

From: Susan Wessels [mailto:slwessels2010@gmail.com]
Sent: Saturday, August 15, 2015 7:27 AM
To: PUC
Subject: Docket 14-380

Dear PUC Commissioners

My husband and I are being told the home we built 20 years ago in Rindge is in the “study zone” of the planned Kinder Morgan pipeline. Almost our entire wooded 3-acre lot will be permanently cleared of all the natural and planned vegetation we have so lovingly planted and maintained to provide a peaceful, natural and private setting. The water well will be destroyed, likely by blasting harmful chemicals into our ground and ground water. The house, itself, would remain, tho in an uninhabitable form, since it will be surrounded by denuded land which itself will be sprayed regularly with toxic chemicals to prevent vegetation from growing. We would be subjected to pipeline leaks, un-potable water, formaldehyde blow-back from nearby release valves, etc.

Our house represents our most important financial asset. That will be destroyed. Despite poor health, I will be required to live in this house after it is essentially destroyed. The exposure to chemicals of various sorts will, no doubt, influence the health and life expectancy of both of us. Yet Kinder Morgan will not buy the house, just the easement they need to build the pipeline just feet away, in our back yard.

I would think that when the stakes are this high for people, our State public officials would ensure this was truly for the greater good and would protect those of us with the most to lose, from catastrophe. The fragile state of the fracked gas industry is described below as is the trend toward reversing pipeline directions favoring transporting westerly over eastern export paths. Both these issues bear directly on the wisdom of New Hampshire investing so much in building this NED pipeline. The article by Tara Lohan relies on sources who have been industry experts for decades and who, by no means, represent “outliers.” The information on the recent trend to reverse pipeline directions, too, is well-sourced.

Please understand how much will be destroyed along the pipeline route. Creating a wide scar across Southern New Hampshire will bring destruction to human, vegetative and animal habitats; water, air and quality of life in general. Please take these tremendous costs into consideration as you wrestle with your decision to approve or not approve this pipeline. Real people stand to lose everything if this pipeline is built. You have the power to stop this disastrous investment, the costs of which we will all be living with far beyond any conceivable benefit.

Some pertinent information follows:

Excerpted From *The Nation*, August 5, 2015

By Tara Lohan

“The US boom in the production of oil and gas in the past seven years has been largely driven by horizontal drilling and hydraulic fracturing (or fracking) of rock formations known as shale plays. But the growth may not be as long-lived as advertised. For starters, there’s good evidence to suggest that

the amount of economically recoverable reserves of both shale oil and gas are not as much as previously hyped.

J. David Hughes, a geoscientist and fellow at the Post Carbon Institute, who spent 32 years with the Geological Survey of Canada, found that while short-term production of shale oil and gas is undoubtedly significant, the long-term view shows that the growth is not sustainable. His research reveals production peaking in both shale oil and gas in most of the significant plays in the United States by 2020. "For the past five years we've been told we're going to be energy independent...it's just not going to happen."

The next problem facing the industry is the price tag of its operations. The costs to drill and complete a shale well can range from \$6 million to \$8 million or more a well—depending on the play and the number of drilling stages.

Production on shale wells also declines very quickly. For shale oil, the three-year average well decline rate in most major US plays falls between 60 and 91 percent. Around half of all the oil that will be produced from these wells will come in the first three years. For shale gas, the three-year average well decline rate is between 74 and 82 percent.

This means that in order to maintain or increase production, you have to keep a frenetic pace of new drilling—what Lawrence Berkeley National Laboratory scientist David Fridley likened to being on an "accelerating treadmill." The drilling frenzy that has characterized the shale boom caused a spike in production, contributing to a global glut, which has resulted in falling prices. It's a vicious circle, and one that was hard to make economical even when crude was selling for \$100 a barrel.

When prices dropped earlier this year to around \$50 a barrel, things became more dire for the shale industry, and they haven't greatly improved in the last six months. Despite briefly reaching around \$63 a barrel in late spring, prices have fallen again. "For the past five years we've been told we're going to be energy independent and we will have all this oil and we're going to export gas to Europe and we're going to export gas to Asia, and it's just not going to happen," said Fridley.

