

Monitoring Expertise: A perspective on environmental impacts monitoring in northeast  
British Columbia

by

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BSc, University of Alberta, 2009

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of the Requirements for the Degree of

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in the School of Environmental Studies

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## **Supervisory Committee**

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## Abstract

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The shale gas industry in northeast British Columbia is rapidly expanding and is promoted by the provincial government as a promising economic venture for the entire province. However, the industry is having impacts on the traditional territory of the Fort Nelson First Nation, although they have constitutionally recognized treaty rights to continue to use the land to meet their subsistence needs. I conducted this research in partnership with the Fort Nelson First Nation Department of Lands and Resources, with a focus on critically assessing the challenges they face. This research focuses on determining how the Fort Nelson First Nation can protect their treaty rights by taking control of, or inserting themselves into the data collection and monitoring activities of the shale gas industry. Utilizing a theory of knowledge politics, this research analyzes two strategies that challenge what knowledge should count, and on what terms: (1) the Fort Nelson First Nation's participation and appropriation of the professionalized science regime and (2) the development of the Fort Nelson First Nation's community-based monitoring program and its ability to impact decision-making. Drawing on primary research, participant observation, literature reviews and document analyses, I argue that these strategies are crucial and can create – but do not guarantee – links to affecting natural resource management decisions.

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## Chapter 1: Introduction

### 1. Overview

The shale gas industry is rapidly expanding in northeastern British Columbia (BC) as the province moves to compete for lucrative liquefied natural gas markets in Asia (BC MEM, 2012). The shale gas industry requires infrastructure such as well pads, seismic lines, roads and pipelines. This new infrastructure is having impacts on top of the historical impacts of conventional natural resource development projects like mining, conventional oil and gas and forestry, developments that already fragment the landscape. Cumulatively, these impacts have the potential to adversely affect wildlife, surface and groundwater resources, air quality and human health (CCA, 2014; West Coast Environmental Law, 2004; Parfitt, 2011; Campbell and Horne, 2011; University of Victoria Environmental Law Centre, 2013; Gale and Lowe, 2013; Garvie et al., 2014; Garvie and Shaw, 2014). The wide range of impacts aren't currently being adequately assessed or monitored under the provincial environmental management regime. There has been little account for the cumulative impacts of past, current and future resource development projects: baseline studies prior to development and cumulative effects assessments are currently not mandated, and are generally not undertaken. Further, provincial decision-makers are primarily relying on industry-hired consultants to collect data where required for monitoring activities<sup>1</sup>. This situation is problematic given the pace of change in the region: how can the province make good decisions about resource use without adequate monitoring of the environmental and social impacts? These impacts are occurring on the traditional territory of the Fort Nelson First Nation (FNFN), and yet they are not adequately included in assessing or monitoring these impacts. Further, the FNFN continues to rely upon subsistence practices<sup>2</sup> in their territory, and their rights to do so are recognized and affirmed by the Constitution.

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<sup>1</sup> For this thesis, the data collection process required for monitoring activities includes any data collected on the baseline state of the environment as well as subsequent measurements to determine the extent of the environmental impacts.

<sup>2</sup> Subsistence-based practices include collection of food, medicine and cultural and spiritual practices.

This research, conducted in partnership with the Fort Nelson First Nation (FNFN) Department of Lands and Resources, sought to provide insights into how the impacts of shale gas projects could be better monitored and mitigated. The Lands Department serves the members of the FNFN by protecting and asserting their rights to their traditional lands that have sustained them for countless generations (FNFN Lands Department, 2015). The staff at the Lands Department serve a variety of functions related to land and resource management including: reviewing referrals, consultation and environmental assessment processes; conducting environmental reviews and field audits; creating digital maps; hosting community events, and participating in and conducting research. According to the FNFN Lands Department:

We envision a future when our community works together to care for our land, air and water. We envision our community taking a central role in land and resource management in our territory and we strive for responsible development in our land, where balance is once again found between our traditional cultural values and economic use of the land and resources. Today the Fort Nelson First Nation Lands Department upholds the spirit and intent of our treaty by asserting our rights to our land and taking responsibility to ensure that our future generations are able to live their lives in our lands in a way that honours our ancestors<sup>3</sup>.

During the summer of 2013, I spent six weeks doing participant observation in the FNFN Lands Department in order to better understand the challenges they are facing. During this time, through dialogue with the Lands Department, we developed two aims for this research:

- 1) To draw upon the perspectives of the FNFN Lands Department to develop an understanding of the challenges they are facing in developing an appropriate environmental monitoring regime, and
- 2) To explore community-based monitoring as a possible way for the FNFN Lands Department to restructure and inform current monitoring activities.

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<sup>3</sup> From [lands.fnnation.ca/about-us](http://lands.fnnation.ca/about-us)

I conducted this research to support the work being done by the FNFN Lands Department as well as to critically assess the challenges they face for the benefit of a wider audience. This research revolves around determining how the FNFN can assert their treaty rights by taking control of, or inserting themselves in the data collection and monitoring activities of the shale gas industry. Utilizing a theory of knowledge politics, I analyze two of the FNFN's strategies that challenge what knowledge should count, and on what terms: their participation in and appropriation of the professionalized science regime in Chapter 2, and the development of their community-based monitoring program and its ability to impact decision-making in Chapter 3. This is a manuscript thesis where each of the core chapters (Chapters 2 and 3) is written as a stand-alone article. Chapter 2, which draws upon the FNFN Lands Department's perceptions of current environmental monitoring activities to develop an understanding of the challenges they are facing, is written as an article for submission to *BC Studies* for potential publication. Chapter 3, which explores community-based monitoring as a possible way for the FNFN Lands Department to restructure and inform current monitoring activities, is written as a briefing paper for the FNFN Lands Department.

In Chapter 2, I draw upon the perspectives of the FNFN Lands Department to develop an understanding of the challenges they are facing in developing an appropriate environmental monitoring regime. The results detail the Lands Department's concerns with current monitoring activities, including that they are industry-driven and are not adequately inclusive of the FNFN. Further, my interview participants reported heavy reliance on industry-hired consultants to design and carry out monitoring activities. There are challenges with relying on industry-hired expertise as shown in recent analyses of BC's forest management framework (FPB, 2014; BC Auditor General, 2011) and resource management more generally (ELC, 2015; BC Ombudsperson, 2014). These challenges include increased industry discretion in public interest decision-making, decreased government oversight and issues of accountability. This research identifies similar impacts and challenges in the environmental management regime governing the shale gas industry. I conclude

the chapter with recommendations on how to improve environmental monitoring for all involved in the environmental management regime in northeast BC: the FNFN, industry, and the provincial government.

Chapter 3 explores community-based monitoring (CBM) as a possible way for the FNFN Lands Department to restructure and inform current monitoring activities. This chapter is written primarily for the benefit of the FNFN Lands Department. First, I present what I learned from interviews about the FNFN's ambitions for their CBM program and the challenges they face in achieving these. I then go on to critically explore what the CBM literature offers to help them negotiate these challenges and achieve these ambitions, concluding with an assessment of some of the limitations of this literature and suggestions for other resources that provide helpful supplementation. This chapter contains suggestions for the FNFN Lands Department on creating a CBM program. I outline key considerations for designing a CBM program but argue that a well-designed program is not on its own sufficient to affect decision-making. I conclude that it is very important work for First Nations communities to challenge knowledge politics in order to be recognized not only as knowledge holders but knowledge producers, to inform current monitoring activities. However, in order to restructure current environmental monitoring regimes they should also be recognized *as* decision-makers, not just contributors to decisions in current structures.

## **2. Critical Context**

In this section, I provide critical context for the thesis, including: the pace and scale of shale gas development in BC; who the Fort Nelson First Nation are and the impacts the industry is having in their territory; how our understanding of these impacts is affected by "knowledge politics"; how the environmental management regime in northeast BC has changed; and the FNFN's current strategy for addressing inadequacies in environmental management and monitoring in their territory.

### **2.1 Shale gas**

Technological advances have made it possible and profitable to extract natural gas



## Basin, Cordova Embayment, Liard Basin and the Montney play (Figure 2).

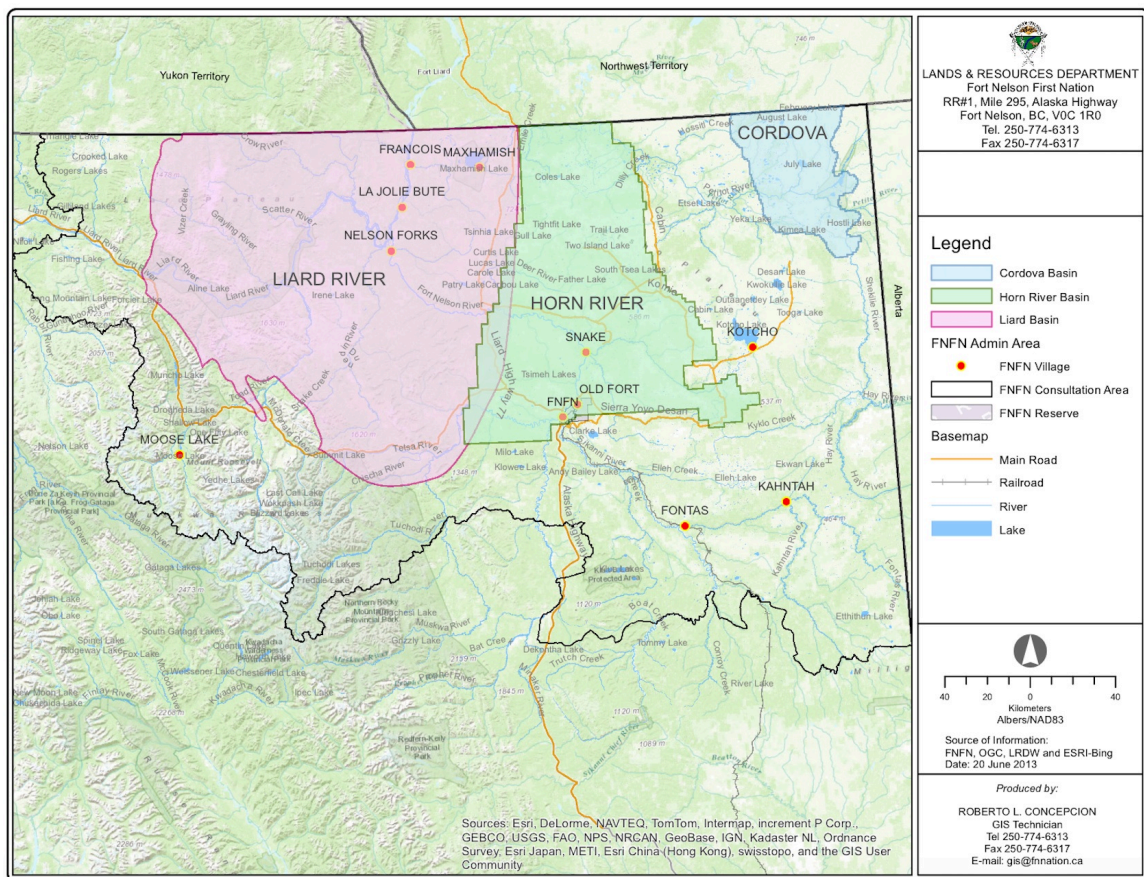


Figure 2: Major shale gas basins in BC (BC MEM, 2011)

According to the BC Ministry of Natural Gas Development's 2014/15–2016/17 Service Plan, annual investment in natural gas and oil exploration is forecast at \$5.5 billion in 2013/14, approximately 10% more than the \$4.8 billion 2013/14 target provided in the 2013/14–2015/16 Ministry Service Plan. For the BC government, investing in natural gas exploration and development activities is critical to advancing the LNG export industry to overseas markets (BC MEM, 2012; Adams, 2014). In this context, shale gas is portrayed, alongside LNG, as a unique and indisputable economic opportunity for the benefit of the entire province. Raw natural gas production in BC in 2013 was 1.58 trillion cubic feet (4.4 billion cubic feet/day), which was second highest in Canada or 26% of total Canadian production. Raw gas production from BC's shale gas regions in northeast BC contributes more

than 60% of the province's total gas production, and that percentage continues to grow (Adams, 2014).

The large scale of BC's shale gas resources and rapid pace of development raises questions over its impacts on both communities and environments. In some places, the resulting rush to extract these resources has already significantly altered physical environments, economic systems, community structures, and human health (Willow and Wylie, 2014). Although proponents have celebrated shale gas development and LNG as the best alternative energy, a great economic opportunity and a "transition fuel," it has numerous critics that focus on a variety of perspectives including impacts on water, climate change and communities (e.g. Parfitt, 2011; Stephenson et al., 2012; Willow and Wiley, 2014, respectively).

## **2.2 The Fort Nelson First Nation**

The Fort Nelson First Nation is a Dene and Cree community whose traditional territory covers a large portion of the northeast corner of British Columbia (BC). The FNFN's traditional territory covers three of the four major shale gas basins in northeast BC (Figure 2). The shale gas industry is not the first extractive industry to hit the FNFN's traditional territory. Treaty 8 (Figure 3) was created in response to conflicts occurring between First Nations and miners passing through their territories (Scott, 1898; Ratcliff, 2015). Industrial resource development has been shaping the lives of Treaty 8 First Nations since settler contact. Understanding the history of resource development in northeastern BC is important to understanding the current resistance to shale gas development. BC relies on resource extraction-based economies and as such, conflicts over resource management have long been endured (Low and Shaw, 2011). These conflicts have raised questions not only about the environmental impacts of resource extraction projects but also about who should manage, benefit from or bear the impacts of these projects (Nadasdy, 2003).

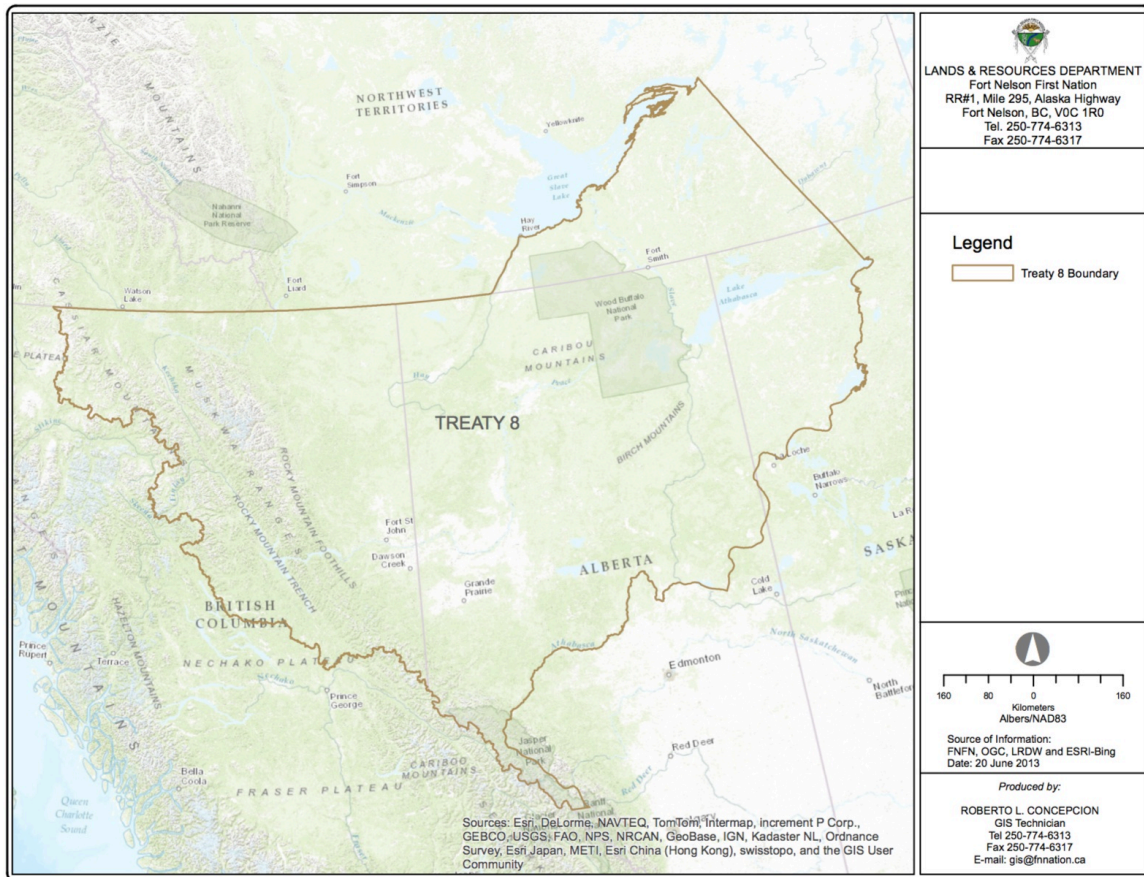


Figure 3: Area covered by Treaty 8 (FNFN Lands Department)

Until the discovery of gold, First Nations of the northwest had largely been ignored (Fumoleau, 2004). When the Treaty was created, and arguably still today, economic considerations outweighed all other factors in the development of Indian policy (Fumoleau, 2004). Treaty 8 provided the federal government with an increased level of certainty and access to profitable resources including gold, lumber, and oil and gas. In 1898, northeastern BC was recognized for its mining potential, ensuring its inclusion in the treaty (Fumoleau, 2004). At the time, Treaty 8 First Nations were most concerned about their ability to continue to hunt, trap and fish freely. At the signing of the Treaty, the Indian Commissioners "...had to solemnly assure them that only such laws as to hunting and fishing as were in the interest of the Indians and were found necessary in order to protect the fish and fur-bearing animals would be made, and that they would be as free to hunt and fish after the treaty as they would be if they never entered into it" (Laird et al., 1899). In 1910, FNFN signed onto

Treaty 8 with the government of Canada, affirming their rights to their traditional lands and ways of life and to live as formerly and undisturbed by newcomers. However, in the 100 years since the Treaty was signed, the FNFN at times questions whether the spirit of the treaty has been forgotten (FNFN SLUP, 2012), as the provincial government's desire to exploit their land for its natural resources is in direct conflict with their treaty rights (e.g. Ratcliff, 2015).

By the 1950s, reserves were allocated to Treaty 8 First Nations and oil exploration was occurring in much of the region. Oil exploration required an expansion of the road network and with roads came more settlers and agricultural development (Ridington, 1982). Increased infrastructure and agriculture led to the degradation of lands previously used for hunting, creating an increased need to supplement First Nations' subsistence lifestyles with cash (Ridington, 1982). Northeast BC is still a remote and sparsely populated area of the province that is primarily a mixed economy. Although the FNFN actively participates in the wage economy, they also continue to substantially rely on the land to meet their needs (FNFN SLUP, 2012; Lutz, 2008).

Since the 1970s, industrial resource extraction in northeast BC has increased. Before the shale gas boom there was already an unprecedented level of impacts to the region from other resource extractive industries including forestry and oil and gas, resulting in un-quantified cumulative effects across the Treaty 8 area (Nitschke, 2008; Ratcliff, 2015). The shale gas industry has exacerbated existing impacts as well as introduced novel impacts to the region through new technologies such as hydraulic fracturing. The expansion of the shale gas industry requires infrastructure such as well pads, seismic lines, roads and pipelines as well as large amounts of water to operate. Cumulatively, new and existing development has resulted in an expanse of impacts to the local landscape with the potential to adversely effect wildlife, biodiversity, surface and groundwater resources, air quality, economic systems, community structures and human health (Garvie et al., 2014; Willow and Wylie, 2014).

