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# "*Ants to the Picnic*": Canaccord's 2008 *New Frontier* Emphasis to Investors on the Development of Quebec's Utica Shale Gas, and an account of what happened to the Larin Family in Saint Louis

By Will Koop,
February 23, 2011

*Community relations: Québec does not have a history of large scale oil and gas extraction, and the mineral owners are not the surface owners; this could present some challenges.*

*As we look at the more successful shale gas plays, we favour first movers. In general, these producers tend to pick up the best acreage for the least amount of money. As the play becomes more well known, competition for land and services intensifies, becoming more like "ants to the picnic" – a phrase coined by Newfield Exploration (NFX : NYSE).*

*Investors need to be aware of the risks inherent in the oil and gas industry that could affect our valuations. Without limitation, these risks include:*

*1. trading liquidity risks;*
*2. geological, engineering, regulatory and environmental risks related to the exploration for and development of crude oil and natural gas resources; and*
*3. volatility in crude oil and natural gas prices that can materially affect financial performance and the accuracy of our estimates. Risks also include government tax and potential changes to the royalty regime and regulatory policy pertaining to either income trusts or the oil and gas industry.*

## THE NEW FRONTIER (LA NOUVELLE FRONTIERE)

CANACCORD/Adams, an Equity (investment) Research arm of the global capital markets group of Canaccord Capital Inc. (CCI: TSC / AIM), published a 46-page document on July 28, 2008, *Utica Shale in Quebec: La nouvelle frontiere (The New Frontier)*. [1] From August, 2006 to July, 2008, Canaccord published five other investment reports ("thematic pieces") on shale gas:

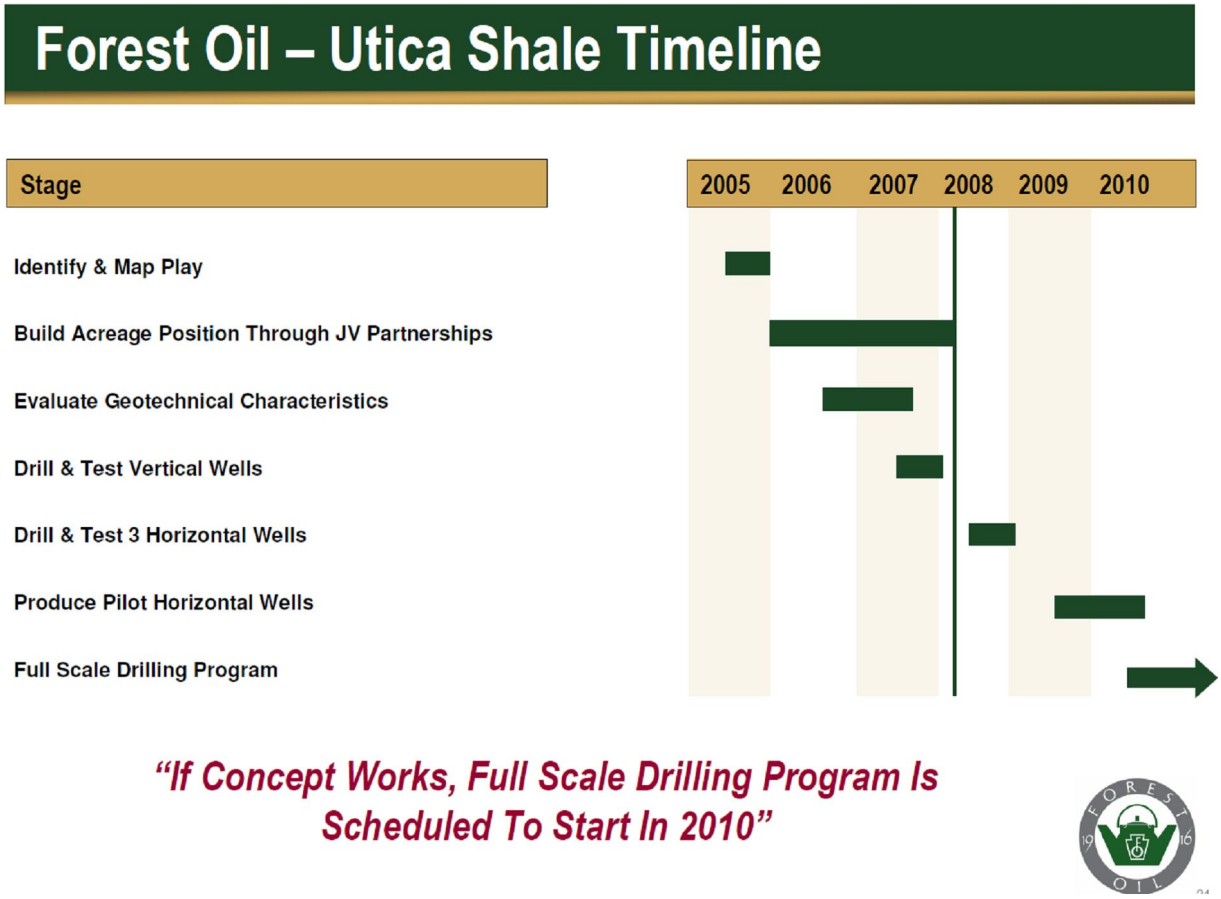
- *Shale gas: An emerging play in North America and beyond* (August 9, 2006)
- *Shale gas in the Maritimes: Put this on your radar screen* (September 26, 2007)
- *Shale gas in the Maritimes: More important shale gas tests ahead* (December 20, 2007)
- *Utica Shale play in Québec: Forest Oil announced new trend* (April 8, 2008)
- *The Full Montney* (June 23, 2008)

Canaccord's July 28, 2008 report was an insider's promotional, informational expose on the beginning gold rush of Quebec's unconventional deep shale gas, an area nicknamed the "main Utica Fairway". As evidenced in numerous business and stock market media outlets from April Fools Day onward (April 1, 2008), Canadian Forest Oil's publicized discovery information from one of its shale gas wells got the big ball rolling and prompted Canaccord's outlook assessment report:

> *We like how the Utica Shale exploration program is unfolding. The play is now anchored by two big players: Forest Oil and Talisman Energy. In addition to capital, these producers are bringing expertise and know-how. The Utica Shale Play now has a much better chance of becoming commercial in the next few years.*
>
> *Forest Oil announced this April that it had made a significant resource play discovery in the Utica Shale in the Québec region. This triggered double digit gains for the larger Utica Shale players. The smaller players saw their shares double and triple. Most have raised equity and have grown their market capitalization significantly since. The key questions are: how can we properly quantify the value of the shale gas at this early stage and is there more upside to these stocks?*
>
> *We have reviewed nine companies and evaluated their holdings within our Tier One core area and our Tier Two shallow gas play. According to our analysis, Junex and Questerre still have plenty of upside. Gastem is intriguing as it is a first mover in the Utica Shale in New York. Between now and year-end, we expect more than half a dozen new wells drilled in Québec alone which will help delineate the main Utica Fairway. In addition, more will be known about the overlying Lorraine Shale and the overthrust area. In short, we expect multiple catalysts for the play in Québec and New York.*
>
> *Forest Oil's announcement was the key event that triggered double-digit gains for the bigger Utica Shale players. Between April 1 and May 31, Talisman's shares were up by 18% and Forest Oil saw a 32% increase in its share price. Since the April announcement, the smaller players saw their shares catapult: Gastem's shares were up 112%, Junex gained*

[1] Canaccord/Adams is a "securities broker-dealer with principal offices located in Vancouver, Calgary, Toronto, Montreal (all Canada), Boston, New York, San Francisco (all US) and London (UK)." Stated in its "Research Disclosures" at the end of *The New Frontier* document, Talisman Energy Inc. and Encana Corp. were either "clients" or "affiliated" with Canaccord/Adams.

*345% and Questerre Energy gained 348%. In addition, most of the smaller players have raised equity and have grown their market capitalization significantly since.*




Canaccord 'quantified', 'identified', 'estimated', and 'assessed':

*EnCana Corp. (ECA : TSX : C$73.21 | BUY, C$115.00 12-month target price) did reconnaissance work on the Utica Shale Play in 2005 and presented the results in a poster session at the 2007 CSPG-CSEC Joint Convention in Calgary.*

*The company had estimated that the maximum recoverable resource was 24 Tcf and that the Utica Shale could be a viable resource play. Encana concluded from the study that the Utica Shale gas play meets most shale gas target parameters .... However, before the study was concluded, Talisman entered into an agreement with Questerre targeting the Trenton-Black River Play, taking the last big chunk of contiguous acreage out of circulation.*

*Much like the Barnett Shale and Woodford Shale trends, we expect most producers will start exploring the Utica by focusing on a core area. After proving the concept, ramping up development, and establishing production in this core area, we expect producers to move into the more peripheral areas in a staged or staggered manner. We need a tidy framework to assess this play, so we borrow classifications from the Barnett Play and subdivide the trend into "tiers" reflecting the relative stage of evaluation or development.*

- ***Tier One:*** *The core area defined by the Yamaska Growth Fault in the west and the Logan's Line in the east. This is the area where we have the most modern data, the best well tests, and an active 2008 drilling program. We will treat the "Tier One" area as a resource play in our valuation efforts.*

- ***Tier Two:*** *The shallow area along the St. Lawrence River that corresponds to Junex's "Antrim Type" Play and Gastem's Zone 2. This area is characterized by shallow drill depth, and gas of biogenic origin. We have fewer data points in this area; however, we do view this as a resource play and will attempt to assess the resource potential.*

- ***Tier Three:*** *A catch-all category of mostly exploration targets which includes the area east of the Logan's Line and any other areas within the St. Lawrence Lowlands that are highly structured or not well defined due to a lack of recent data. Since our understanding of these areas is very limited, it is premature to attempt any assessments. To properly assess the more structurally complex parts of Tier Three areas, one would need detailed structure maps, pay thicknesses, and prospect specific risk factors – information that is not available now, in our opinion. We believe that with more capital infusion into exploration, with time, new plays could emerge from these areas and we will continue to watch drilling progress with great interest.*

Canaccord provided investors with summary details on the existing gas pipeline distribution network and infrastructure, commenting on "meaningful land position" and "well-head deliverability and infrastructure availability." In the Trans Quebec & Maritimes Pipeline May 2007 gas pipeline map, the main pipeline is situated on the north side of the Saint Lawrence river, with a main feed from the Montreal area into the State of New Hampshire. Later, during the federal Standing Committee on Natural Resources' study of Energy Security in Canada, the Canadian Gas Associations' chairman, Timothy Egan, made a pitch to the Committee on February 3, 2011, that if the Quebec government would export it's hydro-electricity to the United States then the future gas to be generated from the Saint Lawrence lowlands could replace the diverted energy.

