

Hydraulic Fracturing

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The Hydraulic Fracturing Process

Hydraulic Fracturing (hydrofracking or fracking) is a drilling process that uses water, sand and chemicals to extract natural gas from shale rock. This is done in a four-step process:

1. The well is first drilled about a mile underground, until it hits the shale layer of the earth. The drill then turns at a ninety-degree angle and continues to run into the shale for about another mile.
2. Charges are detonated in the pipe causing the shale to fracture.
3. A high-pressured injection of sand, water and chemicals are driven into the fissures.
4. The gas then flows up the pipe along with the mixture of fluid. The sand keeps these fissures open thereby allowing gas and wastewater flow for years.¹

It has been for years widely known for years within the gas industry that shale has an abundance of natural gas, however, it has been just too difficult and expensive to extract. George Mitchell, a Texas wildcatter, is credited with inventing the fracking process in the 1980's. Mitchell found that a mix of horizontal drilling and fracking could pry natural gas efficiently. In fact, he soon discovered, the more water he used the better it was for capturing the gas. In the most extreme cases it can take up to 13 million gallons of water to open up a single well.²

The horizontal drilling component of hydrofracking is a recent development and is what has spurred the boom of fracking in the United States. Gas companies are able to more effectively extract gas from the shale with this new technology.

Clean Energy?

Many contend that natural gas is a cleaner and more abundant energy source than oil or coal. In a speech given earlier this year, President Barack Obama hailed natural gas as an alternative to reducing our country's oil addiction. "The potential

¹ Bryan Walsh, "The Gas Dilemma," *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

² Suzanne Goldenberg, "Water Shortages Threaten Renewable Energy Production, Experts Warn," *Guardian.co.uk*, 27 June 2011, *Guardian.co.uk*, 30 June 2011, <http://www.guardian.co.uk/environment/2011/jun/27/water-shortages-threaten-renewable-energy>.

for natural gas is enormous,” he said.³ There are three reasons the push for natural gas is so high right now. One, there is a booming demand for oil in emerging economies like China and India. Two, the disaster of Japan’s Fukushima nuclear plant has greatly diminished talks of nuclear power resurgence as a viable alternative energy. Three, the continuing turmoil in the Middle East has many concerned about the stability of gas prices given the U.S.’s dependence on crude oil.⁴ Natural gas is a viable option for fueling vehicles, thereby dramatically decreasing our dependence on oil from the Middle East. Also, as carbon output eventually becomes regulated and or taxed in the U.S., utility companies would benefit by switching from coal (one of the largest producers of carbons in the atmosphere) to natural gas as a power source.

The Marcellus Shale Formation, considered the U.S.’s largest natural gas reservoir, rests under New York, Pennsylvania, West Virginia, and Ohio. According to Terry Engler, a geoscientist at Penn State University, the gas underlying this region is equivalent to 86 million barrels of oil.⁵ Currently, Pennsylvania has had more than 3,000 wells drilled since 2008, and has a plan to drill thousands more every year.

But the solution is not that easy. As more and more fracking drills broke the earth’s lithosphere, the environmental damage began. Immediately, there were complaints about spills and air pollution coming from the wells. Because fracking is a water intensive process, there is fear of wastewater contamination. According to ProPublica, an investigative news site, there have already been over 1,000 cases reported, “in which various aspects of the fracturing lifecycle have affected water supplies, including spills of fracturing fluid waste, cracking of underground cement

³ Bryan Walsh, “The Gas Dilemma,” *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

⁴ Bryan Walsh, “The Gas Dilemma,” *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

⁵ Bryan Walsh, “The Gas Dilemma,” *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

and well casings meant to enclose the fracturing process, and methane gas traveling large distances underground through faults and fractures.”⁶

Most of these incidents occurred in Pennsylvania. Large landowners and farmers have leased gas rights on their land to oil companies for several years. Once it was discovered that the Marcellus Formation had the largest supply of natural gas in the U.S. lease prices skyrocketed, before 2008 the leases went for a few dollars but today farmers and landowners are getting \$5000 per acre plus a small percentage of royalties by the sale gas extracted from their land.⁷ In Bradford County, PA, 93% of landowners lease their land to Chesapeake Oil Company. Chesapeake, then installs hydrofracking drills, also called well pads on the landowners property. Some of these pads are as close as 400 feet to the landowner’s homes.

