THE PATH FORWARD

Louis LaPierre, Ph.D., C.M.

Over the course of my career I have been tasked to gather feedback from citizens on a variety of issues and report my findings to governments at all levels. It has always been an honour and privilege to serve both the citizens and the government in this capacity. My experience with the Shale Gas Public Consultations was no exception.

I was asked by the Office of the Premier and the Minister of Natural Resources to solicit feedback on the government's proposed regulations for the shale gas industry. Shale Gas development has been an issue of great concern for many New Brunswickers, particularly in areas that could potentially be impacted by a shale gas industry. The proposed regulations are critically important to building confidence among the public that Government is committed to developing the industry on a safe and sustainable basis.

I agreed to take on this consultation as long as government agreed to two specific requirements. Firstly, that I would be independent in my ability to seek input from any and all sources I believed would add to the discussion; and secondly that I would be free to release my report at a time, place and manner of my choosing. Government agreed to both of those requirements and my work commenced.

Over the course of 9 public meetings New Brunswickers voiced their concerns with the development of a shale gas industry in our province and provided feedback on the proposed regulations. In addition to the public meetings New Brunswickers were able to submit their feedback online. I also met with several stakeholder groups in separate sessions.

Upon reviewing all the submissions received and the recordings of the public sessions my task was to provide a summary report on the issues concerning the regulation of shale gas exploration in this province. In this report I have identified what I feel are the issues that are a primary concern to New Brunswickers with regards to the shale gas industry based on specific key topic areas. I have also made recommendations to Government on these specific items to focus attention on public concerns.

Throughout this process I became acutely aware of the economic importance and beneficial impact the shale gas industry could have on our province as well as the very real concerns of New Brunswickers. I began to think about how the two could co-exist.

Given the divergent views on this subject I have taken it upon myself to propose what I believe is a sustainable path forward, if this industry is to exist in any form in New Brunswick.

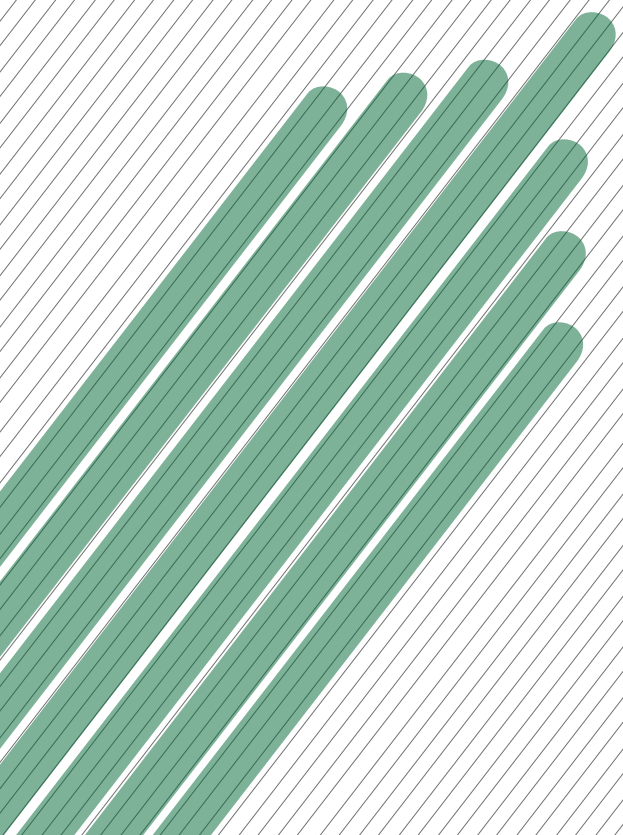
Government and industry proponents have not done enough to provide a clear and credible New Brunswick based, science-driven direction on this industrial opportunity, in my view. The opportunity requires a high degree of accountability to New Brunswickers and I hope my suggested path forward can help do that.

I truly believe the Path Forward should be considered by all stakeholders when examining the potential for a shale gas industry in New Brunswick.

Sincerely,

Louis LaPierre, PhD. CM

SECTION I:
PUBLIC MEETING SUMMARY



In May of 2012, I was asked to chair a panel with members of the Natural Gas Group at the request of the provincial government to obtain feedback from New Brunswickers on the proposed regulations which were released on May 17th, 2012. The original intent of the meetings was to take recommendations based on specific sections of the draft document *Responsible Environmental Management of Oil and Gas Activities* in New Brunswick, back to government. It is believed that consultation with New Brunswickers would improve the regulations while informing citizens of the rules and guidelines that would protect them and their environment should a shale gas industry develop in the province's future.

During the months of June, July and August I heard from over 200 New Brunswickers through 9 public meetings and subsequent presentations as they expressed their position on shale gas development. The panel heard from representatives on both sides of the issue; however the majority of participants that spoke at the public meetings were against the development of natural gas. It should be noted that once the public meetings began the majority of participants had not yet familiarized themselves with the government's proposed regulations document and would use the forum to voice their opinions and concerns. Therefore some participants that attended the meetings were satisfied that the proposed regulations already addressed a lot of their concerns.

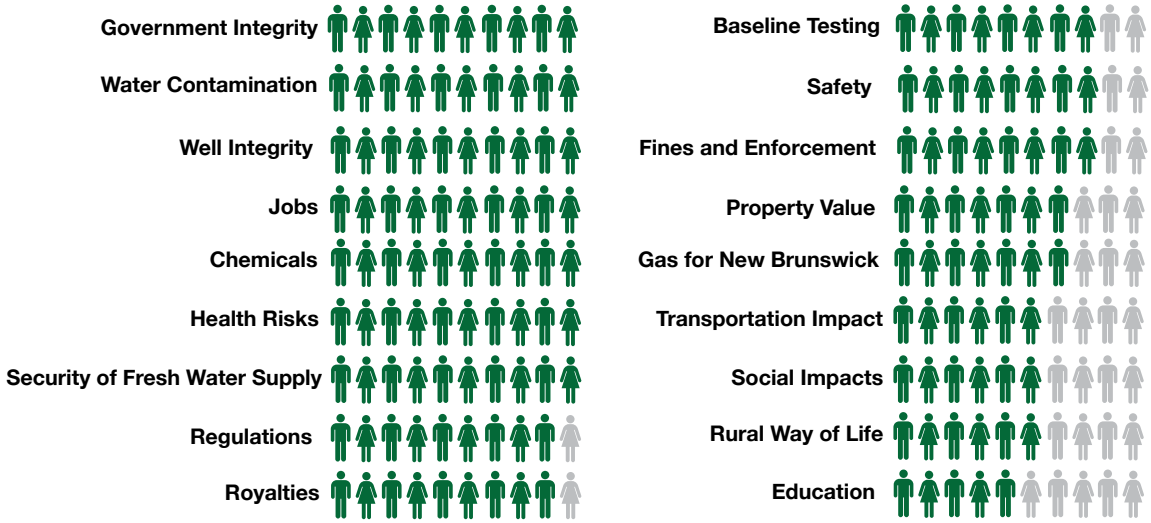
There has been an active group of New Brunswickers from across the province that oppose shale gas exploration and used the public meetings to express their discontent and as an opportunity to present research they found that was contrary to the industry. Some of the facts and figures that were referenced in the public meetings were difficult to substantiate.

Given the importance of the gas industry for commercial and industry business in New Brunswick paired with the diminishing supply of off-shore gas in Nova Scotia, I was surprised that various business chambers, boards of trade and municipalities did not choose to make a formal position or recommendation through the consultation process. The sole report I received from such an organization was a position paper from the Association of Francophone Municipalities. I personally find it concerning that organizations such as these chose to remain silent on an issue that could have a profound impact on New Brunswick's economy.

Participants from across the province shared many of the same concerns with the majority of comments falling into the following themes: Water, Well Casing, Industrialization, Economy, Environment, Health, Legal and Energy.

Below I have summarized what I heard from New Brunswickers during this listening exercise. It goes without saying that the topic of shale gas is currently a very divisive issue for New Brunswickers. I approached this assignment from an impartial perspective while looking through the lens of what is best for New Brunswick's future.

Summary of the Main Issues



GOVERNMENT INTEGRITY

Many people came to the meetings expecting to voice their concerns directly to politicians and some were disappointed that there was no political presence at the meetings. Many people called for a referendum on shale gas stating that the government does not have the right to proceed with the industry without an agreement from the people. Many references were made to the proposed asset sale of NB Power, as it represented a government policy that was met with significant opposition around the province until the deal was ultimately cancelled. Comments were made insinuating that the only reason why the Liberals were defeated in 2010 was because they acted contrary to the will of the people. Participants warned that the Alward government could face a similar fate and be the second one term government in New Brunswick's history as a result of not properly consulting with the public on shale gas.

> *"If you remember well, in the last election, we had a liberal government that wouldn't listen to the people on the whole issue of energy. You know what happened? They're no longer there. So we have convinced ourselves that we have a power and that we can make things happen, if we consider that our quality of life is compromised. The Government of New Brunswick must absolutely find financial means other than those of shale gas to finance our programs." Roger Doiron*

Some of the participants stated that they felt as though the government had already made the decision to proceed and was working with the industry. They felt that the government website was propaganda and that all of the facts, figures and pictures used in presentations painted an inaccurate picture of how ugly the industry can be for areas with gas production. They also felt that the government's use of the term 'natural gas' as opposed to 'shale gas' was the government's way to mislead the public.

The Natural Gas Group received many complaints from participants that meetings were only held in rural areas, and in some areas where no leases for exploration existed. Participants felt that the cities should have had meetings as the industry would impact all New Brunswick and most people lived in the cities. The meeting locations required people to travel long distances to attend and have their voices heard, therefore making them feel disenfranchised. They believed the meeting locations not only segregated the population by urban verses rural, but also by rich verses poor, as low income individuals could not afford to attend the public meetings because they didn't have a car.

Rural New Brunswickers also had concerns regarding the perceived lack of representation in the legislature, as most of the seats are in the cities, therefore giving them more say. People on both sides of the issue have serious concerns about people living in southern urban centres making decisions that will impact their rural existence. People opposed to industry stated that city dwellers lacked an appreciation for the rural way of life, whereas people in favour of developing an industry stated that urban New Brunswickers are unfamiliar with how desolate rural communities are.

