

**RESPONDING TO STAKEHOLDER CONCERNS REGARDING POTENTIAL
HYDRAULIC FRACTURING IN WESTERN NEWFOUNDLAND**

by

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Abstract

Stakeholder views should be considered in decisions relating to natural resource management. There are public consultation processes in countries such as Canada but it is unknown if citizen participation impacts policy-making. This study explores one such case of whether the views and opinions of the public were considered in decision-making. The public was invited to participate in the decision-making process associated with the prospect of hydraulic fracturing along the West Coast of Newfoundland. The Government of Newfoundland and Labrador instituted an independent panel to conduct a public review and assess the potential socio-economic and environmental implications of hydraulic fracturing. The Panel subsequently provided a report to the Minister of the Environment erring on the side of caution. The Panel neither supported nor opposed hydraulic fracturing citing the unavailability of sufficient research data for their neutral stance. Citizens, businesses and other organizations, raised several concerns such as apprehensions about water, health and quality of life for future generations through submissions to the Panel. Content and document analysis were used to ascertain the concerns raised in the five hundred and forty-five submissions and compare them against the recommendations made by the Panel. The research determined that the Panel largely addressed the concerns raised in the participants' submissions. Nonetheless, the study concluded that improvement is needed in future panel compositions as well as in efforts to actively engage members of the public. These changes are necessary in providing an impartial, deliberative and democratic decision that is representative of stakeholders.

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List of Abbreviations and Terms

Bbls – Standard Tank Barrels

BSE – Black Spruce Exploration Corporation

C-NLOPB – Canada-Newfoundland & Labrador Offshore Petroleum Board

CAP-NL – Coalition for Alternatives to Pesticides-NL

CBC – Canada Broadcasting Corporation

CBPC – Corner Brook Port Corporation

CCA – Council of Canadian Academies

CETA – Comprehensive Economic and Trade Agreement

EL – Exploration Licence

GHG – Greenhouse Gas

HIA – Health Impact Assessment

NL – Newfoundland and Labrador

NL-FAN – Newfoundland & Labrador Fracking Awareness Network

NLHFRP – Newfoundland and Labrador Hydraulic Fracturing Review Panel

OCCEE – Office of Climate Change and Energy Efficiency

QMFN – Qalipu Mi’Kmaq First Nation Band

REA – Responsible Energy Action

SPE – Shoal Point Energy

UNESCO – United Nations Educational, Scientific and Cultural Organization

US – United States of America

Western DMO – Western Newfoundland Destination Management Organization

Chapter 1: Introduction

1.1 Rationale and Research Questions

This research provides insight on the extent to which the Newfoundland and Labrador Hydraulic Fracturing Review Panel's (NLHFRP's) final report addressed concerns raised by members of the public in response to the prospect of oil and gas exploration, using hydraulic fracturing, off the west coast of Newfoundland. Hydraulic fracturing is the subject of ongoing debate internationally; this attests to an increased awareness and interest in environmental conservation. Increasingly, policy management has become more integrative by connecting social, economic and environmental issues (Pollock, 2004). Over time, the inclusion of citizens in environmental decision-making has grown (Beierle & Konisky, 2001) and it has become a widely accepted concept that citizens should play a role in decisions that impact them (Dryzek, 2000).

A participatory approach in decision-making influences the quality of the decisions, the relationships among the parties involved, and improved management capacity (Beierle & Konisky, 2001). Theoretically, public participation is ideal, but in reality, the public's views oftentimes have limited impact on decisions being made and the resultant policies (Barnes, 1999). In the province of Newfoundland and Labrador (NL), Canada, discussions arose concerning possible hydraulic fracturing along the west coast of the island of Newfoundland. The Newfoundland and Labrador Hydraulic Fracturing Review Panel (NLHFRP) was subsequently created by the Government of

Newfoundland and Labrador to carry out a public review with a view to providing recommendations.

The main objective of this research is to determine whether the concerns raised by the public were taken into consideration by the NLHFRP. In order to attain this objective, the research will have to answer the following questions:

1. What are the concerns raised in the public submissions to the NLHFRP?
2. What recommendations did the NLHFRP make?
3. Were the concerns raised by members of the public addressed in the report presented by the NLHFRP?

The answers to these questions will ascertain what concerns of the public, if any, were addressed by the report and the extent to which these concerns were discussed.

1.2 Background of Study

Four public consultation sessions were held in Newfoundland to provide stakeholders an opportunity to share their opinions on the proposed hydraulic fracturing of areas in Western Newfoundland. Despite these consultation sessions, were the concerns of citizens and organizations represented in the final report submitted by the Newfoundland and Labrador Hydraulic Fracturing Review Panel? Citizen involvement is considered a necessity in effective policy-making and the participatory efforts by the public are regarded as vital to democracy (Michels & Graaf, 2010). Notwithstanding,

citizens often play only a minimal role in actual policy-making (Michels & Graaf, 2010). This minor role played by the public may be construed as problematic as a major aim of having the public participate is to “create a healthier and more active democracy” (Barnes, 1999, p. 67). This problem is neither limited to environmental policy-making nor a specific geographical location (Michels & Graaf, 2010). It is therefore questionable whether participatory activities by citizens contribute to democratic decision-making (Michels & Graaf, 2010), particularly in natural resource management.

Hydraulic fracturing, more commonly known as fracking enables the extraction of natural gas trapped in shale formations underground through the drilling of wells using a combination of techniques including vertical, horizontal and directional drilling (O’Brien & Hipel, 2016). The proposal to explore for oil and gas in Western Newfoundland has been met with protest actions by citizens. In August 2014, Derrick Dalley, the provincial Minister of Natural Resources, announced that an independent review panel would be appointed to investigate the possibility of undertaking hydraulic fracturing in the province, in compliance with statutory regulations (CBC News, 2014).

The panel had a mandate to “conduct a public review and advise the Minister of Natural Resources on the socio-economic and environmental implications of the hydraulic fracturing process with respect to the possible exploration and development of the petroleum resources of Western Newfoundland” (Newfoundland and Labrador Government, 2015c). In conducting the review, the appointed panel had been

“proactively soliciting input and information from a variety of sources to assist the Panel in delivering on its mandate” since April 15, 2015 (NLHFRP, 2015). In doing so, they used the services of an external organization to conduct a province-wide survey; conducted four (4) public consultation sessions and received over six hundred submissions from members of the public expressing a range of concerns and opinions (Newfoundland and Labrador Government, 2015b). In an October 01, 2015 update on the review panel process, the panel advised the public of the progress of the input obtained to date and provided information on the public consultation sessions, including time and location. The sessions were held in four towns in Newfoundland from October 13, 2015 to October 16, 2015 (NLHFRP, 2015).

1.3 Purpose of Study

This study examines the concerns of the public as it relates to hydraulic fracturing in NL and the policy-making process in natural resource management. Emphasis is placed on the review panel’s report and the public’s participation in the process. This will contribute to the larger question of how citizens can be more effectively engaged in policy-making, particularly in natural resource management, and more specifically in fracking. The purpose of this research is to determine whether the concerns of citizens, citizen groups and organizations were considered by the provincial government’s panel; it will also identify lessons learned as it relates to public participation in the policy-making process on fracking with a view to developing best practices. These goals will be

achieved through text-based analysis of the submissions made to the NLHFRP and an assessment of the NLHFRP's final report.

1.4 Significance of Study

There is significant research on the standalone topics of fracking and public participation. The environmental impact of fracking has been studied at length from a natural science perspective but fracking has not been studied in great detail by social scientists (Jaspal, Turner, & Nerlich, 2014). Social science research on unconventional energy development, including fracking, is poised to provide the necessary connections between the technical aspects and the human impacts of fracking (Willow & Wylie, 2014). Citizen engagement, in the context of natural resource management, and specifically, shale gas governance, is still an emerging research area within the social sciences. As such, research on the impact of citizen participation on policy-making on fracking in Newfoundland and Labrador can make a valuable contribution to this growing area of study. More specifically, there has been no research on whether public concerns in relation to the proposed fracking in Western Newfoundland were addressed by members of the panel in their report.

Two recent publications refer to the proposed fracking in Western Newfoundland, namely, Brake & Addo (2014) and Sodero & Stoddart (2015). Brake & Addo (2014) focused on the potential socio-economic, cultural and environmental impacts that

fracking might have on tourism in the region and found that sustainable tourism is dependent on the effective management of natural and cultural resources, which justified public objections (Brake & Addo, 2014). The focal point of Sodero & Stoddart's (2015) article is the contradiction that exists whereby steps are taken to expand the tourism and oil industries while reducing greenhouse gas emissions. Simultaneously, fracking is being proposed.

This research will be important to the provincial government of Newfoundland and Labrador as well as its residents, the academic community, and the public in general. Given that public consultations are used as the method of public participation in many jurisdictions, the research will have relevance beyond Newfoundland and Labrador. It is especially necessary to study unconventional energy development from social science perspectives to bridge the gap between technical discourse and human experience (Willow & Wylie, 2014).

1.5 Methodology: Case Study

The case study approach is used in this research. A case study was chosen as it allows for in-depth focus on topics and the extraction of rich data (Eisenhardt, 1989; Hartley, 2004).. This research uses a single instrumental case study, whereby a specific case is selected to illustrate the issue under consideration (Stake, 1995). The fracking controversy in western NL is ideal as a case study at this time. This is due in part to the

identified gap in the literature as it relates to the social science perspective and the lack of research within the context of NL.

The research focuses on the submissions made to the NLHFRP and their subsequent report, as well as on the public's role and participation in the policy-making process, using a descriptive qualitative research approach. Descriptive research details an occurrence, that is, how or why something has happened (Nassaji, 2015) while qualitative research is more exploratory in nature (Creswell, 2013). The descriptive technique is used to provide an overview of the case to be studied and the qualitative approach is used to provide an in-depth view on the impact of public participation in the policy-making process, as it relates to fracking in Western NL. Content analysis and document analysis are used as the data collection and data analysis methods.

Content analysis is defined as a “research technique for the objective, systematic, and quantitative description of the manifest content of communication” (Berelson, 1952, p. 18). Document analysis is a method used to evaluate and interpret material, including text and images (Bowen, 2009). The documents used are chronicled without interaction between the authors and the researcher (Bowen, 2009). The analysis of documents provides data, including relevant quotations, that are arranged into major themes and/ or categories using content analysis (Labuschagne, 2003).

In the context of this research, content analysis provides the basis for some statistical measures and document analysis corroborates these findings while providing an in-depth view through excerpts and quotations. The documents used as the data set were submissions to the NLHFRP by citizens, businesses and other organizations. These submissions were made following the solicitation of input, by the panel, on the discussion regarding oil and gas exploration through hydraulic fracturing in the province of NL. Submissions were made electronically and are publicly available through the panel's official website, Newfoundland and Labrador Hydraulic Fracturing Review Panel (<http://www.nlhfrp.ca/>). The NLHFRP's official report is also in the public domain and is accessible through the abovementioned website.

Speech acts were also used in the coding process to aid in theme building. Speech acts are generally considered acts of communication which express a certain attitude, for example, an apology expresses regret (Bach, 1998). If a speech is successfully received by an audience, the audience will be able to identify the attitude being conveyed by the addresser (Bach, 1998). Speech acts can be presented in more ways than oral statements (Austin, 1965). Speech acts are usually used in reference to face-to-face situations, however, the term may be used generically in any form of language use (Bach, 1998). Speech acts may also be constative or performative in nature (Austin, 1965). Constatives are used for statements that are more descriptive in nature whereas performatives refer to carrying out an action (Austin, 1965). Speech acts can be divided into three actions namely the locutionary act, illocutionary act and the perlocutionary act (Austin, 1965).

Kempson (1977, p. 51) differentiated the three actions as follows: “a speaker utters sentences with a particular meaning (locutionary act), and with a particular force (illocutionary act), in order to achieve a certain effect on the hearer (perlocutionary act).”

1.6 Ethical Considerations

No human subjects were directly involved in this research as data for analysis was collected from secondary sources. In light of this, no ethics approval was sought for this study.

1.7 Limitations

This research is limited to the proposed fracking in Western Newfoundland with the scope encompassing public participation and the impact of the citizens’ contributions on the resultant report. The relevant period is between April 15, 2015, when public submissions were invited (Newfoundland and Labrador Government, 2015a) and June 2016 which is when the final report was released to the public.

1.8 Overview

The preceding chapter set out the rationale, research questions, purpose and significance of the research. It also provides the background of the study and highlights the main points for the chosen methodology and limitations faced with this study.

Chapter 2 focuses on the theoretical principles guiding the research including public participation, public consultation and the environment, public perception and engagement and technology.

Chapter 3 provides background on fracking while exploring the province of NL and why it is considered an ideal case to be studied.

Chapter 4 details the theory and research methodology employed throughout the research. This includes the research paradigm, theoretical framework, methodological approach, methods of data collection and analysis and coding techniques.

Chapter 5 presents and discusses the findings from the data analysis and seeks to answer the research questions. Also included is chapter 6 which gives a summary of the findings, policy recommendations and scope for further research.

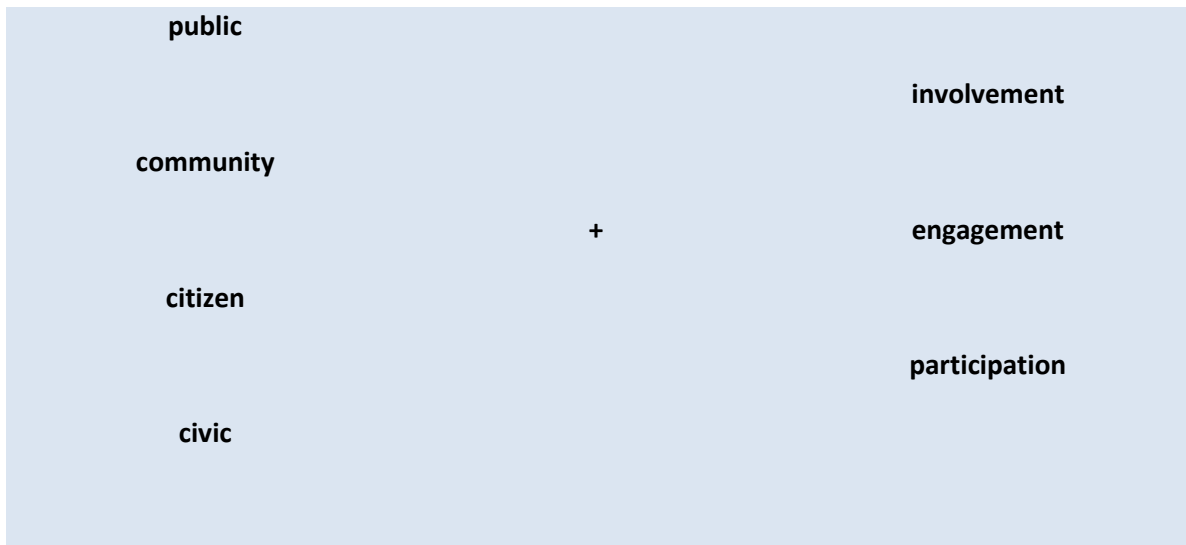
Chapter 2: Literature Review

2.1 Public Participation

According to Richardson, “People must be able to have their say – to vote, to engage in political debate and to let those in power know their views on issues which concern them. This is what democracy is about” (1983, p.1). The concept of citizen involvement can be traced to the 1970s when social movements, with the support of political theorists such as Pateman (1970), “questioned hierarchical authority and demanded ‘direct democracy’” (Wesselink, Paavola, Fritsch, & Renn, 2011, pp. 2688-89). Government bodies and organizations alike have begun to realize and accept the importance of non-state actors in policy and decision making. There now exists a collective understanding that citizen engagement is necessary in the policy-making process as it is instrumental to effective policy-making (United Nations, 2007). Community and stakeholder participation in the management of natural resources is crucial in decision making processes if policy-makers seek acceptance by these parties (Hodge & Southorn, 2003). Facilitating the participation of citizens who will be affected by policy decisions is also considered a logical method of garnering public support (Pollock, 2004).

Many terms which are used interchangeably to denote the idea of citizen engagement, including the following configurations (Figure 2.1):

Figure 2.1 – Terms Denoting Engagement of the Public



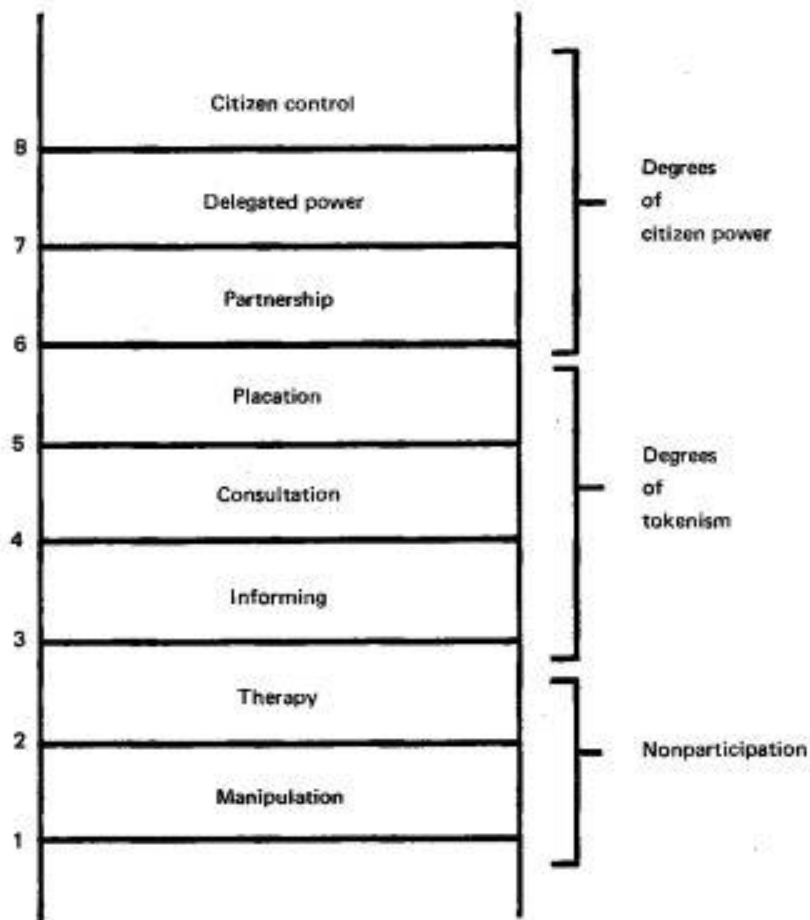
Source: Adapted from Montecvecchi (2011, pp. 6)

The term public participation is often defined as providing opportunities for the public to be involved in governmental decision making (Glass, 1979). Beierle & Cayford define public participation as “any of several ‘mechanisms’ intentionally instituted to involve the lay public or their representatives in administrative decision-making” (2002, p.6). The term is limited however. Glass (1979) points out that even the most notable definition of public participation fails to provide information on how participatory efforts should be structured and the term participation has been used in varying situations which are sometimes conflicting. Participatory practices may range from stakeholders having no

power to having the power to make the final decision in the policy-making process.

Arnstein (1969, pp. 17) developed the first participation model entitled ‘Eight Rungs in a Ladder of Citizen Participation’ – see Figure 2.2.

Figure 2.2 – Eight Rungs on a Ladder of Citizen Participation



Source: Arnstein (1969, pp. 217)

On the other hand, Pretty and Smith (2004) identified six types of participation:

1. “passive participation, in which people participate by being told what has been decided or has already happened;
2. consultative participation, in which people participate by being answering questions, with the process not conceding any share in decision making;
3. bought participation, in which people participate in return for food, cash, or other material incentives;
4. functional participation, in which participation is seen by external agencies as a means to achieve their goals, and people form groups to meet predetermined objectives;
5. functional participation, in which participation is seen by external agencies as a means to achieve their goals, and people form groups to meet predetermined objectives;
6. interactive participation, in which people participate in joint analysis, development of action plans, and formation or strengthening of local groups or institutions; and
7. self-mobilization, in which people participate by taking initiatives independently and retain control over how resources are used” (636 – 637).

The types of public participation put forth by Pretty and Smith (2004) corroborate with the five elements on a public participation spectrum as outlined by the International

Association for Public Participation (IAP²). The IAP² designed a spectrum based on the public’s increasing impact on the final decision. On the lower end of the spectrum, the public is provided with information, that is, there is no participation from the public, to the highest level of the spectrum where the public is empowered thereby allowing the final decision to be made by members of the public (IAP², 2014) – see Figure 2.3.

Figure 2.3 – IAP²'s Public Participation Spectrum

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Source: International Association for Public Participation (2014)

There are no benchmarks in place for effectively maximizing and incorporating public response (Glass, 1979). This point is reinforced by Wagenet and Pfeffer (2007) as they also stated that there is no set standard to support what public participation should entail. Pollock (2004) has made moves to remedy the ambiguity through the creation of criteria for effective citizen engagement (Figure 2.4).

Additionally, the IAP² has presented seven core values for the effective practice of public participation:

1. “Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process
2. Public participation includes the promise that the public's contribution will influence the decision
3. Public participation promotes sustainable decisions by recognizing and communicating the needs and interests of all participants, including decision makers
4. Public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision
5. Public participation seeks input from participants in designing how they participate
6. Public participation provides participants with the information they need to participate in a meaningful way

Figure 2.4 – Criteria for Effective Citizen Engagement

Criteria for Process	Criteria for Engagement	Criteria for Outcomes
Strategic: involves planning and identifying timelines, resources, stakeholders and objectives for the process	Enabling: the process should be equally accessible to all stakeholders	Efficient: should be cost-effective and timely
Inclusive: stakeholders should represent the affected population by virtue of age, gender, ethnicity, competing values and interest groups	Respectful: constructive dialogue includes exchanging perspectives which in turn may build trust between participants	Instrumental: deliberations should meet strategic goals and objectives and substantive results should emerge from the process
Transparent: show clearly how decisions are made and to what extent stakeholder involvement influenced outcomes	Constructive: involves sharing knowledge and providing feedback which is critical for maintaining respect and providing transparency	Meaningful: deliberations should influence the decisions at stake

Source: Pollock (2004, p. 31)

7. Public participation communicates to participants how their input affected the decision” (IAP², n.d.).

Public participation in policy-making matters allows for collaboration between government and stakeholders leading to higher levels of compliance and more effective enforcement of regulatory programs (Lum, 2008). According to Kathlene & Martin (1991), citizen participation is a unique but complex process which extends far beyond providing an official forum to voice community concerns. Public participation can be employed in varying forms and to varying degrees at various stages of the policy-making process, however, officials decide what method of forum is to be used, how much information is to be provided and to what extent the citizen’s input would be utilized in the designing of the policy (Kathlene & Martin, 1991); this creates a power imbalance.

Thomas (1995) points out that policy-makers use the guise of citizen participation as a means to obtain ease of implementation and acceptance by the public. Methods employed in public participation do not involve communities leading the process; instead, the processes are usually developed and shaped by experts who utilize a top-down approach in exercising their command over the proceedings (Hodge & Southorn, 2003). What is often referred to as citizen engagement usually entails making the decision, announcing the decision that has been made and defending the position taken in the decision (Forester, 1999). Representatives appointed to lead consultation processes are considered agents who “give a good deal of lip service to the idea of consulting with the

public, but in practice this consultation commonly consists of getting groups of citizens together so that they can be indoctrinated with the official point of view” (Rourke, 1969, p. 54). This has led to the value of public participation in policy matters being called into question as there exists dissatisfaction in the perceived levels of achievements gained from consulting the public (Hoppe, 2011).