Time Magazine featured families in rural Pennsylvania whose lives have been severely affected by well pollution. Bonnie and Truman Burnett built a second dream home in Bradford County, PA, which is situated in the northeastern part of the state. It was a perfect hidden paradise where they could bring their grandchildren to swim and fish in their beautiful wooded pond on the property. Not anymore, on the property adjacent to theirs, a well pad went in about 400 feet from their home. While they were gone tens of thousands of gallons of the drilling water mixture ran down onto their property killing 50-foot swath of trees and all of the wildlife in the pond. Gone forever are the bass and perch they used to fish for. Then came the second leak from the well pad – 3,000 to 5,000 gallons of hydrochloric acid leaked on to their property contaminating their well water and rendering it undrinkable. Even worse, the contaminated pond has a stream running from it that feeds into the Susquehanna River.⁸ This river provides drinking water for millions of Pennsylvanians. The well pad next to their property continues to run twenty-four hours a day.

⁶ Abraham Lustgarten, “Broad Scope of EPA’s Fracturing Study Raise the Ire of Gas Industry,” *ProPublica*, 7 April 2010, *ProPublica*, 15 July 2011, <http://www.propublica.org/article/broad-scope-of-epas-fracturing-study-raises-ire-of-gas-industry>.

⁷ Bryan Walsh, “The Gas Dilemma,” *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

⁸ Bryan Walsh, “The Gas Dilemma,” *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

Shari Varkson, who also lives in Bradford County, has a well pad 500 feet from her home. She noticed the water coming out of her kitchen sink was sputtering. Her well is contaminated by methane; the levels are explosively high, so much so that when she turns the tap on and strikes a match the water bursts in to flames. She asks, "How contaminated is the water? How severely contaminated is the water and with what? What can be done to correct this?"

A third family, the Johnsons, had to euthanize thirty-six of their cattle because radioactive strontium leaked out of a gas company holding pond and their cattle drank it.

Stories of contaminated livestock and flaming faucets have generated heated debates throughout the regions affected by the fracking process. Some residents in these "oil boom towns" are benefitting because oil company contract workers are filling up neighboring hotels and restaurants. Local gas station owners profit as well with the influx of traffic from large oil company trucks.

The gas companies' love for drilling in Pennsylvania is three-fold, one, the abundance of natural gas in the Marcellus Shale Formation; two, Pennsylvania is the largest state gas-drilling state without a tax on gas extraction; and three Pennsylvania's penalties for violating state regulations lag many other states."⁹ And Pennsylvania was anxious to attract the oil companies to their state in hopes of an economic boom. However, in terms of regulation they were under prepared and it cost them. "We were not ready for this," said John Quigley, former head of Pennsylvania's Department of Conservation and Natural Resources. "We weren't ready for the technology or the scale or the pace." The chemicals used in the fracking process contaminated their drinking supply. It was one of the few states that allowed partially treated drilling wastewater to be discharged into rivers from which drinking water is drawn for residents. "Since drilling companies began using high-volume hydraulic fracturing in earnest in 2008 to extract natural gas from the shale, they have taken millions of barrels of the briny waste to treatment plants that

⁹ The Associated Press, "Pennsylvania environmental officials suggest stronger hydrofracking rules are needed," www.syracuse.com, 2 June 2011, 27 June 2011, http://www.syracuse.com/have-you-heard/index.ssf/2011/06/pennsylvania_environmental_off.html.

discharge into rivers where utilities also draw drinking water for hundreds of thousands, if not millions, of Pennsylvanians.”¹⁰

Environmental Legislation

In the United States, the gas industry is exempt from federal regulation, leaving the oversight to state governments that have been slow in keeping up with the growth rate of this kind of drilling.¹¹ Pennsylvania Governor, Tom Corbett, is now recommending tougher laws to protect the state’s drinking water supply from further pollution. The state’s Department of Environmental Protection made the following recommendations to the Governor’s office:

- Restrict well drilling from 100 to 1,000 feet of any public water supply;
- Require comprehensive tracking of drilling wastewater;
- Expand buffer requirements between gas wells and private water wells from 200 to 500 feet;
- Extend the driller’s presumptive liability for pollution or water loss from 1,000 to 2,500 feet from a gas well.

