



frac

AT A TIME when global oil producers are battling for market share, the debate over fracking in Canada's eastern provinces has slipped from back burner to cold storage. Quebec may have just come out of a fracking moratorium, but it's no closer to resource play development than New Brunswick, Nova Scotia and Newfoundland, all of which are holding "No Fracking" signs.

Floundering commodity prices and energy stock sell-offs have oil and gas producers huddling around their best assets in the friendliest jurisdictions, while the anti-frac contingent in eastern Canada is breathing a sigh of relief. Kevin Heffernan, president of the Canadian Society for Unconventional Resources, however, sees this as an opportune time for those provinces to have a calm discussion around fracking.

"Shale gas projects are long-life projects," he says. "They generally

start slow as data is acquired and knowledge is built. The opportunity doesn't go away if there's six months or a year or two of cash challenges for producers."

MORATORIUMS

Quebec has the largest shale gas resource potential of any province in eastern Canada, and it lifted its fracking moratorium this January even though the government of Premier Philippe Couillard is decidedly cooler to resource play development in the rural St. Lawrence Lowlands than it is to oil exploration on Anticosti Island, which has a larger population of deer than people.

Erik Richer La Flèche, a Montreal-based transaction lawyer with Stikeman Elliott, says Quebec is generally unprepared for oil and gas development. It lacks a legal, tax and revenue-sharing framework or the

talk TALK

What it will take to change public opinion on fracking in eastern Canada

BY R.P. STASTNY

institutional capability to supervise the industry on a large scale.

"There [also] remains considerable opposition to shale gas," he writes in an email to *Oilweek*. "Since social acceptability is essential to exploration and development, the government must tread lightly. Government is looking at establishing guidelines as to the meaning of 'social acceptability.'"

Opposition to fracking is the common denominator across eastern Canada. Lack of government and public familiarity with hydraulic stimulation and widely propagated stories of its ills in Pennsylvania have laid the groundwork of fear and public mistrust. Brad Hayes, president of Calgary-based Petrel Robertson Consulting, says frac bans in the east are largely politically motivated.

Hayes was a member of a Nova Scotia independent review

panel on hydraulic fracturing last summer, chaired by Cape Breton University president David Wheeler. The panel produced a comprehensive report on the technical, social, legal, medical and economic implications of petroleum exploration in the province and submitted its carefully considered findings and recommendations to Nova Scotia's energy minister, Andrew Younger, who three days later imposed a ban on fracking despite that option not being recommended in the report.

"[The government] perceived that the voting sentiment was against hydraulic fracking, and they didn't want to get caught on something that wouldn't look good before the next election," Hayes explains.

Newfoundland, which in point of fact doesn't have a formal fracking moratorium, is in a state of fracking limbo amounting to the same. In

the meantime, Shoal Point Energy's farmout deal with Black Spruce Exploration to have up to 12 exploration wells on the island's west coast will have to wait until the provincial election this October—and then some.

In New Brunswick, the minister of natural resources, Donald Arseneault, introduced a bill in December banning fracking in the province. Meanwhile, Premier Brian Gallant stated that certain conditions need to be met before the moratorium is lifted: establishing social license for hydraulic fracking through industry/community consultations; providing clear and credible information on the impacts on air, health and water so that a regulatory regime can be developed; and establishing a plan to mitigate impacts on public infrastructure.

Gallant also stated that the province intends to honour its obligation ►

to consult with First Nations and develop a proper royalty structure. In other words, a lot needs to be done there before anything is done to lift the moratorium.

UNDER THE HOOD

Anyone who has sifted through the volumes of studies referenced on the Internet that look at the environmental impacts of hydraulic fracking will find what appears to be clear and credible

information on both sides of the argument, and nothing is as clear-cut as it might seem.

A sampling of these studies shows that resource play development requires more water than conventional gas drilling, but when natural gas is used in place of coal or nuclear fuel to generate electricity, there is a net savings in water usage because coal power consumes more than twice the water per megawatt-hour as gas-fired power, based on a mining-to-generation analysis.

The impact of fracking on climate change and local air pollution is similar to its impact on water, according to the study "The Environmental Costs and Benefits of Fracking," published in the *Annual Review of Environment and Resources*.

Fracked wells present a higher potential for health threats arising

from increases in volatile organic compounds and air toxins than conventional oil and gas drilling, but when natural gas replaces coal as a fuel for power generation, air quality improves because of lower CO₂ emissions and almost none of the mercury, sulfur dioxide or fly ash associated with coal combustion.