There is, however, a gradual shift from the usual top-down approach to one in which the public demands, and has gained in many instances, greater access to information and an input in policy-making decisions (Beierle & Cayford, 2002). There has been movement away from the traditional modes of participation, including public comment and public hearings, to more sophisticated approaches such as consensus-based participation through which interest groups agree on policy outcomes (Beierle & Cayford, 2002). A poll done on citizen engagement revealed that “85% of Canadians would be more confident in government decisions if it was clear that the government sought citizens’ input more regularly, and 68% of Canadians believe that there are not enough citizen engagement initiatives on issues of public policy” (Sheedy, MacKinnon, Pitre, & Watling, 2008, p. 9). This demonstrates the entrenchment or institutionalization of this sort of participation in government decision-making. Inviting public participation in the management of natural resources is expected to result in standards, including legitimacy based on a fair representation of stakeholders, public interest, values and concerns at each stage of the policy-making process (Grodzińska-Jurczak & Cent, 2011).

In the United States of America, “Native (Indigenous) Nations are often not respected or considered sufficiently competent to have meaningful participation in decisions that affect their Nations, lands and resources” (Arquette, et al., 2002, p. 260). However, in Canada, federal legislation protects the rights of First Nations, Inuit and Metis, whose rights are affirmed in section 35 of the Canadian constitution (Booth & Skelton, 2011). First Nations people in Canada are the descendants of the original settlers who inhabited the country for thousands of years before the arrival of the Europeans (Government of Canada, 2014). Section 35 subsection 1 states that “the existing aboriginal and treaty rights of the aboriginal peoples of Canada are hereby recognized and affirmed” (Department of Justice, Canada, 2013, p. 63). In order to provide clarity, subsection 3 defines treaty rights as “rights that now exist by way of land claims agreement or may be so acquired” (Department of Justice, Canada, 2013, p. 63).

In keeping with section 35 of the constitution and following litigation, Canadian courts have introduced a government duty to consult with First Nations prior to undertaking any projects on or in close proximity to First Nations lands (Booth & Skelton, 2011). The actual implementation of the duty to consult is overseen by the respective provincial governments as the management of natural resources falls under provincial jurisdiction and the practices of consultation vary by province (Bains & Ishkanian, 2016), as seen in Figure 2.5. In a number of provinces, the duty to consult is passed on to the entity that seeks to embark on the development which may infringe on First Nations’ rights and lands (Booth & Skelton, 2011; Bains & Ishkanian, 2016).

Figure 2.5 – Duty to Consult Provisions by Province

Feature	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	Canada
Aboriginal participation required		•	•		•		•	•	•	•	•
Crown takes responsibility for the duty to consult	•	•	•	•	•	•	•	•	•	•	•
Clear offloading procedures for proponents	•	•	•		•	•	•	•	•	•	•
Draft policy	•			•	•	•					
Final policy		•	•				•	•	•	•	•
Time frame for consultation process		•	•								
Coordination with other levels of government (municipal/ federal/ provincial)	•	•	•	•	•	•	•	•	•	•	•
Legislation around the duty to consult policy											

Source: Bains & Ishkanian (2016, p. 8)

NL has a policy in place on consulting Aboriginals on development projects which may potentially impact them. The term Aboriginal, as used in the NL policy, is a term that encompasses First Nations, Inuit and Métis peoples (Government of Canada, 2014). In NL's Aboriginal Consultation Policy (the Policy), the government of NL declared that they are "committed to consulting Aboriginal organizations when (the government of) NL contemplates making land and resource development decisions that have the potential to adversely impact asserted Aboriginal rights or asserted treaty rights" (Government of Newfoundland and Labrador, 2013, p. 1). The Policy provides guidelines on consultation measures and expectations of the three parties involved, namely Indigenous governments, project proponent(s) and the government (Government of Newfoundland and Labrador, 2013).

The consultation process itself is intended to enhance communication, build stronger relationships and facilitate easier resolution of issues among the Indigenous governments, project proponents and the government of NL (Government of Newfoundland and Labrador, 2013). In an annual survey of mining companies, a consultant for an exploration company provided the following statement: "(L)ong drawn-out environmental approvals; lack of clarity on negotiations with First Nations; no guidelines and uncertainty of cost outcomes; (and) unrealistic government requirements for NL benefits, are all deterrents in Newfoundland and Labrador" (Jackson & Green, 2016, p. 35). This statement suggests that the aim of the consultation process, as presented by the provincial government, is not being met. Clear procedures and

guidelines are needed to improve the process, as well as to provide a timeline to both the public and industry players.

Difficulties faced in receiving public support for the approval and implementation of policies are attributed to the public failing to recognize the benefits of fracking and their lack of reassurance that the institution is committed to providing effective management (Williams, Macnaghten, Davies, & Curtis, 2015). This belief is built on the model capturing the public's understanding of science, which is also referred to as the deficit model of science communication (Simis, Madden, Cacciatore, & Yeo, 2016).

In this approach, public unease in matters is attributed to a lack of understanding which stems from a lack of knowledge (Williams, Macnaghten, Davies, & Curtis, 2015). The best way to overcome this hurdle would be through the provision of accurate scientific knowledge on risks and benefits which will prompt public acceptance (Williams, Macnaghten, Davies, & Curtis, 2015). Authors have since criticized the model on a number of grounds, including the public's fear and worry based on cultural norms, beliefs and values; appropriate methods of measuring scientific understanding; determining what knowledge is pertinent to the issue and that the influence of social trust on perceptions is greater than scientific knowledge (Douglas & Wildavsky, 1983; Hayes & Tariq, 2000; Peters, 2000 and Siegrist, Cvetkovich, & Roth, 2000). This leads to the question of whether citizens are provided with enough means and/or access to resources to facilitate their participation in decisions involving natural resource management.

There have been arguments both for and against having the public participate in policy-making, and in some instances, the extent to which the public should be allowed to participate. In cases that promote the public's participation, there are real barriers that can hinder some citizens from participating; these can range from transportation to socio-economic barriers (Sheedy, MacKinnon, Pitre, & Watling, 2008). Figure 2.6 provides a table detailing the categories of people at risk of being excluded with the corresponding barrier and potential solutions.

Figure 2.6 – Barriers to Participation and Potential Solutions

Categories of Exclusion	Barriers to Participation	Potential Solutions
Cross cutting barriers: can be applied to all categories	Sense of worth: people of various backgrounds have been stigmatized, belittled and marginalized	<ul style="list-style-type: none"> • Reinforce the value in input • Hire facilitators who are sensitive and skilled in inclusion measures • Keep track of speakers and if any one group is dominant, prioritize the non-dominant groups
Economic: poverty is a pervasive issue that often excludes people from society	Time: working endlessly to support family leaves no time for participating	<ul style="list-style-type: none"> • Consult target population to agree on date and time • Hold event close to their homes
	Social and cultural access	<ul style="list-style-type: none"> • Choose venue in area inhabited by the majority • Work with trusted community partners • Hold event on main public transit line
	Economic access	<ul style="list-style-type: none"> • Provide remuneration • Provide food and/or childcare
Ethno-cultural and newly arrived Canadians (economic barriers may be applicable here)	Citizenship: non-citizens feel excluded	<ul style="list-style-type: none"> • Use alternative phrases to "citizen engagement"
	Language: english may not be the first language	<ul style="list-style-type: none"> • Translate written material • Offer event-based translation measures
	Social and cultural: culturally diverse people occupy unique spaces	<ul style="list-style-type: none"> • Research places of gathering and communication and use them as venues and to provide outreach
Stereotyping age: those too young or too old are discredited	Legitimacy: the youth and the elderly are often excluded from discussions	<ul style="list-style-type: none"> • Define concepts and frame the problem in ways all can understand • Adapt processes that encourage these groups to speak up e.g. small groups
Ability: the needs of those living with disabilities are often overlooked	Physical access	<ul style="list-style-type: none"> • Ensure venue is accessible
	Transportation	<ul style="list-style-type: none"> • Give sufficient notice facilitate planning
	Communication	<ul style="list-style-type: none"> • Ask persons with special needs what they will need to participate • Provide translation
Gender: women are underrepresented; policies do not reflect their needs	Parenting: women are responsible for childcare	<ul style="list-style-type: none"> • Provide childcare or compensation for childcare
	Legitimacy: people who do not identify as either male or female	<ul style="list-style-type: none"> • See solutions for 'sense of worth' barrier

Source: Sheedy, MacKinnon, Pitre, & Watling (2008, pp. 15 – 16)

2.2 Public Consultation

Public consultation has become a critical component in matters concerning environmental governance (Wesselink, Paavola, Fritsch, & Renn, 2011). A great advantage to using the consultation method is that it allows decision-makers to be exposed to the publics' perspectives (Bishop & Davis, 2002).

Bishop & Davis (2002) included consultation as one of five methods of engaging the public in decision-making. The consultation method is the most common method of participation and it is widely-known and acknowledged that the public has the ability to influence the result, but it is the government that ultimately makes the decision (Bishop & Davis, 2002). Despite this, some citizens are skeptical about the process if their views are not clearly reflected in the resultant policy (Culver & Howe, 2004). The impact of the public's participatory efforts is usually measured by examining how the policy addresses the public's views and recommendations (Jones & Einsiedel, 2011).

There are different methods that can be employed in consulting the public including "e-consultation" (Culver & Howe, 2004, p. 53). E-consultation allows the participants to share their views at a time and place of their convenience via the World Wide Web (Culver & Howe, 2004). This reduces the number of persons who would be excluded because of their unavailability to attend a physical location on a specific day at

a given time. Traditional methods of consultation, such as mail surveys, may also be used to facilitate the inclusion of persons without computer access (Culver & Howe, 2004)

Unmet expectations, in some instances, have resulted in doubts being raised about the effectiveness and necessity of consulting the public when making policies. This is because the public's expectation is that deliberations and the resultant policy should be directly correlated. It therefore follows that the level of assurance in the importance of partaking in consultations is higher when the link between discussions and the final decision is evident (Parkins & Mitchell, 2005).

Public consultations can have positive impacts on environmental decisions. For example, in Grenada, efforts to manage the country's solid waste led to the need for a new landfill (The World Bank, 1999). A landfill site was identified, assessed and subsequently passed by the environmental assessment team (The World Bank, 1999). Public consultations were held and information gathered in these sessions led to the protection of endangered species in the proposed area (The World Bank, 1999). In Ecuador, alterations were made to the flood evacuation canal following consultation with groups impacted by the flood control project; this change resulted in higher costs while saving an important wetlands area (The World Bank, 1999).

There are limitations associated with the consultation process. Some hurdles in the public consultation process include the limited number of persons who actively

participate; knowledge base of the participants concerning the subject matter; whether the opinions of the participants are representative of the entire population; and the real versus the perceived values of the contributions made (Culver & Howe, 2004).

2.3 Public Perception

Before implementing any form of policy related to the proposed hydraulic fracturing in Western Newfoundland, it is important to acknowledge and understand how the general public perceives the proposed activity. Public perception of risk, in the context of this research, is defined as “the perceived likelihood of negative consequences to oneself and society from one specific environmental phenomenon” (O'Connor, Bord, & Fisher, 1999). The environmental phenomenon in this case is the prospective hydraulic fracturing.

Attitudes, values and beliefs and environmental knowledge are cognitive factors which impact perception (O'Connor, Bord, & Fisher, 1999) while age, education, gender and income are considered socio-cultural influences on perception (McFarlane, 2005). Attitudes affect risk perception and behaviour (Stern, Dietz, & Guagnano, 1995; Schultz & Zelezny, 1999); values and beliefs influence people's assessment and response to environmental risk (Stedman, 2004; O'Connor, Bord, & Fisher, 1999); and knowledge impacts risk assessment. However, in general, it has been found that women, younger persons, and persons with lower education and income tend to be more concerned about

the environment (Davidson & Freudenburg, 1996; Slovic, 1999; Kraus, Malmfors, & Slovic, 1992; and Savage, 1993).

The noted differences are perceived to be based on the respective groups' exposure to risks (McFarlane, 2005). Different age groups will have varying susceptibility to the hazards that may arise from the risk; for example, the elderly may be more vulnerable to hazardous health effects and would therefore have a keen perception of possible risks (Masuda & Garvin, 2006). The “interaction of psychological, cultural, social, and institutional processes that amplify or attenuate public experience of risk” are also factors which impact the public's perception of risk (Renn, Burns, Kasperson, Kasperson, & Slovic, 1992). Place and culture also play an integral role in risk perception as place forms the basis of culture (Masuda & Garvin, 2006).

It is therefore evident that perception will vary from person to person and from culture to culture based on a variety of elements which fall under behavioural, social, cultural and economic factors.

2.4 Social Movements

Globally, social movements first emerged during the eighteenth century in England and the United States amidst great economic and political changes (Tilly & Wood, 2015). Social movements during this time were generally recognized for their

features of extremity, depravity and violence (Tarrow, 2011). Instead of defining social movements based on those aspects, Tarrow defines social movement as “collective challenges, based on common purposes and social solidarities, in sustained interaction with elites, opponents, and authorities” (2011, p. 9). By the 1840s, petitions, barricades, demonstration and public meetings were widely known methods of opposition (Tarrow, 2011) and have been compared in general to other protest groups given their lack of alliance with any political organization (McKean, 1981).

The basic properties of social movements include “first, mounting collective challenges, second, drawing on social networks, common purposes, and cultural frameworks, and third, building solidarity through connective structures and collective identities to sustain collective action” (Tarrow, 2011, p. 8). With collective action, participants of a social movement generally engage in disruptive actions geared towards authorities and other groups; however, their activities can range from providing incentives to supporters to negotiating with authorities and to challenging cultural codes (Tarrow, 2011). In identifying with a common purpose, participants come together in a movement to support common or overlapping claims against the opponent, whether it is authorities or elites (Tarrow, 2011). The prevailing communal factor in the formation of social movements is the recognition of mutual interests and this propels participants into action (Tarrow, 2011).

While collective challenges, common purpose, and solidarity all contribute to the formation of a social movement, it is the persistence of collective action against opponents that fosters the growth and life of the social movement (Tarrow, 2011). Without sustaining the collective action, social movements usually dissolve or retreat into isolation (Tarrow, 2011). Since its emergence, the phenomenon of social movements has become institutionalized in the democratic process to the point where it is becoming a part of participation (Meyer & Tarrow, 1997).

The possibility of hydraulic fracturing taking place in Western Newfoundland was met with opposition by some citizens, organizations and other entities who are in opposition to the prospect. These groups have banded together with the collective interest of influencing the provincial government to ensure that no further licenses are provided to energy companies to explore for shoal gas reserves. This determination has been made as these groups portray the basic properties of a social movement as identified by Tarrow (2011) and noted above. These properties include collective challenges, common purposes and social solidarity (Tarrow, 2011). Within any social movement, for their collective action efforts to be effective and achieve positive political outcomes, "is it not better to work together on the basis in which one does not worry about 'who we are' but chooses a common ground, on which many people can work together? Theoretically, the question is then whether and how it is possible to affirm both unity and difference simultaneously" (Melucci 1996: p. 186-187). Social movements which demonstrate

collective action generally endeavor to externally portray unity; an effort is made to respect individual differences whilst holding true to the united cause (Melucci, 1996).

Chapter 3: Contextual Framework: Potential Fracking in Western Newfoundland

3.1 Hydraulic Fracturing

The term natural gas describes gases associated with petroleum-producing geologic formations (Speight, 2013). These natural gas resources can be further broken down into conventional and unconventional gases. Conventional gas can be found in sandstone or limestone reservoirs which are easily permeated and can therefore be extracted readily and inexpensively (Speight, 2007) while unconventional gases are contained in deep underground geographical formations that are virtually impermeable (deRijke, 2013). The permeability of the geographical formations signifies the ability for liquid to flow through them. An example of a rock with low permeability is the shale rock which exists in geologic formations located beneath the earth's surface that trap oil and gas (Speight, 1999).

Non-renewable sources of natural gas are depleting at a faster rate than that at which it is being produced; meanwhile, fossil fuels supply approximately 80% of the world's energy (Asif & Muneer, 2007). Efforts to sustainably supply the world's energy demands see more investment in renewable energy and natural gas (International Energy Agency, 2016). The 2012 World Energy Outlook report predicts that the share of unconventional gas in the overall global gas production will rise from fourteen percent in 2010 to thirty-two percent in 2035 (International Energy Agency, 2012). Additionally, approximately sixty percent of the world's energy is expected to come from renewables

by 2040, with nearly a half of this amount consisting of energy from wind and solar photovoltaic systems (International Energy Agency, 2016). The surplus supply of gas is expected to come from shale gas reserves worldwide including those located within the United States and Canada. Shale gas reserves are present in the United States of America in states such as Colorado, Louisiana, New York, Pennsylvania, Texas, and Wyoming and provinces in Canada including Alberta, British Columbia, and Saskatchewan (Carter & Eaton, 2016; Weber, 2012).

With the depletion rates of these sources, the oil and gas industry has been using technological advances in finding new and innovative sources of energy, some of which were once considered neither feasible nor profitable (Weber, 2012). These new techniques involve methods such as drilling which is an unconventional and controversial technique of extracting oil and gas from rocks located underground (deRijke, 2013).

Drilling for gas has been around since the 1950s, however, it was during the late 1990s that drillers discovered they could increase the permeability of shale rocks by pumping water, at extremely high pressure, down the well thereby fracturing the rocks (Speight, 2013). The discovery revolutionized drilling technology in the oil and gas industry in the United States, giving rise to the concept of hydraulic fracturing as an unconventional source of gas. In 1997, Mitchell Energy made a breakthrough in the hydraulic fracturing technology when it successfully performed water fracture stimulation on the Barnett Shale near Fort Worth, Texas and were able to collect the

extracted hydrocarbons (Yeates & Abrameit, 2011). Hydraulic fracturing first became commercially viable in 2001 as a method for extracting shale gas (Yeates & Abrameit, 2011). Production of shale gas on a large scale has grown increasingly feasible within the last decade as advances in technology improved the horizontal drilling techniques needed to extract the gas (Jackson, Pearson, Osborn, Warner, & Vengosh, 2011; Yeates & Abrameit, 2011).

An unconventional technique, hydraulic fracturing enables the extraction of natural gas trapped in shale formations underground through the drilling of wells using a combination of techniques including vertical, horizontal and directional drilling (O'Brien & Hipel, 2016). Shale rocks are usually situated at a great distance below the surface of the earth. To stimulate oil and gas production, a high volume of water, silica sand and chemicals, at high pressure, is injected into underground geological rock formations causing them to fracture and release the oil or gas (Sumi, 2005). The sand particles, as well as other propping agents, are used to keep the fractures in the rocks open therefore facilitating the extraction of the gas into wells.

3.2 The Province of Newfoundland and Labrador

3.2.1 Geophysical Environment

Newfoundland and Labrador is home to some of the oldest archaeological sites known on earth (Bell & Liverman, 1997). The province was formed by continental

collision, mountain-building, volcanoes, oceans, rivers and ice sheets many millions of years ago (Bell & Liverman, 1997). Labrador, the larger of the two land masses, has a vast area that is made up of plutonic and metamorphic rocks (Bell & Liverman, 1997). Most of the landscape in the province has been sculpted by glaciations (Kennedy, 1997). An aerial view of the province shows “a maze of lakes, marshes, interconnecting rivers, barren uplands and coniferous forests” (Kennedy, 1997, p. 300).

The province of Newfoundland and Labrador (NL) is the most easterly province in Canada with Newfoundland, an island, and Labrador, part of the mainland of Canada (see Figure 3.1). Labrador and the island of Newfoundland are separated by the Strait of Belle Isle (Bell & Liverman, 1997). NL is also Canada’s newest province having joined confederation in 1949 (Hiller, 1997), 92 years after the country was formed.

3.2.2 Newfoundland’s Native Inhabitants

Indigenous Beothuk Indians are among the original native inhabitants of the island of Newfoundland (Carignan, 1977) having inhabited the island prior to the seventeenth century (Rowley-Conwy, 1990). Early recordings see the Europeans and the Beothuks being friendly, however, the relationship quickly deteriorated and they became hostile towards each other (Carignan, 1977). Shanawdithit, the last known Beothuk Indian, died in 1829 and this marked the extinction of the Beothuk Indians (Budgel, 1992).

Figure 3.1 – Map of Canada



Source: Natural Resources Canada (n.d.)

On the contrary, the Indigenous Mi’Kmaq successfully established themselves despite the ever-growing European presence (Upton, 1977). Mi’Kmaq presence may have been in southern Newfoundland since prehistoric times (Martijn, 2003). Southern Newfoundland was a part of the Mi’Kmaq domain of islands along with Cape Breton, the Magdalene Islands, St. Pierre and Miquelon (Martijn, 1989). The Mi’Kmaq changed settlements with the changing seasons and environmental conditions as they sought to exploit the different ecological habitats (Martijn, 2003). Their main sources of food were through hunting, fishing and small garden plots for subsistence farming (Martijn, 2003). The Mi’Kmaq entered into trade relations with the Europeans and the existence of the “white intruders” merely strengthened them as a people (Upton, 1977, p. 153). The Mi’Kmaq population still exists in Newfoundland and the Qalipu Mi’Kmaq First Nation Band made a submission to the Panel.

3.2.3 Political History

On June 7, 1832, a bill was introduced in Britain to give Newfoundland an elective assembly, that is, representative government (Gunn, 1966; Noel, 1971). The bill came eight years after Newfoundland received colonial status from Britain (Gunn, 1966). In 1855, Newfoundland became self-governing – more commonly known as Responsible Government (Noel, 1971).

During the 1890s, Newfoundland’s economy was simultaneously impacted by a declining fishing industry; the increasing costs associated with the construction of the

trans-island railway and allegations of corrupt electoral practices by the elected Liberal party (Hiller, 2011). The island started seeing a certain level of prosperity in the early 20th century; however, this was short-lived (Hiller, 2011). Having paid its war debt (one of few countries to do so), Newfoundland was brought to the brink of bankruptcy by the Great Depression (Hiller, 2011). This largely contributed to the economic troubles that faced the province (Hiller, 2011). By the winter of 1932, a quarter of the population was dependent on the government for assistance in obtaining basic necessities including food (Baker, 1987).

In 1933, while the island still struggled to recover from the political scandal and their financial woes, Newfoundland withdrew its support for self-government and instead established a Commission of Government (FitzGerald, 1992). Newfoundland's strategic location attracted American interest and their wartime activities during World War II (FitzGerald, 1992). This newfound importance, in addition to the island's resources, garnered Canada's interest (FitzGerald, 1992). Skepticism arose about Central Canada's interest in the island (Hiller, 2007). It was also widely believed that "Central Canada was a foreign and threatening place whose imperial agenda would drive up taxation, dislocate trade, cause friction with the United States and promote sectarian strife" (Hiller, 2007, p. 120).

Between 1946 and 1949, the Responsible Government League rallied efforts to have the island return to self-government before even contemplating joining

confederation with Canada (FitzGerald, 1992). J.R. Smallwood led the charge in favour of confederation (FitzGerald, 1992). The decision to become a Canadian province came on the heels of two referenda held in 1948 with a slim majority of Newfoundlanders finally voting to join Canada (Hiller, 1997). On March 31, 1949, Newfoundland and Labrador became the tenth province of Canada (Baker, 1987). During this time, Newfoundland and Labrador had a population of approximately 345,000 residents (Government of Newfoundland and Labrador, n.d. (a)).

The island of Newfoundland was never an integral member of the British North American colonies, having only become a colony of Britain in 1824, over two centuries after colonizing the island (Gunn, 1966). In spite of efforts by the residents of Newfoundland, the island was unable to maintain its Dominion status after losing all viability in 1933 (Gunn, 1966). Britain made Newfoundland's foreign affairs decisions up until Confederation in 1949, a change which almost half the population was against (Gunn, 1966). NL's political history is characterized by economic crises and dependence on exploiting the province's natural resources (Higgins, 2007). In the late 1800s, the Government sought to explore the undeveloped mineral and forest resources located on the island's interior in order to provide sources of employment (Higgins, 2007).