EDUCATION

Another concern that was raised on more than one occasion was the level of education that one required to read and properly understand the proposed regulations and the information found on the government website. People believe that government should strive to keep the information at a basic fifth grade level so that all New Brunswickers can make an informed decision. Concerns were expressed that the proposed regulation documents were not written at a level which favoured a comprehension of the issues by the average New Brunswicker. I have remained mindful of these concerns throughout this report.

WATER

An issue of concern that was raised at all of the sessions was the impact a potential industry could have on the water supply of New Brunswick. Concerns were raised through both a micro and macro lens, as many people were worried about the impact to their personal wells that they rely on for drinking and other important household uses, while others raised concerns about the province's water supply and the potential risk of polluting and contaminating New Brunswick's streams and rivers. It was stated very clearly at the meetings that water is one of New Brunswick's most valuable resources and must be protected.

I have grouped the water-related issues into five categories, as follows:

- Water Contamination
- Security of our Fresh Water Supply
- Baseline Testing
- Distances from Domestic Wells
- Penobsquis Experience

Water Contamination

New Brunswickers expressed concerns that water contamination can happen during the various stages of the fracking process both under and above ground. Participants suggested that there was a heightened risk of water contamination underground if there were well casing problems that resulted in a leak or from the migration of frack fluid that was not recovered at the surface and remained in the ground. One participant referenced the statistic that 60-70% of the slick water remains in the ground, which they found to be alarming. Examples of flow back water contamination have been documented in other jurisdictions and are cause for concern. While many participants are aware that hydrofracking generally happens several hundred meters below the depth of a water well, there remain concerns that frack fluid would migrate upwards, therefore placing the ground water supply and water wells at risk.

Concerns of waste water run-off and well pad drainage are also potential risks for above ground water contamination. Participants shared concerns about the handling and transportation of water after it has the fracking chemicals added. The majority of reported incidents and spills have resulted from human error, therefore many questions arose from participants regarding the monitoring systems that would be in place at the drilling sites to ensure safety throughout the process.

Participants voiced concerns for their future should water contamination occur. Many viewed the shale gas industry as a 'ticking time bomb' which could potentially have a detrimental impact on the future. A clean water supply is needed for human survival to the extent that the Vatican recently declared water as a human right.

> *"On March 23, 2012, the Catholic Church registry in Rome has taken a stand and declared water a human right" William Brewer*

Therefore New Brunswickers take the risks that have been so widely publicized in other jurisdictions very seriously, as they value the plentiful supply of clean water that New Brunswick currently has.

Security of our Fresh Water Supply

New Brunswickers depend on their water supply and believe that our ability to have an abundance of clean water is what makes this province a great place to live. I heard from many people that depend on water for their livelihood, small businesses and entrepreneurial ventures. Farmers raised concerns for the protection of their water as they depend on having a large quantity of water available to them at all times for the overall operation of their farms. They also raised the importance that they have clean water so that their product, both food and livestock meet regulatory standards. The codes and regulations that farmers abide by are stringent, particularly for farmers who wish to comply with organic certifications, therefore they can't risk the possibility of their water supply being contaminated.

Recently introduced industrial cranberry operations in Rogersville also need a secure supply of clean fresh water to meet exporting expectations. Participants expressed that it is imperative that the government be mindful of guidelines that other long-term prospering industries must adhere to.

New Brunswickers are aware that large amounts of water are required to complete a frack, and as a result have serious concerns that local water sources will be used and ruined during the process. Some of the wells that have been hydrofracked in the province have used water from municipal resources which many participants find troubling. While a hierarchy of water for use in the fracking process has been proposed within the draft regulations, many participants state that is impossible and unjust to prioritize water resources as they are all valuable. Hydrofracking under certain conditions can possibly be performed using other solutions and products such as propane and recycled water which participants seem to have fewer concerns with.

Participants cautioned the government and municipalities to not give away water for free, and to charge a fee comparable to what one would pay for a bottle of water. The belief is that gas companies would begin to look for solutions other than water to frack with. Some presenters suggested that it may be time to stop regarding water as a free commodity that is available to industry for little or no costs.

Once water is used as part of a frack it needs to be treated, transported and appropriately handled throughout the recycling process. Presently waste fracking water from New Brunswick is treated at a facility in Debert, Nova Scotia and transported by truck. Once water is treated to an acceptable industrial standard it is released into the Bay of Fundy. Some participants regarded this as polluting the marine environment, as it was not treated to the level of drinking water prior to its release to the natural environment.

Baseline testing

Many people are uncomfortable with any exploratory testing or disturbance of the ground and water table. Participants raised concerns that the government is unaware of what lies beneath the surface and that proper aquifer mapping should be completed before any exploratory testing. To fully protect New Brunswick's water, participants requested that well documented water table info be readily available to the public. Many non government organizations exist around the province with the purpose to protect New Brunswick's water and other items of ecological value, and they have a vested interest in having this info available to the public for accountability and oversight. The recommendation was made by various participants that the government should undertake a comprehensive delineation of the watershed where industrial shale gas extraction is being considered. The delineation should identify the recharge and discharge source for the water table and it should also identify vulnerable areas within the watershed where ground water extraction could be problematic.

Distances from domestic wells

As stated in the introduction of this summary, the public meetings heard from New Brunswickers on all sides of the issue. Many New Brunswickers voiced concerns that they had about a particular issue, and if a proposed regulation remediated that issue they could consider supporting a shale gas industry in the province. One of such issues was the distance or setback that would be required from residential wells. New Brunswickers were pleased that companies could not perform tests or development on private property without land owner consent, however participants raised the issue of natural gas companies drilling in close proximity to their wells without requiring access to their land. This was an area that was very valuable to the public consultation process, as participants provided their own recommendations of proposed distances based on draft regulations. The recommendation was made for the distance to be the same across board to 250 m, which increases the proposed distance of any permanent building to 100 m.

Penobsquis Experience

The issue of Penobsquis residents loosing their wells was raised on many occasions during the public meetings, particularly in the southern part of the province. Comments ranged from, what was the cause, how the residents were treated by government and industry, and their current property value. Contradictory statements made it apparent that the actual cause of residents loosing their wells has yet to be determined. It was evident that many people believe through their personal understanding of the issue that exploratory testing, including seismic could cause similar issues. The situation in Penobsquis adds a unique element to the discussion as it is an example of what can go wrong that is very close to home.

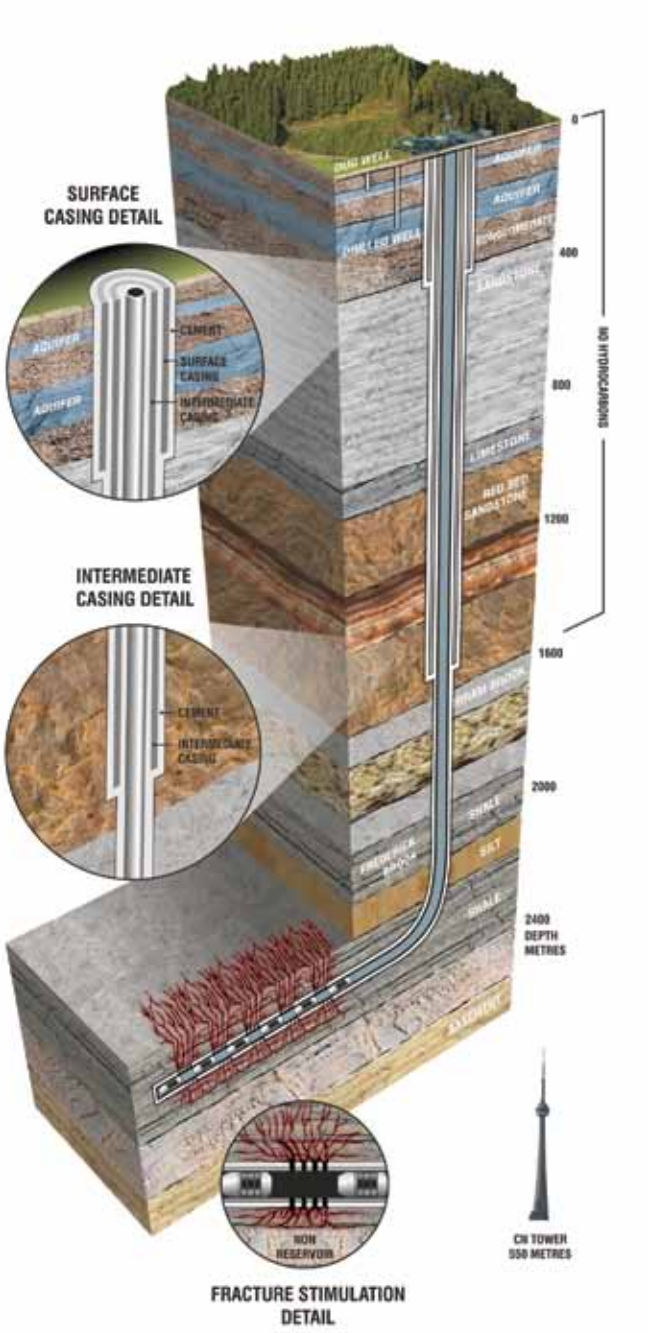
Over the course of the sessions many people linked the functionality of their residential well and its ability to produce clean water directly to the value of their home and land. It became clear that New Brunswickers would not tolerate any risk and would passionately protect their water. Municipalities in the province have passed resolutions to place a local moratorium on exploration as residents expressed concerns over their wells.

> *"I am the Mayor of Bouctouche and I'm here with the Mayors of Richibucto and St. Antoine. What's going to happen if shale gas is fracked and our water systems are fracked too?" Aldeo Saulnier*

New Brunswickers want to hear from scientists that it is possible to have their water protected and that the government regulations will be enforced to ensure that it is.

Water Related Recommendations:

1. Tests will need to be performed both prior to and through various stages of the exploration and drilling process to ensure that well water has not been contaminated or compromised in any way. The data collected should be periodically subjected to an independent third party evaluation.
2. Enable the identification and delineation and mapping of the major aquifers prior to any exploration.
3. The water that is currently used during hydrofracking in the province can be treated at the Debert water treatment facility, however should a full scale shale gas industry be developed in New Brunswick, a suitable water treatment facility will need to be set up in the province.
4. The province should consider creating a water management strategy akin to the way forestry and wildlife are handled through a regulatory framework.