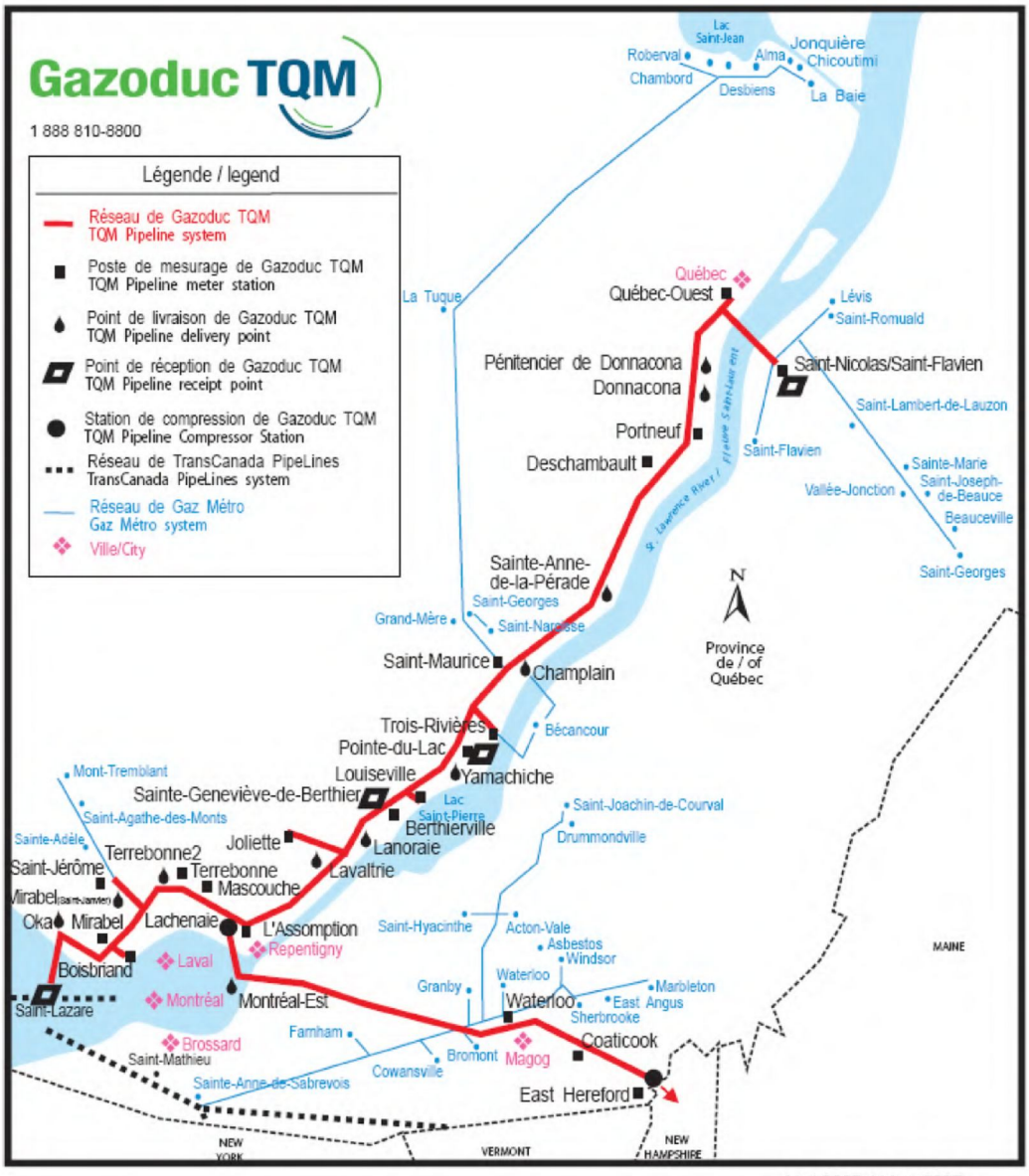
Canaccord stated to investors that there were "a number of key unknowns", the top three of which were (1) recovery per well; (2) production profile from stimulated horizontal wells; and (3) optimal development strategy."

> *Based on our estimates, the economics of the Utica Shale play are generally robust, with the favourable royalty regime and realized pricing environment being important contributors in the investment returns.*
>
> *However, we note that due to various factors such as well depth, pay thickness, and the type of well drilled, the economics of the play are not uniform across all prospective areas. As detailed in prior sections, we subdivided the play trend into "tiers" reflecting the relative maturity of the evaluation and, even then, there is expected to be large variability of outcomes within those regions.*
>
> *We note that our analysis uses current capitalization, and the full development of the various projects will require external funding, and considerable future equity dilution. In*

*addition, for some companies like Altai and Epsilon, the Utica opportunity is one of several resource opportunities in its portfolio, and capital allocation decisions may affect the timing of future development. This is unlike Junex, as an example, where the Québec plays are the primary growth projects.*

*We believe that in the next 12 to 18 months, our knowledge of Québec's petroleum potential will increase exponentially. While our valuation efforts for this study has been limited to the more unstructured Tier One and Tier Two areas, we believe that with more spending and reconnaissance work, we will have a much better understanding in how the Tier Three areas will shake out.*

**Figure 10: Transportation and distribution network in Québec**



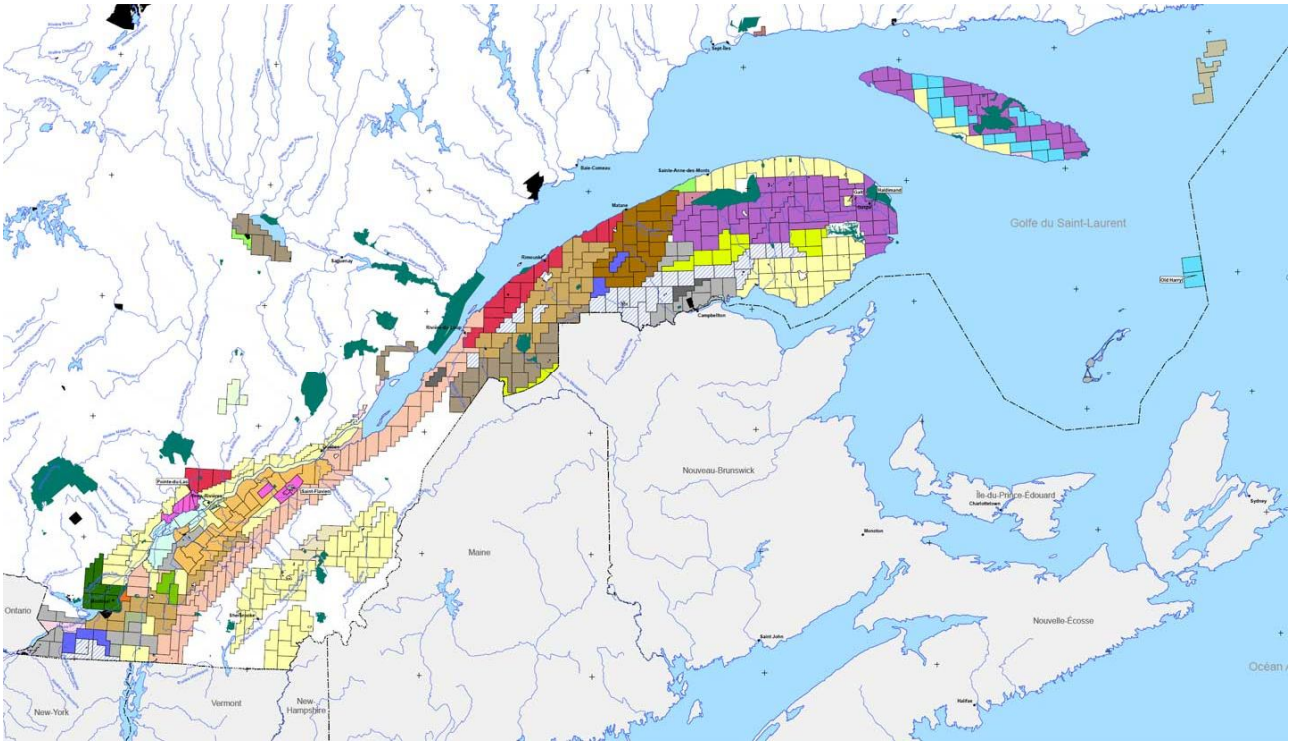

Source: Trans Québec & Maritimes Pipeline (TQM Pipeline)

## THE "CHALLENGES"!!

On page 23 of its *New Frontier* report, Canaccord provided a list of ten "data points" to be "sorted out" in Quebec's "Utica Play" over the following "12 to 18" months. Mixed in with a series of shale gas development considerations, point number five stated somewhat vaguely and ominously:

> *Community relations: Québec does not have a history of large scale oil and gas extraction, and the mineral owners are not the surface owners; this could present some challenges.*

As it turned out, Canaccord's "challenges" summary on "community relations" was a monstrous understatement. Over a period of two years following, the deep shale gas developments would evolve into a boiling pot of deep public concern and resistance that would eventually provoke a demand for a shale gas moratorium in Quebec, with the Quebec government then implementing a public review of shale gas developments beginning in September, 2010, that is, only after about 120 shale gas leases were handed out to energy companies. The public movement in Quebec occurred during the public up swell of resistance across the border in the northeastern United States, amidst the fury of shale gas developments in the Marcellus and other U.S. 'uncoventional' shales.




A segment from a 2010 map produced by the Quebec government showing the deep shale gas leases in Quebec. Almost all of these leases (each color representing a separate company's holdings) were let since 2006, over a five-year period. The length from the lower left, or southwestern corner, to the eastern end of the Gaspe Peninsula stretches about 450 kilometres. Not seen on this map, are the contiguous shale gas leases and properties in New Brunswick, Nova Scotia, Prince Edward Island, the States of Maine, New Hampshire, Vermont and New York.

Canaccord failed to carefully disclose to investors by way of analysis the following facts:

- that the shale gas leases let by the Quebec government were situated in the most heavily populated areas of Quebec, in the Saint Lawrence lowlands;

- that the Quebec government had failed to notify, consult, and brief residents in the lowlands concerning the future implications of "large scale gas extraction" on vast tracts of public and private lands it had leased, and continued to lease, to energy companies, and what those impacts meant to the lives of citizens and to the general environment.

Towards the latter half of 2010, clusters of organized citizen groups mounted a public petition for a shale gas moratorium and a another petition for the resignation of Quebec Premier Jean Charest.

Following the first public debate on hydraulic fracturing ("fracking") practices in Canada sponsored by the Munk School of Global Affairs at the University of Toronto on October 14, 2010, Questerre Energy Corporation's president and CEO Michael Binnion, a panel member at the day's forum, announced that Questerre would be temporarily leaving Quebec and would instead temporarily divert and focus its attention on developing the company's deep shale gas land lease assets in British Columbia.