Because of the Pennsylvania’s lack of regulation, which resulted in exponential growth and environmental problems, New York State legislation passed a bill that would formally ban hydrofracking there, but former Governor David Paterson vetoed the bill putting in effect a one-year ban, that ended on July 1, 2011. The ban did provide NY’s Department of Environmental Conservation (DEC) time to research the mistakes made in Pennsylvania and determine the best way to regulate drilling.¹² Current Governor Andrew Cuomo gave the DEC a July 1 deadline to complete the study and issue its results.

An intense battle is being fought in New York between environmental groups and politicians; the executive branch and legislators; and citizens that oppose

¹⁰ Associated Press, “Pennsylvania officials say flow of fracking wastewater to public water treatment facilities has almost halted,” [www.Syracuse.com](http://www.syracuse.com/news/index.ssf/2011/06/pennsylvania_officials_say_flo.html), 3 June 2011, 28 June 2011, http://www.syracuse.com/news/index.ssf/2011/06/pennsylvania_officials_say_flo.html

¹¹ Bryan Walsh, “The Gas Dilemma,” *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

¹² Glenn Coin, “NY State Assembly set to extend hydrofracking moratorium to June 2012,” [www.syracuse.com](http://www.syracuse.com/news/index.ssf/2011/06/assembly_set_to_extend_hydrofr.html), 6 June 2011, 27 June 2011, http://www.syracuse.com/news/index.ssf/2011/06/assembly_set_to_extend_hydrofr.html.

hydrofracking and those that support it. The environmental groups fear that wastewater from the drilling is “contaminated with toxic materials...including naturally occurring radioactive elements, or carcinogens like benzene. Proponents, on the other hand, focus on the potential benefits. Drilling for natural gas has been promoted because it burns more cleanly than coal, can reduce dependence on imported energy sources, and can also bring jobs to economically battered regions of the state.”¹³

On June 6, 2011, The NY State Assembly leaders announced that they were seeking a moratorium to extend the then existing hydrofracking ban until June 2012. They contend the DEC’s report due July 1, 2011, needs to be thoroughly studied before legislative action can take place.¹⁴ Governor Cuomo was clear on his fracking stance by issuing the following statement during his campaign last year: “The economic potential from the Marcellus Shale could provide a badly needed boost to the economy of the Southern Tier and even many environmentalists agree we want to produce more domestic natural gas that reduces the need for environmentally damaging fuel sources such as coal.” His campaign further added, “Existing watersheds are sacrosanct, and Andrew Cuomo would not support any drilling that would threaten the state’s major sources of drinking water.”¹⁵

“In May, Attorney General Eric T. Schneiderman of New York filed a lawsuit against several federal agencies that are affiliated with the Delaware River Basin Commission, a multistate entity including New York that regulates the river basin, to block the commission from issuing final regulations on hydrofracking until a full environmental review could be conducted. This month, Mr. Schneiderman also subpoenaed five of the largest companies in the country that do natural gas drilling to determine whether they were accurately disclosing the risks of hydrofracking. “Before any decisions on drilling are made, it is our responsibility to follow the facts

¹³ Danny Hakim and Nicholas Confessore, “Cuomo will seek to lift ban on hydraulic fracturing,” www.nytimes.com, 30 June 2011, 1 July 2011, <http://www.nytimes.com/2011/07/01/nyregion/cuomo-will-see-to-lift-drilling-ban.html>.

¹⁴ Glenn Coin, “NY State Assembly set to extend hydrofracking moratorium to June 2012,” www.syracuse.com, 6 June 2011, 27 June 2011, http://www.syracuse.com/news/index.ssf/2011/06/assembly_set_to_extend_hydrofr.html.

¹⁵ Danny Hakim and Nicholas Confessore, “Cuomo will seek to lift ban on hydraulic fracturing,” www.nytimes.com, 30 June 2011, 1 July 2011, <http://www.nytimes.com/2011/07/01/nyregion/cuomo-will-see-to-lift-drilling-ban.html>.

and understand the public health and safety effects posed by potential natural gas development,” Mr. Schneiderman said earlier this year.”¹⁶

The DEC issued a 1,000-page report on its findings earlier this month along with a two page document titled, “Fact Sheet: What We Learned From Pennsylvania,” both of these documents can we found on there website: www.dec.ny.gov. The four main component that were studied from Pennsylvania’s missteps in the fact sheet are:

1. Preventing Methane Gas Migration;
2. Avoiding Fracturing Fluid Releases;
3. Preventing Uncontrolled Wellbore Release of Flowback Water and Brine;
4. Averting High Total Dissolved Solids (TDS) Discharges.¹⁷

The DEC also said hydrofracking would be permitted on private lands “under rigorous and effective controls.” Among the other restrictions, there would be no permits for drilling “within 500 feet of a private water well or domestic-use spring,” or within 2,000 feet of a public reservoir or drinking water supply without further study.” The DEC is will create an advisory panel of environmental and industry experts to make recommendations on monitoring steps to mitigate potential hazards and explore fees that would be levied on the industry.¹⁸ However, the ban will continue on both Syracuse’s and New York City’s watersheds. These watersheds provide drinking water for about 9 million of the state’s residents.