WELL CASING

Well casing integrity was another item that received many mentions during the public meetings. Well failures and leaks are reported to be the root cause of most problems associated to hydrofracking for shale gas development. Similar to water, the concerns are both above and below the surface; therefore building codes and safety standards need to be enforced by government regulation to ensure the safety and security of the operations.

Concerns were expressed on the adequacy of the current regulations in four main areas, as follows:

- Well Integrity
- Safety
- Earthquakes
- Regulations

Well Integrity

The integrity of the well casing is paramount to the safety of a shale gas industry. A number of statistics exist where faulty wells resulted in leaks and emitted air pollutants. One statistic that was heard at many of the sessions was that 6% of wells failed, however this statistic could not be verified. Industry representatives have indicated that well failures were fewer than 2%.

Safety

The issue of safety was raised at a number of meetings with participants drawing on their various levels of expertise and different personal experiences. One individual that attended a number of the meetings drew on his knowledge as a retired corporate safety advisor and made the panel aware of standards used in other jurisdictions as well as international guidelines that could be applied to monitoring a New Brunswick gas industry to ensure safety. One participant advocated for an outside regulatory agency to peer review all safety codes and incident reports. The belief is that with proper safety codes and procedures that a lot of incidents would not occur. The recommendation was made to set up an Occupational Health and Safety centre in the province to help establish the rules and monitor the industry.

Participants that had experience working in industrial settings, including the oil and gas industry, identified that they are always cognizant of the risks associated with the duties they are asked to perform. Many participants who voiced their support for a shale gas industry in the province believe that it can be done safely with proper regulation and training.

> *"I went to school in Medicine Hat, Alberta, known as the Gas city in 1960's. They have a lot of gas wells there. They had gas wells that blew out with the 60's technology. Those gas wells are still there, they are not blowing up anymore. That's because things are a lot safer. A lot of improvements have been made in 50 years. Things are really safe now. That's my experience with gas, and it was positive. It can be done safely." Wayne Hold, Renous*

Some participants have lived in other parts of Canada and are familiar with living in a community that is adjacent to gas and oil production and have no personal safety concerns. While others cited that the health complications that they are currently dealing with are a result of years they spent in close proximity to the perceived pollutants associated with the industry.

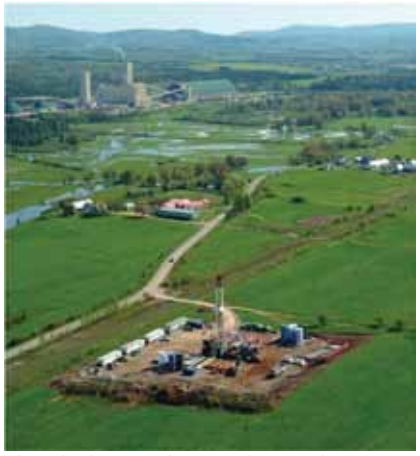


Photo looking southeast at the potash mine; it is a picture of the Corridor Resources F-67 well pad during drilling operations in the McCully Field.

Earthquakes

Some studies have found that the process of hydrofracking is linked to earthquakes which many New Brunswickers find extremely troubling. Even minor earthquakes can cause structural damage above ground, as well as the possibility of obstructing well casing below the surface. People stated their belief that the process of hydrofracking is unnatural and it is the apparent cause of earthquakes. Concerns were also expressed on the risks that remain once the well is sealed, as a participant shared concerns about the possibility that cement seals, which are used to block a well, could be compromised should an earthquake occur.

Regulations

As noted in the introduction, the intended purpose of the consultations was to provide feedback on the proposed regulations. Many New Brunswickers submitted comments online or attended public sessions providing detailed feedback on specific sections of the draft document. It should be noted that the majority of participants at the public sessions had not had time to review the proposed regulations until arriving at the session, and in some instances individuals were pleased with the approach the government was taking, in particular with the mandatory requirement to disclose all chemicals in fracking fluid. This rule was put in place after citizens voiced their grave concerns when chemical disclosure was not available publicly as is the case in other jurisdictions because of corporate confidentiality agreements.

One item that was raised on several occasions was the government's ability to impose and enforce the regulations on the industry. There were allegations that the government would make exceptions and be lenient on regulations to appease industry. An incident in the fall of 2011 where a gas company performed seismic tests within a municipality without receiving appropriate permission to do so, proved to be a circumstance where government regulations were not presently strong enough to hold the company accountable for actions contrary to regulations. This incident drew scepticism from many interested parties on the government's ability to enforce regulation, given that the government states that New Brunswick will have the most stringent gas regulations in North America.

For the gas industry to operate with the checks and balances included as part of the proposed regulations, a significant number of monitors, inspectors and emergency responders will need to be available. Concerns over who the monitors would report to and who would pay for them was raised. New Brunswickers have hesitations if monitors report to industry and would view this type of scenario as a direct conflict of interest.

This picture is the Corridor Resources F-58 well pad in the McCully Field, currently producing natural gas. This well pad is in the production stage.

The role of the individual inspectors was also an item of discussion at the public meetings based on the proposed regulations. Currently the role of the inspectors is not clear, therefore questions arose about whether checks would be routine, or would they only be performed when a complaint was made or incident filed. As well, would gas companies be given notification when an inspection was to take place or would they happen unannounced? Because these will be newly created positions specifically for the shale gas industry many items need to be determined such as the frequency of inspections, where will the training be provided for inspectors and what is the optimal number needed to ensure that regulations are enforced throughout the industry.

Well Casing Recommendations:

1. A monitoring system will need to be created to oversee several stages of gas development with monitors onsite as well as unannounced checks.
2. Proper training must be provided for all industry workers to ensure safety of all employees and to reduce risk of human error.

INDUSTRIALIZATION

Participants from both sides of the issue voiced their opinion on industrialization and the impact it could have on New Brunswick.

A wide range of topics fit in this category identifying both the benefits and the challenges associated with the industry, as follows:

- Property Value
- Transportation Impacts / Road Destruction
- Noise
- Loss of rural serenity

Property Value

Property value was raised by a number of participants, many in reference to the incident at Penobsquis where some individuals lost their wells. The concern by many is what will happen to the value of their home if their well is compromised. Many people have a lot of equity invested into their home and need assurance that they will be able to sell it at a reasonable market price when they decide to sell. Many expressed concern that the security bonds which would be required from the companies are not sufficient to cover the damages following the contamination of their land.

Farmers and food producers that operate on large pieces of land had serious concerns about their land value, in addition to the concerns that they had for their reliance on large quantities of water. They feel that people will not want or trust their product if they are set up beside a producing well pad.

> *"I'm producing milk and we have very strict guidelines to be able produce milk to be able to send to the province so that the people have a very good product. I'm going to be trying to produce a product for consumers with polluted land and water. How am I supposed to grow food that people will trust me to grow food, to grow crops, to feed my cattle and produce milk. What will happen? How am I going to be compensated for my land for everything that I do now, that has been done for 75 years." Margo, Memramcook (4th generation farmer)*

The majority of the leases that have been given to gas companies for exploration are for rural areas. Many hardworking New Brunswickers have invested a lot of money into their homes and view their property as their own personal rural retreat. For many it remains their sole retirement fund. Because of this they view any disruption to the natural surroundings of their home is very unsettling. The participants took comfort in knowing that they would have the final say of whether to allow development on their property, but they continue to have concerns about the potential impact if their neighbours in adjacent properties choose to allow development. New Brunswickers want assurance from the government that industry will be required to pay the difference if the value of their land depreciates in any way.

Transportation Impacts / Road Destruction

One of the challenges associated with the shale gas industry is the amount of traffic that is required while setting up the well pad and during production. Large quantities of water need to be trucked in as well as many other heavy materials which can be very destructive to rural roads which are not used to, or designed for large amounts of heavy equipment traffic.

In addition to the destruction to the roadways, many rural New Brunswickers have safety concerns for their children with increased traffic as well as the constant noise. The assumption is that the well operation would be 24 hours a day 7 days a week, which would also mean that traffic would be continuous.

New Brunswickers pay a lot of money for their roadways and keeping their roads in good condition is important to them. Participants want to ensure that any destruction to their roads as a result of heavy equipment traffic will be repaired when production is complete.

Noise

The traffic noise associated with natural gas production will presumably be of some disturbance to many homes located along the haul routes. While many participants raised specific traffic concerns, the panel also heard from New Brunswickers who had serious concerns about the decibel levels of operating compressors and the permanent damage it could cause.

The concern is that private landowners will be subjected to the constant noise even though they are located a fair distance away from the well pad. There are many health studies that examine the health hazards associated with continuous exposure to industrial sound. They also believe that this will have a damaging impact on their property value, as well as compromise the enjoyment they receive from doing outdoor activities.

One participant in Grand Falls voiced concerns about the possible impact noise could have on domestic animals, bats and other wildlife. Low frequency sound which is inaudible by humans travels farther than high frequency, therefore more research needs to be done on the possible side effects of noise, specifically from a compressor that runs continuously. Research has shown the side effects and health risks associated with the sound of wind mills, therefore there is sensitivity about the noise of the industry.

Loss of Rural Serenity

Rural New Brunswickers have made a conscience choice to live in rural areas and have embraced its way of life and do not want it disturbed. The panel heard from many New Brunswickers, particularly younger generations that take great pride in growing their own food, maintaining large properties and raising young families in rural New Brunswick.

Some of the people grew up and continue to reside within the communities where they were born, while others have retreated to create their own rural existence, some of which continue to work in the city and commute to live in a natural rural setting.

> *"People have chosen to live in areas like Havelock and Cornhill and Petitcodiac because of the way of life possible, and many of us commute great distances to go to work." Jane Bradbrook, Cornhill*

These individuals are against any industrialization that would impact the life they have created and feel that shale gas development would devastate the rural New Brunswick way of life for generations to come.

ECONOMY

Like other Maritime provinces, the future of New Brunswick's economy comes with its challenges as younger generations leave the province in search of employment while New Brunswick's population continues to age, therefore placing increasing demands on the health care system. New Brunswick's unemployment rate is one of the highest in the country with a large percentage of seasonal workers. New Brunswick currently receives a large percentage of its operating budget to provide health care, education and other services through equalization payments from the federal government. The provinces that have best weathered the economic storm have been those that have developed their natural resources such as Alberta, Saskatchewan, British Columbia and Newfoundland & Labrador.