> *Shares of Calgary-based Questerre Energy Corp. fell almost 14 per cent after a news report quoted its CEO as saying the shale gas industry in Quebec, where the company operates, has virtually ground to a halt.*
>
> *The Globe and Mail reported CEO Michael Binnion said Quebec's shale gas industry has essentially stalled because of low prices for natural gas and high drilling costs. Binnion made the comment in reference to calls for a moratorium on drilling in the area over growing concerns about water use and potential environmental damage.*
>
> *Shale gas is extracted by blasting chemicals, sand and water into deep, underground wells. Opponents fear that consumes huge amounts of water, pollutes existing supplies and leaves a contaminated byproduct.*
>
> *On Thursday, a University of Toronto report raised concerns Canada has not developed adequate regulations to address the potential impact of shale-gas extraction on the country's water supply.*
>
> *"In Canada, government has notably embraced the benefits of shale production while studiously avoiding any serious discussion of its considerable environmental costs," Ben Parfitt wrote in his report for the university's Munk School of Global Affairs.*
>
> *"The silence from the National Energy Board, Environment Canada and provincial energy regulators is troubling," he said.*
>
> (CBC News, October 15, 2010, *Questerre shares fall 14%*)

*Quebec's much-touted "shale gale" has been put on hold after the leading developers postponed a planned drilling program, citing high costs and public criticism of shale gas development.*

*Questerre Energy Corp. and its partner Talisman Energy Inc. had planned to complete two new test wells this year to further assess commercial development of the shale gas resource on the south shore of the St. Lawrence River. But they have pushed back that schedule by at least six months.*

*The move comes as the Quebec government and the industry face an uproar at public hearings over fears that an anticipated increase in drilling could threaten local water supplies. Oil companies are encountering a backlash throughout North America over unconventional drilling techniques in which chemically laced water is shot into shale rocks to open fissures and collect the natural gas, a process known as hydraulic fracturing, or "fracking."*

*At public hearings, some Quebec residents have demanded a moratorium on drilling, but Questerre chief executive officer Michael Binnion said the industry has essentially ground to a halt as natural gas prices remain depressed and companies cut exploration budgets in high-cost regions.*

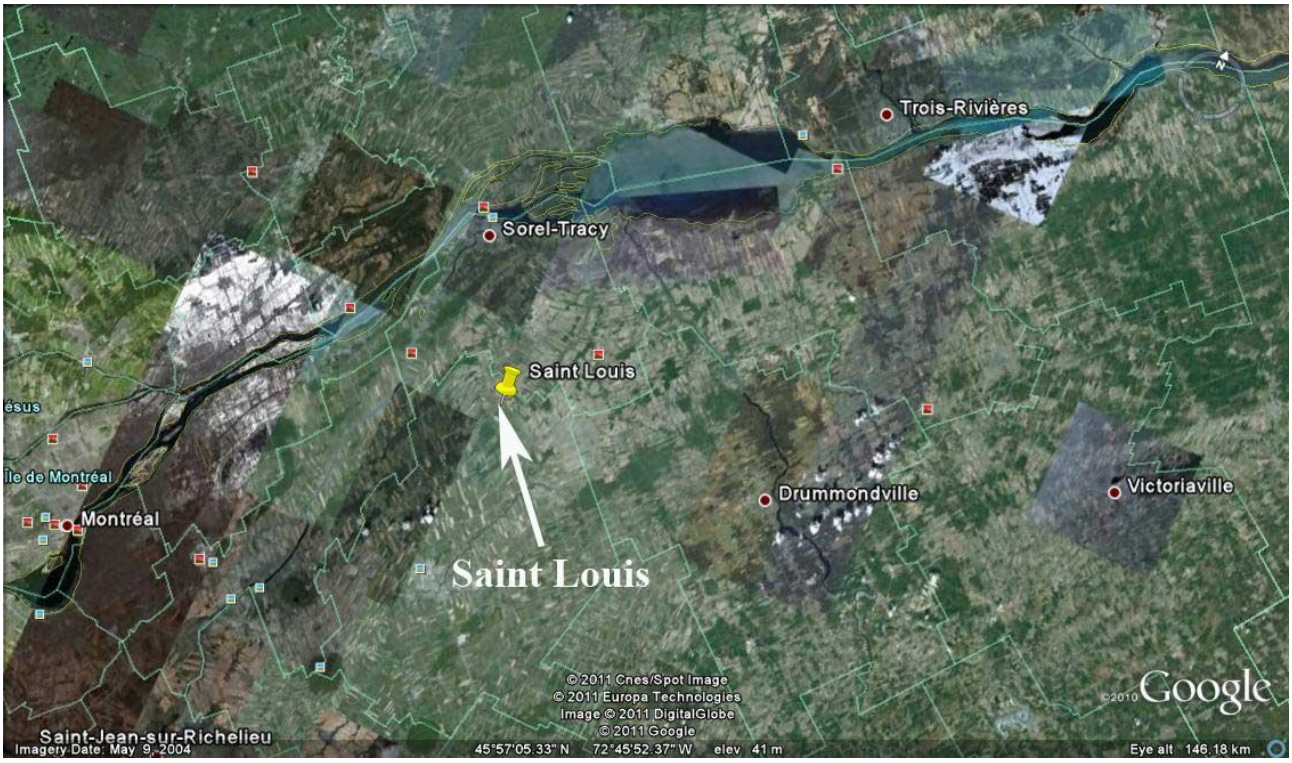
*The Calgary-based oil executive was in Toronto for the launch a new study published by the University of Toronto's Munk School of Global Affairs, which argues that Canadian regulators are ill-prepared for the shale gas boom.*

*Questerre and Talisman created considerable excitement in the past year as they launched a drilling program to develop the Utica shale resource, one of a dozen unconventional gas plays that have fundamentally changed the energy picture in North America.*
*Earlier this year, Questerre boasted that drilling results indicated that the Utica is among the top 10 shale fields on the continent.*
(Globe and Mail, October 18, 2010, *Quebec shale gas project grinds to a halt*)

A meeting of Inter-Regional citizen groups, representing the concerns of residents scattered across the Saint Lawrence Lowlands, in Drummondville on February 6, 2011. Following this meeting, on February 8th, representatives presented a 120,000 signature petition to the provincial parliament in Quebec City for a moratorium on shale gas development.

## PARADISE LOST: THE STORY OF WHAT HAPPENED TO RESIDENTS IN THE VILLAGE OF SAINT LOUIS (2007 - 2009)

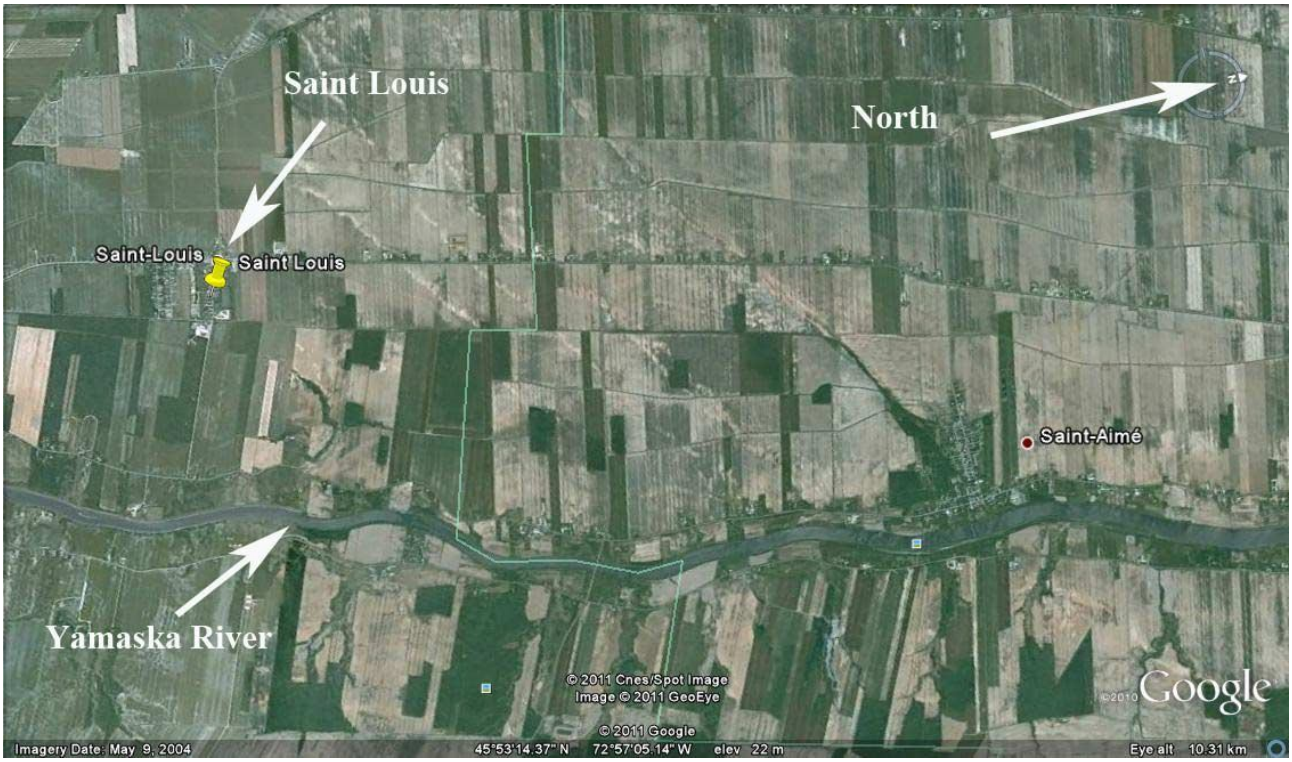
Canaccord's somewhat rosy 2008 forecast for shale gas developments in the Saint Lawrence lowlands were not, however, looking so rosy for rural residents, the people that actually lived there.



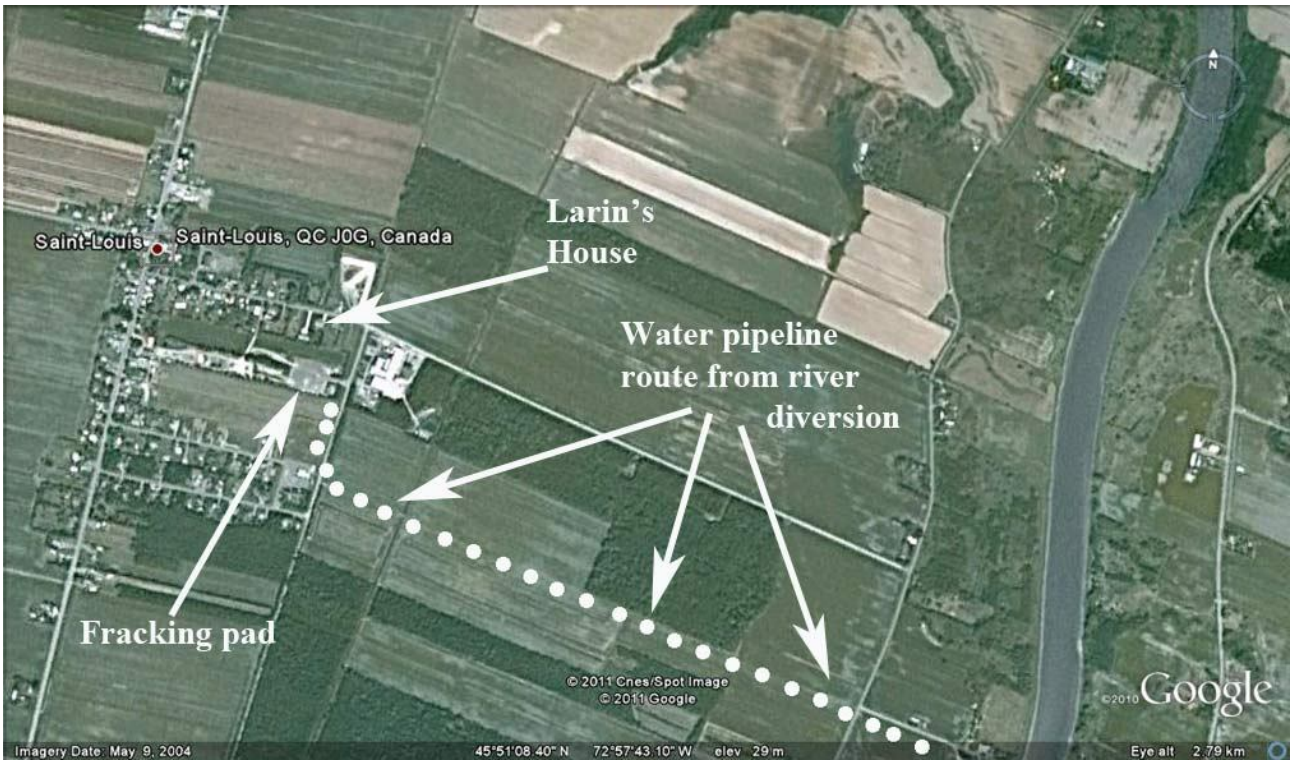

For instance, Odette and Rolland Larin, a retired couple with a lovely house in the country village of Saint Louis. Their story, later recounted in a number of local French newspapers and on French television, was presented in the Larin's November, 2010 written submission (included in both English and French as Appendix A in this report) to the Quebec government's public review by the Office of Environmental Public Hearing (BAPE) concerning deep shale gas developments.

