemption may have on their ability to find and extract oil and gas."

To keep the legislation alive, Diana DeGette, D-Colo., its main sponsor, has shifted gears to seek environmental studies and hearings rather than a quick passage into law.

"The opposition has been throwing out scare tactics and mischaracterizations of what she is trying to do," said DeGette's spokesman, Kristofer Eisenla. "Unfortunately the oil and gas guys came out of the barn storming."

Fuzzy Numbers

The study that has received the most publicity [2] (PDF) is also among the most misleading.

The report, which evaluates the costs of regulations for the oil and gas industry, was written for the Department of Energy by a consulting company also used by the energy industry, Advanced Resources International, or ARI. It contains a table [16] (PDF) listing seven specific processes it says would be mandated under the proposed federal regulations, and what those processes would cost -- a total of $100,505 per well. Among the listed items is "state of the art" fracture imaging, at a per-well average cost of $37,500, and three-dimensional fracture simulation, at a cost of $7,500.

But a footnote reveals that these figures are based on memo sent to a DOE official by another consulting firm in 1999. The report's author said they haven't been updated to reflect technological advances or substantial shifts in the drilling business over the last decade.

Furthermore, none of the tests listed in the table are mentioned in the text of Safe Drinking Water Act, the federal law that would apply to hydraulic fracturing, according to an EPA spokesperson in Washington. And they aren't mentioned in the bill being floated in Congress either.

"It's a sense of magnitude of the impacts, not a sense of absolute accuracy," said Michael Godec, Vice President of ARI and author of the report. The regulatory requirements were interpolated on a "bad-case" scenario, he explained, because the federal laws are not specific. "We took some liberties. You have to make some assumptions about what might be required."

One of the industry reports raises serious questions about the construction of the pits used to store toxic drilling waste and what happens when dangerous fluids are spilled.

[17]Godec believes that many of the processes listed in the report are already being practiced to a greater degree than they were in 1999, meaning that even if they were required they may not be additional burdens at all. But he said that anecdotal conversations with drilling companies confirm that the report's conclusions are still "about right."

Godec said he did not obtain recent cost figures from drilling companies, which are closely guarded. Halliburton -- one of the largest hydraulic fracturing service providers -- did not return calls from ProPublica for comment about the expense of the procedures listed.

Asked whether the age of the data was a concern, Godec said it had been discussed with Nancy Johnson, the DOE official who commissioned the report. He said he was instructed that the report was needed quickly, that the budget was limited and that he should move forward because "this is a hot topic and people are testifying."

Nancy Johnson did not return calls for comment and the Department of Energy's office of fossil energy did not make its officials available for an interview after repeated requests. It said, through a spokesperson, that the Department did not author the report.

Godec also produced a similar report on costs and state gas regulations for the Independent Petroleum Association of America that was published in late April. Titled "Bringing Real Information on Energy Forward," [11] (PDF) that report also makes the case that state regulations of drilling practices are effective. Godec says his company's work is impartial and his conclusions would have been the same whether he was contracted by the oil and gas industry, or the federal government.

Even if the costs Godec laid out in the DOE report were up-to-date and accurate, it's doubtful they would have the devastating financial impact the industry claims.

The estimated expense of regulating hydraulic fracturing amounts to between one and three percent of the total cost of drilling a new well when factored into operating costs estimated by financial analysts at Deutsche Bank. If all the testing that Godec includes is factored out, the regulations would cost the industry just $4,500 per well, according to his report, or just six hundredths of a percent of the cost of establishing a typical new well.

"I think at the end of the day it's unlikely to have a real huge impact," says John Freeman, a senior vice president for energy equity research at the investment bank Raymond James. "It's a lot of

fuzzy stuff that I can't get my hands around. This just seems to be more of a soft number that I frankly have more of a hard time connecting the dots on."

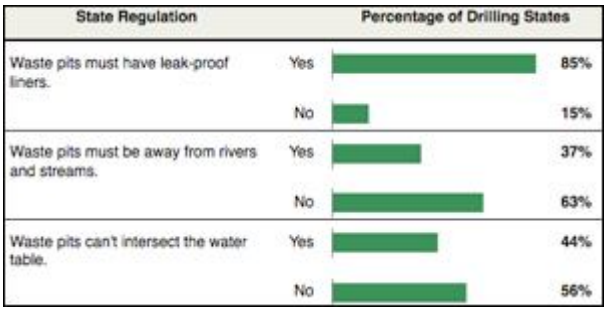
State Regulations Leave Gaps

In May the Ground Water Protection Council [18], a group made up mostly of industry representatives and state oil and gas regulators, released the first comprehensive review [3] (PDF) of oil and gas regulations across 27 of 31 drilling states it surveyed. The report, paid for by the DOE, concluded that most states have requirements to encase wells in cement and protect groundwater, and that a majority also require they be notified after hydraulic fracturing takes place.

"The study confirms what the industry has been saying [19] (PDF): that regulation of oil and gas field activities, including hydraulic fracturing, is best accomplished at the state level," the American Petroleum Institute said a press release about the study.

But the GWPC report -- which focuses on what regulations are in place, rather than what may be missing -- raises important points that are downplayed in its summary. It reveals that regulatory oversight is inconsistent from state to state and has substantial gaps. It also says hydraulic fracturing requires "comprehensive" further study "to determine the relative risk" and to determine best practices.

In fact, the report calls for some of same measures found in the congressional bill the industry is so hotly contesting.



See where states stand on regulating oil and gas.

[20] Regarding fracturing in areas close to the surface or near shallow aquifers, the report reads: "States should consider requiring companies to submit a list of additives used in formation fracturing and their concentration." It also says that shallow fracturing very close to certain drinking water aquifers "should either be stopped, or restricted to the use of materials that do not pose a risk of endangering ground water and do not have the potential to cause human health effects."

A close examination of the appendices [21] (PDF) attached to the research also showed that 21 of the 31 states listed do not have any specific regulation addressing hydraulic fracturing; 17 states do not require companies to list the chemicals they put in the ground; and no state requires companies to track how much drilling fluid they pump into or remove from the earth -- crucial data for determining what portion of chemicals has been discarded underground.

“The tone is that in general states do an adequate job of protecting water,” said Michael Nickolaus, the report’s author, special projects director for the GWPC and former director of Indiana’s state Oil and Gas Division. “There are certain gaps in certain states ... it’s not a hundred percent world.”

The GWPC report does not name the states that lack more stringent regulations, a detail that is important because one or two states can account for a large proportion of the drilling in the United States. To extract that information from the report would require analyzing all the state regulations included in the appendices [21] (PDF) and repeating much of the GWPC’s original research. Nickolaus also declined to name the states in an interview with ProPublica, saying that the GWPC was obliged to protect its members.

Nickolaus says well construction -- especially the cementing process that keeps drilling fluids and gas from seeping into groundwater -- is more important than the fracturing issue. But according to the report, state regulations about cementing are sometimes vague and often don’t specify standards that makes the protection fool-proof.

While most states have regulations that protect drinking water near the surface, a third don’t require that the cement casing extends far enough to completely isolate wells from geologic layers and the deepest aquifers, according to the report. Twenty-two percent don’t require the cement to harden before the well is used for fracturing, and don’t test cement quality and consistency -- one of the surest ways to protect against contamination.

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Tags: Drilling, Hydraulic Fracturing, Natural Gas

Democrats Call for Studies as Industry Assails Proposals to Regulate Hydraulic Fracturing

by Abrahm Lustgarten, ProPublica - July 13, 2009 8:00 pm EST

A version of this story was co-published with Salon [1].

Abrahm Lustgarten/ProPublica

Legislators who've been pushing a bill [2] to regulate a controversial natural gas drilling process are now calling for further scientific study, a change in tack made under intense lobbying pressure and after a personal request from Colorado's Democratic governor.

If the lawmakers wait for the results of a study, the bill is unlikely to move [3] forward any time soon.

Rep. Diana DeGette, D-Colo., and Rep. Maurice Hinchey, D-N.Y., two of the sponsors of the so-called FRAC Act [4] (PDF), a House bill that would establish federal environmental controls over the process of hydraulic fracturing [5], are now calling for committee hearings and renewed research into the environmental impacts of the drilling method. Last month, Hinchey attached a provision authorizing funding for such a study to a House appropriations bill.

In an interview this week, Hinchey told ProPublica he is not backing off the FRAC Act. He said he is concerned about new reports of water contamination [6] from drilling and thinks a study could bring those incidents to the forefront of the debate.

"What we want to do is make it clear what is going on," Hinchey said. "The appropriations bill is an incremental step. It will continue to focus attention on this."

Asked whether the FRAC Act is losing momentum [7], Hinchey pointed out that the bill now has 13 sponsors [8], 10 more than it had in June. But he acknowledged that the energy industry's opposition to the bill has swayed some members of Congress. "It's not moving forward with the rapidity that I would like to see it move forward," he said.

That may be in part because of the difficulties of bringing diverse perspectives together on energy and economic issues, including within the Democratic Party.

In a speech Thursday [9] before the Colorado Oil and Gas Association [10], a prominent industry trade group, Colorado Gov. Bill Ritter, a Democrat, assured the group of his support for the natural gas businesses and said he had asked DeGette not to pursue the legislation.

"I encouraged Congresswoman DeGette to consider authorizing a comprehensive study of this issue instead of going directly to a new and potentially intrusive regulatory program," the governor said.

“She agreed at that time to go instead to something that would be more in the way of a study instead of an amendment that would prescribe a certain way of every state having to put in place these rules. I thank the congresswoman for having done that.”

DeGette, who has been trying to pass fracturing legislation since 2005, confirmed through a spokesman that she and the governor had spoken last month, but said that she had not agreed to abandon the legislation.

“She understands his concerns,” said her spokesman, Kristofer Eisenla, “but all options remain on the table. She is moving forward with a potential hearing, and with a study which she would welcome the industry to be a part of.”

In an earlier interview, Eisenla said that the information campaign undertaken by the bill’s opponents had surprised legislators and slowed their progress.

“The oil and gas guys came out of the barn storming,” he said. “I think that opposition has been throwing out scare tactics and mischaracterizations of what she is trying to do.”

At least five reports [11] (PDF) have been issued since January arguing that the proposed legislation -- which would give the Environmental Protection Agency authority to investigate fracturing accidents and to dictate how the process is done -- would hamper exploration [12] (PDF), raise fuel prices and cost Americans jobs and energy.

The industry maintains that state regulations already protect drinking water from hydraulic fracturing, a process that forces vast amounts of water laced with chemicals underground to break up rock and release gas. In Thursday’s speech, Ritter touted Colorado’s new rules as an example of strong state regulation, and later that day an industry group sent out a news release underscoring his statement. What neither mentioned at the time: the Colorado Oil and Gas Association is suing Colorado to block those rules.

The reports supporting the industry’s arguments were examined in a recent article by ProPublica [13], which found that the economic assessments were exaggerated and based in part on 10-year-old data [14] (PDF). Three of the reports were paid for by the Department of Energy but produced by consulting firms that also work for the oil and gas industry. One of the DOE reports [15] (PDF) was written by the same person who produced a study for the Independent Petroleum Association of America -- and bore a nearly identical cover.

The oil and gas industry has spent millions of dollars lobbying against fracturing regulation over the last two years. In May, it launched a Web site [16] that disputes criticism of industry and argues against regulation.

As a result, Eisenla said, the true content of the FRAC Act and its implications for the oil and gas industry have become muddled in a thicket of rhetoric and misleading data.

The bill proposes to remove an exemption that was written into the Safe Drinking Water Act (SDWA) in 2005 that says hydraulic fracturing is not subject to regulation. It would also require drilling companies to disclose the names of the chemicals they pump underground, information that

is currently a protected trade secret. If the act is passed, hydraulic fracturing would be governed by the portion of the SDWA that controls what is injected into underground wells and how it is done.

According to the EPA, the oil and gas industry is the only industry exempted from oversight under one of the nation's landmark laws to protect drinking water.

Representatives of the energy industry say the 2005 legislation wasn't an exemption as much as a clarification of the law. They maintain that the Safe Drinking Water Act didn't explicitly apply to hydraulic fracturing until 2001, when the 11th Circuit Court of Appeals forced the EPA to oversee the process in Alabama. At the time the EPA wasn't using the SDWA rules [17] to monitor hydraulic fracturing, then an emerging technology.

Whether the EPA applied the SDWA to fracturing or not, prior to 2005 it had the authority to do so, according to the agency's former assistant administrator for water, Benjamin Grumbles. Now it does not.

Industry analysts, including at the American Petroleum Institute, maintain that hydraulic fracturing shouldn't be subject to Safe Drinking Water Act regulations that address injection disposal, because the fluids aren't disposed of underground [18]. But the analysts also acknowledge that 30 to 70 percent [19] (PDF) of fracturing fluids can be left underground after the process is completed, and that hydraulic fracturing with chemicals is far more prevalent today than when the Safe Drinking Water Act was written or when courts were examining the issue in Alabama.

The language of the SDWA explicitly gives states authority to enforce the law as long as they meet basic federal criteria. So if federal authority is restored, state regulations would be superseded only if the EPA deemed them insufficient.

The proposed bill would not ban hydraulic fracturing. Nor does the bill, or the Safe Drinking Water Act, require the expensive processes that one industry report said it does.

"Because there has never been any federal regulation of hydraulic fracturing, we have to make some assumptions based on what could be done," said Lee Fuller, vice president for government relations at the Independent Petroleum Association of America. "It's an educated guess based on what the history of regulation has been and the kinds of requirements they would plausibly think that the EPA might require."

Several industry representatives have told ProPublica that what is really driving their opposition to the FRAC Act is their worst fear: that if EPA authority is restored, a suite of lawsuits from environmental organizations will follow, forcing the agency to issue tougher regulations -- possibly even creating a new class of laws for fracturing -- and grinding business to a halt while the issues play out in court.

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Rep. Jared Polis, D-Colo.


Rep. Bobby L. Rush, D-Ill.


Rep. Lynn C. Woolsey, R-N.Y.

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Tags: Bill Ritter, Diana DeGette, Drilling, Environmental Protection Agency, FRAC Act, Hydraulic Fracturing, Independent Petroleum Association of America, Maurice Hinchey, Natural Gas, Safe Drinking Water Act

Inhofe Defends Hydraulic Fracturing on Senate Floor

by Abrahm Lustgarten, ProPublica - July 29, 2009 10:56 am EST

Sen. James Inhofe defends hydraulic fracturing on the Senate floor.

In a lengthy speech Tuesday Sen. James Inhofe, R-Okla. [1], the ranking member of the Senate Environment and Public Works Committee, defended the natural gas production method of hydraulic fracturing [2] and warned that legislation reinstating the Environmental Protection Agency's authority over the process would be a "disaster." Inhofe pointed to recent reports showing that America's reserves of natural gas are far greater than previously thought, and said that developing those reserves — which he pointed out depends on hydraulic fracturing — could help secure America's energy future.

For 26 minutes, Inhofe offered a detailed response to critics of the process and reiterated the central arguments that have been offered by the energy industry and lobby: that fracturing is safe [3]; that recent reports say regulating it [4] would cost Americans billions in jobs and lost tax revenues; and that the Safe Drinking Water Act, the federal water protection law from which fracturing is currently exempted, was never intended to oversee the process in the first place. Many of these assertions have been challenged in a series of articles [5] by ProPublica. Read the full text of Inhofe's speech, and watch the video, here. [1]

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [6].

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Tags: Drilling, Hydraulic Fracturing, James Inhofe, Natural Gas

Water Problems From Drilling Are More Frequent Than PA Officials Said

by Abrahm Lustgarten, ProPublica - July 31, 2009 11:29 am EST

A drill site is seen from the back of Dimock resident Ronald Carter's home. Carter was told the methane coming from his pipes shouldn't be a problem as long as he cracked a window while running the tap. (Abrahm Lustgarten/ProPublica)

When methane began bubbling out of kitchen taps near a gas drilling site in Pennsylvania last winter, a state regulator described the problem as "an anomaly." But at the time he made that statement to ProPublica, that same official was investigating a similar case affecting more than a dozen homes near gas wells halfway across the state.

In fact, methane related to the natural gas industry has contaminated water wells in at least seven Pennsylvania counties since 2004 and is common enough that the state hired a full-time inspector dedicated to the issue in 2006. In one case, methane was detected in water sampled over 15 square miles. In another, a methane leak led to an explosion that killed a couple and their 17-month-old grandson [1].

Methane is the largest component of natural gas. Since it evaporates out of drinking water, it is not considered toxic, but in the air it can lead to explosions. When methane is found in water supplies, it can also signal that deeply drilled gas wells are linked with drinking water systems.

In many cases the methane seepage comes from thousands of old abandoned gas wells that riddle Pennsylvania's geology, state inspectors say. But other cases, including several this year and the 2004 disaster that left three people dead, were linked to problems with newly drilled, active natural gas wells.

Dimock resident Norma Fiorentino's drinking water well exploded on New Year's morning. The blast was so strong it tossed aside a several-thousand=pound concrete slab. Click to see more of Dimock's residents' stories. (Abrahm Lustgarten/ProPublica)

The issue came to the forefront in January when methane was found in the water at 16 homes in the small town of Dimock [2], in northeastern Pennsylvania. State officials cited Cabot Oil & Gas for several violations they say allowed the gas to seep out of the well structures and into water supplies there. The Department of Environmental Protection asked the company to encase its lower well pipes completely in concrete — a process known in the industry as "cementing" — and assured the public that the contamination in Dimock was rare.

But according to a department spokeswoman, there have been at least 52 separate cases of what the state calls "methane migration" in the past five years. In two of the 2009 cases, regulators responded to complaints from more than 32 households and asked gas companies to supply clean water to at least a dozen homes with contaminated wells.

An undated report from the Pittsburgh Geological Society posted to the DEP's Web site makes it clear that old wells and new drilling can lead to stray gas problems. "Although it rarely makes headlines," the report reads, "damage or threats caused by gas migration is a common problem in Western Pennsylvania."

Craig Lobins, the DEP regional oil and gas manager who initially described the Dimock case as an anomaly in interviews with ProPublica, said he still believes the frequency of contamination incidents is statistically insignificant.

Records show there are roughly 58,000 active gas wells in Pennsylvania. "We are just dealing with a very small percentage," he said in a follow-up interview.

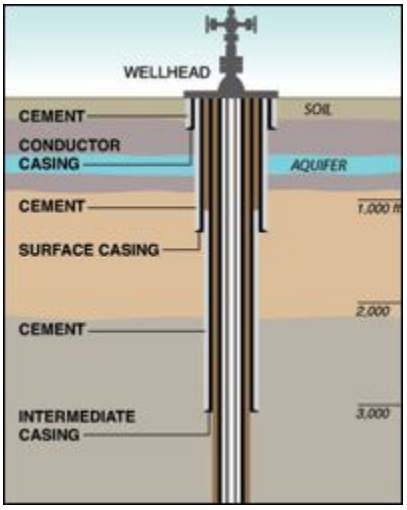
The case Lobins was investigating at the same time as the Dimock case concerned a string of problems in Bradford, a rural town 200 miles west of Dimock along the state's northern border. Shortly after a contractor for Schreiner Oil and Gas drilled several dozen wells in the area last spring, residents began complaining of murky and foul-smelling tap water. When the DEP investigated, it found methane in three water wells and metals in six others. It asked Schreiner to supply water to eight homes, and the company has begun installing water treatment systems at each house. While no new gas wells have been drilled in the Bradford area, according to the DEP, the existing ones continue to operate.

Michael Schreiner, Schreiner's president, declined to comment for this article.

Lobins said the problems in Bradford — as in many of the contamination cases across the state — stem from a bad cementing job around the core of the well. In most gas drilling, the well pipe is encased in layers of concrete [3] to keep it isolated from surrounding groundwater. The concrete

also contains the enormous pressure exerted on the system during the process of hydraulic fracturing [4], which pumps water, sand and chemicals to the well bottom to break up rock.

In Bradford, Lobins said, concrete was poured into the space around the wells but never filled the space — a sign of a possible leak. Because Pennsylvania does not have regulations that require inspections or testing of the concrete casing, the state didn't notice the problem until methane began showing up in water wells. By then, the suspected concrete error had been repeated in as many as 27 different places, Lobins said.



In most gas drilling, the well pipe is encased in layers of concrete to keep it isolated from groundwater. This practice of encasing the well is seen as key to protecting water supplies. (Graphic by Al Granberg/ProPublica)

Controlling the quality of cementing and well casing is widely viewed as the most important factor in protecting water supplies and ensuring the integrity of a well. A recent federally funded study of state regulations across the country [5] (PDF), published by the Ground Water Protection Council, a consortium of state oil and gas regulators, industry representatives, and some environmental consultants, said that proper concrete casing is critical to environmental protection. While 96 percent of states, including Pennsylvania, have standards specifying that concrete be used to protect aquifers, the report found that one in five, also including Pennsylvania, do not require testing to confirm that the concrete used is strong enough for the job. That means that until water problems arose as a result of the casing problems in Bradford, the state had little recourse.

"What they are doing is not a violation until the gas is leaving the borehole," Lobins said. "We don't know that until it manifests itself somewhere else."

Lobins said the state is reviewing its regulations and that changes are planned to address both well casing and methane migration issues. But when asked what specific changes were being discussed, Lobins said he did not know. Similar questions went unanswered by Ron Gilius, the DEP's oil and gas director, after they were submitted by ProPublica both in interviews and in writing.

For their part, Bradford residents were surprised to learn that their problems were not unique.

"They didn't say that there were other problems similar to this," said Lori Trumbull, who complained about her water but later found that it was OK. "They said that the odds of having water contamination from drilling operations is very rare."

Fred Baldassare, the state's dedicated methane migration investigator, said he has investigated water contaminated with drilling-related methane in numerous places across the state in recent years. In Bridgeville, two homes exploded when a well casing failed and methane seeped into their basements, he said. In Dayton, he said, residents were evacuated after a well casing failed and methane migrated into an adjacent abandoned well, blowing out its casing and travelling a third of a mile underground.

In Vandergrift, drillers stumbled across an old gas well that no one knew was there. Baldassare said that when the new well was hydraulically fractured, the intense pressure forced gas into the adjacent wells. It then percolated up through water and mud until it surfaced just feet from homes in a heavily populated neighborhood.

The most tragic Pennsylvania methane case began on March 5, 2004, in Jefferson County, about 80 miles northeast of Pittsburgh. According to Baldassare, gas seeped into the home of 64-year-old Charles Harper and his 53-year-old wife, Dorothy, from one of several adjacent wells being drilled by Snyder Brothers. The gas collected until it exploded and, according to court records and news reports at the time, reduced the home to "a pile of rubble." Debris was found across the road, and insulation hung from trees 30 feet in the air. The bodies of the Harpers and their grandson, Baelee, were found buried in the debris.

Executives from Snyder Brothers did not return calls for comment. The company was sued in state court in Jefferson County and reached an undisclosed settlement with the Harper family.

State officials traced the methane's geochemical fingerprint and determined it had come from one of three Snyder wells nearby. The investigation, however, remains open in part because Snyder has yet to comply with state orders to conduct pressure tests on the wells — orders delivered in 2005, according to Baldassare. But that doesn't mean state officials aren't sure about what happened.

According to Baldassare, the Snyder methane caused the explosion.

"In my view," he said, "there was no uncertainty."

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [6].

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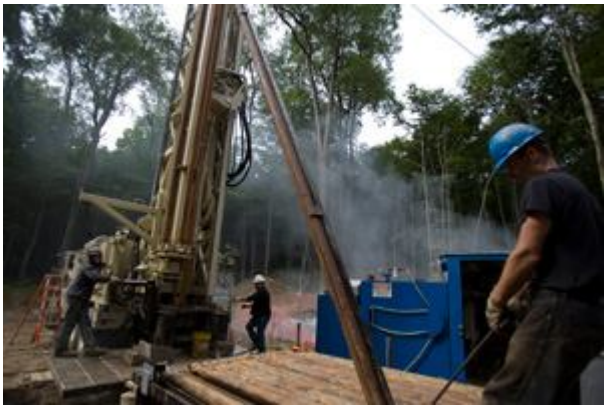
Tags: Drilling, Hydraulic Fracturing, Natural Gas, Pennsylvania, Well Casing

More Gas Contamination Affects Pennsylvania Residents

by Abrahm Lustgarten, ProPublica - August 4, 2009 1:45 pm EST



A drilling crew move a section of steel pipe at a natural gas well site near Bradford, Pa., last August. (Robert Nickelsberg/Getty Images)

Pennsylvania environment officials are investigating another natural gas well leak, after residents near the town of Roaring Branch complained last month that rust-colored water was flowing from a spring and two small creeks were bubbling with methane gas.

The incident is the latest in a string of more than 50 similar cases related to gas drilling in the state, and comes as ProPublica published an article last week reporting that such events were more frequent than officials said [1].

According to the Department of Environmental Protection, at least four homes in the rural north-central part of Lycoming County are now being supplied with drinking water and 18 are having their water tested or their homes monitored for gas while the investigation continues. At least one woman was temporarily evacuated from her home last week as a precaution, according to Robert Yowell, north-central regional director for the DEP's oil and gas bureau.

Officials suspect that a well casing on one of three natural gas wells drilled by East Resources failed, allowing the gas to migrate into the ground and the streams, according to Yowell and a statement e-mailed to ProPublica from DEP headquarters. The wells were drilled into the Oriskany geologic formation, not the Marcellus shale, where much of the state's new development is targeted. The department is analyzing water and gas samples and has promised to post the results on the DEP Web site by the end of the week.

The well casing [2] consists of several layers of steel pipe and concrete that surround a well structure and is intended to protect groundwater supplies from the gas and drilling fluids inside of the well. Unlike many other gas drilling states, Pennsylvania doesn't have regulations that require this concrete and casing be tested to confirm its strength.

East Resources referred questions to its general counsel who was not immediately available for comment.

According to Yowell, the company has temporarily shut down the suspected problem well by filling it with drilling mud, a slurry of the waste produced from the drilling of the well hole, and has been working to reduce pent-up pressure inside its wells that could be forcing stray gas out of cracks in the casing. To release that pressure, East Resources flared -- or burned off gas -- from two of the suspected wells.

“It looked like the sky was on fire,” said Margaret Yaggie, a Roaring Branch resident who can sit on her porch and see the East Resources wells a few miles away. Yaggie said the flames stretched hundreds of feet and carried fumes and smoke. “It’s above the trees, on the side of a mountain. It looks like hell.”

It appears the measures have been effective in slowing the gas leak.

“One well that was suspect has been plugged and killed,” Yowell said, adding that the plugging dramatically reduced pressure. “The readings (of methane) around the stream have gone down. We believe things are getting under control but (they’re) certainly not abated yet.”

Though Pennsylvania has more gas wells than any state other than Texas, Lycoming County hasn’t seen such development until recently. According to Yowell, who only began to oversee oil and gas operations in April when the state established a regional headquarters to handle the rush to drill, the Roaring Branch contamination is the first of its kind in the area.

In a weekend article in the *Wayne Independent* [3], a local newspaper, East Resources spokesperson Douglas Mehan — who later referred ProPublica’s questions to the company’s attorney — was quoted as saying “the gut feeling of everybody is that this is very, very rare — a unique incident.”

ProPublica has documented a series of cases [4] in seven other Pennsylvania counties and across the nation in which methane has leaked from natural gas drilling operations. On Friday ProPublica published an article challenging Pennsylvania officials’ claims that such cases were “an anomaly,” [5] noting that the state has hired a full-time inspector dedicated to stray gas problems and has recorded at least 52 cases similar to the one in Lycoming County. In several instances houses exploded as a result of the gas leaks. In one case, three people were killed.

Asked whether these cases constituted a pattern, the Department of Environmental Protection official who first described methane contamination as an anomaly, Craig Lobins, told ProPublica that the number of safely drilled wells in Pennsylvania far outweigh those that cause problems. “We are just dealing with a very small percentage,” he said.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [6].

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Tags: Drilling, Hydraulic Fracturing, Methane, Natural Gas, Pennsylvania

EPA: Chemicals Found in Wyo. Drinking Water Might Be From Fracking

by Abrahm Lustgarten, ProPublica - August 25, 2009 12:36 pm EST

Louis Meeks' well water contains methane gas, hydrocarbons, lead and copper, according to the EPA's test results. When he drilled a new water well, it also showed contaminants. The drilling company Encana is supplying Meeks with drinking water. (Abrahm Lustgarten/ProPublica)

Federal environment officials investigating drinking water contamination [1] near the ranching town of Pavillion, Wyo., have found that at least three water wells contain a chemical used in the natural gas drilling process of hydraulic fracturing [2]. Scientists also found traces of other contaminants, including oil, gas or metals, in 11 of 39 wells tested there since March.

The study, which is being conducted under the Environmental Protection Agency's Superfund program, is the first time the EPA has undertaken its own water analysis in response to complaints of contamination in drilling areas, and it could be pivotal in the national debate [3] over the role of natural gas in America's energy policy.

Abundant gas reserves are being aggressively developed in 31 states, including New York [4] and Pennsylvania [5]. Congress is mulling a bill [6] that aims to protect those water resources from hydraulic fracturing, the process in which fluids and sand are injected under high pressure to break up rock and release gas. But the industry says environmental regulation is unnecessary [7] because it is impossible for fracturing fluids to reach underground water supplies and no such case has ever been proven.

Scientists in Wyoming will continue testing this fall to determine the level of chemicals in the water and exactly where they came from. If they find that the contamination did result from drilling, the placid plains arching up to the Wind River Range would become the first site where fracturing fluids have been scientifically linked to groundwater contamination.

In interviews with ProPublica and at a public meeting this month in Pavillion's community hall, officials spoke cautiously about their preliminary findings. They were careful to say they're investigating a broad array of sources for the contamination, including agricultural activity. They said the contaminant causing the most concern – a compound called 2-butoxyethanol, known as 2-BE – can be found in some common household cleaners, not just in fracturing fluids.

But those same EPA officials also said they had found no pesticides – a signature of agricultural contamination – and no indication that any industry or activity besides drilling could be to blame. Other than farming, there is no industry in the immediate area.

Pavillion, Wyoming

In Pavillion, a town of about 160 people in the heart of the Wind River Indian Reservation, the gas wells are crowded close together in an ecologically vivid area packed with large wetlands and home to 10 threatened or endangered species. Beneath the ground, according to the U.S. Geological Survey, the earth is a complex system of folded crusts containing at least 30 water-bearing aquifer layers.

EPA officials told residents that some of the substances found in their water may have been poured down a sink drain. But according to EPA investigation documents, most of the water wells were flushed three times before they were tested in order to rid them of anything that wasn't flowing through the aquifer itself. That means the contaminants found in Pavillion would have had to work their way from a sink not only into the well but deep into the aquifer at significant concentrations in order to be detected. An independent drinking water expert with decades of experience in central Wyoming, Doyle Ward, dismissed such an explanation as "less than a one in a million" chance.

Some of the EPA's most cautious scientists are beginning to agree.

"It starts to finger-point stronger and stronger to the source being somehow related to the gas development, including, but not necessarily conclusively, hydraulic fracturing itself," said Nathan Wiser, an EPA scientist and hydraulic fracturing expert who oversees enforcement for the underground injection control program under the Safe Drinking Water Act in the Rocky Mountain region. The investigation "could certainly have a focusing effect on a lot of folks in the Pavillion area as a nexus between hydraulic fracturing and water contamination."

Tanks hold natural gas condensate and mark the spot of producing gas wells in the Pavillion field, in Fremont County, Wyo., in the heart of the Wind River Indian Reservation. The Environmental Protection Agency has found chemicals that are used in gas drilling in water wells near this site. (Abrahm Lustgarten/ProPublica)

The Superfund investigation follows a series of complaints by residents in the Pavillion area, some stemming back 15 years, that their water wells turned sour and reeked of fuel vapors shortly after drilling took place nearby. Several of those residents shared their stories with ProPublica [8], while other information was found through court and local records. Several years ago, one resident's animals went blind and died after drinking from a well. In two current cases, a resident's well water shows small pooling oil slicks on the surface, and a woman is coping with a mysterious nervous system disorder: Her family blames arsenic and metals found in her water. In two of those cases, the Canadian drilling company EnCana, which bought most of the area's wells after they were drilled and assumed liability for them, is either supplying fresh drinking water to the residents or has purchased the land. In the third case, a drilling company bought by EnCana, Tom Brown Inc., had previously reached an out-of-court settlement to provide water filtering.

Though the drilling companies have repeatedly compensated residents with the worst cases of contamination, they have not acknowledged any fault in causing the pollution. An EnCana spokesman, Doug Hock, told ProPublica the company wants "to better understand the science and the source of the compounds" found in the water near Pavillion before he would speculate on whether the company was responsible.

Precise details about the nature and cause of the contamination, as well as the extent of the plume running in the aquifer beneath this region 150 miles east of Jackson Hole, have been difficult for scientists to collect. That's in part because the identity of the chemicals used by the gas industry for drilling and fracturing are protected as trade secrets [1], and because the EPA, based on an exemption passed under the 2005 Energy Policy Act, does not have authority to investigate the fracturing process under the Safe Drinking Water Act. Using the Superfund program gave the agency extra authority to investigate the Pavillion reports, including the right to subpoena the secret information if it needs to. It also unlocked funding to pay for the research.

John Fenton's drinking water appeared to be perfect, until the EPA found it contained methane and contaminants associated with plastics. Fenton is president of the Pavillion Area Concerned Citizens. (Abrahm Lustgarten/ProPublica)

EPA officials have repeatedly said that disclosure of the fluids used in fracking – something that would be required if the bill being debated in Congress were passed – would enable them to investigate contamination incidents faster, more conclusively and for less money. The current study, which is expected to end next spring, has already cost $130,000.

About 65 people, many in jeans, boots and 10-gallon hats, filled Pavillion's community hall on Aug. 11 to hear the EPA's findings. They were told that a range of contaminants, including arsenic, copper, vanadium and methane gas were found in the water. Many of these substances are found in various fluids used at drilling sites.