The economic realities that New Brunswick faces are perhaps the most divisive issues of where people stand on Shale Gas:

- Jobs
- Royalties
- Business Case

Jobs

Those who are in favour of shale gas production focus primarily on the economic benefits it would have for the entire province. While those who are opposed indicated that a shale gas industry would provide limited employment and that many more jobs could be created if we embraced the green energy alternatives such as solar, wind and other renewable options. Many participants expressed the need for jobs in New Brunswick to keep our people at home. Currently many New Brunswickers travel to work in the oil and gas industry at many of the same jobs that would be required for a full scale shale gas industry here at home. The idea of keeping New Brunswick's work force in the province as part of the tax base was the most prominent reason in favour of an industry.

> *"Everyone here knows someone that is working out west in Alberta that is part of their prosperous economy. This is New Brunswick's opportunity to reconnect families. The industry will lead to the well paying jobs that are needed in this province. Saskatchewan is prospering, Alberta is prospering and I hope New Brunswick will prosper soon."*
> *David Donahue, Blackville*

The meeting in Blackville had the most participants that spoke in favour of the industry for its regional economic benefits. In addition to the direct jobs that would be associated with the industry, there are also many indirect jobs that would spin off within the different communities. Many entrepreneurs are anxiously anticipating the opportunities that could arise should a full scale industry take place from people providing materials for the well pads, such as the fabrication of work trailers, to servicing the influx of workers with accommodations and restaurants. An increased tax base would also mean more money spent in New Brunswick on housing and other big ticket purchases.

Some participants that were critical of the industry warned that the majority of the jobs would go to people from out of province because the training that is required to work in the industry is so specific that New Brunswick's current workforce could not meet the demand. Others believed that the job numbers that the government and industry state could result from a shale gas industry are largely inflated, and they also caution that the shale gas industry is a short term industry and that 15 years down the road all of the companies will return to western Canada and the United States, while local businesses that opened to feed the boom would be boarded up.

These New Brunswickers want government to look at ways New Brunswick can have sustainable growth and worry of a boom and bust phenomenon.

Royalties

In addition to the draft regulations the government also released document *Sharing of Royal Revenues From Natural Gas Activities in New Brunswick*, to discuss a potential royalty structure. New Brunswickers feel that both the landowner and the communities should receive a sizeable royalty for assuming the potential risk of drilling activities. Participants questioned the current royalty formula stating that the companies will have a lot of costs to cover and that few profits will exist. They also believe that all of the royalties for the province will be swallowed up to pay for inspectors and other required infrastructure. Industry representatives indicated that the proposed royalty structure was not sustainable and that it didn't reflect the current Canadian practices. They suggested that New Brunswick should review the royalty structure in BC as a possible model.

Business Case

Participants expressed the need to be brought fully up to speed on the province's numbers and forecasts associated with the industry. Some participants were critical of job numbers and other economic spinoffs that the provincial government predicts would result from a full scale shale gas operation. New Brunswickers want to see the business case for the industry and many feel that all advancements in regulation and exploration should come to a complete halt until all of the material is made available to the public. A comparison was made that investors do not provide money to entrepreneurs without a solid business case, therefore they believe that New Brunswickers should be regarded as the investors and their investment is their environment and their workforce.

Recommendations on the Economy:

1. Develop a comprehensive business case for the development of a shale gas industry in New Brunswick detailing and evaluating the positive and negative impacts for both the short and long term.

ENVIRONMENT

New Brunswickers care a great deal about their environment and have formed many groups that advocate for increased protection. Environment protection was one of the primary concerns that was raised at all meetings with many citing alarm over potential risk to water quality. Participants also cited concerns they have pertaining to other kinds of pollution.

The most prominent environmental issues include:

- Pollution
- EIA Process
- Permits

Pollution

It is no secret that many communities with an industry presence have identified some changes in air quality. Years ago large scale pulp and paper mills were viewed as very damaging to the environment and health with many people linking respiratory illnesses, such as asthma to their proximity of the mill site. Today many changes have been made and all industries are forced to comply with environmental regulations and air quality monitoring. Regulations such as these help the federal government reach Greenhouse Gas reduction targets.

As noted earlier New Brunswickers have done a considerable amount of personal research associated with the shale gas industry and have found that communities with a shale gas industry have experienced increased rates of air pollution, hazardous radiation and damage to the riparian zone.

Studies provided by the presenters support the claim that the procedure of hydrofracking is more damaging to the environment with high emissions of greenhouse gas, comparable to operating a large coal fired plant. New Brunswickers have been working to lower their GHG emissions and have been able to do so as a result of minimal industry and manufacturing sectors. Canada's Department of Environment recently announced that New Brunswick had the lowest GHG emissions in the country.

EIA Process

New Brunswickers take pride in government regulation that is in place to protect their environment and the standards that industry must adhere to. The Environmental Impact Assessment is a procedure that all industrial activity must go through.

Throughout the public consultation process we heard from people on both sides of the issue. Industry feels that their projects are often held up because of the length of time it takes the government to complete the assessment.

Others who are opposed to the industry have concerns that the government is too lenient, and 'in the back pocket' of the gas companies and therefore will not reject any proposals.

> *"When I look at the government publications and the website that we've been directed to by the government to make an informed decision on this – I am very disappointed. I believe the government has done an enormous disservice to the people of this province. That website is a propaganda piece. It is unabashedly pro-industry. This is such a disservice. The fact of the matter is that the spin is positive shale gas development." Steven Gilbert*

Participants referenced projects that had caused problems in their communities and were interested to learn that the EIA process is new and that many of the projects that were completed in previous years would not pass today's EIA process.

Industry representatives expressed concerns with the current EIA process by indicating that the time it currently takes to process an application is detrimental to the development of the industry. They find that the process which requires all phases of the exploration to be subjected to the same level of review to be excessive and unnecessary. Industry expressed the need to streamline the process and that one government agency should be responsible for the processing of the applications and permitting.

Permits

The Panel heard from representatives that work in the gas industry who are frustrated with the permit process as they are held up for months and in some instances years to obtain the required permits to advance their project. They feel that having to deal with different government departments is a waste of government resources as they are often supplying the same information to different departments. Industry would like to see more cooperation among government departments to allow for faster processing and less duplication.

Recommendations on Environment:

1. Government should consider the establishment of a central agency to process all permitting and EIA application.

2. Define appropriate time lines for all the phases of the government review.

HEALTH

Many of the concerns associated with a shale gas industry, particularly with water contamination are linked to possible health risks. When matters of health and disease were raised we heard very passionate pleas and arguments against the industry. A lot of the information that exists in the media focuses on health issues that people living in areas with shale development attribute to the industry.

The purpose of the meetings were to comment on the proposed regulations, but many people said that they felt uncomfortable commenting on any aspect of the industry until they knew the potential health risks. Many participants felt that Public Health should be part of the panel, while others were satisfied that the Department of Health is currently conducting their own independent study of the industry.

It is apparent that the health issues will need to be addressed to clearly define the health implications associated with the shale gas industry, including:

- Chemicals
- Research
- First Responders
- Health Risks
- Social Risks

Chemicals

One of the biggest concerns is what chemicals are used in the frack fluid because of the perceived risk that it could contaminate drinking water. The current rules in New Brunswick stipulate that companies need to disclose what chemical additives are being used, however people want the specific cocktail recipes posted online. There are concerns over the synergistic reaction of various chemicals once they are mixed in fracking fluid. At this time not enough research has been done from a health perspective to fully understand the risks to people and environment when certain levels of the chemicals are mixed together.

Research

Prominent members of the health care community have come out opposing the shale gas industry citing the lack of research into the industry as their major concern. They indicated that the engineering of the shale gas extraction process was clearly ahead of the peer reviewed science. Health care professionals that attended the public meetings are in favour of a moratorium until more time has elapsed for peer reviewed articles to be published. One emergency room doctor stated that without knowing all of the facts it is impossible to treat patients adequately until they have total disclosure of all the chemicals involved.

"It's hard to do public health studies because there is difficulty with proving the public health affects. If you come to me because you have a headache, funny rashes , or nose bleeds it's vague, because there are too many differential diagnoses that it can be. Currently I can't prove they result from drilling in your area unless we have dedicated people doing public health impact assessments both prospectively and retrospectively." Dr. Angie LeGresley, Moncton

First Responders

First responders need to be fully aware of all the potential risks and hazards they are dealing with when assessing an emergency situation in order to take the correct actions. Details about specific chemicals and treatments need to be made available by request to all health care professionals in the province. Doctors have stated publicly that without knowing all of the facts they can't properly treat their patient therefore placing the individual at greater risk.

Health Risks

The panel heard touching stories from cancer survivors who begged the government not to endanger the health of its citizens. Studies exist that compare areas with shale gas production to those without and notice significant increase in the amount of cancer cases, respiratory problems and other illnesses. There are concerns that the shale gas industry would be similar to Agent Orange where New Brunswickers that were exposed to the chemical developed many health problems years later.

Social Risks

Certain participants voiced concerns of the social problems that result from an economic boom citing many of the challenges that oil and gas producing communities face. Increased rates of crime, homelessness, drug addition and prostitution have resulted in communities such as Fort McMurray. Participants alluded to the fact that the province currently doesn't have the resources to provide help to people who currently need it and wonder what will happen when all of these problems spiral out of control.

People had concerns that the industry would only benefit those who were directly working in it and that the cost of housing and other commodities would increase substantially, therefore making things unaffordable for many other hardworking New Brunswickers. Participants cited the astronomical prices that people pay for housing in Alberta and don't want that to happen in New Brunswick. People believe that the low cost of living is one of the greatest reasons to raise a family in New Brunswick and the government should work to protect that.

Health Recommendations:

1. Create a science based risk assessment process to define the level of health risks associated with each phase of the gas exploration with defined mitigation options.

2. Government should consider the creation of a dedicated health registrar which would be available to physicians on a 24/7 basis. The health registry would contain all of the relevant information on the fracking chemicals which are used in the province.

LEGAL

Many participants were acutely concerned about the financial burden that could be placed on them should they have to oppose a gas exploration company causing environmental damage or affecting the health of residents.

