March 26, 2018
Dear Municipal Councillors,

In coming weeks, your municipal council may be asked to consider a motion calling for the province to remove the ban on hydraulic fracturing. The recent release of the NS Onshore Petroleum Atlas Department confirmed what we already knew: that Nova Scotia has onshore gas resources. Since the atlas was released, a small but insistent chorus led by petroleum industry representatives has been calling for an end to the legislated ban that followed a lengthy review and public consultation process carried out by the Nova Scotia Independent Panel on Hydraulic Fracturing.

The Municipality of the District of Guysborough (MoDG), which does not have a potential for commercial development of the resource, has taken up the call of the oil and gas industry. Without any discussion with citizens, MoDG councillors passed a motion calling for an end to the ban. Instead of a ban, they want the province to adopt regulations allowing investors to undertake a pilot project to assess the potential of onshore gas. MoDG is calling on other municipal units to follow their lead, and their proposal may be coming to your council soon.

The MoDG proposal is based on two main assumptions:

- That there are vast economic benefits, too good to pass up.

- That lifting the ban to allow investors to undertake a pilot project could allow us to determine whether shale gas development involving fracking can be done safely.

There are serious flaws in both of these assumptions.

In relation to the economic benefits shale gas seems to promise:

- There is a glut in shale gas across North America. Prices are low. Western Canada and the Marcellus Shale in the US have untapped resources that are far easier to develop. In response to industry calls for New Brunswick to remove their moratorium two years ago, Calgary energy analyst Samir Kayande pointed out that industry and investors are focused on resources which are "already known and available, and will last us for many, many years into the future." At that time, Kayande stated that even without a moratorium, shale gas development in New Brunswick province would be unlikely in the foreseeable future. [i]

- Unconventional gas development using hydraulic fracturing will never involve just a few wells. Shale gas production drops quickly, with 80% of gas extracted within the first two years of a well's life. [ii] This sharp drop-off explains why unconventional gas projects require ever increasing numbers of wells to maintain production. With Nova Scotia's present royalty and tax structure, the province would earn negligible revenues. This is very different from conventional oil and gas projects such as Sable, which produce at a stable rate for years.

- The Newfoundland and Labrador Hydraulic Fracturing Review Panel issued its final report in 2016. On economic impacts, evaluating an unconventional oil project scenario of 480 wells over 20 years, the panel was clear.

- Newfoundland and Labrador would receive "far less than the revenues normally attributed to offshore oil and gas activities including royalties."

- "Revenues would be more in line with revenues from lotteries, vehicle and driver license fees, tobacco tax and insurance company tax."

- "Fracking for oil in western Newfoundland would not be a game changer in respect to the fiscal position of the province." [iii]

The Pilot Project Idea

The impacts of "one test well" cannot determine whether shale gas can be developed safely. The pilot project idea is similar to assuming you could determine the effects of smoking by whether one or two smokers were healthy after smoking for several months. It's not science, and it does not tell you anything useful.

Shale gas development is a complex industrial process involving hundreds of wells and related infrastructure and activities. It needs to be evaluated as a total system, with impacts that add up over time and are often not apparent for many years. Both the Nova Scotia and Newfoundland-Labrador Independent Review Panels recognize that a systems and cumulative approach, rather than a piece by piece approach, is essential to understand the impacts of this industry.[iv]

The quick and easy pilot project approach proposed by Guysborough does not make sense in the real world. The Newfoundland and Labrador Hydraulic Fracturing Independent Review Panel concluded that a broad range of essential questions must be answered before considering whether to end the province's "pause" on fracking. The panel was clear that the process for doing this would require considerable investment of government resources.

Determining whether there is social license for fracking was a key recommendation of Nova Scotia's Hydraulic Fracturing Review, as well as those in New Brunswick and Newfoundland-Labrador. Social license means that the community that would be affected- not a municipal council- must go through an extensive process of full information and discussion before it can decide that it is open to having shale gas development, including hydraulic fracturing, take place in that community.

Amendments to the Nova Scotia Petroleum Act which established a ban on hydraulic fracturing in 2014 set up a process by which the legislated ban could be lifted if social license existed. That process requires evaluating the net benefit to Nova Scotians and includes consideration of social, economic, health, environmental, scientific, technical and regulatory issues. [v]

What industry representatives and the Municipality of Guysborough are calling for is an end run around both social license and serious examination of the full potential impacts of this industry.