Of particular concern were compounds called adamantanes, a natural hydrocarbon found in gas that can be used to fingerprint its origin, and 2-BE, listed as a common fracturing fluid in the EPA's 2004 research report on hydraulic fracturing. That compound, which EPA scientists in Wyoming said they identified with 97 percent certainty, was suspected by some environmental groups in a 2004 drilling-related contamination case in Colorado, also involving EnCana.

EPA investigators explained that because they had no idea what to test for, they were relegated to an exhaustive process of scanning water samples for spikes in unidentified compounds and then running those compounds like fingerprints through a criminal database for matches against a vast library of unregulated and understudied substances. That is how they found the adamantanes and 2-BE.

An EnCana representative told the crowd that the company was as concerned about the contamination as the residents were, and pledged to help the EPA in its investigation.

Some people seemed confounded by what they were hearing.

"How in god's name can the oil industry dump sh*t in our drinking water and not tell us what it is?" shouted Alan Hofer, who lives near the center of the sites being investigated by the EPA.

"If they'd tell us what they were using then you could go out and test for things and it would make it a lot easier, right?" asked Jim Van Dorn, who represents Wyoming Rural Water, a nonprofit that advises utilities and private well owners on water management.

"Exactly," said Luke Chavez, the EPA's chief Superfund investigator on the project. "That's our idea too."

Now that the EPA has found a chemical used in fracturing fluids in Pavillion's drinking water, Chavez said the next step in the research is to ask EnCana for a list of the chemicals it uses and then do more sampling using that list. (An EnCana spokesman told ProPublica the company will supply any information that the EPA requires.) The EPA is also working with area health departments, a toxicologist and a representative from the Centers for Disease Control's Agency for Toxic Substances and Disease Registry to assess health risks, he said.

Depending on what they find, the investigation in Wyoming could have broad implications. Before hydraulic fracturing was exempted from the Safe Drinking Water Act in 2005, the EPA assessed the process and concluded it did not pose a threat to drinking water. That study, however, did not involve field research or water testing and has been criticized as incomplete. This spring, EPA

administrator Lisa Jackson called some of the contamination reports “startling” and told members of Congress [9] that it is time to take another look. The Pavillion investigation, according to Chavez, is just that.

“If there is a problem, maybe we don’t have the tools, or the laws, to deal with it,” Chavez said. “That’s one of the things that could come out of this process.”

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [10].

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Tags: Drilling, Encana, Energy Policy Act, Environmental Protection Agency, Hydraulic Fracturing, Natural Gas, Safe Drinking Water Act, Superfund, Water, Water Contamination, Wyoming

Frack Fluid Spill in Dimock Contaminates Stream, Killing Fish

by Abrahm Lustgarten, ProPublica - September 21, 2009 4:09 pm EST

Sept. 22: This post has been corrected [1].

A drill site entrance near the spill site in Dimock, Pa., taken this past winter. (Abrahm Lustgarten /ProPublica)

Pennsylvania environment officials are racing to clean up as much as 8,000 gallons of dangerous drilling fluids after a series of spills at a natural gas production site near the town of Dimock last week.

The spills, which occurred at a well site run by Cabot Oil and Gas, involve a compound manufactured by Halliburton that is described as a "potential carcinogen" and is used in the drilling process of hydraulic fracturing, according to state officials. The contaminants have seeped into a nearby creek, where a fish kill was reported by the state Department of Environmental Protection. The DEP also reported fish "swimming erratically."

The incident is the latest in a series of environmental problems [2] connected to Cabot's drilling in the Dimock area. Last winter, drinking water in several area homes [3] was found to contain metals and methane gas that state officials determined leaked underground from Cabot wells. And in the spring, the company was fined for several other spills, including an 800-gallon diesel spill from a truck that overturned.

Dimock, Penn.

Neither Cabot Oil and Gas nor Halliburton immediately returned calls for comment on Monday. A Halliburton spokesperson sent an e-mail referring any questions to information on the company's Web site.

DEP officials were also unavailable for interviews, but said through e-mail that faulty piping is suspected and that they have not confirmed the exact cause of the spill. A press spokesperson said to expect an announcement and actions toward Cabot by Tuesday.

ProPublica interviewed state officials several months ago about drilling problems in Dimock [2]. "Cabot has definitely had their share of problems out there," Craig Lobins, a regional oil and gas division

director, said then. “Some of them is just being a little bit careless … or sloppy, or maybe a little bit of bad luck too.”

The drilling fluid spill Wednesday may be the most serious yet, because it involves chemicals that are known to pose a risk to human health and has spread into the area’s surface water system.

According to a Material Safety Data Sheet provided to the state this week by Halliburton, the spilled drilling fluid contained a liquid gel concentrate consisting of a paraffinic solvent and polysaccharide, chemicals listed as possible carcinogens for people. The MSDS form – for Halliburton’s proprietary product called LGC-35 CBM – does not list the entire makeup of the gel or the quantity of its constituents, but it warns that the substances have led to skin cancer in animals and “may cause headache, dizziness and other central nervous system effects” to anyone who breathes or swallows the fluids.

It is not yet clear exactly what led to or caused the spill. State officials report that at least 1,000 gallons of fluid were spilled Wednesday afternoon, and another 5,900 gallons about 10 that night. The substance was reportedly a clay-like mixture, with the Halliburton gel mixed at about five gallons per 1,000 gallons of water. A DEP spokesperson said in an e-mail that the spills appear to be the result of supply pipe failures. In one case a pressurized line may have broken, and in another a seal may have given way. State officials said the fluids had spilled into Stevens Creek.

The contamination incident comes as the state faces increasing scrutiny for its handling of a natural gas drilling boom and dozens of instances of spills and water contamination related to it across the state. Earlier investigations by ProPublica found that methane had leaked into drinking water supplies from gas wells in at least seven Pennsylvania counties. And earlier this month the DEP began investigating a suspected chemical spill in the northwestern part of the state, hundreds of miles from Dimock, which decimated aquatic life along a 30-mile stretch of pristine river. No determination has been made in that case either, but waste fluids from drilling are among the possibilities being investigated.

Correction: This story has been updated. A description of the spill provided in the story by Vincent Fronda actually referred to a Sept. 3 discharge near the Cabot well site in question. It was several hundred feet away and separate from the fracturing fluid spill that occurred last Wednesday. The photograph that accompanied the story, which was sent to ProPublica by a Dimock resident, was also of that earlier spill. Both the photo and the descriptive passage have been removed.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [4].

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Tags: Cabot Oil and Gas, Dimock, Drilling, Halliburton, Hydraulic Fracturing, Natural Gas, Pennsylvania, Water Contamination

DEP Issues Citation to Pennsylvania Driller as a Third Spill Occurs

by Abrahm Lustgarten, ProPublica - September 23, 2009 12:13 pm EST

A drill site in Dimock, Pa., taken last February. (Abrahm Lustgarten/ProPublica)

Pennsylvania environment officials have charged Cabot Oil and Gas with five violations after nearly 8,000 gallons of hydraulic fracturing solution spilled [1] from a pipe system in two separate incidents near the town of Dimock last week. The department reported that a third, smaller spill occurred at the site Tuesday morning.

According to the state, Cabot failed to prevent a fracturing fluid discharge, failed to keep that discharge from escaping into the environment and from entering a creek, and inappropriately dammed that creek after the spill, among other violations. The company could face fines topping $130,000.

“I was concerned with two releases,” said Bob Yowell, director of the north central regional office of the DEP. “A third release, although it was relatively small, gives us great concern that something unusual is happening at this particular well. This isn’t a normal situation.”

The spills began on Wednesday, Sept. 16, at 2 p.m. when a pipe coupling failed on the system that mixes the fracturing ingredients, sending as much as 2,100 gallons of fluid into the environment. At 8 p.m. that same day another pipe coupling broke in the same system, and 5,880 additional gallons of fracturing fluid were discharged, according to both state and Cabot accounts. On Tuesday morning, Sept. 22, another hose ruptured under pressure, releasing 420 more gallons of the same mixture, though only 10 gallons of that last spill escaped from the company’s spill catch system.

According to Ken Komoroski, a Cabot Oil and Gas spokesman, the fracturing procedure was being conducted by two contractors: Halliburton, one of biggest oil services companies in the world, and Baker Tanks, a petroleum storage tank company.

“Our policy is zero spills, zero unpermitted releases, and those goals were not met so there needs to be evaluations of what can be done to prevent them in the future,” Komoroski told ProPublica. “The spills were less than .5 percent gel, and at 99.5 percent water, this material is not hazardous or dangerous nor does it present any environmental risk.”

Pennsylvania officials allowed Cabot to continue fracturing the well while they conducted their investigation. According to the DEP’s Yowell, halting the fracturing may have presented additional problems, though he could not specify what those risks were. Cabot voluntarily halted the fracturing on Tuesday, after the third spill occurred.

The investigation into the spill is ongoing. According to a DEP press release and the notice letter sent to Cabot, a nearby wetland has been flushed and further remediation may be required, including excavation of soil surrounding the site.

ProPublica reported the spills Monday [1], stating that the fluids had seeped into Stevens Creek and killed fish there, an assertion repeated in the DEP's press release on Tuesday. Follow-up interviews with the state's of Fish and Boat Commission, however, show that a small number of minnows were harmed and that the damage to the creek appeared minimal. However, water samples from the creek are still being evaluated, according to the DEP's Yowell.

According to a Material Safety Data Sheet provided to the state by Halliburton, the substance spilled was a lubricating gel used in hydraulic fracturing that poses a substantial threat to human health and was described in the Halliburton document as a "potential carcinogen" that has caused skin cancer in animals.

Cabot's Komoroski points out that the document refers to the gel's concentrated form, and that the mixture spilled in Dimock was mostly water. He also disputes the information on the Halliburton form that warns the product is a "potential carcinogen." The disclosure, required by law on the MSDS form, was an effort to be extremely conservative and account for the possibility that a derivative from the refining process could be part of the gel mixture, Komoroski said. He could not say what that derivative was, except that it is a hydrocarbon.

Halliburton did not respond to questions about the details of its MSDS disclosure for the product, called LGC-35 CBM.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [2].

Want to know more? Follow ProPublica on Facebook [3] and Twitter [4], and get ProPublica headlines delivered by e-mail every day [5].

Tags: Cabot Oil and Gas, Dimock, Drilling, Halliburton, Hydraulic Fracturing, Natural Gas, Pennsylvania

Pennsylvania Orders Cabot Oil and Gas to Stop Fracturing in Troubled County

by Abrahm Lustgarten, ProPublica - September 25, 2009 12:39 pm EST

A Cabot Oil & Gas sign in Susquehanna County, Pa., taken last February. (Abrahm Lustgarten/ProPublica)

After three chemical spills [1] in the past nine days, and following a history of environmental problems over the last year [2], Pennsylvania officials have ordered Cabot Oil and Gas, one of the most active natural gas companies in the state, to stop its hydraulic fracturing operations in Susquehanna County pending an intensive review.

"The department took this action because of our concern about Cabot's current fracking process [3] and to ensure that the environment in Susquehanna County is properly protected," DEP north central regional Director Robert Yowell said in a news release distributed this morning.

The stop-work order, which was accompanied by new citations issued for the third spill, will interrupt development of seven new wells that Cabot is currently drilling, and intending to fracture, in Susquehanna County. The citations were similar to those levied earlier in the week, including a failure to contain fracturing fluids.

The state's order gives Cabot two weeks to re-submit an "accurate" Pollution Prevention and Contingency Plan and Control and Disposal Plan for its well pad sites in the county. It gives the company three weeks to complete an engineering study of the equipment and practices used for hydraulic fracturing.

"There were unique elements of the location that experienced the three incidents and it was not necessary to force a shutdown of all fracturing activities," said Cabot spokesman Ken Komoroski, explaining that fluids were piped farther than usual at the well site in question. "However, Cabot understands the department has an important job to do."

In interviews earlier this week, Komoroski underscored that the spills had happened under the watch of two of its contractors: Halliburton, one of the world's largest drilling service companies, and Baker Tanks, a tank transport company.

In recognition of those circumstances, Pennsylvania will require Cabot to post its new pollution prevention plan at each well site and make it available to all its contractors, something that is not normally required in the state.

You can read the full press release here [4] (PDF).

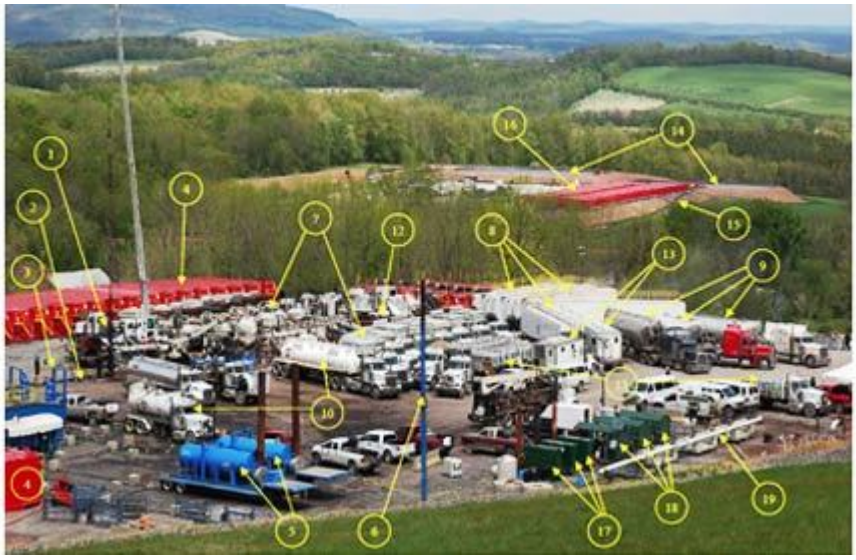
Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [5].

Want to know more? Follow ProPublica on Facebook [6] and Twitter [7], and get ProPublica headlines delivered by e-mail every day [8].

Tags: Cabot Oil and Gas, Drilling, Hydraulic Fracturing, Natural Gas, Pennsylvania, Susquehanna County

New York State Paves Way for Gas Drilling With Release of Environmental Review

by Abrahm Lustgarten, Joaquin Sapien, and Sabrina Shankman, ProPublica - September 30, 2009 7:57 pm EST



From page 194 of the environmental review: "These photos show a hydraulic fracturing operation at a Fortuna Energy multiwell site in Troy, PA"

A long-anticipated draft environmental review laying out proposed laws for natural gas drilling in New York's Marcellus Shale has been released by the state after 18 months of study and several delays. State officials say the guidelines, which are 809 pages long and extremely detailed [1], address key concerns, including the disclosure of fluids used in the drilling process known as hydraulic fracturing and the on-site handling of drilling waste.

But according to a summary that accompanied the document [1], which was released just before 6 p.m. Wednesday, it would not ban drilling inside the New York City watershed, a central Catskill Mountain area that supplies drinking water to 9 million people.

“The state’s mitigation proposals are half measures,” Manhattan Borough President Scott Stringer said in a news release Wednesday night. “I believe the choice is simple: we either correct this error and ban drilling now, or soon enough the officials entrusted with protecting our environment will be asked to explain why they were asleep at the switch when it mattered most.”

Provisions highlighted in the news release would make New York State’s environmental protections more stringent than those in many other drilling areas, but a quick review of the document indicates those provisions may be accompanied by conditions and stipulations, making it unclear exactly where the rules would apply and how they would be implemented.

We are beginning to work our way through the entire document [1] and will be reporting in depth on what we find.

According to the Department of Environmental Conservation’s summary, the document [1] stipulates that:

- Energy operators disclose all the chemicals used in hydraulic fracturing, including their concentration.
- Operators complete a checklist and certification form before any well can be hydraulically fractured.
- Residential drinking water wells near drilling sites be tested for contaminants prior to drilling, to establish baseline information in case an accident occurs.
- Certain kinds of waste pits – which have been responsible for water contamination in other parts of the country – be prohibited inside the New York City watershed and limited elsewhere in the state. In some cases, drillers would be required to store their waste in steel tanks.

The review is a supplement to a 16-year-old environmental impact assessment that did not address several of the issues raised by modern drilling in the Marcellus Shale, one of the largest unconventional natural gas deposits in the United States.

New York Gov. David Paterson ordered the Supplemental Generic Environmental Impact Statement in July 2008 [2], one day after a ProPublica investigation [3] raised questions about the state’s preparedness to handle a rush of drilling in the Marcellus Shale. The governor has since made clear that drilling will eventually play a prominent role in the state’s economy.

The ProPublica investigation [3] found that the DEC had told state legislators that hydraulic fracturing was safe, even though the agency had not studied or discussed the sometimes dangerous chemicals that it uses and that later wind up in its waste. The DEC also did not have a plan for where the vast amounts of water needed for fracturing would come from or where it would be treated after it was used.

Fracturing a Marcellus gas well can require more than 3 million gallons and a single well can be fractured as many as eight times. When the DEC’s last impact statement was released in 1992, a typical well required only about 80,000 gallons of water.

In 2008, ProPublica also reported that New York was unprepared to treat the wastewater itself – the DEC said drillers would have to ship it to neighboring Pennsylvania. But ProPublica found that Pennsylvania's specialized treatment plants don't have the capacity for it either.

Hydraulic fracturing has made the Marcellus Shale and other difficult-to-reach deposits of gas accessible to drillers. The process shoots millions of gallons of water, sand and chemicals underground at high pressure to break up rock and release gas. According to some estimates, the Marcellus holds enough gas to meet the country's natural gas needs for more than 20 years.

Figuring out where to get water to fracture the wells is among the water-related questions the DEC is trying to answer. When the water is sucked back out of a well, it can contain natural toxins dredged up during drilling, including cadmium and benzene, which both carry cancer risks.

ProPublica will be examining the details in today's report [1]. In the meantime, if you spot something send us an e-mail. [4] The environmental review can be found here [1].

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [4].

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [5].

Write to Joaquin Sapien at joaquin.sapien@propublica.org [6].

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Tags: Department of Environmental Conservation, Drilling, Hydraulic Fracturing, Marcellus Shale, Natural Gas, New York, New York City, New York Drilling, Water Contamination

Gas Execs Call for Disclosure of Chemicals Used in Hydraulic Fracturing

by Abrahm Lustgarten, ProPublica - October 2, 2009 1:58 pm EST

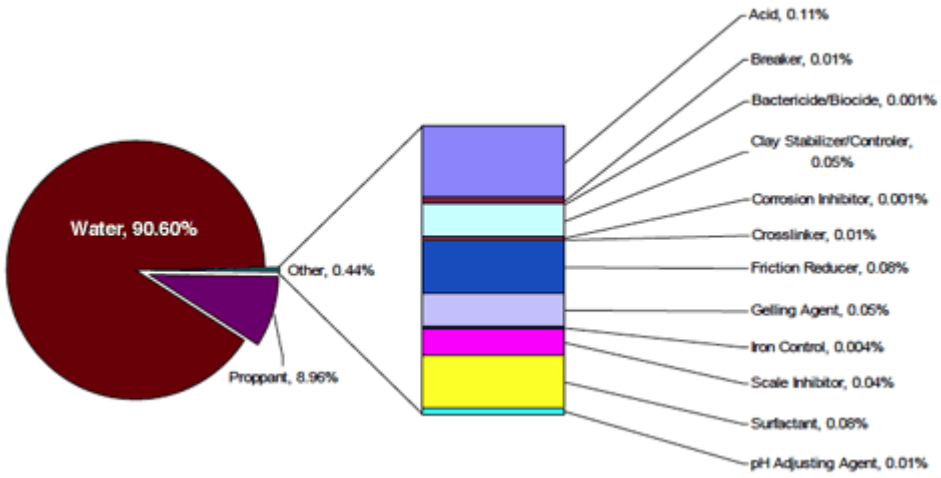


Figure 5-3, 'Sample Fracture Fluid Composition by Weight', as seen in the draft Supplemental Generic Environmental Impact Statement on natural gas drilling by the New York State Department of Environmental Conservation Division of Mineral Resources

Two prominent gas industry executives have directly addressed one of the key environmental concerns surrounding the expansion of natural gas development by calling for the disclosure of chemicals used in hydraulic fracturing.

The statements – made last week by Chesapeake Energy CEO Aubrey McClendon and Range Resources CEO John Pinkerton – came as the industry faces increasing pressure to be more forthcoming about the chemicals it uses. New York state recently released an environmental impact statement that specifically called for disclosure of the chemicals used in hydraulic fracturing. Colorado and several other states also have asked for that information.

At issue is whether hydraulic fracturing, and the chemicals it requires, might be responsible for water contamination incidents in drilling areas across the country. The process, which is currently exempt from federal oversight under the Safe Drinking Water Act, forces millions of gallons of water, mixed with sand and small amounts of chemicals, into the earth to break rock and release gas. Scientists, including some at the Environmental Protection Agency, have said they can't thoroughly investigate the contamination incidents because the names of the chemicals are protected trade secrets.

At a panel discussion at the IHS Herold Pacesetters Energy Conference in Greenwich, Conn., McClendon told attendees that fracturing should be demystified, and that "we need to disclose the chemicals that we are using and search for alternatives," according to an account of the discussion from Reuters. In other news reports, McClendon was quoted as saying he was concerned that undue fears about the drilling chemicals had bogged down efforts to open the Marcellus Shale, a

mammoth natural gas deposit that lies beneath much of Ohio, West Virginia, Pennsylvania and New York.

Chesapeake and other gas producers subcontract fracturing services from companies that specialize in the process, including Halliburton, Schlumberger and BJ Services. In the past, those companies have said they are differentiated by the recipes they use for fracturing underground and that forced disclosure would erase any competitive advantage. But a Schlumberger spokesperson was recently quoted as saying the company is willing to discuss more disclosure.

At the energy conference, Pinkerton called the companies' concerns that disclosure would put them at a disadvantage "silly" and said, according to a report in Natural Gas Intelligence, that "I've basically told them that this is not acceptable."

Chesapeake and several gas industry associations already offer the public educational fact sheets that detail a few dominant ingredients in fracturing solutions, but the fact sheets don't list all the ingredients or explain how they might be combined, information that environmental scientists say is critical to measuring the risk associated with fracturing fluids. It isn't clear how much more McClendon and Pinkerton would favor disclosing.

"The question remains, what is that disclosure going to be?" said Amy Mall, a policy analyst for the Natural Resources Defense Council. "Is it going to be specifics that allow a health specialist or a hydrologist to analyze exactly what the risks are to human health? The devil is in the details."

A Chesapeake spokesman declined to clarify McClendon's statements, but in an e-mailed response said "the discussion about the types of additives used in minimal amounts during hydraulic fracturing is misguided since each additive that is brought onto a well location is accompanied by a Materials Safety Data Sheet, which not only identifies the materials but outlines proper ways in which to utilize them." The MSDS sheets, which are available to the public, are required by law to provide information on how workers might be poisoned by chemicals – but they've also been criticized as providing only partial information.

Pinkerton, the Range Resources CEO, also declined to comment for this article, but a company spokesman said Pinkerton would like to see more information made public than is currently available. "We need to go further than where we have been so far," said the spokesman, Matt Pitzarella. "We need to get it to a level where everyone is comfortable. In recent years, more and more of those chemicals are now organically based, and I think we need to get a movement towards more and more organically based chemicals."

It remains to be seen whether service providers such as Halliburton, and the chemical manufacturers that supply them, will go along with a movement toward disclosure, as they are the ones with the most at stake. Neither Halliburton nor Schlumberger responded to requests for comment.

"When you start getting from the general to the specific, people may have considerations that aren't reflected in those general statements," said Lee Fuller, vice president for government relations for the Independent Petroleum Association of America. "We've been having conversations with our members about chemical disclosure and types of disclosure and proprietary information for months if not longer."

A series of reports from ProPublica in the past year have documented numerous cases in which gas drilling and the handling of the fluids it requires have led to water contamination. In response to those concerns, New York state put a moratorium on new drilling in the prized Marcellus Shale gas deposit, and hydraulic fracturing has become a hot button issue across the country.

Political pressure has also been building.

The day before the two executives spoke in Connecticut, a bipartisan group of senators urged their colleagues to include a study of the environmental impacts of fracturing in the energy and climate bill being considered by Congress.

In June, members of the House and Senate also weighed in on the subject, introducing twin bills that would give the EPA authority to regulate fracturing under the Safe Drinking Water Act and mandate disclosure of the chemicals used in the fracturing process. The energy industry is fighting the legislation, known as the Frack Act, and it has languished since summer.

Gwen Lachelt, director of the Oil and Gas Accountability Project, an environmental advocacy group based in Durango, Colo., thinks the executives' statements show how eager they are to put environmental controversies behind them.

"There is a lot of horse trading going on right now," Lachelt said. "I don't think it's any coincidence that we are hearing from companies about their willingness to disclose and the timing of this letter from the senators."

Fuller, of the Independent Petroleum Association of America, said that if a study of fracturing is included in the climate bill, it would "diminish any interest in moving forward on the Frack Act."

Not so, said Kristofer Eisenla, deputy chief of staff for one of the bill's main sponsors, Rep. Diana DeGette, D-Colo., who supports both the study and the disclosure but would also like to see a regulatory framework for addressing the fracturing process.

"Just because they are coming around to see the light of day on this and starting to agree with us doesn't mean we are going to fold up and go home," he said. "It does validate what we are trying to do here."

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [1].

Want to know more? Follow ProPublica on Facebook [2] and Twitter [3], and get ProPublica headlines delivered by e-mail every day [4].

Tags: BJ Services, Chesapeake Energy, Drilling, Halliburton, Hydraulic Fracturing, Independent Petroleum Association of America, Marcellus Shale, Natural Gas, Oil and Gas Accountability Project, Range Resources, Safe Drinking Water Act, Schlumberger, Water Contamination

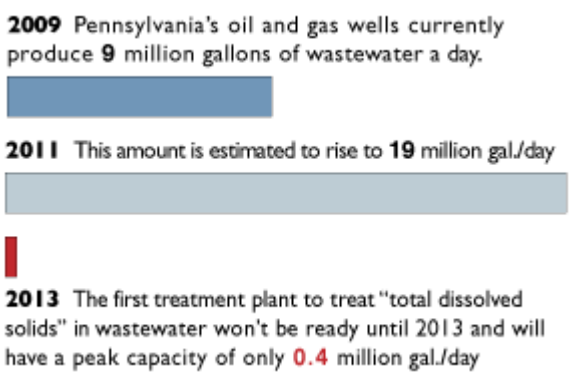
With Natural Gas Drilling Boom, Pennsylvania Faces an Onslaught of Wastewater

by Joaquin Sapien, ProPublica - October 3, 2009 11:05 pm EST

Nov. 3: This post has been updated [1].

The McKeesport Sewage Treatment Plant, one of nine plants on the Monongahela River that has treated wastewater from Marcellus Shale drilling operations. (Joaquin Sapien/ProPublica)

Workers at a steel mill and a power plant were the first to notice something strange about the Monongahela River last summer. The water that U.S. Steel and Allegheny Energy used to power their plants contained so much salty sediment that it was corroding their machinery [2]. Nearby residents saw something odd, too. Dishwashers were malfunctioning, and plates were coming out with spots that couldn't easily be rinsed off.



Pennsylvania's Department of Environmental Protection soon identified the likely cause [3] and came up with a quick fix. The Monongahela, a drinking water source for 350,000 people, had apparently been contaminated by chemically tainted wastewater from the state's growing natural gas industry. So the DEP reduced the amount of drilling wastewater that was being discharged into the river and unlocked dams upstream to dilute the contamination.

But questions raised by the incident on the Monongahela haven't gone away.

In August, contamination levels in the river spiked [4] again, and the DEP still doesn't know exactly why. And this month the DEP began investigating whether drilling wastewater contributed to the death of 10,000 fish on a 33-mile stretch of Dunkard Creek, which winds through West Virginia and feeds into the Monongahela. A spate of other water contamination problems [5] have also been linked to gas drilling in Pennsylvania, including methane leaks that have affected drinking water in at least seven counties.

2011: 19 million gallons, per day

Pennsylvania is at the forefront of the nation's gas drilling boom, with at least 4,000 new oil and gas wells drilled here last year alone, more than in any other state except Texas. This rapid expansion has forced state regulators to confront a problem that has been overlooked as gas drilling accelerates nationwide: How will the industry dispose of the enormous amount of wastewater it produces?

Oil and gas wells disgorge about 9 million gallons of wastewater a day in Pennsylvania, according to industry estimates used by the DEP. By 2011 that figure is expected to rise to at least 19 million gallons, enough to fill almost 29 Olympic-sized swimming pools every day. That's more than all the state's waterways, combined, can safely absorb, DEP officials say.

"I don't know that even our [water] program people had any idea about the volumes of water that would be used," said Dana Aunkst, who heads the DEP's water program.

Much of the wastewater is the byproduct of a drilling process called hydraulic fracturing [6], or fracking, which pumps at least a million gallons of water per well deep into the earth to break layers of rock and release gas. When the water is sucked back out, it contains natural toxins [7] dredged up during drilling, including cadmium and benzene, which both carry cancer risks. It can also contain small amounts of chemicals added to enhance drilling.

But DEP officials say one of the most worrisome contaminants in the wastewater is a gritty substance called Total Dissolved Solids, or TDS, a mixture of salt and other minerals that lie deep underground. Drilling wastewater contains so much TDS that it can be five times as salty [8] as sea water.

Large quantities of TDS can clog machinery and affect the color, taste and odor of drinking water – precisely the problems reported along the Monongahela. While TDS isn't considered particularly harmful to people [9], it can damage freshwater streams, which is what happened when TDS levels spiked in Dunkard Creek this month. West Virginia's DEP is investigating whether TDS-laden wastewater from a coal mine near the creek could be to blame. It is also investigating reports that wastewater from natural gas wells may have been illegally dumped into the stream.

Gas drilling companies currently dispose of their wastewater in Pennsylvania's municipal sewage plants and in some industrial treatment plants, which then discharge it into rivers and streams. The U.S. Environmental Protection Agency warns against [9] this form of treatment, because the plants aren't equipped to remove TDS or any of the chemicals the water may contain. Of even more concern, TDS can disrupt the plants' treatment of ordinary sewage, including human waste.

A lack of capacity

When U.S. Steel and Allegheny Energy complained about the Monongahela's water in 2008, the DEP found [10] almost twice as much TDS as the agency considers safe [11]. DEP officials blamed some of the problem on the river's low flow last summer and on abandoned mines that have leaked TDS into the river for decades. What apparently tipped the balance, however, was the drilling wastewater that nine sewage plants were discharging into the river.

Steve Rhoads, president of the Pennsylvania Oil and Gas Association, an industry trade group, argues that most of the TDS came from abandoned mines, not from drilling wastewater. A study [12] prepared for a different trade group came to the same conclusion.

Rhoads also says Pennsylvania's waterways "are not anywhere near" their capacity to handle TDS and that the DEP's estimate of how much wastewater the industry produces is "completely exaggerated."

DEP chief John Hanger is confident his agency can control the wastewater problem. In April drilling companies began temporarily trucking their wastewater to other states or to sewage treatment plants in other parts of Pennsylvania: the idea is to dilute it by spreading it among more rivers. Hanger said a more permanent solution will begin on Jan. 1, 2011, when he has promised that new regulations [13] will be in place requiring that the wastewater be treated by plants capable of removing TDS.

But an examination of public records, visits to sewage treatment plants, and extensive interviews with state officials by ProPublica reveal flaws in the DEP's plans.

Currently, no plant in Pennsylvania has the technology to remove TDS, and it's unlikely that new plants capable of doing so can be built by 2011. The company whose bid is furthest along in the permitting process says its plant won't be ready until at least 2013. And at its peak that plant would be able to treat only 400,000 gallons of wastewater a day [14]. The DEP would need 50 plants that size to process all the wastewater expected by 2011.

In the meantime, the DEP is allowing municipal sewage plants to continue taking drilling wastewater, even though none of them can remove TDS. "That's not what these municipal plants are designed to handle – the DEP is inviting legal problems as well as environmental problems," said Bruce Baizel, a senior attorney for the Oil and Gas Accountability Project, a Colorado-based nonprofit that focuses on the environmental impact of natural gas drilling.

As the DEP's responsibilities continue to grow, its operating budget could be slashed: The state legislature's latest draft of Pennsylvania's 2010 budget calls for a 25 percent cut in DEP funding.

Caught off guard

Hanger says Pennsylvania's extensive experience with oil drilling – the first oil well in the country was drilled here in 1859—has prepared it to quickly deal with gas drilling problems.

But ProPublica found that the DEP was caught off guard by the amount of wastewater the industry would produce when drilling began in the Marcellus Shale, a deeply buried layer of rock that some analysts say holds enough gas to meet the nation's natural gas needs for more than 20 years [15].

When energy prices spiked in 2008, drillers flocked to Pennsylvania, bringing sorely needed revenue and jobs. A recent Pennsylvania State University study [16] touted the benefits drilling brought last year: 29,000 jobs and $240 million in state and local taxes.

Even the industry's wastewater promised profits.

The traps that collect solid waste at the Clairton sewage treatment plant have to be cleaned out periodically with shovels. (Joaquin Sapien/ProPublica)

"Cha-ching!" is how Francis Geletko, financial director for the sewage plant in Clairton, described his first thought when he learned that drillers would pay five cents a gallon to get their wastewater processed at his plant. The 1960s-era facility is in such desperate need of modernization that workers still use shovels to remove solid waste from its traps and filters. Many of the state's plants are similarly outdated: A recent report [17] commissioned by Gov. Ed Rendell concluded that Pennsylvania needs to spend $100 billion over the next 20 years to maintain its aging sewage plants and pipelines.

Plant operators say the DEP didn't initially offer them much guidance about processing the water, a complaint the DEP doesn't dispute.

Ed Golanka, who manages a sewage plant in Charleroi, said that when he checked with the DEP nobody told him that state and federal laws required his plant to get an amendment to its permit before accepting industrial wastewater. The amendment would require expensive modifications that Charleroi couldn't afford, he said.

"At the time it was a new subject for all of us," Golanka said. "There was a limited amount of conversation [with the DEP] until the issue with TDS last summer."