3.2.4 Oil and Gas in Newfoundland

The island of Newfoundland attracted settlers because of the fish available off its coast and the island's economy was built on that seasonal industry (Schrank, 2005). Since

European settlement, settlers concentrated solely on fishing until the 1890s with the building of the trans-island railroad (Schrank, 2005). However, further attempts to diversify the economy repeatedly failed over the ensuing years (Schrank, 2005). Industrialization, technological changes, and overfishing of the northern cod in the Atlantic waters off the coast of Newfoundland led to the collapse of the cod stocks (Bundy, 2001). This resulted in the establishment of a moratorium on cod on July 2, 1992 by the federal government which has jurisdiction of marine fisheries (Schrank, 2005) which signified the end of the large-scale commercial trade in cod (Hutchings & Myers, 1994).

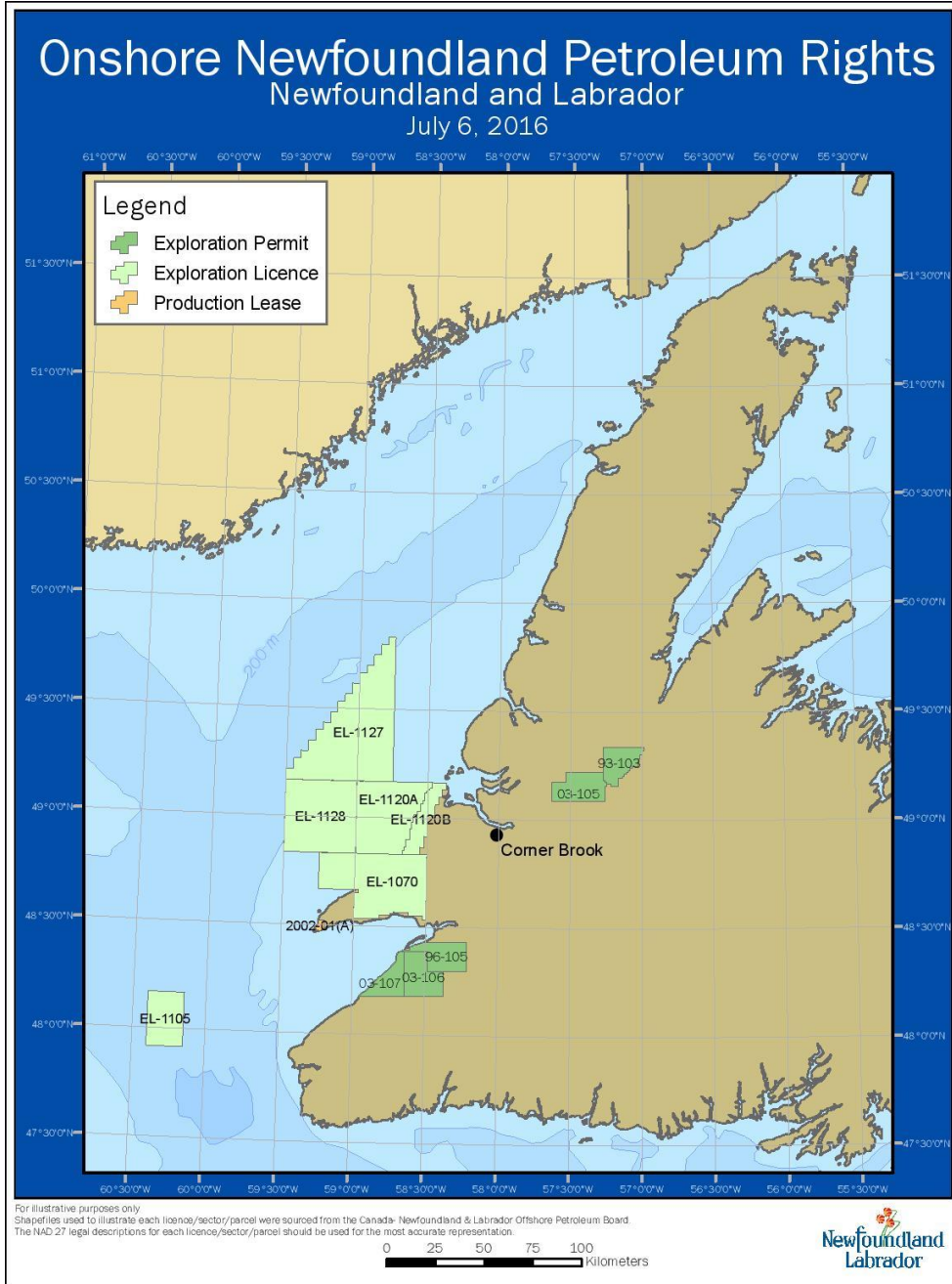
The depletion of the cod had a ripple effect as the cod represented an essential element in the ocean's ecosystem (Bundy, 2001). Other groundfish, including the American plaice and yellowtail flounder, experienced rapidly waning stock levels (Bundy, 2001). Declining groundfish stocks led to the indefinite extension of the cod moratorium and the inclusion of other groundfish by the end of 1993 (Schrank, 1995). Cod stock levels remained low twelve years after the 1992 moratorium and emphasis switched from groundfish to shellfish (Schrank, 2005). Following the crash of the fishing industry, the province's economy suffered and oil production became the major economic development avenue (Schrank, 2005).

The period following the establishment of the moratoria marks the 'largest layoff in Canadian history' and resulted in massive rural unemployment (Neis, 2000). The crash

of the fishing industry impacted over ninety-seven thousand persons (Williams, 1996). Approximately fifty thousand were directly employed in the industry and forty-seven thousand were employed in sectors dependent on the fishing industry (Williams, 1996). The impact of the crash was quite concentrated in Newfoundland and Labrador (Neis, 2000) although the collapse affected the entire Atlantic Canada and Quebec (Williams, 1996). Based on this history of the province, persons may be inclined to prioritize jobs regardless of their nature. However, this assumption is not reflective of the actual outcome of the research. As at May 2017, the unemployment rate in the province of Newfoundland and Labrador stood at 14.8%, the highest amongst the provinces in Canada (Statistics Canada, 2017a).

There is considerable oil and gas development on Newfoundland's east coast; however, the west coast is home to an expanse of shale gas reserves (Brake & Addo, 2014). Two oil companies, Shoal Point Energy (SPE) and Black Spruce Exploration (BSE) sought licences to explore onshore to offshore on Green Point Shale (The Council of Canadians, 2013) located along the west coast of Newfoundland (see Figure 3.2). The proposed area is within close proximity to the Gros Morne National Park (see Figure 3.3) and Port-au-Port. Gros Morne National Park has been designated a UNESCO world heritage site since 1987 (UNESCO, n.d.). The UNESCO World Heritage Committee has encouraged the federal government of Canada to implement a permanent buffer zone to protect the site from effects of hydraulic fracturing (The Canadian Press, 2014) and any future development.

Figure 3.2 – Onshore Newfoundland Petroleum Rights



Source: Government of Newfoundland and Labrador (2016b)

Figure 3.3 – Gros Morne National Park



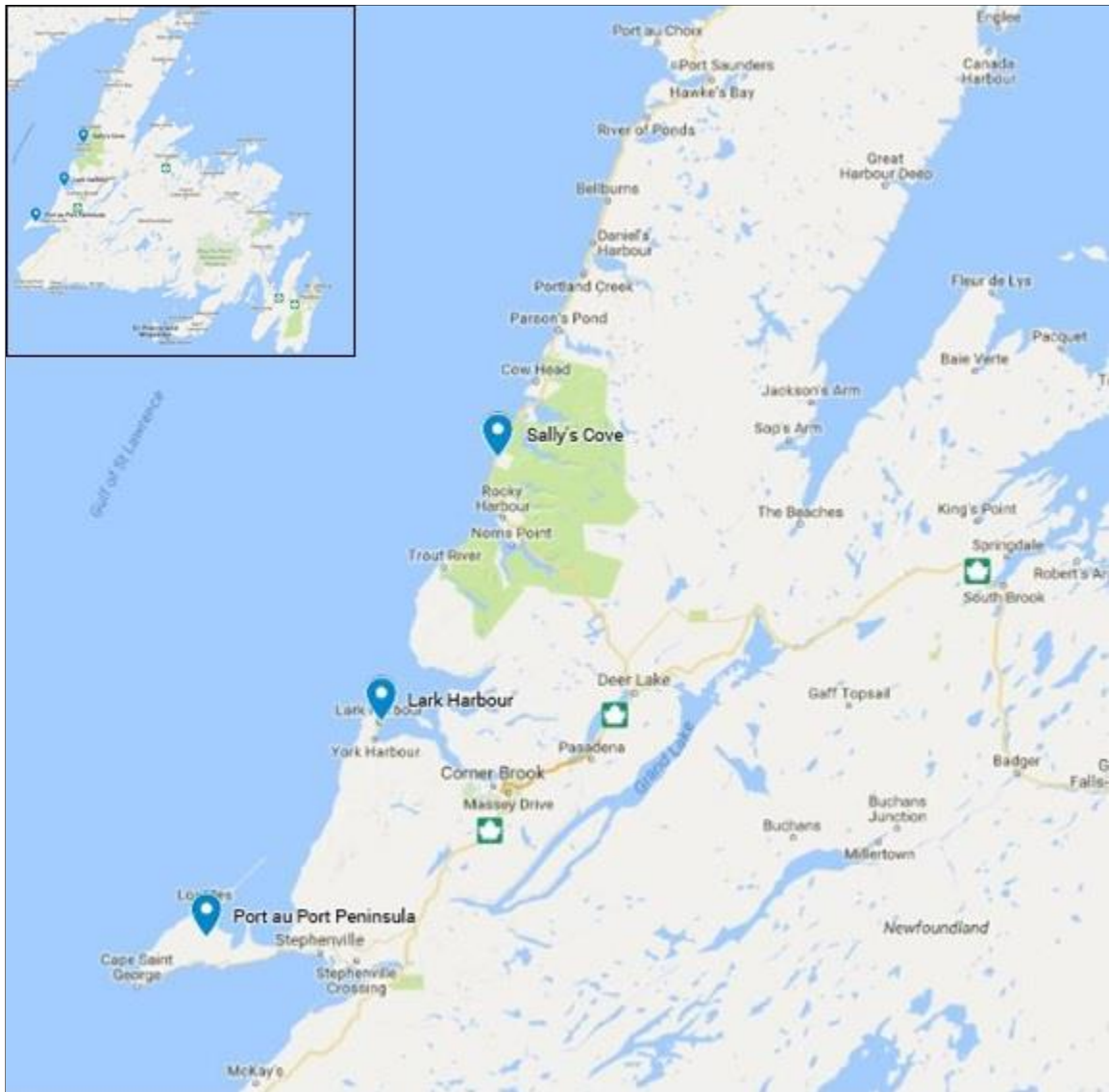
Source: Brackley (2013)

The area includes the communities of Port-au-Port Peninsula, Lark's Harbour and Sally's Cove (see Figure 3.4). Sally's Cove is a fishing community located in Gros Morne National Park (Sally's Cove, 1994, p. 61) with a total population of 20 as at 2016 (Statistics Canada, 2017b). The population has decreased by 25.9 percent from the 2011 population of 27 residents (Statistics Canada, 2017b). Sally's Cove spans 4.54 square kilometres (Statistics Canada, 2017b) and is approximately 15 kilometres north of Rocky Harbour (Sally's Cove, 1994). Just off the coast of this community are several fishing grounds which have been historically productive (Sally's Cove, 1994).

Lark Harbour is predominantly a fishing community and is located on the north shore of the Bay of Islands (Lark Harbour, 1991). Lark Harbour has a population of 522 persons which represents a 2.4 percent increase from the 2011 population of 510 persons (Statistics Canada, 2017c).

The Port au Port Peninsula is a triangular-shaped, mass of land which extends into the Gulf of St. Lawrence and covers an area of over 500 square kilometres (Port-au-Port Peninsula, 1993). This census division had a population of 1,957 in 2016, down 0.8% from its 2011 population of 1,973 (Government of Newfoundland and Labrador, 2017). Located at the westernmost end of the island of Newfoundland, the community is 10km west of Stephenville and is connected to the mainland by a narrow isthmus know as Port au Port (Port-au-Port Peninsula, 1993). The economy is primarily dependent on farming and fishing (Pitt, 2013). However, between 1940 and 1966, employment at the United

Figure 3.4 – Communities with the Proposed Fracking Sites – Port Au Port Peninsula, Lark Harbour and Sally’s Cove



Source: (Google, n.d.)

States air force base in Stephenville was the main income earner while the paper mill in the region was the largest employer between 1981 and 2005 (Pitt, 2013). Some sections of the area are known for their natural resources, for example, the oil present in Shoal Point (Port-au-Port Peninsula, 1993).

A variety of peoples settled in the area which has led to diversity in ethnicities and languages as compared to other areas in NL (Pitt, 2013). Aboriginal and French cultures are present in most of the communities throughout the Peninsula (Integrated Coastal and Ocean Management: Newfoundland and Labrador (ICOM-NL), n.d.). Several Acadian families, most of which were farmers from Nova Scotia, settled in the area between 1825 and 1845 with some Acadian women marrying the French fisherman and staying (Port-au-Port Peninsula, 1993).

With a combined land area of 370,514 square kilometres (Statistics Canada, 2016a), NL is the largest of the Atlantic provinces and boasts 29,000 kilometres of unspoiled coastline (Newfoundland and Labrador, n.d.). The island of Newfoundland covers an area of 156,453 square kilometres which represents the combined area of Nova Scotia, New Brunswick and Prince Edward Island (Newfoundland and Labrador, n.d.). Notwithstanding the land size, Newfoundland and Labrador has a relatively low population size of 519,716, making NL Canada's second least populated province, ahead of Prince Edward Island with 142,907 (Statistics Canada, 2016a; Statistics Canada, 2016b). 39.6 percent of the population, that is, 205,955 persons, resides in the census

metropolitan area of St. John's which has a land area of 804.79 square kilometres (Statistics Canada, 2016c). NL has a population density of 1.4 persons per square kilometre compared to the national average of 3.9 persons per square kilometre (Statistics Canada, 2016a), making the province very sparsely populated.

3.2.5 Population Density

The relatively low population of the province is influenced by a number of factors, including the geophysical environment. For example, the exhaustion following the labour-intensive task of fishing in the summer, coupled with poor soil, resulted in the settlers' limited ability to engage in agriculture (Cadigan, 1995). From as far as the 1800s and 1900s where the population resided near to the coasts, poverty levels among fishermen were so high that "anyone who could scrape together the money for passage fare left Newfoundland" (Cadigan, 1995, p. 138). Fast-forward to 2016 and the population remains sparse. With almost forty percent of the province's population residing in the capital city, approximately sixty percent of the population is divided between Labrador and the remainder of the island of Newfoundland. The combined population of Sally's Cove, Lark Harbour and Port-au-Port Peninsula is 2499, representing 0.48% of the population of NL. This is the percentage of residents who would be directly impacted by any development in and around these communities.

3.2.6 Oil and Gas in Western Newfoundland

While energy development is not entirely new in the province of Newfoundland, it is important to recognize the inherent risks associated with the industry and strive to address public concerns. Specific attention needs to be paid to communities which are unaccustomed to oil and gas development; additionally, both physical and regulatory means, need to be implemented (Arthur, Langhus, & Alleman, 2008) as they are necessary in maximizing protection of the environment.

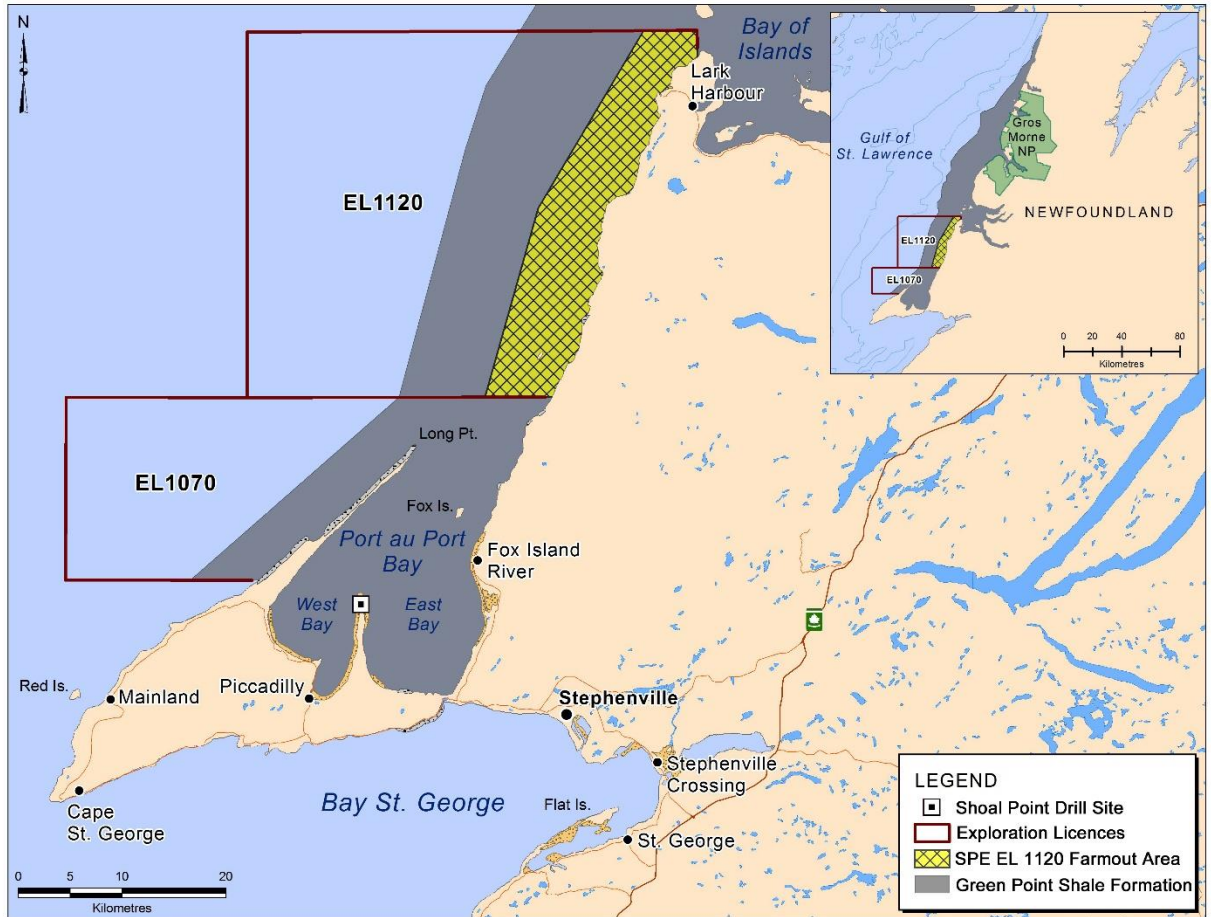
Shoal Point Energy researched the resource potential of shale formation in Western Newfoundland. The results indicate that there is between 177,270,000 and 908,620,000 standard tank barrels (Bbls) of oil that can be extracted (Shoal Point Energy, 2016). The best estimate, which is closer to the likely amount to be extracted, is 428,420,000 Bbls (Shoal Point Energy, 2016). It was assumed that the gas produced from the process would be utilized on site and therefore none would be sold on the gas market (Shoal Point Energy, 2016). However, there is no definite location on the natural resource and there is uncertainty about economic and commercial viability of resource extraction and production. (Shoal Point Energy, 2016). The degree of uncertainty varies and is dependent upon the geological information attained on the shale formation and the interpretation of this information (Morning Star Consultants, 2014).

Shoal Point Energy owns and operates exploration licence (EL) 1070 and has some rights to EL 1120 which is owned by Black Spruce Exploration (Canada-

Newfoundland & Labrador Offshore Petroleum Board (C-NLOPB), 2015; Shoal Point Energy, 2016). The ELs cover a vast area of where the green point shale formation is located, approximately 220,000 acres – see Figure 3.5 (Shoal Point Energy, n.d.). In the exploration process, wells would be built onshore to offshore using multi well pads thereby minimizing costs and surface footprint (Shoal Point Energy, 2016). The shale formation is in a prime location as there is easy access to ports that would allow transportation; there is also ample space for the development of the necessary infrastructure (Shoal Point Energy, n.d.). There is an airport in Stephenville which is approximately 30 km from Shoal Point and there is a year-round deep-sea port, along an accessible coastline in the area, allowing for low transportation costs (Shoal Point Energy, 2016). The research by SPE also revealed that there are natural fractures in the shale formation caused by plate tectonics and hydrocarbon generation (Shoal Point Energy, 2016). This has a positive impact as it would require less human-made stimulation to produce the resource located within the shale formation.

To date, approximately 17 wells drilled in the area: eleven shallow wells were drilled between 1898 – 1933 and six deeper wells between 1996 and 2012 (Shoal Point Energy, 2016). On all occasions, drilling halted because of a lack of the appropriate technology required to properly drill and extract the resource. SPE has drilled two wells in the general area since 2008 and this activity led to the area being recognized as a potential major oil producer (Shoal Point Energy, n.d.).

Figure 3.5 – Shoal Point Energy’s Humber Arm Shale



Source: Shoal Point Energy (2016)

3.3 Fracking Awareness and the NLHFRP

3.3.1 Fracking Awareness

The possibility of hydraulic fracturing occurring in the province of NL led to the emergence of residents, business and organizations alike who are not in favour the unconventional method of fracking for oil and gas within the province based on a variety of assorted reasons. One such organization is the Newfoundland & Labrador Fracking Awareness Network (NL-FAN). The NL-FAN is “a non-partisan network of organization and individuals who have serious concerns about the potential risks of hydraulic fracturing (fracking) used in oil & gas exploration and development in Newfoundland and Labrador” (Newfoundland & Labrador Fracking Awareness Network (NL-FAN), n.d.). This network consisted of 17 businesses and organizations and 195 individuals from various communities across the province (NL-FAN, n.d.). The businesses and organizations include:

1. Light Essentials Consulting, Bonne Bay, NL
2. Coastal Landowners Association of Western Newfoundland, Bonne Bay, NL
3. Gros Morne Coastal Alliance, Bonne Bay, NL
4. Common Sense Consulting, Bonne Bay, NL
5. Molly Made Crafts & Design, Woody Point, NL
6. The Western Environment Centre, Corner Brook, NL
7. Rocky Harbour Pioneers 50+ Club, Rocky Harbour, NL
8. Gros Morne Adventures, Norris Point, NL

9. Port Au Port / Bay St. George Fracking Awareness Group, NL
10. Atlantic Salmon Federation, NL
11. Council of Canadians, St. John's Chapter, NL
12. Council of Canadians
13. Mercy Centre for Ecology and Justice, St. John's, NL
14. Blow Me Downer Newsletter, Lark Harbour, NL
15. Green Drinks, St. John's, NL
16. Canadian Parks and Wilderness Association, NL Chapter
17. First United Church, Stephenville, NL (NL-FAN, n.d.)

The NL-FAN rallied for a freeze on unconventional oil exploration whilst imploring the government to institute an independent panel to:

- “1. Conduct a scientific and public review of hydraulic fracturing in Newfoundland and Labrador in order to fully assess the potential health, environmental, economic, and social effects on the region as a whole;
2. Review the associated regulatory, policy, and legislative issues; and
3. Recommend an approach that protects citizens and the environment, and fosters sustainable development” (NL-FAN, n.d.). They wrote to Minister Dalley to this effect on November 26, 2013 while applauding the Minister’s announcement of a moratorium on hydraulic fracturing in the province (NL-FAN, n.d.).