States With Drilling Disclosure Rules

As of this writing, five states have passed laws or administrative rules that require drilling companies to reveal some or all of the chemicals used when fluids are injected into the shale to extract the natural gas from its foundation.

¹⁶ Danny Hakim and Nicholas Confessore, “Cuomo will seek to lift ban on hydraulic fracturing” www.nytimes.com, 30 June 2011, 1 July 2011, <http://www.nytimes.com/2011/07/01/nyregion/cuomo-will-seek-to-lift-drilling-ban.html>.

¹⁷ “News” “Fact Sheet: What We Learned From Pennsylvania,” www.dec.ny.gov, July 2011, 6 July 2011, http://www.dec.ny.gov/docs/administration_pdf/pafactsheet072011.pdf.

¹⁸ Danny Hakim and Nicholas Confessore, “Cuomo will seek to lift ban on hydraulic fracturing” www.nytimes.com, 30 June 2011, 1 July 2011, <http://www.nytimes.com/2011/07/01/nyregion/cuomo-will-seek-to-lift-drilling-ban.html>.

Wyoming*	All chemicals used in fracking.	Volume and concentration of the products are disclosed, but not of individual ingredients in chemical mixtures.	Disclosed to regulators, secret to the public.	Yes, via state website.
Arkansas	All chemicals used in fracking.	No.	Exempt.	Yes, via state website.
Pennsylvania	All hazardous chemicals used at an individual well after fracking is complete.	For hazardous chemicals only.	Unclear.**	No; available by request.
Michigan	Must submit Material Safety Data Sheets for hazardous chemicals.	For hazardous chemicals only.	Exempt.	Yes, via state website.
Texas***	All chemicals used in fracking.	For hazardous chemicals only.	To be determined.	Yes, via state website and FracFocus, an industry website.

**Wyoming was the first state to require disclosure of fracking fluids.*

*** Pennsylvania officials did not return calls or e-mails seeking clarification.*

**** The Texas legislature passed the law in May 2011, but state regulators have until 2013 to complete the actual rules.¹⁹*

Stakeholder Analysis

Economic Impact- Dimock, Pennsylvania is a poor rural farming community. Many residents of the community were struggling as a result of the recession. Like so many others across the nation, foreclosure numbers were increasing daily. Therefore, when representatives from Cabot Oil & Gas came to Dimock, PA, in 2008, they sold hope and a promise that many landowners wanted to hear “sign a gas lease and the land might finally pay for itself.” 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.²⁰

¹⁹ “ProPublica,” “Critics find gaps in state laws to disclose hydrofracking chemicals, [ProPublica](http://www.syracuse.com/news/index.ssf/2011/06/critics_find_gaps_in_state_law.html), 21 June 2011, 27 June 2011, http://www.syracuse.com/news/index.ssf/2011/06/critics_find_gaps_in_state_law.html.

²⁰ Abraham Lustgarten, “Officials in three states pin water woes on gas drilling,” [ProPublica](http://www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426), 26 April 2009, [ProPublica](http://www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426), 15 July 2011, <http://www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426>.

Tim Considine, an energy economist, at the University of Wyoming, co-authored an industry-sponsored study in early 2010 that estimated that Marcellus drilling would create or support 88,000 jobs that year and more than 100,000 in 2011, plus billions of dollars in economic value for the state.²¹ It is important to remember that industry-sponsored studies mean the University and the person hired to do the report are paid by the stakeholder who has something to gain. In this case, Mr. Considine, economically benefitted from the gas industry sponsored study. Further, in reality, relatively few of those jobs directly involve drilling and fracking —most of that work goes to roughnecks with Texas or Oklahoma license plates on their pickups.²²

As the gas started flowing in Dimock, some of the residents began to build some wealth. A few landowners there will earn more than a half-million dollars this year. The local economy is also stimulated because Cabot hires some contract workers. But most of the economic injection is the result of out of state contract workers filling up motels, restaurants, and bars.