In the summer of 2007, Gastem Inc., a Montreal-based company, [2] began drilling a deep shale gas well (identified as Saint Louis-de-Richelieu #1) about 70 metres south of the Larin's house door and much closer to their backyard property line. As the Larins stated in their submission to the BAPE, Gastem did so "without consulting us or giving us any information." There was no legal requirement for the Montreal-based company to advise or inform the Larins, nor did it reportedly seek to do so voluntarily. The Larins were ordinary, trusting country people, naive perhaps about the ways of the shale gas energy industry, and inexperienced on how to challenge the government and the energy industry, a naivety and inexperience that disappeared over time.

[2] According to information on the company's website (February 20, 2011), Gastem Inc. "was the first (company) to target the Quebec Utica Shale formation when it drilled and cored two wells on the Yamaska permit in 2007", and has accumulated "exploration and storage rights to over 1.1 million acres of land in the St. Lawrence Lowlands, the Gaspe Peninsula and the Magdelan Islands in Quebec", and with "exploration licenses to approximately 34,400 acres in New York State and 1,200 acres in Virginia".

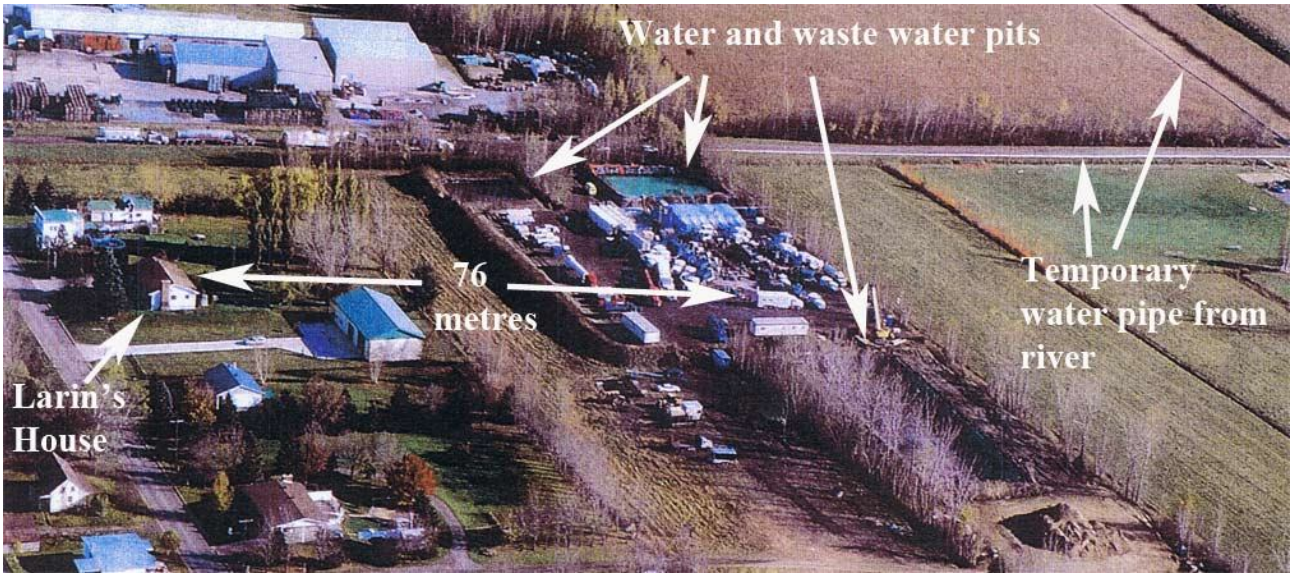



*Because we wanted to know more about what was going on, and after a lot of asking around, we finally got some information from a Natural Resources employee. He gave us the names of the companies involved in the project, added they had all the needed permits and so we needed not to worry, that there was no danger at all.* (Larin, 2010 submission)



In a November 7, 2010 article by reporter Jessica Nadeau, *Retired couple decided to resist the powerful gas industry*, the Larins were depicted as a staging a battle "of David and Goliath" proportions, and by eventually going to court. The story begins by how the Larins, after complaining about the drilling along with other neighbours, had accepted financial compensation by Gastem "for the three weeks of work. In exchange, they had to sign a confidentiality agreement:"

> *We were told that we could not do anything anyway, so as to endure, it was decided to take the money," says Odette Larin.*
> (Photo by Annik MH de Carufel)

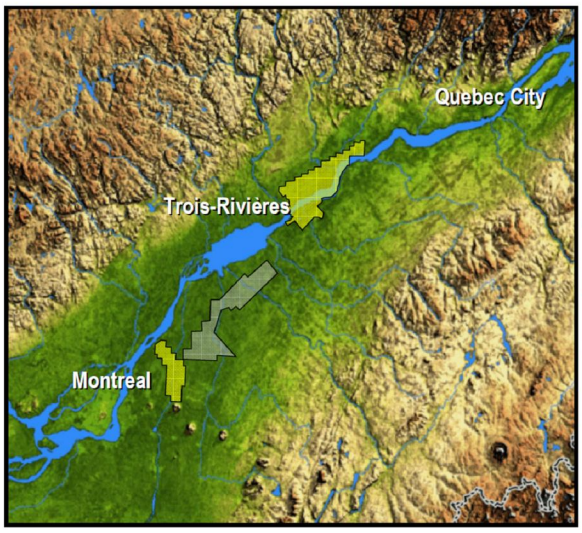



According to Canaccord, prior to the drilling of the well, Gastem Inc. gave Canadian Forest Oil Ltd. a "60% working interest in the Yamaska project." And, according to a February 21, 2008 media release by Gastem, it made the agreement with Canadian Forest Oil in January 2007, whereby following a successful fracking operation by Gastem at its St.-Francois-du-Lac #1 well in December, 2007, Canadian Forest Oil "exercised its Financial Commitment option on the Yamaska Property". (Gastem hired "Sproule and Associates of Calgary to complete a Gastem resource assessment for the Yamaska property.")

Canadian Forest Oil Ltd. (formerly ATCOR Resources Ltd.), headquartered in the Canadian energy capital of Calgary, Alberta, is a Canadian subsidiary of Denver, Colorado-based Forest Oil Corporation (New York Stock Exchange, *FST*), one of Forest Oil's three principal subsidiaries. Canaccord reported in 2008 that Canadian Forest Oil:

- had "339,000 gross acres, or 269,200 net acres, within the Utica Shale trend;"
- "plans to drill three horizontal wells to twin the vertical wells drilled in 2007," and that "these wells will have 2,000-foot lateral lengths, with 4-stage fracs;"
- "will likely launch a full scale drilling program in 2010."

# Utica Shale – Resource Potential




**339,000 Gross Acres, 70% Prospective**

**Resource Potential**

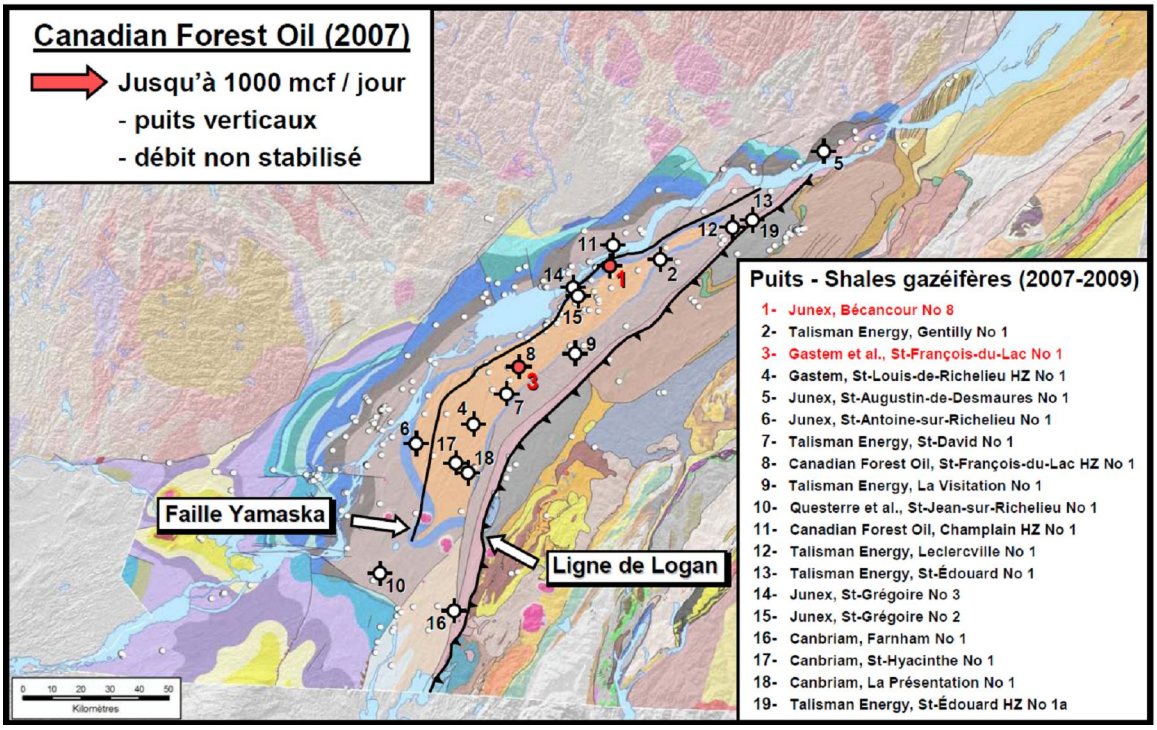
- 93 Bcf average gas-in-place per section

| Recovery Efficiency | Net Recoverable Tcf* | Net Bcf/well @ 100 acre spacing |
|---|---|---|
| 15% | 3.1 | 1.3 |
| 20% | 4.1 | 1.7 |
| 25% | 5.2 | 2.2 |