### **2.3 Knowledge Politics**

There are many entry points to study the contemporary situation in the northeast, in the FNFN territory. For example, the shale gas industry in northeast BC could be analyzed as simply a politics about access to and control over land and resources as there will likely be losers and winners associated with different scenarios. However, how these politics play out depends on the knowledge claims produced about the impacts or changes to the land (Goldman and Turner, 2011). In this section I introduce the theoretical context for my thesis, which focuses our attention on what geographers Goldman and Turner (2011) term the “politics of knowledge”. This is an approach that does not simply consider the formal politics of who decides or makes decisions, or who benefits and loses (although these are very important), but focuses our attention on how valid understandings of environmental health or ill-health, or impact are produced, applied, and circulated in resource conflicts and decision-making. In other words, this thesis begins from a starting point that environmental data-collection and monitoring are deeply political and worthy of further investigation and consideration.

Such an approach means that we cannot understand current environmental management frameworks and policies without also analyzing the knowledge claims that enable them (Lave, 2012), and vice versa. As figure 4 demonstrates (from Lave 2012, drawing from Prestre 2003), political economic forces (here represented as state and market forces) impact the way that environmental science is produced, shaping what questions are investigated and funded. Ultimately, this knowledge returns to influence state and market forces (as the arrow back up suggests) – thus influencing who benefits from said knowledge. Science studies theorist Dominic Preste (2003) argues we need to understand knowledge in its complexity and in relation to the particular place and time in which it is produced, and how the knowledge that is produced is circulated and applied. Scientists do not always work under circumstances of their own choosing, and those circumstances shape but do not necessarily determine what research is undertaken and the research findings (Lave, 2012). This is doubly the case when resource extraction is at stake, when

governments (like the current BC government) have staked their political life on the growth of shale gas and LNG. Indeed, as I outline below, in the context of northeastern BC, neoliberal environmental management reforms have created a science regime that is reliant on industry-funded expertise.

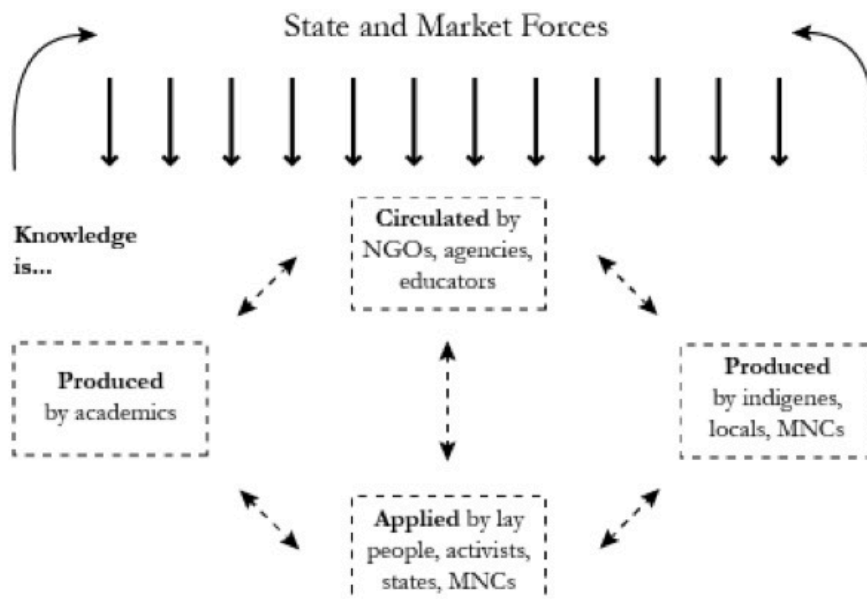


Figure 4: Model of science regime (From Lave, 2012)

Before outlining this neoliberal environmental context in BC, it is crucial to note that the contemporary politics of knowledge continue colonial relations that are of great concern to the FNFN. The FNFN face an uphill battle on this front, given the long history of First Nations' exclusions from state-led land management, which is backed by the colonial assumption that western scientific approaches to understanding and managing the land are objective and therefore more legitimate. Beginning in the mid to late 1800s, scientists began a process of "professionalization," excluding other types of knowledge (Lave, 2012). These exclusionary processes included university degrees and also the creation of professional societies. Professionalization combined with appropriation of other types of knowledge creating a body of knowledge that was the product of "white, Western professional scientists" with no credit or access to the broader community (i.e. the holders of other types of knowledge) that enabled their conclusions (Lave,

2012). During most of the twentieth century, scientists gave little attention to knowledge generated outside of the academy – what Lave (2012) refers to as “extramural science.”

However, around 1980, extramural science experienced a sudden resurgence. In Canada, the integration of indigenous knowledge (a form of “extramural science”) into environmental management policies was required in 1985 (Nadasdy, 1999). Further, the Convention on Biological Diversity, signed in 1992, linked biodiversity conservation with indigenous knowledge. These shifts increased legitimacy of environmental knowledge produced outside of the academy (Lave, 2012). However, extramural knowledge – indigenous knowledge in particular for my case study – is still frequently considered less legitimate compared to university-produced knowledge claims and continues to be a target of appropriation, and of academic study catalyzed by a variety of neoliberal forces (Lave, 2012). Typically, as white, Western scientists do not hold or produce traditional knowledge, it is often inappropriately treated in the academic literature as another form of data – something non-evolving, marginalized, disregarded or endangered or even as an ideal for sustainability (Lave, 2012). On the other hand, this increased attention has given indigenous knowledge more credibility and indigenous groups are now consulted in ways that were previously unimaginable (Nadasdy, 1999). These knowledge politics continue to play out in northeast BC. The FNFN has seen drastic changes to their land base and the subsequent ability to carry out some of their cultural and Treaty rights. This type of visual and tangible evidence of change, as well as their traditional knowledge, is often deemed “anecdotal” by decision-makers. Decision-makers and industry must fulfill the requirement to consult with the FNFN and consider their concerns; however, that process primarily exists to “check the box” in the permitting process, not to incorporate the FNFN’s values, evidence or concerns into the process in a meaningful way (Hayward, 2014; Garvie and Shaw, 2015).

## **2.4 Changing environmental management and monitoring in NE BC**

Understanding an environment and the subsequent potential impacts to that environment, or “knowing nature” is a complex, political process (Goldman and Turner, 2011). In this section I outline how the environmental management regime works in northeast BC and how it has changed to provide more discretion to industry, clearly showing how state and market forces influence the production of environmental knowledge (see Figure 4 above). The section also outlines how the FNFN are incorporated (or not) in the production of knowledge.

### *The state of environmental management: Streamlining*

Provincial governance of the oil and gas industry exists in the context of neoliberal reforms that are changing environmental regulation, streamlining natural resource regulatory processes, and reducing the presence of provincial government staff in the northeast (Markey et al., 2008; McBride and McNutt, 2007). Streamlining the oil and gas industry began in 1998 with the introduction of the BC Oil and Gas Commission (OGC) – a “one stop shop” for industry. The OGC has a broad mandate and is responsible for “reviewing and assessing applications for industry activity, consulting with First Nations, cooperating with partner agencies, and ensuring that industry complies with provincial legislation and all regulatory requirements” (BC OGC, 2013). The Oil and Gas Activities Act (2008) redefined the roles and responsibilities of the BC OGC, giving it “stronger compliance and enforcement powers” and greater authority over a growing number of oil and gas related activities more generally (BC MEM, 2010). At the same time, provincial ministries were downsized, resulting in greater reliance on the industry-funded OGC for expertise. During these regulatory reforms, much of this responsibility was also delegated to industry themselves, who hire consulting companies to generate expertise.

### *The state of environmental monitoring: Current Impact Assessment Framework*

Cumulative environmental impacts are the additive and interactive impacts that result from human activities that are repeated over space and time. Small,

independent actions are often considered individually insignificant. However, over time, such actions can compound and accumulate leading to significant and often irreversible changes to the environment (Tollefson and Wippond, 1998; BC Auditor General, 2015). Managing the cumulative impacts of human activities on the land base is important to ensure the ability to sustainably derive long-term benefits from the province's natural resources (BC Auditor General, 2015). The cumulative impacts of proposed resource extraction projects are often assessed through an environmental impact assessment or a cumulative effects assessment. Cumulative effects assessments are required under the *Canadian Environmental Assessment Act*. However, the *Canadian Environmental Assessment Act* only applies for projects undergoing a federal or joint federal-provincial review, which is not the case for the majority of projects proposed in northeast BC. Many provincial environmental assessment regulations in Canada also require cumulative effects to be assessed, such as in Alberta and Yukon, and while the BC Environmental Assessment Office 2009 User Guide states that it considers cumulative effects in their environmental assessments, it is not a mandatory requirement (Roach, 2012).

Further, due to changes in BC's Reviewable Projects Regulations<sup>5</sup>, many large-scale projects do not require an environmental assessment and their impacts are assessed solely within permitting processes. Even where environmental assessments are occurring there has been inadequate attention paid to cumulative effects, follow-up and monitoring requirements as well as to First Nations' rights (Haddock, 2010; Office of the Auditor General of BC, 2011). Permitting processes assess projects on a reactive, project-by-project or permit-by-permit basis, which is widely acknowledged as inadequate for capturing cumulative effects (Tollefson and Wippond, 1998; Haddock, 2010; Haddock et al, 2012). As neither legislation nor other government directives explicitly require cumulative effects assessment,

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<sup>5</sup> The Reviewable Projects Regulation, under BC's Environmental Assessment Act set thresholds that triggered the EA requirement for certain industrial, mine, energy, waste management, water management, tourism resort, transportation and food processing projects based on proposed size or production capacity. The Environmental Assessment Act was changed in 2002 as part of a broad deregulation of many environmental laws, affecting the size and scope of projects that now require an EA

government bodies such as the BC Auditor General and organizations such as the University of Victoria's Environmental Law Center and West Coast Environmental Law have asked the province to better address the cumulative impacts of development when authorizing the use of natural resources. As a result, the BC government has developed a Cumulative Effects Framework<sup>6</sup> (CEF). However, this framework will not be fully implemented until 2021 and in the meantime, decisions about natural resource development will continue to be made without a full understanding of their implications (BC Auditor General, 2015). Further, it remains unclear how the government will use the CEF in decision-making processes, which is concerning because this is fundamental if the framework is to be of value (BC Auditor General, 2015).

Environmental and cumulative environmental impact assessments, when done well, generate the baseline data required to measure future environmental change against. Without baseline data, it is difficult to understand how projects are approved in the permitting process. In the permitting process for shale gas projects in northeast BC, proponents (via an environmental consultancy service) collect their own data for their permit applications and then store that data in their own private data management system. One major concern for the FNFN Lands Department is the lack of meaningful inclusion of their values in data collection and monitoring activities. Without a consideration of their values and knowledge, the current permitting process produces environmental knowledge about the land and impacts of the shale gas industry that does not address the concerns of the FNFN Lands Department. From their perspective, the environmental knowledge currently produced is incomplete, as it does not account for the cumulative effects of the industry as a whole. This knowledge is then circulated by and through those with decision-making power (industry and provincial regulators).

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<sup>6</sup> The BC government began development of the CEF in 2010. Implementation of the CEF was approved in December 2013. The province claims province-wide implementation by April 2016, not 2021 as the Auditor General Report indicates. There are currently three CEF pilot projects underway.

Through discussions with staff of the FNFN Lands Department, I discovered that there is currently limited monitoring occurring. The majority of monitoring that is occurring is project specific and as a result does not account for the “big picture” of the environment or how it is changing (i.e. the cumulative effects). Through conversations and a search of what’s publicly available, I learned that, at the time of my research, there was no air quality monitoring, some caribou monitoring as well as monitoring for water quality and quantity<sup>7</sup>. However, the general consensus from the staff at the Lands Department was that this limited amount of monitoring is not sufficient as it has not adequately established baseline data on the values of importance to them and as a result cannot fully capture how and if the landscape is changing and in what ways. In addition to being project specific and not region-wide, the monitoring that is occurring is not guided by the same protocols or guidelines so it cannot be easily shared. Without region-wide guidelines for data collection activities, it is difficult to share the information collected as well as to build off of it.

From the FNFN’s perspective, there are data gaps (i.e. no data being collected) on certain values of importance to them, particularly in relation to establishing a baseline and understanding the cumulative impacts of development across the entire landbase. Equally important though, are the knowledge gaps created by a lack of transparency into and sharing of much of the data that is collected by proponents (i.e. data collected outside of what’s publically available on government websites). It is from this understanding – that there are data gaps on values of importance to the FNFN in combination with knowledge gaps created by a project-specific/proponent-driven approach to monitoring – that my thesis research begins. This research also recognizes that the FNFN has diverse relationships with different proponents where some proponents are more aware of and responsive to working with First Nations than others.

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<sup>7</sup> More information on current water monitoring is publicly available from <https://www.bcogc.ca/public-zone/water-information> and <http://www.geosciencebc.com/s/HornRiverBasin.asp> and available upon request from [http://www.env.gov.bc.ca/epd/wamr/ems\\_internet/](http://www.env.gov.bc.ca/epd/wamr/ems_internet/)

Theorizing neoliberal environmental knowledge production in general, Lave (2012) argues the effects of neoliberal science regimes are contradictory: appropriation, privatization, and commercialization on one hand and increased visibility and respect on the other. This contradiction is evident in my research. Members of the FNFN are often utilized in monitoring activities primarily in order to fulfill participation requirements. While this makes it appear that the FNFN is involved in industry monitoring activities, it was explained by interview participants that in these scenarios, the members are often not treated with respect and their knowledge is taken out of context and used without permission. As a result, I argue that increased visibility alone does not grant respect or legitimacy to indigenous knowledge in knowledge production processes. Rather, only by shifting current power dynamics within the current environmental management regime can the FNFN participate in the production of scientific claims. Any scientific claims produced about the shale gas industry have to be seen alongside the values and the political-economic context that created them. This shapes and frames the environmental research affecting which information is collected, used and circulated (Forsyth and Walker, 2008; Forsyth, 2011; Lave, 2012).

### **2.5 FNFN's New Approach**

Given that the provincial government has continuously ignored their concerns over the cumulative effects and lack of baseline studies, the FNFN Lands Department is testing out a new approach to impacts monitoring. In the summer of 2013, the Lands Department learned of Apache's plans for an unprecedentedly large seismic program in the Liard Basin, covering 950 km<sup>2</sup>. Seismic exploration is the process through which companies map out the subsurface location of shale gas in order to plan their future drilling activities. The subsurface impacts of seismic exploration are insignificant; however, the above ground impacts, from cutting the land into grids of three meter wide cut lines, significantly fragment the landscape. The Liard region is relatively undeveloped and extremely important to the FNFN. With Apache's planned seismic program, the Liard's enormous production potential and

the pressure from BC's commitment to LNG, the FNFN knew there would be little chance of stopping shale gas exploration in the Liard. Given the size and importance of the Liard and knowing they cannot count on the current environmental management regime, the FNFN Lands Department chose a pro-active approach to the Apache-Liard Seismic Program. The essence of their approach is to get ahead of current consultation processes and insert their values early on, building a framework for shared decision-making in their territory.

The FNFN's new approach to shared decision-making recognizes the political, environmental and economic stakes in the Liard Basin. As a result, they are working to strategically manipulate the current power structures in their relationships with industry and government with the aim of shifting more decision-making power into their own domain (Hayward, 2014). Through shifting this power and re-aligning their relationships, the FNFN hopes their values will be given more weight in managing and protecting the resources in their territory. The new approach is complex and utilizes a number of different initiatives to address the inadequacies in the current system. Important to this thesis is the new approach to environmental mitigation and monitoring, including fee-for-service consultancy.

The new approach is designed around a fee-for-service consultancy model. Under this model Apache will contract the FNFN Lands Department to provide the planning services in designing permit applications and management plans for their seismic operations (Hayward, 2014). So instead of hiring an environmental consultancy company for their services in assessing environmental impacts and designing and conducting monitoring and mitigation plans, Apache will consult with the FNFN directly to produce these studies and documents. This model is unique for British Columbia. It more closely resembles how industry consults with First Nations on seismic and other programs in the Northwest Territories. In this model the FNFN is paid to integrate and assert their authority, values, interests and limits into environmental management and planning activities, generating greater economic value by investing in capacity building (Hayward, 2014). The new

approach aims to foster relationship building, increase industry accountability to the FNFN and grant more decision-making power to the FNFN. As the service provider to Apache, the FNFN aims to gain more power over how projects are carried out, control the production of environmental knowledge and how the impacts of the shale gas industry are understood and create opportunities for their members to be involved in planning, monitoring and stewardship roles.

Under the new approach, the FNFN Lands Department replaces the environmental consultancy companies in environmental assessment, monitoring and mitigation activities. This switches the accountability of the professionals hired to make the plans and conduct monitoring activities – biologists, hydrologists, archaeologists, and foresters – from their firms and industry to the FNFN. This is a unique approach because instead of challenging the idea of ‘experts’ within the current professional reliance model, the FNFN is challenging and leveraging who the experts are accountable to and whose values shape the data and subsequent knowledge produced about and understanding of the shale gas industry and their territory.

### **3. Research Problem and Questions**

#### *Problem*

The critical context section above presented information outlining my research problem. To summarize: The shale gas industry in northeast BC is rapidly expanding and is promoted by the BC government as a promising economic venture for the entire province. However, the industry is having impacts on the FNFN’s territory although they have protected rights to continue to use the land to meet their subsistence needs. These impacts are not fully understood and continue to be under-explored on issues of importance to the FNFN. Our understanding of the impacts of the shale gas industry in northeast BC to date has been shaped by “knowledge politics” playing out within neoliberal environmental management reforms. Streamlining and deregulation have led to fewer mandatory environmental assessments and increased discretion given to industry and industry-hired consultants to carry out environmental management and monitoring activities. This

created a science regime that is reliant on industry-funded expertise. Further, the FNFN does not have access to the knowledge produced through this process and is otherwise excluded from the regime: the FNFN's knowledge and values are not incorporated, what can be included in the consultation process is limited and the FNFN is excluded from the decision-making process. This thesis brings to light the relationship between the production and politics of knowledge and decision-making. I do this by focusing on environmental monitoring, expertise and the knowledge produced (and excluded) during monitoring activities in Chapter 2 and the challenges of linking knowledge to decision-making in community-based monitoring programs in Chapter 3.

### *Questions*

With this problem in mind, this research revolves around determining how the FNFN can assert their rights and title by taking control of, or inserting themselves in the data collection and monitoring activities of the shale gas industry. I have two main aims:

- 1) To draw upon the perspectives of the FNFN Lands Department to develop an understanding of the challenges they are facing in developing an appropriate environmental monitoring regime, and
- 2) To explore community-based monitoring as a possible way for the FNFN Lands Department to restructure and inform current monitoring activities.

Overall, I am interested in how initiatives led by the FNFN Lands Department can challenge the current knowledge politics and decision-making on and about their territory to change the environmental management regime to better account for the cumulative impacts of industrial development and ensure that the FNFN has a meaningful voice in resource management.