There are five main legal issues, including:

- Fines and Regulations
- Compensation
- Enforcement
- Burden of Proof
- Permission

Fines and Regulations

New Brunswickers want to be certain that whatever regulations are agreed to and finalized are strictly followed. Participants brought examples where pre-job briefs and incident reports were not properly filed in the province. The intent of the regulations is to protect New Brunswickers and their property and they need assurances the regulations will be enforced. Participants voiced concerns of when previous charges against a gas company were dropped because the government didn't have the grounds to fully prosecute. Some participants felt that the fines listed in the proposed recommendations need to be increased, stating that gas companies would not abide by regulations unless the fines were high enough that they would have a crippling affect on their corporation.

Industry representatives indicated that a punitive regulatory process would discourage companies from working in New Brunswick. They also had particular concerns with the responsibility to assume the burden of proof for all infractions.

Compensation

We heard from many New Brunswickers that have concerns of private citizens being tied up in lengthy and costly legal battles with major corporations if their property or health is compromised. Many of the people that we heard from have unfavourable impressions of oil and gas companies and believe that they have little regard for the landowner and their property. There are many stories available that reference people using all of their savings attempting to sue the companies, but to no avail, as the company's large legal departments purposely use delay tactics until the plaintiff uses up all of their resources. New Brunswickers don't want to feel as though they're up against the gas companies alone and they want their government to protect their interests.

> *"In a case that there is damage and water has been contaminated, a homeowner will loose land value. Where do they recover the value? Who would buy property that is contaminated? Who is going to look after the landowner?" Ann Cramer, Derby Junction*

New Brunswickers believe that no amount of money can be paid to compensate for damaging one's health or the environment, and believe that the proposed bond is not sufficient insurance considering the risk.

Enforcement

New Brunswickers would like to know where the resources are going to come from to enforce the regulations and who will keep the companies accountable. It's apparent that any regulations need to be strictly enforced and that additional staff will need to be hired to ensure the regulations are adhered to. Participants expressed that government intentions to have the most stringent regulations in North America is meaningless if they are not enforceable.

Burden of Proof

Stories in the media stipulate that one of the most difficult aspects in many of the court cases is proving that the gas companies are responsible. The proposed regulations are drafted in such a way that industry would need to prove that they are not responsible for any issues that could arise. Therefore in interest of both parties, testing will need to be done through various stages of the production. Industry representatives indicated that burden of proof legislation would be a 'show stopper' for the development of the industry.

Permission

Landowners are satisfied that they have the right to deny access to gas companies for any type of exploration and drilling. Participants came to some of the sessions citing incidents in the United States where gas companies used private land without acquiring permission.

Municipalities across the province have been very involved in the discussion of a possible shale gas industry. A number of Mayors and councils have passed motions to ban seismic testing and hydrofracking within city limits. One question that arose was who had absolute authority, the land owner or municipality, and if a municipality could prevent someone from leasing their land.

Legal Recommendations:

1. Test and implement the proposed regulations and legislation within an operating framework.

ENERGY

There were different options expressed by participants regarding the best energy direction for New Brunswick.

There are two major areas of note here, including:

- Energy Options
- Gas for New Brunswick

Energy Options

We heard from individuals who believe that government should be looking into renewable energy and develop an expertise that could be exported to the world. They believe that because of the small size of our province and where we are positioned that we should move towards wind, tidal and solar energy, and begin to shut down large power plants that are costly and damaging to the environment.

Gas for New Brunswick

To many New Brunswickers natural gas is a fuel that is available for home heating, and the option of converting to natural gas is not available in most areas of the province. There is a strong sentiment that exists of whether or not it is worth all of the potential risk to extract natural gas only to be sold to the United States.

"In the past we saw the benefits of resource development locally, Moncton had a pipeline from the workings in Albert Mines area. Not only was it exported but it was used locally as well. What it seems like so far is that this pipe is heading for New England. To me that doesn't seem like it's supporting communities. If we go forward how will we ensure that development helps communities?"
Bernard Woolsey, Curryville

People feel that the province should wait to extract natural gas until the market value is higher or until better technology exists to extract it with minimal risk. New Brunswickers are not keen to disrupt their lives without any benefit.

One participant in Grand Falls said that he would be in favour of an industry if the entire province could benefit. Natural gas is positioned to become the fuel of choice for industry and eventually automobiles, therefore setting up infrastructure and being early adopters could be very beneficial for the province. Because the natural gas belongs to the province any development of a gas industry in New Brunswick should ensure that a portion of the gas is allocated to the economic development within New Brunswick. The panel heard from a number of participants that they do not want to have their natural resources shipped away from the province without a clear expression of a net benefit to New Brunswickers.

The low price of natural gas at the time of this report is one of the leading reasons people believe the government should hold off on development. However it was also brought to the panel's attention that the low market value is beneficial to large industrial plants as they use large quantities of natural gas for their daily operation. The distribution of low cost natural gas around the province could also provide incentive to develop new industries which depend on a secure energy source.

Energy Recommendations:

1. Government should consider the identification of a heritage gas pool which would be dedicated for New Brunswick.

FIRST NATIONS

Members of the First Nations community that attended the meetings shared concerns for the environment and mother earth. They believe that it is a violation of the treaty rights and are concerned that the process had advanced to the exploratory process without proper consultation with the indigenous people. First Nations participants cautioned that consulting with Chiefs alone is not an adequate consultation. Another member of the First Nations community had serious concerns over wasting water and the proposed hierarchy of water as all water is valuable and goes against the will of their creator.

They also voiced their opposition to shale development because of the risks associated with the industry and because of the damaging impact it could have on hunting and harvesting ability.

First Nations Recommendation:

1. Government must consult with all First Nations Leaders in New Brunswick.

CONCLUSION

All of the input received during my tour convinces me that there are some important issues to be addressed by government and industry as regards to the possible development of shale gas in New Brunswick. I have also isolated key recommendations that I believe are fundamental to establishing a credible basis on which to ask the citizens of New Brunswick to consider this opportunity.

A moratorium on future shale gas exploration activities would not provide the opportunity to address the concerns of the citizens nor would it enable government to define the economic potential of the shale gas industry.

By its definition a moratorium is an authorized period of delay or waiting without defining the issues that would be addressed during the period of the moratorium. Such a delay would likely prevent important discourse among proponents, opponents, and the public and would not advance the debate concerning the major issues surrounding a shale gas industry.

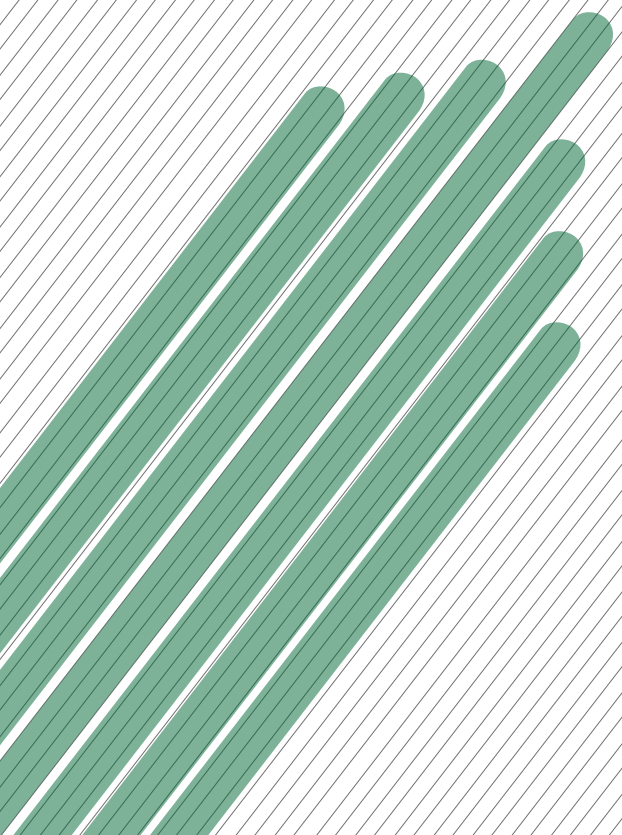
Given the industrial and commercial activities which are currently dependent on a secured supply of competitively priced natural gas it is important that we continue determining the potential for extracting a supply from our own provincial shale gas deposits.

While there is a belief that New Brunswick does possess large scale shale gas deposits, the potential still needs to be calibrated through more exploration and testing. A moratorium will only serve to delay that important study and postpone making a determination if there is a business case for shale gas extraction, how it can be done on an environmentally sound basis, and how proposed regulations can be implemented to have the desired effect.

It is only through a rational, science-based process and structured dialogue – not a moratorium – that we can assess the issues associated with Shale Gas to decide if we will proceed with the development here in New Brunswick.

SECTION II:

THE PATH FORWARD



SECTION II: THE PATH FORWARD

Following our tour of New Brunswick and after listening to individuals, groups and industry representatives it is apparent that there is a great divergence of opinions on the issues associated with the development of a shale gas industry in New Brunswick.

It was apparent from the discussion throughout the tour and the written submissions received that both government and industry have failed to provide the information needed for citizens to clearly understand the environmental, economic, and social implications associated with shale gas development. The government also did not communicate a cohesive business plan to support the benefits that a shale gas industry could bring to the people of New Brunswick.

While some believe that New Brunswick does possess large scale shale gas deposits, there is still much investigation needed to quantify the commercial viability of the industry, and to determine whether the extraction of the gas can be done in an environmentally sound manner. There is also a need to assure the public that health-related issues can be properly assessed.

Citizens need to be assured that should they be negatively impacted by any phase of the exploration activity they will be adequately compensated without having to resort to a lengthy and costly legal litigation with a company. In the following proposed path forward I am suggesting that an ombudsman office be established within the EUB with full power to allocate compensation to citizens which are negatively impacted. The government and the companies will be left to determine who is ultimately responsible for the incident. This is to ensure that should a citizen experience a problem that it will be immediately remediated.

It should also be noted that gas exploration in rural New Brunswick cannot be compared to similar operations in remote parts of British Columbia and Alberta. In New Brunswick the exploration activities can be located close to or within rural communities. Many residents within these communities have an attachment which reaches back many generations. They have pride in the community they helped to build. For many the equity in their homes, farms etc. is a valuable part of their retirement which they wish to protect. Therefore it is important that they are properly informed on industrial activities which are being considered within their community. They need to be provided with credible factual information on these issues. It was evident during the hearings that citizens were not receiving the required information they deserved.