There is really no such thing as a "pilot project" for this industry- either Nova Scotia opens itself up to shale gas fracking, or it does not. Investors will not put money into a pilot project without assurances that they could move ahead. The only purpose of the "pilot project" idea is to bypass serious consideration of risks and impacts and the need for social license.

Moratoriums and bans increasing, science shows ongoing problems

Since Nova Scotia enacted a ban on hydraulic fracturing in 2014, there has been a steady increase in bans, moratoriums and "pauses" on hydraulic fracturing in North America and around the world.[vi] Why? Because none of the identified problems associated with unconventional gas and oil development have been solved, and evidence of harmful impacts is growing. [vii]

A summary of studies conducted since 2016 found that 84% of studies that discussed health impacts of fracking found elevated health hazards; 69% of studies that looked at water raised major concerns about contamination; and 87% of studies on air impacts raised concerns about pollutant emissions and atmospheric concentrations of methane.

Every frack still uses enormous amounts of fresh water, an estimated 15 million litres per frack. Every well can be fracked up to 15 times. Meanwhile, Nova Scotia experienced higher than ever levels of water shortages in 2017, affecting households across the province. The US Environmental Protection Agency confirmed that drinking water has been contaminated through fracking operations. The full extent remains unknown, due to the fact that companies commonly require signed secrecy agreements before providing compensation to affected homeowners.

Disposal of millions of gallons of highly contaminated fracking wastewater continues to be an unresolved problem and an environmental threat. When Triangle Petroleum drilled and vertically fracked three exploratory wells in Hants County in 2008, they generated 14 million litres of radioactive wastewater. It took 10 years and a multitude of errors before the wastewater was cleaned up.[viii] After Triangle left the province and declared bankruptcy, some of the cleanup costs were covered by taxpayers. Perhaps the lessons of Triangle's operations should be considered instead of proposing a new "pilot project." Learning from Nova Scotia and elsewhere, New Brunswick banned disposal of fracking wastewater in municipal and provincial sewage systems in 2016.

Groundwater issues of "utmost importance" and poorly understood

Hydrogeologist Dr. John Cherry chaired the expert panel on shale gas commissioned by the Canadian government, which issued its report in 2014. Two years later, Dr. Cherry told a New Brunswick audience, "From my hydrogeological perspective, shale gas development should be viewed as a big experiment for which we have minimal scientific basis for predicting the outcome for impacts on groundwater quality of stray gas." Cherry added, "All expert reports have deemed groundwater issues and uncertainties to have utmost importance [yet] the impacts … are unknown, because almost no science-focused monitoring has been done anywhere."[ix] Without scientific understanding, regulations can only be guesswork.

Some things can't be regulated

We cannot regulate geology. The two areas of Nova Scotia with the greatest unconventional gas resources are Hants County and Cumberland County. Both have characteristics which make hydraulic fracking operations particularly risky. Hants County geology is recognized as having extensive geological faults and folds. Fracking in such conditions can create new fractures which intersect existing faults, creating conduits for fluid escape.[x] In one of Triangle Petroleum's three fracked wells, only 15% of fracking fluid was recovered, far lower than normal.[xi] The company had no explanation for the low

recovery rate. The remaining chemical laden fluid remains underground, with access to the water aquifers and surface waters.

Cumberland County is criss-crossed by networks of underground coal mines, both official mines which are mapped and unmapped bootleg mines. These create weak areas through which gas and fracking wastewater can escape. Both water contamination and subsidence are serious risks.[xii]

You can't regulate away the fact that fracking in Nova Scotia's uranium-bearing ground releases radioactive materials, contaminating wastewater, pipes, filters and other materials used in fracking operations. With half-lives of many millions of years, these accumulate and present mounting hazards in disposal as experienced in other areas.

You can't regulate away the fact that industrialization of rural areas is an inevitable result of unconventional oil and gas development, which requires a large number of wells, well pads, wastewater holding ponds, connecting pipelines, access roads, compressor stations and more. This results in impacts on productive farmland, existing rural economic sectors and rural quality of life.