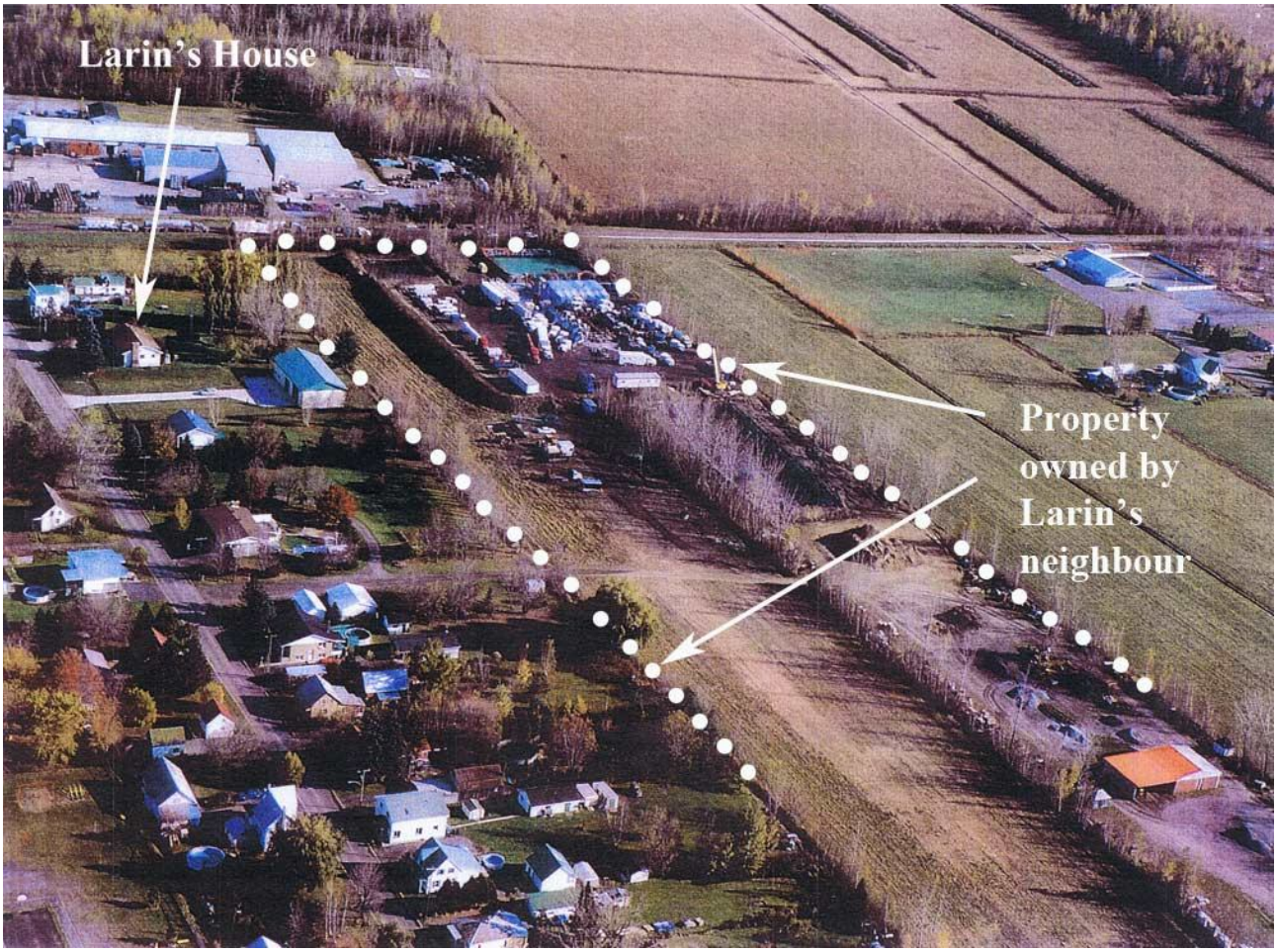
**Well Information**

- 4,000 – 7,000' total measured depth
- 4 stage frac
- 2008 activity $2.5 – 4.0 MM per well
- Target $2.5 MM for ultimate program

# Essais de production - Canadian Forest Oil




Gastem and Canadian Forest Oil's shale gas well in Saint Louis is identified as well number 4, above.



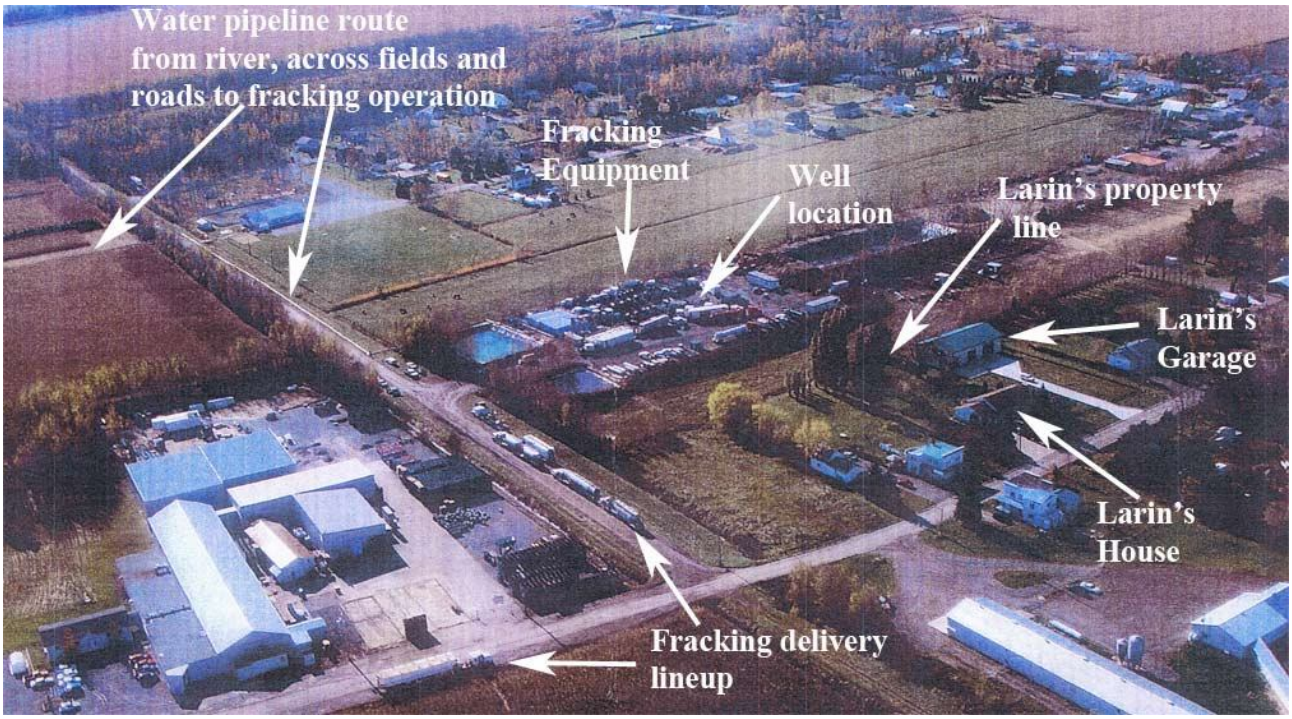

Gastem and partner Canadian Forest Oil negotiated a confidential access and development agreement with the Larin's neighbour who had inherited a long parcel of land that ran the southern length alongside a number of neighbourhood properties, including the Larin's, where Gastem and Canadian Forest Oil conducted their shale gas operations and placed their gas well. According to the Larins, the deal somehow also included the blessings of the mayor of Saint Louis. Day and night the drilling rig equipment engines were roaring, the bright location lights for the operation illuminating the landscape every night. An industrial development in Larin's back yard. They were absolutely furious.

> *Gastem (TSX VENTURE: GMR) is pleased to announce that the well at St- Louis de Richelieu has been drilled on budget and on time. Preliminary results of the drill program are very positive with core and log data analysis continuing.*
>
> *The well was spudded on June 23rd and drilling continued until July 13th to a target depth of 1,760 m* (5,774 feet) *to the Trenton Black River Formation. Cores were retrieved from the Utica Shale formation and sent for analysis. Logging was completed, the well plugged back to intermediate casing and the well suspended pending further work which should be undertaken shortly.*
>
> *Utica Shale formation thickness at St-Louis was 220 meters with excellent gas shows throughout. This is an important information milestone in the development of the Yamaska shale gas project as it confirms results from, among others, the St-Francois well and is*

*encouraging for the next phase in Gastem's Lowlands projects. An overview of results and future programs related to both wells and the Yamaska permits will be released in the coming weeks.*

*With the drilling completed on the St-Louis well, the initial two well program (St-Francois and St-Louis) is now finished and the drill rig released. The project is now in the data evaluation phase and will advance on an accelerated basis to the next series of tests.* (Gastem Inc. media release, July 24, 2007)

Following the three week-long initial drilling episode in the summer of 2007, the Larin neighbourhood of eastern Saint Louis enjoyed a quiet respite, that is, until the summer of 2008 when Canadian Forest Oil's fracking service contractor showed up at the well site, for stage two of the joint venture company partnership operations.




*Then, in the summer of 2008, a partner American company came back and when the installations were completed, the representative met with us and told us the same construction work would be done like in 2007 and when that would be done, it would be over. That drilling work lasted for 28 days, 24 hours a day.* (Larin, 2010 submission)

In Nadeau's November 2010 article, the Larins were informed by the company that the horizontal fracking operations "would last only three weeks and they were offered financial compensation." However, the fracking contractor returned "two months later ... this time for three months."

*This is where the hell really started for Larin. Work night and day, 7 days 7 nights, trucks, dust everywhere, horns, flames coming out of the flare.*

*"The worst thing for 6 days they proceeded to fracturing, remembers the lady. There was no way out of my house so there was pollution. Just down the five steps to the entrance, I had*

*palpitations, burning eyes, throat stinging and I was breathless. Yet I have always been in excellent health. I called Info-Santé and was told that I had all the symptoms of poisoning smog."*

*The couple said that the bedroom window you could see the flames rising from the flare at 100 feet in the air. The windows of the house shook. "It was pretty traumatic!" Recalls the former official.*

*The day after this incident, she called the company representative. "He talked about compensation yet, but he told us that the Forest Oil Company in Denver, Colorado, said that the work does not bother us and there would be no compensation this time."* (Google simple translator rendition of the article, French into English)


Photo of an unidentified, Canadian Forest Oil Utica Test Well in the Saint Lawrence Lowlands (Source: Forest Oil, May 5, 2008 document, *Shale Gas Teach-In*.)

*Finally, in the Fall of 2008, the partner company did some hydraulic fracturing, from October to January 2009, right in the middle of town. For 93 days, we lived through all the operations and manoeuvres of hydraulic fracturing, almost 24 hours a day. We were shaken by two explosions in the middle of the night, one of them was really bad and made all the windows of our house shake. We had to tolerate the nuisance of bright lights, the noise of running generators, the never ending traffic of heavy machinery, trucks and semi-trailers.*

*During 6 days, we were heavily intoxicated by carbon monoxide emanations from motors running on diesel and a lot of heavy machinery not usually seen in a small agricultural community. The noise generated by all these monster machines was unbearable. The company also put in three holding ponds, one of which was bigger to hold the waste-water from the fracking, all this in the middle of town. As per some studies published recently, that waste-water could contain some volatile compounds and other toxic products bad for our health.* (Larin, 2010 submission)

Canadian Forest Oil refused to make any further payments or financial concessions to the Larins due to the added three months of hydraulic fracturing activity in the formerly quiet sanctuary of Saint Louis. The compensation question then went into a tail spin, with the Larins refusing to sign a further confidentiality agreement. The Larins then filed a motion to the Supreme Court for damages. If the Larin's case (*Odette Larin and Rolland Larin, Plaintiffs, vs. Gastem Inc. and Canadian Forest Oil Ltd., Defendants, No. 765-17-000854-093, Superior Court, Province of Quebec, District of Richelieu*) is successful, it is said to be precedent-setting. The case is scheduled for a hearing in June, 2011.