## **4. Methods**

To answer my research questions I used a multi-method approach that included literature reviews and document analyses, semi-structured in-depth interviews,

spending time in the FNFN Lands Department and community and journaling to understand and account for my own positionality.

### *Literature reviews and document analyses*

To answer my first research question, I reviewed both academic and popular news sources on the potential environmental impacts of the shale gas industry, exploring what is known and unknown. Document analysis on the permitting and assessment processes in British Columbia was conducted to gain insight into how and where impacts are being accounted for and monitored. I also analyzed government and non-government documentation on the professional reliance model: What it is; its intentions; whether or not it works; and for whom.

To answer my second research question, I conducted a literature review of other community-based monitoring (CBM) programs. To gain an understanding of CBM generally, I did a broad sweep of the CBM literature and then narrowed the focus to CBM programs in Canada and those that involved First Nations communities. Examining the case studies within Canada involved a document analysis of pertinent programs initiated by government or other agencies. A review of other case studies helped to better understand the variety of CBM programs that exist and the intricacies of their successes and limitations. From a practical standpoint, situating the current research project within the broader field of CBM programs leads me to provide recommendations for FNFN moving forward.

Throughout the literature review, I defined a range of questions that the FNFN could ask while designing their own monitoring program to suit their unique needs. What I produced from the literature review was used to guide my conversations and interviews regarding the FNFN's community-based monitoring and stewardship program. In conversations with the Lands Manager and the Department's lead ecologist, I focused questions on the aspects of community-based monitoring that may be important priorities for the FNFN such as the determination of valued components, the potential role of traditional knowledge in a monitoring program

and how to engage different groups within the community, including trappers or youth, in monitoring activities. In these conversations I did not attempt to impose a specific CBM framework on the landscape of northeastern BC. Rather, my approach was to gain a sense of the FNFN Lands Department's priorities and to ask my interviewees their perspectives on those priorities and how best to implement them. At the time of my field research, the FNFN Lands Department recently proposed a monitoring and stewardship program. The conversation I initiated attempted to ensure that the Department's monitoring program would be a success from their perspective.

### *Interviews*

Both the document analysis and literature review provided crucial context when analyzing my other primary data source: interviews. Because my research questions were exploratory, I conducted semi-structured, one-on-one, in-depth interviews. Purposeful sampling to select informants was used as it allows for the identification of the most knowledgeable informants who will be able to provide rich, insightful data on a particular issue, place, or object (DiCicco-Bloom and Crabtree, 2006). Meetings and interviews were conducted over a period of six weeks in the summer of 2013 in the community of Fort Nelson, located in northeast British Columbia. Eleven interviews were conducted with members of FNFN who are staff at the FNFN Lands Department, non-members of FNFN who are staff at the FNFN Lands Department that both live in and out of the community, members of FNFN who live in the community, provincial government staff living in the community, provincial government staff living outside of the community and industry staff that live outside of the community but spend months of the year working in the region. Eleven interviews was sufficient to capture the key informants required for this research. However, of that eleven only three interviews accounted for government and industry participation. I tried extensively to secure more participation from these groups but continually failed. This limited my research from being able to offer a complete government or industry perspective. Interviews were digitally recorded and journaling was used while in the field to keep track of perceptions and other

details of the meetings and interviews. Interview transcripts were analyzed using NVivo 10, software designed to store, organize and classify qualitative data. Interview transcripts were coded according to themes. In the analysis, particular emphasis was placed on themes that were identified by a majority of those interviewed, or by interviewees from different sectors. During coding, minor themes were identified and amalgamated into the broader, major themes where appropriate. Occasionally, I also draw from minor themes identified by fewer interviewees that did not fit into dominant themes but when doing so it is made explicitly clear.

### *Participant observation*

During my time in Fort Nelson I spent most of my days in the office of the Fort Nelson First Nation Lands Department. During this time I conducted my formal interviews for my research as well as had many informal conversations to understand the varied and complex work of those in the Department. I sat in on negotiations with the BC government and industry representatives. I attended strategic planning sessions with the FNFN's negotiation team. I sat in on calls with the FNFN Lands Department's Water Management Strategy Technical Team. I worked with the Department's Director and lead landscape ecologist on a strategic community-based monitoring and stewardship plan. I attended Lands Department staff meetings and a beaver training session. I went on a helicopter tour of part of the region and saw the expanse of development as well as where many monitoring stations are currently set up. Post-field research, I attended a series of Environmental Appeals Board hearings between the FNFN and Nexen Energy. I returned to Fort Nelson in the winter of 2014 and attended an LNG conference hosted by the FNFN and attended many community and cultural events. Through the FNFN Lands Department, I had access to parts of FNFN's traditional territory, community, and many other important resources that helped me understand the current reality of the shale gas industry as well as the Lands Department's vision for a new approach to managing the impacts on their community and territory. In this way, this research is a collaboration with the FNFN Lands Department. My findings

are not necessarily representative of the FNFN community as a whole but rather those involved in the daily resource management and decision-making processes for the Nation. My observations during all of these activities supplemented my analyses of the formal interviews I conducted.

### *Journaling*

My position as a settler Canadian and outsider to the Fort Nelson First Nation community affected my analysis and interpretations. Working within a community requires an understanding that certain insights can only be obtained through experience – and my experience in northeast BC was limited to six weeks. As a result, I have never directly experienced many of the challenges discussed by my interview participants. I used journaling to keep track of this as well as my general perceptions, feelings and the atmosphere around the experiences I was privileged to. After transcribing and coding my interviews I used my journal to further guide my analysis. Using this method to account for my positionality, I hoped to bring an exploratory voice to my research as well as to bring these issues to an audience that may otherwise never heard of them. Additionally, this research may be added to the FNFN's ever-growing body of resources to be used in negotiations.

## **5. Summary of thesis findings**

Chapter Two sought to determine the perspectives of those working for the FNFN Lands Department on current environmental impact assessment and monitoring processes to identify the challenges they face that need to be addressed. I found that the FNFN's concerns are consistent with wider findings: the extent of the impacts of shale gas extraction, generally, is under-researched and uncertain. However, the FNFN is still faced with a rapidly expanding industry with the potential to severely compromise their culture and Treaty rights. This points to a problem that must be resolved prior to the industry scaling up any more than it already has. Through interviews, I found that the FNFN Lands Department has a series of concerns about how projects are being approved and monitoring is being conducted; mainly that these processes do not include enough baseline studies or consideration of the

cumulative impacts of development. Further, monitoring approaches primarily focus on the values and needs of industry, not those of the FNFN. Interview participants explained their concerns as partially arising from restrictions in current permitting processes, increased discretion to licensees and the reliance on consultants accountable to licensees to produce environmental data for decision-makers. Although the shale gas industry is highly promoted by the provincial government as being safe, understood and highly profitable for the province, this is not consistent with my findings where interview participants suggests a lack of knowledge and limited monitoring of the impacts. In response to this tension, I make suggestions for how current data collection and monitoring activities can involve the FNFN more meaningfully and be made more transparent. Increasing transparency into the use of experts and the knowledge production process and circulating the knowledge more widely to the public and others concerned about impacts could improve trust in its application in decision-making processes. I summarize how the FNFN's new approach addresses some of their key concerns as well as make recommendations for how it could evolve to drive at the deeper issues in the regulatory framework. These recommendations can also be considered in the wider context of professional reliance across the natural resource sector in British Columbia.

Chapter Three sought to explore community-based monitoring as a possible way for the FNFN Lands Department to restructure and inform current monitoring activities. To do this, I answer two questions: What does the FNFN want their CBM program to achieve? And, what can the CBM literature or other resources offer to help them realize their ambitions? I present information that is critical to understanding why the FNFN wants a community-based monitoring program and a summary of the benefits and challenges of CBM reported in the academic literature. My results show the FNFN's goals and priorities for their CBM program and the challenges they face in achieving these. I critically explore what the CBM literature offers to help them negotiate these challenges and achieve these ambitions, concluding with an assessment of some of the limitations of this literature and

suggestions for other resources that provide helpful supplementation. My overall argument includes a list of recommendations for the FNFN to consider in designing their CBM program. However, a perfectly designed CBM program cannot on its own ensure a link to affecting decision-making, a main priority for the FNFN. If the FNFN are not included as decision-makers in a *new* environmental management regime they run the risk of their CBM program extending state power and preventing the FNFN from achieving their priorities instead of utilizing the program as a step toward community empowerment and autonomous decision-making.

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## **Chapter 2: Navigating the impacts of the shale gas industry: A perspective on environmental monitoring activities in northeast BC**

Intended for submission to *BC Studies*

### **1. Introduction:**

The Government of British Columbia has made it an urgent priority to launch a Liquefied Natural Gas (LNG) industry in the Province (BC MEM, 2012; BC Gov., 2011). The industry will primarily be fed by unconventional (shale and tight) natural gas deposits located in northeast BC. Three of the four unconventional gas plays<sup>8</sup> are located in the traditional territory of Fort Nelson First Nation (FNFN). Over the past decade, as the industry has begun to expand into these gas plays, the FNFN has raised concerns about whether the environmental impacts of industry expansion were being properly assessed and monitored (Garvie et al., 2014). The impacts from the shale gas industry are not well understood to date in part because it is a relatively new industry (CCA, 2014; Willow and Wylie, 2014). However, potential environmental impacts of a shale gas industry include habitat loss and impacts to population size and biodiversity from linear disturbance, degraded or diminished surface and groundwater resources from water withdrawals required for hydraulic fracturing, and greenhouse gas emissions and other air quality concerns (Garvie et al, 2014). More crucial from the FNFN's perspective, though, is that this somewhat novel industry, with likewise potentially novel impacts, is being allowed to rapidly expand in the absence of adequate baseline data in their region, which is necessary in order to measure the significance of impacts and determine appropriate thresholds and mitigation measures. This latter work is time consuming, and the tension between these timelines and the rapid timeline that the provincial government has imposed on shale gas development has dramatically heightened the FNFN's concerns about the planned rapid and dramatic expansion of the industry on their territory.

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<sup>8</sup> Shale gas “plays” are shale formations containing significant accumulations of natural gas and which share similar geologic and geographic properties.

There are many entry points to study the contemporary situation in the northeast, in the FNFN territory. For example, the shale gas industry in northeast BC could be analyzed as simply a politics about access to and control over land and resources as there will likely be losers and winners associated with different scenarios. However, how these politics play out depends on the knowledge claims produced about the impacts or changes to the land (Goldman and Turner, 2011). I utilize this theoretical context of “knowledge politics” to analyze what knowledge should count, and on what terms. This is an approach that does not simply consider the formal politics of who decides or makes decisions, or who benefits and loses (although these are very important), but focuses our attention on how valid understandings of environmental health or ill-health, or impact, are produced, applied, and circulated in resource conflicts and decision-making. In other words, I begin from a starting point that environmental data-collection and monitoring are deeply political and worthy of further investigation and consideration.

This research was conducted in collaboration with the Fort Nelson First Nation Lands Department. I examine the FNFN Lands Department’s critical perspectives on environmental monitoring in their territory. My results show that the FNFN has concerns with current monitoring activities, primarily that they are driven by industry licensees and not adequately inclusive of the FNFN. Further, my interview participants reported heavy reliance on industry-hired consultants to design and carry out monitoring activities. There are challenges with relying on professionals as shown in analyses of BC’s forest management framework (e.g. the BC Forest Practices Board and Auditor General) and resource management more generally (e.g. the University of Victoria’s Environmental Law Center and BC’s Qualified Person Cross-ministry Working Group and Ombudsperson). These challenges include increased industry discretion in public interest decision-making, decreased government oversight and issues of accountability. This research contributes to that conversation, showing similar impacts and challenges in the environmental management regime governing the shale gas industry.

I begin with critical context examining the potential impacts of shale gas development, showing the critical importance of baseline data. There are still many unknowns regarding the potential significance of the cumulative impacts. I then introduce the professional reliance model highlighting the challenges that have been reported on its use and drawing connections between these and the environmental management regime in northeast BC. After a brief explanation of methods, I draw on interview data to show the specific concerns the FNFN has with current monitoring activities. My analysis focuses especially on the role and character of professional reliance in current governance models to contribute to the conversation on what increased deregulation and reliance on professionals means for natural resource management in BC. I then outline the FNFN Lands Department's new approach to utilizing consultancy services in conducting impact assessment and monitoring in this context. I conclude with recommendations for all involved – the FNFN Lands Department, government and industry – on how to potentially improve the environmental monitoring and management regime.

## **2. Critical Context:**

In this section I explore how the potential impacts of the shale gas industry are understood and emphasized by different parties. This provides the political context of the shale gas industry in BC and is important given that large-scale decisions require a comprehensive understanding of potential impacts. I then present an overview of the current regulatory processes available for assessing impacts. Decisions are being made in assessment processes without the adequate information to fully understand the significance or extent of the resulting impacts. In the final section I introduce the professional reliance model highlighting the challenges that have been reported on its use and draw connections between these and the shale gas industry.

### **2.1 Impacts**

Recently, the Council of Canadian Academics (CCA), an independent, not-for-profit organization whose tagline is 'science advice in the public interest', released a report titled 'Environmental Impacts of Shale Gas Extraction in Canada.' The report

assesses the “state of knowledge about the impacts of shale gas exploration, extraction and development in Canada (pg. xii).” It acknowledges what the shale gas industry may mean for Canada stating that dependent on gas prices and government regulations the industry could potentially span many decades and consist of tens of thousands of horizontally drilled hydraulic fracturing wells. The report states that the “rapid expansion of shale gas development in Canada over the past decade has occurred without a corresponding investment in monitoring and research addressing the impacts on the environment, public health and communities (pg. xii).” The primary concerns raised in the CCA report include the degradation of surface and ground water quality, increased greenhouse gas emissions and other air quality concerns, disruptive effects on communities and land, potential earthquakes and adverse effects on human health. These impacts will vary by region, as a reflection of different geologies, hydrologies, land uses and population densities. The report concludes that assessment of these environmental impacts is often hindered by a lack of data on key issues especially a lack of environmental baseline data necessary to measure cumulative effects on the land and in communities.

A similar academic study by Souther et al. (2014), focusing on the biotic impacts of shale gas development, came to many of the same conclusions as the CCA Report. They found that the threats to biota from shale development include surface and groundwater contamination, diminished stream flow, stream siltation, habitat loss and fragmentation, localized air, noise and light pollution, climate change and cumulative impacts. Given the knowledge gaps they found, they suggested the highest research priorities to explore the risks of chemical contamination from spills, deep well failures, storage leaks and underground fluid migration. They found that the cumulative effects of shale gas development may represent the most severe threat to plants and animals. Further, Garvie et al. (2014) showed the potential impacts of shale gas extraction specifically in northeast BC to include threats to wildlife, water use and contamination and air quality and greenhouse gas emissions. Additionally, all development in FNFN’s territory is happening without systematic

baseline studies, monitoring, or mitigation plans for cumulative impacts (Garvie et al., 2014; Hayward, 2014).

The provincial government in BC has made it clear that their next big venture is in LNG. This is evident in the creation of the Ministry of Natural Gas Development, the BC LNG Strategy (BC MEM, 2012), BC Jobs Plan (BC Gov., 2011), multiple speeches by the Premier and in many ministerial business plans across the natural resource sector. To have an LNG industry, the gas must first be brought out of the shale. However, the government has not been nearly as explicit about the linkages between shale gas development, or fracking, and LNG. As a result, there is no publicly available documentation of the connection between the two: Given that conventional gas production is declining, virtually all of the LNG would come from shale gas extraction (Garvie et al., 2014). Regardless, when concerns about these potential impacts are raised, the BC government has largely gone on the defense. After the release of the Council of Canadian Academics (CCA) report that urged a cautionary, go-slow approach until more research is done, Deputy Premier Rich Coleman challenged their conclusions saying “I don’t agree with them [...] we do it as well or better than anybody else in the world” and also challenged the objectivity of the scientists themselves (O’Neil and Shaw, 2014). This reaction, while disappointing to many concerned about the environmental and community impacts of the industry, is not surprising. The position of Premier Christy Clark’s government is that natural gas exports will make BC both rich and a global leader “in the transition to a low-carbon global economy.” The conclusions of the CCA report run counter to this position. In fact, even the notion of natural gas as a “transition fuel” has been widely debated (Stephenson et al., 2012; Parfitt, 2011).

There are different levels of concern about the impacts and confidence in how well these impacts are being monitored and assessed, between FNFN and the provincial government. When we turn to the research community for clarity, what is emphasized most strongly is the high level of uncertainty about impacts, and a real concern about whether the conditions are in place to ensure that they are being

appropriately assessed and regulated. This uncertainty frames what may be the biggest challenge the industry faces. As the CCA Report aptly states (pg. xvi):

Public acceptance of large-scale shale gas development will not be gained through industry claims of technological prowess or through government assurances that environmental effects are acceptable. It will be gained by transparent and credible monitoring of the environmental impacts.

## **2.2 Current regulatory processes to assess impacts**

Although there are environmental assessment and permitting processes in BC, at this point these processes only cover a small percentage of the shale gas industry and its impacts (Table 1). This is because the majority of projects in northeast BC do not trigger a formal environmental assessment under the *BC Environmental Assessment Act's* Reviewable Project Regulations. Further, there are no mandatory cumulative impact assessment requirements in BC and the permitting process is conducted in a way that is piecemeal, failing to adequately capture the full suite of potential impacts (Roach, 2012). Within the current Oil and Gas Commission permitting process, recent research found existing consultation processes for oil and gas development in British Columbia inadequate as they do not accommodate First Nations' concerns (Hayward, 2014; Garvie and Shaw, 2014). These processes operate at a culturally inappropriate (project-by-project) scale and exclude First Nations from the decision making process (Garvie and Shaw, 2014). As a result, current processes do not adequately capture the FNFN's values or concerns regarding the lack of baseline studies or cumulative impacts. Further, there are no mechanisms within the regulatory regime to mitigate these concerns and the provincial government increasingly focuses on non-legislated processes. These processes are often still unable to address the suite of concerns of many communities as they are geographically constricted, occurring at a pace slower than industrial expansion, lacking meaningful consultation strategies and have no mandatory requirements.

Currently, the FNFN's values are not included in decision-making processes in their territory until the referrals (i.e. consultation) process (Hayward, 2014; Garvie and

Shaw, 2014). Further, the consultation process requires significant time and resources from the FNFN Lands Department yet yields little influence on permitting decisions. When the Lands Department receives notification of a project, they will often also receive a request from the company for participation of the Lands Department's field monitors. During the project, the consulting company will do an orientation with the FNFN field monitors. Field monitors are requested to assist in a variety of data collection activities including archaeology, wildlife, fish, soil, vegetation, seismic and traditional use studies. FNFN field monitors are employed by the FNFN Lands Department and are entitled to take notes, collect GPS information and take photos, according to protocol agreements. The Lands Department then stores this information in a database and accesses it when needed. However, the FNFN field monitors are essentially 'along for the ride' as the FNFN's values do not shape the data collection activities nor is the data collected by the FNFN field monitors analyzed or used by the consulting company or decision maker. Currently, it is the consulting company, hired by the industry proponent, who designs data collection activities and analyzes and interprets the data in order to produce results in a report for the proponent.