Given the importance of resource development to New Brunswick I have taken the opportunity to develop a possible path forward for our province when it comes to responsible exploration for gas and oil. I feel compelled to attempt to provide some additional options by which we can assess the positive and negative impacts associated with the development of a shale gas industry. I believe a new, richer model is called for to bring citizens together. The government should change its current course to create a stronger, more focused program designed to determine if, in fact, this industry can be a net benefit to our province.

Concerns of rural New Brunswick communities experiencing the impacts of 'boom and bust' cycles have been brought to my attention. This is understandable because the shale gas industry is finite – it has a beginning, a working lifecycle, and an end when the reserves run out. While I do believe that plans need to be in place to mitigate potential negative social impacts associated with shale gas industrialization, I do not believe that New Brunswick will experience the boom and bust phenomenon. Simply put, New Brunswick is too small and has little in common with remote gas development regions in Alberta, BC, Saskatchewan, Ontario, or Labrador.

Unlike other jurisdictions that have experienced boom and bust scenarios, the workers that would be associated with the New Brunswick shale gas industry would locate in pre-existing communities. And, many of the rural communities where gas could be extracted will not be gaining significant new population. Instead many areas will be welcoming workers back from other provinces or re-employing workers who have lost jobs in other industries rather than making room for short-term, transient employees.

Our current transportation systems and institutional infrastructure already serve to link all areas of the province. In addition, communities where exploration could happen will not expand beyond their capacity. Necessary services such as hospitals, schools, grocery stores, and even car dealerships already exist within a natural service area adjacent to these communities so the businesses there or within driving distance will grow organically to meet the likely increases in activity.

The town of Sussex is an example of the positive impact that resource development can have on a rural community. During the last ten years the community growth has been developed in a constructive manner with little disruption to the rural town citizens were accustomed to, as the rural character remains present.

When you look at the top four provincial economies in Canada – Alberta, British Columbia, Saskatchewan, and Newfoundland and Labrador – they all have one thing in common. All four are resource-based economies that are creating jobs, economic prosperity and wealth within their borders thanks to the abundant natural resources they possess. All four provinces would maintain that the extraction of those resources is done in a safe and environmentally responsible manner.

The success of these four provincial economies begs the question – how could New Brunswick address public concerns and still participate in the energy economy?

ENVIRONMENTAL AND HEALTH CONCERNS

Environmental and health related issues were dominant throughout the progress of the tour. Given that there are already active gas production fields in New Brunswick there is a need to address these issues with a structured process to ensure all the scientific information available from citizens and the industry is reviewed for its relevancy to New Brunswick.

During the course of the review I was presented with numerous reports, scientific studies, and other related documents that express both opposition and support for the shale gas industry. I did review the written comments and the reports that were submitted. However, my mandate did not provide me with sufficient time to conduct a throrough analysis of the material. Nor do I have the comprehensive expertise to conduct a scientific peer review of all the referenced literature and reports.

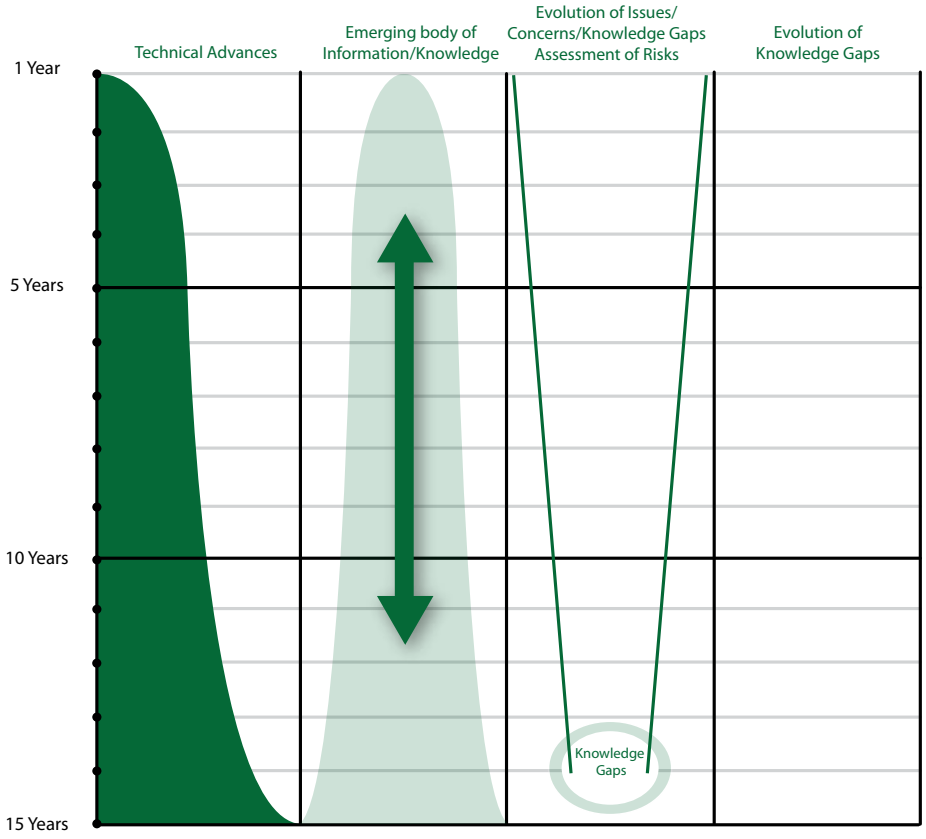
The government's Natural Gas Group compiled an extensive, annotated scientific bibliography during the preparation of the proposed regulations for the industry, but that list was not segmented to indicate which sources had been subjected to peer review.

Participants during the tour echoed the worry over the limited amount of verified, factual information about shale gas which is available in a format that can be easily accessed by the average citizen.

For these reasons an independent scientific peer review of the literature and technical reports is a necessary first step to provide a comprehensive overview of the environmental and health issues that may relate to the extraction of shale gas in New Brunswick in my view. After the review is complete we would be in a position to identify any knowledge gaps and to provide valid information to the public in a format that makes it easy to understand.

The diagram below provides an overview of how such a review could be structured. Given the advances in technology and management practices, many of the issues identified in the early stages of the industry have been addressed. However, in order to gain a full understanding, I would recommend we proceed with a full scientific review of the peer reviewed literature for both environment and health.

Scientific Peer Review of Information/Literature on Shale Gas



In addition I recommend that a shale gas health database be established to support health care professionals and assuage concerns of citizens. Both provincial Health Authorities should be involved in the set-up and management of the database to ensure it is complete and available to physicians or first responders on a 24/7 basis. This database would provide:

- A listing of all the chemicals used in any active fracking process underway in New Brunswick.
- Information of the chemical structure and toxicity pathways of the fracking ingredients.
- Information on the synergistic properties of various chemicals when mixed together in a fracking formula.

CREDIBILITY GAP

Many rural participants during the tour communicated they are worried about the lack of elected rural representatives who will bring their concerns to government. Cities, towns, and incorporated municipalities have a structure where citizens can voice their concerns and issues publicly on a continuing basis. Rural citizens who live in unincorporated areas do not have any other choice than to go directly to their Member of the Legislative Assembly (MLA).

A particular consequence of this void is that more than 40 groups of citizens have organized to obtain even more information on the issues, especially information regarding 'fracking.' As many participants expressed a distrust towards government sponsored information there remains a need to deliver verified information from a credible source and in a context that relates directly to New Brunswick.

I would also recommend that a structured process be designed to enable citizens with divergent views on shale gas to debate the issues within in an environment of mutual trust and respect.

A RESOURCE NEW BRUNSWICK NEEDS

Our goal in New Brunswick should be to look at natural resource opportunities that will improve our economic outlook without damaging our natural or social environment. But New Brunswick participants were very clear on one point during my tour – they do not want to have shale gas extraction take place in our province if it is all exported elsewhere. Unless they have a chance to benefit from the resource that is brought to the surface they are not convinced the risks are warranted.

So, how would we use new supplies of domestically produced shale gas?

First, our province will need new supplies of natural gas to sustain existing users. Eventually New Brunswick residents and businesses will have to purchase natural gas from new sources to fuel its economy. It is important that those new supplies come from secure and competitively priced sources.

Maritimes and Northeast Pipeline

- Many New Brunswick homes and businesses use natural gas now and more may want to convert to avoid high oil prices while contributing to reducing greenhouse gas emissions.
- The Nova Scotia offshore gas supply we currently depend on is estimated to be depleted in the next 4 to 5 years, with few new wells coming online to replace the supply in sufficient high volumes.
- New Brunswick industry will need to acquire new large supplies of natural gas in the foreseeable future.

Second, shale gas could also contribute to provincial prosperity in many different ways.

- Providing jobs for workers displaced from other industries or those already working in the oil and gas industry somewhere else in Canada and across the globe.
- Supporting local New Brunswick businesses ranging from equipment wholesalers, engineering consultants, hoteliers, gas/convenience store owners, restaurateurs, and more.
- Pumping royalty revenue into provincial coffers to help fund essential services like highways, education, and health care.
- Creating opportunities for world-class research and exportable intellectual property related to the industry.
- Spin-off growth in other businesses that depend on a steady supply of natural gas for their operations.

Given that the gas belongs to New Brunswick one important step the government could take to keep the benefits of the industry in the province would be to set aside a portion of the extracted gas for the exclusive use of New Brunswickers in building our economy. Like the highly successful Alberta 'Heritage Pool' of oil and gas, the reserved portion of shale gas would provide home-based users with a guaranteed, affordable and readily available supply of gas that is independent of foreign market price fluctuations.

A secured supply of shale gas – 'the New Brunswick Heritage Pool' – could:

- Make it economic to convert current electrical generation like Coleson Cove or Belledune from coal and oil to natural gas;
- Enable the conversion of the transport industry, reducing fuel costs as well as atmospheric emissions;
- Enable the establishment of a natural gas distribution network across the province;
- Enhance industrial and commercial development in New Brunswick by offering a stable supply of cleaner energy within a fixed cost structure like the regime that applies to the Alberta Heritage Pool or to Hydro Québec industrial electricity rates.