It seemed like God's providence," 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."²³ However, the Farnellis are now forced to live with a compromise: revenues from the drill lease versus methane contaminated water. They now spend \$100 a month to buy bottled water. The last royalty check they got was for \$97.²⁴

In a 2003 study, the U.S. Department of Health and Human Services investigated nearby residents' complaints of "dizziness," "blacking out," "rashes,"

²¹ Bryan Walsh, "The Gas Dilemma," *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

²² Bryan Walsh, "The Gas Dilemma," *TIME Publishing*, 31 March 2011, *TIME*, 28 June 2011, <http://www.time.com/time/magazine/article/0,9171,2062456,00.html>.

²³ Abraham Lustgarten, "Officials in three states pin water woes on gas drilling," *ProPublica*, 26 April 2009, *ProPublica*, 15 July 2011, <http://www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426>.

²⁴ Abraham Lustgarten, "Officials in three states pin water woes on gas drilling," *ProPublica*, 26 April 2009, *ProPublica*, 15 July 2011, <http://www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426>.

"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 "combustible gases, including methane, in private well water present an urgent public health hazard."²⁵

Water contamination is not the only problem. Land contamination is another grave concern. Most of the fracking wells are located on farmland. These farms supply fresh produce for the region. Richard Seymour runs a certified natural farm in, Dimock, PA, and grows fresh produce, which supplies food for residents of the state. His well is running red and turbid, and it bubbles with so much gas that he fears he'll lose that agricultural certification.²⁶ "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."²⁷

New York State's proposed regulation will allow drilling on private land only. Produce or livestock farms occupy most of this private land. There is a real danger of killing an industry that supports the state with food. Not to mention the water supply of the states 14 million residents.

Air pollution is another consequence of the current hydrofracking method. When pollutants become air borne, the EPA has the authority to regulate. EPA Secretary Lisa Jackson says the regulations will control air pollution in areas that face new impacts from fracking noting the growing smog problems in rural areas where drilling is taking place. "There is a lot of activity around those wells and that has an impact on air quality — and we know it already. The EPA will soon be coming out with regulations to deal with the air quality around natural gas production," she says.²⁸

²⁵ Abraham Lustgarten, "Officials in three states pin water woes on gas drilling," *ProPublica*, 26 April 2009, *ProPublica*, 15 July 2011, <http://www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426>.

²⁶ Abraham Lustgarten, "Officials in three states pin water woes on gas drilling," *ProPublica*, 26 April 2009, *ProPublica*, 15 July 2011, <http://www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426>.

²⁷ Abraham Lustgarten, "Officials in three states pin water woes on gas drilling," *ProPublica*, 26 April 2009, *ProPublica*, 15 July 2011, <http://www.propublica.org/article/officials-in-three-states-pin-water-woes-on-gas-drilling-426>.

²⁸ Sustainable Business, "EPA Promises Hydraulic Fracturing Regs, NY lifts Ban," www.sustainablebusiness.com, 1 July 2011, 17 July 2011, <http://www.sustainablebusiness.com/index.cfm/go/news.display/id/22627>.

Last, hydrofracking methods are that they use enormous amounts of fresh water to extract the natural gas. Unlike in Pennsylvania, where the chemicals used in natural gas drilling have contaminated drinking supplies, the problems in Texas are a matter of water quantity, not water quality.²⁹ It takes up to 13million gallons of water to open up a single well in the Eagle Ford shale region in south Texas, where water is in perennially short supply. Such demands are going to block development of areas in south and west Texas, which are suffering water shortages.³⁰

Currently the U.S. government subsidies' fresh water, the gas and oil industry pay the same rates for water as any citizen of this country despite using millions and millions of gallons. Fresh water is not an unlimited natural resource. In fact, scientist Dr. Kevin Mulligan, a professor of Economics and Geography at Texas Tech, believes that the largest aquifer in the U.S., the Ogallala Aquifer, will run out of usable water by 2030.³¹ This data is spurring investors like Texas tycoon, T. Boone Pickens, to invest heavily in water. Pickens predicts that water will become bigger commodity than oil.³²

Recommendations

If states continue to allow gas companies to use the current hydrofracking methods, environmental disaster will follow, potentially crippling any economic growth in the states where the drilling occurs. A more innovative way to extract the natural gas is needed. Hydrofracking is dangerous on four fronts: water contamination, land contamination, air pollution, and excess water usage. Further, it put gas companies and state governments at risk for potential punitive damages resulting from unsafe drilling methods.