3.3.2 Newfoundland and Labrador Hydraulic Fracturing Review Panel

On November 4, 2013, Derrick Dalley, Newfoundland and Labrador's Minister of Natural Resources, addressed hydraulic fracturing to the House of Assembly (Government of Newfoundland and Labrador, 2013). When exploring avenues for sustainable economic development, the government's priority is the health and safety of the people as well as protection of the environment, he said (Dalley, 2013). Accordingly, the government announced it would stop "accepting applications for onshore and offshore petroleum exploration using hydraulic fracturing" (Dalley, 2013). Ray Gosine, the Panel's chair, highlighted that there is no official moratorium in place on hydraulic fracturing in Newfoundland and Labrador (Bird, 2016). The 'moratorium', as it is widely considered and referred to by individuals and organizations, is the government issued 'halt' in oil and gas exploration using the unconventional method of hydraulic fracturing and does not constitute an actual moratorium (Bird, 2016).

An independent review panel was established by the provincial government's Minister of Natural Resources in October 2014 and was named the Newfoundland and Labrador Hydraulic Fracturing Review Panel (NLHFRP). The panel's mandate was to "conduct a public review and advise the Minister of Natural Resources on the socio-economic and environmental implications of the hydraulic fracturing process with respect to the possible exploration and development of the petroleum resources of Western Newfoundland" (NLHFRP, 2015c). The panel was also tasked with making "recommendations on whether or not hydraulic fracturing should be undertaken in

Western Newfoundland” (NLHFRP, n.d.(b)). The NLHFRP released their report on the Panel’s website and formally presented the report to the government on May 31, 2016 (NLHFRP, 2016). The report advised the provincial Minister of Natural Resources, and the public, of the panel’s findings and recommendations. The scope of the NLHFRP’s mandate is limited to potential impacts of hydraulic fracturing in Western NL and the Panel sought input from the public on two key issues: protecting and monitoring water quality and protecting communities and the environment (NLHFRP, 2015c).

The Panel developed and displayed sample questions on their website to aid in guiding the participants’ submissions and ultimately the research. Protecting and monitoring water quality was divided into two primary topics, namely the potential impacts on groundwater and the potential impacts on surface water (NLHFRP, 2015c). Protecting communities and the environment were broken down into twelve key areas: impact on land; waste management; management of additives; wellbore integrity; seismicity and geological risks; regulatory oversight and responsibility; site restoration; financial security and insurance; air emissions; public safety and emergency planning; community engagement and socio-economic impacts (NLHFRP, 2015c).

Newfoundland and Labrador’s Environmental Protection Act requires an environmental assessment whenever a proposed project may have significant impact on the natural, social or economic environment. The purpose of the assessment is to “protect the environment and quality of life of the people of the province; and facilitate the wise

management of the natural resources of the province” (Government of Newfoundland and Labrador, n.d. (b)). Following the release of the report, the provincial Minister of Natural Resources advised that “(a)ny future decisions regarding the hydraulic fracturing industry will be based on scientific evidence, and most importantly, on a social license from the Newfoundlanders and Labradorians who may be affected” (Government of Newfoundland and Labrador, 2016c).

The members of the panel were selected by the Minister of Natural Resources from outside the public service and “(had) knowledge or experience relevant to hydraulic fracturing operations and/or the potential impacts thereof” (NLHFRP, 2015c). The NLHFRP consisted of five members: Dr. Ray Gosine, the Chair; Dr. Graham Gagnon; Dr. Maurice Dusseault; Dr. Wade Locke; and Dr. Kevin Keough (NLHFRP, n.d.(a)) – see Appendix A. Following the announcement of the panelists, individuals, as well as groups and other organizations, expressed concern about the exclusive composition of the panel (CBC News, 2015). Of the five panelists chosen by the Minister of Natural Resources, none were women, none represented the First Nations community, and none were from the west coast of the province or resided there (CBC News, 2015). A member of the social action group, the Council of Canadians, emphasized the fact that the panelists were all university-educated white males who own land (CBC News, 2015). This led to a Council of Canadians’ social activist, Paula Graham, asking “(w)hy are we only drawing from such a small percentage of our population?” (CBC News, 2015) Actor Greg Malone objected to the fact that the panelists are all from the industry in some

capacity and some have publicly declared their support of the unconventional practice (CBC News, 2015). In contrast, Nova Scotia's hydraulic fracturing review panel was representative of all stakeholder groups, including industry players and First Nations (CBC News, 2015).

Chapter 4: Theory and Research Methodology

This chapter explores the theories and research philosophies that guide the research. The discussion is centred on research paradigms, theories and key concepts as well as the implications in selecting a methodological approach. This chapter also introduces the methodological approach and the methods of data collection and data analysis used. Proposed hydraulic fracturing, and the subsequent call for public input, in Western Newfoundland presents an ideal opportunity for case study research. The secondary data for the case study includes the submissions made to the Newfoundland and Labrador Hydraulic Fracturing Review Panel (NLHFRP) and the subsequent report. Secondary data is published data that was primarily gathered for another purpose; whether it be for general information or for use in another research project (Stewart & Kamins, 1993); secondary data includes public and official documents, newspaper articles, and records (Bowen, 2009). The methods of content analysis and document analysis are both used to collect and analyze the data. Content analysis provides the basis for statistical inferences to be made while document is used to corroborate these findings and provide an in-depth view.

4.1 Research Paradigm

A research paradigm is defined as a “set of interrelated assumptions about the social world which provides a philosophical and conceptual framework for the organized

study of that world” (Filstead, 1979, p. 34). As such, the paradigm provides the basis of the research including the intent and prospective outcomes. The paradigm lends the background for philosophical assumptions while guiding the tools, including the methods, used in the study (Denzin & Lincoln, 2005).

There are four major research paradigms: positivism, postpositivism, critical theory and constructivism (Guba & Lincoln, 1994). Positivism and postpositivism are more objective in nature whereas critical theory and constructivism are generally subjective (Guba & Lincoln, 1994). Stake (1995) and Merriam (2009) approach case study research from the constructivist paradigm while Yin (2012), Flyvbjerg (2011) and Eisenhardt (1989) view case studies from the postpositivist paradigm (Hyett, Kenny, & Dickson-Swift, 2014) .

Postpositivism comes from the realm of realism (Lincoln, Lynham, & Guba, 2011). Postpositivists accept that there are limitations in acquiring knowledge which can be attributed to “flawed human intellectual mechanisms and the fundamentally intractable nature of phenomena” (Guba & Lincoln, 1994, p. 110). This paradigm was borne from the general dissatisfaction with the positivism paradigm as it recognizes that obtaining purely objective knowledge may not be attainable (Lincoln, Lynham, & Guba, 2011). Constructivism, on the other hand, is from the realm of relativism which recognizes numerous ‘realities’ based on human experiences (Guba & Lincoln, 1994). A significant

goal in constructivism is obtaining “lived experiences” which can only come from the perspectives of people living day to day in the reality of the situation (Schwandt, 2000).

Following careful consideration of the postpositivism and constructivism paradigms and given the context of this issue, I chose the constructivism paradigm to guide the research. Constructivism stems from the study of interpretive understanding, otherwise known as hermeneutics (Clegg & Slife, 2009) and follows the notion that people, including researchers, should try to understand the issue at hand through knowledge gained from the people living the experience (Schwandt, 2000). Deep reflection on issues at hand will allow for hidden thoughts to surface (Schwandt, 2000) and this is thought to be encouraged by dialogue between a researcher and participants. The methodology therefore associated with constructivism is usually based on “dialectical interchange” which results in informed knowledge (Guba & Lincoln, 1994, p. 111).

However, for the purposes of this research, submissions made by the public to the NLHFRP form the basis of the data. The pieces have been submitted mostly from persons ‘living the experience’ and therefore provide the level of authenticity required in obtaining the relevant true opinions and/ or beliefs under the constructivism paradigm. The concepts explored in detail include public participation, public consultation, public perception, and social movements. The usefulness of the constructivism paradigm can be seen in these concepts. The engagement of citizens in activities pertaining to natural

resource management allows for their knowledge and experiences to facilitate informed decision-making. These lived experiences also play a role in guiding their respective risk perceptions and influence the formation of social movements.

4.2 Theoretical Framework

This research draws upon aspects of deliberative democratic theory. The deliberative democratic theory “refers to a body of political theory that seeks to develop a substantive version of democracy based on public justification through deliberation” (Baiocchi, 2001, p. 44). Democracy with an aspect of deliberation has been traced back to theorists such as John Dewey from the early twentieth century (Dryzek, 2000). The phrase ‘deliberative democracy’ was developed by Joseph Bessette (1980) but was hardly used prior to 1990 (Dryzek, 2000).

Deliberation involves the discussion of well-informed alternative solutions with the goal of addressing participants’ concerns or overcoming a conflict (Sanders, 1997). Deliberation covers a broad spectrum and gives all participants an opportunity to engage in discussions (Sanders, 1997). Deliberation ultimately allows for the perspectives of all members to be heard while highlighting and clarifying issues at stake in the political arena (Sanders, 1997). A well-conducted democratic event “involves public deliberation focused on the common good, requires some form of manifest equality among citizens, and shapes the identity and interests of citizens in ways that contribute to the formation of

a public conception of common good” (Cohen, 1989, p. 69). Deliberation is an exemplary practice for democrats and has “become a standard for the accomplishment of democracy: it is what democratic theorists aim for,” their aspiration (Sanders, 1997, p. 347). In democratic events, discussions should occur among representatives of all those who may be potentially impacted with the aim of reaching an amicable and inclusive decision (Bohman & Rehg, 1997).

Deliberation appeals to the “talk-centric” characteristic associated with democracy and replaces the general “voting-centric” aspect (Chambers, 2003, p. 308). For the deliberation process to be considered legitimate, it must be “authentic, inclusive, and consequential” (Dryzek, 2009, p. 1382). Deliberative democracy can be subdivided into two models: the elitist, which is centred around decisions made by the elite who depend on the judiciary and legislative branches, for example judges and politicians; and the populist, which focuses on the involvement of the people themselves in decision-making processes and not only the bodies instituted by the elites (Leib, 2010, pp. 31-34).

A major facet of this research includes the participation of citizens in decision-making on matters relating to natural resource management which ties in to deliberative democratic theory. Public participation in policy matters involves citizens engaging in deliberation in an effort to address any concerns they may have on the implementation and impact of the proposed policy. In Western Newfoundland, an independent Panel was instituted by the province’s Minister of Natural Resources (NLHFRP, 2015c). This Panel

was tasked with conducting a public review on the socio-economic and environmental implications of the hydraulic fracturing process (NLHFRP, 2015c).

The Panel also sought the public's input through different means including a survey of Newfoundland and Labrador residents by an external company; three public consultation sessions; and an open call for members of the public to make online submissions (NLHFRP, 2015b). These methods of soliciting the public's input represent an act of democracy and some aspects of deliberation. The survey, public consultation sessions and online submissions all allow for the public to participate through providing their views, however, they do not offer much of an opportunity for discussion. One main aspect of deliberation as cited by Sanders (1997) is addressing participants' concerns and overcoming conflict.

The methods of retrieving data through survey and online submissions leave no room for addressing the concerns raised or overcoming conflict. However, of the three public consultation sessions which were held with the members of the Panel in attendance, there were no responses to concerns raised nor was there room for conflict resolution. Instead, the Panel occasionally asked the presenter questions based on the information they presented. While the deliberative aspect may have been sub-par, the Panel subsequently released their report on the socio-economic and environmental implications of the hydraulic fracturing process. This report is deemed to represent the public's input on the subject matter and represents the very nature of this research. The

research aims to ascertain whether the public's input was taken into consideration by the Panel.

4.3 Methodological Approach

In fulfilling the purpose of this research, this study explores the debates surrounding hydraulic fracturing in NL and the policy-making process. Emphasis is placed on the areas of concern highlighted by individuals, businesses and organizations who made submissions to the NLHFRP as well as whether these concerns were addressed in the report produced by the Panel. In doing so, a descriptive qualitative research approach was used and sources of literature on the areas of the study were retrieved from predominantly secondary sources.

Nassaji (2015) differentiates between descriptive and qualitative research methods though they are often used interchangeably when conducting research. However, they differ in goal, level of control and how datum is analyzed (Nassaji, 2015). Descriptive research is more concerned with describing an occurrence and its characteristics while qualitative research seeks to “gain a deeper understanding of individual participants, including their opinions, perspectives and attitudes” (Nassaji, 2015, p. 129). This definition is in line with Creswell's who describes qualitative research as “an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures,

data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and interpretations of the meaning of the data" (2013, p.4). Qualitative studies have come under criticisms for being highly subjective, creating more problems than solutions, contributing slowly to the disciplined science and being time consuming and costly (Stake, 1995, p. 45).

There are numerous ways to classify approaches to qualitative studies. Creswell (2012) has narrowed it down to five qualitative approaches: narrative, phenomenological, grounded theory, ethnographic and case study research. For the purposes of this research, the case study approach is used.

A case study is defined as "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and concept are not clearly evident" (Yin, 2009, p. 18). The case study approach was chosen based its suitability in focusing in-depth on the contemporary events associated with the proposed fracking in Western Newfoundland. This case was selected based on the fact that it was an ongoing development and the public's input was sought in the decision-making process. There was also a good database readily available and a subsequent report from the NLHFRP, neither of which has not been analyzed. Studying a particular case encompasses an in-depth analysis of collected data and is bound either by definition and context (Miles & Huberman, 1994); time and activity (Stake, 1995); or time and place (Creswell, 2013). Case studies of a qualitative nature

may be differentiated by the size of the case or by the objective of the case analysis (Creswell, 2012).

Case study analysis may include a single case study or multiple case studies, otherwise referred to as comparative case method (Yin, 2009). There exist three types of case studies: single instrumental case study, multiple case study and the intrinsic case study (Creswell, 2012). The single instrumental case study is where one case is selected to illustrate the issue that is being researched (Stake, 1995). This type of study is used in conducting this research with the issue being whether the public's concerns were taken into consideration when fulfilling the panel's mandate. Using the single case study provides detailed analysis on the subject of public participation in decision-making about hydraulic fracturing in Western Newfoundland. The case study allows for inferences to be made and applied to other cases of public participation in natural resource management. The case studied is in Western Newfoundland where a panel was instituted to inform the Minister of Natural Resources of the implications associated with the unconventional method of hydraulic fracturing.

4.4 Methods

Case studies were borne out of the limitations associated with quantitative methods, specifically the need for holistic and in-depth explanations of social and behavioural issues raised in research (Zainal, 2007). The case study method addresses

this concern as it can use both qualitative and quantitative methods. Researchers have cautioned that case studies are not synonymous with qualitative research and it is possible for case studies to be based entirely on quantitative evidence (Yin, 2009), although this is not the case here.

A single instrumental case study is used in conducting this research because of its ability to provide rich data and deep understandings, conduct thorough examinations on the subject matter, and facilitate inferences. This is where one case is selected to illustrate the issue that is being researched (Stake, 1995). A recurring challenge presented by using a single case is the concern of generalization (Yin, 2009; Tellis, 1997). However, in conducting a case study, the aim is to “expand and generalize theories (analytic generalizations) and not to extrapolate probabilities (statistical generalizations) (Yin, 2014, p. 21). However, content analysis allows for inferences to be drawn from the research (Krippendorff, 2004).

4.4.1 Content Analysis

There are various definitions of content analysis. Many define content analysis as a technique used in research to analyze communication in a systematic, objective and quantitative manner (Berelson, 1952; Holsti, 1968; Kerlinger, 1986). More broadly, content analysis is “a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” (Krippendorff, 2004, p. 18), a definition that is similar to that of Weber (1990). Content analysis is also

considered a non-reactive method in research as it asks questions of the communication that people have already produced (Kerlinger, 1986). Since its inception, content analysis has evolved into a method which can yield inferences from verbal, pictorial or communication data (Krippendorff, 2004). Content analysis is one of many research methods used to analyze textual data. Textual data can be in many forms including print, electronic documents, media articles or verbal input; or may be the results obtained from another method such as surveys, interviews, observations or focus groups (Kondracki, Wellman, & Amundson, 2002).

A distinguishing feature in content analysis is quantification (Kassarjian, 1977). Content analysis' primary purpose is to group large amounts of data with similar meanings into classifications (Weber, 1990). It is used in measuring the emphasis or omission of any given words and/or phrases (Kassarjian, 1977) and highlights language characteristics while taking into account the contextual meaning of the text (Lindkvist, 1981; McTavish & Pirro, 1990). There are four basic steps in carrying out content analysis: collecting material instrumental to the research area; defining the topics to be categorized and measured; choosing a standard unit of measurement, whether a word or phrase etc.; and determining the numeric value to be used in coding each category (Johnson, Reynolds, & Mycoff, 2015).

The benefits of content analysis include: it is content-sensitive (Krippendorff, 2004); it facilitates a deeper understanding of the meaning in pieces of communication

(Cavanaugh, 1997); it simple and safe, allowing for the revisiting of data (Woodrum, 1984); it has the ability to generalize and replicate the study (Krippendorff, 2004); and it is unobtrusive (Kerlinger, 1986). Among the benefits of using content analysis is its flexibility (Harwood & Garry, 2003), however, this attribute can be considered a hindrance considering that there is no right or wrong way to analyze text. Limitations associated with content analysis include: its inability to test causal relationships between variables (Chadwick, Bahar & Albrecht, 1984); questions about the reliability and validity of research using this method (Krippendorff, 2004); and semantic differences as it relates to the meaning of words worsens the validity and reliability (Berelson, 1952). In addition, inferences made by the researcher may not be interpreted in the way the creator meant (Krippendorff, 2004); and it is uncertain whether content analysis accounts for the context in which the coded word/phrase was used (Berelson, 1952 and Krippendorff, 1989). Given the objectivity of the method, content analysis allows for generalization (Krippendorff, 2004) thereby combatting the potential weakness of the single instrumental case study. In the context of this research, content analysis is used primarily in a quantitative manner. Using content analysis within a case study builds upon the detailed analysis of the case study. Content analysis provides statistical data that supports the conclusions made and facilitates generalization by other researchers within the area of public participation in natural resource management.

4.4.2 Document Analysis

In its simplest form, document analysis is the gathering of facts from a document related to the area of research (Caulley, 1983). Document analysis is “a systematic procedure for reviewing or evaluating document – both printed and electronic...material” (Bowen, 2009, p. 27). In document analysis, data is examined and inferences made to give meaning and facilitate greater understanding of the data (Rapley, 2007). The inference allows for the documents to be evaluated in accordance with the research questions.

The majority of the sources of information, data and ideas in policy research fall into two main categories: documents and people (Bardach, 2015). Case study researchers usually gather information from existing documents in order to reinforce the results obtained from other methods in relation to the answering of research questions (Caulley, 1983). The triangulation of the data lends some credibility to the study. These documents can include those obtained from internet sources, public and private records, physical evidence and through other methods used by the researcher (Caulley, 1983). Private records may include any document created by an individual that gives insight into one’s beliefs and attitudes, such as personal letters, while public records are documents which reflect an individual’s beliefs, behaviours and attitudes (Caulley, 1983). Though document analysis is primarily used in coordination with another method such as observation or interviews, it can also be used as a method on its own (Bowen, 2009).

Bowen (2009) outlines five specific functions of documents in a research project. These are to provide: background data on the context; questions that need to be asked and answered within the research; necessary supplementary research data; means of tracking change and development; and a way of verifying findings through the analysis of the document (Bowen, 2009, p. 29-30). In analyzing documents for their respective usage, a three-stage process is usually adapted: scanning through the document; reading the document thoroughly; and interpreting the document (Bowen, 2009).

There are a number of strengths associated with document analysis: it does not require the collection of new data, but instead can use existing data thereby saving on time and costs; information obtained from documents are oftentimes more credible than those obtained from other techniques, such as observation; it may be the only avenue to obtain certain information; it is convenient; it is an efficient method of collecting data; it is inexpensive; it is non-reactive; and the process is iterative allowing for documents to be continually added and fed into the analytic technique (Caulley, 1983, p. 20-21).

Despite these strengths, document analysis has limitations. These include: documents not having enough details as they were prepared without reference to the current research agenda; access to some documents may be limited; and the research runs the risk of being selectively biased based on an incomplete collection of documents (Bowen, 2009, p. 31-32). Document analysis, however, possesses the necessary properties, as a research method, required by this study. The data set for the study consists entirely of secondary textual data and document analysis is a non-reactive technique that allows iteration which

is necessary in this research. With this method, examples and quotes can be taken from the text to support the statistical information obtained through content analysis.

Content analysis and document analysis each have their respective advantages and challenges as with any method but can be useful in conducting the in-depth research that is necessary in this study. For the purposes of this research, content analysis is used to provide quantitative measures in collecting and analyzing the data while document analysis covers the qualitative aspect. Berelson (1952), Holsti (1969), Krippendorff (2004), Weber (1990), and Kerlinger, (1986) all agree that content analysis possesses the three basic properties of a quantitative method by virtue of its objectivity, its systematic nature and its facilitation of inferences. On the other hand, document analysis is qualitative and is based mainly on the interpretation of the documents by the researcher. The use of these methods in tandem provides both the numbers required in coding and understanding the data as well as facilitating in-depth analysis of the phenomenon present in the deliberations occurring in Western Newfoundland. The use of both content analysis and document analysis also lends credibility to the study as together they provide information on the range of areas of concern and the number of submissions that highlighted each concern.

4.5 Coding

General themes emerged while scanning the submissions during the compilation process. Pre-defined words and phrases have been generated based on the Panel's scope of research using the fourteen topics on which the Panel sought input from the public (see Figure 4.1). The pre-defined words and phrases provide the groundwork for analyzing the submissions. Henceforth, these words and phrases are referred to as codes (see Figure 4.2) and the submissions made by the public are referred to as documents. Coding is an analytic technique through which "data are fractured, conceptualized, and integrated to form theory" (Strauss & Corbin, 1998, p. 3). The method of open coding has been applied; this involves identifying themes through reviewing the documents and extracting examples from the text (Ryan & Bernard, 2000). Coding facilitates the emergence of manageable themes from a large volume of raw data (Neuman, 2014). The headings used in the refinement of the coding process are shown in Appendix B.

The occurrences of codes in the documents have been located using NVivo 11 qualitative research software as the search engine tool. However, NVivo does not possess analysis capabilities and as such, it was only used to code the raw data using what the software calls 'nodes.' The documents were analyzed using Singleton & Straits' three step process: "organizing information and identifying patterns; developing ideas; and drawing and verifying conclusions" (1999, p. 350). Statistical analysis was done on the number of documents which cited each code as an area of concern.

Figure 4.1 – Scope of Review by the NLHFRP

Scope of Research	Topic	Description
Protecting and Monitoring Water Quality	Potential Impacts on Groundwater	Short and long-term risks to groundwater and water wells
	Potential Impacts on Surface Water	Volume of water required and potential impact on users of this source
Protecting Communities and the Environment	Impacts on Land	Risk for soil contamination from site development and from handling of additives
	Waste Management	Treatment of fracking fluids during and after usage including storage
	Management of Additives	The types of additives used in fracking and treatment of additives during and after usage
	Wellbore Integrity	Regulation to ensure wells are drilled, stimulated, suspended and abandoned in a manner that assures wellbore integrity
	Seismic and Geological Risks	Geological risk associated with fracking operations, including induced seismicity
	Regulatory Oversight and Responsibility	Regulations governing the approval process and design of hydraulic fracturing operations, including the chemicals used
	Site Restoration	Includes well-decommissioning, removal of infrastructure, and soil remediation
	Financial Security and Insurance	The types of activities that should be covered by insurance and long-term costs of environmental risks
	Air Emissions	Risks to air quality; includes monitoring emissions and setting emission limits
	Public Safety and Emergency Planning	Risks to public safety and associated emergency response planning
	Community Engagement	Involve communities throughout the life cycle of the project, from exploration to abandonment
Socio-Economic Impacts	Potential socio-economic impact from unconventional petroleum development	

Source: NLHFRP (2015c)

Figure 4.2 - Codes

Impact
Groundwater
Drinking Water
Surface Water
Regulations
Community
Environment
Land
Soil
Contaminate
Storage
Waste
Additives
Risk
Fluid
Wellbore Integrity
Seismic/ Earthquake
Geological
Site Restoration
Insurance

Financial Security
Air Emission/ Pollution
GHG Emissions
Public Safety
Emergency
Community Engagement/ Participation
Panel Composition
Employment
Infrastructure
Economic impact
Social Impact

Statistical measures were used to ascertain the number of documents which support, oppose or remain undecided on the use of hydraulic fracturing as an oil and gas exploration tool in Western NL.