Aunkst, the DEP's director of water standards, said he didn't know the plants along the Monongahela were accepting the water until the spring of 2008, when people complained about long lines of trucks idling at sewage treatment plants. But the agency was so short-staffed that it didn't respond to the complaints immediately. Aunkst said many DEP regulators had left for more lucrative jobs with drilling companies.

"As the industry was ramping up, we were ramping down," he said. "In order for us to really catch these people we have to almost have an inspector coincidentally there on the day that these trucks pull up, because we have so many facilities and so few staff."

The DEP is supposed to inspect major plants every two years, but ProPublica found that most inspections are triggered by pollution violations or equipment failures.

A review of inspection records [18] at the DEP's Pittsburgh office showed that only three of the nine plants along the Monongahela were inspected in the year before Allegheny Energy and U.S. Steel complained. One plant hadn't been inspected in five years. DEP officials warned that those records may not have been complete, because inspection reports aren't filed electronically and pages from the files may have been sitting on an employee's desk during the two days when ProPublica was there in March.

Inspections occur even less frequently at sites where wells are drilled. According to minutes taken at an October 2008 meeting of DEP officials, the agency has so few inspectors that they visit gas wells only once every 10 years.

After Aunkst heard about the trucks, he wrote a letter [7] to all the state's sewage plants, reminding them that they couldn't take the wastewater without a special permit.

But before he sent it, TDS levels in the Monongahela skyrocketed, causing U.S. Steel and Allegheny Energy to complain. The chain of events made Aunkst remember two other peculiar incidents: Two creeks had been sucked dry, and DEP inspectors suspected that drilling companies had withdrawn the water to fracture nearby wells.

"We were trying to scramble, to put it bluntly, to get our act together to figure out how we were going to address these withdrawals as well as the disposal issues," Aunkst said.

The DEP did two things to quickly lower the Monongahela's TDS level. It unlocked [19] dams upriver to flush out some of the TDS. And it ordered [20] nearby sewage treatment plants to reduce the amount of drilling wastewater they accepted to just 1 percent of the total amount of water that flowed through their plants each day.

The cut shocked the industry. Trucking water to distant sites is far more expensive than treating it locally, and some drillers threatened to take their rigs to other states if they couldn't dispose of their water in Pennsylvania.

"Basically, it shuts us down," Lou D'Amico, executive director of the Independent Oil and Gas Association of Pennsylvania, told a local newspaper [21]. "We can't generate fluids we can't dispose of."

The DEP issued a news release [22] assuring the public that the TDS was "not considered a major human health risk … But under the circumstances, if consumers have concerns, DEP recommends consumers use bottled water for drinking and preparing food until the exceedance is eliminated."

Some sewage plant operators were so alarmed that they stopped taking any wastewater at all.

But by January, the uproar had subsided. TDS levels in the Monongahela were back to normal [23] and plant operators began accepting the wastewater again, although in smaller quantities.

Joe Rost, executive director at the McKeesport Sewage Treatment Plant (Joaquin Sapien/ProPublica)

"We didn't want to be the ones to stop the economy from growing in this area, and we felt that we were helping the country become energy independent," said Joe Rost, executive director at a sewage plant in McKeesport, 14 miles south of Pittsburgh.

Setting goals

Federal guidelines specifically recommend against sending drilling wastewater to ordinary sewage plants, as Pennsylvania is doing now, because it might damage the plants and taint drinking water supplies. But the EPA approved Pennsylvania's plan, because the DEP promised to have more aggressive regulations in place by 2011.

"Every time you set an aggressive goal generally you have a transition period to get there," said Jon Capacasa, the EPA's top mid-Atlantic water pollution enforcer.

To keep the water safe until then, the DEP has added TDS monitors along the Monongahela. And before the DEP allows a sewage plant to accept drilling wastewater, the agency will assess the current TDS level in the stream where the water will be discharged, to make sure it can handle the additional load.

The DEP also has promised to tighten TDS discharge standards by 2011, so that all drilling wastewater will be treated in plants capable of removing TDS. The agency has streamlined the permitting process for companies that want to build the new plants. But when ProPublica interviewed spokesmen for eight of the 17 plants that have been proposed, all of them said it will be impossible to begin operating by the 2011 deadline.

A spokesman for Larson Design Group, whose application [14] is furthest along in the process, expects that after it gets its permit it will need at least 40 months to build the plant and begin operating.

Temporary lull

Drilling has slowed in Pennsylvania this year, because natural gas prices have dipped to about a third of what they were at the peak of the boom last summer. But the lull will almost certainly be temporary. The DEP expects to issue permits for approximately 1,700 wells in the Marcellus Shale in 2009, up from 450 in 2008.

"Companies are willing to get these permits now because they know that competition is going to heat up," said Raoul LeBlanc, a senior financial consultant at PFC Energy, which provides financial

and political advice to energy companies and governments. “When prices rise they will want to be the first to drill more wells.”

Congress is preparing for the expansion, too. A group of Democratic legislators has introduced a bill [24] that would allow the federal government to regulate the hydraulic fracturing drilling process under the Safe Drinking Water Act. The bill prompted an immediate backlash from the oil and gas industry, which says state agencies like the DEP are doing a good job of regulating drilling.

Even if the bill is passed, however, it won’t directly address Pennsylvania’s most pressing drilling-related problem: protecting the state’s water supply against the coming onslaught of wastewater.

Update: This story appeared on Oct. 4 in the *Pittsburgh Post-Gazette* [25] and on Oct. 16 in the *Philadelphia Daily News* [26]. ProPublica has updated the following sentences in the story in response to correspondence with John Hanger, secretary of Pennsylvania’s Department of Environmental Protection. The new information is italicized; words that were removed are in parentheses. Several of the clarifications reflect the fact that the story was reported over five months and several of the numbers quoted were refined. None of the new wording alters the story’s main finding, which is that over the next few years, Pennsylvania faces a flood of wastewater from gas drilling that goes far beyond its current or projected processing capacities.

- To keep the water safe until then, the *DEP has added* (promised to add more) TDS monitors along the Monongahela. (although they haven’t been installed yet.)
- The DEP is supposed to inspect *major* plants *every two years* (once a year), but ProPublica found that most inspections are triggered by pollution violations or equipment failures.
- The DEP expects to issue permits for approximately *1,700* (700) wells in the Marcellus Shale in 2009, up from 450 in 2008.
- Gas drilling companies currently dispose of their wastewater in Pennsylvania’s municipal sewage plants *and in some industrial treatment plants*, which then discharge it into rivers and streams. Note: Pennsylvania’s industrial treatment plants, like its municipal plants, are not equipped to remove total dissolved solids or TDS, the substance that is the focus of this story.

Write to Joaquin Sapien at joaquin.sapien@propublica.org [27].

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Tags: Drilling, Hydraulic Fracturing, Marcellus Shale, Monongahela River, Natural Gas, Pennsylvania, Safe Drinking Water Act, Total Dissolved Solids, Water Contamination

Gas Drilling Vs. Drinking Water: New York City Consultant's Report Sets Stage for Fight With Albany

by Abrahm Lustgarten, ProPublica - October 7, 2009 11:11 pm EST

NYC mayoral candidate William Thompson criticized the state's tentative proposal to allow drilling in the watershed. Mayor Bloomberg's office said water safety is "not a fringe issue for this administration." Photo credit: Water drop (WikiCommons/Sven Hoppe), Mayor Bloomberg (Stephen Chernin/Getty Images), William Thompson (Reuters/Patrick Andrade)

A version of this story appeared in the Albany Times-Union [1] on Oct. 8, 2009.

A preliminary report [2] from a consultant hired by New York City warns that "nearly every activity" associated with natural gas drilling could potentially harm the city's drinking water supply and that while the risk can be reduced with strict regulations, "the likelihood of water quality impairment … cannot be eliminated [2]."

That assessment contrasts sharply with the picture presented by an environmental review released by state officials last week [3]. Aside from clauses that ban some waste pits and promise additional consideration for drilling within 1,000 feet of the city's reservoirs and water infrastructure in upstate New York, the environmental review does little to respond to New York City's long-standing concerns [4] that the watershed deserves special environmental consideration and instead paves the way for drilling to proceed throughout the watershed.

The issue appears to be emerging as a point of controversy in New York City's mayoral election.

City comptroller and mayoral candidate William Thompson criticized the state's environmental review in a news release and said Mayor Michael Bloomberg should be more outspoken. "I am also concerned that the City and the Water Board have been extremely lax in responding to this threat," he said.

Marc LaVorgna, a spokesman for Bloomberg's office, said the mayor will withhold judgment until he sees the final version of the report the city commissioned from Hazen and Sawyer, a New York

City-based environmental engineering firm. The full report isn't expected to be delivered until December, after the public comment period for the state environmental review has ended.

LaVorgna emphasized that the Bloomberg administration has invested heavily in the city's water system and would not rule out a protracted fight to protect it.

"This is not a fringe issue for this administration," LaVorgna said. "This is a mayor that adamantly orders tap water every night he dines out."

In one of his few statements on the subject, Bloomberg, who has generally supported the idea of energy development, told WNYC radio Thursday [5] that "if this has the danger of polluting, we will fight it."

The clashing reports seem poised to reignite long-standing tensions between upstate New York and New York City, which depends almost entirely on water delivered from rural, upstate areas.

"The stakes are very high based on the conclusions of this report," Manhattan Borough President Scott Stringer said in an interview with ProPublica. The report, he said, "suggests that city elected officials have a role to play here and a responsibility to step up and say, 'What does frack drilling mean to New York City residents?'"

Last week Stringer announced he was launching a Kill the Drill campaign.

New York is one of four major cities in the United States with a special permit from the U.S. Environmental Protection Agency allowing its drinking water to go unfiltered. That pristine water comes from a network of upstate reservoirs and rivers spread across 1,600 square miles in five upstate counties. Those reservoirs – which all lie west of the Hudson River – supply 90 percent of the drinking water for 9 million downstate residents, nearly half the state's population. If the EPA were to rescind the city's special permit, New York City would have to build a treatment facility that could cost between $10 billion and $30 billion, according to various estimates.

Hazen and Sawyer's early findings [2] were summarized at a city meeting last week and posted on the city Department of Environmental Protection's Web site Tuesday evening, after repeated requests for the document by ProPublica over the past several days.

The report [2], and an accompanying summary PowerPoint presentation, lay out several areas of concern. The consultants found that drilling "introduces hazardous chemicals into the watershed" and that "the well bore, which acts as a conduit between geologic formations, can allow previously isolated contaminants to flow into shallow groundwater or surface water."

The research also warned of "enormous volumes" of wastewater and said there are no treatment plants in the region designed to treat these wastes. It said the disturbance from hydraulic fracturing could cause seismic shifts or otherwise damage the tunnels or aqueducts that bring the water to the city. Hydraulic fracturing shoots millions of gallons of water, sand and chemicals underground with such force that it breaks rock and releases pockets of gas.

So far, New York City's top officials have preferred a behind-the-scenes approach as the public debate over the state's natural gas drilling policy unfurls in Albany. City DEP officials have

protested to the state Department of Environmental Conservation in private letters, but have said little publicly.

In a letter obtained by ProPublica in July 2008, then New York City DEP commissioner Emily Lloyd asked the DEC commissioner [6] to disclose the chemicals used in hydraulic fracturing and to consider a partial ban on drilling near the reservoirs that supply New York City's water. Shortly afterward, and following an investigation by ProPublica, Gov. David Paterson ordered the environmental review [7] that was released Sept. 30. Called the Draft Supplemental Generic Environmental Impact Statement, it supplements gas and oil drilling rules established in 1992 [8]. New York City officials have since sent several additional letters to the state DEC voicing their ongoing concerns.

A spokesman for the state DEC did not return repeated calls for comment.

The state supplemental draft report discloses many of the drilling chemicals, as Lloyd had requested, and it also strengthens several other environmental protections. But it did not recommend a full or partial ban on drilling in the watershed.

The supplementary impact statement is now subject to a 60-day public comment period, after which final guidelines will be issued. But Stringer and others are pressing the state for a 30-day extension, which would allow the findings from the Hazen and Sawyer report to be included.

Read the "Rapid Impact Assessment Report [2]" by consulting firm Hazen and Sawyer.

Read our full coverage of natural gas drilling [9].

ProPublica reporters Joaquin Sapien and Saprina Shankman contributed to this story.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [10].

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Tags: Bill Thompson, Department of Environmental Conservation, Department of Environmental Protection, Drilling, Hydraulic Fracturing, Michael Bloomberg, Natural Gas, New York, New York City, Water Contamination

Company Won't Drill in NYC Watershed

by Sabrina Shankman, ProPublica - October 28, 2009 4:31 pm EST

(flickr user meironke)

For now, New York City's water appears to be safe from drilling [1]. Responding to mounting concerns that chemicals from natural gas drilling could contaminate drinking water, Chesapeake Energy Corporation declared it will not drill in the city's upstate watershed, the pristine water source [2] that supplies unfiltered water to 9 million downstate residents.

"Our research has shown we are the only leasehold owner in the New York City watershed, and so Chesapeake is uniquely positioned to take this issue off the table," Chesapeake CEO Aubrey McClendon said in a released statement.

Chesapeake owns leases for 5,000 acres of the watershed, which falls within the Marcellus Shale, a deeply buried gas-rich rock formation that is poised for development. McClendon told *The New York Times* [3] that the company's holdings in the watershed are "a drop in the bucket" compared with the 1.5 million acres it has leased across the shale formation in New York and in other states.

"How could any one well be so profitable that it would be worth damaging the New York City water system?" he said to the *Times*.

Chesapeake's announcement came after more than 18 months of turmoil over drilling in the watershed. Gov. David Paterson issued a de facto moratorium on permits for drilling anywhere in New York's portion of the Marcellus Shale after a July 2008 article by ProPublica [1] raised environmental concerns about the drilling process. Paterson ordered [4] state officials to conduct a fresh environmental impact analysis, and New York City representatives began asking for a ban on drilling [5] inside the watershed. When the state's analysis was released late last month [6], it proposed conditions that would allow drilling to go forward in the watershed and sparked a clamor of protest.

Environmentalists and city officials applauded Chesapeake's announcement, but they are also urging the company to take its pledge further and sell its leases in the watershed to the city for $1.

"That way, the good words we've heard today will not be undercut by an unforeseen corporate deal a year or two from now, once this controversy has passed," Manhattan Borough President Scott Stringer said in a statement.

James Gennaro, a New York City councilman who chairs the city's committee on environmental protection, is among those who have urged the state to ban drilling in the watershed. "What does it say when gas companies show more sensitivity toward protecting the water supply for 9 million

New Yorkers [7] than the Paterson administration and the state's environmental regulators?" Gennaro said in a statement Wednesday.

Kate Sinding, a senior attorney with the Natural Resources Defense Council, said that now is the time for the state to pass a ban. "If Chesapeake is right that they're the only company that holds leases in the watershed, then there's no property interest that the state would have to compensate to impose a ban on drilling in the watershed," she said, alluding one of the obstacles state officials have said precludes a ban. "It's the perfect time."

Responding to Chesapeake's announcement, Yancey Roy, the spokesman for the state Department of Environmental Conservation, said the state's environmental review had made drilling in the watershed so restrictive that Chesapeake had few options. "The drilling companies will all make their own decisions about where to invest," he said in an e-mail, "but the Chesapeake announcement provides a clear indication that the state proposal contains rigorous protections for the watershed."

In Chesapeake's statement, however, McClendon offered another explanation. "Though Chesapeake believes it can drill safely in any watershed, including New York City's as confirmed by New York's Department of Environmental Conservation's supplemental Generic Environmental Impact Statement (GEIS), we have chosen to focus our efforts on more promising areas for gas development in the state."

The company's announcement takes many of New York City's concerns off the table, but others, including what will happen with the wastewater from drilling across the state, remain. The first of a series of public hearings [8] on Marcellus Shale drilling in the state will be held tonight in Sullivan County, with others to follow throughout the state.

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [9].

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Tags: Chesapeake Energy, Department of Environmental Conservation, Drilling, Hydraulic Fracturing, Marcellus Shale, Natural Gas, New York, New York City, Water Contamination

New York Drilling Study a Step Forward

by Abrahm Lustgarten, ProPublica - October 22, 2009 11:00 pm EST

A drilling rig in the town of Barton, in Tioga County, N.Y. (NYS Dec. 2008)

New York's recently released review of the environmental risks [1] (PDF) posed by natural gas production in the Marcellus Shale offers the clearest picture yet of the chemicals used in the drilling process called hydraulic fracturing.

The document makes public the names of 260 chemicals, more than eight times as many as Pennsylvania state regulators have compiled. The list is the most complete released by any state or federal agency and could help answer concerns about hydraulic fracturing in Congress and in states where gas drilling has increased in recent years.

The review also takes another dramatic step by proposing that in certain situations companies that drill in New York be required to report the concentrations of the chemicals they use to state regulators, thereby creating a suite of information that environmental scientists say is essential to investigating water pollution from drilling. New York would be the first state to make such a demand.

The industry has been reluctant to release information about the chemicals it uses, because it considers them a proprietary trade secret. While New York has made the names of the chemicals public, it seems likely that the data about their concentration will be shared only with state officials.

The 800-page environmental impact assessment also proposes a slew of safeguards for well construction, waste disposal and water protection. If those rules are finalized after the ongoing public review period, New York's environmental protections for gas drilling would be among the strongest in the nation.

"In a number of areas these regulations are more stringent than in other states," said Kate Sinding, a senior attorney with the Natural Resources Defense Council. "As commendable as that is, and

wanting to give the department credit where credit is due, the bar set in most other states is so abysmally low, it still begs the question of whether stronger is strong enough."

Environmental scientists have long sought complete information about the chemicals used in hydraulic fracturing, saying they need it to thoroughly investigate water pollution. Contamination can occur when the chemicals are pumped underground, held in waste pits or trucked to water treatment plants before being discharged back into rivers and drinking water supplies.

Colorado passed regulations last year requiring companies to disclose the names of chemicals, but they apply only to chemicals held in 50-gallons drums or larger. Now the industry is suing Colorado to repeal the group of regulations that includes that clause. In Pennsylvania, environment officials told ProPublica that their list of chemical products used for drilling there was complete, but it names just 39 products and 31 unique chemicals. Congress has been debating a bill to require disclosure, but the industry is fighting the legislation with millions of dollars in lobbying efforts.

New York obtained the names of the chemicals by surveying drilling companies, their contractors and the manufacturers of the chemicals. The Department of Environmental Conservation identified 152 trademarked products and obtained the complete list of their ingredients; it gathered a partial list of ingredients for an additional 45 products.

The review, which was released last month, leaves some environmental concerns unanswered. It offers few specific measures to protect New York City's watershed -- the unfiltered source of drinking water for nearly half the state's population. It says that wastewater will be treated by facilities in New York and Pennsylvania, but does not confirm whether those plants have the capacity to receive Marcellus Shale wastewater or the technology to make that water safe. Critics also complain it does little to describe how several thousand new wells would cumulatively affect air and water quality, leaving the analysis to a per-well basis.

"The DEC's shocking refusal to assess cumulative impacts undermines the validity of the entire study and if implemented will lead to devastating, unanticipated outcomes," said Roger Downs, a conservation associate at the Sierra Club's Atlantic Chapter, which has called for a ban on drilling in New York despite the Sierra Club's general support for gas development in the United States.

The review does, however, deal directly with some of most critical problems that have led to contamination in other drilling states.

It suggests strict limits on the kind of open waste pits that have led to hundreds of cases of water contamination in other states; guarantees additional scientific review before drilling can happen near water supplies; and requires government inspectors to be more regularly involved at several stages of the drilling and fracturing processes. An environmental review, sometimes including public hearings, would be required each time a gas well is proposed within 150 feet of a private water well, stream or pond or within 300 feet of a reservoir. An additional environmental review would also be required before gas wells could be hydraulically fractured within 1,000 feet of water supply infrastructure, or within 2,000 feet of the surface. Private water wells within 1,000 feet of a gas well would be tested before drilling begins, to create a baseline for measuring any future pollution.

The review recommends requiring that chemical-laden wastewater from hydraulic fracturing be enclosed in steel tanks rather than pits at well sites, a practice that has been proven to reduce the risk of spills and prevent evaporation of chemicals into the air. Some waste could still be kept in open pits, but new rules would require that those pits be emptied after seven days, and that state inspectors check the pits and their liners before they can be used again.

The review also suggests strengthening structural requirements to prevent leaks from inside gas well pipes, and establishing an explicit chain of custody record to make sure drilling wastewater is delivered to treatment facilities that are capable of accepting it.

Yancey Roy, a spokesman for the DEC, declined to answer questions about the document. Instead he cited passages in the environmental review. New York's industry group, the Independent Oil and Gas Association of New York State, did not return calls for comment. Two prominent new natural gas industry associations -- America's Natural Gas Alliance and Energy In Depth -- also declined to comment on New York's rulemaking process.

The draft review, called the Supplemental Generic Environmental Impact Statement, updates the state's 1992 drilling study. It was ordered by Gov. David Paterson last summer after an investigation by ProPublica [2] found that the state was not familiar with the chemical makeup of fracturing fluids and was unprepared to manage a boom of modern drilling in the Marcellus Shale.

The state has allowed for a 60-day comment period before the recommendations will be finalized and is holding four hearings across New York [3] beginning later this month. Several state, city and federal lawmakers, including U.S. Sen. Kirsten Gillibrand, D-N.Y., have said the comment period is too short and called for an extension from the Nov. 30 deadline. Comments can be submitted online [4] or sent by e-mail [5].

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [6].

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Tags: Department of Environmental Conservation, Drilling, Gas Wells, Hydraulic Fracturing, Marcellus Shale, Natural Gas, New York, New York Drilling

New York City Hints at Anti-Drilling Stance

by Abrahm Lustgarten, ProPublica - October 23, 2009 3:33 pm EST

Acting Department of Environmental Protection Commissioner Steven Lawitts. (nyc.gov)

As New York State continues to hash out the environmental ramifications of natural gas drilling [1] in the Marcellus Shale, anticipation is building over what New York City, and its mayor, will have to say about it. The city gets 90 percent of its drinking water from the Catskill-Delaware watershed, which is smack in middle of the area where drilling could happen.

One of the strongest clues to the administration's stance came Friday in testimony at City Hall, where acting Department of Environmental Protection [2]Commissioner Steven Lawitts said he hopes the city's watershed will be afforded the same protections that apply to parts of the Great Lakes region. Gas drilling is forbidden under the beds of Lakes Erie and Ontario.

"This precautionary approach is appropriate for the Catskill-Delaware watersheds," Lawitts told the City Council's committee on environmental protection and some 200 people who packed the hearing room.

Did that mean Lawitts was calling for a ban on drilling in the watershed?

Not quite.

A spokesman for Mayor Michael Bloomberg cautioned us not to read between the lines.

Lawitts "gave very strong comments because we have deep, deep concern for the potential impacts and we are still reviewing the issue – but we have not called for a ban," the spokesman, Marc LaVorgna, said in an e-mail. "The Great Lakes analogy is apt in that they were able to carve out special considerations."

LaVorgna said the city won't formalize its position on gas drilling until it gets the final report from a consultant it hired to assess drilling in the watershed, due by the end of the year. The consultant's preliminary report [3] contrasted with the state's own environmental review released late last month and warned that no amount of regulations or protections could protect the city's water. The city has repeatedly expressed concerns that the state's review process hasn't adequately addressed dangers to the watershed.

At the time the consultant's preliminary findings about drilling were released, Bloomberg told reporters [3] that "if this has the danger of polluting, we will fight it."

In his testimony before the council, Lawitts underscored that commitment.

"We will do whatever we have to do to protect the watershed," he said. "And that includes whatever legal options are available to us."

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [4].

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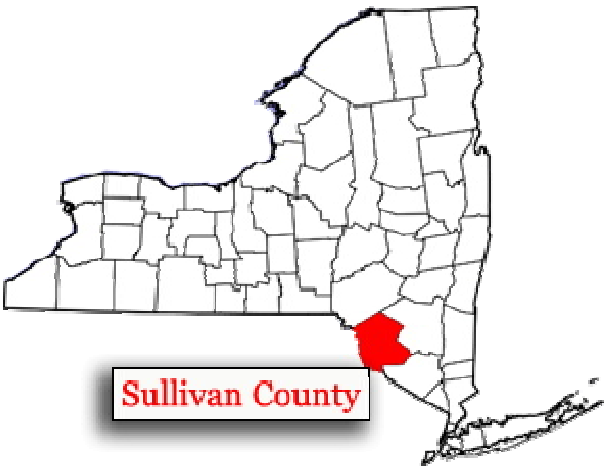
Tags: Department of Environmental Protection, Drilling, Hydraulic Fracturing, Marcellus Shale, Michael Bloomberg, Natural Gas, New York City, Water Contamination

Feisty Audience Tackles Natural Gas Drilling Report

by Sabrina Shankman, ProPublica - October 29, 2009 4:51 pm EST



Sullivan County, N.Y., was the location for the first public hearing on natural gas drilling in the state. (Wikimedia Commons)

At the first public hearing of the New York Department of Environmental Conservation's review of natural gas drilling, one speaker summed up the sentiment of many in Sullivan County, which is likely to see much of the drilling in the state.

"This is not good enough," said Callicoon resident Jane Blake. "How are we going to build a local economy and provide for ourselves if the future of the land is destroyed?"

More than 300 people crowded the theater at Sullivan County Community College, many voicing the concern that they have little control over the drilling that seems destined for their region, even though they will directly feel its effects.

"As chairman of the Planning Board, if you want to build a woodshed, you have to come to me," said Edwin Jackson. "Right now." he said, the gas companies "don't have to ask me anything."

The Wednesday night hearing was the public's first chance to critique the DEC's draft environmental review [1] of drilling in the Marcellus Shale, an 800-plus page report that was released Sept. 30 and is in the midst of a 60-day public review period.

Environmentalists, town leaders and residents used their five-minute allotments to passionately compile a laundry list of changes they hope to see added to the document, which will dictate how gas development is overseen in the state.

They asked that communities be alerted when drilling applications are filed in their region; that additional safeguards be added to protect their drinking water; and that the cumulative impact of multiple drilling sites be considered. Some asked that drilling be banned altogether, citing hazardous toxins, the potential for roads to be destroyed and water contamination incidents in other states.

“There’s nothing less than the future of our most valuable resource at stake,” said homeowner Zeke Boyle.

A few people also spoke in favor of drilling, saying that it offered the chance for an economic renaissance in the county, which includes vast swaths of farmland and is struggling economically.

“Over the years, the farmers have been the best stewards of our land,” said Jim Greier, a supervisor in the town of Fremont. “The leasing of their mineral rights will allow them to continue to stay in business and preserve our open space.” Greier said many farmers are in a financial bind because of recent changes in the agricultural industry and the economy.

Scott Rotruck, from Chesapeake Energy Corp., also attended the hearing. Chesapeake is the largest holder of leases in the Marcellus Shale, and Rotruck repeated the company’s recent announcement [2] that it will not drill on the leases it holds in the watershed that provides most of New York City’s drinking water.

The next hearing [3] is scheduled for Nov. 10 in New York City.

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [4].

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Tags: Department of Environmental Conservation, Drilling, Gas Wells, Hydraulic Fracturing, Marcellus Shale, Natural Gas, New York, Sullivan County, Water

Does Chesapeake's No-Drilling Pledge Do Enough to Protect NYC's Watershed?

by Sabrina Shankman, ProPublica - November 3, 2009 2:40 pm EST

Brooklyn Assemblyman Jim Brennan is proposing a ban on natural gas drilling in the New York City watershed, denoted in light blue, and within five miles of its border. (Map by Jennifer LaFleur/ProPublica)

Last week, the largest natural gas lease holder in New York state issued two slightly different messages about its plans for drilling in the watershed that provides 90 percent of New York City's drinking water.

On Wednesday morning, Chesapeake Energy Corp. announced that it had voluntarily decided not to drill [1] in the watershed in upstate New York. But later that evening, at the state's first public hearing on proposed natural gas development [2] in the Marcellus Shale, the company said it would object to any official state ban on drilling in the watershed.

"It would be improper to ban drilling in any particular area of the state, as such a ban is inconsistent with the declared legislative policy to promote recovery of this resource and amounts to a regulatory taking of the mineral interests affected by such a ban," said Scott Rotruck, Chesapeake's vice president of corporate development, who read from a prepared statement at the meeting. Chesapeake did not respond to requests for an interview.

So what does Chesapeake's pledge actually mean?

Legally, it doesn't mean much, said gas lease attorney Joshua Bernstein. Chesapeake could change its mind and go ahead with its drilling plans. It could also offer its leases to another company. "The way the lease is drawn up, they could turn it over to anyone," Bernstein said.

Environmentalists and some state legislators say the only way to make sure the watershed is protected is to officially ban drilling there.

"I call on both the Department of Environmental Conservation and the governor now to ban drilling in the watershed," said Deborah Goldberg, the managing attorney at Earthjustice, formerly the Sierra Club Legal Defense Fund. "It is needed to make sure that the promise is permanent."

Assemblyman Jim Brennan, D-Brooklyn, who has legislation pending that would prohibit gas drilling in the New York City watershed and within five miles of its border, said such a ban would not amount to a "regulatory taking."

“The state has the power to protect public health and safety,” Brennan said. “It’s not an indirect taking of property. The state has the right to protect its residents.”

Brennan said 22 other assembly members have signed on as co-sponsors of his bill, and Sen. Tom Duane, D-Manhattan, is carrying the bill in the Senate.

New York City Mayor Michael Bloomberg’s administration hasn’t taken an official position on the drilling ban. But the city’s Department of Environmental Protection continues to push for further assurance that the water source will be protected.

“One company’s voluntary moratorium at this point is no substitute for a thorough analysis by the state DEC and the state Department of Health to determine the potential of drilling failure in the watershed and damage to critical infrastructure in adjacent communities,” said Michael Saucier, spokesman for the city agency.

Chesapeake’s no-ban-is-needed approach to the watershed issue drew support from Dennis Holbrook, an executive vice president at Norse Energy Corp. USA, which holds leases 100 miles west of the city’s watershed.

“It’s not as much that I’m concerned about the ability to drill safely within the watershed as much as I am about the public perception,” Holbrook said. “My approach is that the watershed is a sensitive area, and there are other areas to drill right now, so why don’t we focus on those and in the future this issue can be revisited if it’s appropriate.”

John Conrad, a hydrogeologist with Conrad Geoscience Corp. in Poughkeepsie, said there’s no reason to be concerned about the drilling because New York’s drilling regulations are already stricter than elsewhere.

“I know there is at least a perception that hydro-fracturing and horizontal drilling somehow generates new risks for groundwater,” he said. “The truth is that they don’t, as long as procedures are followed that are required in New York.”

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [3].

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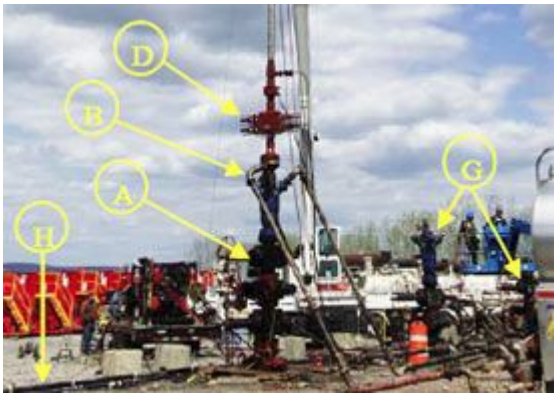
Tags: Chesapeake Energy, Department of Environmental Conservation, Department of Environmental Protection, Drilling, Gas Wells, Hydraulic Fracturing, Marcellus Shale, Natural Gas, New York, New York City, Water Contamination

Public Gets More Time to Comment on New York's Gas Drilling Plans

by Sabrina Shankman, ProPublica - November 4, 2009 4:40 pm EST



A well head; photo from the draft environmental impact statement.

Responding to calls from politicians, environmentalists and concerned residents, the New York State Department of Environmental Conservation announced Wednesday that it has extended the public comment period for an environmental review [1] of natural gas drilling in the Marcellus Shale.

The comment period, which began Sept. 30 with the release of the draft Supplemental Generic Environmental Impact Statement [2], now extends through Dec. 31. It was previously slated to end Nov. 30. Since the release of the technical, 800-plus page document, there have been complaints that the original 60-day comment period was insufficient for people to read and understand its findings.

"This is the biggest environmental issue of the decade in New York," Manhattan Borough President Scott Stringer said in a statement. "It's good to see that the public's demand for more time has been heard."

The DEC has also moved up the start time for the second public hearing on the environmental review, which will be held Nov. 10 at Stuyvesant High School in New York City. Doors for the hearing will now open at 5:30 p.m. for individual questions and speaker sign-up. The DEC staff will also be on hand to answer questions about the draft. The public comment period will begin at 6:30 p.m. (More info on the public hearings here [3].)

Read our complete natural gas drilling coverage. [4]

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [5].

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Tags: Drilling, Hydraulic Fracturing, Marcellus Shale, Natural Gas, New York

Pennsylvania Tells Drilling Company to Clean Up Its Act

by Sabrina Shankman, ProPublica - November 6, 2009 9:40 am EST


COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CONSENT ORDER AND AGREEMENT

Findings

After a year of chemical spills [1], water well contamination and an explosion caused by leaking underground methane, Cabot Oil and Gas Corp. has been fined $120,000 and ordered to abide by a set of stricter-than-usual probationary regulations if it wants to continue its vast natural gas drilling [2] operation in Pennsylvania.

The judgment is the latest chapter in a saga of drilling controversy [3] and environmental contamination as a result of drilling for natural gas in northeastern Pennsylvania that we've been following since January [2], and is part of our ongoing investigation into the environmental consequences of gas drilling across the country. [4]

The charges and conditions against Cabot were outlined by the Pennsylvania Department of Environmental Protection in a 23-page document [5] that lists each of Cabot's offenses – from failure to properly cement wells to failure to maintain and submit proper records – and asks the company to acknowledge and address the findings. The fine is the largest issued by the Pennsylvania agency to a gas company.