Table 1: Current regulatory processes for assessing environmental impacts of shale gas development in northeast BC

Regulatory Process	Acts and Regulations	Regulator	Required?	Other Processes
Environmental Assessment	BC <i>Environmental Assessment Act</i> and its associated Regulations <sup>9</sup>	BC Environmental Assessment Office (EAO)	No <sup>10</sup>	
	<i>Canadian Environmental Assessment Act</i>	Canadian Environmental Assessment Agency	No	
Cumulative Effects Assessment	Guidelines for CEA are in the Environmental Assessment Office User Guide	BC EAO	No <sup>11</sup>	FLNRO's Cumulative Effects Framework <sup>12</sup> , OGC's Area Based Analysis <sup>13</sup> , Land-Use Planning <sup>14</sup>
	<i>Canadian Environmental Assessment Act</i>	Canadian Environmental Assessment Agency	No	
Permits (including water, well and pipeline permits, etc.)	<i>Oil and Gas Activities Act, Petroleum and Natural Gas Act, Environmental Management Act</i> and associated Regulations <sup>15</sup>	BC Oil and Gas Commission; FLNRO <sup>16</sup>	Yes	

<sup>9</sup> A list and explanation of the Regulations under the BC *EAA* can be found in the Environmental Assessment Office User Guide: [http://www.eao.gov.bc.ca/pdf/EAO\\_User\\_Guide%20Final-Mar2011.pdf](http://www.eao.gov.bc.ca/pdf/EAO_User_Guide%20Final-Mar2011.pdf)

<sup>10</sup> The majority of projects in northeast BC do not trigger a formal environmental assessment under the Act due to amendments in the *Reviewable Project Regulations*

<sup>11</sup> Guidelines for CEA are in the BC Environmental Assessment Office Use Guide; however, CEA is not mandatory in BC.

<sup>12</sup> The provincial government is in the process of conducting a Cumulative Effects Assessment for some parts of the province. The CEA relies on GIS data and has consisted of four pilot projects throughout the province (none as far north as Fort Nelson). Critiques of the framework include the location of its pilot projects and consultation and engagement activities with First Nations. It is unclear how the CEA will be linked to permitting and monitoring processes.

<sup>13</sup> The BC OGC has proposed an Area Based Analysis to address concerns over baseline data and cumulative impacts. See: <http://www.bcogc.ca/node/8254/download>

<sup>14</sup> Land use planning is often argued as a critical tool in natural resource management. It can help address cumulative impacts by determining “no go” areas and setting thresholds for areas with development. However, the province of BC no longer has functional land use planning.

<sup>15</sup> For a list of OGC regulations see <https://www.bcogc.ca/legislation>

<sup>16</sup> For long-term water licenses

### 2.3 The professional reliance model

Over the last decade, the BC government embarked on a major law reform initiative to reduce the “regulatory burden” on industry, reduce the size of the civil service and its role in resource management, and therefore increase the dependence on professionals employed by industry proponents to meet the public interest in natural resource management and environmental protection (ELC, 2015). According to the BC government (2015):

The agencies that regulate the use of natural resources in British Columbia are looking at opportunities to improve the effectiveness and efficiency of natural resource administration. The use of qualified persons is one approach to achieving this objective.

A wide variety of “qualified persons”<sup>17</sup> work in the natural resource sector in BC, providing knowledge and expertise to support decision-making and operational activities. The qualifications required to perform a certain type of work may include registration with a professional association and many of the qualified persons working in the natural resource sector are registered professionals. But the approach to professional reliance is variable across regulatory regimes. Adding to the complexity, different terminology is used in different regulations, varying from “qualified professional”, “qualified person,” “qualified environmental professional,” or “qualified registered professional” to “approved professional” and “authorized persons.” These various terms appear alongside their functions in different regulations. Even where professional reliance is not built into the regulatory regime

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<sup>17</sup> A qualified person is one who possesses the specified knowledge, skills, training, experience and other requirements to perform a specified type of work as:

- set out in legislation
- set out in government policy or
- required by an organization satisfactory to government that has the responsibility for specifying the requirements.

The requirements include holding an accreditation bestowed by:

- government,
- a professional association constituted under an Act, or
- other organization satisfactory to government.

Attainment of the requirements is either

- verified through a process undertaken by government, a professional association or other organization satisfactory to government, to confirm that all requirements are met, or
- self-assessed by members of a professional association constituted under an Act, where a code of ethics requires members to operate only within their area of expertise.

itself, it has become part of the culture of environmental management in BC (ELC, 2015).

Given the variability of professional reliance across regulatory regimes, statements like “professional reliance is a success” or “professional reliance is a failure” are not credible (ELC, 2015). Some environmental management regimes (e.g. BC’s contaminated sites regime) have a well-structured approach to the role of professionals through detailed regulations and agreements between the BC government and professional oversight bodies (ELC, 2015). However, other regimes (e.g. BC’s forest management framework) have reported challenges on a loose and unstructured approach to professional reliance that fails to address known concerns (ELC, 2015; FPB, 2013; Ombudsperson, 2014). Adding further confusion is the fact that “professional reliance” has become a euphemism for deregulation (ELC, 2015). Politicians and professionals both often refer to regulatory systems as “professional reliance” even though the scheme might not actually incorporate any of the elements of deliberate professional reliance regimes. Instead, it may simply be deregulation that removes the oversight role previously performed by government. Deregulation removes government discretion and leaves health, safety and environmental protection to the social license to operate for a given licensee or industry (ELC, 2015). Most licensees employ or contract with professionals to carry out their business, but merely doing so does not indicate an actual system of professional reliance backed by rules and regulations that provide checks and balances (ELC, 2015). This distinction is extremely relevant for this research as the environmental management regime of the shale gas industry in northeast BC is not explicitly a professional reliance regime for all activities. However, whether it is “professional reliance,” reliance on “qualified persons,” or simply deregulation that has provided industry with so much discretion, the regime is negatively impacting the FNFN, other users on the landbase.

The recent ELC (2015) report argues that the role of public interest decision-making, traditionally reserved for government, has been inappropriately

transferred to professionals as a result of legislative structure. This concern has also been raised in BC's forest management framework by the Association of BC Forest Professionals and the Forest Practices Board. Examples include where government discretion is explicitly limited in authorizations and quality control such as the ability to intervene given mistakes or poor professional judgement (ELC, 2015). Further, professional reliance regimes suffer from concerns that conflicts of interest aren't acknowledged or addressed. Sometimes, when forced to balance competing interests of their employer, the public and the environment, professionals will prioritize their employer (ELC, 2015, FPB, 2014). This is enabled through a lack of checks and balances in the professional reliance system. The main accountability in the professional reliance system to hold professionals accountable for poor work is through their professional associations. This is problematic because there is a lack of confidence in professional disciplinary processes (ELC, 2015). In addition, if a professional does not prioritize their employer, they may be subject to "expert shopping," when an expert opinion is undesirable to a proponent, another expert may be sought until the desired advice is found (ELC, 2015).

To summarize, the main challenges with professional reliance regimes include increased industry discretion in environmental management and monitoring activities with decreased government oversight of these activities and subsequent issues of accountability when relying on industry-funded expertise. My research aims to determine the FNFN Lands Department's perspectives on monitoring activities within an environmental management framework that has delegated much responsibly to industry licensees. After presenting my interview results, I discuss this tension and the over-reliance on licensees or consulting companies to make social decisions on Treaty 8 land in the context of managing and monitoring the impacts of the shale gas industry in northeast BC. This research does not explicitly focus on the performance of individual practicing professionals or the professional associations they belong to. Rather, I focus on the overall robustness of the regulatory regime that provides professionals with so much discretion.

### **3. Methods:**

I used a qualitative approach to my research question to help build a better understanding of how the FNFN is experiencing the impacts of the shale gas industry, the processes used to assess and monitor these impacts and the implications, providing a baseline for future research on professional reliance in the shale gas industry in BC.

A review of both academic and popular news sources was conducted on the potential environmental impacts of the shale gas industry, exploring what is known and unknown. Document analysis on the permitting and assessment processes in British Columbia was conducted to gain insight into how and where impacts are being accounted for and monitored. Both the literature review and document analysis provided crucial context when analyzing the other primary data source: semi-structured interviews.

Because my research questions are exploratory, I conducted semi-structured, one-on-one, in-depth interviews (see Appendix 1 for a list of interview questions). Purposeful sampling to select informants was used as it allows for the identification of the most knowledgeable informants who will be able to provide rich, insightful data on a particular issue, place, or object (DiCicco-Bloom and Crabtree, 2006). Meetings and interviews were conducted over a period of six weeks in the summer of 2013 in the community of Fort Nelson, located in northeast British Columbia. The results of this research are based on eight interviews conducted with members of the FNFN who are staff at the FNFN Lands Department, non-members of FNFN who are staff at the FNFN Lands Department that both live in and out of the community and members of the FNFN who live in the community. Interviews were digitally recorded and journaling was used while in the field to keep track of perceptions and other details of the meetings and interviews. Interview transcripts were analyzed using NVivo 10, software designed to store, organize and classify qualitative data. Interview transcripts were coded according to themes. In the analysis, particular emphasis was placed on themes that were identified by a majority of those

interviewed, or by interviewees from different sectors. During coding, minor themes were identified and amalgamated into the broader, major themes where appropriate. Occasionally, I also draw from minor themes identified by fewer interviewees that did not fit into dominant themes but when doing so it is made explicitly clear.

#### **4. Results:**

Interviews revealed the impacts of most concern to the FNFN and the specific concerns that the FNFN Lands Department has with current monitoring activities. I first outline the impacts of most concern, including the cumulative effects of development and lack of baseline studies, in order to show that these concerns are not being accounted for in current monitoring activities. I then outline the FNFN Lands Department's specific concerns with current monitoring activities including:

- Accountability
- Lack of coordination and transparency
- Ownership of monitoring data
- Knowledge produced and used for decision-making

#### **4.1 Impacts of concern**

##### *Cumulative effects*

Interview data revealed that the biggest impacts of concern for the Fort Nelson First Nation Lands Department and others living in the area include impacts to water quality and quantity from hydraulic fracturing, air quality from venting to the atmosphere, and health of certain wildlife species – both their tissue health and habitat – particularly moose, deer and beaver. The most frequently mentioned concern was the cumulative impacts on the above-mentioned components, especially in relation to Treaty rights. Many interviewees referred to this as the “big picture” and that the impacts from the shale gas industry *as a whole* are not being adequately considered when permits are granted or during monitoring activities. The cumulative impacts from the shale gas industry were a concern for many participants who expressed that ecological links are being ignored:

The oil and gas industry is destroying the landscape starting with seismic - they mulch up the forest - mulch chips are eroding and contaminating the water system. Well pads destroy trees and change the landscape – they say it’s a small footprint but I don’t know how they got that – it’s actually a bigger footprint, cumulatively, with all the companies and all the wells they want.

Air, water, wildlife habitat – they’re all dependent on one another; all part of the jigsaw puzzle.

There are consequences of oil and gas activity, especially the fracking on the water, the vast amount of water it uses. And that water – if it was just the water, left on its own, the land will heal the water and the water will heal the land – but that whole system is being interrupted by overuse of water.

Interview participants were also concerned about the long-term impacts to future generations, asking the question of who is assuming responsibility for them: “I wonder why industry has such short-term plans: 40 years – Our grandchildren will be here longer than that,” and:

They've always said the right things to us. We've always had concerns about the water and about the land and about the animals and about the people who go out on the land and about the fish and about the berries – Those things matter to us and they've always assured us that they've taken really good care of it and that nothing's going to happen to it and that they're always going to look after our interests. And then these companies get sold. So what happens to all of those discussions that we had? They got what they wanted and they just carry on but we're still here dealing with the consequences.

### *Baseline studies*

The lack of baseline studies conducted in northeast BC was a large issue and focal point for the majority of participants. Baseline studies are fundamental because they provide information on the current state of the environment, pre-disturbance, against which change can be measured throughout the life of a project. Without adequate baseline studies, participants wondered how potential impacts are determined and decisions are being made:

I think there is a definite weakness in the fact that we lack a significant amount or any baseline data to be able to accurately understand – especially specific to water and flow rates – Yes, there are monitoring stations but from what I understand they are old and the data is old. I think that because of the lack of baseline data, I'm not too sure how we can possibly continue moving forward,

issuing permits and licenses to allow significant amounts of water to be withdrawn, when we don't even know what impact that may or may not have on the water cycle. And not just the water cycle but also the entire local ecosystem.

Participants did agree that some baseline studies are being conducted but that "it's not enough and the approach is uncoordinated." One participant commented on the inadequacy of the timeframes and scope of current baseline monitoring:

There needs to be more baseline monitoring done, and for a number of years, not just one or two years as this doesn't fully capture how and if the landscape is changing and in what ways. Region-wide monitoring also needs to happen. Right now most monitoring is based on specific projects, which doesn't give the government, First Nations, or industry a true idea of what the 'Big Picture' effects are.

#### **4.2 Impacts Monitoring**

Interview participants were dissatisfied with the ability of current monitoring activities to address the impacts of most concern to them. Interview participants explained that current monitoring activities do not reflect the FNFN's concerns primarily because they are "industry-centric." Further, interview participants critiqued the use of industry-hired consultants and current monitoring activities for a variety of reasons including a lack of meaningful relationships to the FNFN or landbase; primary accountability of consultants to the licensee and the licensee's values; lack of coordination between companies; ownership of monitoring data; lack of transparency into data collection activities and data use; and the knowledge generated and used in decision-making.

##### *Lack of meaningful relationships*

Interview participants expressed concerns with how much say environmental consultants currently have: "Right now companies like Amec and Stantec and EcoFor and EcoWeb, etc. [environmental service/consulting companies] are doing all the [management, mitigation, monitoring] planning." This was concerning for participants partly because these companies often work on a fly-in, fly-out basis and as such do not have the same intimate understanding of the land base as someone who lives on the land and spends more time on the land.

Although consulting companies will often hire the FNFN Lands Department field monitors to participate in their field studies, interview participants did not think that this type of inclusion was adequate. Currently, the Lands Department's field monitors are sent out to "witness what's going on and follow along with what the company needs." As explained by the Lands Department's field coordinator, field monitors are sent out on a job after they receive notification of a project and a project participation request for a field assistant from a company. The projects that field monitors are asked to participate in include archaeology, wildlife studies including bird and moose surveys, fish studies, other aquatic studies, vegetation, soils and invasive plant studies. When out in the field, the Lands Department field monitors are able to collect their own data, including notes, photographs and GPS points; however, one field monitor expressed that "a lot of people from industry treat the FNFN monitors as mules or slaves that are only there to carry equipment." Further, the FNFN Lands Department director said that:

Our monitoring program has been just us as First Nations participants, which is standard across the industry. They think that it's enough to have us appear to assist the archaeology crews or the biology crews and not really have a say in what it is they're monitoring or why they're even out there.

Interview participants discussed these concerns in the context of the lack of meaningful relationships where the FNFN's cultural values, knowledge and understanding of the landbase are not taken seriously. This is indicative of deeper colonial relations where the permit holder or licensee perceives its primary relationship and sense of responsibility to the state and not to the Nation, resulting in the inferior treatment of the FNFN as they are not seen as rightsholders.

#### *Accountability*

Interview participants expressed concern that consulting companies are hired and paid for by industry. This accountability issue was explained as problematic because:

The way it's happening now is that those folks [consultants] who go out and do the work currently report to the company - the company is the boss and they

have 2 drivers: Getting their bosses the information that they want and doing it as cheaply as possible with the budget that they have.

For interview participants, the primary accountability of consulting companies to their industrial employer also means that they are accountable to their employer's values and exclude the values of the FNFN. The majority of interview participants expressed that current monitoring activities are not adequately grounded in the values of the FNFN. As explained by participants, values are a fundamental part of permitting and monitoring processes. Values determine what will be monitored and thus shape planning and management activities. As a result, whose values shape what is monitored, managed and protected is fundamentally important. One interview participant used the example of beaver management plans. In industry's view, a beaver management plan is one that keeps the beavers from interfering with industry operations, including shooting beavers and destroying their dams. However, from the FNFN's perspective, beavers are linked to their culture and Treaty rights. Thus, although both the FNFN Lands Department and industry may want a beaver management plan, the values that inform that plan can be fundamentally different, leading to radically different outcomes. This was one example used to express a major concern for interview participants where the accountability of those in charge of designing monitoring and management plans is to the needs and economic values of their industrial employer with little regard for the FNFN's cultural values and Treaty rights.

Interview participants also expressed concern over who current regulators, primarily the BC Oil and Gas Commission, are accountable to, arguing that it is to industry and not the FNFN or the general public. An example of this provided by one interview participant was the current compliance and enforcement regime. This participant explained that it is an industry-biased approach where the regulator is making it easy for the industrial proponent:

I know [the Oil and Gas Commission] does audits and sometimes they do field investigations but usually with plenty of notice given to the company. This means that a company has time to prepare for the inspection ensuring any non-compliance activities are in compliance by the time of the inspection.

Participants expressed that the implementation of current compliance and enforcement activities suffers from an industry-biased approach, which was partly contributed to a lack of government staff available to conduct surprise investigations. Compliance and enforcement is usually an important part of the environmental assessment or permitting process to ensure operators are following the conditions designed in the assessment or permitting process to mitigate potential adverse effects. However, interview participants do not believe the BC Oil and Gas Commission's (OGC) implementation of compliance and enforcement activities to be adequate or fair. First, participants feel there is an inadequate amount of compliance and enforcement staff saying: "The OGC has one, possibly two, compliance and enforcement officers that work in the area and I'm not sure how active they are;" and:

The government has two - three different forms of compliance and enforcement in northeastern BC. One of them being the OGC and their compliance inspectors of which I think there's 2 or 3 in Fort Nelson. Other compliance is through the Conservation Officers and there are only 2 in Fort Nelson, serving a very broad landscape as well. There is minimal staff that have a very broad area to cover.

*Lack of coordination and transparency*

Interview participants were concerned that there are so many licensees operating on the landbase, a variety of consulting companies employed and no overarching rules to standardize or coordinate their activities. One interview participant described this uncoordinated approach in relation to government and industry: "industry is doing their thing and the BC government is doing their thing and the federal government is doing their thing." This was problematic for interview participants because, from their perspective, the cumulative impacts are of critical importance and can't be adequately dealt with when operators and regulators are approaching assessments, permits and monitoring in a uncoordinated, compartmentalized manner. Frustrations were also expressed over the lack of transparency, information sharing, standardized methodology and a centralized

database. One interview participant explained this in the context of water monitoring:

The oil and gas industry does conduct some water monitoring, but all the companies aren't using the same protocols and guidelines, so a lot of the data can't be shared easily. There needs to be a province-wide guideline on collecting water data so that it can be shared effortlessly to anyone that wants to access it, or build off of it.

Employees of the Lands Department are able to request to view data but as emphasized above, data is not always collected in a way that allows it to be easily shared. Further, the timelines to process requests and wait to receive it are often so slow that it is not worthwhile for FNFN Lands Department Staff. Given that data is often collected in places or on values that are not in line with those the FNFN views as appropriate, the data is often of little use to them. Further, there is often a high level of mistrust between the Lands Department and some licensees and they therefore have little confidence in the licensee's data. For these reasons, ownership of data was a primary concern for the FNFN.