With these opportunities hanging in the balance, what could we do differently to help New Brunswickers make an informed judgement about the shale gas industry?

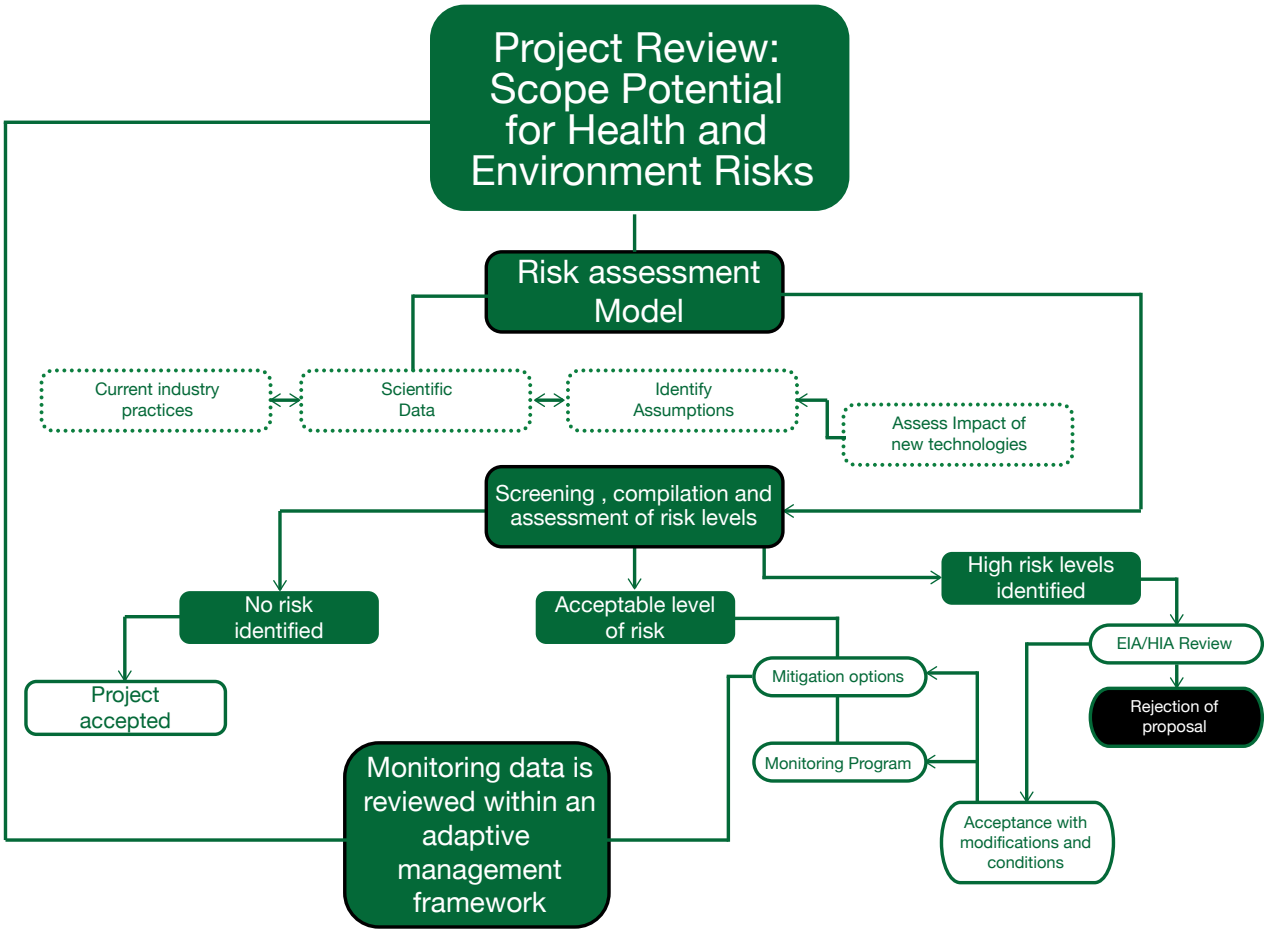
RISK ASSESSMENT MODEL

A structured, science-based risk assessment process is required to determine both health, environmental, social, and economic risks associated with a New Brunswick shale gas industry. New Brunswick shale gas deposits have different geological specificity and it is not evident that data which has been gathered from other jurisdictions can be extrapolated to the New Brunswick situation.

A science-based risk assessment process would define the level of risk associated with each phase of exploration, extraction, and management to define mitigation options as well as monitoring programs that need to be implemented to compile statistical data relevant to New Brunswick.

Once the risk assessments are defined for each segment of shale gas development the appropriate impact evaluations will establish the management system that will be required to ensure that shale gas can be extracted safely.

The chart below provides an overview of elements within a risk assessment model.



Business Model

Citizens we heard from during the tour wanted some tangible evidence that a shale gas industry would benefit those of us who live here. If we are enduring the impacts and managing the risks there is an expectation that we should also enjoy direct, measurable and desirable benefits. They also want an assurance that the shale gas industry will not compromise our natural or social environment, nor will it jeopardize public health.

I recommend a thorough business model be prepared to establish a rationale for the industry and show how it will benefit New Brunswick in the short and long term. Both direct and indirect benefits should be quantified along with specifics on investment, economic development and job opportunities that would be created.

Importantly, the model should also paint a picture of the social outcomes of developing the industry to ensure citizens have a well-rounded, fact-based view of the opportunity.

Phased Approach

The work of the various licensed exploration companies to map and research most of the potential gas deposits in the southern half of the province all at once without informing citizens thoroughly has contributed to a spirited public debate among affected communities focused on their natural environment, the security of clean water supplies, and their rural way of life. This shotgun approach to exploration has raised the alarm although little or no actual exploration has taken place to date. As a result the collection of scientific data through various methods such as seismic testing has been greatly misunderstood.

Provincial geologists examine rock on Hwy 1 road cuts, just to the east of Norton. The exposed outcrops are Albert Formation shale rocks.

To remedy this situation I recommend that the government adopt a phased approach to future exploration initiatives. This staged-in approach would be rolled out in an adaptive management framework which means that new knowledge and experience is constantly being integrated back into the activities of the industry participants.

A phased approach would restrict the exploration focus to specific areas chosen with input from community leaders and residents rather than the widespread area approach currently used. It would offer the possibility to verify the following:

- The effectiveness of the proposed legislation and industry regulations; testing in a real operational setting would identify vulnerabilities in the legislation and correct misgivings in the application of the regulations.
- Provide a forum where the affected residents could be informed and involved throughout the exploration and extraction processes.
- Give us an opportunity to collect sound, comparable socio-economic data and develop robust eco-metric models to assess the impacts of gas development in New Brunswick.
- The conditions to develop and implement appropriate monitoring programs that will ensure that the issues and concerns of citizens are properly addressed within sound science-based monitoring parameters.
- Baseline data on water, air, and other aspects of the natural environment.
- Enable the identification and delineation of major aquifers prior to exploration.

INDUSTRY GOVERNANCE

Currently the Natural Gas Group is made up of civil servants who have been assigned from a variety of areas within government to lend their expertise to the development of regulations and oversight of the industry as scientific testing was getting underway. Quite simply this will not be adequate to deal with the long term implications of developing an industry. A more permanent management structure is needed.

Even before limited exploration starts in 2013 it is my recommendation that a new industry governance model be established in New Brunswick to manage the gas and oil sectors, from exploration to market.

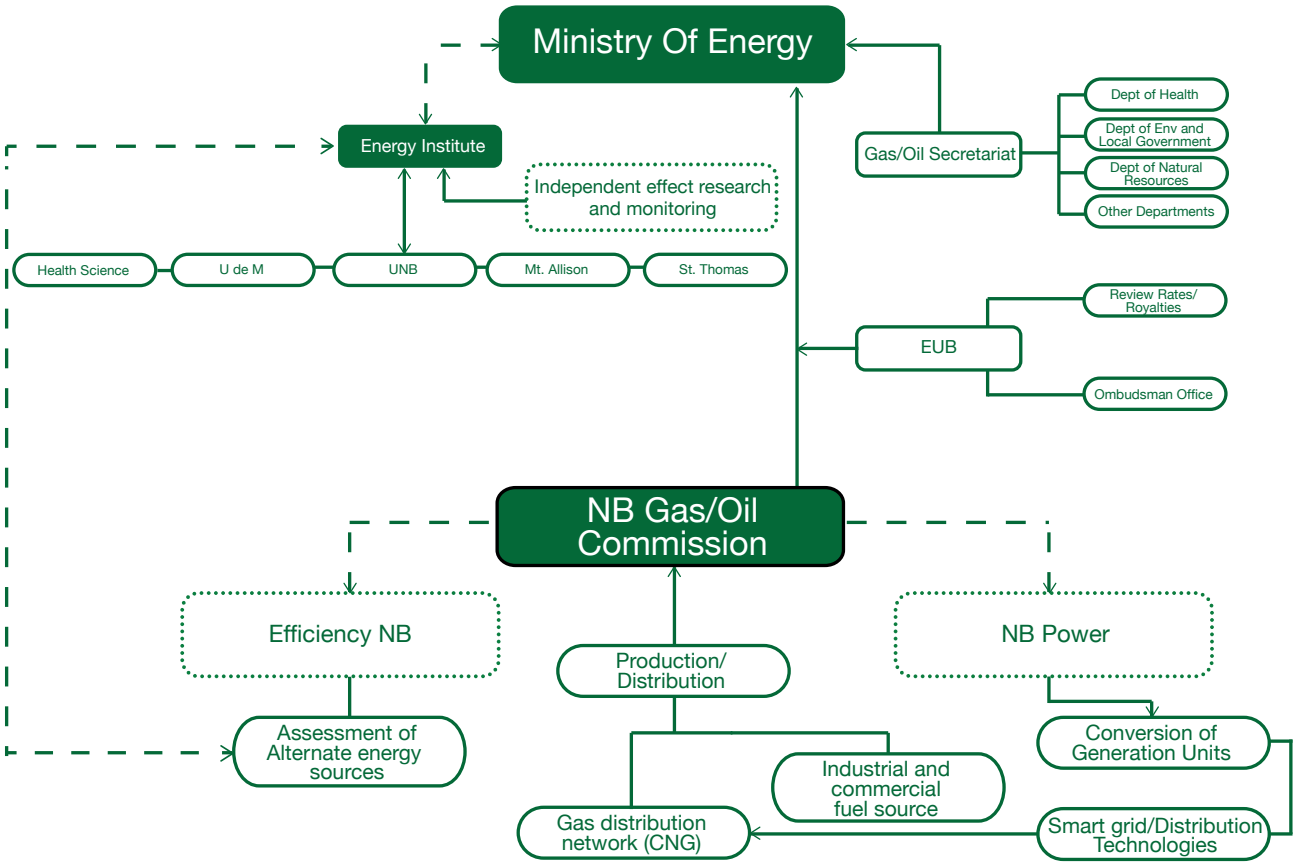
I am recommending that the oversight of shale gas development in New Brunswick be transferred to the Minister of Energy as soon as possible and integrated with provincial energy policy. Natural gas is an opportunity for New Brunswick to develop our owwn lower cost, cleaner fuel source for use in New Brunswick and for sale in the export market. It is first and foremost an energy option that should be managed in our provincial government structure where the accountability for energy policy resides.