Cabot signed the order Wednesday agreeing to the state's conditions, but seemed to stop short of taking full responsibility. "The department made several findings, and we agreed with the basic facts as they were laid out," said a Cabot spokesman, Ken Komoroski. "But Cabot did not agree to the legal conclusions of violations of laws and regulations."

The DEP began investigating Cabot early this year, after residents in Dimock, Pa., started reporting methane bubbling out of their faucets [3] – a sign that natural gas had contaminated their water supplies. Investigators found that some of Cabot's well casings, which seal well pipes from water supplies, were faulty and had allowed natural gas to migrate into the groundwater.

The groundwater incidents were the first of several spills and accidents [6] that followed. In at least two cases the company spilled diesel or drilling fluids that reached water supplies. And in September, the DEP ordered Cabot to stop its hydraulic fracturing operations in Susquehanna County after it allowed three hydraulic fracturing fluid spills in nine days. The ban was lifted on Oct. 16, after the company revised its pollution prevention and control plan.

Now the company has until March 31 to comply with parts of the DEP's order and submit a plan outlining how it will permanently replace the water supplies for more than a dozen affected homes near the town of Dimock.

The most important requirements have to do with well construction. Cabot will have to submit well casing and cementing plans to the DEP, which will have to approve the well before Cabot can proceed with drilling or any hydraulic fracturing. The company will also have to submit a plan that specifically lays out how it will prove the integrity of the casing and cementing on existing wells and fix any that are defective. If the defective casing isn't fixed by the March deadline, Cabot will be ordered to plug its defective wells.

"They've got to go back and fix all of those wells," said DEP spokeswoman Teresa Candori.

Finally, the company will be required to tell the DEP who has contacted the company with concerns about the quantity or quality of their water supplies. [1]

"It does add some additional requirements beyond the regulations but these are measures and procedures that Cabot agrees are appropriate for the area," Cabot spokesman Komoroski said.

Cabot has been drilling in the Marcellus Shale of Pennsylvania since 2006. It drilled one well in 2006, and one in 2007, before ramping up in 2008 and drilling 20. The company will drill between 40 and 60 wells in 2009, and has plans to drill between 50 and 70 more in 2010.

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [7].

Want to know more? Follow ProPublica on Facebook [8] and Twitter [9], and get ProPublica headlines delivered by e-mail every day [10].

Tags: Cabot Oil and Gas, Dimock, Drilling, Gas Wells, Hydraulic Fracturing, Marcellus Shale, Pennsylvania

Is New York's Marcellus Shale Too Hot to Handle?

by Abrahm Lustgarten, ProPublica - November 9, 2009 5:10 am EST

Fluids made up of a combination of naturally occurring water from the shale formation and drilling mud are pumped into a lined retaining area behind the drilling rig on a farm in Houston, Pa., in October 2008. New York state is currently holding a public comment period for an environmental review of natural gas drilling in the Marcellus Shale. (Keith Srakocic/AP Photo)

As New York gears up for a massive expansion of gas drilling in the Marcellus Shale, state officials have made a potentially troubling discovery about the wastewater created by the process: It's radioactive. And they have yet to say how they'll deal with it.

The information comes from New York's Department of Environmental Conservation, which analyzed 13 samples of wastewater brought thousands of feet to the surface from drilling and found that they contain levels of radium-226, a derivative of uranium, as high as 267 times the limit safe for discharge into the environment and thousands of times the limit safe for people to drink.

The findings, if backed up with more tests, have several implications: The energy industry would likely face stiffer regulations and expenses, and have more trouble finding treatment plants to accept its waste -- if any would at all. Companies would need to license their waste handlers and test their workers for radioactive exposure, and possibly ship waste across the country. And the state would have to sort out how its laws for radioactive waste might apply to drilling and how the waste could impact water supplies and the environment.

What is less clear is how the wastewater may affect the health of New Yorkers, since the danger depends on how much radiation people are exposed to and how they are exposed to it. Radium is known to cause bone, liver and breast cancers, and the EPA publishes exposure guidelines for it, but there is still disagreement over exactly how dangerous low-level doses can be to workers who handle it, or to the public.

The DEC has yet to address any of these questions. But New York's Health Department raised concerns about the amount of radioactive materials in the wastewater in a confidential letter to the DEC's oil and gas regulators in July.

"Handling and disposal of this wastewater could be a public health concern," DOH officials said in the letter, which was obtained by ProPublica. "The issues raised are not trivial, but are also not insurmountable."

The letter warned that the state may have difficulty disposing of the drilling waste, that thorough testing will be needed at water treatment plants, and that workers may need to be monitored for radiation as much as they might be at nuclear facilities.

Health Department officials declined to comment on the letter. The DEC sent an e-mail response to questions about the radioactivity stating that "concentrations are generally not a problem for water discharges, or in solid waste streams" in New York state. But the agency did not directly address the radioactivity levels, which were disclosed in the appendices of the agency's environmental review of gas drilling in the Marcellus Shale, released Sept. 30.

The review did not calculate how much radioactivity people may be exposed to, even though such calculations are routinely completed by scientists studying radiation exposure. Yet the review concluded that radiation levels were "very low" and that the wastewater "does not present a risk to workers." DEC officials declined to explain how they reached this conclusion.

Although the review pointed to a possible need for radioactive licensing and disposal for certain materials, and it looked at other states with laws aimed at radioactive waste from drilling, the DEC said there is no precedent for examining how these radioactive materials might affect the environment when brought to the surface at the volumes and scale expected in New York. And it said that more study is needed before the DEC can lay out precise plans to deal with the waste.

In comments to ProPublica, the DEC emphasized that the environmental review proposes testing all wastewater for radioactivity before it is allowed to leave the well site, and said that the volumes of brine water, which contain most of the radioactivity detected, would be far less than the volumes of fluid from hydraulic fracturing that are removed from the well.

What scientists call naturally occurring radioactive materials -- known by the acronym NORM -- are common in oil and gas drilling waste, and especially in brine, the dirty water that has been soaking in the shale for centuries. Radium, a potent carcinogen, is among the most dangerous of these metals because it gives off radon gas, accumulates in plants and vegetables and takes 1,600 years to decay. Geologists say radioactivity levels can vary across the Marcellus, but the tests taken so far suggest the amount of radioactive material measured in New York is far higher than in many other places.

The state took its 13 samples -- 11 of which significantly exceeded legal limits -- between October 2008 and April 2009. The DEC did not respond to questions about whether additional sampling has begun or whether the state would begin issuing drilling permits before the radioactivity issues are resolved. The DEC told ProPublica it did not know where the wastewater would be treated.

“It’s got to go somewhere,” said Theodore Adams, a radiation remediation and water treatment consultant with 30 years of experience with radioactive waste. “It’s not going to just go away.”

A Vague Threat

Determining the health threat that radioactive material poses to workers and to the public is complicated. Measuring human exposure -- which is quantified in doses of millirems per year -- from radiation is notoriously difficult, in part because it depends on variables like whether objects interfere with radiation, or how sustained exposure is over long periods of time.

Gas industry workers, for example, would almost certainly face an increased risk of cancer if they worked in a confined space where radon gas, a leading cause of lung cancer and a derivative of radium, can collect to dangerous levels. They would also be at risk if they somehow swallowed or breathed fumes from the radioactive wastewater, or handled the concentrated materials regularly for 20 years. But without these types of intensive or confined exposures, the materials may be less dangerous, making it difficult to discern effects on workers’ health, experts say.

People absorb radioactivity in their daily routines, complicating health assessments. Eighty percent of human radioactivity exposure comes from natural sources, according to the EPA. Everything from granite countertops to a pile of playground dirt can emit radioactivity that is higher than the EPA, which regulates based on a theory that zero exposure is best, may prefer.

“You start with the world where you and I are getting an exposure from the sun, from the soil we walk on, from the brick in our house that on average is about 400 millirems a year -- which is dangerous,” said Tom Lenhart, a former member of the federal-state Interagency Steering Committee on Radiation Standards. “The EPA would never allow that kind of exposure. So you are starting from a baseline of dangerous exposure, and this is what makes regulating it a nightmare.”

The EPA estimates that Americans are exposed to about 300 to 360 millirems per year, including routine artificial exposures like getting an X-ray or flying in an airplane. Each multiple of this “background level” denotes a proportional increase in the chance of getting cancer.

The natural radioactivity of the Marcellus Shale has caused concern since the mid-1980s, when high levels of radon gas were found in the basements of homes in Marcellus, a town in upstate New York, where the shale reaches the surface. The question has long been, if the Marcellus can cause radioactive gas to seep into people’s basements, how much radioactivity might be infused into the water left over from drilling? Add to that the question of how much human exposure can be expected from the radiation detected at some Marcellus drilling sites.

In its environmental review, the state said it couldn’t answer those questions because exposure depends on so many variables and because the units of measurement for human exposure and concentrations in water are incompatible. There is “no simple or universally accepted equivalence between these units,” the DEC wrote in its environmental review.

But Rick Kessy, operations manager for Fortuna Energy, a subsidiary of Canadian Talisman Energy and the largest gas producer in New York, says his company has assessed worker exposure at two of the company’s well sites in Pennsylvania, where it found no serious risk.

And a U.S. Department of Energy expert who specializes in such exposure conversions said an analysis in New York should be "very easy to do."

"If they know the concentrations and they know the exposure pathways it should be straightforward to calculate that," said Charley Yu, who runs the national computer dose modeling program at Argonne National Labs for the U.S. Department of Energy.

In fact, New York's DEC used Yu's government modeling program, called RESRAD, in a 1999 study [1] to establish radioactivity exposure risks for oilfield brine spread on roads, a common disposal practice. Its brine samples in that case contained far less radium than the Marcellus water. It laid out a simple scenario, assuming a person walked on the road for two hours a day over 20 years and a fixed quantity of brine was spread there. That study found no threat to human health.

No such analysis was included in the state's recent supplemental environmental impact statement.

Few Disposal Options

All this would be of substantially less concern if New York were like most of the other states that produce some radioactive waste during natural gas drilling. In those states, the waste is re-injected underground. But in New York, injection disposal wells are uncommon, and those that do exist aren't licensed to receive radioactive waste or Marcellus Shale wastewater, according to the EPA. Instead, most drilling wastewater is treated by municipal or industrial water treatment plants and discharged back into public waterways.

The radium-laden wastewater would almost certainly need to be carefully treated by plants capable of filtering out the radioactive substances. Kessy, the Fortuna manager, which operates five of the wells with spiked readings in New York, said the levels are higher than he has seen elsewhere. Treatment plants in Pennsylvania are accepting Fortuna wastewater with much lower levels of radioactivity from the company's wells there, Kessy said, but if plants can't take the higher concentrations, it could be crippling.

"In the event that they were not able to comply due to high radioactivity, they would reject the water," Kessy said. "And if we did not have a viable option for it, our operations would just shut down. There is no other option."

It is not clear which treatment plants, if any in New York, are capable of handling such material.

DEC spokesman Yancey Roy said that "there are currently no facilities specifically designated for treating them." He added that the state depends on the drilling companies to make sure there is a legal treatment option for the water, and then reviews those plans.

"The department has not received any permit submissions from the well operators that include details about treatment options for the brine containing NORM," he said. "So we do not know what treatment options are being considered or how effective NORM removal will be."

ProPublica contacted several plant managers in central New York who said they could not take the waste or were not familiar with state regulations.

“We are not set up to take radioactive substances,” said Patricia Pastella, commissioner of the Onondaga County Department of Water Environment Protection, which operates the Metropolitan plant in Syracuse, N.Y. “It does present a problem with disposal.”

Filtering the water is just one of several problems. Plants that can filter out the radioactive materials are left with a concentrated sludge that has substantially higher radioactivity than the wastewater. Sludge can also collect inside the pipes at well sites, in waste pits and in holding tanks.

Federal laws don’t directly address naturally occurring radioactivity, and the oil and gas industry is exempt from federal laws dictating handling of toxic waste, leaving the burden on New York state. New York has laws governing radioactive materials, but the state’s drilling plans don’t specify when they would apply.

Experts who reviewed the concentrations of radioactive metals found in New York’s wastewater said the leftover sludge is likely to exceed the legal limits for hazardous waste and would need to be shipped to Idaho or Washington, to some of the only landfills in the country permitted to accept it.

Fortuna’s Kessy said that’s an acceptable cost of doing business. “We’ll be willing, of course, to fund the necessary disposal means,” he said.

The same may be required of some of the equipment used in drilling, which can eventually emit much higher levels of radiation than the water itself. Louisiana, for example, began regulating radioactive materials after it found radioactive build-up in pipes [2] dumped in scrap yards and in the steel used to build schoolyard bleachers.

But the levels in that state were just one-eighth of those measured so far in New York.

“I don’t believe anyone has taken a look, seriously, at what the unintended consequences are to dealing with these kinds of materials,” said Theodore Adams, the radioactive waste disposal consultant. “It’s a unique animal -- a unique disposal -- and depending on where it is located and who is receiving it, it could have an impact.”

ProPublica’s Sabrina Shankman contributed reporting to this article.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [3].

Tags: Department of Energy, Department of Environmental Conservation, Drilling, Fortuna Energy, Horizontal Drilling, Hydraulic Fracturing, Marcellus Shale, Natural Gas, New York, Radioactive Materials, Radium-226

Congress Tells EPA to Study Hydraulic Fracturing

by Abrahm Lustgarten and Sabrina Shankman, ProPublica - November 10, 2009 3:18 pm EST

Nov. 11: This post has been updated [1].

Rep. Maurice Hinchey (D-NY) said he expects the EPA to follow through on Congress' request for additional study of hydraulic fracturing.

Five years ago the U.S. Environmental Protection Agency assured the nation that the technology credited with opening vast new natural gas supplies was safe. Now Congress has ordered the agency to take another look.

As part of the $32 billion Interior and Environment Appropriations Bill recently signed by President Barack Obama, lawmakers asked the EPA to revisit hydraulic fracturing, the process where copious amounts of water and sand mixed with toxic chemical additives are furiously pumped underground to break up gas-bearing rock thousands of feet below.

The bill urges the EPA to use a portion of the money to fund a scientifically robust and peer-reviewed study of the relationship between hydraulic fracturing and drinking water, "using a credible approach that relies on the best available science."

The EPA gave hydraulic fracturing its stamp of approval in a 2004 report [2], but that study has been widely criticized as politically motivated and scientifically unsound. After the report was released, veteran EPA scientist Weston Wilson wrote a letter [3] to Colorado representatives saying that "based on available science and literature, EPA's conclusions are unsupportable." He also wrote that five out seven members of a panel that reviewed the findings had conflicts of interest and "may benefit from EPA's decision not to conduct further investigation or impose regulatory conditions."

In 2008 ProPublica reported [4] that EPA staff involved in the study negotiated directly with Halliburton, one of the leaders in the hydraulic fracturing business, and other stakeholders to soften inspection pressure from the agency. In exchange, the companies agreed to voluntarily stop using diesel fuel for some of their fracturing processes. That report was part of an investigation showing that water sources have been contaminated across the country from drilling.

The 2004 study was used to help justify the passage of an amendment in the 2005 Energy Policy Act that exempted hydraulic fracturing from coverage under the Safe Drinking Water Act.

Ever since, environmentalists and some Democratic members of Congress have been pushing for a reversal.

The new request for a study of fracturing is just one paragraph, deep in the 393-page bill that funds everything from drinking water infrastructure to Great Lakes conservation, and it does not specify an amount of money to be spent on the study.

The office of EPA administrator Lisa Jackson did not respond to requests for comment for this article. But the measure's sponsor, Rep. Maurice Hinchey, D-N.Y., says he expects the EPA to follow through. "I don't think that there is any question that they are going to move forward on it," said Hinchey, adding that Jackson has indicated this to him directly.

Jackson previously said [5] she recognized that the current regulations restrict the EPA's ability to protect groundwater and said the issue "was well worth looking into." But she hadn't indicated how the EPA would approach the problem or whether the 2004 study would be revised.

The request for a new study comes six months after a matching pair of bills called the FRAC Act was introduced in the House and the Senate. The Fracturing Responsibility and Awareness Chemicals Act – sponsored by Hinchey, among others – would repeal the oil and gas industry's exemption from the Safe Drinking Water Act.

It's not unusual for a study to be introduced as a way of delaying legislation. But Hinchey says this study serves a real purpose because there is a dearth of scientifically neutral information about hydraulic fracturing.

"We are very sincere and deeply dedicated to getting this done," he said.

UPDATE: After this story was published, the U.S. Environmental Protection Agency sent the following response to ProPublica's questions:

"EPA is committed to protecting underground sources of drinking water and is assessing reports of drinking water contamination that may be associated with hydraulic fracturing activities. EPA is reviewing available information to determine whether hydraulic fracturing fluids have contaminated drinking water and has dedicated resources to properly studying this issue. EPA will use this information to determine what steps need to be taken to protect underground sources of drinking water within the limits of its authority. "

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [6].

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [7].

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Tags: EPA, Fracturing Responsibility and Awareness Chemicals Act, Hydraulic Fracturing, Lisa Jackson, Maurice Hinchey, Natural Gas, Safe Drinking Water Act

New Yorkers Tell State Enviro Department: 'No Fracking Way'

by Sabrina Shankman, ProPublica - November 11, 2009 3:42 pm EST

Protesters against natural gas drilling in New York gather outside of the Department of Environmental Conservation's public hearing in New York City on Nov. 10, 2009. (Susan White/ProPublica)

It didn't take long for a New York City public hearing on natural gas drilling to descend into near chaos.

Just seconds after the first speaker took the microphone at the Department of Environmental Conservation's hearing, a man in a suit and tie jumped onto the stage at Stuyvesant High School, where the meeting was held.

"We want a statewide ban!" he shouted. "The gas drilling is dangerous!" As a pair of officers escorted the shouter off the stage, the crowd -- which spilled out of the large auditorium -- stood and screamed, brandishing anti-drilling signs.

This was the second public hearing on the DEC's environmental review [1] of natural gas drilling in the Marcellus Shale, a process heralded as environmentally sound by the energy industry and as environmentally treacherous by its opponents, including a slew of politicians, environmentalists and concerned residents.

The group that gathered Tuesday night had no intention of reconciling those points of view.

The first speakers were public officials (or their stand-ins), who read prepared statements echoing each other's calls for a ban of drilling in New York City's upstate watershed, which supplies drinking water for 9 million city residents. Chesapeake Energy Corp., which says it is the only company that owns leases in the watershed, has pledged not to drill [2] there. But the officials who spoke -- including Manhattan Borough President Scott Stringer, who has led the cause locally -- were pushing for the state to take that pledge further by banning drilling in the watershed.

"A press release is not a contract," Stringer said, referring to Chesapeake's announcement of Oct. 28. "A company's pledge is not legally binding."

In his testimony at the hearing, Scott Rotruck, Chesapeake's vice president of corporate development, was applauded when he repeated his company's promise. Later in his statement, however, many of his points -- including the claim that the "winners environmentally and financially will include the residents of New York City" -- were met with boos.

Other industry representatives, including Brad Gill of the Independent Oil and Gas Association of New York state, had planned to make comments but left without doing so.

The DEC recently extended the public comment period on the 800-plus-page report from 60 days to 90, and will hold two more public hearings before the period ends Dec. 31. Comments can also be submitted by mail or online.

Kate Sinding, a senior attorney with the Natural Resources Defense Council, used her five minutes at the microphone to list problems with the review. She said it fails to prohibit drilling in special ecological areas and fails to consider the cumulative impacts of drilling. Sinding also complained that the review doesn't require any legally defensible regulations.

Rather than imposing regulations, Sinding said, "DEC is proposing instead to 'implement' the mitigations through form filings and permit conditions."

"Only through legally enforceable regulations can the public be assured that gas companies are being held to the new requirements being proposed by the DEC," she said over a crescendo of applause.

The next hearing is scheduled for Thursday evening in Chenango Bridge, N.Y.

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [3].

Want to know more? Follow ProPublica on Facebook [4] and Twitter [5], and get ProPublica headlines delivered by e-mail every day [6].

Tags: Chesapeake Energy, Department of Environmental Conservation, Drilling, Gas Wells, Hydraulic Fracturing, Natural Gas, New York, New York City, New York Drilling

ProPublica's Abrahm Lustgarten on the Brian Lehrer Show

by Mike Webb, ProPublica - November 11, 2009 3:31 pm EST

Abrahm Lustgarten

Yesterday, WNYC's Brian Lehrer Show [1] had ProPublica's Abrahm Lustgarten on to discuss his report about the high level of radioactive materials in wastewater produced by natural gas drilling in New York state. Lustgarten has written more than 40 reports [2] about the potential threat a new drilling technique (hydraulic fracturing aka hydrofracking) poses to drinking water.

Lustgarten was joined by Riverkeeper's Alex Matthiessen. Click here [1] to listen to the segment.

Write to Mike Webb at mike.webb@propublica.org [3].

Want to know more? Follow ProPublica on Facebook [4] and Twitter [5], and get ProPublica headlines delivered by e-mail every day [6].

Tags: Drilling, Hydraulic Fracturing, Natural Gas

Pa. Residents Sue Gas Driller for Contamination, Health Concerns

by Abrahm Lustgarten, ProPublica - November 20, 2009 10:00 am EST

Dimock resident Julie Sautner, seen here in her basement with her water filtration system, flushed her toilet one day to find a rush of earth-brown water. Tests showed her drinking water was high in aluminum, iron and methane. She is now part of a lawsuit against driller Cabot Oil and Gas. (Abrahm Lustgarten/ProPublica)

Pennsylvania residents whose streams and fields have been damaged by toxic spills and whose drinking water has allegedly been contaminated [1] by drilling for natural gas are suing the Houston-based energy company that drilled the wells. A worker at the company is among the 15 families bringing suit.

The civil case, filed Thursday in U.S District Court in Scranton, Pa., seeks to stop future drilling in the Marcellus Shale by Cabot Oil and Gas near the town of Dimock. It also seeks to set up a trust fund to cover medical treatment for residents who say they have been sickened by pollutants. Health problems listed in the complaint include neurological and gastrointestinal illnesses; the complaint also alleges that at least one person's blood tests show toxic levels of the same metals found in the contaminated water.

The suit alleges that Cabot allowed methane [2] and metals to seep into drinking water wells, failed to uphold terms of its contracts with landowners, and acted fraudulently when it said that the drilling process, including the chemicals used in the underground manipulation process called hydraulic fracturing [3], could not contaminate groundwater and posed no harm to the people who live there.

"We've been lied to, we've been pushed around, and enough is enough," said Julie Sautner, whose drinking water began showing high levels of methane, iron and aluminum in February and who is receiving fresh water deliveries from Cabot. "We need to push back."

A Cabot spokesman, Ken Komoroski, did not return calls for comment.

Among the 15 families bringing the case to court is Nolan Scott Ely, a Cabot employee who could lend an inside perspective to the case on how the company operates and how it has approached the myriad problems the company has had [4] in Dimock. Nolan Ely did not return calls for comment.

Ely's relatives, who have lived in Dimock for generations, own several properties where Cabot has wells. In January a well at the home of Michael Ely, one of Nolan Ely's relatives who is also part of the lawsuit, caught fire after methane leaked underground into the water supply. At the top of the hill near Michael Ely's home is Cabot's Ely 6H well, which is among the most productive horizontal wells drilled in the Marcellus Shale. Cabot has touted Ely 6H as being one of the company's most profitable.

Fifteen families in Dimock, Pa., file a lawsuit against natural gas drilling company Cabot Oil and Gas, seeking to halt future drilling in the Marcellus Shale near their town. Meet the residents behind the lawsuit. (Abrahm Lustgarten/ProPublica)

[5]Cabot's problems in Dimock go back to January, when a drinking water well [1] belonging to Norma Fiorentino -- who is a plaintiff in the lawsuit -- exploded after a methane buildup. Since then methane and metals have been found in numerous drinking water wells in the region. In the last year Pennsylvania's Department of Environmental Protection has determined that Cabot was responsible for several spills of diesel fuel and drilling mud and for an 8,000-gallon leak [4] of hydraulic fracturing fluids being prepared by a contractor, Halliburton, that seeped into a fresh water stream in September.

The DEP concluded early on that faulty well construction [6] allowed contaminants to leak from Cabot's wells into water supplies. In September, following the fracturing fluid spill, the state temporarily banned [7] Cabot from hydraulically fracturing any more wells near Dimock, but that prohibition was lifted several weeks later.

On Nov. 4 the DEP issued a document listing more than a dozen infractions [8] (PDF), including fracturing fluid spills, diesel spills and well-construction problems that allowed methane gas to seep underground into private drinking water wells. The document lists 13 families [8] whose drinking water is affected by the contamination, many of whom are being supplied fresh drinking water by Cabot.

The lawsuit, filed by the New York City-based law firm Jacob D. Fuchsberg and two other firms based in Philadelphia, Pa., and Buffalo, N.Y., did not specify what monetary damages would be sought from Cabot. Dimock residents tell ProPublica that they would be entitled to two thirds of the net judgment after expenses if they win.

Lawyers handling the case did not respond to requests for comment.

In addition to the cost of health care and health monitoring, the suit seeks compensation for the loss of property values in the rural area -- something that would allow affected residents there, if nothing else, to leave.

“I don’t think we’ve asked for the moon here,” said Victoria Switzer, a Dimock resident who is party to the suit. “I mean, Norma just wanted water, for goodness’ sake. The compensation, if it were enough to know that we could go away, that’s all I want.”

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [9].

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Tags: Cabot Oil and Gas, Dimock, Drilling, Horizontal Drilling, Hydraulic Fracturing, Marcellus Shale, Methane, Natural Gas, Pennsylvania, Water, Water Contamination

Underused Drilling Practices Could Avoid Pollution

by Abrahm Lustgarten, ProPublica - December 14, 2009 12:00 am EST

Versions of this story were published in the Albany Times Union [1] *and the* Times Herald-Record [2].

Abrahm Lustgarten/ProPublica

As environmental concerns threaten to derail natural gas drilling projects across the country, the energy industry has developed innovative ways to make it easier to exploit the nation's reserves without polluting air and drinking water.

Energy companies have figured out how to drill wells with fewer toxic chemicals, enclose wastewater so it can't contaminate streams and groundwater, and sharply curb emissions from everything from truck traffic to leaky gas well valves. Some of their techniques also make good business sense because they boost productivity and ultimately save the industry money -- $10,000 per well in some cases.

Yet these environmental safeguards are used only intermittently in the 32 states [3] where natural gas is drilled. The energy industry is exempted from many federal environmental laws, so regulation of this growing industry is left almost entirely to the states, which often recommend, but seldom mandate the use of these techniques. In one Wyoming gas field, for instance, drillers have taken steps to curb emissions, while 100 miles away in the same state, they have not.

The debate over the safety of natural gas drilling has intensified in the past year, even as the nation increasingly turns to cleaner-burning natural gas as an alternative to oil and coal. In Congress, one group of politicians is writing a climate bill that would encourage the use of more natural gas, while

another group is pushing a bill that would put a key part of the process under federal regulation and force the disclosure of chemicals used in the drilling process. Neither bill addresses the question of how to encourage energy companies to use existing techniques that lower the risks of environmental damage.

Interviews with state officials and industry executives in states across the country show the industry tends to use these environmental safeguards only when political, regulatory, cost or social pressures force it to do so.

When states have tried to toughen regulations aimed at protecting the environment or institutionalizing these practices, energy companies have fought hard to defend the status quo. They argue that current laws are sufficient, that mandating practices imposes specific solutions on regions where they may not work best, and that the cost of complying with additional laws and safeguards would bankrupt them.

“Sometimes environmental considerations aren’t the same as the public considerations, and many times the economic considerations don’t fit,” said David Burnett, an associate research scientist at Texas A&M University’s Global Petroleum Research Institute and a founder of Environmentally Friendly Drilling, a government and industry-funded program that identifies best practices and encourages their use. “There could be better management practices used. We have to find a balance.”

Michael Freeman, an attorney at the environmental group Earthjustice, says there is no escaping some damage from drilling. But if the best available precautions were routinely followed, environmental harm could be minimized and the industry may face less resistance from the public as it taps the vast new gas deposits that have been discovered in recent years.

“It would certainly address a lot of people’s concerns,” Freeman said. “But the government agencies that regulate the oil and gas industry need to be aggressive about making them clean up their act.”

Good Chemistry

Few notions have sparked more hope among environmentalists than the possibility of replacing toxic chemicals used in drilling with what are being called “green” or non-toxic drilling fluids.

A review of scientific documents and interviews with drilling companies and the chemists who supply them shows that the transition is more than theoretical. It’s starting to happen.

EnCana, a Canadian company that operates on both sides of the border, recently said it stopped using 2-Butoxyethanol, a solvent that has caused reproductive problems in animals. BJ Services, one of the largest fracturing service providers in the world, has discontinued the use of fluorocarbons, a family of compounds that are persistent environmental pollutants.

Neither company would say what it is using to replace these chemicals. But a presentation made by Denver-based Antero Resources and obtained by ProPublica says that plant-based oils are occasionally replacing mineral oil and that soy can replace some toxic polymers. David Holcomb, director of research for the Texas-based drilling chemistry company Frac Tech, offered more

specifics: He uses orange citrus to replace some solvents, and palm oil in place of a common slicking agent that has been prohibited in Europe but is still allowed in the United States.

The “single biggest move” the industry has made to reduce the toxicity of its fluids, according to David Dunlap, chief operating officer for BJ Services, is phasing out diesel fuel, a solvent that contains the potent carcinogen benzene.

Diesel was once a common solvent used in hydraulic fracturing [4], the process where water, sand and chemical additives are pumped underground at high pressure to break apart rock and release gas. In some fracturing jobs -- like those in the Marcellus Shale in Pennsylvania and New York -- more than 40,000 gallons of fracturing chemicals can be used at a single well.

Today, many companies have replaced diesel with mineral oil, a less toxic hydrocarbon solvent, in most of their fracturing solutions. The shift began in 2003, after the EPA pressed the nation’s dominant fracturing companies to voluntarily eliminate diesel from some of their fluids.

“It sounds like a simple thing, but it’s the largest single volume other than water that is used in a frack job,” said Dunlap, whose company is being acquired by Baker Hughes, the international drilling company. BJ no longer uses diesel in its fracturing fluids, Dunlap said, though it may still be used in other applications.

Despite these improvements, it is still difficult to say how safe the drilling and fracturing fluids are for people, and for the environment. The EPA says “green” chemistry should not be dangerously toxic and should not build up in plants or organisms. But because there are no laws that dictate what chemicals can be used for drilling on U.S. soil -- and because most companies still keep the exact makeup of their fluids a secret from state and federal regulators -- the definition of “green” remains subjective. “Green” is often shades of gray.

New York’s Department of Environmental Conservation raised the “green” issue in its new environmental review for drilling in the Marcellus Shale. The report said that while non-toxic fracturing fluids would be preferable, “it may not be feasible to require the use of ‘green’ chemicals because presently there is no metric or chemicals approvals process in place in the U.S.”

Actually, such standards do exist, but only for the fracturing fluids used in offshore drilling. Both European law and the regulations of the U.S. Minerals and Management Services dictate that chemicals used in the North Sea and the Gulf of Mexico must be safe enough that they won’t kill fish and other organisms if they are dumped overboard.

“You can always do it,” said BJ Services’ Dunlap, whose company has been a leader in innovating sustainable materials. But, Dunlap said, the chemistry costs more, and is justifiable to his shareholders only because the regulations for offshore drilling left no choice.

“There are places around the world where the type of adherence is not required,” he said, “and where the cost of using those chemicals is something operators are not required to pay for.”

A Breath of Air

The natural gas industry has also found ways to reduce the greenhouses gases and volatile organic compounds it contributes to ozone pollution and climate change.

Although natural gas burns cleaner than other fossil fuels, the drilling and production of oil and gas is responsible for some 18 percent of the world's human-caused emissions of methane, a greenhouse gas that is the main component of natural gas, according to the Environmental Protection Agency. More methane is produced in the U.S. than anywhere else in the world except Russia.

Under the guidance of an EPA program, EnCana, the Canadian oil and gas giant, is curbing those methane emissions -- and might save money doing it. Using infrared cameras, the company finds and seals methane leaks on wells and pipelines that would otherwise be invisible, sharply curtailing levels of some the most dangerous heat-trapping atmospheric gases. According to Richard Haut, project director for the Houston Advanced Research Center, a partner on the Environmentally Friendly Drilling Project, such programs could pay for themselves within two years, and then turn a profit as the extra gas captured goes to market.

The industry has also found ways to reduce another set of dangerous emissions that has been blamed for air quality problems in Texas, Wyoming and Colorado, among other places: CO2 from trucks and processing plants and the ozone-causing volatile organic compounds. Last winter, when tests showed that high ozone levels had put sparsely populated Sublette County, Wyo., out of compliance with federal air quality laws normally applied to the nation's big cities, the industry took a number of straightforward steps to curb the pollution.

Questar Exploration and Production, a prominent Rocky Mountain drilling company, eliminated 62,000 truck delivery trips and the diesel exhaust that came with them by building a network of pipes to transport its fluids.

EnCana began using natural gas instead of diesel fuel to power its 150-foot-tall drilling rigs, a seemingly small change that resulted in 85 percent less volatile organic compounds being spewed into the air. EnCana also installed other, less polluting new equipment, including refinery-grade combustors.

Doug Hock, a spokesman for EnCana, said the company has spent some $25 million on such efforts since 2005.

"Technology is the key driver in all of this," Hock said. "It is important for policymakers to first understand the technology being used and secondly, allow operators the flexibility for further innovation to occur. This, rather than blanket mandates, will ensure continued reductions in impacts."

But the industry's efforts in Sublette County were triggered by an aggressive push by the federal government.

Before the U.S. Bureau of Land Management allowed more drilling in the Jonah Field, one of the gas development areas on public land in Sublette County, the companies had to agree to reduce their

emissions there. Companies understood that if they did not agree to the BLM's conditions in the Jonah Field they might not get more permits to drill in other parts of Sublette County. "There is kind of a big hammer hanging over their heads," said Chuck Otto, the BLM field manager there.