*One day she (Odette Larin) was told that a single grain of sand could derail a big machine. Suddenly she smiled, her eyes sparkling with new hope. "Rolland and I are going to be two grains of sand."*

*Photo of the Larins at their home. The binder laying before them on their dining room table is a collection of the court documents. (February 5, 2011)*

Below, in Appendix B, are quotes from one of Canadian Forest Oils' documents filed with the Quebec Supreme Court, documents on the *Daily Completion Reports*, the details on the fracking operations that occurred over a three-month period.

*Gastem's operating partner on the Yamaska permit, Canadian Forest Oil presented in its "2008 Financial and Operational Results" a brief project update on its work program on the Utica Shale properties.*

*"Forest drilled and completed the first three horizontal Utica Shale wells in Quebec's St. Lawrence Lowlands, which were successfully cased and fracture stimulated in four stages with rates ranging from 100 - 800 Mcf/d. Frac load flowback was incomplete due to the lack of coiled tubing units in the area. Forest expects to continue to test its wells after the winter season is over. Although sustained rates were not as high as anticipated, the tests have allowed Forest to identify the section of the shale it intends to target in future test wells. Each of the wells were tested in different sections of the Utica Shale with an objective of*

*gathering data on productivity to allow optimization of future completions. Furthermore, Forest proved the ability to successfully drill the wells horizontally and pump multi-stage slickwater frac jobs without major operational issues."*

*Two of the three horizontal wells were drilled and completed on the Yamaska Property at St-Francois and St-Louis and are considered an important step forward in the validation of the Utica. Further testing work is currently being planned on Yamaska after this winter. As with any other new and developing shale play, it is to be expected that well productivity will improve with knowledge gained.*

*On its recently acquired participation on the St-Hyacinthe permit, located to the South West of Yamaska, Canbriam and Gastem are currently preparing a 3 vertical well program designed to test the Utica and Loraine Shale sequences this summer and fall. St-Hyacinthe is contiguous and geologically analogous to Yamaska, and the location of the test wells is in the process of being selected to facilitate potential pipeline tie-ins.*

(February 26, 2009, *Gastem, partner continues test on Yamaska,* in Scandanavian Oil & Gas magazine)

## APPENDIX A: THE LARIN'S WRITTEN SUBMISSION TO THE BAPE (English and French)

# (Translated from French) Submission (DM-39) presented to the: Office of Environmental Public Hearing (BAPE) on SUSTAINABLE DEVELOPMENT OF SHALE GAS IN QUEBEC

Presented by:
Odette Larin
Rolland Larin
November 2010

Mr. President, Commissioners:

My husband and I have retired since December 2006. We live in the Municipality of St.-Louis, in the District of Richelieu, since 1979. We have also spent our childhood and teens here; I was born here and my husband moved in this region when he was two. The only time we did not live in St.-Louis was between 1969 and 1979 when we moved to Longueuil where our children were born. When we had to choose between an exciting life in the city or the peace and quiet of the countryside, we chose the calmness, the sweet air and the tranquility we thought was necessary for our children and ourselves: we settled in St.-Louis for good, our own little paradise.

In the summer of 2007, a drilling company came and started to do some exploration, looking for natural gas. It chose an abandoned plot, right in the middle of town, 250 feet (76 meters) from our property, without consulting us or giving us any information. Because we wanted to know more about what was going on, and after a lot of asking around, we finally got some information from a Natural Resources employee. He gave us the names of the companies involved in the project, added they had all the needed permits and so we needed not to worry, that there was no danger at all. We learned later on during the last information meeting of the Gas Association that the company owning the claim needed to quickly find a lot zoned "white" (Ed. note: urban, as opposed to "green" which is agricultural only) to avoid sending the derrick back to Alberta while waiting for the permit from the CPATQ ( Ed. note: Commission to protect agricultural land in Quebec who have to give their okay if the drilling pad is to be located on agricultural land). And so because of a few administrative procedures, the company had no qualms in locating the drilling pad right in the middle of our small community.

It's only when the construction work of the installation was finished that a representative of this company took the time to meet us and inform us, saying that once the work is over, they would not come back. They drilled for 22 days, day and night. Then, in the summer of 2008, a partner American company came back and when the installations were completed, the representative met with us and told us the same construction work would be done like in 2007 and when that would be done, it would be over. That drilling work lasted for 28 days, 24 hours a day.

Finally, in the Fall of 2008, the partner company did some hydraulic fracturing, from October to January 2009, right in the middle of town. For 93 days, we lived through all the operations and manoeuvres of hydraulic fracturing, almost 24 hours a day. We were shaken by two explosions in

the middle of the night, one of them was really bad and made all the windows of our house shake. We had to tolerate the nuisance of bright lights, the noise of running generators, the never ending traffic of heavy machinery, trucks and semi-trailers. During 6 days, we were heavily intoxicated by carbon monoxide emanations from motors running on diesel and a lot of heavy machinery not usually seen in a small agricultural community. The noise generated by all these monster machines was unbearable. The company also put in three holding ponds, one of which was bigger to hold the waste-water from the fracking, all this in the middle of town. As per some studies published recently, that waste-water could contain some volatile compounds and other toxic products bad for our health.

We include in Appendix 1 two areal pictures to show you what we're describing and in Appendix 2, we include a video we recorded ourselves. The aerial photographs were taken by the gas company in October 2008 just before the fracking when all the necessary equipment was there to do the job. We circled our house in the photographs. We recorded the DVD ourselves at different times between October and December 2008, and the last part of the film was done in the summer of 2009. The DVD shows a bit of the machinery used to inject de the frack fluids at high pressure in the well. It also lets you hear the noise and the pollution emitted by the diesel motors running while the fracking is done. A few frames show the flaring and the lights kept on all night on the site. We also can see the derrick for the fracking, smaller than the rig for the vertical and horizontal drilling itself. We heard the second day of the hearings of the BAPE that the gas industry claims the noise coming from the fracking doesn't go over 40 decibels and that if the work annoys some, reduction measures could be undertaken.

The industry, as a citizen claiming to take its responsibilities seriously, can claim whatever it wants. But the size of their machinery, of their diesel run motors working them, and the large number of them, what concrete measures can they really employ to make their operations acceptable when we know that they need at least a dozen of them?

Another question that has to be addressed are the royalties, or rather the lack of them. If our understanding of it is correct, the government exempts the gas companies from paying royalties for the first 5 years of production (Ed. note: if the well starts producing before the end of 2010). We include in Appendix 3 a copy of a document published by Wellington West Capital Market dated July 22 2008 that says that the most productive extraction is in the first 3 years of an active well. How can it be said that there will be money to be made for the Quebec people if the wells are almost dry after 5 years?

The mining laws, which date from the end of the 19th century, let the companies work up to a 100 meters near homes. We are now in the 21st century and one doesn't have to be a specialist to be able to say that the equipment and the technology used these days cannot be compared to what was used one century ago. For these reasons mentioned above, here are our suggestions that could maybe bring social acceptability wished by both parties.

First, we suggest that it is strictly forbidden to drill within any urban perimeter. Consequently, to avoid any prejudices, we suggest that companies have to abandon and seal the wells drilled within the Municipality of St.Louis.

Second, we suggest that companies are forbidden to drill within one kilometre of any residence because of air pollution, noise pollution and light pollution generated by exploration operations.

Finally, even if the BAPE is not the right platform to make such a request, we ask that a moratorium be declared so that the people concerned have the time and give themselves the ways to evaluate the merits of exploring and exploiting shale gas. What do we want to hand down to our children and grand-children? Land emptied from its riches that are still there? A polluted environment? Or do we want to bequeath a bit of these riches so they too have a chance at prosperity.

In conclusion, even if we still wonder at what can become of the limited mandate given to you, even if we doubt the influence our recommendations may have to influence our decision-makers, even if we pondered for a long time about sharing our position with you, we still hope that this democratic process is not an empty word and that our intervention will weigh in the balance of things.

## Mémoire présenté au:
## Bureau d'audiences publiques en environnement (BAPE)

## DÉVELOPPEMENT DURABLE DE L'INDUSTRIE DES GAZ DE SCHISTE AU QUÉBEC

Présenté par:
Odette Larin
Rolland Larin
Novembre 2010

Monsieur le président
Madame et messieurs les comssaires

Mon mari et moi sommes retraités depuis décembre 2006. Nous habitons la municipalité de Saint-Louis, dans le district de Richelieu, depuis 1979. Nous y avons aussi vécu notre enfance et notre adolescence, moi pour y être née et mon mari pour y être arrivé à l'âge de deux ans La seule période de notre vie qui &est déroulée hors de Saint-Louis fut de 1969 à 1979, période pendant laquelle nous avons vécu à Longueuil et où nos enfants sont nés. Puis, nous avons dû choisir entre la vie mouvementée à la ville, ou la paix et la quiétude à la campagne. Pour offrir à nos enfants et à nous-mêmes le calme, l'air pur et la tranquilité que nous avons jugés nécessaires, nous avons choisi de nous établir définitivement à Saint-Louis, notre petit paradis.

À l'été 2007, une compagnie d'exploitation gazifière est venu forer un puits, à la recherche de gaz naturel. Elle s'est installée sur un terrain vague, en plein centre du périmètre urbain, à 250 pieds (76 mètres) de notre propriété, sans aucune consultation ni information préalable. C'est en voulant en savoir davantage et après plusieurs démarches que nous avons réussi à obtenir quelques informations d'un représentant du ministère des Ressources naturelles. Il nous a mentionné le nom des compagnies impliquées, qu'elles détenaient tous les permis nécessaires et que nous n'avions pas à nous inquiéter, qu'il n'y avait aucun danger. On apprendra plus tard, lors de la dernière rencontre d'information de l'Association gazière, que la compagnie qui détient le "daim" avait besoin de trouver rapidement un terrain en zone blanche afin d'éviter que la foreuse retourne en Alberta et pour éviter le délais d'attente pour l'obtention d'une autorisation de la CPTAQ, si les travaux

avaient été faits en zone agricole Ainsi, pour quelques préoccupations d'ordre matériel, la compagnie n'a eu aucun scrupule à s'installer en plein centre de notre petit village.

C'est seulement lorsque les travaux d'installation ont été terminés que le représentant de cette compagnie est venu nous rencontrer pour nous informer et discuter avec nous en expliquant qu'une fois les travaux terminés, ils ne reviendraient plus. Ils ont foré pendant 22 jours, nuit et jour.

Puis, à rété 2008, une compagnie américaine partenaire est venue et encore une fois, lorsque les installations ont été complétées, le représentant nous a rencontré en mentionnant que le même genre de travaux qu'en 2007 seraient faits et qu'ensuite, ce serait fini. Ces travaux ont duré 28 jours, 24 heures sur 24.