In terms of the steps involved, firstly, the documents are located and compiled and then a system is created to record aspects of the content (Neuman, 2014). The created system encompasses identifying the themes and noting the number of times each theme occurs. The amount of times the theme arises, within the contents of the documents, is tabulated and recorded for further analysis. Snippets of some documents are recorded to provide perspectives on some statements. The direction of each document, whether its content supports, opposes or is undecided on the topic of exploration for oil and gas using hydraulic fracturing was also measured. In achieving the purpose of the research, which is to ascertain whether the concerns raised by the public were considered by the Panel as measured through reflection in its recommendations, the identified themes are then sought within the context of the Panel's published report. A coding procedure and codebook were then created with the information from the analyzed data. Coding procedure is a set of rules used for "assigning numbers to specific variable attributes, usually in preparation for statistical analysis and carefully recorded in a codebook" (Neuman, 2014, p. 394). The codebook is a document that "describes the procedure for coding variables and their location in a format that computers can use" (Neuman, 2014, p. 394). The presence, or lack thereof, of each theme and how the theme is addressed in the report will provide the basis for conclusions to be made on whether the Panel

considered the submitted documents and addressed the concerns made by citizens, businesses and other organizations.

In some documents, the writer's stance is not explicitly stated and the researcher's interpretation of the document is used as the tool in categorizing such documents. In the event that the researcher is unable to infer the author's stance based on the material provided, the document is classified as not applicable (N/A) in the respective class of analysis. For example, in instances where the author of a document simply said 'no' or 'no fracking,' they were classified as asking for an outright ban and would be placed in the opposing category. Persons who said 'no, pending further research' were classified as 'undecided' and were considered sway voters given the uncertainty of their position at the time of authoring the document. A scale was subsequently created to track the conditions presented by the submissions requesting further research. In reviewing the documents, it was noted that there were a number of submissions that were verbatim, but signed with different names. In these cases, it is believed that the documents came from one organization and were signed by each of its members.

Understanding speech acts also assisted in the coding and classification of the submissions. A speech act is "really the performance of several acts at once, distinguished by distinct aspects of the speaker's intention: there is the act of saying something, what one does in saying it, such as requesting or promising, and how one is trying to affect one's audience" (Bach, 1998, p. 81). Speech acts can be broken down into

three dimensions: the locutionary act, the illocutionary act, and the perlocutionary act (Austin, 1965). A locutionary act is “uttering a certain sentence with a certain sense and reference”; an illocutionary act is “utterances which have a certain (conventional) force” such as informing, warning or ordering; and perlocutionary acts are “what we bring about or achieve *by* saying something, such as convincing, (and) persuading” (Austin, 1965, p. 108). Bach (2006, p. 150) simplifies Austin’s (1965) three levels of action as “the act of saying something, what one does *in* saying it, and what one does *by* saying it” represent the locutionary, illocutionary and perlocutionary acts respectively.

In coding by virtue of the specific speech act, it was determined whether the author was merely reporting facts; eliciting a warning of some kind; and/ or hoping for a given outcome in keeping with the three types of speech acts. Each of these types of speech acts are present in the documents; some authors gave reports of the impacts of fracking in other geographical areas while others warned of the ‘dangers’ associated with hydraulic fracturing; and invariably, all hoped for their personal viewpoint to be the prevailing stance in the end. Speech acts also support content analysis given the method’s use of language characteristics and contextual meanings. The use of speech acts in the study is necessary because of this characteristic and its ability to aid in coding.

Chapter 5: Data Analysis/ Discussion – Stakeholder Responses to Proposed Hydraulic Fracturing in Western Newfoundland

5.1 Introduction

Local anti-fracking groups in Newfoundland are concerned with issues of future human and environmental health, water contamination, community disempowerment and the industrialization of rural landscapes. Environmental risks have been attributed to the technique used in drilling for gas (deRijke, 2013). These include pollution and seismic activity which occur in and around areas where hydraulic fracturing has occurred (deRijke, 2013). The concerns of residents are further boosted by research published on fracking activities in the United States and provinces in Canada such as Alberta and British Columbia. For example, unconventional oil and gas development in the Appalachian Basin showed the inadequacies of their regulatory framework (Kargbo, Wilhelm, & Campbell, 2010). The Appalachian Basin is home to the Marcellus shale which “underlies a large portion of Pennsylvania, east of West Virginia, and parts of New York, Ohio, and Maryland” and represents the largest expanse of shale in play in the US (Kargbo, Wilhelm, & Campbell, 2010, p. 1). The regulatory framework governing drinking water in the US, the Safe Drinking Water Act, omits the regulation of hydraulic fracturing resulting in oil and gas companies being able to keep their additives and formulae confidential (Kargbo, Wilhelm, & Campbell, 2010). The lack of disclosure also impacts the disposal and treatment of the wastewater (Kargbo, Wilhelm, & Campbell,

2010). Other environmental risks that exist include impacts of GHG emissions from methane leakage (Jiang, et al., 2011); air pollution (Beaver, 2014); land use; wastewater disposal and water availability and contamination (Mauter, Palmer, Tang, & Behrer, 2013). The state of New York has effectively banned hydraulic fracturing, a ban which has been upheld by the New York State Supreme Court on many occasions (Efstathiou & Dolmetsch, 2012) whereas cities such as Fort Worth and Southlake in Texas have made no attempt to ban the development of unconventional gas extraction, but have instead required that it has less impact on human health and the environment (Clark, Burnham, Harto, & Horner, 2012).

While there is much debate about the environmental concerns related to fracking, the real and perceived economic benefits have been highlighted as fracking is considered a potential source of cheaper and cleaner-burning energy compared to the alternative sources such as crude oil and coal (deRijke, 2013). According to KPMG (2011, p. 2) “Shale gas has the potential to turn the world’s energy industry on its head. It’s abundant. It’s cheap. It burns cleaner than fossil fuels. And it’s being found almost everywhere.” The development of the unconventional shale gas is, however, linked to adverse environmental effects including impacts to climate change (Schrag, 2012), air and water quality, seismic activity and local communities (Clark, Burnham, Harto, & Horner, 2012). In the United States, the safety of the practices associated with fracking has been called into question resulting in the publication of the report ‘Our Drinking Water at Risk: What EPA and the Oil and Gas Industry Don’t want us to know about Hydraulic

Fracturing’, which outlines the inadequacies of government evaluations pursuant to the United States’ Environment Protection Act (Sumi, 2005). The paper also calls for tighter regulations and compliance under the Safe Drinking Water Act (Sumi, 2005).

The qualitative software, NVivo 11, was used in the initial stages to aid in coding the raw data. Data obtained using NVivo was used as the framework to conduct the content analysis. Content analysis was used to place the data into a format that allowed for quantitative inferences. Content analysis allowed the researcher to infer information such as the number of participants who cited each concern and subsequently the ranking of this information in ascending order. Using the information obtained through content analysis, some submissions underwent more detailed scrutiny using the method of document analysis. This provided the quotations obtained to substantiate each claim made in the discussion. Document analysis was also used in the analysis of the Panel’s report and facilitated the gathering of the Panel’s recommendations as they relate to each concern raised by the participants.

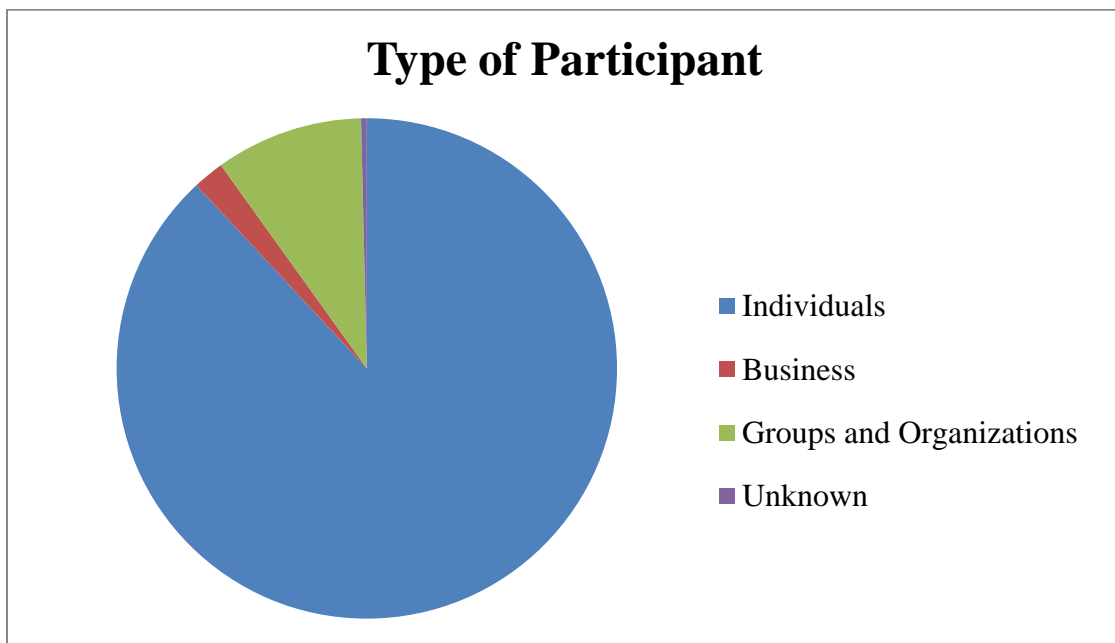
In summarizing the submissions, the NL Panel utilized the services of geographer Keith Storey (Gosine, Dusseault, Gagnon, Keough, & Locke, 2016)¹. Submissions considered were those received as of July 23, 2015 and included four hundred and eighty-eight submissions from individuals, thirty-eight submissions from community organizations, and four submissions from private companies (Panel, 2016).

¹ Henceforth, ‘Panel’ will be used to denote the authors of the report, Gosine, Dusseault, Gagnon, Keough, & Locke

5.2 Findings

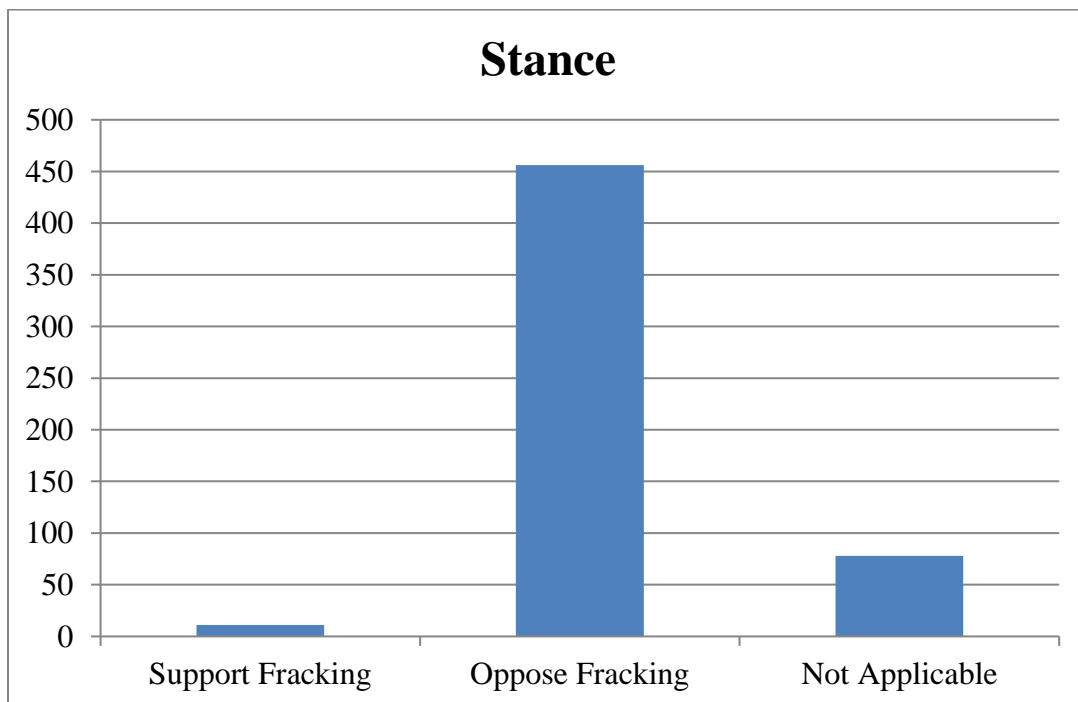
A total of 545 submissions were reviewed for this research. The documents are publicly available and may be viewed at <http://nlhfrp.ca/wp-content/uploads/2016/06/NLHFRP-Master-List-May-16-v5.pdf>. The submissions are authored by individuals, businesses, community organizations and groups. Of the total submissions, eighty-eight percent were from individuals, ten percent were from groups and organizations and two percent represented businesses (see Figure 5.1).

Figure 5.1 – Type of Participant



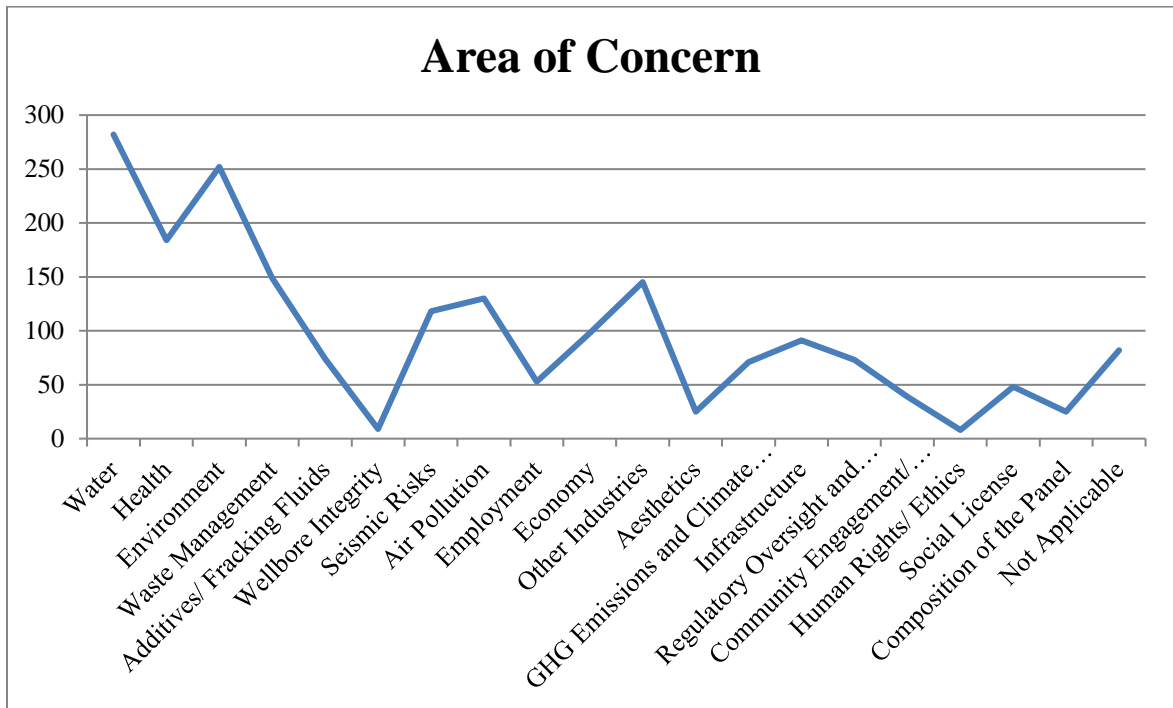
There was overwhelming opposition to the proposed use of hydraulic fracturing in oil and gas exploration in the province of Newfoundland and Labrador. A total of eleven submissions supported fracking while four hundred and fifty-six submissions were against it. Of the eleven submissions in support of hydraulic fracturing, eight were from individuals, one from a business owner in the west coast of the island, and two were from organizations in Corner Brook. Seventy-eight of the submissions neither supported nor opposed the venture (see Figure 5.2). Of those seventy-eight submissions, the participants either requested that the Panel complete their mandate while exercising fairness or their stance could not be determined.

Figure 5.2 – Stance



A total of twenty areas of concern emerged during the review process. These topics represent the environmental, socio-economic and regulatory aspects of fracking as perceived by the participants as well as concerns raised about the consultation efforts and the composition of the Panel (see Figure 5.3).

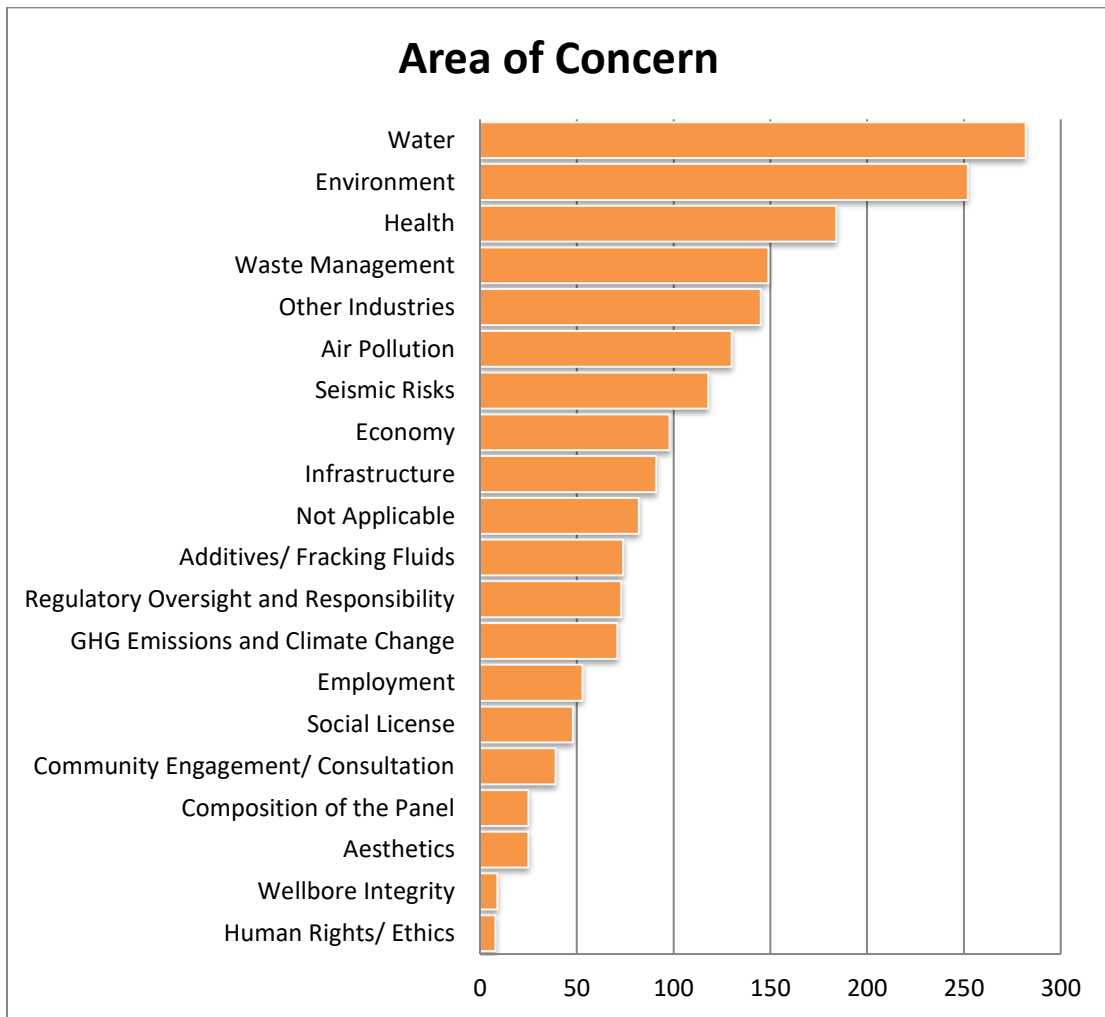
Figure 5.3 – Area of Concern



Water represents the main cause of concern followed by the environment and health. Water concerns in the submissions collectively included contamination to groundwater, surface water, and/ or drinking water; water quality and water quantity. The

least three areas of concern are aesthetics, wellbore integrity, and human rights (see Figure 5.4).

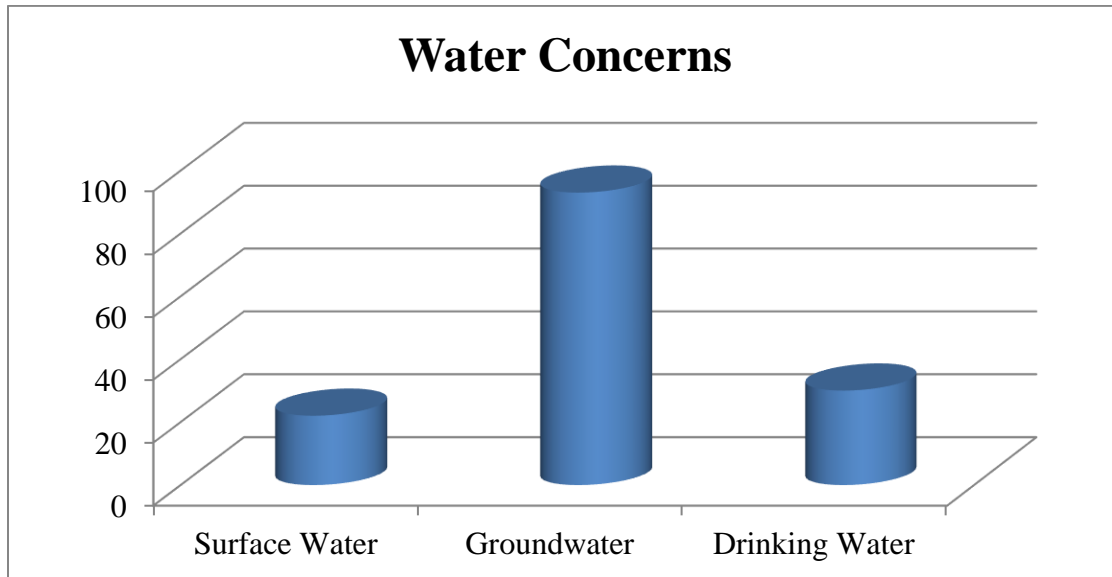
Figure 5.4 – Area of Concern in Descending Order



5.2.1 Water

The management of water resources in the hydraulic fracturing process was the main concern for participants. Issues ranged from the volume of water needed in the process to the life forms that may be affected by contaminated water. Water quality and contamination were the key issues with the impact on the ocean and ocean life mentioned in passing. Of the 282 participants who cited water as an area of concern, 145 referred to: surface water, groundwater, or drinking water. Twenty-two participants were concerned about surface water, ninety-three participants indicated groundwater and thirty mentioned drinking water (see Figure 5.5).

Figure 5.5 – Water Concerns



Water bodies in and around drilling sites may be contaminated through spills, leaks, the disposal of inadequately treated shale gas wastewater, the accumulation of

toxic and radioactive elements in soil or stream sediments or with fugitive hydrocarbon gases (stray gas contamination) (Vengosh, Jackson, Warner, Darrah, & Kondash, 2014).

An example of an excerpt covering all three concerns can be seen below:

“In addition to the serious risks to public health and environmental safety ... there remain other pathways for surface and ground water contamination as a result of the hydraulic fracturing process. We wish to urge the panel that the precautionary approach must prevail when contamination could impact drinking water sources or important wildlife habitat” (Western Environment Centre, n.d., pp. 5-6).