Dirty Water

One of the most challenging environmental problems associated with drilling is disposing of its wastewater, which is typically laced with heavy metals, chemicals and hydrocarbons. Usually the waste is collected in open, dirt-brimmed waste pits where it sits until it's hauled off to treatment facilities or injection wells. In the meantime, the fluids can evaporate or seep into the earth, or overflow if rain or snow overfills the pit.

A 1992 congressional report found that one of "the greatest opportunities" to prevent this type of pollution is something called a closed loop system, a series of pipes that gathers the waste as it comes out of a gas well, separates some of the water for reuse, and confines the concentrated leftovers in a steel tank. According to EPA findings quoted in the report, closed loop systems can reduce the volume of drilling fluids -- and the chemicals used -- by more than 90 percent. Because the waste is enclosed, chemicals can't evaporate, fluids are less likely to spill and permanent pits aren't needed.

Closed loop systems are rarely required in state regulations, but they are increasingly used, in part because they can save money for the companies that use them.

A 2001 case study by the Texas Railroad Commission, which regulates gas drilling in Texas, focused on a small gas producer that tested such a system. Building the pipes and tanks cost the company more initially, according to the report, but the company -- which it did not name -- didn't have to construct a waste pit, remediate the land when it finished drilling, haul its toxic materials to a disposal site or pay the slew of environmental fees levied by the state. According to the Railroad Commission, the company saved at least $10,000 for each gas well that was connected to the closed loop system. At that rate, the savings from the use of such a system on all the roughly 4,500 wells in Sublette County could tally $45 million.

Yet the industry continues to fight laws that would lead to increased use of closed loop systems.

In 2008 New Mexico Gov. Bill Richardson's administration passed some of the nation's strongest rules prohibiting the use of unlined waste pits and thereby encouraging the use of a closed-loop system as an alternative. The regulation was inspired by a study that found that leaks or seepage from waste pits had contaminated water supplies in some 400 cases.

The industry mounted a public relations, lobbying, and legal war to stop the law, claiming that it would weigh down business with excessive costs that would ultimately result in lost jobs. In early 2009, Richardson relented and directed his administration to relax several of the rule's requirements and timelines.

What Spurs Change?

When change does happen, it is usually foisted on the industry by excessive costs, fear of catastrophe, or regulations.

Chesapeake Energy began a pilot program to recycle wastewater from its Texas wells after drought and aquifer depletion threatened the industry's water supply there. The pressure to reuse rather than dispose of wastewater also may have been increased by a series of earthquakes this year near Dallas. Researchers said the earthquakes may have been caused by the company's normal disposal process: injecting wastewater underground.

Drillers in the Marcellus Shale in Pennsylvania speeded up their search for new water recycling technologies last year, after Pennsylvania's Department of Environmental Protection sharply limited treatment plants from accepting large quantities of drilling waste. Range Resources now recycles much of the wastewater from its Pennsylvania wells. "In the long term the biggest problem is going to be wastewater treatment," said spokesman Matt Pitzarella. "And we have to figure out how to deal with it."

Asked why his company pursued "green" drilling and fracturing fluid innovations for drilling in the North Sea -- products that it now sometimes uses onshore too -- BJ Services' Dunlap was unequivocal: The law made him do it.

"It's because of local regulations," Dunlap said. "That's typically what drives us to develop and bring to market these environmentally friendly products."

But given the choice, energy companies prefer that they, rather than government regulators, decide when, where or whether to use the environmentally friendly technologies they've developed. They oppose state-wide or regional mandates, arguing that a best practice may be less effective -- or less affordable -- in one place more than another. They also say that formal regulations can institutionalize technologies that may later be proved ineffective, or could be improved on.

"No matter what we do we are capitalists here in the U.S.," said Richard Haut, the Houston Advanced Research Center project director. "We do have to look for a balance between environmental issues and development."

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Tags: Drilling, Hydraulic Fracturing, Natural Gas, Waste Pits, Water

Colorado Towns Take Extra Measures to Protect Their Water From Gas Drilling

by Abrahm Lustgarten, ProPublica - December 15, 2009 4:08 pm EST

Abrahm Lustgarten/ProPublica

In 2005 the U.S. Bureau of Land Management offered up thousands of acres of federal land in Colorado to drilling. Because the land was in the heart of an area that supplies drinking water to 55,000 people in the western part of the state, the plan drew stong opposition from local communities.

The concerns they raised -- that the disruption and chemicals used in drilling might ruin their water [1] -- foreshadowed similar concerns that have since rippled across the country as drilling operations expand from Wyoming to New York [2]. And their solution may be a lesson that ripples to those communities as well.

The communities -- the city of Grand Junction and the neighboring town of Palisade -- began by making their concerns clear: drilling is important, but protecting the water supply is paramount.

“Our feeling all along was that you shouldn’t drill in our watershed. It’s the last resort,” said Tim Sarmo, the town manager for Palisade, who, together with the city of Grand Junction, fought the development. “Shouldn’t someone say these are areas of higher priority, greater vulnerability?”

Their concerns focused on the chemicals pumped underground by drillers in hydraulic fracturing [3] and then disposed of in the area’s dozens of open waste pits -- fears echoed in upstate New York, where the Marcellus Shale underlies the watershed supplying New York City’s 9 million residents, and in other parts of the country where gas is being drilled.

At first, Grand Junction and Palisade tried to buy the mineral rights themselves. In early 2006 they bid more than $300 an acre at auction -- eight times what gas companies were typically paying for mineral leases in that part of the state at the time -- but were outbid by Genesis Gas and Oil.

Then they tried a different tack: If drilling had to go forward, they wanted to define the terms, making sure the safest techniques would be used [4] to protect the quality of their water. In this case, they wanted measures more stringent than what state regulations required.

With BLM officials arbitrating -- the agency made a goodwill agreement a condition of the leasing and permitting process -- the municipalities and Genesis Gas and Oil spent the next two years negotiating a compromise that could now stand as a model for towns across the country.

The result is a 60-page Watershed Plan [5] (PDF) that dictates that Genesis will only use "green" hydraulic fracturing fluids, will reveal the chemical makeup of those fluids and will inject a tracer along with those fluids so any alleged contamination in the area can be quickly linked to its source.

Though the agreement has yet to be tested -- Genesis has not yet applied for permits to drill in the area -- local representatives found that there was more opportunity for them to steer oversight of drilling, and reach beyond what state regulations require, than they had thought.

Genesis Oil and Gas did not respond to requests for comment.

"There wasn't a lot of resistance," said Greg Trainor, the Grand Junction utilities director who sought the concessions from Genesis and says they put him at ease with the drilling. "It may not be a legally binding agreement, but it's a political agreement. It's a very good template."

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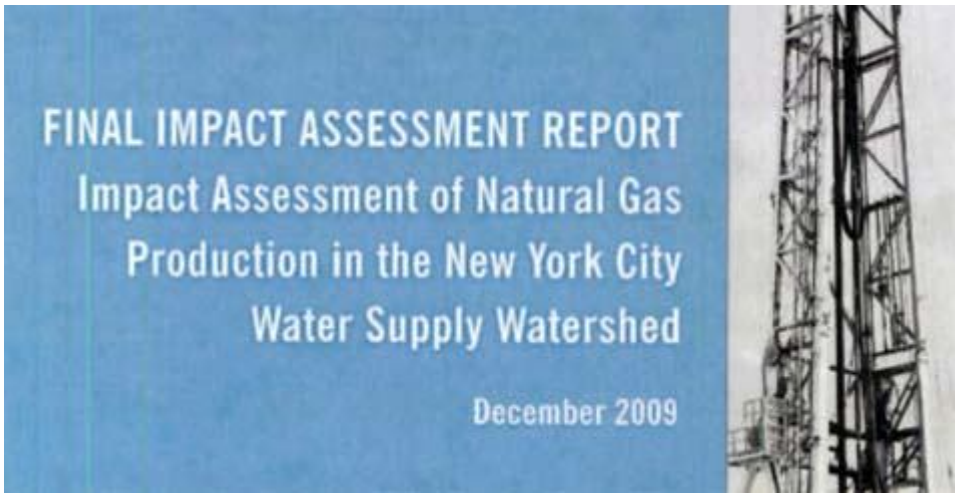
Tags: Colorado, Drilling, Genesis Gas and Oil, Hydraulic Fracturing, Marcellus Shale, Natural Gas, Water Contamination

New York City Calls for Drilling Ban in Watershed, Rejects State Study

by Joaquin Sapien and Abrahm Lustgarten and Christopher Flavelle, ProPublica - December 24, 2009 3:47 pm EST



After months of warning signs [1], New York City officials have called for a ban on natural gas drilling within the city's 2,000-square-mile upstate watershed and urged Albany to withdraw its controversial draft environmental review for drilling across the state.

The move follows the completion of a yearlong study [2] by a private consulting firm commissioned by the city, which found that "gas drilling poses unacceptable risks to the unfiltered drinking water supply for nine million New Yorkers." It sets up a confrontation between the city, which says any degradation of its unfiltered water supply could cost upwards of $10 billion to fix, and Gov. David Paterson, who has said the drilling would be an important part of the state's economic recovery.

The city announced its position following the release of a consultant's report [2], commissioned by city's Department of Environmental Protection, which found that the chemicals injected into the ground as part of the drilling process known as hydraulic fracturing could make their way to groundwater and contaminate water reservoirs. It cautioned that the wastewater produced from the process posed a similar risk.

Gas development, the report said, could mean 6,000 wells drilled in the watershed and brings a "risk of exposing watershed residents and potentially NYC residents to chronic low levels of toxic chemicals."

The report also found that the fracturing process, which happens under very high pressure, could spread subsurface contamination and alter the natural flow of deep groundwater. It raised concerns that the disruption from the process could damage the tunnels that bring drinking water to the five boroughs.

The city's investigation as well as a statewide environmental review follow a lengthy investigation [3] by ProPublica, which found that state environment officials may not be prepared to handle [4] the effects of the drilling, and raised early questions about how drilling development could impact New York City's water supply.

Mayor Michael Bloomberg had declined to take a firm stance [5] on the issue until the report was completed, but has now submitted the city's comments to the state Department of Environmental Conservation in time to meet Albany's Dec. 31 deadline for public review of the drilling plan.

"The mayor very clearly said that if our analysis were to determine that [drilling] should be prohibited – and now it has – we would fight it," said Marc LaVorgna, a spokesman for Bloomberg. "It's clear that it's a risk that cannot be taken and drilling cannot be permitted."

At a press conference held yesterday, Gov. Paterson said that his office was aware of the mayor's position, and that his comments would be considered during public comment period for the state's draft environmental review [6] on drilling released in September. The public comment period was extended [7] from November to the end of December in response to uproar from environmentalists, politicians and concerned residents, and to allow New York City the time to complete its review.

"This is the time when the public, the mayor and any other advocate can try to persuade us that this decision needs to be reversed," said Paterson.

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Tags: Drilling, Hydraulic Fracturing, Natural Gas, New York

In New Gas Wells, More Drilling Chemicals Remain Underground

by Abrahm Lustgarten, ProPublica - December 27, 2009 8:12 am EST

This story was co-published with Politico [1].

A hydraulic fracturing operation in Bradford County, Pa. It's possible that for each modern gas well drilled in the Marcellus and places like it, more than three million gallons of chemically tainted wastewater could be left in the ground forever.(Photo courtesy of the New York State Environmental Impact Statement)

For more than a decade the energy industry has steadfastly argued before courts, Congress and the public that the federal law protecting drinking water should not be applied to hydraulic fracturing [2], the industrial process that is essential to extracting the nation's vast natural gas reserves. In 2005 Congress, persuaded, passed a law prohibiting such regulation.

Now an important part of that argument -- that most of the millions of gallons of toxic chemicals that drillers inject underground are removed for safe disposal, and are not permanently discarded inside the earth -- does not apply to drilling in many of the nation's booming new gas fields.

Three company spokesmen and a regulatory official said in separate interviews with ProPublica that as much as 85 percent of the fluids used during hydraulic fracturing is being left underground after wells are drilled in the Marcellus Shale, the massive gas deposit that stretches from New York to Tennessee.

That means that for each modern gas well drilled in the Marcellus and places like it, more than 3 million gallons of chemically tainted wastewater could be left in the ground forever. Drilling companies say that chemicals make up less than 1 percent of that fluid. But by volume, those chemicals alone still amount to 34,000 gallons in a typical well.

These disclosures raise new questions about why the Safe Drinking Water Act, the federal law that regulates fluids injected underground so they don't contaminate drinking water aquifers, should not

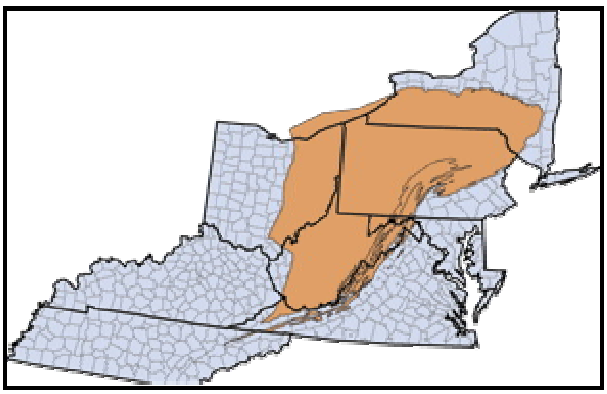
apply to hydraulic fracturing, and whether the thinking behind Congress' 2005 vote to shield drilling from regulation is still valid.

When lawmakers approved that exemption, it was generally accepted that only about 30 percent of the fluids stayed in the ground. At the time, fracturing was also used in far fewer wells than it is today and required far less fluid. Ninety percent of the nation's wells now rely on the process, which is widely credited for making it financially feasible to tap into the Marcellus Shale and other new gas deposits.

Congress is considering a bill that would repeal the exemption, and has directed the Environmental Protection Agency to undertake a fresh study of how hydraulic fracturing may affect drinking water supplies. But the government faces stiff pressure from the energy industry [3] to maintain the status quo -- in which gas drilling is regulated state by state -- as companies race to exploit the nation's vast shale deposits and meet the growing demand for cleaner fuel. Just this month, Exxon announced it would spend some $31 billion to buy XTO Energy, a company that controls substantial gas reserves in the Marcellus -- but only on the condition that Congress doesn't enact laws on fracturing that make drilling "commercially impracticable."

The realization that most of the chemicals and fluids injected underground remain there could stoke the debate further, especially since it contradicts the industry's long-standing message that only a small proportion of the fluids is left behind at most wells.

But while the message has not changed, the drilling has.



The Marcellus Shale, denoted in brown, primarily cuts across large swaths of New York, Pennsylvania, Ohio and West Virginia. (Map by Jennifer LaFleur/ProPublica)

In the nation's largest and most important natural gas fields, far more chemicals are being used today than when Congress and the EPA last visited the fracturing issue, and far more of those fluids are remaining underground. Drilling companies say that as they've drilled in the Marcellus they've discovered that the shale rock -- which is similar to many of the nation's largest natural gas projects in Louisiana, Texas and several other states -- holds more fluids than they expected.

During hydraulic fracturing, drillers use combinations of some of the 260 chemical additives associated with the process, plus large amounts of water and sand, to break rock and release gas. Benzene and formaldehyde, both known carcinogens, are among the substances that are commonly found.

If another industry proposed injecting chemicals -- or even salt water -- underground for disposal, the EPA would require it to conduct a geological study to make sure the ground could hold those fluids without leaking and to follow construction standards when building the well. In some cases the EPA would also establish a monitoring system to track what happened as the well aged.

But because hydraulic fracturing is exempt from the Safe Drinking Water Act, it doesn't necessarily have to conform to these federal standards. Instead, oversight of the drilling chemicals and the injection process has been left solely to the states, some of which regulate parts of the process while others do not.

As the industry was lobbying Congress for that exemption -- and ever since -- the notion that most fluids would not be left underground continued to emerge as a recurring theme put forth by everyone from attorneys for Halliburton, which developed the fracturing process and is one of the leading drilling service companies, to government researchers and regulators.

"Hydraulic fracturing is fundamentally different," wrote Mike Paque, director of the Ground Water Protection Council, an association of state oil and gas regulators, to Senate staff in a 2002 letter advocating for the exemption, "because it is part of the well completion process, does not 'dispose of fluids' and is of short duration, with most of the fluids being immediately recovered."

In May, ProPublica heard a similar explanation from the industry-funded American Petroleum Institute.

"Hydraulic fracturing operations are something that are done from 24 hours to a couple of days versus a program where you are injecting products into the ground and they are intended to be sequestered for time into the future," said Stephanie Meadows, a senior API policy analyst who has been closely involved in fracturing legislation issues. "I don't see the benefit of trying to take that sort of sequestration type activity and applying it to something that is temporary in time."

Asked how much fracturing fluid can remain underground, and whether it could be as high as 30 percent, the figure that was still being included in government reports earlier this year, Meadows said: "I guess I didn't know that the statistics are that high."

Neither the American Petroleum Institute nor the Ground Water Protection Council responded to requests for further comment.

EPA officials maintained in 2005, and say now, that the volume of fluids left underground had little to do with its opinion that hydraulic fracturing for gas wells is not the same as underground injection. They say that distinction is because the primary function of the two types of wells is different: Gas wells are for production processes, while most EPA-regulated underground injection wells are intended for storage.

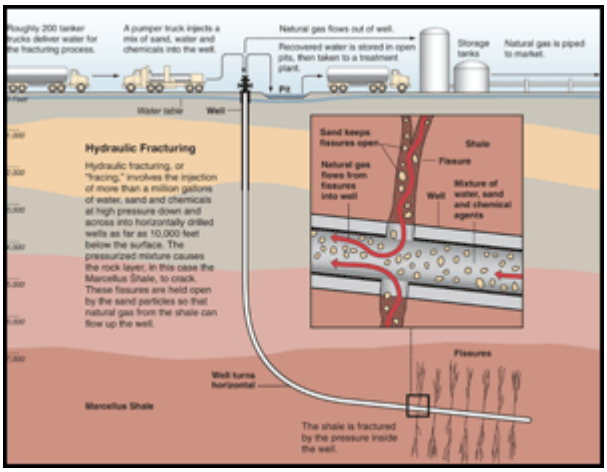
But Stephen Heare, director of the EPA's Drinking Water Protection Division in Washington, said that both the circumstances and the drilling technology have evolved. When asked to explain how hydraulic fracturing today is different from other forms of underground injection, he said the bottom line was simple.

"If you are emplacing fluid, it does not matter whether you are recovering 30 percent or 65 percent of it, if you are emplacing fluids, that is underground injection," Heare said. "The simple explanation for why hydraulic fracturing is different from other injection activities," he added, is that hydraulic fracturing "is exempt from regulation under the Safe Drinking Water Act."

*

The argument that fracturing should not be regulated by the EPA became prominent in the 1990s, after the EPA said that fracturing lay outside the scope of the Safe Drinking Water Act, because the primary purpose of gas wells was energy production, not fluid disposal.

A 1997 Alabama lawsuit challenged that position, and the 11th Circuit Court of Appeals ruled against the EPA.



What is hydraulic fracturing? Click here to see it explained. (Graphic by Al Granberg)

[2] In that decision, the judges wrote that "According to the state agency, hydraulic fracturing is not underground injection because it does not result in permanent subsurface 'emplacement' of the fluids, as these fluids are pumped out of the ground before methane gas is extracted out of the well." But the judges called that assertion "untenable" and ordered the EPA to regulate fracturing in Alabama under the Safe Drinking Water Act. They also ordered the EPA to more clearly define fracturing as a type of underground injection, a move that could have paved the way for regulation in other states as well.

But in 2005, before such regulation could happen, Congress stepped in and gave hydraulic fracturing its special exemption from the Safe Drinking Water Act.

When Congress voted for the exemption, it referred to a 2004 EPA report, which concluded that fracturing did not pose a threat to drinking water. That report, which has since been criticized as incomplete, said that while some of the fracturing fluids remained underground, "Most of the fracturing fluids injected into the formation are pumped back out of the well along with groundwater and methane gas."

Lee Fuller, vice president of government affairs for the Independent Petroleum Association of America, said that the emphasis on wastewater removal was made to help legislators understand how fracturing was different from underground injection, but that those legislators also knew that much of the water stayed underground when they voted for the exemption.

"The EPA study said there was a certain amount of the water that does stay in the fractured formation. That information was known," he said, adding that more of the water may seep out over the life span of the well. "So I think there was an understanding of it on the part of the proponents of the proposal."

In the 2004 report, the EPA said as much as 59 percent of fracturing fluids can remain underground. A 2009 Department of Energy report titled Modern Shale Gas put that figure at 30 to 70 percent, but emphasized that most wells fall into the lower end of that range, explaining that "the majority of fracturing fluid is recovered in a matter of several hours to a couple of weeks."

Just six months ago that point was reiterated in testimony before the House Committee on Natural Resources, when the Interstate Oil and Gas Compact Commission repeated a statement that former Alabama state geologist Donald Oltz made in the 1997 Alabama court case: "Almost all hydraulic fracturing fluid is recovered to the surface after a hydraulic fracturing operation."

*

That statement contrasts sharply with the latest reports from regions where gas drilling is on the upswing.

Spokesmen for Cabot Oil and Gas, Range Resources and Fortuna Energy -- three of the most active companies developing gas resources in the Marcellus Shale -- say that more water is trapped underground in newer drilling areas because the "tight shale" that is loath to give up the gas is likely to hold on to the fluids too.

"It's not like you pump a volume of water into the frack and then it gives you that volume back," said Ken Komoroski, a spokesman for Cabot Oil and Gas, who says only 15 to 20 percent of the fluid comes back out. "Most of the water and sand stays in the formation compared to in other geologic formations."

In Pennsylvania, where regulators had once predicted that drilling in the Marcellus would produce about 19 million gallons of wastewater per day, that estimate has been revised to just a fraction of that volume, largely because so much of the fluid is remaining underground.

Range Resources now reuses 100 percent of the wastewater it extracts from its Pennsylvania wells by diluting it with fresh water and using it to drill more wells, said spokesman Matt Pitzarella. Range has been able to do that, Pitzarella said, in part because it's extracting only 20 percent of the 4 million gallons it pumps underground for each of its wells.

Gas industry officials say the amount of fluids they leave behind in their wells should have no bearing on whether hydraulic fracturing is or is not regulated by the federal government. What's important is managing the risk, says the Independent Petroleum Association's Fuller, a job he says the industry is doing very well without additional oversight.

"You are wrapping yourself around a distinction of whether something should or should not be regulated under the Safe Drinking Water Act as opposed to whether something does or does not pose an environmental risk," said Fuller, who asserts that despite numerous reports of contamination in drilling areas, the fracturing process has never been conclusively proven to be the cause.

Regulation, Fuller said, "may shut down natural gas drilling for a long time, but it is not going to make the environment any better."

It will fall to Congress -- and then to the EPA -- to decide whether that is truly the case. Sponsors of the Frack Act [4] hope for a vote this spring. If it passes, and if the EPA finds reason to change the conclusions it reached in 2004, the agency would then have to decide exactly how fracturing will be addressed by the Safe Drinking Water Act.

“The thinking we did then, the study that we did then, we were really looking at a different set of circumstances,” said Heare, the EPA’s Drinking Water Protection Division director. “The agency has not investigated the impacts of hydraulic fracturing in other settings such as shale gas production and at this time is unable to quantify the potential threat.”

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Tags: Cabot Oil and Gas, EPA, Fortuna Energy, FRAC Act, Gas Wells, Hydraulic Fracturing, Independent Petroleum Association of America, Marcellus Shale, Natural Gas, Range Resources, Safe Drinking Water Act

Drilling Wastewater Disposal Options in N.Y. Report Have Problems of Their Own

by Joaquin Sapien and Sabrina Shankman, ProPublica - December 29, 2009 12:00 am EST

Dec. 29: This story has been updated [1] and clarified [2].

*A version of this story is being published by the [3]*Albany Times-Union [3].

The site of one of Canada-based Gastem USA's wells in Otsego County, N.Y. The well produced far less wastewater than most Marcellus Shale wells will, but it still took the drillers more than a year to get permission to drill it, because they couldn't find a place to dispose of the water. (Joaquin Sapien/ProPublica)

Environmentalists, state regulators and even energy companies agree that the problem most likely to slow natural gas drilling in the Marcellus Shale in New York is safely disposing of the billions of gallons of contaminated wastewater the industry will produce.

Between 1,500 and 2,500 wells per year could eventually be drilled into the huge natural gas reserve, state regulators say [4], although other estimates are far higher [5] (PDF). Each well will produce about 1.2 million gallons of wastewater that can contain chemicals introduced during the drilling process and dredged up from deep within the earth. Using the state's higher estimate, that means the industry will have to find a way to dispose of as much as 3 billion gallons a year, enough to fill 5,000 Olympic-sized swimming pools.

New York's Department of Environmental Conservation took a stab at addressing the wastewater problem in the draft environmental impact statement [6] (EIS) on gas drilling it released in September. The report said the DEC won't issue drilling permits until companies prove they can dispose of the water. The report also listed three disposal options [7]: Injecting it into underground storage wells, trucking it to specialized treatment plants in nearby states, or having it processed at sewage plants in New York.

But ProPublica has found that none of these methods are realistic.

- Of the 135 New York plants listed [8] in the report, only a tiny fraction can or will accept Marcellus Shale wastewater. ProPublica interviewed spokespeople for 109 of those plants and found that just three have any interest in accepting the water -- and only in small amounts. New York City's 14 treatment plants, whose operators declined to talk to ProPublica, are already running at capacity [9] -- and often over it -- which means they too are unlikely wastewater recipients.
- Of the 11 out-of-state plants [7] the DEC listed as options, nine can't take any more wastewater. Two declined to answer questions for this story.
- Of the six injection wells [10] (PDF) that operate in New York, only one is licensed to accept oil and gas wastewater. It's owned by Lenape Resources Inc., which uses it exclusively for wastewater from its own gas fields.

When asked why the report included options that aren't feasible, DEC officials said they weren't recommending the facilities, but were merely offering an inventory of possible disposal methods. Ultimately it is the responsibility of the energy companies -- not the regulators -- to solve the wastewater problem, they said.

"In the history of environmental regulation, I think there are many instances where environmental regulatory requirements have been a driver of technology, and this could be one of those instances," said Stuart Gruskin, the DEC's executive deputy commissioner.

Raoul LeBlanc, a senior financial analyst for the energy consulting firm PFC Energy, said the "theme of regulation outrunning capacity" is likely to be repeated in the development of the Marcellus.

"This probably means delays to the ambitious programs for developing this resource and getting it to Northeast consumers," LeBlanc said.

Gastem's contractors prepare to drill a vertical well into New York's Utica Shale. The gas well produced far less wastewater than a horizontal well drilled into the Marcellus Shale is expected to yield. (Joaquin Sapien/ProPublica)

The bottleneck of treatment options has already inspired Range Resources, one of the biggest natural gas producers in the Northeast, to develop technology that allows it to reuse all the wastewater it removes from its Pennsylvania wells. Range leaves about 80 percent of its wastewater in its wells. The 20 percent that is recovered is blended with fresh water and used to drill new wells.

"Six months ago recycling was not even considered a realistic option, but there are certain things you don't know until you try," said Matt Pitzarella, a spokesman for Range, which is among the companies expected to apply for drilling permits in New York.

Range and other energy companies are also working with Radisav Vidic, an environmental engineering professor at the University of Pittsburgh who has a $1.06 million grant from the U.S. Department of Energy to find new wastewater recycling techniques [11]. But Vidic says that reusing wastewater has its own limitations. It's working for Range, Vidic said, because most of the company's water stays underground and because its wells are spaced close together, so it's easy to truck the recovered wastewater from well to well.

DEC officials, government scientists and industry representatives all told ProPublica that until more sophisticated treatment solutions are developed, drilling in New York's portion of the Marcellus Shale will be off to a slow start.

"If no one is going to accept it, and the DEC follows the line in the EIS, then apparently drilling will be in hiatus until someone comes up with a way to treat it," said Bill Kappel, a hydrologist with the U.S. Geological Survey.

Wastewater Already a Problem in Pennsylvania

Wastewater disposal is especially critical in the Marcellus, because much of the gas there is buried a mile or more underground and the only way to get it out is through hydraulic fracturing [12], a process that uses large amounts of water mixed with chemicals to break layers of rock and release the gas. Instead of plunging vertically into the ground, as existing New York wells do, most Marcellus wells will be shifted horizontally once they reach the shale. This allows drillers to extract more gas from a broader area with fewer wells, but each horizontal well can create about a million gallons more wastewater than a vertical well.

When the water flows back out, it contains small amounts of the chemicals added to facilitate gas production, plus natural toxins dredged up from the earth, like benzene, which carries cancer risks. When the DEC tested 12 vertical wells in the Marcellus in 2008 and 2009, it found that the wastewater at 10 of them also contained a radioactive derivative of uranium at levels hundreds of times as high as the federal limit [13] for people to drink safely.

Drilling wastewater also contains high levels of total dissolved solids, or TDS, which includes minerals that can make it five times as salty as seawater [14] (PDF). TDS isn't considered particularly harmful to people [15] (PDF), but it can damage freshwater streams and affect the color, taste and odor of drinking water.

In Western states drillers usually dispose of their wastewater in injection wells that are designed for long-term storage and are regulated by the U.S. Environmental Protection Agency. But the geography in the Northeast makes it difficult and costly to drill injection wells. There are only six such wells in New York, although Chesapeake Energy Corp. is filing an application [16] (PDF) for another one.

Trucks like this one, owned by Barber & Deline, carry gas wastewater across the state to sewage plants and other water disposal facilities. (Joaquin Sapien/ProPublica)

Instead, most drilling wastewater in the Northeast is processed through municipal and industrial treatment plants that aren't equipped to remove TDS, radium or any chemicals it contains. The water is then discharged into nearby streams and rivers.

High TDS levels have already caused problems [17] for drinking water in Pennsylvania, where Marcellus Shale gas drilling accelerated in the spring of 2008. Much of Pennsylvania's wastewater was originally sent to municipal sewage treatment plants along the Monongahela River, a drinking water source for 250,000 people. TDS levels in the river were already high because of leakage from abandoned mines and other industrial waste, but after drilling wastewater was released into the river, TDS skyrocketed. Pennsylvania's Department of Environmental Protection is holding public hearings on new regulations [18] (PDF) that would dramatically reduce the amount of TDS that can be discharged into waterways after Jan. 1, 2011.

New York's municipal and industrial treatment plants are also unequipped to remove TDS, which is one reason so many plant operators say they don't want to take the wastewater. Their biggest fear is that TDS or some other contaminant in the wastewater might kill the freshwater organisms that they use in their treatment process, leaving untreated sewage flowing into rivers and streams where they release their water.

Many of the New York plant operators ProPublica interviewed have refused requests from drillers to take the wastewater and were annoyed that the DEC put them on the list of possible disposal options. DEC spokesman Yancey Roy said the DEC had contacted most of the operators it listed -- but most of the operators interviewed by ProPublica said they hadn't spoken with the DEC about taking drilling wastewater.

Brian Rayburn, who oversees the municipal sewage plant in the village of Bloomfield, said his facility has already reached its 323,000-gallon-a-day capacity just serving the needs of his community. Ken Bray, who operates the city of Amsterdam's plant, said the DEC recommended in 2004 that the plant not take on any new types of waste until repairs were made. Those repairs aren't finished, so Bray was surprised to find his plant on the list.

DEC Also Short-Staffed

Katherine Nadeau, a water and natural resources associate for Environmental Advocates of New York, thinks the operators' concerns about drilling wastewater are well-founded.

Last year Nadeau studied the records of 32 New York sewage plants and found that many were discharging more pollutants [19] (PDF) than they are allowed to under state and federal laws and that some hadn't received a full compliance review from the DEC in decades. She thinks the DEC staff is stretched too thin to make sure New York's drinking water is protected from drilling.

James Tierney, the DEC's assistant commissioner of water resources, raised the staffing issue in testimony [20] (PDF) submitted to a New York State Senate committee in October, the day after the draft environmental review came out.

"Even before the current state and national fiscal crisis, the Division of Water faced significant cuts to both state and federal funding," said Tierney, whose department oversees the treatment plants

that accept drilling wastewater. “In 1990, the Division had 339 staff; today, the Division has 267 staff, and at least twice the workload.”

Wastewater a “Hot Potato”

Orville Cole, president of Gastem USA, a subsidiary of the Canadian-based natural gas company Gastem, spent more than a year trying to get permission to drill a well in Otsego County, N.Y. (Joaquin Sapien/ProPublica)

Although the recommendations in New York’s environmental impact statement haven’t been finalized yet, the DEC is already enforcing new wastewater disposal requirements, causing delays for some drillers.

Orville Cole spent more than a year searching for a plant that would take the wastewater from a well he was drilling in Otsego County for Gastem USA, a subsidiary of the Canadian-based natural gas company Gastem. The well is vertical, which means it will produce only about 35,000 gallons of wastewater, about 3 percent of the amount that will come from one of the horizontal wells planned for the Marcellus. Yet three different sewage treatment plants rejected Cole’s water, because they feared that the chemicals the water contained could damage their plants or foul the waterways they discharge into.

Finally a municipal sewage treatment plant in Watertown, a three-hour drive from Cole’s drilling site, agreed to take the wastewater. But still there were problems.

As the first five tanker loads of Cole’s wastewater were being pumped into the Watertown plant in September, the plant’s chief operator, Michael Sligar, noticed that it was turning dark and dirty.

Fearing that his plant might not be able to handle whatever was in the water, Sligar sent the last two tanker trucks back to Cole’s drill site, where they sat for two weeks while Sligar analyzed the contents. The DEC and Sligar eventually decided that the plant could safely accept the water. But Sligar said that’s no assurance that he’ll be able to treat future deliveries from Cole’s well, because the composition of a well’s wastewater can change, depending on how long it has been underground.

If Sligar ends up rejecting the wastewater, Cole would turn to the backup plan the DEC now requires all drillers to have. In Cole’s case that’s an underground storage well in Ohio, a 10-hour drive from his well.

Sligar calls the Marcellus Shale wastewater a “hot potato” and says he’s taking it only because he feels obligated to the state, which helps fund his plant.