#### *Ownership of monitoring data*

Interview participants explained that consulting companies often treat the information they have gathered as their own and reuse it without re-consulting with FNFN:

Consultants accumulate as much information as they can. They take Traditional Use Study information, land information, water information and they hold it and then they re-sell it. This may be intentional or not. But from FNFN's point of view, from the aboriginal relationship to the land point of view, it's wrong. Because everything is a blank sheet, everything belongs in the conversation about what's happening. It is paternal and offensive for someone to say 'oh we know all about that, so that's why we avoided it.' It's nice but it misses the point – just because you know the location of one burial ground, for example, doesn't mean that there isn't something else in the area. What it does mean is that they haven't looked at the whole perspective, which is the entirety of the suite of values of the ecosystem.

Once a consulting company collects data in a given area for a specific purpose, they and their employer then own that data and are free to use it in any way they desire without re-consulting with FNFN. Interview participants explained that this data is

often not publicly available or shared between licensees. If an FNFN field monitor is used in the data collection activities, the information they provide to the consultants is often misused or misinterpreted. For example, one participant explained that if an FNFN field monitor mentions to a consultant when out in the field that their relative used to have a cabin in the area, the consultant will use that information as “traditional knowledge.” Interview participants were concerned with this type of misuse: Portraying anecdotal stories told out in the field as traditional knowledge or counting the fact that the FNFN field monitors were involved as consultation with the FNFN Lands Department.

*Knowledge generated and used*

In the concerns raised about current monitoring activities, themes about authority and knowledge emerged. In the data collection process, the FNFN’s values and knowledge are not incorporated nor do they have the authority to insert them. The data or knowledge that is produced from current monitoring isn’t transparent, accessible by or useful to the FNFN Lands Department, as their values, culture or Treaty rights do not inform it. One interview participant aptly linked authority, knowledge and decision-making to the lack of baseline studies:

I think that the challenge with northeast BC is that it’s the money making machine for the entire province. But there are not as many people knowledgeable about – there are a lot of people knowledgeable about the permitting process and pumping permits and licenses out the door – but there are few people who are actually knowledgeable about the land and the cumulative effects. There’s just such a limitation on the amount that’s known about anything – baseline data on anything. But it’s kind of the elephant in the room – we all know that there’s a lack of this knowledge so how come we’re not going out and gaining that knowledge? And there’s a lot of people in positions of power that live outside of this area who are making decisions – I really think that you need to *really* know the people and know the area and know the land if you’re going to be making these really big decisions.

**5. Implications:**

My results show that the FNFN has major concerns with the current monitoring initiatives accounting for the impacts of the shale gas industry in northeast BC. Many of the FNFN’s concerns are linked to and were articulated specifically in relation to over-reliance on industry-hired professional consultants. Interview participants’

main concerns with how current consultancy companies work include the lack of meaningful relationships to the FNFN or landbase; primary accountability to their industrial employer and their employer's values; lack of coordination between companies; ownership of monitoring data; lack of transparency into data collection activities and data use; and the knowledge generated and used in decision-making. In the critical context section I presented the challenges seen in streamlining regulation and providing increased discretion to industry licensees in professional reliance models. Debate over the effectiveness of professional reliance is not unique to my case study and is currently a heated topic across the natural resource sector in BC (Haddock, 2014; BC Ombudsperson, 2014; Hoekstra, 2015; Forest Practices Board, 2014; Professional Employees Association, 2014); however, discussing its implications in the shale gas industry is a new contribution to that conversation. In this section I discuss the implications of my results in a broader context of impacts, the reliance on professionals or qualified persons as well as through explaining what the FNFN Lands Department is doing to address their concerns.

### **5.1 The politics of knowledge in shale gas extraction in northeast BC**

On one hand, the provincial government in BC is promoting LNG and the required shale gas extraction as a promising venture for both British Columbians in terms of job creation and the globe in terms of transitioning away from fossil fuels and for profitable exports. At the same time, as my research highlights, they are ignoring or disputing claims by the FNFN and researchers that the impacts are under-investigated and potentially wide-ranging. In a move to streamline approvals across the natural resource sector, they have employed a model of professional reliance, with a decreasing amount of public servants on the ground monitoring and in the office knowledgeable about the impacts. Streamlining was undertaken to allow for more efficient processes for proponents as well as to maintain environmental sustainability objectives. While this approach has led to an industry that serves the needs of proponents very well, it is not serving the needs of the FNFN or considering their culture and Treaty rights.

For the FNFN, this is particularly troubling with the lack of knowledge and data surrounding the impacts of shale gas and LNG and in the absence of regulation requiring the assessment of cumulative impacts. Instead, projects are assessed through an uncoordinated, permit-by-permit process. Interview participants emphasized a general lack of knowledge on the baseline state of the environment and the cumulative impacts of development. However, the response of the BC government has been to ignore or dispute these concerns put forward by the FNFN and others. Interview results provide evidence, at the community-level, that there has not been adequate monitoring of, or research on, the impacts of the shale gas industry from an ecological or community perspective (CCA, 2014). Further, the results from this research show that although there are some monitoring initiatives in place, those on the ground experiencing the impacts are dissatisfied with them.

According to provincial regulators, the impacts of the shale gas industry in northeast BC are being assessed in current permitting processes and they are being tracked and mitigated with current monitoring efforts. However, as evidenced in this chapter, impacts are not fully understood or accounted for in current processes. The implications of this may range from severe environmental consequences to a loss of confidence in the current regulators and resource development (i.e. social license to operate). Severe environmental consequences can result when decisions are made in the absence of adequate information or under poorly designed programs. A recent case brought before BC's Environmental Appeal Board between Chief Sharlene Gale in her own right and on behalf of the members of the Fort Nelson First Nation and the Assistant Regional Water Manager and Nexen Energy ULC is an example of this. The hearing showed the implications of flawed monitoring programs used in decision-making, resulting in a massive over withdrawal of water in the Tsea Lakes area. Also of interest is the scope of the hearing: It showed the extent of potential environmental impacts that can result from decisions based on inadequate information at the project-level (i.e. from a *single* project). Scaling up, the potential impacts at a landscape-level from *multiple* projects all relying on inadequate information could be catastrophic. This concern regarding the

cumulative impacts of development is constantly raised by FNFN but they have yet to be given an adequate response.

The provincial response to cumulative impacts across all of British Columbia has been the Cumulative Effects Framework (CEF), which will rely on existing monitoring programs. This is problematic from the FNFN's perspective because, according to my interview participants, current monitoring initiatives are inadequate, suffering from questions around values, ownership of data, accountability and coordination. Further, the CEF will not be fully implemented until 2021 and in the meantime, decisions about natural resource development will continue to be made without a full understanding of their implications (BC Auditor General, 2015). It remains unclear how the government will use the CEF in decision-making processes, which is concerning because this is fundamental if the framework is to be of value (BC Auditor General, 2015). Because the BC government has interpreted and portrayed northeast BC and the shale gas industry as an economically positive venture for the province, it makes sense that they are in no hurry to create better legislation or directives for assessing and monitoring cumulative impacts. However, evidence for the need for better legislation or directives continues to mount (BC Auditor General, 2015; Haddock et al., 2012; BC Auditor General, 2011; Haddock, 2010).

## **5.2 Professional Reliance**

Streamlining regulation provides increased discretion to industry and industry-hired consultants to make decisions and carry out environmental management and monitoring activities (ELC, 2015; FPB, 2013). Decreased government discretion within permitting processes and in quality control over data collection and management was a major concern for interview participants in this research. This is what led interview participants to describe the current environmental management and monitoring regime as "industry-centric." Further, much of the problem for interview participants with an industry-centric approach, or increased discretion given to licensees, was the accountability of licensee-hired consultants (qualified

persons). The accountability of qualified persons to their employers is a large challenge in professional reliance regimes (ELC, 2015; FPB, 2014). Much of BC's deregulation goes too far in handing over matters of the public interest to those employed by industry (ELC, 2015). Proponents should not be decision-makers for matters involving the weighing and balancing of multiple, often competing, environmental and societal values. This raises conflicts of interest and a lack of democratic accountability for many resource management decisions (ELC, 2015).

The government is lacking clear objectives and priorities for baseline studies and cumulative effects assessment in northeast BC, the values of concern to the FNFN. The objectives and initiatives that are in place were assessed by participants in this research as exclusionary of the FNFN, uncoordinated and non-transparent. It is the responsibility of the licensee and their hired consultants to propose monitoring and management strategies within government objectives, even if those objectives do not reflect the concerns of other users on the landbase. Professionals are expected to navigate either a lack of objectives or objectives that conflict with other values on the landbase and interpret what they mean in order to propose plans for licensees. This can be very difficult and also problematic as members of the public and other licensees in the same area often hold conflicting views of what is in the public interest (FPB, 2013; ELC, 2015). Professionals, through their professional associations, have an obligation to the public as well as ethical obligations. However, individual professionals working for a licensee are challenged to balance their employer's interests with the expectations of the public and others, placing them in a difficult position with a perceived vested interest (FPB, 2006; 2008; 2009; 2010).

Government support of existing regimes relying on professionals or qualified persons is insufficient for success (ELC, 2015). Examples include the erosion of government oversight and accountability capacity such as reduced compliance and enforcement resources; reduced stewardship staff and expertise; and failure to apply continuous improvement to address known issues (ELC, 2015). To address these issues, regulators and professional associations could provide more guidance

to those designing and implementing plans and programs to incorporate best practices, improve consistency and provide more accountability for the information generated (FPB, 2014; ELC, 2015). More guidance could help address many of the concerns presented by participants in this research including the lack of coordination between companies and the lack of transparency into data collection activities, data use and the knowledge generated and used in decision-making.

In all of the reports I read on professionalization (e.g. FPB, 2014; Ombudsperson, 2014; ELC, 2015), I found no guidance to professionals on how to approach First Nations' issues. Treaty 8 is a relationship between the FNFN and the government, not a relationship between the FNFN and industry. The ability to uphold the Treaty and the FNFN's subsequent Treaty rights is one of the many troublesome aspects of delegating so much discretion to licensees. Asking professionals to make decisions regarding Treaty 8 land without clear direction on how to adequately consult and include the impacted First Nations is one of many social decisions and responsibilities that government should not be able to delegate so easily. Given recent court decisions in BC (e.g. Fort Nelson First Nation v. British Columbia (Environmental Assessment Office), 2015 and Tsilhqot'in Nation v. British Columbia, 2014) and the focus on the use of qualified persons in the natural resource sector, this work should be undertaken as it ties into the province's duty to consult and the subsequent inclusion of First Nations in environmental management and monitoring activities.

## **6. The FNFN Lands Department's response to this context**

The FNFN Lands Department is testing out a new approach to impacts monitoring given that they are dissatisfied with current monitoring activities and the provincial government continuously ignores their concerns over the cumulative effects and lack of baseline studies. In the summer of 2013, the Lands Department learned of Apache's plans for an unprecedentedly large seismic program in the Liard Basin, covering 950 km<sup>2</sup>. Seismic exploration is the process through which companies map out the subsurface location of shale gas in order to plan their future drilling

activities. The subsurface impacts of seismic exploration are insignificant; however, the above ground impacts, from cutting the land into grids of three meter wide cut lines, significantly fragment the landscape. The Liard region is relatively undeveloped and extremely important to the FNFN. With Apache's planned seismic program, the Liard's enormous production potential and the pressure from BC's commitment to LNG, the FNFN knew there would be little chance of stopping shale gas exploration in the Liard. Given the size and importance of the Liard and knowing they cannot count on the current environmental management regime, the FNFN Lands Department chose a pro-active approach to the Apache-Liard Seismic Program. The essence of this approach is to get ahead of current consultation processes and insert their values early on for a new approach to shared decision-making in their territory.

FNFN's new approach to shared decision-making recognizes the political, environmental and economic stakes in the Liard Basin. As a result, they are working to strategically manipulate the current power structures in their relationships with industry licensees and government in order to shift more decision-making power into their own domain (Hayward, 2014). Through shifting this power and re-aligning their relationships, the FNFN will ensure their values are given more weight in managing and protecting the resources in their territory, to which they have rights and responsibilities. The new approach is complex and utilizes a number of different initiatives to address the inadequacies in the current system. Important here is the new approach to environmental mitigation and monitoring, including fee-for-service consultancy.

The new approach is designed around a fee-for-service consultancy model (Hayward, 2014). As described to me by the FNFN's lead negotiator, under this model Apache will contract the FNFN Lands Department to provide the planning services in designing permit applications and management plans for their seismic operations. More simply, instead of hiring an environmental consultancy company for their services in assessing environmental impacts and designing and conducting

monitoring and mitigation plans, Apache will consult with the FNFN Lands Department directly. According to one interview participant, this model is unique for British Columbia but more closely resembles how industry consults with First Nations on seismic and other programs in the Northwest Territories. In the new approach, the FNFN is paid to integrate and assert their authority, values, interests and limits into environmental management and planning activities (Hayward, 2014). It aims to foster relationship building, increase consultant and industry accountability to the FNFN Lands Department and grant more decision-making power to the FNFN. As the service provider to Apache, the FNFN gains more power over how projects are carried out, controls the production of environmental knowledge and how the impacts of the shale gas industry are understood through data collection activities and creates opportunities for their members to be involved in planning, monitoring and stewardship roles.

The FNFN's new approach addresses many of the concerns expressed by interview participants. Through appropriating the consultancy model they are effectively shifting the relationship between consultant and licensee. By doing this, the FNFN inserts their values much earlier than they are currently able to in the permitting process. For the Apache-Liard Seismic Program, the FNFN has also inserted their values into the design of data collection activities. This makes the consultants accountable to the FNFN's values as well as to those of the licensee and current regulations. In the new approach, the FNFN will own and store all of the above-ground data collected for the Apache Liard Seismic Program. The process used in the new approach greatly increases transparency for the FNFN into the relationship between hired consultants and Apache. What the new approach does not ensure is the same type of changed relationship or care for the FNFN's values with licensees and consultants outside of the Apache Liard Seismic Program. Further, it does not increase coordination between licensees across the landbase, ensure a standardized approach or offer mechanisms for limiting the impacts of development.

However, the Apache Liard Seismic Program has the potential to address some of these deeper issues in the regulatory framework governing the shale gas industry. If

it is successful in granting the FNFN more protection for their cultural and Treaty rights and more decision-making power, the Lands Department may make it the new standard for how licensees must consult with them over impacts assessment, monitoring and management activities.

## **7. Conclusion and Recommendations**

Although FNFN's concerns are consistent with wider findings on the unknown impacts of shale gas extraction, the community is still faced with a rapidly expanding industry with the potential to severely compromise their culture and Treaty rights. This points to a problem that must be resolved prior to the industry scaling up any more than it already has. I found the FNFN has a series of concerns about how projects are being approved and monitoring is being conducted, mainly that these processes do not include enough baseline studies or consideration of the cumulative impacts of development. Further, monitoring approaches primarily focus on the values and needs of industry, not those of the FNFN. Interview participants explained their concerns as partially arising from restrictions in current permitting processes, increased discretion to licensees and the reliance on consultants accountable to licensees to produce environmental data for decision-makers. Although the shale gas industry is highly promoted by the provincial government as being safe, understood and highly profitable for the province, this is not consistent with our findings where participants and wider research suggests a lack of knowledge and limited monitoring of the impacts. The FNFN Lands Department's new approach to consultancy hopes to address many of their concerns. Their new approach is unique because instead of challenging the idea of 'experts' within the current professional reliance model, FNFN is challenging and leveraging who the experts are accountable to and whose values shape the design of data collection activities and the subsequent knowledge produced about the shale gas industry and their territory.

Below is a summary of how the FNFN's new approach addresses some of their key concerns as well as recommendations for how it could evolve to drive at the deeper

issues in the regulatory framework. These recommendations can also be considered in the wider context of professional reliance across the natural resource sector in British Columbia.

**1. Early and meaningful consultation of the FNFN Lands Department by those in charge of designing and implementing environmental management and monitoring plans and programs. The FNFN Lands Department should not only be consulted as part of the permitting process but on management plans and monitoring programs.**

Consultation should occur prior to monitoring initiatives being designed and include discussions on values, protocols and data sharing and management. Involving FNFN in creating management and monitoring plans prior to permits being granted will allow for increased inclusion of their values, transparency and trust in the monitoring data that's collected. By instilling their values in management plans before they are sent to the regulator and through the permit application, FNFN's values will be reaffirmed in the permit once granted, rather than industry's values, as participants perceived the current case to be.

**2. The FNFN Lands Department should utilize resources and agreements with industry or government to ensure capacity is built within the community to involve members in monitoring processes in a meaningful way.**

Involving members of FNFN in monitoring initiatives in a meaningful way helps to further ensure the inclusion of traditional knowledge. Building the capacity in the community to fulfill this recommendation also aids in taking steps toward gaining more authority on the land base (explored further in the next chapter).

**3. Increased regulatory oversight by the provincial government of the professional-reliance or qualified persons model currently used for designing and implementing monitoring initiatives.**

This could include amendments to the legislation governing assessment and permitting processes to allow for increased oversight on the design of

monitoring programs. However, this would require more government resources and perhaps a step back along current streamlining processes. Along the same vein, professional reliance is a double-edged sword, while good if used correctly, it requires resources and due diligence to implement it properly. While we know that professional reliance requires more government oversight to function properly, at the same time government resources continue to be strained. To explore this tension, the next chapter looks to what negotiated agreements and community-based monitoring programs can offer to the robustness of data collection under the professional reliance model, if regulatory oversight does not increase.

This should include a regulatory analysis of the shale gas industry to determine where exactly professionals are being relied upon and what guidance exists and is lacking. This may require more explicit language to be added into the regulations governing shale gas on what a professional or qualified person is and what they are and are not required to do. Particularly in northeast BC, guidance for professionals or qualified persons on how to approach rights and titles issues should be provided.

#### **4. An independent, third party watchdog with an oil and gas mandate.**

BC has three independent agencies with a mandate to hold government accountable for its stewardship of public resources: the Auditor General, Ombudsperson and Forest Practices Board. The first two have broad mandates that occasionally address natural resource management issues, while the third has a very narrow mandate limited to forest practices. However, the analytical approaches of these three agencies have been found to be useful for questions of sound management and good governance (ELC, 2015).

I recommend the mandate of one of these agencies be expanded to include other natural resource sectors such as mining and oil and gas. This type of watchdog would be particularly beneficial for the shale gas industry in northeast BC where

there is so much uncertainty and debate surrounding the impacts. The Forest Practices Board (2011) recommends an impartial decision-maker or arbiter, who can independently weigh and balance priorities, risks and benefits for proceeding with management activities. An independent watchdog also increases public confidence and transparency into decision-making processes.

**5. A coordinated, transparent approach to monitoring activities between the FNFN, industry and government.**

New design parameters for monitoring programs need to be developed to allow for a more coordinated and transparent approach. As my interview participants noted, standardized protocols would allow for more successful implementation of monitoring initiatives. A new data management system, designed to hold data collected by all stakeholders and be publically accessible would greatly increase transparency and trust in the data used to make decisions. Questions surrounding who consolidates the data, who owns it and who decides who can access it need to be addressed in order to safeguard traditional knowledge.

