BUSINESS | JANUARY 21, 2010

Drilling Tactic Unleashes a Trove Of Natural Gas—And a Backlash

By BEN CASSELMAN And RUSSELL GOLD

SHREVEPORT, La.—A mounting backlash against a technique used in natural-gas drilling is threatening to slow development of the huge gas fields that some hope will reduce U.S. dependence on foreign oil and polluting coal.

The U.S. energy industry says there is enough untapped domestic natural gas to last a century—but getting to that gas requires injecting millions of gallons of water into the ground to crack open the dense rocks holding the deposits. The process, known as hydraulic fracturing, has turned gas deposits in shale formations into an energy bonanza.

The industry's success has triggered increasing debate over whether the drilling process could pollute freshwater supplies. Federal and state authorities are considering action that could regulate hydraulic fracturing, potentially making drilling less profitable and giving companies less reason to tap into this ample supply of natural gas.

Exxon Mobil Corp. placed itself squarely in the middle of the wrangling when it agreed last month to pay $29 billion for gas producer XTO Energy Inc., a fracturing pioneer. Wary of the rising outcry, Exxon negotiated the right to back out of its deal if Congress passes a law to make hydraulic fracturing illegal or "commercially impracticable."

On Wednesday, Exxon Chairman and Chief Executive Rex Tillerson faced questions about the environmental impact of hydraulic fracturing at a Capitol Hill hearing on the merger.

"We can now find and produce unconventional natural-gas supplies miles below the surface in a safe, efficient and environmentally responsible manner," Mr. Tillerson told members of the House Energy and Commerce Committee.

Criticism of hydraulic fracturing was muted at the hearing, with most representatives focusing on the potential benefits of increased gas use. But the merger has given drilling opponents a new target.

"It puts Exxon at front and center of this whole issue," said Michael Passoff, associate director of As You Sow, an environmental-minded investment group.

Even before the Exxon-XTO deal, the controversy over hydraulic fracturing, also known as "fracking" or "fracing," was growing.

Oilmen were injecting water into wells to free up valuable oil and gas as far back as the 1940s. But in the past decade the technique has really taken off. First in East Texas and in the outskirts of Fort Worth, companies began pumping water under enormous pressure to see if they could break open dense shale-rock formations to release gas.

These initial efforts were largely welcomed by communities, with homeowners and landlords often receiving lucrative checks for the mineral rights that allowed companies to drill on their land.

When early efforts succeeded, the companies began running bigger fracturing jobs, using more water and higher pressure—and in turn searching for even more gas-bearing shale deposits.

This took the gas industry into places where drilling was less common in modern times, including downtown Fort Worth, northeastern Pennsylvania and within the city limits of Shreveport, La.

Hydraulic fracturing and some other technology improvements have created a way to tap a domestic fuel source that has proved abundant. U.S. natural-gas production has risen about 20% since 2005 in large part because of these developments, making gas a much bigger player in energy-policy planning.

Natural gas heats more than half of U.S. homes and generates a fifth of America's electricity, far less than coal, which provides the U.S. with nearly half its power. The industry and its allies are promoting natural gas a bridge fuel to help wean the U.S. off coal, which emits more global-warming gases, and imported oil until renewable fuels are able to meet the demand.

What most worries environmentalists isn't the water in the fracturing process—it's the chemicals mixed in the water to reduce friction, kill bacteria and prevent mineral buildup. The chemicals make up less than 1% of the overall solution, but some are hazardous in low concentrations.