“My peers don’t warmly embrace this entire challenge,” he said. “We would rather have this problem go away, but we don’t have that option.”

Update: A spokesman for New York City's Department of Environmental Protection got back to us and let us know that its 14 wastewater treatment plants won't accept wastewater from drilling in the Marcellus Shale. The spokesman said the city only accepts wastewater from within its jurisdiction, so applications to bring in wastewater from the Marcellus, which is upstate, would be turned down.

Clarification: This post originally said that state regulators said that at least 2,500 wells per year could eventually be drilled in New York's Marcellus Shale. Actually, their estimate ranged from 1,500 to 2,500 wells per year, although other estimates are far higher [5].

Write to Joaquin Sapien at joaquin.sapien@propublica.org [21].

Write to Sabrina Shankman at Sabrina.Shankman@propublica.org [22].

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Tags: Department of Environmental Conservation, Drilling, Gas Wells, Hydraulic Fracturing, Natural Gas, New York, Wastewater

State Oil and Gas Regulators Are Spread Too Thin to Do Their Jobs

by Abrahm Lustgarten, ProPublica - December 30, 2009 12:38 pm EST

This photo, taken Oct. 5, 2007, is of an underground injection disposal well site outside Fort Worth, Texas, that had passed the state's Railroad Commission's inspection eight days earlier. Sixty-one days later, inspectors returned after a resident complained of spilled oil, overflowing dikes and green-colored fluid in standing puddles. The well site was found to have several violations. (Photo courtesy of Sharon Wilson)

Larry Parrish knew something was wrong as soon as he wheeled his state-owned pickup off the West Virginia highway and onto the rocky field where the natural gas well was supposed to be. Oak trees 18 inches in diameter looked dead as boards, and brush as brown as kindling stretched across a piece of farmland the size of a football field.

The dead zone in this otherwise lush mountain country meant one thing to Parrish: Gas drillers had been illegally dumping briny water mixed with chemicals, and the waste had killed everything from the rusty well head all the way downhill into a creek. The worst part, Parrish said, was that the devastation could have been avoided if the West Virginia Department of Environmental Protection had had enough inspectors to make sure the state's growing number of gas wells were checked regularly.

"It was sad -- sickening," said Parrish, a former field inspector for the DEP's office of oil and gas. "It probably had been years since anybody had been out there."

West Virginia has added a handful of people to oversee its growing drilling industry since Parrish retired in 2006, but other than that not much has changed. For the state's 17 inspectors to visit West Virginia's 55,222 wells once a year, they would have to inspect nine wells a day, every day of the year -- no weekends, no vacations.

"We are doing what we can do," said Gene Smith, a regulatory compliance manager for West Virginia. "But that still leaves thousands of wells that are not inspected yearly or even every decade."

Regulators in other states are equally overwhelmed as they try to keep tabs on the nation's nearly one million active oil and gas wells, a number that's likely to climb as the feverish growth in natural gas exploration continues.

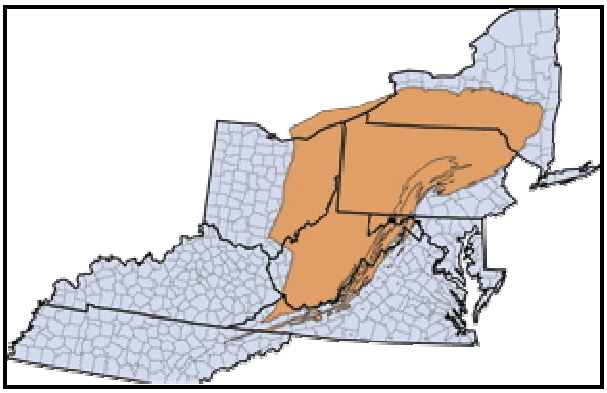
Search ProPublica's database [1] to find how many gas regulators work in your state.

A ProPublica investigation [1] comparing the rapid expansion of drilling in 22 states with staffing levels at the agencies charged with policing the wells found that the nation's capacity to enforce its environmental protections is weakening. The picture strikes at the heart of the industry's long-standing argument that state regulatory agencies will be more effective industry watchdogs than the federal government.

While the number of new oil and gas wells being drilled in the 22 states each year has jumped 45 percent since 2004, most of the states have added only a few regulators. Those with the widest gaps are Texas, which is already grappling with the most drilling, and New York, which is expected to soon have the fastest rate of growth.

As regulators' workloads have grown, enforcement actions -- the number of times violations were recorded and acted on -- have dropped in many states, often by more than half. That could mean companies are complying with the law -- or that inspectors aren't checking the wells.

“You just can’t do it, physically,” said Parrish, who received a $31,000 salary and said he was chronically overworked. “You’ve got to put out the hottest fires and there was a lot of stuff that slipped through the cracks because no one was looking.”



The Marcellus Shale, denoted in brown, primarily cuts across large swaths of New York, Pennsylvania, Ohio and West Virginia. (Map by Jennifer LaFleur/ProPublica)

The imbalance between drilling growth and regulatory staffing levels could become a crucial factor as lawmakers and the public weigh how much environmental damage to expect in exchange for the benefits brought by the drilling boom. Thanks in large part to advances in drilling technology, estimates for the amount of natural gas held underneath parts of the United States have increased by 35 percent since 2007 and are now believed to be plentiful enough to meet the nation’s needs for more than 100 years. As a result, drilling is expanding rapidly, including in the Marcellus Shale, the layer of rock that stretches from central New York, underneath West Virginia to Tennessee.

The boom, however, has brought complaints of water and air pollution. Modern gas drilling in particular has drawn scrutiny because it relies on hydraulic fracturing [2], a process that injects millions of gallons of chemically infused water underground and produces large volumes of waste. The industry has fended off efforts to establish stricter regulations in part with its argument that the current state oversight is effective.

What it takes to enforce regulations, and whether authorities have enough resources to get the job done, are questions that rarely enter the debate.

“Not having eyeballs on the ground is horrendous,” said Jim Baca, who served during the Clinton administration as director of the U.S. Bureau of Land Management, the federal agency that oversees more than 85,000 oil and gas wells on federal land. “If you don’t enforce the law, the industry will do whatever they think they can get away with.”

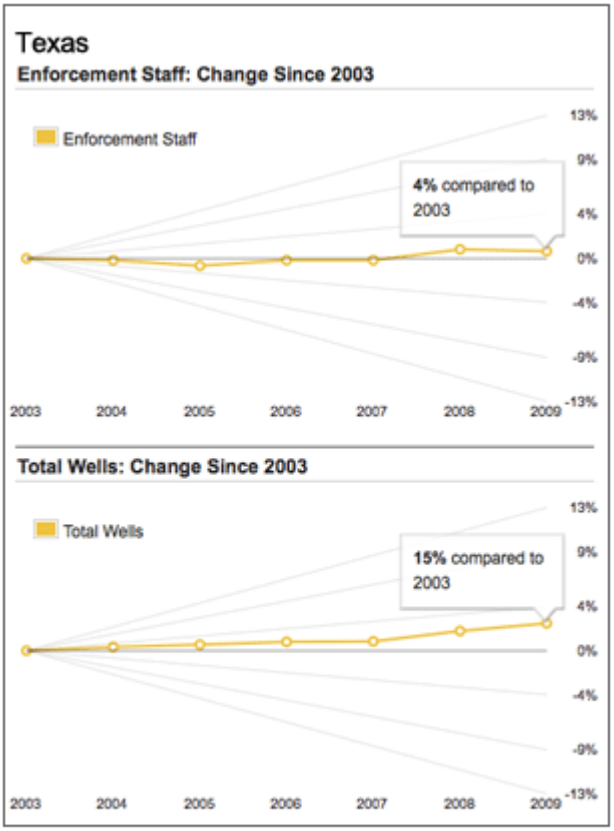
Spokesmen for state and federal regulatory agencies defend their effectiveness and caution that the picture is more nuanced than mathematical equations can convey. They say that they are working to improve efficiency in their departments and that the number of inspectors alone doesn’t always reflect enforcement because staffers can be shifted to meet urgent priorities. Employees might have capacity in their workload to absorb much of the growth in drilling that is taking place, they say.

“They may have to work a little harder,” said Stuart Gruskin, New York’s executive deputy commissioner for environmental conservation, about staffing in his state. “It’s like any other business. You can adjust from a management perspective how you utilize your resources until you reach the point where you are not doing a good enough job.”

The New York State public employees union disagrees. “Attempting to have them do even more with less is not possible,” it said this week in a statement calling for delaying the expansion of

drilling for at least a year because of, among other things, what it called understaffing at the Department of Environmental Conservation and other state agencies.

The Lone Star Record



Values on the right indicate the rate of growth compared to 2003. The gray lines represent a theoretical constant annual rate of change.

Source: State regulatory agency

Click to see our database of wells and inspection staff per state.

[1] No state has more drilling than Texas, which has 273,660 wells and just 106 regulators to oversee them.

As in most states, regulators for the Railroad Commission of Texas, the agency that is charged with oil and gas regulation, are kept busy by a broad range of responsibilities. They police gas wells, oil wells, waste injection wells, disposal pits, compressor stations and access roads. The wells can be spread across hundreds of miles, sometimes peppered throughout difficult-to-access terrain, with limited cell phone or computer access, heavy rains and rough roads requiring four-wheel drive.

Regulators also approve new permits -- and try to do it fast enough to not saddle the companies applying for them with extra costs. They visit new wells several times during construction and old wells before they are shut in, or sealed. They are obligated to quickly respond to all complaints, which can range from an unauthorized flaring of emissions or gases to a spill of hazardous fluids.

Eighty-three of Texas' regulatory staffers conduct field inspections, according to the commission, meaning each person is responsible for almost 3,300 wells, many of them requiring several visits in a year.

As in West Virginia, keeping up with the workload is nearly impossible.

"It's one of the worst-kept secrets around the state that the wells that are ostensibly checked once a year aren't," said Jeff Weems, a Houston attorney who specializes in the energy industry and is running for the top job at the Texas Railroad Commission. "They could double the number of inspectors and still be straining their staff to do their job."

This photo, taken Oct. 5, 2007, is of an underground injection disposal well site outside Fort Worth, Texas, that had passed the Railroad Commission's inspection eight days earlier. Inspectors returned about two months later after a resident complained of spilled oil, overflowing dikes and green-colored fluid. The well site was found to have several violations, including oil-stained soil as seen under the disposal pump, above in yellow. (Photo courtesy of Sharon Wilson)

In late 2007, a Texas state auditor's report [3] (PDF) examined the Railroad Commission's enforcement record and found that nearly half of the state's wells hadn't been inspected in the five years between 2001 and 2006, when the data was collected. (It also said regulators' routine acceptance of gifts from the companies they police raised questions about their objectivity and conflicts of interest, and the commission imposed a $50 limit on gifts as a result.)

In Texas, as in most states, regulators prioritize their work to make sure the most essential inspections get done. Complaints and spills top the list, along with new well construction.

But the Texas auditor's report found that 30 percent of all spills were inspected "either late or not at all."

"It is quite clear to management that inspecting 100 percent of these notices ... is not possible with current resources," the Railroad Commission wrote in its response to the audit. "To the extent resources become available in future legislative sessions, the Commission could witness more activities."

A spokeswoman for the commission said its workload decreased when drilling activity slowed in 2008, so the staffing situation has improved. She said the agency conducted 128,270 inspections in 2009, and visits every site it deems essential.

"Texas has maintained and will continue to maintain a strong enforcement effort for our environmental rules, regulations and policies," the spokeswoman, Stacie Fowler, said in an e-mail.

But the commission's Web site [4] also makes clear that facilitating energy production is a priority and the state won't slow drilling while inspections catch up. It advertises [4] the current waiting period for approval of new drilling permits: three days.

According to ProPublica's analysis [5], the number of new wells drilled each year in Texas has jumped 75 percent since 2003. However, staffing increased just 5 percent during that period and enforcement actions increased only 6 percent.

Records show that the Railroad Commission's budget for monitoring and inspections has decreased 10 percent since 2005. Fowler said the agency had requested more staffing from the state legislature at least three times in the last five years and been turned down every time.

From the industry's view, the paucity of enforcement staffing sometimes means it is up to the drilling companies to follow the rules as best they can.

"I never saw a Railroad Commissioner on one of the sites," said Dale Henry, a hydraulic fracturing expert who worked in Texas for the global services company Schlumberger for several decades. Henry said companies abided by the law whether regulators were there or not, but he also said the normal work schedule meant that they often avoided regulators. Inspectors worked 7 a.m. to 5 p.m. weekdays, and "all the work in the field is done by operators between 5 p.m. and 6 a.m. and on weekends."

A Schlumberger spokesman said that the company works closely with regulators and that it is the nature of the process to work through the night.

Even when regulators do inspect problematic sites, the oversight can be patchy.

In September 2007, a field inspector working in the Barnett Shale outside of Fort Worth made a routine stop at an underground injection disposal well site. His formal report [6] (PDF) found no problems and stated: "Well area clean."

This photo, taken Oct. 5, 2007, is of the underground injection disposal well site outside Fort Worth, Texas, that had passed the Railroad Commission's inspection on Sept. 27, 2007. On their second visit two months later, inspectors found several violations, including dikes that did not meet the facility's holding capacity. (Photo courtesy of Sharon Wilson)

Inspectors returned 61 days later after a resident complained of spilled oil, overflowing dikes and green-colored fluid in standing puddles. According to their report [7] (PDF), they found that "oil-stained soil" had seeped several inches into the ground around a large tank, that the "containment dike will not hold estimated capacity" and that standing rainwater had oil in it.

When asked about the discrepancy, Fowler, the Railroad Commission spokeswoman, said conditions can change at a site on a daily basis. But Fowler did not address perhaps the most remarkable finding in the inspectors' report [8] (PDF): State records showed that the well site was not being used, when in fact it was actively being injected with hazardous waste.

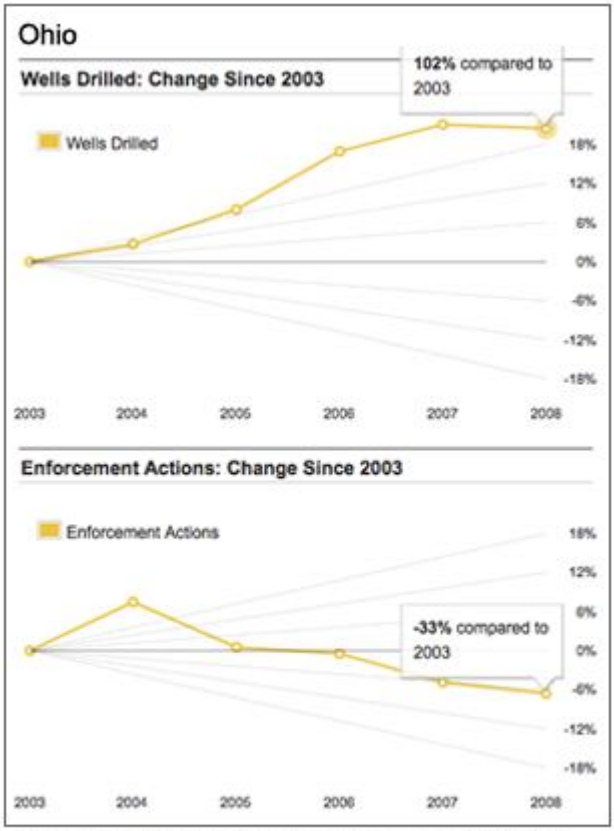
“We looked at some records and found that the well was never technically shut in,” said Charles Morris, the now-retired inspector who wrote the second report about the troubled well. “That happens all the time in the field, too. I hate to say it, but the commission, sometimes their record keeping is not what it should be.”

Part of a Pattern

Texas’ staffing challenges match a pattern across the states where drilling is most active.

The number of new wells drilled in West Virginia [9] increased 53 percent from 2003 to 2008. Since 2003 its regulatory staffing increased 20 percent. Enforcement actions, meanwhile, remained relatively constant, though they temporarily dropped by more than half during a peak in drilling in 2007.

North Dakota [10] saw a 987 percent increase in new wells drilled each year since 2003, but took 13 percent fewer enforcement actions, even though it added five regulators.



Values on the right indicate the rate of growth compared to 2003. The gray lines represent a theoretical constant annual rate of change.

Source: State regulatory agency

Click to see our database of wells and inspection staff per state.

[1] In Ohio [11], where the number of new wells drilled each year doubled between 2003 and 2008, four new staffers were hired but the number of formal actions dropped 33 percent.

Not every state saw a drop in enforcement actions.

In Pennsylvania [12], a state with intensive new Marcellus Shale drilling, state regulators doubled their enforcement staffing last year. Between 2003 and 2009 enforcement actions increased by 60 percent.

Of the 21 states that supplied data on their enforcement actions, five substantially increased those actions even as their staff-to-well ratio lagged. In Louisiana [13], for example, staffing was flat or falling until 2007, when more inspectors were hired and enforcement actions began shooting up. As a result, the state took almost twice as many enforcement actions between 2003 and 2008, even though the overall staff growth was just 3 percent and the number of new wells drilled annually more than doubled.

The federal government, which separately regulates a large proportion of the drilling on federal land in Western states, is also struggling to police its territory. It has seen a 31 percent increase in drilling since 2003.

A 2005 report [14] (PDF) from the U.S. Government Accountability Office said that the Bureau of Land Management's ability to meet its obligations had been lessened by intense growth, and that "staff had to devote increased time to processing drilling permits, leaving less time for mitigation activities, such as environmental inspections."

The agency has significantly expanded its staffing since then. But even so, a 2009 analysis of its enforcement activity by the Western Organization of Resource Councils, a group of environmental organizations, found that the agency issued fewer enforcement actions in 2007, the last year for which data was available, than it did in 1999.

The analysis, which focused on BLM enforcement and inspection in five Western states, found that BLM inspectors spent a third less time on environmental inspections and completed only 15 percent of the highest-priority inspections. In Farmington, N.M., for example, BLM inspectors completed just 82 of 1,257 high-priority inspections. In Buffalo, Wyo., they finished just 136 of 3,527 red-flag jobs, according to a federal database.

Signs point in all directions to drilling sites in Wyoming. (Abrahm Lustgarten/ProPublica)

"If you ask any BLM staff who has been dealing with the oil and gas industry, they admit they don't have the staff do deal with this. It hasn't been a priority," said Daniel Patterson, an Arizona state representative and southwest regional director for the group Public Employees for Environmental Responsibility, which works to convey confidential views of its government employee members. "It's pretty much up to the operator to decide if they are

going to operate legally or if they are going to cut corners that lead to more pollution. That's a problem."

State and federal regulatory officials say that there is no such thing as a proper ratio of enforcement actions to wells, and that there is no way to measure how effective informal warnings between inspectors and operators are as a deterrent. Such warnings are not recorded in regulators' statistics. They also say there are myriad ways to increase the effectiveness of their oversight, including investing in new technology that improves efficiency and writing stronger laws.

Colorado [15], which has seen a 149 percent increase in the number of wells drilled each year since 2003, is one state that has done both.

In 2006 the state hired several new inspectors and began computerizing its records and equipping field regulators with laptops full of everything from well histories to violations. In April the state instituted new drilling regulations that are widely seen as some of the toughest in the country.

"We now have more prescriptive rules and policies, which will help to prevent problems that could otherwise evolve into violations triggering the need for enforcement," said David Neslin, director of the Colorado Oil and Gas Conservation Commission.

Whether that is enough to do the job remains to be seen. One new hire is Chuck Browning, who came on eight months ago as a field inspector for the northwest part of the state and said the magnitude of the job can be overwhelming. With two other inspectors, Browning shares responsibility for some 25,000 wells. He bounces back and forth between the Utah and Wyoming borders, tallying 17,000 miles on his Trailblazer since March.

"I'm off in some far-flung remote area of the country side and there's thousands of wells around me," said Browning, a former geologist who has worked in the oil industry for 20 years. "I just pick my way out of the woods knocking them out as best I can."

Not long ago, Browning was wandering through the Rangely field -- an eight-mile wide swath of oil, gas and injection wells that stick up out of the brown arid plain of Northern Colorado like candles in a cake -- when he stumbled on an unmarked open pipe jutting out of the dirt. Gas fumes wavered six inches in the air and when Browning dropped a pebble into the hole, he heard a kurplunk as it struck liquid. Abandoned wells are supposed to be capped and dry -- but this one was about to overflow.

In his truck he fired up his laptop, accessing topographic maps, records and aerial photos of some 88,000 wells across the state, searching for this one. But it didn't appear anywhere.

"I still absolutely have no idea how many wells are up in Rangely. It's well over 1,000," he said. "This one is definitely a potential hazard."

It was the kind of puzzle that can take a day to sort through, and at least another day to bring in the equipment and crews to begin to take care of the abandoned well. It's a wild card that can play havoc with the 10-wells-per-day inspection schedule Browning and so many other regulators are forced to keep.

New York State

If Texas and Colorado -- the first- and eighth-ranked states in the country [16] for number of natural gas wells -- can provide a lesson, states like New York may have the most to learn.

New York, which sits atop the Marcellus Shale, has found itself at the epicenter of the nation's drilling boom and the epicenter of the debate over drilling's effect on the environment. The state's relatively small oil and gas division currently oversees some 13,684 wells, but it is under intense pressure from drilling companies, which would like to see thousands more wells drilled.

Chesapeake Energy, one of the nation's largest natural gas companies, has gobbled up more than a half a million acres of land leases in New York, and earlier this month Exxon said it would pay $31 billion for XTO Energy, a gas company that also holds extensive rights to drill in Pennsylvania and West Virginia's Marcellus Shale.

The site of one of Canada-based Gastem USA's wells in Otsego County, N.Y. (Joaquin Sapien/ProPublica)

The state has delayed that development, however, to study the environmental consequences of hydraulic fracturing and investigate a chorus of objections from people who fear that drilling will contaminate drinking water. Just last week New York City called for a ban [17] on drilling inside its watershed, citing a consultant's report that said it could jeopardize the drinking water for nine million residents.

At the same time, however, Gov. David Paterson, reeling from one of the worst state financial shortfalls in the nation, has made gas development a cornerstone of his draft energy plan.

New York regulators say that they have a better environmental record than most states when it comes to regulating oil and gas, and that a suite of proposed rules will put the state's drilling laws on par with Colorado's. Yet New York [18] is the only state examined by ProPublica that has cut its regulatory staffing in recent years. Since 2003 New York's Department of Environmental Conservation has reduced its oil and gas division field inspector staffing by 20 percent (its overall enforcement-related staff, when including management and office positions, dropped 10 percent), stoking concerns that when the drilling kicks into high gear, the state will suffer the same sort of problems that have plagued West Virginia and Texas.

Gruskin, the New York DEC's executive deputy commissioner, says that the agency is committed to good oversight and that energy companies that want to drill in New York will simply have to adapt to the agency's pace.

"It's going to go slow. Very slow," he said. "If we only have a certain number of inspectors available in that region, people are going to have to wait until they are available. And that's just reality, that's the way it's going to be."

But Gruskin's promise not to let drilling outpace his headcount doesn't match the recent past. Even as the regulatory staffing was being reduced, the DEC allowed a 676 percent increase in new wells drilled each year, a statistic that makes New York one of the fastest-growing drilling states in the nation. Meanwhile, the state's 16 field inspectors took only three more enforcement actions against drilling companies in 2008 than they did in 2003.

If the flat enforcement statistics were a problem, Gruskin said, the number of spills and environmental problems would have gone up -- something he points out hasn't happened.

And unless it does, the state appears content to play chicken.

"I don't think the industry believes that our resources have become so thin that they are not going to get caught." Gruskin said. "There are a lot of eyes on what is going on."

ProPublica reporter Sabrina Shankman contributed to this report. So did ProPublica's director of research Lisa Schwartz and researcher Kitty Bennett.

Write to Abrahm Lustgarten at Abrahm.Lustgarten@propublica.org [19].

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Tags: Drilling, Gas Wells, Hydraulic Fracturing, Natural Gas, Oil Drilling

Natural Gas Drilling: What We Don't Know

by Abrahm Lustgarten, ProPublica - December 31, 2009 2:48 pm EST

It takes brute force to wrest natural gas from the earth. Millions of gallons of chemical-laden water mixed with sand -- under enough pressure to peel paint from a car -- are pumped into the ground, pulverizing a layer of rock that holds billions of small bubbles of gas.

The chemicals transform the fluid into a frictionless mass that works its way deep into the earth, prying open tiny cracks that can extend thousands of feet. The particles of sand or silicon wedge inside those cracks, holding the earth open just enough to allow the gas to slip by.

Gas drilling is often portrayed as the ultimate win-win in an era of hard choices: a new, 100-year supply of cleaner-burning fuel, a risk-free solution to the nation's dependence on foreign energy. In the next 10 years, the United States will use the fracturing technology to drill hundreds of thousands of new wells astride cities, rivers and watersheds. Cash-strapped state governments are pining for the revenue and the much-needed jobs that drilling is expected to bring to poor, rural areas.

Drilling companies assert that the destructive forces unleashed by the fracturing process, including the sometimes toxic chemicals that keep the liquid flowing, remain safely sealed as much as a mile or more beneath the earth, far below drinking water sources and the rest of the natural environment.

More than a year of investigation by ProPublica [1], however, shows that the issues are far less settled than the industry contends, and that hidden environmental costs could cut deeply into the anticipated benefits.

The technique used to extract the gas, known as hydraulic fracturing [2], has not received the same scientific scrutiny as the processes used for many other energy sources.

For example, it remains unclear how far the tiny fissures that radiate through the bedrock from hydraulic fracturing might reach, or whether they can connect underground passageways or open cracks into groundwater aquifers that could allow the chemical solution to escape into drinking water. It is not certain that the chemicals – some, such as benzene, that are known to cause cancer – are adequately contained by either the well structure beneath the earth or by the people, pipelines and trucks that handle it on the surface. And it is unclear how the voluminous waste the process creates can be disposed of safely [3].

"This is a field where there is almost no research," said Geoffrey Thyne, a former professor at the Colorado School of Mines and an environmental engineering consultant for local government officials in Colorado. "It is very much an emerging problem."

The lack of scientific certainty about hydraulic fracturing can be traced in part to the drilling industry's success in persuading Congress to leave regulation of the process to the states, which often lack manpower and funding to do complex studies of underground geology. As a consequence, regulations vary wildly across the country and many basic questions remain unanswered.

ProPublica has uncovered more than a thousand reports [4] of water contamination from drilling across the country, some from surface spills and some from seepage underground. In many instances the water is contaminated with compounds found in the fluids used in hydraulic fracturing. ProPublica also found dozens of homes in Ohio, Pennsylvania and Colorado [5] in which gas from drilling had migrated through underground cracks into basements or wells.

But most of these problems have been blamed on peripheral problems that could be associated with hydraulic fracturing – like well failures or leaks – without a rigorous investigation of the entire process.

ProPublica has also found that drilling procedures that can prevent water pollution [6] and sharply reduce toxic air emissions – another frequent side effect -- are seldom required by state regulators and are mostly practiced when and where the industry wishes.

Another uncertainty arises from the enormous amounts of water needed for "fracking." The government estimates that companies will drill at least 32,000 new gas wells annually [7] by 2012. That could mean more than 100 billion gallons of hazardous fluids will be used and disposed of each year if existing techniques, which often involve 4 million gallons of water per well, are used.

Proposals for new regulations that might prevent many of these problems almost always lead to a fight. And more often than not, that fight devolves into stark, overdrawn choices between turning on the lights or having clean drinking water; getting rich or staying poor.

Energy lobbyists portray skeptics as hysterical and would-be-regulators as over-reaching. Environmentalists cast the dangers as more proven than is the case, and as unsolvable.

In less contentious settings, even the industry acknowledges the lack of science on key issues.

In a conference call with reporters this spring, American Petroleum Institute senior policy advisor Richard Ranger – an industry expert who has spoken frequently on the fracturing issue -- was asked for evidence that fracturing is without environmental risk:

“Have there been any recent studies done on the safety of this?” a reporter asked.

“The issue of where do these fracking fluids go, the answer is based on the geology being drilled,” Ranger said. “You’ve got them trapped somewhere thousands of feet below with the only pathway out being the well bore.

“I’m just not sure that that study is out there,” Ranger said.

“To be clear, we are saying this is a totally safe technology but we can’t point to any recent studies that say this is a safe technology?” the reporter asked.

“Or that says it is unsafe,” Ranger replied.

ProPublica reporters have posed similar questions to more than 40 academic experts, scientists, industry officials, and federal and state regulators. No one has yet provided a more definitive response.

ProPublica’s reporting over the last year points to four looming questions:

Where are the gaps in the environmental science and what will it take to address them?

How will the wastewater be safely disposed of [3]?

Are regulations in place to make sure the gas is extracted as safely as possible [6]?

And are state and federal regulatory agencies equipped to keep up with the pace of drilling?

“Most likely there are not a lot of win-win propositions,” said David Burnett, a scientist at Texas A&M University’s Global Petroleum Research Institute who specializes in industry practices to reduce environmental harm. But, he said, there is opportunity for compromise on enough issues “so that everybody wins sometimes.”

What We Think We Know

Drilling industry officials say they use a slew of engineering techniques – from sonar to magnetic resonance imaging – to study the underground explosions and strictly control the reach of hydraulic fracturing.

They say that the actual fracturing happens thousands of feet from water supplies and below layers of impenetrable rock that seals the world above from what happens down below.

Yet there are reasons for concern. Even if layers of rock can seal water supplies from the layer where fluid is injected, the gas well itself creates an opening in that layer. The well bore is supposed to be surrounded by cement, but often there are large empty pockets or the cement itself cracks

under pressure. In many instances, the high pressure of the fluids being injected into the ground has created leaks of gas – and sometimes fluids – into surrounding water supplies.

A recent regional government study in Colorado concluded that the same methane gas tapped by drilling had migrated into dozens of water wells [8], possibly through natural faults and fissures exacerbated by hydraulic fracturing.

Dennis Coleman, a geologist in Illinois, has seen an example where methane gas has seeped underground for more than seven miles – several times what industry spokespeople say should be possible. He is a leading international expert on molecular testing whose company, Isotech Laboratories, does scientific research for government agencies, pharmaceutical companies, and the oil and gas industry.

“There is no such thing as impossible in terms of migration,” Coleman said. “Like everything else in life it comes down to the probability. It is never a hard and fast thing.”

In another case, benzene, a chemical sometimes found in drilling additives, was discovered throughout a 28-mile long aquifer in Wyoming.

“It is common knowledge that the lower layers are full of irregularities and inconsistencies,” said Patrick Jacobson, a rig worker who manages drilling fluid pumps and has worked on Wyoming drilling projects for more than 20 years. “I think anybody who works in the oil fields, if they tell you the truth, would tell you the same thing.”

Scientists have found it difficult to determine whether hydraulic fracturing is responsible for these problems. In large part that’s because the identities of the chemicals used in the fluids have been tightly held as trade secrets, so scientists don’t know precisely what to look for when they sample polluted streams and taps.

Drilling companies disclose enough information to comply with labor regulations meant to keep workers safe, but that information normally consists of a product trade name and rarely includes a complete list of the chemicals it contains [9].

Recently, this has begun to change.

In September, New York State – as part of a lengthy environmental review meant to assess the risks of fracturing – made public a comprehensive list of 260 chemicals used in drilling fluids, which it had compiled from disclosures it required drilling companies to make [10]. And several companies themselves have begun to advocate for more disclosure, in the hope that transparency may quell the public outcry that has kept them from drilling in valuable parts of New York State.

Chesapeake Energy, which last year told ProPublica that the chemicals are kept secret because “it is like Coke protecting its syrup formula,” now says that disclosure would bring honest discussion.

“We as an industry need to demystify,” Chesapeake’s CEO, Aubrey McClendon, said at an industry conference in September, “and be very upfront about what we are doing, disclose the chemicals that we are using, search for alternatives to some of the chemicals.”

What is now needed most, according to scientists at the Environmental Protection Agency and elsewhere, is a rigorous scientific study that tracks the fracturing process and attempts to measure its reach into underground water supplies.

In Wyoming EPA scientists with the Superfund program are conducting the first federal investigation of this kind, sampling available water sources and looking for any traces of the chemicals used in drilling. But Colorado's Thyne says a proper study would go a step further.

"The critical thing that has to be done is a systematic sampling of the background prior to drilling activity, during and after drilling activity," Thyne said, "Ideally we would go out, we would put monitoring wells in and surround an area that was going to be fractured as part of normal operations. The budget for that kind of project would run ballpark $10 million. It's a relatively small project for the U.S. Geological Survey or the EPA to undertake."

Where Should the Waste Go?

On the East coast, one of the most important unanswered questions about drilling is how to dispose of the chemically tainted wastewater that hydraulic fracturing produces [3].

Most drilling wastewater in other parts of the country is stored in underground injection wells [11] that are regulated by EPA under the Safe Drinking Water Act [12]. However the geology in the East makes injection less viable, and less common. In New York and Pennsylvania, millions of gallons of drilling wastewater could eventually be produced each day.

That wastewater will likely be trucked to treatment plants that don't routinely test for most of the chemicals the wastewater contains and that may not be equipped to remove them. Currently, the plants also can't remove the high levels of Total Dissolved Solids found in drilling wastewater – a mixture of salts, metals and minerals – that can increase the salinity of fresh water streams and interfere with the biological treatment process at sewage treatment plants, allowing untreated waste to flow into waterways. High TDS levels also can harm industrial and household equipment and affect the color and taste of water.

After the wastewater passes through the treatment plants it is dumped back into public waterways that supply drinking water to at least 27 million Americans, including residents of Philadelphia and New York City. But without identification and routine testing for the problematic chemicals, it will be impossible to know how much of them are making their way to drinking water sources, or how they are accumulating over time. Evolving medical science says low-dose exposure to some of those chemicals could have much greater health effects than the EPA or doctors have previously thought.

"Managing produced water has always seemed like one of the large challenges, because this area geologically doesn't have the extensive network of underground injection wells," said Lee Fuller, vice president of government relations for the Independent Petroleum Association of America. "One challenge that industry has got is looking at developing [treatment] technology, which could be very costly."