J. Weir is concerned about the impact of hydraulic fracturing operations on surface water and cited the following:

“In Pavillion, Wyoming residents were informed by EPA in 2009 that many drinking water wells were contaminated by toxics often used in hydraulic fracturing fluids. For nearly a decade Pavillion residents had complained about miscarriages, rare cancers, and central nervous system disorders including seizures. EPA confirmed the presence of 2-butoxyethanol, a known constituent in HF fluid, in three wells (Earthworks, 2009)” (Weir, n.d., p. 1).

Water represents a broad concern as it can include the amount of water used in the hydraulic fracturing process, water contamination, and water quality and can impact surface, ground and/or drinking water. The Panel’s report cited Gagnon & Anderson (2015) in describing the overall quality of drinking water in the Port au Port area as ‘low

quality’ (Panel, 2016). However, the Panel admitted that data on water quality data is extremely limited and “there is a need to understand present day conditions to ensure that an industrial process, such as unconventional oil and gas development, does not result in further deterioration of the quality of the groundwater system” (Panel, 2016, p. 127). The Panel recommended baseline testing and modeling of current water resources and the implementation of “ongoing regular testing and public reporting of groundwater and surface water resources in areas associated with hydraulic fracturing operations” (Panel, 2016, p. 127).

The Panel advised that it is necessary to implement a wastewater management plan that requires “samples of hydraulic fracturing fluids, flowback, and produced water to be analyzed regularly by the regulator to ensure compliance with the approved plan (Panel, 2016, p. 127). Also needed are mitigation strategies to deal with the treatment and disposal of wastewater in such a manner that bodies of water are not exposed to harmful substances (Panel, 2016).

5.2.2 Health

Health concerns rank third on the list of concerns held by individuals, businesses and organizations with a total of one hundred and eighty-four mentions. Two submissions mention that the population of the area to be most impacted along the west coast consists of an aging population, as is the case province-wide (see Figure 5.6). Hoskins (n.d.), a participant, advised that “while there is not an overabundance of children in the

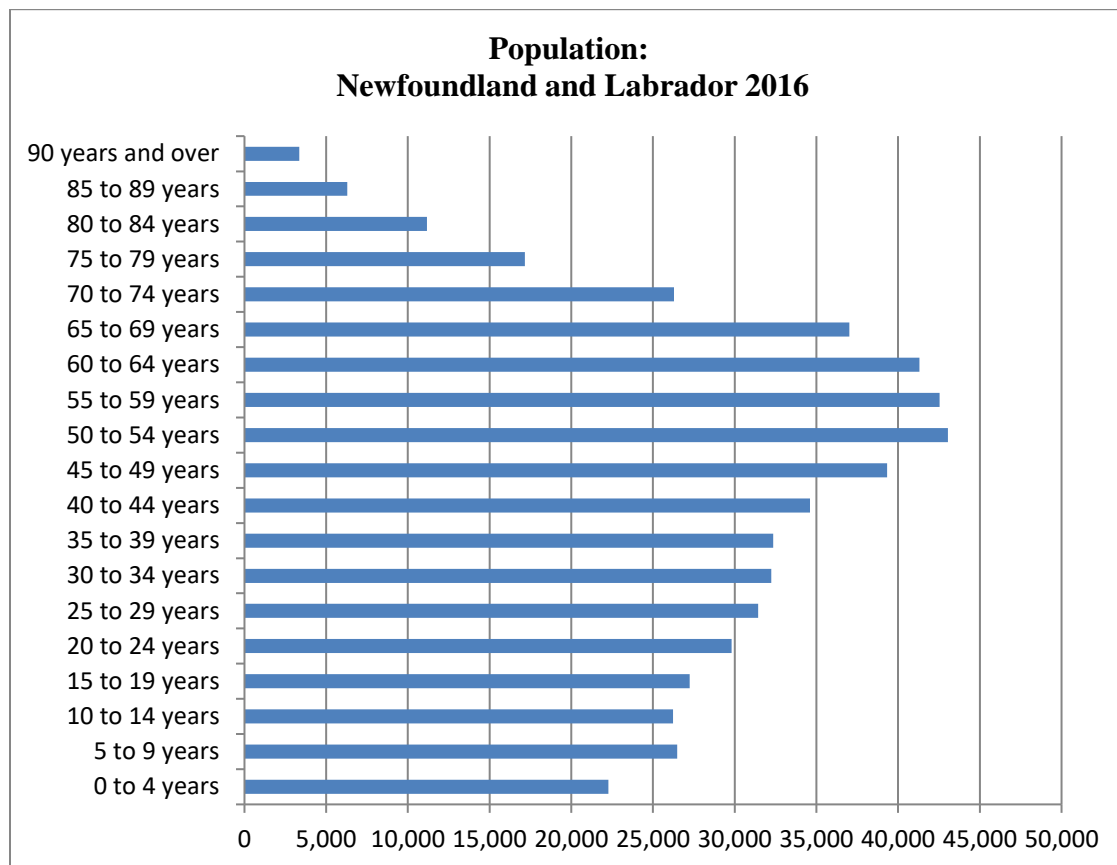
community, there are many seniors and we should be protecting their health, not adding risk factors to it” (Hoskins, n.d., p. 2). K. Hoskins, who resides in Boswarlos, NL, also noted that there “are several members of this community with lung disease” (Hoskins, n.d., p. 2). M. Joyce, a participant and a resident of Lark Harbour, agreed and stated that “we have an older generation in our community with many health issues such as breathing problems (COPD), heart problems, Cancer, and so on (Joyce, n.d., p. 1).

Eighteen participants referenced cancer as an area of concern for them. Of that amount, three participants hinted at a perceived high rate of cancer among persons living on the communities on the west coast of Newfoundland. One participant noted that their father, now deceased, mother and only sibling have all been diagnosed with cancer (Cochrane, n.d.). The participant further went on to state that “cancer rates on the west coast of Newfoundland are staggering. My sister’s doctor told her that many of her cases come from the west coast” (Cochrane, n.d., p. 1). Another participant, L. Alexander, stated that:

“I feel that fracking in this area is would be unsafe considering the geology of the area. We have enough chemicals left over from the Americans in our soil which has increased the numbers of people with cancer in this area” (Alexander, n.d., p. 1).

Though there is limited information on the effects of hydraulic fracturing on human health, the possibility simply cannot be ignored as many illnesses, such as cancer, may develop years after exposure (Finkel & Hays, 2013).

Figure 5.6 – Population by Age in Newfoundland and Labrador



Source: Author’s Construct

Source of Data: (Government of Newfoundland and Labrador, 2016)

A. Pittman, a health-care professional, spoke on how the environment in and of itself can impact one’s health and of the chemicals used in the fracking process which have been linked to adverse health effects. These health implications “can cause further strain on an already over-burdened health care system” (Pittman, 2015, p. 1). This point was reiterated by the West Coast Health Care Action Committee which stated, “We have

to ask ourselves if the benefits as in the few jobs will be worth the health risk which will put more strain on our hospital and clinics which already are experiencing shortage of Doctors and medical staff” (West Coast Health Care Action Committee, n.d., p. 1).

One of the concerns of the Qalipu Mi’Kmaq First Nation Band is the impact of hydraulic fracturing on the children’s health in a holistic sense. The concern raised is “the impact on the children who would be growing up in close proximity to such an industrial site and the effect it will have on them and future generations, whether it be sociologically, psychologically, physically and/or medically” (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016, p. 3).

The Panel recommended a complete Health Impact Assessment for western Newfoundland (Panel, 2016). Health Impact Assessment (HIA) is defined as “a means of evidence based policy making for improvement in health. It is a combination of methods whose aim is to assess the health consequences to a population of a policy, project, or programme that does not necessarily have health as its primary objective” (Lock, 2000, p. 1395). The HIA should be completed on any potential unconventional oil and gas development, including hydraulic fracturing (Panel, 2016). The Panel provided the following guidelines as a part of their recommendation:

“The assessment should be for the local region involved in a potential development and must involve representatives of local residents, industry, and Government, together with appropriate experts. Government should provide

financially for the assessment and provide access to content experts, but it should not perform or lead the assessment” (Panel, 2016, p. 133).

To monitor the risks of hydraulic fracturing activities on health, the Panel suggested that baseline data be gathered and a real-time monitoring system implemented (Panel, 2016). This would allow the continuous measurement of toxicants released into the environment (Panel, 2016). Interpretation of the data will have to be conducted to determine the effect of the toxicants on human health (Panel, 2016). The Panel also recommended that health professionals be given access to all fluids and chemicals used or produced during the process of hydraulic fracturing (Panel, 2016). To ensure compliance by industry players, this should be added as a condition of the licensing agreement (Panel, 2016).

The development of the unconventional oil and gas industry in western Newfoundland requires the ability to respond to potential health impacts, according to the Panel (Panel, 2016). To accomplish this feat, the current healthcare and social services systems must be evaluated to identify and improve upon any shortcomings (Panel, 2016). The aim is to ensure there are resources and/or services available to meet the increased demands on these systems as a result of oil and gas operations (Panel, 2016). This includes providing training and support for “first responders and health professional to enable them to recognize and treat conditions that might arise through environmental contamination during development” (Panel, 2016, p. 137).

5.2.3 Environment

The environment ranked as the second highest area of concern among participants. Other areas of concern listed are ranked as environmental concerns along with references made to the soil, ocean and wildlife. The submissions show that there is a wide belief that we are mere stewards of this earth, as per the local Mi’Kmaq culture, and that we are borrowing it from the future generations. As such, as inhabitants of the earth, we are expected to leave the earth in a better condition than we received it.

For Qalipu Mi’Kmaq First Nation Band (QMFN), the environment ranks high on the list of concerns. The Band stated:

“The environment is paramount in the list of concerns for us. Contrary to some western ideologies, we are a part of (not separate from) the environment and it is a part of us as a people, in our lifestyles and our culture. The preservation of our lifestyle, culture, and hence environment is of utmost importance” (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016, pp. 2-3).

In addressing the environment and land impacts, the Panel quoted the Council of Canadian Academies (CCA): “land impacts may include deforestation, the destruction and fragmentation of wildlife habitat, and adverse effects on existing land use such as agriculture and tourism (CCA, 2014)” (Panel, 2016, p. 128). To effectively monitor risks to the environment, the Panel recommends baseline and continuous testing of “ecological species populations and their health...in the vicinity of anticipated hydraulic fracturing

operations (Panel, 2016, p. 128). For the development, management and decommissioning of hydraulic fracturing operating sites, the Panel suggests the development and implementation of best practices. To this end, industry would be required to “employ standards, certification processes, and best practices for the development, management, and decommissioning of all sites and infrastructure associated with unconventional oil and gas development” (Panel, 2016, p. 128).

5.2.4 Waste Management and Additives

One hundred and forty-nine submissions indicated waste management is an area of concern while seventy participants were concerned with the additives. A high volume of water is required for the hydraulic fracturing process. Additives are added to the water during the process and thus become wastewater in the end as it is unsafe for human consumption. Many submissions referenced the lack of disposal sites in the area for the volume of wastewater that will be generated. Some participants used the example of the wastewater in Nova Scotia that is sitting in a well with no plans for proper disposal. Other issues associated with wastewater tie into infrastructure and possible water contamination as this water would have to be trucked from the drilling area to the disposal site. For example, the Western Environment Centre noted the following:

“Newfoundland’s dispersed and isolated geography within the province and its distant removal from the mainland may necessitate the trucking and/or shipping of waste materials over large distances. This is a very worrisome prospect as it would not only increase truck traffic and the associated negative impacts on

communities and infrastructure, but it would add another pathway of possible contamination and increase the extent and probability of contamination risk” (Western Environment Centre, n.d., p. 4).

The report produced by the Nova Scotia Independent Panel on Hydraulic Fracturing, more commonly known as the Wheeler Report, noted that current municipal wastewater treatment plants do not have the capacity to manage the hazardous waste from fracking operations (Wheeler, et al., 2014). This sentiment was echoed by eight participants who felt that the current system is already inadequate and the situation would only worsen if oil and gas explorations were to occur. C. Davignon, an individual participant, pointed out that the “wastewater requires specialized treatment and decontamination. It is unclear whether any facility capable of treating large volumes of flow back fluid and produced water exists on the island of Newfoundland” (Davignon, n.d., p. 1). Another individual participant, P. McCarthy, voiced concerns about wastewater disposal and specified that “no treatment facility in NL could handle” the amount nor toxicity of water (McCarthy, n.d., p. 1).

The Panel concluded that public disclosure of fluids used in the hydraulic fracturing process is crucial for any future development in this field (Panel, 2016). As such, the Panel recommends that there be “full disclosure to the regulator of additives and concentrations of hydraulic fracturing fluids as part of an approved plan to hydraulically fracture a well; to handle, treat, and dispose of flowback and produced water; and to

manage and mitigate the impacts of any spills. Any deviations from an approved plan should require prior approval by the regulator” (Panel, 2016, p. 130).

5.2.5 Wellbore Integrity

Wellbore integrity was cited as an area of concern in a total of nine submissions. The walls of wells are primarily made of concrete which does not hold up indefinitely and can result in the contamination of groundwater sources (Vengosh, Jackson, Warner, Darrah, & Kondash, 2014). One example of the failure of a cement-encased well is the BP Deepwater Horizon spill where the cement failed to secure the hydrocarbons within the confines of the well (Vengosh, Jackson, Warner, Darrah, & Kondash, 2014). For the Western Environment Centre (WEC), “(f)ailures of well bore integrity are one of the obvious concerns of hydraulic fracturing” (Western Environment Centre, n.d., p. 6).

Wells are used in areas other than in the unconventional oil and gas industry (Panel, 2016). As such, the Panel recommended that the province invest in research in this area. The Panel stated that:

“the province should actively participate in regional, national, and international research efforts to increase long-term well integrity through advances in well construction, monitoring, and remediation techniques and technologies” (Panel, 2016, p. 151).

Additionally, the Panel recommended that groundwater monitoring wells be placed at each well pad before the start of any oil and gas development (Panel, 2016).

The Panel recommended that the development of a well integrity program as well as an abandoned well program to ensure that wells are properly developed, maintained and decommissioned (Panel, 2016). This includes ensuring that there is adequate “financial capacity to cover future costs associated with regular monitoring and remediating of any wells that encounter integrity issues post-abandonment, including the need to remediate wells into perpetuity” (Panel, 2016, p. 146). This financial capacity would come in the form of a security deposit from industry players to ensure the ability to act swiftly in the event of any issues (Panel, 2016).

5.2.6 Seismic Risks

One hundred and eighteen submissions cited seismic activity as an area of concern. Earthquakes occurring around shale activity in US have been linked to hydraulic fracturing. Human activity is capable of inducing earthquakes. However, although there is little scientific evidence to prove a direct correlation between hydraulic fracturing and increased seismic activity, many participants fear that hydraulic fracturing within their community will result in earthquakes. This is further fueled by the shale rock formation present at Shoal Point. One submission referenced a report which was commissioned by NL’s Ministry of Natural Resources. The point highlighted by the submission states that:

“there is currently no way to reliably and accurately depict or predict the extent, location, rock characteristics, or shape of Green Point shale layers below the surface. It is therefore, not feasible to present a model for unconventional shale gas/oil exploration in the area” (Hinchey, Knight, Kilfoil, & Hicks, 2015, p. 166).

The Panel suggested extensive research to address the risk of seismic activity, led by the provincial government's Department of Natural Resources and Nalcor Energy (Panel, 2016). This research should provide a model of the Green Point shale formation as well as provide an assessment on the risks of disposing wastewater in Class II disposal wells (Panel, 2016). Furthermore, the Panel suggested enhanced seismographic network coverage in western Newfoundland to "improve monitoring capabilities for baseline seismicity" (Panel, 2016, p. 116). The data obtained from the enhanced network should be collected over a minimum of a two-year span and subsequently analyzed (Panel, 2016).

Upon completion of the research on seismic risks and the analysis of the baseline data, the Panel recommended a pilot stimulation program (Panel, 2016). By this time, there would be increased knowledge and understanding of the shale formation and western Newfoundland (Panel, 2016). This program would be a 'minimal risk, pilot-scale well stimulation' aimed at understanding "how the Green Point shale responds to stimulation and to further understand the associated risks" (Panel, 2016, p. 117).

5.2.7 Air Pollution, Green House Gas Emissions and Climate Change

The risk of air pollution is noted in one hundred and eighteen submissions while the impact of greenhouse gas emissions on climate change is referenced in seventy-one submissions. More persons were concerned with the overall quality of the air they would inhale day-to-day than were concerned about global warming. Methane flare pipes, diesel

truck exhaust and emissions from wastewater evaporation are cited as major concerns in the submissions for both air pollution and Green House Gas (GHG) emissions.

Some submissions expressed grave displeasure that climate change was not mentioned as in the terms of reference for the Panel. One submission from an individual participant cited the chair of the Panel, Ray Gosine, as stating that “climate change was outside the scope of the panel’s consideration, that it was ‘not what the panel was about’” (Steeves, 2015, p. 1). Steeves (2015) went on to voice his disapproval of the statement. The impact of climate change is evident as “countries around the world (are) feeling the worst effects of climate change in the form of extreme weather—more droughts, hurricanes, floods, heat waves—ocean acidification, and rising sea levels, not to mention the devastating impacts on northern communities, including aboriginal communities of Labrador” (Steeves, 2015, p. 1). In light of this, Steeves (2015) expects that these sorts of deliberations should include “the most pressing existential crisis of our time” (Steeves, 2015, p. 1).

To mitigate risks to air quality, the Panel recommended the following: baseline testing of air quality; modelling potential air quality effects; and regularly testing and reporting of air quality measurements (Panel, 2016). The baseline testing in the immediate vicinity of the proposed fracking site will provide data on air quality levels before the commencement of fracking operations. Modeling potential air quality effects includes the development of “air dispersion modeling techniques to understand and

predict the movement of air pollutants in the atmosphere most affected by hydraulic fracturing in Western Newfoundland” (Panel, 2016, p. 126). Continuous interval testing should be conducted in order to monitor any variances that may occur in the level of pollutants in and around the fracking site (Panel, 2016).

The Panel recommendation (PR) addressing GHG emissions (PR 4&5) involves evaluating GHG emissions associated with unconventional oil and gas development and requiring industry to follow best practices in controlling the levels of GHG emissions (Panel, 2016). In this regard, the Panel proposes the engagement of “the Office of Climate Change and Energy Efficiency to undertake a complete well-through-use assessment of the GHG emissions associated with a representative unconventional oil and gas development in Western Newfoundland” (Panel, 2016, p. 113). These results would then be compared to the province’s GHG emissions objectives to see the standings (Panel, 2016). Establishing best practices in mitigating GHG emissions may include “using ‘cleaner’ fuel sources for vehicles and equipment, utilizing Reduced Emission Completions (RECs) or ‘green completion’ techniques to capture produced gas during well completion, minimizing fugitive emissions associated with leaking wells, and prohibiting venting and flaring of gas associated with oil production or with the storage of chemicals or products” (Panel, 2016, p. 113).

5.2.8 Economic Impact and Employment

Of note is that a number of individuals and community organizations have questioned the economic impact of fracking. Of the submissions that cited the economy as an area of concern, they all referred to the cost of producing a barrel of oil which was greater than the selling price of each barrel at the time of the submissions. Armed with past experiences, unstable oil prices that are generally trending downward and past layoffs in other jurisdictions, such as in Alberta, many participants were skeptical about possible positive economic impacts from oil and gas exploration in the province of Newfoundland and Labrador. A letter from the Town of Kippens, located east of Stephenville on the West Coast of Newfoundland, cited past experiences with the closure of a mainstay business in the community:

“In 2005 this region suffered through a major economic loss with the closure of Abitibi Consolidated². This led to a cascade of small business closures and in turn the loss of many direct as well as spinoff jobs. This area always seems to bounce back but it is possibly attributable to the industrious hard-working nature of the people who live here. The fishery, tourism, hospitality, French ancestry, aboriginal roots and numerous small businesses have managed to pull us through some challenging hardships” (Cormier, 2015, pp. 3-4).

² Abitibi-Consolidated was a pulp and paper company based out of Montreal, Quebec with long-term operations on the island of Newfoundland.

The Panel mentioned that lessons learnt from the island's previous experience with the offshore oil and gas industry gives a platform for identifying measures which need to be implemented (Panel, 2016).

Adverse impacts on other industries as a result of oil and gas exploration may leave the province dependent on the oil industry. This concern is evident in the submissions as it is perceived that this dependence is dangerous to the members of the community and the economy of province itself. Communities that rely on the development of natural resources are vulnerable to population and economic changes that occur throughout the development process (Brown, Dorins, & Krannich, 2005). This point was highlighted in twelve percent of the submissions in regards to the province's economy as well as the impact on other industries. For example, Divest MUN, a university-based economic justice group, had this to say:

“Economies overly dependent upon the fossil fuel industry also carry the risk of being adversely affected by fluctuations in prices elsewhere, a fact which has become particularly apparent in Newfoundland and Labrador over the past several months as a result of the collapse of the price of oil” (Divest MUN, 2015, p. 2).

It is also widely believed that the promise of jobs is just that, a mere promise. Many participants who cited economy, employment and/or impacts on other industries as an area of concern believe that the oil companies already have the specialized workers needed in their employ. As such, options for employment of local residents are expected

to be temporary low-paying jobs on an as needed basis. Divest MUN made mention of this in their submission: “The majority of the jobs created by hydraulic fracturing would likely be held by specialists brought in from elsewhere, and hydraulic fracturing poses a threat to other industries in the Province such as tourism” (Divest MUN, 2015, p. 2).

For the individual submissions that support fracking, some claim that the economic benefits that such an industry brings are exactly what the province needs at this time. For example, Murphy (n.d., p. 1) states that:

“Under the current economic situation and given the recent closures in industry on the west coast we need industry to start investing to stimulate economic growth. While economic growth cannot come at any cost hydraulic fracking is a viable option. Technology has advanced enough that this can be done under very minimal risk if monitored and regulated under strict guidelines.”

For Murphy (n.d.), the province is in dire need of an economic boost and any potential industry will come with inherent risks. After all, “the community of Corner Brook was established as a result of a large industrial development, the paper mill, and the entire west coast of Newfoundland has a strong industrial and manufacturing history” (Corner Brook Port Corporation (CBPC), 2015, p. 2).

The Panel recognized that the Stephenville – Port-au-Port area and the wider western Newfoundland region have “demographic, income, and labour market challenges that could benefit from new economic opportunities” (Panel, 2016, p. 121). The Panel

acknowledged that the expected activity from hydraulic fracturing would merely provide a boost to the local economy in the short term and would not greatly influence the remainder of the province (Panel, 2016). A cost-benefit analysis would also be useful as it would provide data on the impact of other industries (Panel, 2016). The focus of the assessment would be on the cost and benefits to the people of the province and particularly the residents of western NL; employment impacts; and impacts on social and public services (Panel, 2016).

5.2.9 Other Industries

The main industries on the west coast of Newfoundland include fisheries, the tourism sector, and to a lesser extent, agriculture. It is believed that the oil and gas exploration will impact each industry and the livelihoods of the persons who have invested in these industries. The Corner Brook-Rocky Harbour Regional Council of the Rural Secretariat (the Council) submitted a letter to the Panel. The Council's members are selected by the provincial government and consist of representatives from communities across the designated region (Corner Brook – Rocky Harbour Regional Council, 2015). This Council's region comprises of the communities of Corner Brook, Bay of Islands, the Humber Valley, White Bay South, Gros Morne National Park and extends north to Daniel's Harbour and Bellburns (Corner Brook – Rocky Harbour Regional Council, 2015). Of great concern to this organization is the environmental impact and the impact to industry which will invariably affect the communities (Corner

Brook – Rocky Harbour Regional Council, 2015). The Corner Brook – Rocky Harbour Regional Council stated that:

“Of significant concern to us are any negative environmental impacts e.g. via oil spills or leaking of ‘fracking’ chemicals and their potential effects on communities in our region. With both tourism and fishing as our primary industries for many rural parts of the region, any environmental impacts have potential to damage these economic drivers thus substantially impacting the sustainability of our region” (Corner Brook – Rocky Harbour Regional Council, 2015, p. 1).