Less clear, however, is "whether methane losses from well pads and pipelines outweigh the lower CO₂ emissions" because methane is 22 times more greenhouse gas (GHG) intensive than CO₂. Further, shale gas displacement of coal in power generation may be a win for the U.S. environment, but record U.S. coal exports to Europe and other parts of the world have accompanied the shale gas boom, so in effect, the poor air quality and GHG emissions from coal combustion

← Peter Hill, chair of Bakken producer Triangle Petroleum, drank treated frac waste water at a Halifax public meeting in 2014 in an effort to convince people of the environmental safety of fracking.



Burning water

Well integrity and groundwater contamination issues need more study

The oil and gas industry admits that under certain conditions, compromised well-casing integrity can contaminate shallow freshwater aquifers. It happens rarely, and all oil and gas wells run this risk, not just those that are fracked. Beyond that, however, the industry has little to offer vocal anti-frac activists because there is no Canadian data on the problem.

"It's just never been systematically surveyed in Canada," says Maurice Dusseault, a professor of geological engineering in the earth sciences department at the University of Waterloo. He was also part of David Wheeler's expert panel on hydraulic fracking in Nova Scotia last summer.

Apart from casing thread problems and, in some jurisdictions, corrosion that breaches the casing, most

PHOTO: ASHLEY THOMPSON

have only been relocated to other parts of the world.

Environmentalists also point out that cheap shale gas limits the deployment of photovoltaic solar and wind power, which “use no water and emit no greenhouse gas.”

While this is largely the case, that particular claim ignores the full-cycle environmental footprint of mining silicone, iron ore, silica and all the other materials needed to manufacture, ship and install solar and wind power. For example, full-cycle GHG emissions produced by photovoltaic solar power are almost 20 per cent of that produced by natural gas power generation.

In relation to eastern Canada, where fears over drinking-water contamination tops the list of public concerns around fracking, there is a consensus of scientific data that suggests subsurface gases and

chemicals from man-made fractures thousands of metres underground almost never seep upward to freshwater aquifers. The bigger threat comes from gas in intermediary zones seeping up through poorly completed wells and getting into shallower freshwater aquifers. This, coincidentally, is what industry has maintained all along.

Cases of groundwater contamination happen—but rarely. Some U.S. studies suggest casing integrity issues occur in one to 10 per cent of wells, depending on geology and well construction. A portion of those may or may not lead to groundwater contamination.

These studies point to responsible regulatory oversight as a means of mitigating water contamination risks, but public confidence in regulators in some Canadian provinces is a problem.

“One thing I learned while in Nova Scotia,” says Hayes, “is how little faith people have in their regulators. Compared to Alberta and B.C. in particular, there’s an inherent distrust of regulators. As far as I understand, it’s based on the Sydney Tar Ponds and other issues around coal and resource development there.”

CHANGING PUBLIC OPINION

If a template for resource play development emerges in eastern Canada, it will likely be stamped in Quebec. Conventional oil and gas activity in the Gaspé Peninsula by Petroliia, Junex and other producers who are awaiting exploration results could demonstrate that the industry can operate responsibly. But Michael Binnion isn’t waiting for that day. For the last two years, the president and chief executive officer of Questerre ▶

well-integrity issues are less casing failures per se than they are pathways that develop in the rock/cement area outside the casing, according to Dusseault. That pathway then allows slow seepage, typically from some intermediate depth gas zone as opposed to seepage from the target horizon. That gas works its way up around the outside of the casing and escapes into the atmosphere or into the local freshwater aquifer.

Some research in Colorado and Pennsylvania has attempted to quantify the problem, but there is no Canadian data yet (the B.C. Oil and Gas Commission is currently doing a study of well-integrity issues).

Industry generally denies that fracking increases the odds of compromised well integrity. Dusseault, however, says that some fracking techniques that pressurize the casing itself, submitting the cement and the rock outside of the production casing to flex from high-pressure fractures, increases the odds of well casing problems.

“Everyone agrees that this is more conducive to creating what we call micro-annular space—very thin, very small, but still enough for gas seepage,” he says. “On the other hand, if you are using a fracturing technology

that involves a tubing that goes down and is anchored at the bottom of the production casing, the pressure in the tubing increases and decreases but not the production casing itself.”

This suggests a range of measures regulators could take to manage well integrity in jurisdictions concerned about groundwater contamination—mandating certain types of fracking techniques or high-performing cements or requiring a professional engineer or geologist to directly oversee cementing jobs rather than leaving it to technicians and drill crews—but this really jumps the gun.