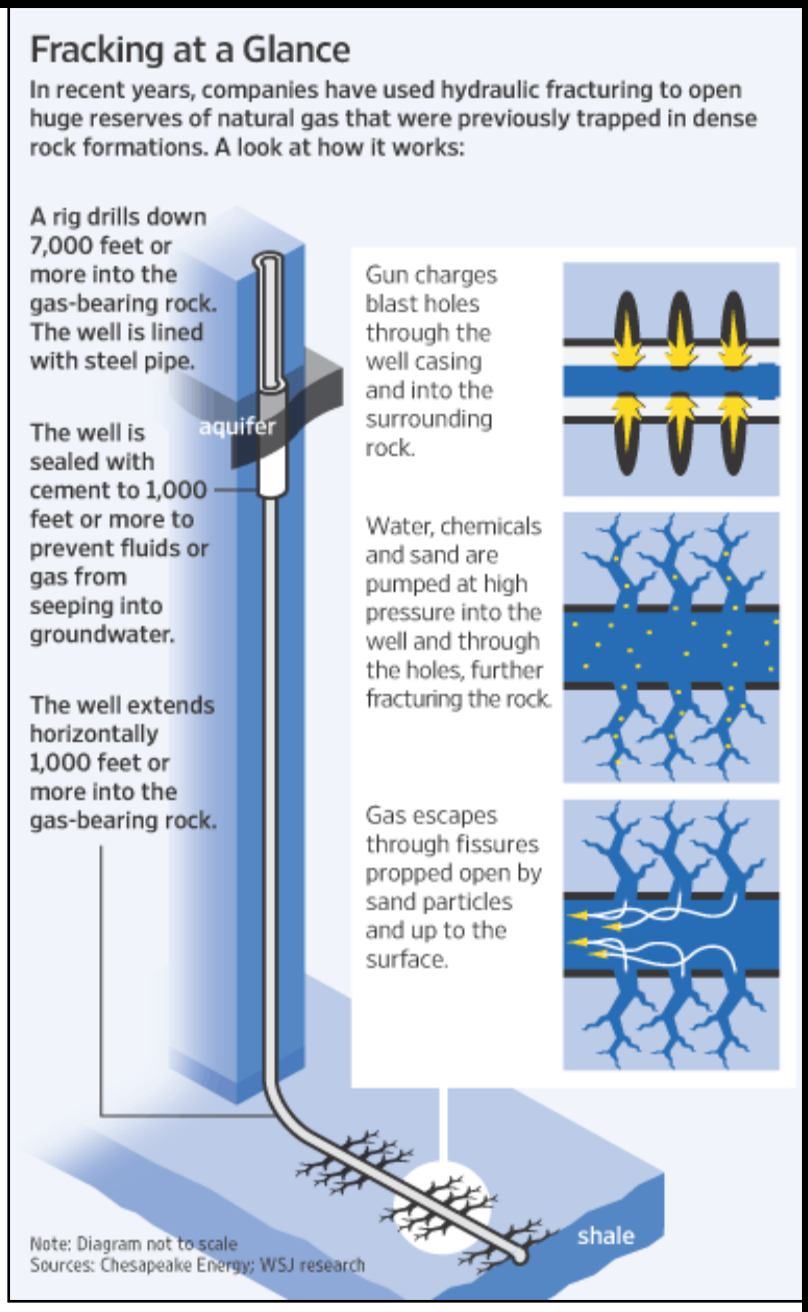
Today, the industry estimates that 90% of all new gas wells are fractured. Shale—a dense, nonporous gas-bearing rock—won't release its gas unless it is cracked open, and other types of formations also produce more gas when fractured. Easier, more porous formations, which don't require fracturing, were tapped in earlier decades and have largely dried up.

As the industry has honed its techniques, hydraulic-fracturing operations have become more complex, requiring far more water and chemicals—millions of gallons per well, rather than tens or hundreds of thousands of gallons in the past.

Environmentalists and some community activists fear hydraulic fracturing could contaminate drinking-water supplies. They point to recent incidents that they say are linked to fracturing, including a water-well explosion in Dimock, Pa., and a chemical spill here in Shreveport.

The industry says fracturing is safe and argues that there have been only a handful of incidents among the millions of wells that have been fractured over the past 50 years. "Hydraulic fracturing has been used since the 1940s in more than one million wells in the United States. It's safe and effective," says Exxon spokeswoman Cynthia Bergman.

Even if the industry can make its case, it still must deal with the public-relations and political fallout from some of the questionable incidents.



On a recent Friday morning, a crew from Cudd Energy Services worked to fracture a Chesapeake Energy Corp. well in Caddo Parish, La., the heart of the Haynesville Shale gas field. While cattle chewed grass in a field across the street, a team of Chesapeake and Cudd employees monitored computer readouts as 21 diesel-powered pumps forced nearly 3,800 gallons of water a minute down a well that reached two miles into the earth.

It is a process Chesapeake says it has learned how to do both efficiently and safely. "We've done it 10,000 times in the company's history without incident," said Aubrey McClendon, Chesapeake's chairman and chief executive officer, in a separate interview.