Tourism and fishing represent the “primary industries for many rural parts of the region, any environmental impacts have potential to damage these economic drivers thus substantially impacting the sustainability of our region. In terms of economic value, our tourism industry on the West Coast is worth approximately \$205 million annually (Source: Department of Business, Tourism, Culture and Rural Development) and our fishery \$35 million per year (Source: The RED Ochre Regional Development Board for the Trout River to St Barbe area)” (Corner Brook – Rocky Harbour Regional Council, 2015, p. 1).

In their submission, Hospitality Newfoundland and Labrador³ stressed the importance of the tourism industry to NL, noting that it is the untouched beauty of areas in the province that makes it a unique and desirable destination (Hospitality Newfoundland and Labrador, 2015). Hospitality NL advised that:

“tourism continues to grow and is one of the most sustainable and stable, revenue-generating industries in our province. Generating more than \$1.1 billion dollars in annual spending, tourism offers a renewable resource and accounts for eight percent of total provincial jobs. Comprised of primarily small- to medium-sized businesses, tourism services and attractions support the needs of a growing economy by providing the foundation of services and attractions (accommodations, transportation services, attractions, restaurants, etc.) that other business sectors need to grow, attract workers and leverage private investment thereby supporting sustainable and viable communities across Newfoundland and Labrador” (Hospitality Newfoundland and Labrador, 2015, p. 1).

One business, Inn at the Cape (Inn), is in support of oil and gas exploration within the province of Newfoundland and Labrador. Located on the tip of the Port-au-Port Peninsula in the town on Cape St. George, the Inn accommodates up to 1000 visitors, mostly tourists, during peak season which is between June and September (Fenwick & Fenwick, n.d.). During the offseason, the Inn hosts mostly business guests including

³ Hospitality Newfoundland and Labrador is “the provincial industry association representing tourism services and attractions throughout the province” (Hospitality Newfoundland and Labrador, 2015, p. 1).

workers at the oil well and sees little or no tourists between Thanksgiving in October and June (Fenwick & Fenwick, n.d.). Between 2011 and 2013, commercial business accounted for forty percent of the Inn's trade with oil workers being the major contributor (Fenwick & Fenwick, n.d.). The imposition of the moratorium on fracking resulted in the closure of oil operations in the area and the Inn experienced a thirty-five percent reduction in revenue (Fenwick & Fenwick, n.d.). In light of their experiences, the owners of the Inn at the Cape believe that "(f)racking does not drive away tourists, it supports the accommodations, restaurants, gas stations, rental car agencies and airlines that are essential to a growing tourism industry. The stronger the oil exploration industry, the stronger the tourism industry" (Fenwick & Fenwick, n.d., p. 2).

Though the oil and gas industry may provide an economic boost, this is not considered a sustainable revenue source. Workers on the oil rigs are temporary residents of the community for the most part and will likely return to their home once their job is complete. The Western Environment Centre noted that:

"It is true that in some regions and communities, fracking has brought some economic benefits. For example, hotels tend to see lower vacancy rates because of the work teams that must come into the community to construct the well pads. However, these economic benefits have shown to be short-term at best" (Western Environment Centre, n.d., p. 3).

In addressing the impact on other industries (PR 6&7), the Panel singled out Gros Morne National Park (the Park) and its surrounding tourist attractions. The Panel recommended a complete ban on hydraulic fracturing operations in the Park with the implementation of a buffer zone around the Park in line with panel submissions (Panel, 2016). The Panel is “of the opinion that hydraulic fracturing operations should not be allowed to proceed in a manner that presents a credible threat to Gros Morne National Park as a UNESCO World Heritage Site or to the tourism industry that is developing in the Gros Morne area” (Panel, 2016, p. 113). The recommendation for the establishment of a buffer zone around Gros Morne National Park is to ensure that future industrial activity, including both onshore and offshore oil and gas development, does not negatively impact on the Park, its World Heritage Site designation, or the tourism industry that is developing around the Park (Panel, 2016, p. 114).

With reference to other local industries, such as fishing, the Panel recommended a detailed analysis and assessment of the impact of fracking on other industries (Panel, 2016).

5.2.10 Aesthetics

Many submissions described either living in or visiting the west coast of Newfoundland because of its ‘pristine beauty’ and unaltered landscape. The effect of a tarnished landscape and the absence of the province’s natural beauty were cited as specific areas of concern. Submissions also noted the impact that fracking would have on

the environment and the tourism sector. Only twenty-five of the five hundred and forty-five submissions mentioned the areas aesthetics as their area of concern.

The Panel concluded that careful planning in the developmental stage would mitigate risks associated with aesthetics (Panel, 2016). To do so, industry players would need to “select sites for well pads, central facilities, and access roads with consideration to proximity to homes and populated areas, including sight lines from roadways and other public sites in the vicinity of well pads” (Panel, 2016, p. 124).

5.2.11 Infrastructure

The City of Corner Brook raised a valid point on infrastructure. The development of any industrial activity in the province will result in increased road usage, particularly by trucks. This increased activity may be combated by restrictions on road access, including hours of operation, and weight. The City concludes that “this issue can be easily resolved and should not factor into the decision making on hydraulic (fracturing)” (City of Corner Brook, 2015, p. 4). In spite of the above, the concerns associated with the lack of infrastructure in place to support the industry cannot be negated.

For the communities along the west coast of Newfoundland, such as Kippens, the main road leading to the proposed site is the same one that services their communities. Damage to this road, whether through natural or human-made causes, leaves the

communities cut-off from the rest of the island of Newfoundland. The Town of Kippens stated that:

“Route 460, also known as Kippens Road runs directly through the community and is the only access to the Port au Port Peninsula. Furthermore, a bridge located at the entrance of Kippens can present challenges for access not only to Kippens but the Port au Port Peninsula in times of heavy rainfall and flooding. Most recently in 1995 and 2005 the area was affected by severe flooding which resulted in damage to this bridge halting all traffic in both directions for an extended period of time. This access issue could potentiate a very serious problem when considering future development for the town requiring increased traffic on route 460” (Cormier, 2015, pp. 2-3).

In response to these concerns, the Panel recommended a full review of the existing civil infrastructure and services to provide information on the physical infrastructure and service upgrades required, including that of fire and emergency services (Panel, 2016). One preferred way of minimizing traffic and avoiding damage to roads is to construct a separate road, by-pass, primarily for the vehicles involved in the development process (Panel, 2016).

5.2.12 Regulatory Oversight and Responsibility

There are participants who have past experience with oil companies and have little to no faith in the province’s regulatory framework and the enforcement of this

framework. These participants lived in the area when there was some exploratory work done in the region years ago. As a result of the handling of conventional oil and gas development which has previously occurred in the province, these participants have a negative perception of the oil and gas industry. For these participants, poor management and the resultant effects and damage following the last exploration has unfavourably impacted their view. Thirteen percent of the submissions cited this as an area of concern.

Between 2008 and 2012, Pennsylvania experienced a boom in shale gas production and it became evident that the state was unprepared for the ramifications of the increased development (Clark, Burnham, Harto, & Horner, 2012). Clark et al. (2012) further noted that despite the development brought to the forefront, there were insufficient regulatory policies in place to mitigate the environmental impact of fracking. There existed outdated laws and regulations that, if modified, could significantly impact how waste from fracking is treated. The experiences of states in the United States, particularly Pennsylvania, can guide other states and/or provinces in Canada on how to regulate the industry and on factors that need to be in place to lessen the risks associated with hydraulic fracturing. Pennsylvania proves to be a good example because of readily available information. Since the introduction of hydraulic fracturing to the Marcellus Shale formation, a wealth of valuable information has become accessible to the public. With the additional information and the known experiences come best practices through lessons learnt. This knowledge would prove useful to other jurisdictions that are considering hydraulic fracturing.

There is a regulatory component attached to the various recommendations made by the Panel. The regulatory body in charge of overseeing the unconventional development of oil and gas in western Newfoundland must ensure they accomplish the following:

“establish, monitor, and enforce regulations and standards for all aspects of unconventional oil and gas development that are based upon the best-available evidence from other jurisdictions and that take local factors into account” (Panel, 2016, p. 135).

Regulatory policies from other jurisdictions should not be implemented without due consideration, however, they can form a framework for NL and be modified to account for differing health, environmental, socio-economic and geological factors (Panel, 2016). In this endeavour, it is recommended that “public and population health experts ... be involved in setting standards and regulations” (Panel, 2016, p. 135).

According to the Panel, any regulation should also include performance-based and prescriptive regulation (Panel, 2016). These measures should be in place before the start of any unconventional oil and gas operations and be continuously updated as new research information becomes available (Panel, 2016). Stakeholders, including members of the public, should be involved in the initial policy-making process and in the review and enhancement process (Panel, 2016). The Panel recommended that the entire oil and gas industry in the province of Newfoundland and Labrador be governed by one regulatory body (Panel, 2016). This includes onshore, offshore and onshore-to-offshore

development (Panel, 2016). The current regulatory body on oil and gas in the province, Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB), has expertise in only offshore operations (Panel, 2016).

5.2.13 Community Engagement/ Consultation and Education

Many individuals, businesses and organizations expressed the view that the number and locations of the public consultation sessions are inadequate. These sessions do not offer the opportunity for members of the communities that will be directly affected to offer their views. Instead, these communities' residents would have to travel to either Corner Brook or Stephenville to meet face to face with members of the Panel, as these were initially the only two consultation locations. Rocky Harbour and Port-au-Port East were later added as host communities for consultation sessions. One organization, the Corner Brook – Rocky Harbour Regional Council (the Council), considered the scheduled sessions as unrepresentative and “reflects neither the wider level of interest on the part of regional citizens nor best practice for public engagement methodology” (Corner Brook – Rocky Harbour Regional Council, 2015, p. 2).

A consultation session request was made for a consultation in Bonne Bay to accommodate members of the communities in the Gros Morne area who would ultimately be most affected (Corner Brook – Rocky Harbour Regional Council, 2015). It is especially necessary for these residents to have a face-to-face meeting in order for them to orally express their views (Corner Brook – Rocky Harbour Regional Council, 2015).

Though there was a call for the submission of documents, the Council “believes that a public engagement session in the Bonne Bay area will help to facilitate the participation of residents who feel more comfortable communicating orally with the Panel” as the province of NL “has a strong oral tradition” (Corner Brook – Rocky Harbour Regional Council, 2015, p. 2). This point was reiterated by Ibrahim (n.d.), an individual participant, who requested more consultation sessions in the body of their letter. The acceptance of only written submissions was a bias which “effectively marginalizes a large segment of the population in a Province characterized by a strong oral tradition, including the cultural traditions of Aboriginal Newfoundlanders and Labradorians” (Ibrahim, n.d., p. 1).

The Qalipu Mi’Kmaq First Nation Band (QMFN) signed a letter of intent with Black Spruce Exploration on October 14, 2015, (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016). The letter of intent asserted aboriginal rights and aimed to protect the traditional Mi’Kmaq territory, and generate economic and business opportunities for members and member-owned businesses (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016). To allow its members to make an informed decision on fracking, the QMFN sought resources to provide to its members (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016). In doing so, the organization researched hydraulic fracturing and spoke with stakeholders which also allowed them to better understand the process (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016).

QMFN listed seven areas of concerns/ recommendations, however, it did not state whether the band itself was opposed to or in support of hydraulic fracturing in western Newfoundland. Instead, the QMFN stated the following:

“The environment is paramount in the list of concerns for us. Contrary to some western ideologies, we are a part of (not separate from) the environment and it is a part of us as a people, in our lifestyles and our culture. The preservation of our lifestyle, culture, and hence (the) environment is of utmost importance” (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016, pp. 3-4).

The QMFN’s submission included the results of a survey of band members and other Newfoundland Mi’Kmaq persons (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016). A total of 714 surveys were completed. 668 of 704 respondents identified themselves as members of the QMFN while ten skipped the question (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016). 583 members, that is 84.01% of the 691 respondents who answered that question, are opposed to fracking in western Newfoundland (Qalipu Mi’Kmaq First Nation Band (QMFN), 2016).

One organization, the Corner Brook Port Corporation (CBPC) called for education sessions as this would allow persons to make informed statements when voicing their opinions (Corner Brook Port Corporation (CBPC), 2015). The CBPC is of the view that:

“there are many people who remain undecided as they have not had an opportunity to be presented with a balanced view of the risks and benefits of this technology. There have been limited opportunities for people to participate and become educated on the issues, and we are concerned that people are feeling intimidated by anti-hydraulic fracturing advocates who present an emotional and overwhelming voice that may be silencing the majority” (Corner Brook Port Corporation (CBPC), 2015, p. 1).

The aforementioned is reinforced by this following excerpt from an individual submission:

“I’ve read through many of the submitted letters to this panel and it’s very clear to me that those writing submissions in protest against frac (sic) operations know very little about hydraulic fracturing, and the information they think they know is incorrect. Simply put, they are not educated on the manner (sic)” (Webb, n.d., p. 1).

The Panel recommended the development of an ongoing program of public education on the benefits, risks, and scale of development similar to the Penn State Marcellus Center for Outreach and Research (Panel, 2016). In addition, any proponent must demonstrate effective community engagement and public confidence (Panel, 2016).

It would require:

“any potential industry proponent to develop and implement a plan for meaningful and ongoing community engagement throughout the life of a project. The plan must include processes, metrics, and a reporting framework to demonstrate that public confidence has been achieved prior to undertaking development and that it is maintained throughout the life of a project” (Panel, 2016, p. 119).

The Panel asserted that this plan would have to be approved and monitored by the regulatory body governing the industry (Panel, 2016). Sustained public participation is essential to the development of strategies aimed at addressing environmental concerns (Maibach, Nisbet, Baldwin, Akerlof, & Diao, 2010).

5.2.14 Human Rights/ Ethics/ Morality

The Roman Catholic Religious Leaders of Newfoundland and Labrador highlighted human rights as their primary concern. Their written presentation to the Panel stated the following:

“on the social responsibility which relates to the decision to allow hydraulic fracturing in western Newfoundland. Our position is rooted in human rights. Such potential impacts – immediate or long term – relate to the rights to health, water (groundwater, surface water and atmospheric water), food (soil, crops and livestock), housing (quality, availability and pricing), information (right of access), participation (public debate and dialogue), and preservation of culture

(cultural practices, specific ways of life, and cultural sites and landscapes)”

(Roman Catholic Religious Leaders of Newfoundland and Labrador , 2015, p. 4).

There was no direct reference to human rights, ethics or morality in the Panel’s report.

5.2.15 Social Licence

Social licence was added to the list of concerns after seeing the term mentioned in a number of submissions. A total of nine percent of the participants indicated that they were concerned with the overall process of hydraulic fracturing and it should not be allowed without a social licence. The report from the Nova Scotia Hydraulic Independent Review Panel defines social licence as “community permission to proceed” (Wheeler, et al., 2014, p. 32).

For the Western Environment Centre, the “idea of social licence and community permission is very important in sustainable development. The idea behind this concept is that the residents of communities who are most affected by the proposal should have the final say on whether it goes ahead. Social licence exists in order to avoid environmental racism. Environmental racism occurs when environmentally degrading activities occur in areas of marginalized communities or low income areas” (Western Environment Centre, n.d., pp. 2-3).

This point is reiterated by Divest MUN which strongly believes that a social licence is required before any hydraulic fracturing takes place within the province. To obtain that social licence, “it would have to be conclusively proven that the vast majority of the population across the province and particularly in any areas likely to be affected (spanning across all segments of society on the socio-economic scale, and across all ethnic, cultural, and gender identities) is supportive of the process going ahead” (Divest MUN, n.d.).

The Panel quotes Lahey (2016) in stating that best practices in community engagement requires one to go “beyond obligatory consultations and instead aims to achieve and sustain a deeply rooted social licence” (Panel, 2016, p. 118). Community engagement is an important means for obtaining a social licence (Dare, Schirmer, & Vanclay, 2014). The ones to be most impacted by unconventional oil and gas development “must clearly understand the scale, benefits, and risks as a precondition to Government gauging public support” (Panel, 2016, p. 117). This gauging will advise the government on whether they have been granted a social licence by the communities.

5.2.16 Composition of the Panel

Twenty-five submissions raised the composition of the Panel as an area of concern. For them, it is impossible to have a fair and impartial consultation process without representation from all stakeholder groups. The Panel is comprised of five white males, none of who reside or work on the western coast of the island. Additionally, there

was no representative of the social sciences nor humanities discipline on the Panel. An individual submission from P. Sheppard, a resident of Lark Harbour and the mother of two boys, sums up the concerns raised in the submissions. P. Sheppard stated the following:

“I have apprehensions about this independent panel set up to complete the review. The mere fact that there is no representation from the West Coast, the area being discussed, is concerning. I also have concerns that the panel consists of all males and that the female perspective nor the aboriginal voice is not present” (Sheppard, n.d., p. 4).

The concerns regarding the composition of the Panel were not directly addressed by the Panel’s report. Instead, the Panel used the fact that the submissions were analyzed using an external person to imply that the submission review process was unbiased regardless of the Panel’s composition. This, however, does not negate the fact that the Panel members were not representative of all stakeholders including members of the communities to be affected and Aboriginal people.

5.3 Panel’s Report

The Panel’s report largely addressed the concerns raised by the submissions. The concerns raised by the public and referred to in this research include water, health, environment, waste management, additives/ fracking fluids, wellbore integrity, seismic

risks, air pollution, employment, economic impacts, other industries, aesthetics, GHG emissions and climate change, infrastructure, regulatory oversight and responsibility, community engagement/ consultation, human rights/ ethics, social licence and the composition of the Panel. The Panel's final report discusses each of these areas under the following headings: public policy, planning, and science considerations; socio-economic considerations; environmental considerations; health considerations; regulatory considerations and other scientific and technical considerations (see Figure 5.7). For every recommendation made by the Panel that involves conducting research or an assessment or gathering data, it is also recommended that the results be made available in the public domain (Panel, 2016).

It is interesting to note that no submissions referenced the financial security and insurance as included in the Panel's scope. Instead, eight participants noted that the government would be required to subsidize operational costs in the unconventional oil and gas industry. An individual participant noted that "it is indeed a mystery to us as to why such short-term economic interests are subsidized, even rushed, while scientific studies that would allow long-term understanding of the effects of human activity are underfunded, squelched and ignored" (Shaffer, 2015, p. 2).

Figure 5.7 – Breakdown of Areas Considered by the Panel

<i>Heading</i>	Breakdown
<i>Public Policy, Planning, and Science</i>	Provincial and Regional Planning Climate Change Gros Morne National Park and UNESCO World Heritage Understanding the Geology
<i>Socio-Economic</i>	Community Engagement Risk Assessment and Management Economics of Full-Scale Operations Civil Infrastructure and Services Impacts
<i>Environmental</i>	Air Quality Water Impacts Land Impacts Coastal Change and Erosion Other Environmental Considerations
<i>Health</i>	Health Impact Assessment Monitoring Composition of Fluids Best Practice in Regulation Adaptive Management Realizing Health Benefits Improving the Ability to Respond to Health Impacts
<i>Regulatory</i>	Regulatory Readiness Regulatory Oversight Regulatory Transparency and Continuous Improvement Regulatory Jurisdiction Abandoned Well Program Financial Security
<i>Other</i>	Seismicity Risks during Hydraulic Fracturing Operations Well Integrity

Adapted from Panel (2016)

5.4 Coding Constraints/ Limitations

Organizations, such as the Western Newfoundland Destination Management Organization (Western DMO) made submissions to the Panel. However, a number of these organizations did not clearly state their position. For example, the Western DMO merely stated that:

“Our Board of Directors respectfully requests that the review panel carefully consider the impacts of hydraulic fracturing activity specifically on how it will detract from our area’s visitor appeal. We respectfully submit these concerns on behalf of tourism stakeholders throughout our region. This type of industrialization in western Newfoundland will jeopardize our collective efforts and would put at risk not only important designations such as Gros Morne’s UNESCO status, but our ability to diversify our rural economy through long-term, sustainable tourism development overall” (English, 2015, p. 1).

In instances such as the abovementioned, I accepted these statements as opposition to fracking based on its effect on the aesthetics of the region and ultimately, the tourism sector.

On the other hand, organizations such as the St. John’s and Area Council of Churches, submitted letters referencing other documents which were not available on the web site/to the public. This organization advised that they “endorse the recommendations made by national and international organizations on September 24, 2013 to the United

Nations Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes” (Tilley, 2015, p. 1). However, these recommendations were not readily available. Additionally, a statement merely stating that “(c)are of the environment for present and future generations is of major concern for all of our religious denominations. ‘Fracking’ is of particular concern because of its threat to human rights and to the integrity and sustainability of the environment” (Tilley, 2015, p. 1) is not enough for the researcher to make an objective decision on the organization’s stance. As a result of the above, the stance on this submission, and others like it, were entered as ‘not applicable.’

Some organizations did not take a stance on whether hydraulic fracturing should occur in Western Newfoundland. One reason noted for this is that people represented by these organizations have conflicting views. For example, the City of Corner Brook’s submission acknowledged that they “have not received clear consensus from residents on the hydraulic fracturing debate” (City of Corner Brook, 2015, p. 1) In such cases, the organization requested further research and fair review process. For example, the City of Corner Brook noted that there are many proponents and opponents of fracking within the community and that they are striving to reach a balance (City of Corner Brook, 2015). For the City of Corner Brook, the Panel should make its decision based on facts and science and not on perception (City of Corner Brook, 2015). The City of Corner Brook concludes that the “development of the oil and gas industry is without a doubt the single greatest economic development opportunity for our region. We ask that the Review Panel

give fair and equitable consideration to the environmental, social and economic factors in making a decision on hydraulic fracking” (City of Corner Brook, 2015, p. 4).

Individual submissions covered a wide range. One participant merely wrote “(c)oncerned about irreversible water contamination” (Charlebois, n.d., p. 1). Such submissions provided no room for interpretation of the participant’s stance on hydraulic fracturing. While the participant is concerned about possible water contamination, they could still be in support of the endeavour for other reasons or may simply want further research on the subject. The limited information provided in the submission, however, has made it impossible to objectively determine the participant’s position.

Areas of concern may be either negative or positive and can therefore support either of the stances taken on hydraulic fracturing by Newfoundland and Labrador residents, businesses and organizations. For example, the Corner Brook Port Corporations (CBPC) wrote a letter providing conditional support of hydraulic fracturing provided the necessary research is conducted and the appropriate regulations are applied. The basis of their decision stems from economic growth and employment opportunities:

“The economy in Western Newfoundland is currently stagnant and has had very little private sector investment in recent years. We believe that the oil and gas industry could provide a significant economic boost to the entire region, creating industrial activity that will stimulate growth, increase employment and generate spin-offs for other sectors. The introduction of new industry has the potential to

improve the overall quality of life for residents. We respectfully ask the panel to consider the science, social, environmental and economic impacts and experiences of other jurisdictions which have successfully used hydraulic fracturing technology to transform their economies and improve the overall quality of life” (Corner Brook Port Corporation (CBPC), 2015, p. 1).

The same areas of concern are also being used in the support of placing a ban on fracking. From this standpoint, oil and gas exploration may initially provide some employment and economic relief while adversely affecting other industries such as fishing and tourism. As such, if the oil companies begin to lay off employees, unemployment rates will rise and there may be a downturn in the economy. However, with other industries affected, these newly unemployed residents may face greater difficulty in gaining new employment. For example, in 2005 when the pulp and paper mill company closed in the town of Kippens, residents could turn to other industries for employment. Furthermore, many question the economic stimulation and employment benefits of fracking will offset the sacrifices made to human health and the environment (Responsible Energy Action (REA), 2015).