Having open and critical, rather than closed and defensive, regulators will be pivotal to moving forward. While overcoming a lack of trust (in regulators, industry or data) isn't easy, my interview participants and others (Forest Practices Board, 2014; ELC, 2015) call for increased transparency and data sharing as part of the solution. Interview participants expressed that without a coordinated and transparent approach they could not trust the decisions that are being made on their land. Indeed, what participants in this research have called for in increased transparency and data sharing could lead to strides in trust in permitting and subsequent monitoring processes.

Although these recommendations are quite straightforward, they are still unlikely to be adopted due to the anti-science culture of the current political context. Given the provincial government's desire to rapidly extract shale gas for an LNG export industry, taking the time to adequately establish a baseline and properly set up the

infrastructure to understand the impacts is in direct conflict. Additionally, the regulatory changes that streamlined the assessment and permitting processes favour industrial proponents. If the government were to adopt these recommendations, they would reshape their relationship to the industry in a way that is not necessarily in line with a profitable LNG industry. Engaging in how and what knowledge is produced through their new approach with the Apache Liard seismic program may not be sufficient for the FNFN to change the current political context of the shale gas industry. However, changing their relationship with certain industry proponents is necessary work and may help circulate a new rhetoric or understanding of the shale gas industry more broadly and potentially challenge the current political context.

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## **Chapter 3: Community-based monitoring: A viable option to better navigate the impacts of the shale gas industry in northeast British Columbia?**

**Briefing Paper for the FNFN Department of Lands and Resources**

### **1. Introduction**

This research was conducted in collaboration with the Fort Nelson First Nation Lands Department. The Lands Department is dissatisfied with the current environmental management regime in northeast BC due to recent regulatory changes and streamlining initiatives that give licensees much of the discretion previously held by government officials. This phenomenon is not unique to my case study: across Canada, there are budget cuts to the public service and changes to environmental legislation, but no simultaneous reduction in industrial activity on the land base. Thus, public concern over the impacts of resource extraction is increasing, but the ability of government to respond to these concerns is decreasing (CIELP, 1999; Whitelaw et al., 2003; Craig et al., 2003; Gayton, 2003 Conrad and Daoust, 2008; Lefler, 2010). In response to this, over the past two decades, community-based approaches, including community-based monitoring (CBM) have grown to bridge the growing gap created by government deregulation (Au et al., 2000; Sharpe et al., 2000; Kellert et al., 2000; EMAN, 2003; Lefler, 2010; Berkes, 2010). Despite cutbacks and changes to regulations, governments still require monitoring data for decision-making processes (Conrad and Hilchey, 2011). Using local people to help study and monitor environmental impacts and change in a region is a logical, seemingly simple solution to a complex problem. However, community-based monitoring does not offer a “one size fits all” solution (Lefler, 2010), as each monitoring program will be shaped by geographical, political and socio-cultural factors.

Given the FNFN Lands Department’s concerns with current monitoring initiatives, a community-based monitoring program is a priority. In this chapter I explore community-based monitoring as a possible way for the FNFN Lands Department to

restructure and inform current monitoring activities. To do this, I answer two questions: What does the FNFN want their CBM program to achieve? And, what can the CBM literature or other resources offer to help them realize their ambitions? I begin with a brief explanation of methods. I then present the information that is critical to understanding why the FNFN wants a community-based monitoring program and a summary of the benefits and challenges of CBM reported in the academic literature. Following the critical context, I present my results. First, I present what I learned from interviews about FNFN's ambitions for the program and the challenges they face in achieving these. I then go on to critically explore what the CBM literature offers to help them negotiate these challenges and achieve these ambitions, concluding with an assessment of some of the limitations of this literature and suggestions for other resources that provide helpful supplementation. My overall argument includes a list of recommendations for the FNFN to consider in designing their CBM program. However, a perfectly designed CBM program cannot on its own ensure a link to affecting decision-making, a main priority for the FNFN. A CBM program can help the FNFN Lands Department empower the members of their community through capacity and leadership building activities, educational programs and recognition of community members' knowledge. But if the FNFN are not included as decision-makers in the broader resource management framework they run the risk of their CBM program extending state power and preventing them from achieving their priority of utilizing the program as a step toward autonomous decision-making.

## **2. Critical Context**

In this section I present the information that is critical to understanding why the FNFN wants a community-based monitoring program (CBM). I introduce the concept of CBM – what it is and what it aims to accomplish. I then examine the literature for common benefits, challenges and recommendations for successful CBM programs. The reported benefits and challenges of CBM provide a useful assessment for program design considerations. However, many of the proposed recommendations have not been tested for their success and require further

investigation. After presenting my interview results, I use this critical context to situate my case study, showing where it is useful to the FNFN and where it is limiting.

### **2.1 Why community-based monitoring is important to the FNFN**

The FNFN has a series of concerns about how projects are being approved and monitoring is being conducted on the shale gas industry in their territory. Mainly, these processes do not include enough baseline studies or consideration of the cumulative impacts of development. Further, monitoring approaches primarily focus on the values and needs of industry, not those of the FNFN. These concerns partially arise from restrictions in current permitting processes, increased discretion to licensees and the reliance on consultants accountable to licensees to conduct monitoring activities and produce environmental data for decision-makers. Because the FNFN is dissatisfied with the current environmental management regime, they are designing a new approach to impacts monitoring, including a community-based monitoring program. Having a community-based monitoring program is a key component for the FNFN Lands Department as it aims to build capacity and leadership in the community to ensure meaningful involvement of the FNFN's knowledge and members in planning, monitoring and stewardship activities. The hope is that this program will result in increased and improved baseline data and environmental monitoring, and ultimately better-informed decision making about how the industry should proceed.

### **2.2 Review of community-based monitoring academic literature**

Community-based monitoring (CBM) is by no means a new concept. CBM is often defined as “a process where concerned citizens, government agencies, industry, academia, community groups, and local institutions collaborate to monitor, track and respond to issues of common community or environmental concern” (Whitelaw et al., 2003; EMAN, 2003). More simply, it is “the systematic process of gathering, synthesizing and reporting information aimed at addressing community defined goals for resource management” (Parlee, 2002). However, CBM is not always a full

collaboration between the community and outside agencies as there are different levels of participation and governance structures (Lawrence, 2006; Conrad and Hilchey, 2011). More accurately, CBM refers to a spectrum of programs ranging from those where the community controls all aspects of the program to those where the community plays only a minor supporting role. CBM captures a continuum of projects, from those led by outside agencies with minimal community participation to those led by the community with minimal outside participation (Binder and Livingstone, 2011).

CBM aims not only to generate appropriate information but also to strengthen local decision-making, public education, community capacity and effective public participation in government. CBM is meant to be a tool to facilitate more inclusive decision-making on issues deemed important to members of a community that incorporate complex aspects of social, economic and environmental factors (EMAN, 2003). There is a wealth of CBM initiatives around the globe (Conrad and Hilchey, 2011). The increase in CBM is particularly dramatic in the USA and Canada (Lawrence, 2006). This increase has been attributed to an increase in public knowledge and concern about anthropogenic impacts on natural ecosystems (Whitelaw et al., 2003; Conrad, 2006; Conrad and Daoust, 2008) and public concern about government monitoring of these ecosystems (Pollock and Whitelaw, 2005). Concerns about the effectiveness of government monitoring are often attributed to government cutbacks in funding and staffing for monitoring activities (Stokes et al., 1990; Pollock and Whitelaw, 2005; Conrad and Daoust, 2008). Despite cutbacks, governments still require monitoring data for decision-making processes and recognize the need to include other stakeholders in these processes (Lawrence and Deagan, 2001; Whitelaw et al., 2003). There is a range of common benefits, challenges and recommendations for successful CBM programs reported in the literature.

### *Benefits*

When CBM was a new concept its value and effectiveness were questioned because of issues related to the accuracy and reliability of the data collected (Heiman, 1997). However, it is now accepted that a community-based approach to ecological monitoring can produce reliable and accurate data while bringing added benefits to communities. Academic research has found that CBM can help democratize science through the sharing of different types of knowledge between scientists and non-scientists (Robertson and Hull, 2001; Carr, 2004; Carolan, 2006). CBM also plays an important educational role in communities by increasing scientific literacy (Evans et al., 2005). CBM has empowered people to take environmental stewardship into their own hands (Quinn and Dubois, 2005; Whitelaw et al., 2003; Cooper et al., 2007). It has reduced costs and logistical constraints by using community youth; built trust in research results for communities; and led to a sense of empowerment for those involved (Carr, 2004; Dyck, 2007). Further, CBM has been reported as facilitating social learning and leading to greater social cohesion more generally (Moyer et al., 2007). Other benefits of CBM include its ability to enhance community capacity and social capital; help communities establish a desired vision; lead to a more inclusive decision-making process; develop and extend social networks; provide more data about the local environment to supplement that of external experts; allow communities to respond to environmental change through adaptive management; create a sense of empowerment in the community; and advance the concept and practice of sustainable development (Quinn and Dubois, 2005; Schwartz, 2006; EMAN, 2002; Pollock et al., 2003; Sharpe and Conrad, 2006; Conrad and Hilchey, 2011).

### *Challenges*

While a community-based approach to ecological monitoring can bring a number of benefits to multiple stakeholders, challenges and limitations of CBM are also recognized. These challenges include: data inaccuracy (Cuthill, 2000; Craig et al., 2003; Engel and Voshell, 2002); loss of interest in the project by volunteers (Craig et al., 2003; Conrad and Daoust, 2008); lack of participant objectivity (Stokes et al.,

1990); lack of funding (Craig et al., 2003; Whitelaw et al., 2003; Hunsberger, 2004); concerns that governments will use CBM as an excuse to cut funding to current monitoring programs (Sharpe et al., 2000); monitoring for the sake of monitoring or collecting monitoring data without any real purpose or objective (Conrad and Daoust, 2008; Noble and Birk, 2011); and difficulties linking monitoring data with decision-makers (Bens, 1994; Conrad, 2006; Craig et al., 2003; EMAN, 2002; Hunsberger, 2004; Makhoul, 2004; Milne et al., 2006; Conrad and Daoust, 2008).

### *Proposed solutions*

Although there are many challenges reported on CBM, there are also many proposed solutions to resolve them (Table 1). These include: positive feedback to volunteers on their roles, such as a volunteer recognition program, in order to avoid volunteer burnout (Craig et al., 2003); using skills assessment to match volunteers with tasks appropriate to their capabilities (Cuthill, 2000); establishing a method to deliver information to decision-makers to make monitoring data useful (Pollock and Whitelaw, 2005); obtaining ongoing and adequate funding to support the project (Yarnell and Gayton, 2003); involving experts in the design of monitoring initiatives to improve their effectiveness (Yarnell and Gayton, 2003); developing partnerships with stakeholders to enhance capacity and link to decision-makers (Craig et al., 2003; Milne et al., 2006); using monitoring protocols to ensure consistent, reliable data is collected (Conrad and Daoust, 2008); and training and supervising volunteers to ensure proper monitoring is undertaken (Au et al., 2000; Stokes et al., 1990).

Table 2: Summary of the challenges and proposed solutions reported in the CBM literature

<i>Challenges</i>	<i>Proposed Solutions</i> (?) = unclear how this is actually achieved
Data inaccuracy	Training and supervising participants; using monitoring protocols
Loss of interest by volunteers	Volunteers recognition program; skills assessment to match volunteers with tasks
Lack of participant objectivity	Training and supervising participants; using monitoring protocols
Lack of funding	Obtaining ongoing and adequate funding (?)
Avoiding monitoring for the sake of monitoring and linking monitoring data to decision-makers	Monitoring protocols and frameworks outlining how to make monitoring data useable and timely for decision-makers (?)

While many of these solutions are important they are often not followed-up with additional fieldwork to provide evidence for their validity (Lefler, 2010). In other words, it is difficult for a community to know exactly how to overcome the many challenges associated with creating a CBM program. While recognizing that integrating the data collected through a CBM program into the decision-making process is both a priority and a large challenge for many communities, the literature lacks case studies showing the use of CBM data by decision-makers or the barriers and linkages and how these might be overcome (Conrad and Hilchey, 2011). Further, the case study approach or comparative CBM literature often does not engage with the issues that get in the way of meaningful influence for First Nations communities. For First Nations' communities, these issues stem from the broader developmentalist frame of the state where communities must adopt western scientific methods for monitoring impacts because non-western ways of understanding impacts are seen as less legitimate. There is a body of literature that deals with the challenges of integrating traditional knowledge into CBM programs (e.g. Berkes et al., 2007; Binder and Livingstone, 2011; Enzo and Ellis, 2011; Parlee et al., 2011). This work tells us that although traditional knowledge has gained recognition over the past thirty years, it is often still appropriated as data. As a result, many First Nations communities still struggle with linking their traditional knowledge to decision-making. Traditional knowledge is its own system of knowing

that can compliment and guide scientific research but is not data to be collected, stored, analyzed or explained using western scientific methods. To move beyond appropriation, traditional knowledge, or ways of knowing, must be recognized as equally legitimate ways of understanding and managing the land.

The aim of this chapter is to explore community-based monitoring as a possible way for the FNFN Lands Department to augment current monitoring activities. After a brief explanation of methods, I present what I learned from interviews about FNFN's ambitions for the program and the challenges they face in achieving these. I then go on to critically explore what the CBM literature offers to help them negotiate these challenges and achieve these ambitions, concluding with an assessment of some of the limitations of this literature and suggestions for other resources that provide helpful supplementation.

### **3. Methods**

To answer my research questions I used a multi-method approach that included a literature review, participant observation with the FNFN Lands Department and community, semi-structured in-depth interviews and journaling. To gain an understanding of CBM generally, I did a broad sweep of the CBM literature, as well as a literature review of other community-based monitoring (CBM) programs. A review of other case studies helped to better understand the variety of CBM programs that exist and their successes and limitations. Situating the current research project within the broader field of CBM programs allowed me to provide advice to the FNFN Lands Department.

Preliminary results from the literature review were used to guide my conversations and interviews regarding the FNFN's community-based monitoring program. In conversations with the Lands Manager and the Department's lead landscape ecologist, I focused questions on the priorities for the FNFN such as the determination of valued components, the potential role of traditional knowledge in a monitoring program and how to meaningfully engage the community in

monitoring activities. In these conversations I did not attempt to impose a specific CBM framework. Rather, my approach was to gain a sense of the FNFN Lands Department's priorities and to ask my interviewees their perspectives on those priorities and how best to implement them. At the time of my field research, the FNFN Lands Department was planning a community-based monitoring program. The conversation I initiated attempted to assess how the Department's monitoring program could be designed to be a success from their perspective.

Because my research questions were exploratory, I conducted semi-structured, one-on-one, in-depth interviews. Purposeful sampling to select informants was used as it allows for the identification of the most knowledgeable informants who will be able to provide rich, insightful data on a particular issue, place, or object (DiCicco-Bloom and Crabtree, 2006). Meetings and interviews were conducted over a period of six weeks in the summer of 2013 in the community of Fort Nelson. Eleven interviews were conducted with members of the FNFN Lands Department staff that both live in and out of the community, members of the FNFN who live in the community, provincial government staff living in the community, provincial government staff living outside of the community and industry staff that live outside of the community but spend months of the year working in the region. The results of this research primarily draw on the eight interviews conducted with the FNFN. Two interviews provide the perception of the current regulators on what CBM is generally but I did not have enough representation from this group for more in-depth analysis. Interviews were digitally recorded and journaling was used while in the field to keep track of perceptions and other details of the meetings and interviews. Interview transcripts were analyzed using NVivo 10, software designed to store, organize and classify qualitative data. Interview transcripts were coded according to themes. In the analysis, particular emphasis was placed on themes that were identified by a majority of those interviewed, or by interviewees from different sectors. During coding, minor themes were identified and amalgamated into the broader, major themes where appropriate. Occasionally, I also draw from minor

themes identified by fewer interviewees that did not fit into dominant themes but when doing so it is made explicitly clear.

My initial review of the community-based monitoring literature provided crucial context when analyzing my interview data. After analyzing my interviews I revisited the literature with a different lens having a better sense of the FNFN's situation: the challenges they face and their priorities. I narrowed the focus of my review to CBM programs in Canada and those that involve First Nations communities. Examining the case studies within Canada involved a document analysis of pertinent programs initiated by government or other agencies. This allowed me to see more clearly the limitations in the CBM literature and engage with other theories and studies that could aid the FNFN in advancing their program and having more meaningful influence.

#### **4. Results**

My results show what the FNFN's priorities are in a community-based monitoring and stewardship (CBMS) program. First, I explain the FNFN's Lands Department Director and lead landscape ecologist's overall goals for the program: to have a strong presence on the land and water, to manage and monitor within their territory, to be self-reliant and self-funded, and to compile and share data. I then explain the priorities for the CBMS program, given the overall goals. I break this into four themes: stewardship, capacity and meaningful involvement, traditional and scientific knowledge, and secure autonomy to affect decision-making.

##### **4.1 The FNFN's Priorities**

###### Overall Goals

During my time in Fort Nelson, I worked with the FNFN Lands Department's Director and lead landscape ecologist on a strategic community-based monitoring and stewardship plan. They determined that the over-arching goal of the community-based monitoring and stewardship (CBMS) program is to protect, conserve, manage and monitor the FNFN traditional territory. In order to do this, they created four key outcomes:

- To have a strong presence on the land and water;
- Manage and monitor within their territory;
- Be self-reliant and self-funded, and
- Compile and share data.

Having a strong presence on the land and water includes patrol activities for water, air and land patrol, as well as continuing use and harvest activities, as the FNFN has traditionally done and plans to do in perpetuity. Managing and monitoring the land and water includes an adaptive approach to air, water, terrestrial, cumulative effects and cultural heritage assessment and monitoring. They explained the desire to be self-reliant and self-funded. In order to achieve this, the FNFN Lands Department are undergoing negotiations with industry to strategically leverage industry's resources and funding to carry out some of their own monitoring activities. Further, on the way to becoming self-reliant, the FNFN Lands Department is using their current capacity, including in-house consultants, to carry out activities and train other members. Using scientific expertise alongside traditional knowledge was explained as a way to ensure their knowledge is not forgotten or treated as something of the past but applied to present day resource management scenarios. The plan states that the FNFN should hold all data related to development in their territory, including both digital data, such as lidar and satellite imagery, and elders' traditional knowledge, in order to influence decision-making by overseeing what knowledge is being produced and shared. They also laid out the importance of compiling and sharing data in an information management system as well as through reporting and communicating in order to increase transparency and trust.

### Priorities

The majority of interview participants agreed on four general priorities important for the CBMS program. First, the program must incorporate the FNFN's stewardship ethic and their values to ensure cultural and environmental protection. Second, capacity must be built within the FNFN community and members must be involved in a meaningful way. Third, multiple ways of knowing must be recognized and

therefore, both traditional and scientific knowledge must be incorporated. And finally, a level of autonomy in planning and monitoring must be secured so as the program is able to affect decision-making in a way that is beneficial to the FNFN.