Et finalement, à l'automne 2008, la compagnie partenaire a fait de la fracturation hydraulique, d'octobre à janvier 2009, en plein milieu du village. Nous avons vécu, pendant 93 jours, toutes les opérations et manoeuvres reliées à la fracturation hydraulique, presque toujours 24 heures sur 24. Nous avons subi deux explosions en plein milieu de la nuit dont une particulièrement traumatisante qui a fait trembler les fenêtres de notre maison. Nous avons subi des nuisances en raison de l'éclairage, du fonctionnement des génératrices, du va-et-vient continuel de machinerie et de la circulation de camions semi-remorque. Pendant six jours, nous avons été fortement intoxiqués par les émanations de monoxyde de carbone des moteurs diésel et par la machinerie lourde très nombreuse qu'il est anormal de retrouver dans le village d'une municipaié agricole. Le bruit causé par ces mastodontes était insoutenable. La compagnie a aussi aménagé trois bassins dont un plus grand pour la récupération des eaux de fracturation, toujours en plein centre du village. Selon des études publiées récemment, ces eaux contiendraient des gaz volatils et d'autres produits nocifs pour la santé.

Pour appuyer nos dires, nous joignons à l'annexe 1 deux photographies aériennes et, à l'annexe 2, une vidéo amateur que nous avons tournée. Les photographies aériennes ont été prises par la compagnie gazière en octobre 2008, juste avant les travaux de fracturation alors qu'une bonne partie de la machinerie nécessaire était déjà sur place pour les travaux. Notre résidence est encerclée sur les photos. Le DVD a été filmé par nous-mêmes à différentes périodes entre octobre et décembre 2008 et pour la dernière partie du film, à l'été 2009.

Ce DVD montre un peu la machinerie utilisée pour injecter à très haute pression l'eau dans le puits. Il permet aussi d'entendre le bruit et de voir la pollution émise par les moteurs diésel durant la fracturation. Quelques prises de vue montrent la flamme qui sort de la torchère ainsi que les lumières utilisées pour éclairer le site pendant la soirée et la nuit. On y voit aussi la foreuse de service pour la fracturation, un peu plus petite que les foreuses servant à faire les forages verticaux et horizontaux.

Lors de la deuxième journée dudiences du BAPE, l'industrie gazifière a affirmé que les opérations de fracturation n'émettent pas plus de 40 décibels et qu'advenant que certains travaux dérangent, des mesures d'atténuation pourraient être prises. L'industrie, en citoyen qui se dit responsable, peut bien prétendre ce qu'elle veut. Mais à voir la taille de ces mastodontes, la taille des moteurs diésel qui les alimentent et le nombre de ces machines, quelles mesures concrètes peuvent-ils bien appliquer pour rendre leurs opérations acceptables quand on sait qu'elles nécessitent une quinzaine de ces machines?

Un autre aspect à approfondir est celui des redevances, ou plutôt du congé de redevances accordé aux gazifières. Si nous avons bien compris le principe, le gouvernement donnerait un congé de redevances durant les 5 premières années de l'exploitation. Nous joignonc en annexe 3 la copie d'un document publié par Wellington West Capital Market, July 22. 2008, qui démontre que l'exploitation principale se fera surtout durant les 3 premières années. Comment peut-on affirmer qu'il y aura de l'argent pour les québécois si les puits sont à sec ou presque après 5 ans?

La loi sur les mines, qui date de la fin du 19e siècle, permet aux compagnies de procéder aux travaux pourvu quelles soient à au moins 100 mètres des résidences. Nous sommes au XXle siècle et il n'est pas besoin dêtre un spécialiste pour dire que la machinerie et les procédés utilisés de nos jours ne se comparent pas à ceux utilisés au début du siècle précédent. Pour toutes les raisons mentionnées précédemment, voici nos suggestions qui permettraient peut-être d'en arriver à l'acceptabilité sociale tellement echerchée de part et d'autres.

Premièrement, nous suggérons qu'il soit strictement interdit de forer dans les limites de tout périmètre urbain. À cet effet, et pour éviter d'autres préjudices, nous suggérons qu'on oblige les compagnies impliquées à abandonner et à condamner e puits de forage creusé dans le village de Saint-Louis.

Deuxièmement, nous suggérons qu'on interdise aux compagnies de forer à moins de un kilomètre de toute résidence, vu les pollutions atmosphérique, sonore et lumineuse engendrées durant les opérations d'exploration.

Finalement, et même si le BAPE n'est pas la tribune appropriée pour raire cette demande, nous demandons aussi qu'un moratoire soit décrété pour que les instances concernées aient le temps et se donnent les moyens nécessaires pour évaluer le bien-fondé de l'exploration et de l'exploitation des gaz de schiste. Que voulons-nous léguer à nos enfants et à nos petits-enfants? Un sous-sol vidé des ressources qu'il contient encore? Un environnement pollué? Ou voulons-nous leur laisser un peu de richesse pour qu'ils puissent aussi avoir une chance de prospérer.

En conclusion, malgré que nous nous questionnions sur ce qui résultera du mandat restreint qui vous a été octroyé malgré que nous ayons de forts doutes sur l'influence que vos recommandations auront sur nos décideurs, malgré que nous ayons hésité longuement avant de vous présenter notre position, nous osons espérer que cette démarche démocratique n'est pas un vain mot et que notre intervention fera un peu pencher la balance.

## APPENDIX B: CANADIAN FOREST OIL'S FRACKING DOCUMENTS

In the ensuing documents filed with the court by Gastem and Canadian Forest Oil (*Odette Larin and Rolland Larin, Plaintiffs, vs. Gastem Inc. and Canadian Forest Oil Ltd., Defendants, No. 765-17-000854-093, Superior Court, Province of Quebec, District of Richelieu*), the Larins were provided with Canadian Forest Oil's *Daily Completion* ("Fracking") *Reports* dated October 12, 2008 to January 11, 2009. According to these documents identified as Project *Quebec 2008 POC*, the "cumulative cost" for the three months of fracking operations by the service companies totalled $3,700,722.

The daily fracking logs contain different sets of valuable data for both Quebecers and Canadians, because this data is otherwise privileged information. Data such as the total amount of fresh water, frack sand, and acids used in the stimulation operations, and the amount of return formation and frack water and gas coming out of the well. [3]

### Fresh Water, Acid, Frack Sand and Frack Water Data

According to the data in the reports filed with the court, the following totals for the four horizontal well frack operations in Saint Louis:

- **1,768,572 gallons of "load fluid"** [4] (Canadian Forest Oil uses the American measurement standard for gallons, [5] which translates to about 262-264 gallons/cubic metre, or a total of about 6,750 cubic metres of "fluid") pumped into the well;
- **10,035 gallons of "acid"** (38.3 cubic metres);
- **1,245,505 pounds of frack sand**;
- **3,907 cubic metres (1,032,229.4 gallons) of frack water** hauled from one of the water pits to an undisclosed disposal site. [6] The fracking reports state, however, that a total of 768,384.6 gallons of "load fluid" were recovered from the well. This is a difference of 263,845 gallons from the total amount of frack water hauled to the disposal site. Does this figure relate to the "formation water", which rose up with the "load fluid"?

### "Load Fluid" up the Well

Gastem and Canadian Forest Oil's well, under natural sub-surface shale elevation pressure following the four fracks, began flowing return water on October 28, 2008 until January 2, 2009 when the well was finally capped. Over that period 768,384.6 gallons (2,932 cubic metres), or 42.9% of the total 1,768,572 gallons of "load fluid" pumped into the well, had so far returned:

[3] One of the 'oddities' in the data is that the data for November 24 and November 25, 2008, is identical. What does this infer? Will the missing data reveal something of interest?

[4] "Load Fluid" is not defined in the report. Is this just water, or a mixture with chemicals before the "acid" is combined? The original total of 1,763,288 gallons was revised on November 8, 2008 to 1,767,251.1 gallons, and then to 1,768,572 gallons.

[5] I.e., on the November 26, 2008 daily report, "total fluid hauled to date 3,777 M3 (997,883 GALS)." By dividing the total cubic metres figure into the total gallons figure.

[6] The reports state that a total of 768,384.6 gallons of "load fluid" were recovered from the well. This is a difference of 263,845 gallons from the total amount of frack water hauled to the disposal site. Does this figure relate to the "formation water", which rose up with the "load fluid"?

- on **October 28th**: over a 16 hour period, 107,604 gallons of "load fluid" returned (6.1% of the total), at 6,725.23 gallons per hour.
- on **October 29th**: over a 17.5 hour period, 128,516 gallons of "load fluid" returned (now, 13.3% of the total), at 7,343.77 gallons per hour.
- on **October 30th**: 8,752 gallons of "load fluid" returned (now, 13.9% of the total) over a 2.75 hour period, at 3,182 gallons per hour.
- on **November 1st**: 140,319.6 gallons of "load fluid" returned (now, 21.8% of the total) over a 16 hour period, at 8,719.98 gallons per hour.
- on **November 2nd**: 122,688.1 gallons of "load fluid" returned (now, 28.8% of the total) over a 24 hour period, at 4,906.7 gallons per hour.
- on **November 3rd**: 58,233.2 gallons of "load fluid" returned (now, 32.1%, or 566,092.9 gallons, of the total) over a 24 hour period, at 2,436.4 gallons per hour.
- on **November 4th**: 32,141.3 gallons of "load fluid returned (now, 33.9% of the total) over a 24 hour period, at 1,339.22 gallons per hour.
- from **November 5th to 6th**: 11,324.3 gallons of "load fluid" returned (now 35.6% of the total) over a 24 hour period, at 471.84 gallons per hour.
- on **November 8th**: total amount of "load fluid" recovered to date at 660,802.3 gallons (37.4% of the total). Over last 24 hour period, return rate of 37.46 gallons per hour.
- on **November 17th**: total amount of "load fluid" recovered now at 678,791.3 gallons (38.4% of the total).
- on **November 27th**: total amount of "load fluid" recovered now at 715,079.3 gallons (40.4% of the total).
- on **December 5th**: total amount of "load fluid" recovered now at 726,660 gallons (41% of the total). Average flow rate now at 53.99 gallons per hour.
- on **December 15th**: total amount of "load fluid" recovered now at 750,591.3 gallons (41.9% of the total).
- on **January 1, 2009**: total amount of "load fluid" recovered now at 767,261.3 gallons (42.8% of the total).
- on **January 2nd**: Last recording of "load fluid", now at 768,384.6 gallons (42.9% of total). The well was "shut in" on January 6, 2009. Well pressures: Tbg 1,250.0 psi, and Csg 1,400.0 psi.

**The Daily Reports - The Four Fracks**

**By October 15th**: "Unloaded and spotted NEWALTA filtration equipment.... Started laying Utica water system piping."

**By October 21st**, nine days into the fracking operations, the filtered-pumped Yamaska River water filled the primary water pit "slightly over half full", as "frack sand trucks are coming into location," and "communications are difficult with all the steel on location." "Cumulative cost: $522,501."