Though the landscapes and laws differ between the US and Canada, more research has been done on fracking in the US, thereby providing more information and more examples to reference. This was evident as participants used events involving the Marcellus Shale, located in the US, as a reference point for what would happen in oil and

gas exploration were to occur in NL. Also, comparisons were made between the Green Point shale and the shale located in the US. For example, Peter Sutherland, an individual participant, stated that:

“The Marcellus, Bakken, and Barnett shales, like many other unconventional reservoirs in North America, are located in basins where the layers are deformed very little, in ways that are easy to map and understand” (Sutherland, 2015, p. 1).

Two submissions were in French and I was unable to code them. No translations of these documents were available.

5.5 Conclusion

While energy development is not entirely new in the province of Newfoundland, it remains important to recognize the inherent risks associated with the nature of the industry and strive to address public concerns. After analyzing both the submissions received and the Panel’s subsequent report, it is evident that most of the concerns raised in the submissions were addressed by the report. The one concern not addressed by the Panel is the issue of human rights as raised by one percent of participants. However, the extent to which each area is discussed differs. Some of the concerns raised, such as social licence, climate change, green energy and composition of the panel, were not included in the terms of reference of the Panel but were addressed in the Panel’s report. With green energy, the Panel noted that such energy alternatives are beyond the scope of the Panel’s

mandate and would not eliminate some of the more significant concerns raised in regards to unconventional oil and gas development.

The Panel completed its review process and published their report on May 31, 2016. The report is available in the public domain at <http://nlhfrp.ca/wp-content/uploads/2016/06/Final-Report-June-2016.pdf>. Despite concerns expressed by participants of the biased nature of the members of the Panel and the Panel's constitution, the Panel maintained that during the hydraulic fracturing review process,

“the Panel was neutral with respect to its opinion about whether unconventional oil and gas development should proceed in Western Newfoundland. As we conclude our review process, based on what we have learned through the process, the Panel remains neutral with respect to an opinion since more information is required for a full and fair assessment of the development challenges and opportunities” (Panel, 2016, p. 152).

Ultimately, the Panel did not take a position on hydraulic fracturing on the west coast of Newfoundland. Instead, the Panel noted that steps need to be taken and research completed before greater consideration can be given to unconventional gas development in Newfoundland. In concluding, the Panel advised that they:

“believe that safe and responsible development of natural resources requires a combination of sound public policies; credible science; good technology; effective regulatory oversight; competent and ethical professionals working for

Government, the regulator, and industry; and good will from communities and other stakeholders” (Panel, 2016, p. 152).

Overall, the Panel recommended a conservative low-risk approach that mirrors most of the submissions. The Panel’s final recommendation reflects the precautionary principle. The precautionary principle “ensures that a substance or activity posing a threat to the environment is prevented from adversely affecting the environment, even if there is no conclusive scientific proof linking that particular substance or activity to environmental damage” (Cameron & Abouchar, 1991, p. 2). The comprehensiveness of the recommendations by the Panel makes it difficult to proceed with unconventional oil and gas development within the province of Newfoundland and Labrador.

The Panel’s decision to err on the side of caution is in keeping with the concerns of the participants. As it is now, the potential risks associated with hydraulic fracturing outweigh the perceived benefits. Some environmental ethicists, for example Rachel Carson, rank human life above economic gain and endorse scientific knowledge while acknowledging its limitations (Cafaro, 2001). Also considered is the intrinsic value of non-human nature, including the natural environment (Cafaro, 2001). I will conclude with the Cree saying, as mentioned in two submissions: “When the last tree is cut down, the last fish eaten, and the last stream destroyed, you will realize that you cannot eat money.”

Chapter 6: Conclusion: Stakeholder Responses and the Panel's Report on the Potential Hydraulic Fracturing in Western Newfoundland

6.1 Summary

The primary objective of the study was to determine whether the Newfoundland and Labrador Hydraulic Fracturing Review Panel acted upon the concerns of the public during its provincially-mandated review process. In order to meet this objective, the concerns raised by the public and the recommendations made by the Panel were obtained from the submissions and the Panel's final report respectively. In determining whether the concerns were considered, the researcher first had to ascertain whether the concerns were addressed in the Panel's report. This is an indicator of whether the concerns were considered by the Panel and was conducted using a qualitative study.

A qualitative study is used as the methodological approach to study public participation in natural resource management with a case study on fracking in Western Newfoundland as case studies provide in-depth focus on contemporary events (Yin, 2009) and is necessary in the context of the research. To achieve the objective of this research, the case study method was used as it has the ability to provide a holistic and in-depth explanation in social research (Zainal, 2007). A single case study, a variant of case studies in general, was chosen for the area of study as it provided the type of deep understandings necessary in carrying out this research (Yin, 2009). Content analysis and document analysis were used as the methods of data analysis. Content analysis as a

research method is useful in taking substantial amounts of data and reducing it to more manageable amounts of useful information (Weber, 1990). On the contrary, document analysis is the gathering of relevant information from documents (Caulley, 1983). For this research, NVivo 11 qualitative research software was used to aid in content analysis. Documents were analyzed by the software for the occurrence and frequency of predetermined codes. Once these were identified, I was able to tabulate the number of occurrences in spreadsheet format allowing for quantitative data to be obtained. Next, document analysis was used to obtain direct quotes from both the submissions and the Panel's report to support the findings of the content analysis. Speech acts were used to a lesser extent in understanding the intentions of the author through their submissions. A speech act is the performance of an 'act' that characterizes the author's intention (Bach, 1998).

Research objectives were achieved through the detailed analysis of the submissions from the public. The underlying basis of each submission shows the creator's main area of concern and the subsequent report, which was published, shows what was addressed. The research was guided by the use of the constructivism paradigm which is rooted in lived experiences (Schwandt, 2000). The study was also influenced by the deliberative democratic theory which represents a version of democracy that entails public discussion (Baiocchi, 2001, p. 44). The theoretical concepts that form the basis of the research are public participation and consultation.

Constructivism is a subjective paradigm (Guba & Lincoln, 1994) which represents the perspectives of those living in the respective situation (Schwandt, 2000). Given the context of this research, that is, western Newfoundland, the constructivist paradigm is ideal. The creators of the submissions did not generally state whether they were from the western portion of the island, a resident of the province itself, or from outside the province. However, some submissions referenced experiencing previous oil and gas exploration on the west coast of the island. The tone of most of the submissions also suggests that the creator either once lived on the west coast or currently resides there. These are the people who will be impacted the greatest by the development of unconventional oil and gas development in the region and represent the ideal candidates for expressing concerns.

Deliberative democratic theory is the body of political theory that is used to develop democracy through deliberation with the public (Baiocchi, 2001). Deliberation is an approach geared towards engaging participants in a meaningful discussion which allows for the sharing of opinions/ concerns and the clarifying of issues (Sanders, 1997). Democracy is essentially a public deliberation on a common good (Cohen, 1989). This theory represents the very epitome upon which the research is based. The purpose of the research is rooted in determining whether the Panel considered the concerns of the participants. Deliberative democracy should be a component of the public review process by the Panel. The Panel called for submissions from the public, facilitated a province-wide survey and hosted four consultation sessions. With these activities, the basic tenet of

deliberative democracy was met. Concerns of the participants were shared through the three activities and the opinions of the Panel were shared in their report.

The body of literature aligned with this study is public participation. Public participation, in its simplest form, is including the public in decision-making (Glass, 1979). The public should have an avenue for discussing the issues that concern them (Richardson, 1983). Arnstein (1969) developed a participation model known as the 'Eight Rungs in a Ladder of Citizen Participation' which ranges from manipulation of members of the public to citizen control of decision-making. On Arnstein's ladder, consultation sessions represent rung number four and fall under the collective heading of 'degrees of tokenism' (Arnstein, 1969). According to one model, there are six types of participation of which consultative participation is ranked as the second least empowering type behind passive participation (Pretty and Smith 2004). Calls for submissions from members of the public were not included in either of the classifications. The consultation sessions formed a portion of the process, but, given the rankings by Arnstein (1969) and Pretty and Smith (2004), these sessions did not offer any power to citizens in the decision-making process. In consultative participation, the public participates by merely answering questions (Pretty & Smith, 2004).

The institution of an independent public review panel by Newfoundland and Labrador's Minister of Natural Resources led to a public review of the socio-economic and environmental implications of the possible unconventional oil and gas exploration.

The Panel initially scheduled two consultation sessions; one in Corner Brook and the other in Stephenville. This number was subsequently increased to four sessions to include one in Rocky Harbour and one in Port-au-Port East. Based on the submissions, approximately six percent of participants cited this number as insufficient, however, it was an improvement on two and gave residents of the west coast better opportunities to attend consultation sessions. The Panel made a call for submissions from the general public on fourteen key areas. These include the following: impact on groundwater, impact on surface water, impact on land, waste management, additives, wellbore integrity, seismic risks, regulatory oversight and responsibility, site restoration, financial security and insurance, air emissions, public safety and emergency planning, community engagement and socio-economic impacts (NLHFRP, 2015c).

Through detailed content and document analyses, it was determined that the report covered all but one area pertaining to hydraulic fracturing that was mentioned in each of the submissions. References to human rights, or any variations including ethics and morality, were not seen in the final report. However, though the Panel did not directly address human rights and morality, there is a human right/ moral aspect present in other concerns which were addressed. For example, water is considered a basic human right (Gleick, 1998) and this concern was discussed at length in Panel's report. Though this was not included, the mere fact that the Panel addressed areas not included within their terms of reference and/ or their scope suggests that the Panel actually took into

consideration what members of the public had to contribute. In turn, these areas of concern were addressed to varying degrees before giving their recommendation.

The Panel's report included referenced information on the individual sub-topics before stating their recommendation. For example, with the concern of impact on water, the Panel cited scholars who referenced the current state of the quality of water in western Newfoundland and spoke about the quantity of water that would be available for hydraulic fracturing operations. Only then did they offer their recommendations as it relates to the concerns noted. In other instances, the Panel referenced submissions. For example, under the health concern, the Panel cited the Qalipu Mi'kmaq First Nation Band (QMFN) who was concerned about the impact of hydraulic fracturing operations on children who would be growing up in close proximity to the site (Panel, 2016).

6.2 Summary of Findings

Listed as the participants' main area of concern is water with fifty-two percent of participants sharing this concern. Rounding out the top five areas of concern in descending order are the environment, health, waste management and impact on other industries. Participants added concerns, such as climate change, human rights and social licence, which were not included in the Panel's Terms of Reference.

In their report, the Panel discussed the process of hydraulic fracturing broadly before delving into their recommendations. Specific recommendations, which were given for each subtopic, were primarily classified under the following headings: public policy, planning, and science considerations, socio-economic considerations, environmental considerations, health considerations, regulatory considerations and other scientific and technical considerations (Panel, 2016). The major recommendation of the Panel is for further research to be conducted on every topic. The Green Point shale, the socio-economic climate of the region, and in general Newfoundland, presents unique opportunities and challenges and requires a vast amount of research before any industry can be developed, the Panel concluded. Following the report's release, Siobhan Coady, the provincial Minister of Natural Resources, released the following statement:

"I extend many thanks to the panel members who have undertaken a thorough and expert report. We received the final report yesterday and met with the panel to discuss the report. Our government has assembled a team to review the information and recommendations that have been put forward. In the meantime, the current policy to not accept applications for hydraulic fracturing will not be changing. Any future decisions regarding the hydraulic fracturing industry will be based on scientific evidence, and most importantly, on a social license from the Newfoundlanders and Labradorians who may be affected" (Coady, 2016).

With the sheer volume of recommendations by the Panel, it remains to be seen whether the oil and gas companies and/ or the government will attempt to proceed with

unconventional oil and gas exploration within the province of Newfoundland and Labrador. The Panel did note that development will not occur if costs and technological barriers are too high (Panel, 2016).

In all aspects of the recommendations, the Panel called for transparency across the unconventional oil and gas industry. For example, they require the information from all research and assessments to be made available to the public and chemicals and their respective compositions to be disclosed. The Panel also recommended a myriad of areas be fully researched, including regulations in other jurisdictions. The regulatory component was stressed by the Panel with recommendations to ensure every aspect of the hydraulic fracturing process is regulated. The Panel strongly recommends building on to and strengthening the existing regulatory framework in effect for the offshore oil and gas industry which is already established in the province of Newfoundland and Labrador (Panel, 2016). Strict enforcement of regulations is imperative to the industry and is expected to result in adherence by industry players. This point is reinforced by Fraser & Ellis (2009) who noted that the current regulatory body overseeing offshore oil and gas development in NL is lenient towards industry players.

The Panel also called for the public availability of any research findings on hydraulic fracturing or any of its associated risks. This shows their support for transparency within the industry which strongly suggests that industry players are more likely to be held accountable for any non-compliance. Moreover, this transparency allows

the public to be aware of what is happening in and around their surroundings. As such, they can hold the regulatory body accountable in the event that the regulatory body is non-reactive to any breaches. Transparency and stricter regulations would work together in achieving the greater good for the environment and its inhabitants.

Another point reinforced by the Panel is to obtain baseline data and conduct constant testing to effectively monitor if any changes occur with the start of unconventional oil and gas development. The call for stringent monitoring by the regulatory body reflects the submissions. This would facilitate a quick response to any changes that may arise and is applicable for concerns including air emissions and wellbore integrity. A quick response to possible contamination may lessen the impact on the environment and its inhabitants.

Ultimately, the Panel recommended that a thorough study/ research be done on the technique of hydraulic fracturing itself and implications of the technique in other provinces (Panel, 2016). This, they say, should be done before there can be more discussions on whether hydraulic fracturing may be used as an acceptable method in oil and gas exploration in Western Newfoundland (Panel, 2016).

6.3 Recommendations

With every process, there is room for improvement. In the context of this research, public participation, democracy and the deliberative process in natural resource management played a significant role. Methods of engaging the public through participatory efforts should ideally include “two-way interaction between decision makers and the public as well as deliberation among participants” (Abelson, et al., 2003, p. 2). All people in the affected population must be provided with an opportunity to participate if competence and fairness is to be achieved (Webler, Kastenholz, & Renn, 1995). To accomplish this, open discussions, educational information for participants and visits to the potential sites are necessary components to accomplish this feat (Webler, Kastenholz, & Renn, 1995). These activities promote public participation while supporting democracy (Webler, Kastenholz, & Renn, 1995). The following recommendations are made to facilitate improved decision-making processes in subsequent matters.

6.3.1 Panel Composition

In future, members of an independent panel tasked with conducting a public review of proposed development should represent each stakeholder group. The Panel would comprise of at least one resident of the communities and a representative of a business that would be affected by the proposed development, an Indigenous representative, a government representative and a representative from the proponents of

the project. There are many reasons to include the various stakeholders as decision-makers such as “to diminish the veto power of various societal actors by involving them in decision making, improve the quality of decision making by using the information and solutions of various actors, and bridge the perceived growing cleavage between citizens and elected politicians” (Edelenbos & Klijn, 2006, p. 1). The composition of the Panel was a concern as its members were all white men not residing in any of the local communities; further, none was Indigenous. The group was therefore not representative in nature. Representation of any kind should account for the distribution of differing views (Rowe & Frewer, 2000). Submissions criticized government’s choice in selecting the individuals who were appointed to the panel, especially since some had gone on record to say they were pro-fracking.

6.3.2 Education

Another area for improvement is information dissemination. My research found that little information on hydraulic fracturing was shared with the public. As such, people without access to facts or the ability to do their own research lacked knowledge and therefore lacked the understanding to make an informed decision on the matter (Williams, Macnaghten, Davies, & Curtis, 2015). Participants mentioned that they received all their information on hydraulic fracturing from doing their own research or attending meetings on fracking awareness.

6.3.3 Public Participation

Another area open for improvement is engaging the public. Four consultation sessions were held in total. This was after only two sessions were scheduled to be held and there was public uproar that none was being held in any of the actual communities that would be primarily affected such as those in Bonne Bay near Gros Morne. The initial sessions were scheduled for the urban centres of Corner Brook and Stephenville and the additional two were held in the more rural towns of Rocky Harbour and Port-au-Port East. All sessions were held during the week in the evening hours. Reference was made in some submissions about community members not being aware of the scheduled meetings as they were not highly or sufficiently publicized. Evaluation of public participation endeavours is necessary to ensure there is fair representation in that the contribution of the public has an impact on the final decision (Rowe & Frewer, 2004).

No further development has occurred in Newfoundland and Labrador on the prospect of unconventional oil and gas exploration. To date, the provincial government has upheld the decision to not accept applications for hydraulic fracturing (Coady, 2016) as recommended by the Panel.

6.4 Scope for Further Research

The research process highlighted areas that need further research. While the Panel addressed most of the participants' concerns, a number of these concerns are in need of

further research and were beyond the scope of this study. The following presents areas for future research on public participation in Newfoundland and Labrador in processes related to industrial development, noting that every industry poses some level of environmental, human and other risks.

The main component that needs in-depth focus is effective and meaningfully engagement of the public in matters that impact them (Richardson, 1983). This epitomizes the essence of public participation and is particularly necessary in natural resource management as there are inherent risks to the public. Concerns raised in the submissions about the consultation process reiterate the need for further research in this area. An assessment should be done on whether the Panel made meaningful efforts to engage the public based on criteria and best practices for public engagement. The case of proposed hydraulic fracking in western Newfoundland or the Muskrat Falls project in Happy Valley-Goose Bay would provide appropriate case studies to complete this research. Meaningful engagement also lends legitimacy to the decision-making process as it is based primarily on fair representation of all stakeholders and should therefore not be overlooked (Grodzińska-Jurczak & Cent, 2011). This area of research would include analyzing Arnstein's (1969) eight types of public participation and studying whether the criteria for effective public participation has been met. The criteria for effective public participation may be found in the literature, for example, in Pollock (2004).

In addition, research is needed on sustainable and renewable energy resources that can be developed in the province of Newfoundland and Labrador. This will present an avenue for long-term ventures to supply energy. Unconventional oil and gas development has been carried out on a profitable scale since the late 1990s (Speight, 2013); however, there are a few known risks associated with the process (Vengosh, Jackson, Warner, Darrah, & Kondash, 2014). The unknown, or rather, the yet to be seen risks, are also of concern as some effects may take years to manifest themselves. Though unconventional oil and gas development is arguably cleaner than conventional oil and gas (Vidic, Brantley, Vandenbossche, Yoxheimer, & Abad, 2013), sustainable and renewable energy sources, such as solar energy, are cleaner than and may leave a smaller ecological footprint (Dincer, 2000).

6.5 Conclusion

Public participation in policy-making matters relating to natural resource management is an increasingly applied method in decision-making matters. The scope of this research was limited to submissions made in response to the proposed hydraulic fracturing in western Newfoundland. Given the specificity of the research, the results of the research are not generalizable as each jurisdiction would respond differently to the prospect of hydraulic fracturing. The inability to generalize is a concern also related to single case studies (Tellis, 1997). However, Yin (2014) notes that while it is improbable, generalizing is not impossible. Notwithstanding, this research is useful to the government

of Newfoundland and Labrador, as well as the industry players, participants, residents of NL and persons generally interested in the proposed unconventional oil and gas development in Newfoundland. The report is also relevant to the current literature on public participation, democracy and stakeholder involvement in decision-making. Additionally, the research lends legitimacy to the Panel's report as it was reviewed from a neutral standpoint and contrasted against the participants' concerns.

The Panel addressed the areas of concern expressed by the participants' submissions, with the exception of a direct reference to the human rights concern. Eighty-four percent of participants were opposed to fracking for varying reasons with water cited as the main concern. The Panel concluded that there is insufficient information present at this time to make an informed decision on unconventional oil and gas development in western Newfoundland. Peer-reviewed research on hydraulic fracturing is limited, thereby limiting the sources of credible information regarding hydraulic fracturing and its impacts including environmental and health (Jackson, Pearson, Osborn, Warner, & Vengosh, 2011 and Vidic, Brantley, Vandebossche, Yoxtheimer, & Abad, 2013).

My view of the Panel is that it thoroughly took account of the submissions it received. However, there was an issue with the composition of the Panel which really should have included a representative of each stakeholder community. The opportunity for members of the public to actively engage in participatory activities was limited by the small number of public consultation sessions. Further restrictions were imposed on the

public by the times and locations of these sessions. The result of this endeavour was a process that was lacking in the crucial aspects of deliberative democracy, namely overcoming conflict and meaningfully engaging the public in a bid to address concerns.

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Appendix A – Composition of the Panel

Dr. Gosine is a professor and J.I. Clark Chair in the faculty of Engineering and Applied Science at the Memorial University of Newfoundland – MUN (NLHFRP, n.d.). He is the Associate Vice-President of Research at Memorial University and his primary areas of interest were telerobotics, machine vision and pattern recognition for use in the resource industries including oil and gas (NLHFRP, n.d.).

Dr. Graham Gagnon is a professor in the Department of Civil and Resource Engineering at Dalhousie University, Nova Scotia (NLHFRP, n.d.). He is also the Natural Sciences and Engineering Research Council of Canada (NSERC) Industrial Research Chair in Water Quality and Treatment and the Director of the Centre for Water Resources Studies (NLHFRP, n.d.). Dr. Gagnon's primary area of focus is on water quality and management and treatment for natural and engineered systems (NLHFRP, n.d.). He contributed to an assessment of Alberta's drinking water policy and to water concerns emanating from onshore oil and gas in Nova Scotia (NLHFRP, n.d.).

Dr. Maurice Dusseault is an Engineering Geology professor in the Department of Earth and Environmental Sciences at the University of Waterloo (NLHFRP, n.d.). His areas of research interests include wellbore integrity, deep disposal technologies for solid and liquid wastes, hydraulic fracture mechanics, and shale gas and shale oil mechanics (NLHFRP, n.d.).

Dr. Wade Locke is an Economics professor at the Memorial University of Newfoundland where he specializes in the economy of NL, primarily the areas of resource economics; public finance; public policy; productivity; economic impact assessment and cost-benefit analysis (NLHFRP, n.d.).

Dr. Kevin Keough is an adjunct professor of Biochemistry at MUN with research interests in molecular organization and function in lung surfactant and membranes, and liposomes as carriers for vaccines and drugs (NLHFRP, n.d.). He completed his doctoral studies at the University of Toronto, Ontario, in 1971 and has since held several positions including past president and chief executive officer of the Alberta Heritage Foundation for Medical Research; Chief Scientist at Health Canada; Vice-President (Research and International Relations); and Head of Biochemistry at MUN (NLHFRP, n.d.).

Appendix B – Coding

Column	Variable Name	Description
1	ID	Author
2	Type of Participant	1 = Citizen 2 = Business 3 = Organization
3	Stance	1 = Support Fracking 2 = Oppose Fracking 3 = Not Applicable (No opinion stated on preferred outcome)
4	Reason for Stance	1 = Research needed 2 = General Opposition 3 = Same as Area of Concern 4 = Not Applicable
5	Opposition Preferred Outcome	1 = Moratorium 2 = Full Ban 3 = Not Applicable (None stated or heading does not apply)
6	Area of Concern	1 = Water 2 = Health 3 = Environment

		<p>4 = Waste (Management)</p> <p>5 = Additives/ Fracking Fluids</p> <p>6 = Wellbore Integrity</p> <p>7 = Seismic Risks</p> <p>8 = Air Pollution</p> <p>9 = Employment</p> <p>10 = Economy</p> <p>11 = Other industries, e.g. Tourism, fishing</p> <p>12 = Aesthetics</p> <p>13 = GHG Emissions</p> <p>14 = Climate Change</p> <p>15 = Infrastructure</p> <p>16 = Regulatory Oversight and Responsibility</p> <p>17 = Community Engagement/ Consultation</p> <p>18 = Human Rights/ Ethics</p> <p>19 = Social License</p> <p>20 = Composition of the Panel</p> <p>21 = Not Applicable (None stated or heading does not apply)</p>
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