In the past seven years, wind and solar capacity in the United States has tripled.

Overproduction, combined with declining consumption, has resulted in plummeting crude prices in the past year. It's the same script that occurred just a few years earlier, when shale gas prices bottomed out in the United States. So what's the industry to do?

Investor Jeremy Grantham, the founder of GMO, a Boston-based money manager, wrote in the financial publication *Barron's*, "Almost no new drilling programs will be initiated at current prices except by the financially desperate and the irrationally impatient, and in three years over 80 percent of all production from current wells will be gone!"

Given the costs of drilling and completing wells, and the number needed to keep production growing, companies must have lots of cash to stay on the treadmill. And that may become harder and harder for many to do.

The Energy Policy Forum's Lawrence has been comparing the financials of some of the industry's top companies for years; she found that they lack free cash flow. "They were spending a lot in capital expenditures—the money needed to drill and complete the wells," she said. "And that was growing every year while the money they were actually making, the cash that was left over at the end of the day, was deteriorating. It was never positive."

Lawrence crunched the numbers on more than 20 US shale operators and found that the companies had been cash-flow-negative since 2009. As *Alberta Oil Magazine* reported, “In 2013, U.S. onshore oil producers outspent their operating cash flow by a ratio of two-to-one.” The record-high production boom we’ve witnessed has been sustained by companies taking on high levels of debt, including \$120 billion in high-risk, high-yield bonds. JPMorgan’s estimate of the default rate for these junk bonds is nearly 4 percent this year and will be a whopping 20 percent next year, if crude prices remain around \$65 a barrel.

This may mean lights out for a number of debt-laden companies. Some will go out of business, while others may be gobbled up by larger corporations. Expect lots of consolidation and cherry-picking of assets by the big players. Giants like Chevron and Exxon Mobil will likely make out well, but they aren’t the only ones. “It will be fantastic for the investment banks, because they will make a fortune off of fees,” says Lawrence. Those who won’t make out well, however, include more than just the debt-heavy industry players. It could be you. “A lot of pension funds invest in energy stocks, and the energy stocks have just gotten creamed,” says Lawrence. “They haven’t had good share returns. You’re going to see that reflected in your portfolio.” Despite the bad news on shales, Lawrence sees a lot of good economic news when it comes to renewable energy.

“I have this feeling that we are on the cusp of a new energy paradigm and things are changing so rapidly,” says Lawrence. “I think you’re going to see a lot of disruption in the next five to 10 years, and I don’t think the oil and gas industry really thinks it’s coming.”

From Fortune magazine, August 13, 2015

“ Unlike conventional projects, shale wells enjoy an extremely short life. In the Bakken region straddling Montana and North Dakota, a well that starts out pumping 1,000 barrels a day will decline to just 280 barrels by the start of year two, a shrinkage of 72%. By the beginning of year three, more than half the reserves of that well will be depleted, and annual production will fall to a trickle. To generate constant or increasing revenue, producers need to constantly drill new wells, since their existing wells span a mere half-life by industry standards.

In fact, fracking is a lot more like mining than conventional oil production. Mining companies need to dig new holes, year after year, to extract reserves of copper or iron ore. In fracking, there is intense pressure to keep replacing the production you lost last year.

On average, the “all-in,” breakeven cost for U.S. hydraulic shale is \$65 per barrel, according to a study by Rystad Energy and Morgan Stanley Commodity Research. So, with the current price at \$48, the industry is under siege. To be sure, the frackers will continue to operate older wells so long as they generate revenues in excess of their variable costs. But the older wells—unlike those in the Middle East or the North Sea—produce only tiny quantities. **To keep the boom going, the shale gang must keep doing what they’ve been doing to thrive; they need to drill many, many new wells.**

Right now, all signs are pointing to retreat. The count of rotary rigs in use—a proxy for new drilling—has fallen from 1,930 to 1,881 since October, after soaring during most of 2014. Continental Resources, a major force in shale, has announced that it will lower its drilling budget by 40% in 2015. Because of the constant need to drill, frackers are always raising more and more money by selling equity, securing bank loans, and selling junk bonds. Many are already heavily indebted. It’s unclear if banks and investors will keep the capital flowing at these prices.