All Equal Under the Law

The gas industry, and hydraulic fracturing, is subject to widely different laws in different states. Some of those laws are tough, perhaps burdening the drilling industry unnecessarily. Others are lenient, perhaps leaving much of the country subject to environmental danger.

One thing is certain: There is no national standard for an industrial process that is used prolifically in 32 states and will be used even more in the future.

Gas drillers receive special exemptions from seven federal environmental regulations that apply to countless other industrial activities across the country [13].

Drilling companies are not required, for example, to report the discharge of toxic chemicals for the Toxics Release Inventory [14] under the Superfund law – including the wastewater that threatens Eastern water supplies. They do not have to comply with the section of the Clean Water Act [15] that regulates pollutants at construction sites. And they don't have to abide by the Clean Air Act [16], which regulates industrial emissions.

Gas drilling also has its own individual exemption [17], approved by Congress during the George W. Bush administration, that explicitly prohibits the Environmental Protection Agency from regulating hydraulic fracturing under the Safe Drinking Water Act, the way the agency regulates almost all other types of underground fluid injection, including those injection wells used for wastewater in the West.

The argument behind these exceptions is that state regulations sufficiently protect the environment from drilling. But the result is that drilling regulation is left to a patchwork of state laws.

A recent report by the Ground Water Protection Council [18], a research group that once had energy executives on its board but now consists mainly of state regulators, revealed that only four of the 31 drilling states it surveyed have regulations that directly address [19] hydraulic fracturing and that no state requires companies to track the volume of chemicals left underground. One in five states don't require that the concrete casing used to contain wells be tested before hydraulic fracturing. And more than half the states allow waste pits that hold toxic fluids from fracturing to intersect with the water table, even though waste pits have been connected to hundreds of cases of water contamination.

Although energy companies have developed many techniques that can reduce the spills and seepages [6] that have occurred across the country, they are usually left to implement them when and if they choose, meaning protections can be entirely different between drilling fields a couple of miles apart.

In northern Pennsylvania, for example, drillers do not have to supply regulators with a complete list detailing every chemical they will pump underground, while 15 miles away, in New York, state authorities have said that such disclosure is a must because it is essential to protecting the water.

Many scientists and members of Congress are arguing for a sturdier national standard that would require minimum environmental protections and ensure that a national energy policy based on natural gas extraction can be pursued without jeopardizing the country's other natural resources.

"What we're talking about is just putting some basic parameters around it," said Rep. Jared Polis, D-Colo. "If companies are able to operate within those parameters… then that's fine. If they can't economically do that, then that is because they are causing more damage than they are creating value, and they probably shouldn't be operating in the first place."

Polis is one of 50 sponsors of the FRAC Act [20], a bill before Congress that would restore the EPA's authority to regulate hydraulic fracturing under the Safe Drinking Water Act and would require the disclosure of the chemical additives.

Congress also recently asked the EPA to conduct a new peer-reviewed [21] study of hydraulic fracturing's effect on water resources, reassessing its old position.

On Wednesday, the EPA voiced its most explicit concerns in a decade about the environmental risks presented by drilling, in its response to New York State's plan for drilling in the Marcellus Shale [22], the layer of rock stretching from central New York to Tennessee. The agency said it had "serious reservations" about whether hydraulic fracturing was safe to do inside the New York City watershed and urged the state to consider possible threats to public health.

EPA scientists have also told ProPublica that the study suggested by Congress may soon be underway. If that research is coupled with a congressional reversal of the exemption from the Safe Drinking Water Act, hydraulic fracturing could eventually be regulated like any other injection well in the U.S. That would require, among other things, thorough testing of the rock miles below the surface to confirm that it can safely contain whatever is injected into it – a stipulation that addresses some of the uncertainty and is inconsistently found in state drilling laws.

EPA regulation "would essentially create a base level," said Steve Heare, director of the EPA's Drinking Water Protection Division in Washington. Under the Safe Drinking Water Act, states "would basically have to make a showing that their regulations were as effective as ours."

Better Policing

All the laws and protections in the world won't ensure that drilling can be done safely if effective enforcement isn't in place to oversee it.

Yet for all the debate about environmental protections, new laws and national benefits, very little emphasis has been placed on bolstering the agencies that issue drilling permits and go out into the field to make sure the processes are done right.

ProPublica's recent analysis of 22 states [23] that account for the vast majority of the country's drilling found that regulatory staffing has not kept up with the drilling boom, meaning that the nation's ability to enforce rules that provide environmental safeguards is systematically weakening.

New York, one of the hot spots expected to supply [24] this gas-based national energy paradigm, has cut its oil and gas regulatory inspection staff 20 percent since 2003, even while it has approved a 676 percent increase in the number of new wells being drilled each year. Other states have added a few people, but almost none have kept up with the crushing pace of new drilling.

In West Virginia, the third most active gas drilling state [25] in the nation, four new enforcement employees have been hired since 2003, but each inspector is still responsible for some 3,300 wells.

"Crisis management is not the best management in the world and we had to deal with crisis management 90 percent of the time," said Jerry Tephabock, a former head of state oil and gas inspections in West Virginia who retired in 2007. "There were wells out there that had been drilled that have never been inspected in 15 to 20 years."

Even if states manage to keep staff levels where they are now – a challenge since 39 states have projected budget deficits for 2010 [26] – the growth that would come from placing more emphasis on natural gas as a part of the nation's energy strategy may still present sizable risks for both the environment and the economy. Either enforcement would have to slacken, or the permitting of new wells would slow so much that it would stifle the economic growth and energy independence that drilling is expected to bring.

Different states are choosing different paths. Texas regulators promise they will issue new permits to drill within 72 hours [27], even though their regulator-to-well ratio is one of the most demanding in the nation. New York, in contrast, has pledged to bring new drilling to a crawl until its staff can catch up.

Neither approach addresses the scientific or regulatory gaps that represent drilling's long-term threats to the environment, however. And it remains to be seen whether politicians and environmental regulators will make sure precautions are taken at the beginning of this new energy boom, or if they will leave the nation to clean up the mess after the boom goes bust, as it has had to do so many times in the past.

ProPublica reporters Joaquin Sapien and Sabrina Shankman contributed to this report.

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Tags: Drilling, Gas Wells, Hydraulic Fracturing, Natural Gas, Oil Drilling

Congress Launches Investigation Into Gas Drilling Practices

By Sabrina Shankman and Abrahm Lustgarten
ProPublica, Feb. 19, 11:33 a.m.

Rep. Henry Waxman announced Thursday that the House Committee on Energy and Commerce, which he chairs, is launching an investigation into potential environmental impacts from hydraulic fracturing. (Tim Sloan/AFP/Getty Images)

Two of the largest companies involved in natural gas drilling have acknowledged pumping hundreds of thousands of gallons of diesel-based fluids into the ground in the process of hydraulic fracturing, raising further concerns that existing state and federal regulations don't adequately protect drinking water from drilling.

Rep. Henry A. Waxman, D-Calif., who released the information in a statement Thursday, announced that the House Committee on Energy and Commerce, which he chairs, is launching an investigation into potential environmental impacts from hydraulic fracturing.

The process, which forces highly pressurized water, sand and chemicals into rock to release the gas and oil locked inside, gives drillers unprecedented access to deeply buried gas deposits and vastly increases the country's known energy reserves. But as ProPublica has detailed in more than 60 articles, the process comes with risks. The fluids used in hydraulic fracturing are laced with chemicals -- some of which are known carcinogens. And because the process is exempt from most federal oversight, it is overseen by state agencies that are spread thin and have widely varying regulations.

In 2004, the U.S. Environmental Protection Agency examined hydraulic fracturing and determined it can be safe as long as diesel fuel isn't added to the drilling fluids. The agency based its decision in part on a non-binding agreement it struck with the three largest drilling service companies -- Halliburton, Schlumberger and B.J. Services -- to stop using diesel. But the agreement applied only to gas drilling in a specific type of geologic formation: shallow coal deposits. The EPA study has since been widely criticized.

The information obtained by Waxman's group shows that B.J. Services violated that agreement and that Halliburton continued to use diesel in other geologic formations not governed by the agreement. All three companies acknowledged using other potentially harmful chemicals, such as benzene, toluene, ethylbenzene and xylene.

A memo (PDF) released by the Energy and Commerce Committee on Thursday said B.J. Services acknowledged that between 2005 and 2007 it injected 2,500 gallons of diesel-based fuels into coal bed methane wells.

Jeff Smith, CFO for B.J. Services, told ProPublica the incidents in which diesel was used were isolated, and that the company has been vigilant in making sure that it has not been used since.

“The company has taken this very seriously,” he said.

The memo said Halliburton reported using more than 807,000 gallons of diesel-based fuel to fracture wells in 15 states during the three-year period. But in a statement released Thursday night Halliburton said any suggestion that it had violated the agreement was “completely inaccurate,” because none of the fuel was used in coal bed methane wells.

“Halliburton is firmly committed to full compliance” with the agreement, the statement said.

The information about the companies came from an investigation Waxman launched when he was chairman of the House Committee on Oversight and Government Reform during the last Congress.

As part of the new investigation by the Energy and Commerce Committee, Waxman and subcommittee chairman Edward Markey, D-Mass., sent letters to eight companies, including Halliburton, B.J. Services and Schlumberger, asking for more information about the drilling process and the chemicals it requires. The five other companies -- Frac Tech Services, Superior Well Services, Universal Well Services, Sanjel Corp. and Calfrac Well Services – are smaller companies that make up a growing share of the market. They are not included in the 2003 memorandum of agreement with the EPA.

“As the use of these technologies expands, there needs to be oversight to ensure that their use does not threaten the public health of nearby communities,” said the memo from Waxman and Markey.

The letters ask the companies for detailed information, including documentation of all the wells they hydraulically fractured from 2007 to 2009, the proximity of those wells to underground drinking water sources, the volumes and types of chemicals used in the process, and any health and environmental effects of the drilling. If the companies comply, the committee will have created the most complete picture to date of hydraulic fracturing.

Smith said B.J. Services will fully respond to the request. When asked if the company has used petroleum distillates and benzene in its drilling process, he said, “I’m not going to get into the details in terms of what the chemicals are.” He said that the information will be disclosed in the company’s response to the committee’s letter.

Halliburton also said it will respond to the committee’s request for information.

Schlumberger spokesman Stephen Harris said in an e-mail that officials at the company “have received the Committee’s request and are reviewing it,” but he declined to comment further.

Gas Drillers Plead Guilty to Felony Dumping Violations

by Sabrina Shankman
ProPublica, Feb. 22, 11:59 a.m.

Swamp Angel Energy was drilling in the Allegheny National Forest in northwestern Pennsylvania. (U.S. Forest Service)

Since Pennsylvania's gas drilling boom ramped up in 2008, companies have been fined regularly for environmental accidents — $23,500 here for spilling 5,000 gallons of waste, $15,557 there for spilling 295 gallons of hydrochloric acid. The fines often amount to slaps on the wrist for companies that stand to make hefty profits from their wells.

But the penalties just got a lot more serious for an owner of Kansas-based Swamp Angel Energy and for the company's site supervisor, who pleaded guilty last week to felony violations of the Safe Drinking Water Act.

As part of a plea agreement with the U.S. attorney for western Pennsylvania, part-owner Michael Evans, 66, of La Quinta, Calif., and John Morgan, 54, of Sheffield, Penn., admitted dumping 200,000 gallons of brine – salty wastewater that's created in the drilling process – down an abandoned oil well. The maximum penalty for both Evans and Morgan is three years in prison, a fine of $250,000, or both. Sentencing will be June 24. Attorneys for both men declined to comment.

Swamp Angel Energy was drilling in the Allegheny National Forest, in McKean County in northwestern Pennsylvania, and the brine was dumped just outside the border of the federal land. In mid-December, a federal judge overturned a ruling that had essentially banned drilling in the Allegheny Forest.

According to Pennsylvania's Department of Environmental Protection, which regulates oil and gas drilling, Swamp Angel has 77 active, permitted wells in Pennsylvania, all of them in McKean County. The company is also registered as a municipal and residential waste hauler in the state.

Although Swamp Angel's well was drilled in a part of the state where the gas-rich Marcellus Shale extends, its well was drilled into a different geologic formation.

Disposing of drilling wastewater is a problem throughout the state, and it's growing because of large amounts of wastewater produced by drilling in the Marcellus (you can read our coverage of the wastewater problem here). A Marcellus well can produce as much as 1.2 million gallons of wastewater, much of which is brine and can't be treated in conventional municipal wastewater treatment plants. In the western United States, most drilling wastewater is injected deep into underground wells, but in the East, geology makes those wells trickier, and more expensive, to drill. Some plants in Pennsylvania are permitted to treat drilling wastewater, but most of them are already at capacity.

The lack of treatment options is expected to become even more critical in 2011, when the state has pledged to have stronger wastewater treatment regulations in place, forcing some plants that currently accept drilling wastewater to make expensive upgrades or to stop accepting it entirely.

Some companies are trying to solve the problem by recycling and reusing their wastewater. (With recycling, the industry is still left with dirty, hard-to-deal-with wastewater, but there's less of it.)

But Swamp Angel Energy chose a different solution.

According to acting U.S. Attorney Robert Cessar, authorities learned about the illegal dumping from a tipster. The EPA found that empty drums had been buried on the site and removed them after determining that they had contained non-hazardous waste.

Regional EPA spokeswoman Terri White said the EPA didn't test to see if area drinking water wells had been contaminated by the brine, because the nearest residential well is about a mile away.

"And the other factor that we considered is that where the two guys dumped the brine was an old oil well," she said. "It was a deep well, much deeper than the shallow aquifer where folks get their water."

White said the brine was left in the abandoned well.

Drilling industry representatives have been quick to condemn Swamp Angel's actions. In a news release, Kathryn Klaber, president of the Marcellus Shale Coalition, said, "On behalf of the members of the Marcellus Shale Coalition, we are appalled by the actions of these two people and their disregard for Pennsylvania's environmental laws."

Asked whether the felony charges would prohibit Swamp Angel Energy from receiving permits to drill more wells, DEP spokesman Neil Weaver said in an e-mail, "DEP must consider compliance history as a part of our regulatory review process. Environmental violations, including federal violations, could affect a company's ability to acquire and maintain permits, certifications, authorizations and licenses to do business within the Commonwealth."

The wastewater problem resurfaced with another fine this week, when the DEP fined the borough of Jersey Shore $75,000 after its wastewater treatment plant accepted more drilling wastewater than the state allowed. As a result, the plant discharged contaminants, including fecal matter, into the Susquehanna River between September 2008 and May 2009.

Correction: This post originally said that John Morgan was a subcontractor for Swamp Angel Energy. He should have been identified as the site supervisor. The story also implied that the Swamp Angel well was drilled into the Marcellus Shale. Although the well is located in the Marcellus Shale area, the story should have said that it was drilled into a different geologic formation.

EPA Launches National Study of Hydraulic Fracturing

by Abrahm Lustgarten
ProPublica, March 18, 4:38 p.m.

Abrahm Lustgarten/ProPublica

Responding to reports of environmental contamination in gas drilling areas across the country, the U.S. Environmental Protection Agency will conduct a nationwide scientific study to determine if the problems are caused by the practice of injecting chemicals and water underground to fracture the gas-bearing rock.

The study, announced Thursday but hinted at for months, will revisit research the agency published in 2004, which concluded that the process of hydraulic fracturing did not pose a threat to drinking water. The 2004 report has been widely criticized, in part because the agency didn't conduct any water tests in reaching that conclusion.

"The use of hydraulic fracturing has significantly increased well beyond the scope of the 2004 study," EPA spokeswoman Enesta Jones wrote in response to questions from ProPublica. The old study, she said, did not address drilling in shale, which is common today. It also didn't take into account the relatively new practice of drilling and hydraulically fracturing horizontally for up to a mile underground, which requires about five times more chemical-laden fluids than vertical drilling. "This study is the agency's response to public concern about this practice and Congressional request."

The 2004 report was used by the Bush administration and Congress to justify legislation exempting hydraulic fracturing from oversight under the Safe Drinking Water Act. The exemption came to be known in some quarters as the "Halliburton loophole" and has inhibited federal regulators ever since.

The fracturing technology, in which a mixture of chemicals and water is injected underground with sand at high pressure to crack the earth and release natural gas, made it possible for energy companies to open vast domestic energy reserves across the country and fueled a nationwide boom in drilling activity.

"EPA needs to finish what it started," said Gwen Lachelt, director of the Oil and Gas Accountability Project, a Colorado-based advocacy group that represents landowners with contaminated water.

“We need comprehensive studies of the entire exploration and production process, but this is an important place to start.”

The American Petroleum Institute released a statement saying it expects the study “to confirm what 60 years of experience and investigation have already demonstrated: that hydraulic fracturing is a safe and well understood technology for producing oil and natural gas.”

Lee Fuller, vice president of government affairs for the Independent Petroleum Association of America, said hydraulic fracturing is one of the industry’s “crowning achievements.”

“Adding another study to the impressive list of those that have already been conducted and completed is a welcome exercise,” he said.

A series of investigations by ProPublica found that fracturing is the common thread in more than 1,000 cases of water contamination across seven states. In some cases fracturing may have caused dozens of well failures where the concrete or steel meant to protect aquifers from the gas and drilling fluids cracked under high pressure, allowing contaminants to seep into the water. In hundreds of other cases the waste and chemicals generated by hydraulic fracturing have been spilled or seeped into surface and groundwater supplies.

Fuller said that Congress’ efforts to allow the EPA to regulate the process “should come to a standstill until this study is completed.”

More than 50 members of the House of Representatives have co-sponsored the Frac Act, a bill that would reverse the drilling industry’s exemption from the Safe Drinking Water Act and allow the EPA to regulate fracturing if it chose to do so. The Frac Act also would require companies to disclose the chemicals pumped underground in the process -- information that is usually protected as trade secrets. The House Energy and Commerce Committee is also conducting a separate investigation of hydraulic fracturing’s impact on water resources.

The EPA has yet to say exactly how the new study will be conducted or when it will begin, but sources within the agency told ProPublica that it will likely involve a number of EPA regional offices in Colorado, Texas, New York, Pennsylvania and elsewhere, and could build off two related investigations the EPA is undertaking in Wyoming gas fields.

In its announcement Thursday, the agency said it will spend nearly $2 million on the research this year and is asking for more money for next year. It promised a transparent, peer-reviewed process that includes stakeholder input. The EPA is seeking input from its Science Advisory Board on exactly how the study should proceed.

Broad Scope of EPA's Fracturing Study Raises Ire of Gas Industry

by Abrahm Lustgarten
ProPublica, April 7, 8:09 a.m.

A gas drilling rig near Gaylord, Mich. (Getty Images file photo)

A federal study of hydraulic fracturing set to begin this spring is expected to provide the most expansive look yet at how the natural gas drilling process can affect drinking water supplies, according to interviews with EPA officials and a set of documents outlining the scope of the project. The research will take a substantial step beyond previous studies and focus on how a broad range of ancillary activity – not just the act of injecting fluids under pressure – may affect drinking water quality.

The oil and gas industry strongly opposes this new approach. The agency's intended research "goes well beyond relationships between hydraulic fracturing and drinking water," said Lee Fuller, vice president of government affairs for the Independent Petroleum Association of America in comments (PDF) he submitted to the Environmental Protection Agency.

The "lifecycle" approach will allow the agency to take into account hundreds of reports of water contamination in gas drilling fields across the country. Although the agency hasn't settled on the exact details, researchers could examine both underground and surface water supplies, gas well construction errors, liquid waste disposal issues and chemical storage plans as part of its assessment.

The EPA begins public hearings today in Washington to nail down the scope of the study.

Plans for the study have attracted international attention and have been the focus of intense debate among lawmakers and the oil and gas industry. The findings could affect Congress' decision whether to repeal an exemption that shields the fracturing process from federal regulation under the Safe Drinking Water Act.

The EPA is undertaking the study in response to a wave of reports of water contamination in drilling areas across the country and a Congressional mandate issued in an appropriations bill last fall. The agency had previously examined hydraulic fracturing in a 2004 study that was limited in scope and was widely criticized.

"When we did the 2004 study we were looking particularly for potential for impacts from hydraulic fracturing fluid underground to underground sources of drinking water," said Cynthia Dougherty, the EPA's director of the Office of Ground Water and Drinking Water. "So it was a much narrower focus."

For the latest study, the EPA sent its scoping document to its Science Advisory Board asking for the group's input in designing the fracturing study. In the document, the EPA explained that information gained from looking at the impact from the start to the end of the process, called a lifecycle assessment "can help policymakers understand and make decisions about the breadth of issues related to hydraulic fracturing, including cross-media risks and the relationship to the entire natural gas production cycle."

In past interviews with ProPublica, Fuller has explained that, in his view, hydraulic fracturing shouldn't be blamed for any contamination unless the process of injecting fracturing fluids underground under pressure was "the sole" cause of contamination. If contamination seeped through cracks in a gas well's protective casing under pressure of the fracturing process, for example, he wouldn't attribute it to fracturing because the cracks may have existed before the fracturing process began and would be a well construction problem, not a fracturing problem.

Fuller's definition of fracturing-related contamination helps explain the oil and gas industry's steadfast claim that that there is not a single case in which hydraulic fracturing has been proven to have contaminated drinking water supplies.

An 18-month investigation by ProPublica, however, has shown more than 1,000 cases in which various aspects of the fracturing lifecycle have affected water supplies, including spills of fracturing fluid waste, cracking of underground cement and well casings meant to enclose the fracturing process, and methane gas traveling large distances underground through faults and fractures.

In planning its study, the EPA has made clear that for its purposes fracturing may play a role in many aspects of the drilling process and in many different environmental risks. The study could examine how well-construction activities have the potential to impact water, what specific materials or design practices would make a well suitable for fracturing, and what are the most effective methods for measuring well integrity.

The EPA hopes to complete its research by late 2012, the end of President Obama's first term in office. Scientists say that may not be enough time to include substantial field monitoring and water analysis; policymakers say that is too long to wait for a decision from Congress.

The agency's conclusions could have wide-ranging effects. Last month President Dmitri Medvedev of Russia said he would curtail natural gas production by the state company Gazprom until the study is completed. In part that's because Medvedev isn't sure there will be a viable market for Russian gas if the U.S. develops its domestic reserves, and because he believes that the regulations that could result from the EPA study could determine whether the U.S. drills its own gas, or imports it from overseas.

If the comments already submitted to the EPA by stakeholders are any indication, the research process will be contentious.

In Fuller's comments (PDF) to the EPA, he said that the study shouldn't focus on the harm fracturing could inflict on water supplies, but rather on whether current environmental regulations "effectively manage the environmental risks of the fracturing process."

“If these risks are well managed, the other questions are meaningless,” he wrote. “The Scoping Materials Document fails to reflect this reality.”

In another letter (PDF), Ben Wallace, chief operating officer of Penneco Oil Co., wrote: “The clear historical record shows that hydraulic fracturing has been employed for decades successfully without incident. We are concerned that bureaucratic machinations have caused the EPA to hypothesize a problem and that EPA is now seeking research to justify a solution to a nonexistent problem.”

Environmental officials from New York City, who are concerned about how plans to drill for gas in the state’s Marcellus Shale will affect the city’s water supply, also submitted comments (PDF) to the EPA, urging the agency to follow through with its ambitious plans.

“The City concluded that horizontal drilling and high-volume hydraulic fracturing using the current technologies pose an unacceptable threat to the water supply of nine million New Yorkers, and cannot be safely permitted in the watershed,” wrote Caswell Holloway, commissioner of New York City’s Department of Environmental Protection. The city encouraged the Science Advisory Board and the EPA “to take a hard look at this activity and to recognize that the absence of contamination does not necessarily imply an activity is safe, but may actually reflect extensive gaps in monitoring information.”

A Fracking First in Pennsylvania: Cattle Quarantine

by Nicholas Kusnetz
ProPublica, July 2, 4:41 p.m.

(Pennsylvania Department of Environmental Protection)

Agriculture officials have quarantined 28 beef cattle on a Pennsylvania farm after wastewater from a nearby gas well leaked into a field and came in contact with the animals.

The state Department of Agriculture said the action was its first livestock quarantine related to pollution from natural gas drilling. Although the quarantine was ordered in May, it was announced Thursday.

Carol Johnson, who along with her husband owns the farm in north-central Pennsylvania, said she noticed in early May that fluids pooling in her pasture had killed the grass. She immediately notified the well owner, East Resources Inc.

“You could smell it. The grass was dying,” she said. “Something was leaking besides ground water.”

The Johnsons' farm sits atop the Marcellus Shale, a layer of rock that lies under swaths of West Virginia, Pennsylvania, New York and Ohio. As ProPublica has reported, reports have proliferated of groundwater pollution, spills and other impacts of hydraulic fracturing, a drilling technique that injects massive amounts of water, sand and chemicals underground to break up the formations that hold the gas.

In the Johnsons' case, a mixture of fresh water and wastewater that had been injected into the well leaked from an impoundment pit on the farm, the state Department of Environmental Protection (DEP) said. Tests performed for East Resources Inc., found hazardous chemicals and heavy metals, including chloride, barium and strontium. East did not dispute that a leak had occurred.

It's unclear whether the Johnsons' animals drank any of the wastewater. The quarantine was put in place to ensure the animals did not go to market with contamination.

An inspection conducted May 3 by the DEP found two seeps from the impoundment. According to the inspection report, an East Resources employee said a contractor had inspected twice in April and he was unsure why the leak wasn't detected earlier.

The DEP inspector issued four violations for the leak and resulting pollution. One cited East's failure to notify the department of the pollution, saying the agency learned about it from the Johnsons' daughter.

State records show that the well, also on the Johnsons' property, was issued five violations by DEP in January, including one labeled "Improperly lined pit." A February inspection found no violations.

Stephen Rhoads, director of external affairs for East Resources, said the January violations were for spilled drilling mud and were unrelated to the subsequent pit leak.

East Resources said tests of the leaked fluid did not show unhealthy levels of any contaminants and that the quarantine was unnecessary. Rhoads said hydraulic fracturing, called fracking for short, had begun April 2 and that wastewater wasn't impounded until a week later.

Upon being notified May 2, Rhoads said, the company immediately fenced off the Johnsons' pasture and began to empty the impoundment and remove all contaminated soil. The well has since been shut down.

The incident isn't the first report of farm animals being affected by fracking. As we reported more than a year ago, 16 cattle died in Louisiana after drinking a mysterious fluid next to a drilling rig.

The Johnsons' cows have fared better so far.

"They're happy, contented, fat," Johnson said.

For Gas-Drilling Data, There's a New Place to Dig

by Nicholas Kusnetz
ProPublica, July 12, 2:01 p.m.

Starving for data about natural gas drilling in the Marcellus Shale? A new website hopes to feed your need. A couple of environmental and public health groups have teamed up to create FracTracker, a web tool that brings together different data sets and presents the information on a map.

Launched in late June, FracTracker allows users to upload their own data on all-things-gas-drilling, from lists of drilling permits or incident records to maps of air monitoring stations. Others can then go to the site and either look at the data in map form or download it raw.

The site is run by the University of Pittsburgh's Center for Healthy Environments and Communities (CHEC), which is funded by the Heinz Endowments. It is hosted by the Foundation for Pennsylvania Watersheds, an environmental group that funds local projects aimed at protecting the state's waterways.

The center's director of operations, Charles Christen, said CHEC came up with the idea while working with communities in western Pennsylvania, which along with much of West Virginia, New York and Ohio sit atop the Marcellus Shale, an extensive rock formation that holds vast quantities of natural gas.

As we've been reporting for two years, people in those communities have become increasingly concerned about the environmental impacts of gas drilling. But they've often found it difficult to come up with the hard data they need to make informed decisions – or even to know what's happening on a neighbor's property. The site is designed to fill that gap, Christen said.

FracTracker allows people to search by topic or select a specific area on a map. It also shows who uploaded the specific data set and whether other people have downloaded it or found it helpful. Since anyone can upload a data set, this transparency is critical to determining whether the information is reliable. CHEC will remove irrelevant data, but it doesn't vet everything for accuracy. CHEC is counting on users to police the data themselves and to distinguish the good from the bad.

Christen said the site may be difficult for the average person to use, so the center has set up a blog to serve as a forum for learning more about the tool. Over the next couple of months, it plans to reach out to various groups that not only may benefit from the site but also may be able to provide the data that FracTracker relies on.

"The success of this network, this information-sharing tool, really depends on the quality of the data we get," Christen said. "I think we're going to see really quality data up on this site and a lot of snapshots being used in a lot of different ways."

Drilling Company Says It Will List Hazardous Chemicals Used in Fracking

by Nicholas Kusnetz
ProPublica, July 15, 12:45 p.m.

A drilling rig in Pennsylvania. (Wikimedia Commons)

One of the largest gas drillers in the Marcellus Shale has announced that it will disclose the chemicals it uses in its Pennsylvania wells. The company, Range Resources, said it will display the list on its website, giving regulators and landowners an account of the hazardous chemicals injected into each well.

Last month, Pennsylvania's Department of Environmental Protection made public a list of more than 80 chemicals used by the drilling industry. But the Range list, first reported by the Wall Street Journal on Tuesday night, goes a step further because it includes the volume, concentration and purpose of the chemicals.

Range's disclosure will help health specialists and regulators determine whether the drilling is polluting drinking-water supplies, said Deborah Goldberg, an attorney at Earthjustice, a nonprofit environmental law firm. But she said the list is just a first step, because it will include only chemicals that are deemed hazardous to workplace safety by federal authorities. She said it won't necessarily include chemicals that may harm aquatic ecosystems or drinking water.

"It does not by any stretch of the imagination cover what most people would consider to be hazardous," Goldberg said.

The drilling industry combines chemicals with water and sand and injects the mixture into wells to break apart shale and release natural gas, a process called hydraulic fracturing, or fracking. Drilling companies have been slow to disclose the chemicals they use, which sometimes include toxic chemicals such as toluene and naphthalene, which is listed by the EPA as a possible carcinogen.

In September, Range CEO John Pinkerton joined another drilling executive in calling on his industry to release this information. The executives blamed the companies that produce the chemical mixes for preventing such disclosure out of proprietary concerns.

In recent years, landowners around the country have grown increasingly concerned that gas drilling is polluting their water, but scientists say it's difficult to determine the source of the pollution without knowing which chemicals are being injected into the earth. Drilling companies have stressed that the chemicals are highly diluted; Range said they account for only about 0.14 percent of the fracking fluid.

The exact percentage of chemicals used in each of Range's Pennsylvania wells will be available on the website, the company said, and each report will be posted within 30 days of a well's completion. A sample report (PDF) from the company shows the components of the fluid in a "typical Marcellus well." It lists four additives that contain a number of chemicals, including ethanol and glutaraldehyde, a toxic pesticide. Range spokesman Matt Pitzarella said these four additives are what the company generally uses in its Marcellus wells.

Information From Gas-Drilling Companies Isn't Coming Easily, Congressmen Say

by Joaquin Sapien
ProPublica, July 20, 2:55 p.m.

(Photo by Abrahm Lustgarten/ProPublica)

Gas and oil companies have deflected congressional inquiries about whether they are drilling near underground drinking water sources and how they are disposing of the chemical-laden wastewater their operations produce, according to a news release issued by Rep. Henry Waxman, D-Calif., and Rep. Edward Markey, D-Mass.

The congressmen, both members of the House Energy and Commerce Committee, tried to get answers to these questions by sending letters to 14 oil and gas service companies that use a controversial drilling technique called hydraulic fracturing. The process involves pumping millions of gallons of water mixed with sand and chemicals deep underground to break rock and release the gas beneath. When the water resurfaces, it contains natural toxins like benzene, which can carry cancer risks. It can also contain small amounts of chemicals added to enhance drilling.

But the 14 companies -- which include Halliburton and Universal Well Services -- said that because they are "well servicers" and not "well operators," they don't maintain the information the congressmen are asking for. Markey and Waxman are members of the Energy and Commerce Committee, which in February began investigating the potential environmental and human health impacts of natural gas drilling.

Now the congressmen are turning to 10 industry giants for the information, including BP America, Encana Corporation and Chesapeake Energy Corporation. In letters (PDF) sent on Monday, they

gave the companies until July 26 to notify them whether they'll comply with the request and until Aug. 6 to actually deliver the information.

The lawmakers' quest for information shows how responsibility for drilling operations can be diffused among a variety of contractors, each doing a different job.

For instance, BJ Services, a company that designs wells and pumps the water underground, told the congressmen that it "does not track or maintain such data because it is the responsibility of the well operator to drill in compliance with the applicable statutes and regulations concerning subsurface aquifers."

When it began its investigation earlier this year, the committee cited (PDF) several stories by ProPublica about water pollution linked to gas drilling. In one of those stories, ProPublica found that drilling wastewater in Pennsylvania was being sent to municipal sewage treatment plants, which didn't have the equipment to properly remove the chemicals from it. As a result, the wastewater contaminated a river that provides drinking water to 350,000 people in the Pittsburgh area. In another story, ProPublica found that many sewage plant operators in New York state don't want to take wastewater because they fear their facilities can't properly treat it.

ProPublica has also uncovered several instances in which underground sources of drinking water have been affected by drilling.

Drilling Accountability Bill Would Regulate Fracturing Too

by Abrahm Lustgarten
ProPublica, July 29, 11 a.m.

(Abrahm Lustgarten photo/ProPublica)

Tucked inside the Senate bill aimed at cracking down on oil drillers after the Gulf spill is a long-sought measure to protect groundwater from natural gas drilling.

The bill, called The Clean Energy Jobs and Oil Company Accountability Act, would require that drilling companies make public a complete list of chemicals injected underground in proprietary formulas to break up rock deep underground and extract natural gas, a process called hydraulic fracturing.

It would not, however, reverse the exemption that prohibits the Environmental Protection Agency from regulating the fracturing process like other forms of underground injection, another important regulatory change that was initially proposed in House and Senate bills last June along with the chemical disclosure.

That bill, called the Frac Act, was sponsored by Sen. Bob Casey, D-Pa., who pushed for its inclusion in the accountability bill now being considered.