**On October 22nd**:

> *Set up equipment used for frac operations, filtered frac water to the pit. Cumulative cost: $563,878.*

On **October 23rd**:

*BJ frac equipment arrived on location. Set up equipment. Cumulative cost: $605,920.*

On **October 24th**:

*At sunrise we found the submersible pump power cables and discharge hoses were slashed by vandals. Forest Oil Corporation Operations and the Quebec police were notified. Action was taken to repair equipment as soon as possible to continue with the frac operation. Pressure test pumps, lines and wellhead valves to 8,703 PSI (60.0 MPA). Held. Wait on water pump repairs. Start frac job with BJ Services referred to job number # S326717, Oct.23/2008.* ***Stage 1. Start frac*** *with slick water.* ***Total volume of fluid pumped 10,907.0 BBLS (458,094.0 Gals). Total acid pumped for job 3,064 gals.... Total sand pumped 361,402 Lbs.*** *(100 mesh sand - 291,340 Lbs) (Ottawa 40/70 - 70,062 Lbs) (100 mesh min. conc. 0.25 Lbs/Gal, Max. conc. 2.2 Lbs/Gal) .... Shut down operations for night. Continued to filter fresh water with NEWALTA. Security monitored operations at water source and pump lines. Cumulative cost: $1,093,765.*

On **October 25th**:

*Wait on Schlumberger to frac well. Rig to perforate.... Spotted Schlumberger wireline unit, unloaded perforation equipment. Made up perf gun cluster. Cumulative cost: $1,137,794.*

On **October 26th**:

*Perfed Stage 2 with Schlumberger addressable firing system. Pulled out of well. Secured well and layed down tools. Dropped plug ball in Wellhead A. Secured top frac valve. Inspected perf guns. All 45 shots expended..... Prepared for* ***Stage 2 frac*** *operations with BJ Services. Pressure tested frac equipment and Master Valve to 9,428.0 PSI (65.0 MPA). Held. Good. Start frac job with BJ Services ... Start Frac with slick water.* ***Total volume of fluid pumped 8,138.0 BBLS (341,796.0 GALS). Total acid pumped for job 1,470.0 GALS.... Total sand pumped 350,000 LBS*** *(100 mesh sand - 287,250 LBS).... Rig up to Perf Stage 3. Made up CCL, Stage 3 perf cluster and Halliburton 5.5 inch drillable composite frac plug to bottom of perf cluster and secured. Armed perf guns.... Penetration of charges - 24.9 inch hole size - 0.44 inch total shots per gun 9. Total shots/ perf cluster - 45.0. Spacing between perf intervals - 50.0 feet. Perfed Stage 3 with Schlumberger addressable firing system. Pulled out of well. Secured well and laid down tools. Dropped plug ball in wellhead and secured top frac valve. Inspected perf guns. All 45 shots expended. Prepared for next perf operation. Shut down for night. Filter water over night to the pit. Cumulative cost: $1,645,858.*

On **October 27th**:

*Pressure tested frac pump line and master valve to 9,428.0 PSI. Held. Good. Start frac job with BJ Services....* ***Stage 3. Start frac*** *with slick water.* ***Total volume of fluid pumped 9,264 BBLS (389,088.0 GALS). Total acid pumped for job, 95.0 BBLS (3,990.0 GALS).... Total sand pumped 163,556.0 LBS.****... Total frac balls dropped - 30. Secured well. Rig up to perf Stage 4.... Made up CCL Stage 4 perf cluster ... Armed perf guns ... Total shots per gun 9. Total shots/ perf cluster - 45.0. Perf'd Stage 4 with Schlumberger addressable firing system.*

*Pulled out of well. Secured well and laid down tools.... Filtered water with NEWALTA to the pit. Cumulative cost: $1,980,165.*

On **October 28th**:

*Start frac job with BJ Services.... Start frac with slick water. Total volume of fluid pumped 12,397.0 BBLS (520,674.0 GALS). Total 7.5% HCL Acid, pumped 36.0 BBLS (1,512.0 GALS). Total sand pumped 370,547.0 Lbs. Water - high raw water turbidity reported in NEWALTA analysis report compared to the previous daily water analysis, was caused by heavy rains raising the water level at the pump source by 7.0 feet and heavy currents. Finished frac and proceeded to rig out frac and NEWALTA water filtration system and move to St. Francois-Du-Lac 1H well site. Cumulative cost: $2,297,268.*

**Toxic Water Disposal**

**November 20th**:

*Rigged in Sani-P to transfer frac water to disposal site. Sani-P shuts down operations for the night. Total loads hauled to disposal site = 17 loads.*

**November 21st**:

*Rig in Sani-P to haul frac water to disposal site. Last load out at 18:30 hours. Total loads hauled, 25.*

**November 22nd**:

*Rig in Sani-P and Drummond Vac to haul frac water to disposal site. Last load out at 17:25. Total loads hauled, 25.*

**November 24th**:

*Rig in Sani-P to haul frac water to disposal. Last load out at 17:45. Total loads hauled, 25.*

**November 25th**:

*Rig in Sani-P to haul frac water to disposal site. Last load out at 17:45. Total loads hauled, 25.*

**November 26th**:

*Rig in Sani-P to haul frac water to disposal site. Last load out at 17:30. Total loads hauled, 15. Total fluid hauled today, 414 cubic metres (109,378.8 gals). Total fluid hauled to date, 3,777 cubic metres (997,883 gals).*

**November 27th**:

> *Rig in Sani-P to haul frac water to disposal site. Last load out at 11:00. Total loads hauled, 5. Total fluid hauled, 130 cubic metres (34,346 gals). Total fluid hauled to date, 3,907 cubic metres (1,032,229.4 gals). Sani-P released at 13:00.*

**Gas Production, Gas Flaring**

**November 5th**: *Gas produced last 24 hours, 0.075 MMCF. Cumulative gas produced, 0.077 MMCF. Cumulative cost: $2,449,907.*

**November 6th**: *Gas produced during 24 hour period was 0.314 MMDF. Small gas flare, no measurable gas to surface.*

**November 7th**: *Checked well pressure, well flowing water and gas at pressures ranging from 100 KPA to 450 KPA.*

**November 10th**: *Gas produced during past 24 hours was 0.043 MMCF, cumulative gas produced 0.436 MMCF. Cumulative cost: $2,633,122.*

**November 15th**: *Gas produced during past 24 hour period was 0.121 MMCF, cumulative gas produced was 0.833 MMCF.*

**November 17th**: *Gas produced during the past 24 hour period was 0.141 MMCF. Cumulative gas produced was 1.041 MMCF. Cumulative cost: $2,871,303.*

**November 18th**: *Gas produced during the past 24 hour period was 0.485 MMCF. Cumulative gas produced was 1.526 MMCF. 01:30 - 06:00; Well flowing water and gas, flowed 0.398 mmcf gas, flow pressure peaked briefly at 1012 psi.*

**November 20th**: *Gas flared for 24 hour period 0.270 MMSCF, cumulative gas flared 2.124 MMSCF.*

**November 21st**: *Gas flared for 24 hour period 0.219 MMSCF, cumulative gas flared 2.343 MMSCF. Sample = Water, no sand, PH 8, salinity 20,000 ppm.*

**November 22nd**: *Gas flared for 24 hour period 0.155 MMSCF, cumulative gas flared 2.498 MMSCF.*

**November 23rd**: *Gas flared for 24 hour period 0.160 MMSCF, cumulative gas flared 2.658 MMSCF.*

**November 24th**: *Gas flared for 24 hour period 0.188 MMSCF, cumulative gas flared 2.846 MMSCF.*

**November 26th**: *Gas flared for 24 hour period 0.175 MMSCF, cumulative gas flared 3.202 MMSCF.*

**November 27th**: *Gas flared for 24 hour period 0.173 MMSCF, cumulative gas flared 3.375 MMSCF.*

**November 28th**: *Gas flared for 24 hour period 0.170 MMSCF, cumulative gas flared 3.545 MMSCF.*

**November 29th**: *Gas flared for 24 hour period 0.180 MMSCF, cumulative gas flared 3.725 MMSCF.*

**November 30th**: *Gas flared for 24 hour period 0.170 MMSCF, cumulative gas flared 3.895 MMSCF.*

**December 1st**: *Gas flared for 24 hour period 0.172 MMSCF, cumulative gas flared 4.067 MMSCF.*

**December 2nd**: *Gas flared for 24 hour period 0.214 MMSCF, cumulative gas flared 4.281 MMSCF.*

**December 3rd**: *Gas flared for 24 hour period 0.186 MMSCF, cumulative gas flared 4.467 MMSCF.*

**December 4th**: *Gas flared for 24 hour period 0.196 MMSCF, cumulative gas flared 4.66 MMSCF.*

**December 5th**: *Gas flared for 24 hour period 0.357 MMSCF, cumulative gas flared 5.020 MMSCF.*

**December 10th**: *Gas flared for 15 hour period - 0.402 MMSCF. Total gas flared to date - 5.514 MMSCF. Gas rates are not a stabilized flow rate, well is surging and unloading the load fluid.*

**December 12th**: *Today we will swab the well in if it does not flow.*

**December 13th**: *Gas flared for 21.5 hour period - 0.341 MMSCF. Total gas flared to date - 5.877 MMSCF.*

**December 14th**: *Total gas flared for 24 hour period - 0.251 MMSCF. Total gas flared to date - 6.128 MMSCF.*

**December 15th**: *Gas flared for period - 0.200 MMSCF. Gas flared to date - 6.328 MMSCF.*

**December 16th**: *Gas flared for 24 period - 0.199 MMSCF. Gas flared to date - 6.527 MMSCF.*

**December 17th**: *Gas flared for 24 period - 0.160 MMSCF. Gas flared to date - 6.687 MMSCF.*

**December 18th**: *Gas flared for 24 period - 0.153 MMSCF. Gas flared to date - 6.840 MMSCF.*

**December 20th**: *Gas flared for 24 period - 0.126 MMSCF. Gas flared to date - 6.966 MMSCF.*

**December 21st**: *Gas flared for 24 period - 0.127 MMSCF. Gas flared to date - 7.216 MMSCF.*

**December 22nd**: *Total gas flared for the last 24 hour period - 0.123 MMSCF. Total gas flared to date - 7.339 MMSCF. Well was shut in at 21:30 hours to allow buildup.*

**December 24th**: *Gas flared for 24 hour period - 0.127 MMSCF. Total gas flared to date - 7.718 MMSCF.*

**December 25th**: *Gas flared for 24 hour period - 0.084 MMSCF. Total gas flared to date - 7.889 MMSCF.*

**December 26th**: *Gas flared for 24 hour period - 0.168 MMSCF. Total gas flared to date - 8.057 MMSCF.*

**December 27th**: *Gas flared for 24 hour period - 0.168 MMSCF. Total gas flared to date - 8.258 MMSCF.*

**December 28th to December 31st**: *Shut in well pressures: from TBG pressure 815 psi and CSG pressure 805.0 psi, to TBG pressure 1,494.0 psi and CSG pressure 1,229.0 psi.*

**January 1st, 2009**: *Gas flared for 19 hour period - 0.364 MMSCF. Total gas flared to date - 8.688 MMSCF.*

**January 2nd**: *Gas flared for 24 hour period - 0.315 MMSCF. Total gas flared to date - 9.003 MMSCF.*