I propose a structure to include the following elements:

- A gas and oil commission responsible to the Minister of Energy
- The Energy and Utilities Board (EUB)
- An independent Energy Science Institute to conduct research related to the exploration, extraction, and processing of gas and oil resources as well as to provide independent scientific advice to the Minister

The Minister would establish a focal point for policy development and coordination with other key ministries including: (1) Department of Environment and Local Government, (2) Department of Health, (3) Department of Transportation & Infrastructure, (4) Department of Natural Resources, and (5) Aboriginal Affairs.

NB Power could be involved as a major user of shale gas to convert generating units and possibly take responsibility for a provincial distribution network. Efficiency NB would be responsible to address energy alternatives as they relate to the expanded use of natural gas across New Brunswick.



GOVERNMENT DEPARTMENTS & AGENCIES

The Gas & Oil Secretariat would report to Minister of Energy and serve as the first point-of-contact and the government clearing the house to provide information to the industry on project applications. The commission would ensure there is no duplication or delay in the processing of applications or permits.

The Department of Environment would be responsible for the application of any legislation, official environmental monitoring, project screenings and conducting Environmental Impact Assessments (EIAs).

Department of Health would be the official provider of technical information to health care practitioners; they would have access to all pertinent health related information as provided by industry participants as a condition of license.

NB Power could be a major customer for shale gas as well as possible manager of a distribution system for the gas in New Brunswick.

Efficiency NB would review energy alternatives and provide advice to government on natural gas usage. The commission could also liaise with the Energy Science Institute to help assess the scientific, engineering, and economic issues associated with different energy choices.

This new governance model would help deal with many of the major, contentious issues expressed by citizens during my tour.

- The Energy Science Institute would provide a credible alternative to government and industry in conducting research and monitoring the industry.
    - Providing an open forum for major stakeholders to meet and debate industry issues.
    - Providing independent, statistical verification of data.
    - Assisting in mapping and creating digital models of provincial watersheds.
    - Conducting objective peer review of scientific literature, technical reports, and other information.
    - Helping government to prepare the business model and plan.
    - Developing and maintaining socio-econometric models to track economic activities associated with the industry.
    - Establishing a comprehensive data base of all chemicals used in gas extraction and production.
    - Helping design a community participation model.
    - Giving scientific advice to the Minister of Energy.
    - Conducting environmental and health risk assessments.

- The EUB would address shale gas rates within New Brunswick, royalty fees, and related financial issues. It is also structured to provide an effective forum through which citizens affected by the shale gas industry could find immediate solutions and financial support through the office of an Industry Ombudsman.

ENERGY & UTILITIES BOARD (EUB)

The EUB would serve as the public review commission for gas rates in the province and be responsible to oversee royalties' issues.

In addition they would be the body to review public complaints and issue remedial compliance orders, should issues arise, utilizing the $100 million bond as recommended in the proposed provincial regulations. They could act in the capacity of an Ombudsman to ensure objective and transparent resolution of disputes.

It makes sense to assign these roles to the EUB given they already have the legal authority and functional organization to take on these new shale gas issues in addition to their existing energy oversight mandate for the province.

ENERGY INSTITUTE

As part of the new structure the province would create The Energy Institute, which would be an independent body reporting to government through the Minister of Energy.

The Institute will work to ensure credible research and monitoring in support of shale gas exploration and production in the province leading up to a decision about the industry and its future in New Brunswick.

Independent Effects Research Program

The effects research program would be conducted under the auspices of the Energy Science Institute by tapping into research capacities within the four provincial universities: Mount Allison University, Université de Moncton, University of New Brunswick, and St. Thomas University. These Universities possess highly qualified, independent researchers within their centres of excellence and funded chairs. An effects research program would also provide an excellent opportunity to train graduate students.

Monitoring/Compliance Audits

The Energy Science Institute could undertake periodic statistical review of data collected and provide reports to the public. The Institute could also conduct risk assessments on issues associated with the production of shale gas.

Communication and Information

The Energy Science Institute would be responsible to develop and maintain an effective communication program that would provide factual and up-to-date information on the shale gas industry.

The Energy Science Institute could also play host to conferences, public forums, and stakeholder workshops that would serve as public venues to review and explore new technology, highlight new research, and debate findings.

The Institute would conduct peer review assessments of the published literature and provide assessments for government and the public.

Funding

The Institute would require an annual budget for a limited staff in the vicinity of $2 million dollars per year. Initially, funding could be provided in part from the Environmental Trust Fund, however, as the industry develops funding should be provided from the shale gas royalties.

The funds would be allocated primarily to research and monitoring activities.

CONCLUSION

During my tour I became convinced that a rational, science-based process and structured dialogue is needed to properly determine whether there is a viable shale gas industry in New Brunswick, and if that economic potential can be realized in a safe manner.

The Path Forward that I have outlined here is based on experience I have gained in other similar roles and I encourage all parties in New Brunswick to renew their efforts to establish a working process that facilitates discourse that will help citizens make an informed choice.

BIOGRAPHICAL NOTES

Louis LaPierre, Ph.D., C.M.

Louis LaPierre is Professor Emeritus in Biology at the Université de Moncton since October 2003. At this same university, he was holder of the K.-C.-Irving Chair in Sustainable Development from 1993 to 2001, professor of Wildlife and Environmental Ecology from 1970 to 1999, and Director of the Master in Environmental Studies program from 1994 to 1999. Between 1990 and 1994, he was also director of the Environmental Science Research Centre.

Since 1996, Dr. LaPierre is chair of the Institute for Environmental Monitoring and Research associated with the low-level flying program in Labrador and northeastern Québec (appointed by the Minister of National Defense). He also serves as a Council Member of Sustainable Development Technology Canada since 2003. And in September 2008, he was named as a member of the list of prequalified members of assessment panels for the Canadian Environmental Assessment Agency. Since April 2010, he is a member to the NB Power board of directors. Since July 2011, he is a member of the Environmental Assessment Panel for the Marathon Platinum Group Metals and Copper Mine Project. And in May 2012, he has been named as Panel Chair for the NB Shale Gas.

Dr. LaPierre was appointed as a member of the Order of Canada in 2012 for his contributions to the protection and preservation of the natural environment at the local, provincial and national levels.

As a concerned citizen and active member of several environmental groups, Dr. LaPierre has dedicated the past 35 years to the protection of the environment at the provincial, national and international levels. He served as chair of the Fundy Model Forest for 10 years. He was chairman of the Environmental Council of New Brunswick between 1981 and 1990 and, between 1989 and 1991 was chairman of the Sustainable Development Task Force for the Premier's Round Table on Environment and Economy. From 1998 to 2003, Dr. LaPierre co-chaired the Round Table with the New Brunswick Minister of Economic Development. In April 1997, he was invited to develop an integrated strategy for the protection of natural areas in New Brunswick. From 2004 to 2006, he was a member of the Canadian Standards Association. From 2004 to 2006, he was a member of the Fisheries Resource Conservation Council. In 2005 and 2006, he was a member of the Environmental Review Panel for the environmental assessment of the Sydney Tar Ponds. In 2007, he was Chair of the Advisory Committee on Used-Tire Management for the Nova Scotia Department of Environment and Labour.

From 2001 to 2010, he was a Tribunal Review Officer for the Canadian Environmental Protection Act. From September 2008 to August 2009, he was chair of the joint review panel for the Bruce Power New Nuclear Reactor project. From November 2009 to February 2010, he was a member of the Advisory Panel on the proposed NB/Québec electricity transaction.

In 2006, Dr. LaPierre received a crystal maple leaf award from the Canadian Model Forest Network. In 2001, he received an Honorary Doctorate in Science from the Université Sainte-Anne. He was recognized as Alumnus of the Year for 2000 by this same university. He received the Governor General's 125th Anniversary Medal in 1993, as well as Environment Canada's Ecocitizenship Award in 1992, and the Lifetime Achievement award in 1991. Rotary International/Dieppe Club presented him in 1994 with the Paul Harris Fellow award. He was recognized as Alumnus of the Year for 1994 by the Université de Moncton. He was a member of National Defense's Environmental Protection Task Force. He was a founding member of the Nova Forest Alliance of Nova Scotia. He was a member of the scientific team reviewing PEI's fixed link impact on the environment. In 1996, he was awarded the Tree of Life Award from the Canadian Association of Forestry for his work on forest ecosystems. He served as a member of the National Round Table on Environment and the Economy Private Woodlot Task Force. He was the recipient of the 1997 Greater Moncton Excellence Award in Environment, and the Town of Dieppe honored him with the New Brunswick Heritage Day Outstanding Citizen Award in August 1997.

In 1998, Dr. LaPierre was awarded as an honorary citizen of the Town of Bouctouche for his work as Chair of the Bouctouche Dune Eco-tourism project. He was the recipient of two Professional Service Awards, one from Jacques Whitford Environmental Limited for his contributions on the Fixed Link Environmental Review Committee and the other from the Canadian Environmental Assessment Agency for his work on the Nuclear Waste Disposal panel. Dr. LaPierre was also awarded the Environmental Professional Award from the Greater Moncton Chamber of Commerce.