“Proper regulation is another essential element in protecting drinking water and public health. That is a battle that we still need to fight,” Casey told ProPublica in an e-mail. But he emphasized that disclosing the chemical names “is an important step toward informing the public and building accountability for oil and gas companies.”

A push for disclosure and stricter regulation of the fracturing process began in earnest last year after a series of articles by ProPublica reported more than a thousand cases of ground and surface water contamination in drilling areas where the process was being used. The articles examined drilling records in more than seven states, and found both a consistent pattern of water contamination in drilling areas, and a gap in scientific knowledge about the way hydraulic fracturing affects underground layers of rock and aquifers.

Problems were severe in Casey’s home state, where fast-paced development of the Marcellus Shale natural gas deposit quickly led to dozens of reports of drinking water well contamination in places where hydraulic fracturing had been employed. Residents reported flammable tap water, and state investigations found that methane had seeped into water supplies underground as a result of the drilling activity.

Investigating the cause of such incidents has been difficult in part because the EPA does not have the jurisdiction to regulate fracturing the way it does other injection processes, and because the chemical makeup of the fracturing fluids has been guarded as a trade secret.

Several states, including New York, Colorado and Wyoming, have recently passed disclosure laws of their own, and industry representatives have begun to support the notion. But the language of the Senate bill is the most specific, and would apply to all of the states where oil and gas is produced.

The disclosure proposed today would still allow companies to withhold the exact recipes they use, meaning they wouldn’t have to disclose the concentrations to the public. But they would -- in case of emergencies -- be required to share that information on a confidential basis with doctors and hospitals responding to an accident.

It’s not clear how far the bill will get in the face of Republican opposition. Sen. Harry Reid, D-Nev., who added the disclosure component to the accountability bill, has said he hoped to bring the bill to a vote next week. Even if it passes, it will need to be reconciled with a House version that does not include the fracturing disclosure language.

Update: Politico notes that Reid may have added the disclosure language as a note to environmentalists, who have been upset that the Senate has moved away from a bill on global warming.

Why Gas Leaks Matter in the Hydraulic Fracturing Debate

by Abrahm Lustgarten
ProPublica, Aug. 2, 3:56 p.m.

(Abrahm Lustgarten photo/ProPublica)

Last week's article about a hydraulic fracturing clause that was included in the Senate's drilling accountability bill sparked a lively debate on ProPublica's website about why methane contamination from drilling is relevant to a discussion of environmental risks of fracturing. In response:

Methane migration is a critical part of the discussions of underground contamination risks from drilling and hydraulic fracturing because it demonstrates that a pathway exists for contaminants to move through the substrata to the surface or into water supplies. In many of the cases described in ProPublica's articles, methane -- which was proved to be thermogenic and not from biological decay -- is believed to have moved from thousands of feet underground, or travelled several miles laterally, sometimes from the same layer of gas being exploited for energy.

Fracturing consists of injecting water and (usually secret) concoctions of chemicals deep underground, where it fractures the rock and releases the natural gas deposits. One of the most influential explanations why fracturing presents no risk hinges on the assertion that the deep isolation and many layers of rock and earth effectively seal off the fracture zone from the surface -- that it is impossible for chemicals, water, gas or anything else to move from thousands of feet below into shallow aquifers.

But the consistent and widespread detection of methane migration from unnatural causes -- in places including Colorado, Wyoming, Pennsylvania, Ohio and New York -- shows that it is not impossible, that in fact there are underground pathways for such movement. And if methane can move, it's an indicator of other substances' ability to migrate as well.

Many of the methane migration cases have been traced to flaws in the cementing and casing of the wells, as many of our articles have explicitly explained. Research shows that others may have migrated directly through underground faults and fissures.

Scientists we ask about these issues consistently make two points:

> 1. The pressure of hydraulic fracturing inside a well structure exerts great force that can exploit cementing problems. In other words, a crack in the cement or casing might be fine until the pressure of hydraulic fracturing forces substances through it.
>
> 2. It doesn't matter whether contaminants reach aquifers through a spider web of geologic cracks created by hydraulic fracturing, or in the spaces alongside the well bore that was

pushed through the earth. Contaminants are reaching water supplies as a result of the processes and pressures being exerted underground.

The question of whether hydraulic fracturing is responsible for this contamination, and whether it is causing other contamination, remains unanswered. Neither our articles, nor anyone we have spoken with, has claimed to have reached a conclusion on that point. That is why the Environmental Protection Agency conducting two simultaneous studies of these issues -- one in Pinedale, Wyo., which will attempt to assess a specific pattern of contamination there, and another broad national study meant to evaluate the potential risks of fracturing. These are the first studies we are aware of that have engaged a scientific process to study these issues.

Two things are clear now, however:

1. Hydraulic fracturing is the only aspect of the complicated drilling process where basic standards for safe operations are not set by the federal government.

2. If fracturing were regulated, for instance, under the Safe Drinking Water Act -- the federal law that regulates every other type of underground chemical injection [6] [6] -- the law would likely require the sort of well integrity tests and localized pre-drilling geologic analysis to ensure that underground faults and fractures could not reach water supplies. It would also likely require that well casing and cementing be solid enough to withstand the pressures exerted by the fracturing process, and thus prevent the well from leaking methane, or chemicals, or anything else.

New York Senate Passes Temporary Ban on Hydraulic Fracturing

by Abrahm Lustgarten and Nicholas Kusnetz
ProPublica, Aug. 4, 5:17 p.m.

(New York State Department of Environmental Conservation photo)

In a predawn vote Wednesday, New York State's senate passed a bill that reaches beyond the debate over the environmental safety of drilling for gas in the Marcellus Shale and would effectively ban almost all gas and oil drilling in the state until next spring. The bill circumvents an environmental review by the state's regulatory agency that could be finished this year.

The bill prohibits the underground process of hydraulic fracturing, which breaks up buried rock and releases gas trapped inside.

Its author, State Senator Antoine Thompson, told ProPublica the moratorium is aimed at pausing the kind of high-volume hydraulic fracturing used in horizontally-drilled wells in the Marcellus Shale until legislators can reach an informed decision about its risks. But the language in the final bill as it is posted on the state's website does not differentiate between the different ways hydraulic fracturing can be used. It appears to be a blanket prohibition that would also stop hydraulic fracturing in New York's many vertical oil and gas wells and would apply to drilling in geologic formations outside the Marcellus.

The Independent Oil and Gas Association of New York, an industry trade group, has pushed hard against the measure, describing it as "unnecessary" and driven by "a calculated campaign of misinformation and ignorance."

An IOGA spokesman told ProPublica the bill was technically flawed and would affect hydraulically fractured wells beyond the intent of the law. It would have the unintended consequence of preventing drilling that is currently allowed, he said.

"They really don't understand what they are opposing and they don't understand why they are opposing it," said Jim Smith, the IOGA spokesman. "Many of them don't know the difference between horizontal drilling and hydraulic fracturing -- they use the term hydraulic fracturing to describe the entire process."

The bill passed with bipartisan support by a vote of 48 to nine. The state assembly, which is considering a similar version of the bill, began its August recess yesterday, so it won't vote on the bill until mid-September. Then the measure would have to be signed by Gov. David Paterson, whose term ends Dec.31, before it becomes law.

The anti-fracturing measure -- the first of its kind in the nation -- initially arose out of concerns that New York could experience the same rash of water contamination, spills and air quality impacts that have affected Pennsylvania since it embraced widespread Marcellus Shale drilling two years ago.

Its passage was speeded by the BP oil spill in the Gulf of Mexico, Thompson said.

"We have to make sure we do our due diligence," Thompson told ProPublica. "There have been clear examples just next door in Pennsylvania where the Department of Environmental Protection fell short. We have to make sure that whether there are concerns raised by landowners, the Farm Bureau, the Sierra Club or just a resident of New York that we try to address them legislatively and not just through the permitting process."

The bill would prevent gas and oil drillers from using hydraulic fracturing in oil or gas wells until May 15, 2011.

The state's Department of Environmental Conservation is charged with permitting drilling in New York, and is in the midst of a two-year-long environmental review of the impacts of hydraulic fracturing. The agency has received more than 14,000 comments on its draft report, and is expected to complete a final study as soon as September, after which it could begin permitting new wells.

A DEC spokesman declined to comment on the progress of the environmental review or the impact of the senate bill.

At a news conference in Albany Wednesday morning, Gov. Paterson spoke indirectly about the Senate bill, saying the DEC is still reviewing mountains of research on the drilling process and should be allowed to finish that process.

He added that drilling stands to be "very lucrative" for the state, which has struggled through budget shortfalls and the recession. "But we don't want that opportunity to in any way obfuscate our intent to provide public safety and clean water, which is a vital problem," he said.

In addition to stepping on the DEC's toes, the ban would defer a decision on the state's drilling policies to the governor's successor, who will be elected in November.

"It makes sense that this outgoing administration not saddle the incoming administration with a permanent program," said Kate Sinding, a senior attorney with the Natural Resources Defense Council. "It's something the environmental and grassroots community in the state has been pushing for, which is a legislative time out."

Drilling Industry and Gubernatorial Candidates Move to Weaken Some State Regulations

by Sabrina Shankman
ProPublica, Aug. 5, 1:08 p.m.

A natural gas drilling rig in Piceance Basin in northwest Colorado. (EnergyTomorrow/Flickr)

As the federal government focuses on strengthening regulations for deepwater drilling, the gas and oil industry is quietly trying to weaken state regulations for drilling on land.

The industry's current targets are regulations passed by New Mexico and Colorado in 2008 and 2009. The New Mexico regulations mandate that the industry use thick industrial liners in the pits that hold its toxic waste. The Colorado regulations tighten controls on just about every aspect of the industry, from the waste pits to air quality.

The industry is challenging the regulations in court and through administrative appeals, arguing that the regulations are unreasonably expensive and are forcing companies to move to states with looser regulations. That argument has also surfaced in the New Mexico and Colorado gubernatorial races, where candidates from both parties have promised to repeal, or at least re-evaluate, the rules.

But the facts lend little support to the industry's -- or the candidates' -- argument.

An examination of drilling rig counts, the most common gauge of the industry's health, shows that the new rules have had little or no impact on drilling activity in New Mexico and Colorado. Rig counts did fall in both states shortly after the rules were established -- but no more than they did in other states as the recession began and then deepened. Now, with the economy slightly improved and gas prices rising, rig counts are soaring.

Nationally, rig counts are up 75.8 percent from June 2009, when drilling nationwide was at its lowest. New Mexico's rig count has rebounded 86.5 percent since then. Colorado's rig count hasn't kept pace -- its rig count is up only 36.4 percent. But that's just a fraction lower than the uptick in neighboring Wyoming -- 38.7 percent -- where regulations are looser.

"It is the price of oil and gas that has by far a greater effect on oil and gas production rates and rig counts, not regulations," said Mark Fesmire, director of New Mexico's Oil Conservation Division, which regulates the industry.

Another gauge of the industry's activity is the number of drilling permits it applies for each year. In 2009, with the recession in full swing, permit approvals in New Mexico dropped 40 percent -- but they also dropped sharply in Wyoming, which saw a 31 percent drop.

Colorado, meanwhile, had only a 14 percent decline -- and this year it's on pace for a 30 percent increase from 2009.

"This would make 2010 the second-busiest year for permitting in the state's history despite the twin impediments of low natural gas prices and decreased economic activity," said Dave Neslin, executive director of Colorado's oil and gas regulatory authority, in a memo to the Oil and Gas Conservation Commission. The state issued 3,112 drilling permits in the first six months of the year, according to the memo.

Deborah Seligman, interim president of the New Mexico Oil and Gas Association, an industry group that has campaigned against the new regulations, concedes that the rig counts have rebounded somewhat. But she said they're still not at the levels they were before the count dropped nearly two years ago. (New Mexico's rig count is 19.8 percent lower than it was in August 2008. But that's better than the national rig count, which is down 20.8 percent.)

"I don't think industry is out there to rape and pillage the world by any means," Seligman said. "Granted, accidents happen. But if there is an accident, if a pit liner leaks, you clean it up. This is like not letting your little boy cross the street, just in case he might get hit."

Gwen Lachelt, project director of the Oil and Gas Accountability Project for the environmental nonprofit Earthworks, said the argument used against pit rules is the same argument she hears in other states every time talk turns to stronger regulations.

"They have always said, 'This is going to drive us out of the state, make it unaffordable and we'll have to go elsewhere.' And it's just not true," Lachelt said. "So now it's the same story in New Mexico."

Colorado: From Friend to Foe

Until its recent reforms, Colorado's regulatory environment for gas and oil drilling was considered one of the loosest in the country. Five of the seven members of the Oil and Gas Conservation Commission, which regulates drilling, were required by law to be from the industry, and many of the state's politicians and regulators had strong oil and gas ties. Before former Gov. Bill Owens began his political career, he headed the Colorado Petroleum Association, a trade group. When Owens left office in 2007, he joined the boards of two energy companies.

Attorney Lance Astrella, who represents surface owners in disputes against oil and gas companies, said that if one of his clients had a case that could go either to court or to the Oil and Gas Commission, "I would have them go to court. I didn't think they could get a fair shake in front of the Commission."

But as gas drilling ramped up during the final years of Owens' governorship, residents became increasingly concerned about the pace of development. After the current governor, Bill Ritter, took office, the number of industry representatives on the Oil and Gas Conservation Commission was reduced from five to three and the commission was expanded to include two members from state regulatory agencies.

"The oil and gas industry had been the 800-pound gorilla on the block for a long time," said Pete Maysmith, executive director of Colorado Conservation Voters. "That changed, and with that has come great progress on the environmental front and I think a slow but hopefully increasing recognition that there's a different way to do things in Colorado politically."

In mid-2007 the state began the long process of revamping its oil and gas regulations, with input from the industry at every step of the way. Pit rules were tightened, industry reporting requirements were beefed up and air quality standards strengthened.

When the rules passed in 2009, environmentalists and regulators across the nation saw them as a blueprint for how states could effectively regulate themselves. The rules were lauded by Lee Fuller, vice president of government relations for the Independent Petroleum Association of America, which has long argued that state regulations are so effective that federal regulations don't need to be strengthened.

"The framework that was adopted in Colorado in their regulatory system would probably be a place where most on all sides of this see a structure that makes a lot of sense," Fuller told ProPublica last year.

But even as Fuller made that statement, the industry was setting out to overturn or modify the rules it had helped write.

The Colorado Oil and Gas Association filed a lawsuit in Denver District Court in May 2009 against the Oil and Gas Conservation Commission, asking that the rules be overturned because the state didn't adequately forecast how much it would cost it to implement them or how much they would cost the industry. That lawsuit is still winding its way through court.

The Colorado Petroleum Association, the industry group once headed by future Gov. Owens, has come to terms with most of the rules, according to its attorney, Jep Seman. It wants just one of them overturned: the requirement that companies remove all pit liners when the drilling is done, rather than continue burying them on site.

Environmentalists are taking a "sky is falling approach" that is forcing the industry to comply with an unnecessary and costly regulation, Seman said. "The state allowed this for 15 to 20 years," he said. "The environmental community never complained before."

In a hearing in March with the Colorado Oil and Gas Conservation Commission, Michael Freeman, who represents the Colorado Environmental Coalition, pointed out that every other industry is required to dispose of its pit liners and that this rule just holds oil and gas drilling to the same standards.

Studies have shown that pit waste can include benzene and other known carcinogens used in drilling, along with heavy salts and naturally occurring chemical compounds dredged up during drilling. Studies have also shown that the waste can seep into groundwater, contaminate nearby soil, and kill animals and birds that drink from the pits.

According to a report by the Ground Water Protection Council, a nonprofit consortium of state regulators, regulating the pits is "the most critical element in prevention of shallow ground water contamination."

Both the lawsuit and the appeal are still pending, but the industry's arguments have landed squarely in the talking points of the gubernatorial candidates. Early campaign finance reports show that all three candidates have received contributions from the oil and gas industry.

Republican Scott McInnis promised early in his campaign to overturn the new regulations.

"What those rules and regulations did, frankly, was take Colorado from No. 1 to rock bottom on states that are friendly to do natural gas and energy business in," the former congressman told the Denver Daily News in February. McInnis did not respond to requests for an interview for this story.

McInnis' Republican opponent in the August primary, Dan Maes, has taken a similar position.

"I feel that the 175 pages of new regulations absolutely hurt the Colorado economy," Maes told ProPublica. "Ideally we would sweep them off the table and start from scratch."

Rather than repeal the rules outright, however, Maes he said he would likely work with experts to systematically change them.

Denver Mayor John Hickenlooper, the only Democrat in the race and a former oil and gas geologist, told energy industry executives early in his campaign that some of Gov. Ritter's rules -- including strict requirements for pit liners -- went too far. But when Hickenlooper met with industry representatives last month, he stressed that he wasn't seeking a complete overhaul. Hickenlooper did not respond to requests for comment.

Under Pressure in New Mexico

New Mexico's recent rules governing pit liners are even stronger than Colorado's, and were equally hard fought.

They were inspired by studies commissioned by Gov. Bill Richardson's administration, which found more than 400 cases of industry-related groundwater contamination. The industry argued that some of the contamination didn't come from drilling pits. But the state moved ahead and proposed a set of rules that required, among other things, that oil and gas well operators use synthetic liners in their pits and that the liners be hauled to landfills after drilling is complete.

The proposal quickly became a point of contention between the industry and regulators.

Bob Gallagher, then the director of the New Mexico Oil and Gas Association, wrote an op-ed piece for the Albuquerque Journal, saying that the rules were unnecessary and expensive to implement and that the study that inspired them was misleading and inaccurate. Joanna Prukop, cabinet secretary of the Environment, Minerals and Natural Resources Department at the time, fired back with a piece accusing Gallagher of "manipulating the facts by providing unfounded and distorted numbers" and of trying to get the rules weakened by publicly attacking state regulators.

Estimates of the cost of complying with the rules varied widely. In a letter Prukop wrote to a state senator at the time, she said one independent producer testified at a hearing that the rules would cost him $38,500 and reduce his expected return on investment from 29 percent to 24 percent. She said his figure was far below the $150,000 to $250,000 per well estimate being circulated by the industry.

The clash between industry and regulators continued in state budget hearings.

"The Senate Finance Committee tucked cuts into its version of the state budget that would essentially punish state agencies [OCD and NMED] that have the audacity to hold oil and gas companies accountable for New Mexico's environment," said a Feb. 4, 2008, entry in a blog from Richardson's office. "Effectively, such a move would weaken the state's ability to enforce environmental regulations and allow those who contaminate our water, pollute our air, and abuse our land to go unregulated."

As the rules edged toward approval, the departments that helped create them took a hit. The Oil Conservation Division's budget was cut 19.4 percent, from $11,136,800 in 2007 to $8,976,100, even though the Environment Department's budget grew by 3.5 percent. About $500,000 of that reduction came from the agencies and departments that regulate the industry, including the Oil Conservation Division's legal staff, which prepares cases against companies that violate environmental regulations.

The Permian Basin Petroleum Association, an industry association in New Mexico and Texas, expressed its satisfaction with the cuts.

"Industry has had some success in having input on the state budget," Ben Shepperd, the association's executive vice president, wrote in the group's magazine. "With respect to the budget,

$275,000 will be cut from both the Oil Conservation Division (OCD) and New Mexico Environment Department (NMED)."

Despite the industry's dire warnings that the pit rules would drive companies out of New Mexico, there was no mass exodus.

When the rules took effect in June 2008, New Mexico had 78 active drilling rigs. Over the next few months, that number climbed into the 90s, where it hovered through the first week of November. In December 2008, as the recession took hold, the rig count started to decline -- but by then it was declining in nearly every other drilling state, too.

Today the industry is rebounding, especially in New Mexico. But Susana Martinez, the Republican candidate for governor, said in July that the pit rules should be overturned because they drive jobs out of state.

Gov. Bill Richardson's administration "did create jobs -- in Texas and Oklahoma," she told New Mexico business leaders at a roundtable discussion.

The Democratic candidate, current Lt. Gov. Diane Denish, told ProPublica that she won't repeal the rules, but is willing to "revisit them."

"Revisiting the pit rule means reviewing it to determine the exact impact it has had on jobs and whether the rule has achieved the desired outcomes since being implemented," Denish said in an e-mail. "In addition, such a review would also need to determine the impact the decline in the price of natural gas has had on New Mexico's oil and gas industry."

Early campaign finance reports show that the industry has contributed $574,600 to New Mexico's gubernatorial candidates, according to the nonpartisan National Institute on Money in State Politics.

Industry donations account for more than 13 percent of the $2,154,432 Martinez, the Republican, has raised as of early August. The industry has given Denish, the Democrat, $65,950, accounting for 2.1 percent of the $3,177,223 she has raised to date.

Deborah Seligman, of the New Mexico Oil and Gas Association, said she doesn't think the industry's donations will influence the politicians' votes.

"I would hate to think that as a citizen of the state of New Mexico that it would take money in order to have my voice heard," she said. "The thought process is beyond me."

As the candidates weigh in on the pit rules, the oil and gas industry is filing appeals with New Mexico's First Judicial District Court, asking that they be overturned.

The Independent Petroleum Association, an industry-lobbying group, has argued that the cost of complying with the rules is prohibitively high. A coalition of 16 of the state's largest independent producers has filed a complementary appeal.

Mark Fesmire, the Oil Conservation Division's director, thinks the pressure being placed on New Mexico's regulations is likely to crop up elsewhere.

“Industry is making the same claim in Colorado,” he said, “and will probably make similar claims as other states update their rules and follow New Mexico’s lead to protect groundwater.”

Correction: This post incorrectly said that New Mexico’s pit rules went into effect in May 2008, when the rig count was 79. It should have said that the pit rules went into effect in June 2008, when the rig count was 78. The story also said that the Independent Petroleum Association’s appeal to overturn the rules was filed in the state Oil Conservation Division, when it was actually filed with the First Judicial District Court.

What You Need to Know About Hydrofracking

by Mike Webb
ProPublica, Aug. 27, 4:57 p.m.

As drilling for natural gas continues in states across America, PBS’s “Need to Know“ bores down into the issue by taking a closer look at the safety concerns that surround the drilling process known as hydraulic fracturing. In a report produced in collaboration with ProPublica reporter Abrahm Lustgarten, the program investigates how fracking threatens to contaminate drinking water sources for millions of Americans.

And for those of you who complain that we don’t feature enough celebrities in our work, “Need to Know” talks to actor Mark Ruffalo about why he opposes fracking. “Need to Know” airs over the weekend on PBS stations across the country. Click here to find your local station and show time.

If you would like more information on stories related to this episode, be sure to read:

EPA: Chemicals Found in Wyo. Drinking Water Might Be From Fracking

EPA Launches National Study of Hydraulic Fracturing

Natural Gas Drilling: What We Don’t Know

Buried Secrets: Is Natural Gas Drilling Endangering U.S. Water Supplies?]

And read all of our natural gas reporting on the ProPublica “Buried Secrets“ series page.

Feds Warn Residents Near Wyoming Gas Drilling Sites Not to Drink Their Water

by Abrahm Lustgarten
ProPublica, Sep. 1, 2010

Drilling rigs in Wyoming. (Abrahm Lustgarten/ProPublica)

The federal government is warning residents in a small Wyoming town with extensive natural gas development not to drink their water, and to use fans and ventilation when showering or washing clothes in order to avoid the risk of an explosion.

The announcement accompanied results from a second round of testing and analysis in the town of Pavillion by Superfund investigators for the Environmental Protection Agency. Researchers found benzene, metals, naphthalene, phenols and methane in wells and in groundwater. They also confirmed the presence of other compounds that they had tentatively identified last summer and that may be linked to drilling activities.

“Last week it became clear to us that the information that we had gathered” “was going to potentially result in a hazard -- result in a recommendation to some of you that you not continue to drink your water,” Martin Hestmark, deputy assistant regional administrator for ecosystems protection and remediation with the EPA in Denver, told a crowd of about 100 gathered at a community center in Pavillion Tuesday night. “We understand the gravity of that.”

Representatives of the EPA and the Agency for Toxic Substances and Disease Registry, which made the health recommendation, said they had not determined the cause of the contamination and said it was too early to tell whether gas drilling was to blame. In addition to contaminants related to oil and gas, the agency detected pesticides in some wells, and significant levels of nitrates in one sample -- signs that agricultural pollution could be partly to blame. The EPA’s final report on Pavillion’s water is expected early next year.

ProPublica first drew attention to Pavillion’s water in late 2008, and reported extensively on the EPA’s ongoing investigation there last August.

EnCana, the oil and gas company that owns most of the wells near Pavillion, has agreed to contribute to the cost of supplying residents with drinking water, even though the company has not accepted responsibility for the contamination.

EnCana spokesman Doug Hock told ProPublica in an e-mail that the petroleum hydrocarbon compounds the EPA found “covers an extremely wide spectrum of chemicals, many of which aren’t associated with oil and gas.”

“ATSDR’s suggestion to landowners was based upon high levels of inorganics -- sodium and sulfate that are naturally occurring in the area,” he said.

EPA scientists began investigating Pavillion’s water in 2008 after residents complained about foul smells, illness and discolored water, and after state agencies declined to investigate. Last August the EPA found contaminants in a quarter of samples taken during the first stage of its investigation, and the agency announced it would continue with another round of samples -- the set being disclosed now.

In the meeting Tuesday, the agency shared results from tests of 23 wells, 19 of which supply drinking water to residents. It found low levels of hydrocarbon compounds -- various substances that make up oil -- in 89 percent of the drinking water wells it tested. Methane gas was detected in seven of the wells and was determined to have come from the gas reservoir being tapped for energy. Eleven of the wells contained low levels of the compound 2-butoxyethanol phosphate -- a compound associated with drilling processes but that is also used as a fire retardant and a plasticizer.

The scientists also found extremely high levels of benzene, a carcinogen, and other compounds in groundwater samples taken near old drilling disposal pits. Some of the samples were taken less than 200 yards from drinking water sources and scientists expressed concerns that the contaminated water was connected to drinking water wells by an underground aquifer.

“The groundwater associated with some inactive oil and gas production pits” “is in fact highly contaminated,” Ayn Schmit, a scientist with the EPA’s ecosystems protection program, told residents. But she also cautioned that the EPA has not determined the cause of the contamination and is continuing its investigation.

Do ‘Environmental Extremists’ Pose Criminal Threat to Gas Drilling?

by Abrahm Lustgarten
ProPublica, Sep. 8, 2010.

The Patterson-UTI Drilling Company LLC horizontal drilling rig in Chartiers Township, Pa., on April 9, 2010. (Andrew Harrer/Bloomberg via Getty Images)

As debate over natural gas drilling in the Marcellus shale reaches a fever pitch, state and federal authorities are warning Pennsylvania law enforcement that “environmental extremists” pose an increasing threat to security and to the energy sector.

A confidential intelligence bulletin sent from the Pennsylvania Department of Homeland Security to law enforcement professionals in late August says drilling opponents have been targeting the energy industry with increasing frequency and that the severity of crimes has increased.

It warns of “the use of tactics to try to intimidate companies into making policy decisions deemed appropriate by extremists,” and states that the FBI -- the source of some of the language in the Pennsylvania bulletin -- has “medium confidence” in the assessment. A spokesman for the FBI did not immediately respond to a request for comment.

The advisory, a copy of which was obtained by ProPublica, doesn’t cite the specific incidents causing concern. It is also unclear from accounts from state law enforcement officials whether the incidents in Pennsylvania posed a substantial threat, or what effect the advisory might have on public gathering and the debate over drilling in the state.

Pennsylvania State Police said there have been only a few isolated crimes involving drilling facilities.

“We haven’t had any incidents of any significance to date where we have identified a problem, or any environmental extremists,” said Joseph Elias, a captain with the Pennsylvania State Police Domestic Security Division, which was not involved in issuing the bulletin.

An aide to Gov. Ed Rendell -- speaking on behalf of the state’s Homeland Security Office -- said the advisory was based on five recent vandalism incidents at drilling facilities, including two in which a shotgun was reportedly fired at a gas facility.

“All this security bulletin does is raise awareness of local officials. It doesn’t accuse anyone of local activity,” said the spokesman, Gary Tuma. “Where the professionals detect a pattern that may pose a threat to public safety, they have a responsibility to alert local law enforcement authorities and potential victims.”

Anti-drilling activists in the state say that public hearings and other events have been peaceful and that they see no evidence of violent opposition. Given the lack of evidence about "extremist" crimes, they say, the bulletin casts drilling opponents as criminals and threatens to stifle open debate.

"It may very well be designed to chill peoples' very legitimate participation in public decision making," said Deborah Goldberg, an attorney with Earthjustice, a national group pressing for stronger environmental protections. "If people who have concerns fear that they are going to be treated as a security threat they may very well be afraid to go and express their views."

The advisory lists a series of public hearings on drilling permit issues across the state as potential flash points. It also mentions a Sept. 3 screening of the anti-drilling film "Gasland" in Philadelphia that went off without incident. Language describes "environmental activists and militants" on one side of the debate and "property owners, mining and drilling companies" on the other.

Finally, the bulletin groups the public hearings and film screening with protest rallies for anarchist clubs focused on "evading law enforcement," and with a Muslim advocacy group's rally for the release of suspects in an alleged terror plot at Fort Dix, N.J.

The advisory was sent to state law enforcement and local government groups, as well as businesses with a specific concern addressed in the bulletin. It was not intended to be distributed to the public.

In issuing such an advisory, the government has to walk a fine line between the need to respect the fundamental rights of freedom of speech and the need to keep the public safe, said Nathan Sales, an assistant law professor at George Mason University and a former policy development staffer at the U.S. Department of Homeland Security.

"The question is how to accomplish the one with minimal consequences to the other," he said.

A pro-drilling group, the Marcellus Shale Coalition, characterized the vandalism in Pennsylvania as "directed at preventing our industry from safely delivering these resources to Pennsylvanians."

The group's president, Kathryn Klaber, said she supported civil debate over drilling, "but to the extent they go in the other direction, and potentially devolve in a manner that undermines our ability to keep our folks safe, then we will have a problem," she said.

Wyoming Fracking Rules Would Disclose Drilling Chemicals

by Nicholas Kusnetz
ProPublica, Sep. 14, 2010.

A drilling rig in Wyoming. (Abrahm Lustgarten/ProPublica)

New rules going into effect Wednesday will place Wyoming at the forefront of the national push to disclose chemicals used in hydraulic fracturing, the drilling technique that's been suspected of polluting groundwater in parts of the country with vast reservoirs of untapped natural gas.

If the rules work as promised, they should provide the most comprehensive accounting yet of exactly what substances drilling companies are injecting into particular wells, a level of specificity that goes beyond disclosures in Pennsylvania and New York, two states where drilling has been controversial.

As we reported last week, the U.S. Environmental Protection Agency is also pressing companies for more information about the chemicals in fluids, something they say is a trade secret. The agency holds the last in a series of community meetings on hydraulic fracturing, called fracking, on Wednesday in New York.

The new Wyoming rules say companies must submit to the Wyoming Oil and Gas Conservation Commission a full list of chemicals they plan to use in fracking operations on a well-by-well basis. Companies will also have to report the concentration of each chemical used once the job is done.

Drillers retain the right to claim that certain details of the chemical mix are proprietary and should be kept confidential. It remains unclear to what extent industry will make this claim, but the commission's supervisor, Tom Doll, expects those cases will be the exception.

"What we've explained to the operators and what we expect is each of these components, whatever is in that mix, will have to be disclosed," he said.

If so, the Wyoming rules would offer the most detailed look so far at the composition of drilling fluids.

While the EPA has sought disclosure, the agency said the list of chemicals would be kept confidential. In Pennsylvania, a couple of companies responded to public concerns by partially disclosing the chemicals used there. The companies list hazardous components and their concentration by well, but do not provide a full list of chemicals.

New York and Pennsylvania have published lists of chemicals used, but these lists simply name chemicals that may be in any given well and do not detail the mixtures or concentrations. New York has proposed but not yet adopted rules similar to Wyoming's.

Wyoming's rules require companies to list a unique identifier for each chemical. Drillers must give a list of chemicals they plan to use before drilling for commission approval. After the job is done, they must report what they ended up using.

Environmental groups say the jury is out on what ultimately will become public.

"The devil's in the details, and I'm sure there'll be lots of discussion about what can be proprietary," said Deb Thomas, an organizer with the Powder River Basin Resource Council, which has pushed for tighter regulation and full disclosure of fracking fluids.

If a company argues certain chemical mixtures are proprietary secrets, Doll said it would be up to the Wyoming commission, chaired by Gov. Dave Freudenthal, or state courts to rule on disclosure. If a claim of trade secrets were upheld, companies still must disclose the full list to regulators but the information would be kept from the public.

John Robitaille, vice president of the Petroleum Association of Wyoming, said the industry does not expect problems complying with the rules.

Wyoming officials have expressed concerns that the federal government may step in to regulate fracking on state lands. In March, Doll was quoted saying that the coming rules, prompted by Freudenthal, were specifically intended to preclude EPA regulation by requiring greater disclosure.

A spokeswoman for the governor said that was only part of his motivation.

"One thing was the governor's concern in how he answered the average person's question: Governor, how do I know this is safe?" said Leigh Anne Manlove. "There's also a belief that Wyoming is best able to regulate what happens in Wyoming**."**

Thomas applauded the Wyoming oil and gas commission's move, but questioned the governor's motives. As ProPublica reported earlier this month, the EPA recently warned residents of a Wyoming town about noxious chemicals lacing their water supply, saying people should use fans while bathing or washing clothes to avoid the risk of explosion. The agency is investigating whether extensive drilling nearby is the source of the pollution.

"He should be wanting these rules to protect the people that live in this state," Thomas said of Freudenthal, "not to keep the federal government out of the state."

Enforcement is another issue. Drilling companies are supposed to post a notice including the list of chemicals for each well they plan to drill. Doll said his inspectors will check to ensure compliance, but he said he has only 12 of them. Last year, he said, about 3,200 fracking operations were performed in the state.

"We won't hit every one of them," he said. "You can't do that with 12 people."