Still, **the future of fracking is extremely hard to predict.** Continental, for example, pledges to raise production in 2015 despite the fall in its drilling budget. It would be a mistake to underestimate the ingenuity of the entrepreneurs who led the shale revolution. They will exploit new technologies that combine vertical and horizontal drilling to lower their costs. In the boom times, equipment rental,

trucking, and labor were all priced at huge premiums; at \$100 a barrel oil, producers put sinking the next well far ahead of fretting over their fat payrolls. Now, those costs are falling.

So it's difficult to know where all-in costs will settle. If oil stays at around \$50, a group of super-efficient producers may still be able to make money. Bruce Everett, who teaches petroleum economics at the Fletcher School at Tufts University, is optimistic. "There will undoubtedly be some tailing off in U.S. drilling activity," he says, "but I expect continued development drilling in major new areas, particularly the Bakken, even at \$50."

If demand rebounds—and it may—prices may very well rise above \$60 once again, and fracking will once again become extremely profitable. But it's not clear if the famous foe of fracking, Saudi Arabia, will let that happen. The Saudis have invested heavily to gain extra capacity of 2 million barrels a day. The Saudis may use that cushion to hold prices around \$50, just out of range—at least today—for most shale oil producers.

Then again, the shale industry's ability to hike production quickly could put a cap of \$50 or \$60 on oil prices. If prices rise much higher, either the Saudis will intervene, or more shale supplies will flood the market, stabilizing the price. "Because shale wells have short lives, allowing production to come on and off more quickly, fracking could moderate price fluctuations so they're less volatile than in the past," says David Kreutzer, an economist at the Heritage Foundation.

But the numbers are still daunting. It's easy to get financing when your costs are \$65 and you're selling at \$100. But when the price is \$50, where will the producers find the funds to keep sinking those new wells? It will take a lot of new drilling just to keep production where it is now. **A steady but no-growth shale industry is not what America has been counting on. The spread of rigs and jobs that seemed such a certainty, and such a staple of our recovery, may be a fading vision.**

Impact on NED - These cost trends will lead to what is described below: reversal of pipeline flow from West-to-East (for overseas shipments) to East-to-Western U.S. thus negating a primary justification for NED:

As more western drilling operations are sidelined, the price of natural gas in the western 2/3 of the country is expected to go up due to the laws of supply and demand. The new western demand for Marcellus gas was NOT PREDICTED when NED was on the drawing board. Between Texas and the West there is about a trillion cubic feet of underground GAS STORAGE. Next year a lot of that storage will be filled up with cheap Marcellus Gas.

It makes sense that expansion of pipelines from the east to the west will reduce the incentive for industry to pursue projects like NED -- THAT WERE ORIGINALLY DESIGNED TO SEND GAS OVERSEAS.

Here are some citations from EIA and the Trade publications to support this claim.

1. Just one year after the larger-than-NED REX (rockies express) east to west pipeline went into service to send gas from east coast to west coast:

[citation: <http://www.eia.gov/todayinenergy/detail.cfm?id=16751>, dated June 18, 2014]...

2. the EIA is reporting in its weekly Natural Gas report that the east to west flows, which were in excess of 1BCF in the past, are getting reversed

[citation: http://www.eia.gov/naturalgas/weekly/archive/2015/08_06/index.cfm dated August 6, 2015]

"REX reversal complete. The Rockies Express Pipeline completed its east-to-west reversal early this month, officially placing into service an additional 1.2 Bcf/d of incremental east-to-west capacity, bringing the total capacity to 1.8 Bcf/d. However, ongoing construction at downstream interconnections may be hampering westward flows, according to Bentek Energy analysis. Outflows on REX have been below the 1.8 Bcf/d capacity since the reversal was officially completed."