“You need to measure the extent of the problem before you start [frittering] away money,” Dusseault says. “But if the industry just keeps on saying that there is no problem, then all those people who are upset in Nova Scotia and New Brunswick and Pennsylvania, Ohio and Texas are mentally unbalanced or something. There have been people screaming about well integrity for years. Dr. Tony Ingraffea from Cornell University has published an article on it recently, and there are cases. I didn’t make this problem up, but I’d like to quantify it.”

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— Brad Hayes, president, Petrel Robertson Consulting

Chief Aaron Sock (centre) of the Elsipogtog First Nation in New Brunswick has vowed to reclaim all Crown land in the province as it fights against shale gas development.

Energy, which already has a discovery in Quebec's Utica shale, has been actively trying to influence public opinion. And he's made some impressive gains.

"It's been my theory since 2010 that this is not a PR campaign. It's a political campaign," he says.

Instead of promoting just his company's interests, Binnion has been taking up the wider cause of shale gas development in Quebec.

"What we're dealing with is how do we get people to be in favour of hydrocarbon projects—or at least less against them," he says. "So our campaign has involved meeting with hundreds of people, door knocking, going around from association to association, conference to conference, local mayor to local mayor, politician to politician, chamber of commerce to chamber of commerce, giving speeches and interviews, and step by step explaining how the development of hydrocarbons is in their benefit."

Binnion, together with a few other small companies, the Quebec Oil and Gas Association and the Petroleum Services Association of Canada are literally laying the foundation for oil and gas development. Their efforts

have even included field trips to Alberta with small groups of Quebec landowners to see how oil and gas development works here.

It's the time-consuming work of changing cultural norms in a society that currently derives no tangible benefits from oil and gas development, so the list of pros and cons is set on its head compared to Alberta.

"It's a pretty incredible accomplishment that just as New Brunswick and Nova Scotia and Newfoundland are bringing in moratoriums, Quebec is finishing theirs," Binnion says. "We've brought ourselves through the environmental hearings to an end of the moratorium. Three of the major trade associations are now in favour of natural gas development, whereas four years ago, they were opposed to it. We're changing the cultural narrative in Quebec from 'hydrocarbons are bad' to 'we need hydrocarbon development.' We now have a relationship with the government, which is to say, 'Yes, you



PHOTO: MILES HOWE/HALIFAX MEDIA COOP

can go ahead as long as you can get local acceptance.”

Binnion adds that this kind of grassroots approach is what’s needed not only in Quebec but throughout eastern Canada if resource play development expects to get a foothold there. To date, the industry hasn’t been willing to do this work or to pay someone to do it. He quotes Winston Churchill, explaining the industry’s mindset.

“Churchill said, ‘You can always count on the Americans to do the right thing, but only after they’ve exhausted all the alternatives.’ Industry needs to do this work, but I don’t think they’ll do this until they’ve exhausted all the alternatives.” ■



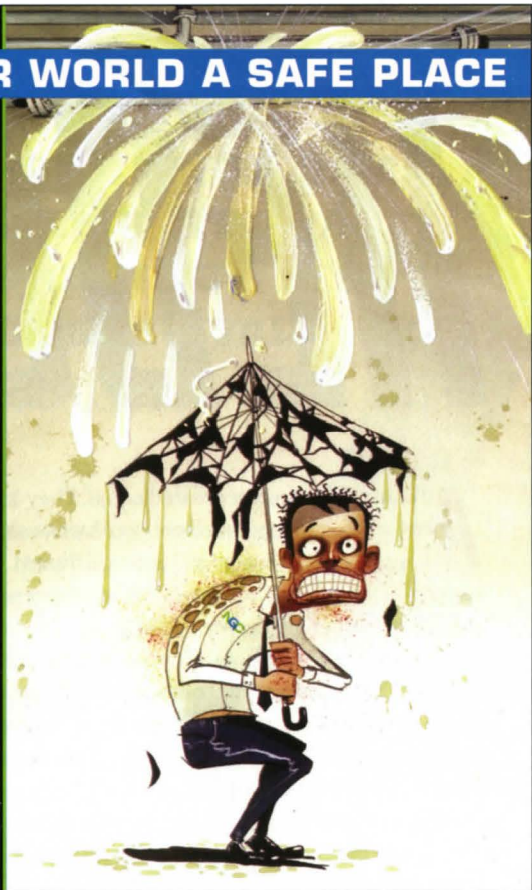
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