The costs and risks of orphaned wells and methane emissions

The extremely costly issue of "orphaned wells" also needs to be on the table. These are wells left behind by energy companies which go bankrupt or shut down due to low prices. Alberta is presently home to 155,000 un-remediated wells, with an estimated cleanup cost of $8 billion.[xiii] In theory, costs should be covered by the industry. In reality, taxpayers and landowners increasingly carry this financial burden. *End-of-Life Liabilities for Oil and Gas Well*s, a 2017 study by the CD Howe Institute, notes that abandoned oil wells can contaminate water and soil, leak greenhouse gases and put nearby homes at risk of explosions and harmful gases.

Recent studies show that methane emissions from active and inactive oil and gas operations in British Columbia are at least 2.5 times higher than reported by government and industry,[xiv] and emissions around Red Deer, Alberta are 15 times higher than reported.[xv] Reported or not, these fugitive emissions have a major impact on the climate. Even though gas burns cleaner than coal, numerous studies show that the cradle-to-grave greenhouse gas impact of unconventional gas is equal to or greater than coal. Fracked gas is not a climate-friendly substitute fuel as often claimed by the industry.

We hope you will consider these points if a motion to lift the ban on hydraulic fracturing comes to your council. We encourage you to reject any such motion. Please also consider affirming your support for the province's continued ban of hydraulic fracturing in shale.

In 2013, the UNSM unanimously passed a resolution calling for a province-wide moratorium on fracking until provincial and federal reviews were completed. Those reviews have now been completed, and Nova Scotia's ban on hydraulic fracturing is one of the results, as are the prohibitions in PEI, New Brunswick and Newfoundland-Labrador. It is striking that all the issues raised in the 2013 resolution remain serious concerns.

Nothing has changed since 2013 that would provide a reason to lift the present ban. What has been learned since 2013 provides evidence of the wisdom of Nova Scotia's decision.

If there is any further information we can provide to assist you in understanding the issues involved, please don't hesitate to contact us. We will post addition supporting information, including the 2013 UNSM resolution, at http://www.nofrac.com/issue-paper-3-hydraulic-fracturing-update-2018/ by the end of March.

Sincerely,

Barb Harris
River John, Nova Scotia

for Nova Scotia Fracking Resource and Action Coalition (NOFRAC)

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[i] https://globalnews.ca/news/3003308/corridor-resources-taking-lead-on-reinstating-fracking-in-n-b/
[ii] https://www.sourcewatch.org/images/c/c5/Chesapeake-OCT08_PPT_0093.png
[iii] http://nlhfrp.ca/wp-content/uploads/2016/05/Executive-Summary.pdf p7
[iv] See http://www.nofrac.com/issue-paper-3-hydraulic-fracturing-update-2018/ , Defintions
[v] https://nslegislature.ca/legc/bills/62nd_2nd/3rd_read/b006.htm
[vi] see http://www.nofrac.com/issue-paper-3-hydraulic-fracturing-update-2018/ , list of bans and moratoriums, and http://concernedhealthny.org/compendium/ pp. 10 -13
[vii] https://www.psehealthyenergy.org/our-work/publications/archive/toward-an-understanding-of-the-environmental-and-public-health-impacts-of-shale-gas-development-an-analysis-of-the-peer-reviewed-scientific-literature-2009-2015/
[viii] http://www.nofrac.com/wp-content/uploads/2013/04/out-of-control-full-report3.pdf
[ix] http://www.noshalegasnb.ca/the-shale-gas-experiment/
[x] Keppie http://www.nofrac.com/wp-content/uploads/2014/04/Keppie-Windsor-Kennetcook-basin-report.pdf
[xi] Out of Control, http://www.nofrac.com/wp-content/uploads/2013/04/out-of-control-full-report3.pdf , fn 17
[xii] http://thechronicleherald.ca/opinion/1552048-opinion-nova-scotia-is-sinking-and-fracking-would-cause-'bumps'-and-quakes
[xiii] http://www.cbc.ca/news/canada/calgary/orphan-wells-alberta-energy-minister-redwater-1.4420929
[xiv] https://globalnews.ca/news/3999537/bc-methane-emissions-david-suzuki-foundation/
[xv] https://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/accuracy-of-methane-leak-reporting-in-alberta-clouds-scope-for-new-regulations/article38317582/