²⁹ Suzanne Goldenberg, "Water Shortages Threaten Renewable Energy Production, Experts Warn," [Guardian.co.uk](http://www.guardian.co.uk), 27 June 2011, [Guardian.co.uk](http://www.guardian.co.uk), 30 June 2011, <http://www.guardian.co.uk/environment/2011/jun/27/water-shortages-threaten-renewable-energy>.

³⁰ Suzanne Goldenberg, "Water Shortages Threaten Renewable Energy Production, Experts Warn," [Guardian.co.uk](http://www.guardian.co.uk), 27 June 2011, [Guardian.co.uk](http://www.guardian.co.uk), 30 June 2011, <http://www.guardian.co.uk/environment/2011/jun/27/water-shortages-threaten-renewable-energy>.

³¹ WordPress, "The Ogallala Aquifer is Drying Up," April 2010, [www.seeker401.wordpress.com](http://seeker401.wordpress.com), 17 July 2011, <http://seeker401.wordpress.com/2010/05/09/the-ogallala-aquifer-is-drying-up/>.

³² Investopedia, "Water Investments: Rising with the Tide," 23 February 2011, [Investopedia.com](http://stocks.investopedia.com), 17 July 2011, <http://stocks.investopedia.com/stock-analysis/2011/Water-Investments-Rising-With-The-Tide-PHO-FLW-BMI-DOW0223.aspx>.

New York has been so vigilant in protecting its citizens, water, and land up to this point. It would be regrettable to see them proceed without strong regulation. There is no contesting the benefits of natural gas as a viable replacement to both oil and coal. Many environmental groups are not opposed to extracting natural gas, but they are fearful of the already proven dangers. “Until they make a commitment to updating the state’s regulations and the legal framework, we would oppose them moving forward in New York,” said David Gahl, policy director of Environmental Advocates of New York (EANY). “Our position has always been that the state needs the right framework to govern this process,” he said. “We’re not against driving a car, but a car needs to have seat belts, speed limits and cops on the road.”³³ State Assembly Speaker Sheldon Silver (D-Manhattan) agrees with the EANY’s director. She told the *Buffalo News* that ending the moratorium is premature. “There are simply too many unknowns to risk inflicting long-term, potentially catastrophic damage to New York’s environment and water supply,” he says. “At a minimum, New York should wait until the [U. S. Environmental Protection Agency] completes its own study on hydraulic fracturing before even considering whether the state should permit this type of drilling activity.”³⁴

There is a Canadian company called Gasfrac Energy Incorporated that has invented an alternative method to hydrofracking. Currently, this technology is more expensive, but safer. Historically, very few companies who are profiting from current methodology will invest in research and development unless government regulation forces them to do so. For example, any oil or gas drilling off of Brazil’s coast requires a two-pipe system. If BP Oil had used a safer two-drill system in the well that exploded in the Gulf of Mexico, it would cost them \$4 billion more to build the rig; however, they chose to forgo this method. In total this rig would have produced less than 1% of BP’s revenue. Ultimately, this decision cost the company over \$40 billion dollars in clean up and recovery costs. It also cost their

³³ Danny Hakim and Nicholas Confessore, “Cuomo will seek to lift ban on hydraulic fracturing” www.nytimes.com, 30 June 2011, 1 July 2011, <http://www.nytimes.com/2011/07/01/nyregion/cuomo-will-see-to-lift-drilling-ban.html>.

³⁴ Sustainable Business, “EPA Promises Hydraulic Fracturing Regs, NY lifts Ban,” www.sustainablebusiness.com, 1 July 2011, 17 July 2011, <http://www.sustainablebusiness.com/index.cfm/go/news.display/id/22627>.

shareholders billions of dollars, as their stock plummeted in the months following the disaster in the Gulf.

My hope is that New York and the other states along the Marcellus Shale Foundation form an alliance to protect their citizens, their air quality, their land and water from contamination. Let these gas companies create jobs by investing in human capita and innovation. There is already an alternative drilling method, I am confident that there will be many more given necessity and opportunity.

Since New York is the home of the Iroquois Nation, let us hope they adopt the Iroquois' seven-generation outlook, which is the idea that decisions should be considered for their impact on the seventh generation to come. New York must ask itself what happens if the gas ruins the land and the water? What then?