### *Stewardship*

A guardian and stewardship aspect of the program was important to interview participants because, as they explained, it is a notion closely in line with the FNFN's sense of responsibility as stewards of the land. Interview participants further explained that the guardian aspect of the program is key to helping to ensure the knowledge of the FNFN members is not discounted or forgotten in current monitoring activities. One participant elaborated:

Industry and regulators need to know that they can't discount our knowledge and understanding and what we actually know to be true and see on the land. It's the only way we're going to get control of the development – more eyes on the ground.

A guardian aspect of the program means that members of the FNFN are able to track and monitor the values and places that are important to them on the landscape. In this way, “guardians” are directly tied to maintaining a ‘stewards of the land’ ethic.

Interview participants explained the importance of monitoring in areas that are culturally significant as well as areas with industrial activity. One participant said an ideal monitoring program would be “throughout our territory, targeting areas that are significant to us culturally and for the practice of our treaty rights but also those that have been hit by oil and gas.” Being more actively involved in monitoring what industry is doing on the land base was important to many participants because of the history of extractive forestry in their territory, as explained:

Probably about twenty years ago we started having logging here. I remember people talking about the logging and our community just didn't take part in it because it was more of the mind-set that we are keepers of the land or stewards of the land or caretakers of the land – we don't exploit the land. Logging was viewed as exploitation. So what we did at that time is we just sat back and watched it happen. I think there are some people who have recognized that this [oil and gas industry] is like another way that the land can

care for us and there seems a little bit more of an appetite for people to work in oil and gas and perhaps they view it as a modern day way of the land caring for us. But there's still the internal conflict because of the consequences of the oil and gas activity, especially the impact of fracking on the water – the vast amount of water it uses. The whole system is being interrupted by overuse of water. How do people come to terms with that? Do we stay home like we did twenty years ago and say ‘that's not our role, that's not what we do’ and allow other people to come in to reap the benefits of the land? Because I think we know that it will happen. We can't stop it. These people have come here and they're here to stay and our people are finding ways to become a part of it, perhaps in one way or the other.

When discussing the importance of the program for ensuring a culturally significant stewardship ethic, one interview participant commented on the meaning and importance of their relationship to the land:

We become more mindful of our relationship to the land once there have been competing interests for it. I think initially, when we look at ourselves as Dene people, we are told that we walk on our ancestors. So it's like we are the land, we come from the land, we will go back to the land, so in that way, our personal relationship with the land is very intimate. The land is like someone looking after you, like a grandmother taking really good care of you. And we give that back to the land - if you care for the land the land will care for you. And when you understand what that means, that's who we are. That's what we are. That's how we are of the land and how the land is of us.

As interview participants noted, the FNFN community had little involvement in the forest industry, feeling they were the stewards of the land and had to care for it but at the same time, didn't have a way to do that and ended up “sitting back and watching” as the industry took over their land. Participants are interested in a guardian and stewardship component of the program to monitor the impacts of the shale gas industry because they are dissatisfied with current compliance and enforcement efforts. This creates space for members of the FNFN to actively engage in their sentiment as stewards of the land and therefore have more meaningful involvement, as opposed to the current situation where participants feel that those currently in charge of monitoring on the land base have no sense of connection to it and are monitoring for different values. Although some interview participants explained that they do actively live out the stewardship ethic in their daily lives, a

formal program is a way to help them feel less powerless in the face of “big industry” and to not have to “sit back and watch” the shale gas industry consume the land in the same way as the forest industry did. One interview participant expressed the feeling of powerlessness in the face of rapid industrial expansion saying, “in the old days we were pulling the wagon and now we’re having a hard time jumping on the back of it.” A guardian and stewardship aspect of the CBMS program could be a mechanism to get back in front of industry and “pull the wagon” or, in other words, be more proactive in the approach to stewardship monitoring rather than the current reactive state.

#### *Capacity building and meaningful involvement*

Interview participants explained that the way the FNFN Lands Department field monitors are currently utilized by consulting companies in charge of monitoring initiatives as inadequate and even hurtful. One interview participant said they are treated as “mules” only there to carry the equipment of those employed by the consulting company. Therefore, interview participants deemed it fundamentally important to involve the members of the FNFN in a more meaningful way. They expressed this through sentiments such as it’s “fundamental to build capacity within the community”, to “use our own people to monitor” and to “have more eyes on the ground.”

Capacity exists within the FNFN Lands Department’s current field monitoring program to a certain extent, as explained by the Department’s field coordinator. The Department’s field monitors took part in the following training: Water quality training for the Horn River Water Study; Canadian Aquatic Biomonitoring Network (CABIN) training through Environment Canada; BEAHR training through Eco Canada; and standard training including first aid, H2S Alive, Workplace Hazardous Materials Information System (WHMIS), Petroleum Safety Training (PST) and wildlife awareness. These trainings contribute to achieving interview participants’ ideal monitoring situation: “The ideal monitoring situation would be our own people trained in using the equipment and methods that are scientifically sound.”

However, interview participants acknowledged that more is needed to further build capacity and involve the community in a meaningful way: “We need to make sure that the infrastructure is there, that the training is there and that our people can go out and collect the information.” One interview participant explained that utilizing the capacity within the community to ensure members of the FNFN are involved meaningfully is directly related to authority: “We need some authority for our community members, or our monitors, to patrol our territory and our rivers so that the level of compliance and enforcement is increased.” One interview participant provided an example of how building capacity in certain programs could eventually lead to increased authority:

Currently, Conservation Officers do some of the wildlife monitoring as well as implement hunting and fishing guidelines. We'd like to have some sort of partnership with them where our people can be out there with them – like job shadowing – so our people can learn some of those skills and ultimately one day we can replace Conservation Officers with our own people.

Another interview participant provided an example of how the Horn River Surface Water Study could lead to more autonomous monitoring:

One of our monitors helps every time the company comes in to set up their water stations and there are a couple more monitors who will be taking the water training that's coming up. Through this field role, they want to kind of bump up the knowledge of the people involved so that we can start actually using the data that's collected and are able to work with that data. What the program is supposed to do is build up the capacity for the FNFN to eventually be able to take over the program .

Increased capacity and meaningful involvement of the FNFN members in data collection, management and analysis activities was important to interview participants to avoid the current mistreatment of their members and appropriation of their traditional knowledge.

#### *Traditional and scientific knowledge*

For interview participants, building capacity in the community and involving members in a meaningful way is directly related to incorporating both traditional

and scientific knowledge into the CBMS program. Meaningfully involving community members could allow for the incorporation of the FNFN's traditional knowledge into the program, while increasing capacity in current monitoring techniques and infrastructure allows for increased incorporation of scientific knowledge into the program. Incorporating scientific knowledge was important to participants in order to keep up with the fast-paced industrial expansion and increasingly technical ways to monitor impacts, including lidar and satellite imagery. Incorporating these two types of knowledge while simultaneously developing the capacity to do so takes time. One interview participant explained the logistics of what the monitoring program would entail:

I think that, obviously, water needs to be monitored, as well as wildlife, biophysical assessments and tissues in animals and plants to see – to get a baseline – of what metals or what chemicals are already present. Obviously, we're looking at shale gas development because that's the big influence here. So how does shale gas development and extraction impact wildlife, water, air and the humans that use the landscape? And not just First Nation humans but also non-aboriginal people.

These logistics require a certain amount of scientific expertise. Interview participants made clear that this expertise would initially come externally from experts that they have established relationships and trust with while they work to further build capacity within the community to eventually house those experts internally. Interview participants also emphasized the importance of using knowledge and values from within the community to guide the logistics of the monitoring program and the scientific research questions and methodologies that are formulated.

Interview participants expressed the importance of recognizing multiple ways of knowing in their program. They want traditional knowledge incorporated into a scientifically rigorous program: "The ideal monitoring situation would be our own people [who have a more intimate relationship to and knowledge about the land] trained in using the equipment and methods that are scientifically sound." One participant explained:

The program needs to have a rigorous amount of scientific knowledge behind it but I think that a community-based approach is really important because it's the people that live on the land – the people that have always lived on the land and have a relationship to it – that are really excellent to know what the changes are, what differences there are. As opposed to other people potentially coming in from down south – southern British Columbia or Alberta – who might not quite have that same connection to the land or that same breadth and depth of knowledge from having lived here for many, many years.

Interview participants explained that having members of the FNFN trained in scientific methods would enable them to have more oversight over the collection of scientific data and how it is informed by their traditional knowledge and relationship to the land. Currently, as explained by one interview participant, many claims brought forward by the FNFN are discounted as “nice to know, anecdotal” or less important because they come out of a way of knowing that is different than a western, scientific way of knowing.

All interview participants agreed that using knowledge that already exists within the community in combination with science was a good idea. Professionals that already work for the FNFN Lands Department who have scientific expertise offered their services in building up the scientific knowledge (capacity) within the community. One professional committed:

As a professional person, I will help develop this strategy and be one of the people that will help support and mentor community members, trying to come up with innovative ways around educating, not necessarily in a formal classroom setting. And potentially being somebody who can help support whatever monitoring processes need to happen on the land. And teaching people how to do that with scientific rigour so that whatever data gets collected can be used by everybody and can be defensible.

Where there was disagreement among interview participants was over how traditional knowledge should be recognized. Some participants felt that it should be formally recognized with a designation, saying:

I think that the knowledge that already exists within the community really needs to be somehow captured or acknowledged in a way that is similar to a professional designation so that First Nations can work for a company. Maybe they don't have the Professional Agriologist designation, as an example, but

they have the Professional Knowledge Holder designation or Traditional Knowledge Holder designation, or whatever it would be called. I think having that other level, where companies recognize it and appreciate it on the same level as all of these other designations, is important.

However, other participants felt that a designation may not be appropriate but that validation was necessary, saying:

How do you do that though? Who becomes the authority on traditional knowledge? I think rather than a professional designation, people just need to be validated in what they know. There's been so many times when I've gone to someone that I know knows a lot about something and I'll ask them 'Tell me about this' and they'll say 'Oh I don't know anything' and then I'll ask one more question and I'm sitting there for a whole hour listening to what they know. They [our community members] know more about the issue and the subject and the landscape than any of the consulting companies that come up here.

Although there was debate over exactly how to recognize traditional knowledge as equally as important as scientific knowledge, interview participants did agree that doing so was fundamental. Using traditional knowledge to guide the more scientific aspects of the program such as data collection and analysis is a way to ensure that the two types of knowledge can co-exist and that community members no longer feel their values are not meaningfully being monitored on the land base. Building capacity and using current programs and expertise, while incorporating the FNFN's knowledge and values into the program, is a step toward autonomous monitoring, which could lead to a greater ability to affect decision-making.

#### *Secure autonomy to affect decision-making*

The whole main purpose of building capacity within the community, utilizing both traditional and scientific knowledge to inform the CBMS program, is to secure autonomous monitoring so that the FNFN can have confidence that the program is monitoring their values on the land base and respecting their stewardship ethic. As interview participants explained, the FNFN hopes to insert their values earlier in the permitting process. A CBMS program is one component of a broader schematic to re-affirm those values are tracked and monitored. As a whole, this approach aims to

better engage with current decision-makers as well as, ideally, grant more decision-making power to the FNFN.

Although interview participants expressed the need for the FNFN to have a greater role in decision-making, they were also cognizant of the other stakeholders in the region and believed that their program could benefit themselves, but also government, industry, scientists and resource professionals. One interview participant explained:

I think that the opportunities are endless, not only for the FNFN, scientists and resource professionals, but also for the government, who no longer have the resources at their fingertips to be able to do this kind of work. And I think it is very beneficial to the oil and gas companies because they need to be held responsible and really understand what impacts they have on the land, not just right now but in a quarter century or century's time.

One interview participant further explained how they think the program would be beneficial to the government:

For the government, I think it would be such a breath of fresh air to have a First Nation come to me and say 'this is our plan, this is what we want to do and this is how we want to help.' Because public servants work in the best interest of the Crown and a program like what we're talking about creating is definitely for the best of the Crown and Crown land management, I would say.

Interview participants explained that those currently in charge of monitoring industrial activity don't have the adequate resources or will to do a good job. Further, they expressed that areas associated with their values are not being adequately monitored. The inadequacies in current monitoring activities is the main driver for the FNFN's CBMS program. However, interview participants explained that the program cannot be successful without the authority to go along with it, which they currently lack. One interview participant commented:

We have the desire to do it; we just don't have the authority. The authority currently rests with the BC Oil and Gas Commission but they don't have the willingness or capacity, apparently, to do it. We're willing to step in; we just need the authority.

The goal of the CBMS program is to bolster current monitoring activities and ensure values of concern to the FNFN are being monitored and any impacts mitigated. However, there needs to be some recognition of this program by current decision-makers so that the FNFN avoids ‘monitoring for the sake of monitoring’ and the results of their program are actually utilized in resource management decisions.

## **5. Discussion**

The FNFN Lands Department will likely encounter challenges when transitioning from their strategic goals and priorities into an actual monitoring program. The FNFN is on their way to addressing some of these challenges as they have some resources including current field monitors and in-house expertise<sup>18</sup>, and the will to build the program, but will need to continue to build capacity, which in turn will require additional resources. Interview participants explained that their biggest priorities and also their biggest challenges are having their knowledge recognized, valued and linked to decision-making. While the CBM literature recognizes that integrating the data collected through a CBM program into the decision-making process is both a priority and a large challenge for many communities (Bens, 1994; Conrad, 2006; Craig et al., 2003; EMAN, 2002; Hunsberger, 2004; Makhoul, 2004; Milne et al., 2006; Conrad and Daoust, 2008), it lacks case studies showing the use of CBM data by decision-makers or the barriers and linkages and how these might be overcome (Conrad and Hilchey, 2011).

Further, the case study approach or comparative CBM literature often does not engage with the issues that get in the way of meaningful influence for First Nations communities. For First Nations’ communities, these issues stem from the broader developmentalist frame of the state where communities must adopt western scientific methods for monitoring impacts because non-western ways of understanding impacts are seen as less legitimate. There is a body of literature that deals with the challenges of integrating traditional knowledge into CBM programs

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<sup>18</sup> In-house expertise in the areas of landscape ecology, wildlife management, fire management, GIS, hydrology and hydrogeology to increase training in scientific methods for members.

(e.g. Berkes et al., 2007; Binder and Livingstone, 2011; Enzoe and Ellis, 2011; Parlee et al., 2011). This work tells us that although traditional knowledge has gained recognition over the past thirty years, it is often still appropriated as data and not recognized as its own system of understanding and managing the land. As a result, many First Nations communities still struggle with linking their traditional knowledge to decision-making processes. Below, I first present what the CBM literature offers as solutions for communities to affect decision-making and evaluate their usefulness for the FNFN. I then offer critical perspectives related to traditional knowledge and knowledge production, integration and meaningful involvement in order to advance the FNFN's understanding for how they can address the challenges they face in order to achieve their goals and priorities.

### **5.1 Linking monitoring to decision-making**

One of the most important challenges identified by researchers is how to formally link monitoring to decision-making processes (Bens 1994, Conrad 2006, Craig *et al.* 2003, EMAN 2002, Hunsberger 2004, Makhoul 2004, Milne *et al.* 2006; Enzoe and Ellis, 2011). The absence of this important link can result in groups collecting data with no clear purpose or objectives (Conrad and Daoust 2008). Hunsberger (2004) suggests that links be made with governments so that decision-makers will respond to monitoring information when they receive it. However, for many communities, it is these relationships with government or other outside agencies that limit them from achieving their priorities. Stakeholders involved in CBM agree on the need for its implementation but there is often disappointment for some groups involved. Disappointment usually arises when one group, often government, views the main purpose of CBM to generate more data while another group, often the community, envisions the main purpose of CBM to facilitate community empowerment. There are a number of examples where communities are dissatisfied with their inclusion in monitoring initiatives because of the often misleading term 'community-based monitoring' where rather than being led by communities, which the term implies, CBM programs are often led by outside organizations with limited community involvement (Binder and Livingstone, 2011). This can and often does lead to

disappointment and resentment within the community because the benefits are limited from their perspective and little is gained by the community in the long-term (Binder and Livingstone, 2011).

Further, even if the community is thought to be involved in a meaningful way, it does not always translate into overall success of the CBM program from the community's perspective. An example is the Lutsel K'e Dene First Nations (LKDFN), considered to be leaders in the development and implementation of CBM programs. LKDFN designed and implemented a major multi-year environmental monitoring program through the West Kitikmeot Slave Study, which later became the more comprehensive Ni hat'ni – watching the land – program. During the study, which ended in 2004, the LKDFN designed traditional indicators of environmental change and a culturally relevant mechanism for gathering, organizing, analyzing and communicating data and results (Enzoe and Ellis, 2011). Looking back, the LKDFN felt they achieved some small successes including, local capacity building in training and community leadership and some of the monitoring did inform the political messaging and policy position of their Nation. However, they still believe that academic researchers professionally benefitted from their involvement to a far greater extent than local people and that monitoring results did not inform the decision-making process of responsible authorities (Enzoe and Ellis, 2011). This is one example where a community did things “right” from a community engagement perspective, but overall, felt dissatisfied because they still faced challenges such as the transient nature of outside “experts” who benefited from their involvement by publishing their “findings”; maintaining the momentum of their program once the research stage ended; and linking the results of their program to the state's broader resource management framework. Again, we see here the importance of challenging who participates in the production of knowledge, owns it and decides how it is used in decision-making.

Conrad (2006) notes that in Nova Scotia the information gathered through CBM is not being used by decision-makers, revealing a number of barriers that cause this

disconnect. These include: lack of political will; lack of staff time; lack of available resources; unequal level of commitment from CBM groups and decision-makers; and discrepancies in power and trust. She suggests CBM initiatives adopt simple guidelines such as researching political and educational strategies to understand how to influence decision-making as well as making monitoring information more usable and timely for decision-makers. These strategies may be useful to the FNFN. Interview participants reported a lack of will, staff and resources in the BC government to carry out adequate monitoring. This may make it difficult to obtain a commitment from the decision-maker to utilize FNFN's monitoring data. Further, the position of the regulators in northeast BC on CBM is to utilize members of the FNFN in their own current monitoring activities not to empower the FNFN to create their own program<sup>19</sup>. This unequal level of commitment between parties and discrepancies in power and trust has led the FNFN to try a "go it alone" approach to their CBMS program and leverage relationships with industry to obtain resources. Interview participants explained it best to "just go out and do it" using their own resources and strategic relationships with their own experts and certain industry licensees and consultants as they believed that the provincial government would not get onboard with their program as they envision it unless they could see its success and potential. This strategy has its own challenges as it is a very broad landscape to cover and without a systematic link to the regulators, the FNFN's program may not have as much visibility or weight as they hope. So the question remains of how the FNFN can ensure their monitoring results actually inform decision-making across the landbase.

Other research suggests ways to bridge the divide between CBM and decision-making. For example, the importance of using a standardized protocol to gather monitoring data has been widely recognized (Conrad and Daoust 2008, Fore *et al.* 2001, Engel and Voshell 2002, Hunsberger 2004, Makhoul 2004, Milne *et al.* 2006,

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<sup>19</sup> This perspective was gained from interviews with two provincial regulators. They both expressed their understanding of CBM to mean utilizing members of the FNFN to help carry out their own (provincial) monitoring activities.