But in a coffee shop in nearby Shreveport, Caddo Parish Commissioner Matthew Linn said he had concerns after more than a dozen cows died during a Chesapeake Energy fracturing operation last year. A preliminary investigation linked the deaths to chemicals that spilled off the well site into a nearby pasture. A Chesapeake spokesman says the company compensated the cattle's owner and has taken steps to prevent a similar incident in the future.

"I'm all for drilling, and I want to get the gas out from underneath us," Mr. Linn said. "But at the same time, how do you balance human life and quality of life and clean water against that?"

Natural-gas companies say what's at work is fear of the new. "When you introduce something like hydraulic fracturing in a part of the country that hasn't had any experience with it, I think it's natural for there to be questions about the procedure," says Mr. McClendon.

Regardless, the industry faces a real prospect of tightened rules that could make it harder, or impractical, to use hydraulic fracturing. In June, congressional Democrats introduced legislation that would regulate fracturing at the federal level for the first time. The bills remain in committee. In October,

the house formally asked the Environmental Protection Agency to study the risks posed by fracturing.

Several states, including Colorado, Pennsylvania and New York, have either passed or are considering tightening regulations on fracturing and related activities. Members of the House of Representatives pushing for new legislation argue that federal oversight is needed to protect water supplies because state regulations vary widely.

The industry worries that new regulations would hurt the thin margins on many gas wells and cut the financial incentive to tap the U.S.'s vast supply of gas. "There is an anticipation that more federal oversight would add enough costs to make it uneconomical, even it wasn't outright prohibited," said Gary Adams, vice chairman of Deloitte LLP's oil and gas consulting division.

Already, the growing concerns about the practice are causing some companies to rethink where they drill. Chesapeake last fall publicly abandoned plans to drill in the watershed that provides New York City with its drinking water after opposition from city officials and others who feared a spill could contaminate the water. Talisman Energy Inc. is shifting its drilling effort away from New York as well.

There have been attempts to regulate fracturing before. The 1974 Safe Water Drinking Act regulated wells that injected liquids underground. The federal courts ruled the law covered fracturing in a 1990s lawsuit from Alabama. But the technique was exempted from federal oversight in the 2005 Energy Bill.

Some argue there is little really known about whether fracturing poses a genuine risk to water supplies. Hannah Wiseman, a visiting law professor at the University of Texas, Austin, says tighter regulation may be warranted. "There just isn't enough information out there right now about the effects," she said.

Some of the potential threats are clearer than others, however. Gas-bearing shale formations typically lie a mile or more below the surface, with thousands of feet of nonporous rock separating them from even the deepest freshwater aquifers.

Most people agree that means that if a fracturing job is done correctly, it would be virtually impossible for water or chemicals to seep upward into drinking water supplies.

The industry argues that there has never been a proven case of water contamination caused by fracturing. But regulators have tied multiple incidents to oil and gas drilling more generally. Environmental groups point out that wells aren't always constructed properly. Moreover, they say, storage ponds that hold chemical-laced water after fracturing is complete can overflow, and trucks carrying chemicals can crash.

A poorly sealed well is the alleged cause of gas escaping into an underground aquifer in Dimock, Pa. Gas also built up in one resident's water well, causing an explosion in January 2009.

The company that drilled the wells, Cabot Oil & Gas, paid a $120,000 fine to settle the matter with the state, but has denied responsibility for the contamination and says fracturing couldn't have been the cause.

"I could never sell this house now," said Dimock resident Craig Sautner, who now has drinking water shipped to him by Cabot. "Our pristine water that we used to have? It's done."

Whether it is the act of fracturing itself or the risk of contamination from related activities is somewhat beside the point, says Amy Mall, a senior policy analyst for the Natural Resources Defense Council, an environmental group that has raised concerns about fracturing. "Ultimately it's semantics. Somebody's water got contaminated," she says.

Still, for Exxon, the hearings this week presented an opportunity to highlight its investment in developing U.S. energy supplies and creating jobs. Most of its investments in recent years have been overseas. And Exxon executives usually face congressional grilling only when oil and gasoline prices skyrocket.
"This should probably be a very pleasant change of pace for Exxon Mobil because it's not going to be an argument about high oil and gasoline prices," says William Hederman, an energy analyst with Washington research firm Concept Capital.