3. and apparently the east to west capacity is still expanding... FERC approved additional east to west flows in March

<http://webcache.googleusercontent.com/search?q=cache:U73EYUCNKW0J:www.naturalgasintel.com/articles/101529-rockies-express-gets-ferc-approval-for-east-to-west-capacity-expansion+&cd=4&hl=en&ct=clnk&gl=us>

"REX has received approval from the Federal Energy Regulatory Commission (FERC) to modify "certain facilities" along the REX pipeline from Monroe County, OH all the way to Moultrie County, IL-something they call the Zone 3 East-to-West Project. When complete, it means REX will flow an additional 1.2 billion cubic feet of natural gas per day from the Utica and Marcellus to Midwest markets"

Citation: marcellus Drilling News, March 3, 2015, "Rockies Express Gets FERC Approval For East-to-West Capacity Expansion"

4. It appears that just a few days ago this pipeline reversal went into service...

"The Rockies Express Pipeline (REX), originally built from Colorado and Wyoming to Monroe County, OH to bring natural gas from west to east, will reverse the flow for a large and important section of the pipeline. On August 1, the section of REX from Monroe County, OH to Mexico, MO will reverse the flow and carry 1.8 billion cubic feet per day (Bcf/d) of Utica and Marcellus Shale gas to the Midwest, including to the greater Chicago area. This flow reversal has the power to a) **increase prices northeast drillers receive for their natural gas**, and b) lower the cost of natural gas for consumers (and industrial companies, and electric generating plants, etc.) in places like Chicago. [NGI, July 30, 2015, *emphasis mine*]

http://webcache.googleusercontent.com/search?q=cache:9vQs34x_qRkJ:marcellusdrilling.com/2015/07/1-8-bcfd-of-marcellusutica-gas-heads-west-on-rex-starting-aug-1/+&cd=1&hl=en&ct=clnk&gl=us

So if more gas flows west to Chicago and eventually to Colorado, Oregon (on existing pipelines originally designed to flow the other way) it keeps prices low in the west but **raises the well head price in the east.**

If the wellhead price goes up from \$2 to \$4 in Pennsylvania it will undercut the argument used by Anthony Buxton and Kinder Morgan in their presentations about saving money for Northeast consumers, particularly electricity consumers. Their argument is that New England electricity consumers paid \$7 billion extra on energy costs because we didn't have the access to the \$2 gas available a few hundred miles to the west. Well now thanks to REX, and other pipelines like it to send gas to other parts of North America on existing pipelines, the predicted \$2 gas they are telling us we can get by building *NED is unlikely to be available to us at ANY time after 2016 or 2017. As a result the industry appears to be backing off from their original concept which was complete reversal of the Maritimes and Northeast pipeline from Dracut to Nova Scotia. The change in primary project scope and purpose may warrant a restart of the entire FERC pre-file and/or scoping process.*

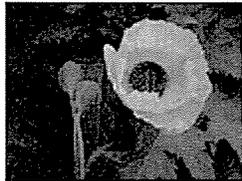
Given the precarious viability of shale produced products, is it prudent for New Hampshire to bet so heavily on future shale production? Is it wise for our state to carve up land and put so many lives, ecosystems, property, water quality and quality of life at risk for this uncertain gamble? We are being told we have to give up our home of 20 years, give up the equity in our home that we have struggled to pay for, give up our peace of mind and our peace. We are told our home will stay even as all the gardens and land surrounding it will be denuded of nature, and periodically treated with toxic herbicides to prevent future growth. Our home will stay but we will no longer have a supply of potable water because of blasting at our well site. We are being told we are in the "incineration zone" should a pipe rupture and explode. We are being told we can stay in a worthless property and still pay taxes on it even tho it is, in all ways, uninhabitable. This is madness! In what rational scheme does this make sense? Please stop NED!

Thank you.....

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