Savan *et al.* 2003, Sullivan and Beveridge 2005; Gofman, 2010). Conrad and Daoust (2008) draw a direct line between monitoring protocols and the effective delivery of monitoring information to decision-makers. Without a monitoring protocol or consistent monitoring methods they found that the data provided to decision-makers was less credible and less reliable. They provide a modified framework that is in part intended to address this issue. This is useful for the FNFN as it suggests limitations to the “go it alone” approach. If the FNFN is not able to create a monitoring framework or protocols with all involved in the environmental management framework – government and industry – they run a serious risk of collecting data that will not be used. Hunsberger (2004) also connects standardized monitoring protocols and linking monitoring to decision-making. She notes that protocols lead to higher quality data and allow for data comparisons to be made. Higher quality data and data comparisons have a greater potential to be used by decision-makers (Hunsberger, 2004; Sullivan and Beveridge, 2005). Milne *et al.* (2006) also note that standard monitoring protocols are part of the solution in linking monitoring with decision-making. However, monitoring protocols must be appropriate for the type of monitoring being undertaken and undergo validation studies (Engel and Voshell, 2002). The FNFN should advocate for monitoring protocols with government and industry. These should be agreed upon by all parties and validated by an independent, external party.

A framework for monitoring is also recognized as an important component for the success of a CBM program (Conrad and Daoust 2008, Craig *et al.* 2003, Pollock and Whitelaw 2005, Whitelaw *et al.* 2003). A monitoring framework attempts to remove the complexity from monitoring by breaking down the design of the program into separate components (Vos *et al.*, 2000). The components can include what to measure and how, how to store and analyze monitoring data, and how to communicate results. Where a monitoring protocol is limited to what, where and how to monitor, a monitoring framework is concerned with the entire monitoring process from data collection to the communication of results (Lefler, 2010). One of the most mentioned frameworks in the literature is the Canadian Community

Monitoring Network (CCMN), which began in the early 2000s. This framework has certain limitations: Monitoring information is still not being used by decision-makers; there is a lack of consistency in monitoring methods; and the current CCMN framework is too conceptual to be functional (Conrad and Daoust, 2008). Therefore, Conrad and Daoust (2008) proposed ways to modify the framework: Identify all stakeholders at the beginning of the process; assess available skills and resources; create a communication plan to provide information to decision-makers; and implement a three pronged monitoring plan including monitoring, analysis and result communication.

Using similar principles, the Cumulative Impact Monitoring Program (CIMP) in Canada's Northwest Territories (NWT) employs a "pathways approach" (Lange and Kokelj, 2011). The CIMP was designed to guide and support the collection and analysis of environmental data relevant to NWT communities and to make that information accessible to decision-makers. The pathways approach has four main principles that require partners to work together to identify: Project goals and questions; appropriate monitoring indicators and study design; methods for data collection and management; and plans for analysis and reporting techniques. Further, the pathways approach has nine steps to provide a framework to organize monitoring input and who should be involved (from Lange and Kokelj, 2011):

Step 1) Defining the purpose: Why are we monitoring?

Step 2) Developing the conceptual model: How does the world work, and what do we need to look at?

Step 3) Conducting a review: What is already known?

Step 4) Developing a research question and hypothesis: A research question comes from thinking about - "what are the questions that need to be answered?"

Step 5) Designing the study: How will we find the answers?

Step 6) Data collection: Gathering the information.

Step 7) Data management and analysis: Turning data into knowledge.

Step 8) Reporting and publication: Telling the story.

Step 9) Adapting: What has changed? Are we still asking the right questions?

The guiding framework for the Cumulative Impact Monitoring Program is set out in the Mackenzie Valley Resource Management Act. It has the potential to support more holistic and interdisciplinary monitoring, however, this potential has yet to be realized (Parlee et al, 2011). This may be due a lack of political leadership at the federal level resulting in socio-political uncertainty and technical confusion or the use of technical “solutions” – the creation of protocols and frameworks – for what is indeed a political problem. This shows that even if there is some level of political support, such as recognition in legislation, there are still difficulties with how this plays out on the ground (i.e. how the regulator can/should utilize monitoring data from CBM programs in decisions and more broadly how CBM data fits within the wider development/management framework). One way in which communities negotiate through and overcome these problems is through strategic alliances with scientists and scientific monitoring programs. Many First Nations communities look to science to answer key questions about environmental conditions while at the same time continue to rely strongly on their traditional knowledge (Parlee et al., 2011). While this approach shows promise on a short-term, project-by-project basis, in the long-term it may instead work to promote the broader developmentalist frame of the state where communities must continually adopt western scientific methods for monitoring impacts because this approach does little by way of systematically recognizing or legitimizing non-western ways knowing.

Through their CBMS program, the FNFN hopes to influence decision-making on a broader scale, monitoring the cumulative impacts from development across their entire territory. However, monitoring on its own cannot address the fundamental issue of cumulative effects (Parlee et al., 2011). Those involved in monitoring at the community level are likely to become discouraged if they have little influence over resource development projects. To maintain community interest in monitoring, clear linkages must be made to institutions and processes that actually use the monitoring data the community collects. Mechanisms should be created where

decision-makers are accountable to both the scientific data and traditional knowledge that is generated to ensure that monitoring is not just monitoring for the sake of monitoring, which distracts from a larger sets of social and ecological sustainability issues (Parlee et al., 2011). Community-based monitoring in the Cumulative Impact Monitoring Program is enabled through the Mackenzie Valley Resource Management Act. Despite being enabled through legislation, the goals of the CIMP will not be realized without meaningful participation of northern communities and traditional knowledge and greater political will, resources and effort from the federal, territorial and regional governments (Parlee et al., 2011)

How to turn data into knowledge can be addressed in a monitoring framework. The FNFN should look to sample monitoring frameworks, such as Conrad and Daoust (2008) and the CIMP's pathways approach to systematically outline how their program will collect monitoring data but also analyze, interpret and present the results as useable knowledge for decision-makers. It was explained to me that the goal for the FNFN Lands Department right now is to have their members trained in carrying out monitoring activities and the expertise (so the people who can conceive of plans, analyze and interpret the data) will come from people on the payroll as staff of the FNFN Lands Department, who are not necessarily members of the FNFN. The thought being if they are employed by the FNFN they are accountable to the FNFN's values. This is as opposed to the current scenario where those employed by the licensee design and conduct monitoring activities and are accountable to the licensee's values (as explained in Chapter 2). This key process of turning data into knowledge utilized in decision-making, whether the data is scientific data collected by the FNFN or their observations while carrying out traditional uses of the land, was a key priority reported by interviewees. The next section provides considerations for the FNFN when utilizing science in combination with traditional knowledge in their monitoring program given their goal to have the end knowledge that is produced recognized and utilized by decision-makers.

## **5.2 Traditional and scientific knowledge**

Traditional knowledge and science can both contribute meaningful input to monitoring programs and are often complementary (Berkes et al., 2007; Stevens et al., 2011). In the NWT it is recognized that “good CBM recognizes that western science and traditional knowledge complement one another to provide a holistic view of the northern environment” (Binder and Livingstone, 2011) There are a growing number of examples of traditional knowledge being used and incorporated into monitoring efforts (e.g. Berkes, 2007; Parlee et al., 2007). This comes from an effort to ensure that science being carried out is responsive to local interests and concerns by monitoring species, locations and particular parameters that community members express as important or problematic (Parlee et al., 2011). Where many scientific monitoring programs claim to include traditional knowledge, there is an important distinction between research that is guided by traditional knowledge and traditional knowledge research. So too, there is a distinction between monitoring that is guided by traditional knowledge and monitoring that is socially and culturally embedded within the traditional way of life of First Nations communities (Parlee et al., 2011).

The past thirty years have witnessed an increase in the amount of research on traditional knowledge in northern Canada. For the first half of that, research was devoted to determining how to collect, document and integrate traditional knowledge with scientific knowledge, ignoring the power relations in these integration projects (Nadasdy, 1999). Most knowledge integration projects treat traditional knowledge as simply a new form of data to be used by scientists and resource managers (Nadasdy, 1999). To this day, as explained by my interview participants, traditional knowledge is often mistreated and misinterpreted by consulting companies. All forms of knowledge – traditional knowledge and science – are influenced by power relations that affect their production and use (Nadasdy, 1999; Lave, 2012). For this reason, instead of negotiating how to incorporate science and traditional knowledge, the FNFN is negotiating who owns and produces the science and decides how it is informed by or relates to traditional knowledge. By

hoping to hold both their traditional knowledge and the science (that they influence) produced in their territory in a centralized database that the FNFN owns, they disperse some of the power out of current administrative centers. This is a strategy to address the misuse or mistreatment of traditional knowledge: rather than give away their traditional knowledge to the producers/holders of science in current administrative (permitting/decision-making) centers, the FNFN aims to move the science (production, etc.) from the current administration to where they hold their traditional knowledge, thus shifting the power of that knowledge. Berkes et al. (2007) argues that there are still difficulties of translating indigenous knowledge and science into forms that are “mutually intelligible” and in a way that is accessible to decision makers. They recommend that to foster the use and acceptability of traditional knowledge, the holders of traditional knowledge and indigenous epistemologies should be included as decision-makers. This is an important consideration for the FNFN because even if they are holders of both their traditional knowledge and the science they produce, if they are not actually included *as* decision-makers, they will still likely have to hand over that data or knowledge if it is to be used in decisions.

Arguably, the challenge of integrating monitoring with decision-making stems from the institutionalization of CBM – much in the way Nadasdy (2005) argues the institutionalization of co-management – which has led to the need to ingrate CBM with existing institutional structures of state management. This leads us to view the challenges associated with CBM as simply logistical problems – for example, how to gather traditional knowledge and incorporate it into current monitoring and management processes. Instead, we should view CBM as an alternative to existing structures and practices of state management. If the goal of CBM is to empower the community, attempting to fit the program into current bureaucratic structures may have the opposite effect, extending state power and preventing communities from achieving their priorities (Nadasdy, 2005). In order to overcome the challenge of linking CBM to decision-making we must first navigate the politics and power in the knowledge production process. The FNFN hopes to navigate this in the impacts

monitoring process by inserting their values into industry planning activities well before what is required by current state management and regulation. Further, they are negotiating agreements that strategically work to shift current power dynamics, reasserting the FNFN's rights and responsibilities through realigning the relationship between the Nation, industry and government, giving FNFN's values more weight in how resources are managed and protected (Hayward, 2014). Currently, this is done through agreements with industry on a per-project basis, inserting the FNFN's values in management plans and monitoring programs, utilizing industry resources. While this approach has its own challenges (Hayward, 2014) it will hopefully ensure that the FNFN remains the holder of their traditional knowledge as well as any scientific data produced in order to allow for greater oversight of how knowledge is shaped and in turn shapes natural resource management approaches and decisions. However, if the FNFN only influences how and what knowledge is produced and are not included in decisions on how to utilize that knowledge, they may not affect decision-making in the way they are hoping. If the FNFN can change current knowledge production structures at the project level and negotiate how to become included as decision-makers on these projects, their program has the potential to scale-up and create a new environmental management and monitoring regime that is not backed by colonial assumptions.

## **Conclusion**

This chapter sought to determine what the Fort Nelson First Nation Lands Department wants their community-based monitoring and stewardship program (CBMS) to achieve, given their concerns with current monitoring activities. Further, I determined what the community-based monitoring (CBM) literature or other resources offer to help the FNFN realize their ambitions and resolve the challenges they face. Reviewing the CBM literature provided insights into the common benefits, challenges and proposed solutions. I found that the FNFN wants their CBMS program to maintain their stewardship ethic, increase capacity and meaningful involvement, utilize traditional and scientific knowledge and secure autonomy to

affect decision-making. Therefore, I recommend they consider the following when designing their program:

- Obtain and secure adequate long-term funding
- Continue to build capacity to carry out monitoring activities
- Continue to train members in data collection activities as well as data analysis and management
- Create protocols to ensure consistent and transparent monitoring between industry, government and the FNFN
- Create a monitoring framework that systematically outlines how the program will collect monitoring data but also analyze, interpret and present the results as useable knowledge for decision-makers.

If the FNFN designs their program according to these suggestions they can increase capacity and leadership in their community and empower their community members and their knowledge, which, on its own, is an important aspect of knowledge politics. Additionally, addressing the technical aspects of monitoring activities by creating standardized or territory-wide protocols and frameworks helps build a foundation for more coordinated and transparent monitoring across the landbase. However, even if the FNFN designs their program according to these suggestions, it may not have an impact unless they are actually participating in decision-making *as* decision-makers, at all levels. Challenging current knowledge production structures is important to the FNFN and important work in shifting current environmental management structures. Changing how science is produced and informed by their traditional knowledge can impact environmental management decisions at the project-level (as described in Chapter 2) and empower their community members, even if wider power relations aren't reshaped directly through their CBMS program. If the FNFN is able to use their program as leverage to strengthen the relationship between knowledge production and decision-making at a landscape-scale, they may be able to impact resource management decisions made across their territory.

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## Chapter 4: Conclusion

This research had two main aims:

- 1) To draw upon the perspectives of the FNFN Lands Department to develop an understanding of the challenges they are facing in developing an appropriate environmental monitoring regime, and
- 2) To explore community-based monitoring as a possible way for the FNFN Lands Department to restructure and inform current monitoring activities.

I found that the FNFN is increasingly concerned with the cumulative impacts of shale gas development on their traditional territory, especially inadequate baseline studies, decision making in the absence of adequate data, and a lack of sensitivity to their values, rights and responsibilities. While each of the body chapters of this thesis is written as stand-alone piece, they both present strategies that challenge the current expertise and knowledge being utilized in the environmental management regime of the shale gas industry. The FNFN hopes to insert themselves into the scientific monitoring process in order to generate knowledge and data that is important *to them* for decisions. The FNFN aims to shift how environmental impacts are currently framed and even known: inserting their values and perspectives will influence what data is collected and scientific claims are generated.

By inserting their values and knowledge in order to shift accountability in the current science regime, the FNFN may intervene in the current “knowledge politics” of environmental management. However, by intervening in these politics, which are deeply embedded in colonial relations, the FNFN runs the risk of perpetuating the very structures they hope to one day overcome. Participating in the current neoliberal regime of environmental management may have the opposite effect the FNFN intends, extending state power and preventing them from achieving autonomy or community empowerment (Nadasdy, 2005). The FNFN is challenging current environmental management and monitoring by contributing to the regime as knowledge holders/producers. They do this in their new approach to utilizing consultancy services in conducting impact assessment and monitoring in this

context. This approach is unique because instead of challenging the idea of ‘experts’ within the current professional reliance model, FNFN is challenging and leveraging who the experts are accountable to and whose values shape the design of data collection activities and the subsequent knowledge produced about the shale gas industry and their territory. I argue that it is very important for First Nations communities to challenge knowledge politics to become recognized not only as knowledge holders but knowledge producers, in order to inform current monitoring activities. However, in order to restructure current environmental monitoring regimes they should also be recognized *as* decision-makers, not just contributors to decisions in current structures. I discussed this in both substantive chapters, focusing on the participation and appropriation of the professionalized science regime in chapter 2, and the development of FNFN’s community-based monitoring program and its ability to impact decision-making in Chapter 3.

In Chapter 2, I presented perspectives of the FNFN Lands Department on the current environmental monitoring regime in their territory in order to understand the challenges they face. I found that many of the challenges described by my interview participants are occurring elsewhere in the province under professional reliance regimes utilized in a variety of natural resource management activities. These challenges include increased industry discretion in environmental management and monitoring activities with decreased government oversight of these activities and subsequent issues of accountability when relying on industry-funded expertise. This article offers evidence for how science regimes that rely on industry-funded expertise within neoliberal environmental management reforms play out on the ground. I concluded with a list of recommendations for all involved – the FNFN Lands Department, industry and government – on how to improve confidence in this regime. These recommendations include:

- Early and meaningful consultation of the FNFN Lands Department by those in charge of designing and implementing environmental management and monitoring plans and programs. The FNFN Lands Department should not

only be consulted as part of the permitting process but on management plans and monitoring programs.

- The FNFN Lands Department should utilize resources and agreements with industry or government to ensure capacity is built within the community to involve members in monitoring processes in a meaningful way.
- Increased regulatory oversight by the provincial government of the professional-reliance or qualified persons model currently used for designing and implementing monitoring initiatives.
- An independent, third party watchdog with a mandate to provide oversight to the oil and gas industry.
- A coordinated, transparent approach to monitoring activities between the FNFN, industry and government.

While the body of literature on professional reliance in natural resource management in BC is growing, its use, or relying on qualified persons (i.e. the use of industry-funded expertise) in the shale gas industry specifically, warrants further investigation. After conducting my analysis in Chapter 2, I concluded that the most immediate future research needed is an analysis of all legislation, regulations and policies governing the shale gas industry to determine where exactly professionals are being relied upon and what guidance exists and is lacking. It would be interesting to determine what a professional or qualified person is in these regulations, for what activities they are required and what they are and are not asked/required to do. Further, it is extremely timely to for the province to assess and/or create guidance for professionals or qualified persons on how to approach rights and title issues not only in northeast BC but also across the province. Additionally, at the time of this research, the FNFN's new approach with the Apache Liard seismic program was in its initial negotiation stages. Reflecting on the new approach a year or two after its introduction would provide useful insight into the success and limitations of appropriating the consultancy model as a strategy. It

would be useful to analyze the resulting science regime and whether or not it has changed and for whose benefit.

Chapter 3 was a briefing paper to the FNFN Lands Department in response to their concerns, advising on how a CBM program may restructure and inform current monitoring activities. I found that the FNFN wants their CBMS program to maintain their stewardship ethic, increase capacity and meaningful involvement, utilize traditional and scientific knowledge in a more appropriate way and secure autonomy to affect decision-making. My overall argument includes a list of recommendations for the FNFN to consider in designing their CBM program. These include:

- Obtaining and securing adequate long-term funding
- Continuing to build capacity to carry out monitoring activities
- Continuing to train members in data collection activities as well as data analysis and management
- Creating protocols to ensure consistent and transparent monitoring between industry, government and the FNFN
- Creating a monitoring framework that systematically outlines how the program will collect monitoring data but also analyze, interpret and present the results as useable knowledge for decision-makers.

However, I conclude that a perfectly designed CBM program cannot on its own ensure a link to affecting decision-making, a main priority for the FNFN. If the FNFN are not included as decision-makers in a restructured environmental management and monitoring regime they run the risk of their CBM program extending state power and preventing them from achieving their priorities. The FNFN's community-based monitoring and stewardship program was in its infancy at the time this research was conducted. An evaluation of the program in the future would be useful: whether and how it came life, what barriers and challenges it faced; and whether and how the FNFN was able to meaningfully impact decision-making or restructure the current regime?

Ultimately, this research revolved around determining how the FNFN can assert their treaty rights by taking control of, or inserting themselves into the data collection and monitoring activities of the shale gas industry. One of the key contexts for this research involved the question of what knowledge should count, and on what terms. The strategy presented in chapter 2, appropriating the current science regime and consultancy model, challenges what knowledge should count. The FNFN Lands Department's response to a science regime that is reliant on industry-funded expertise is to insert themselves into it, challenging the accountability of experts. This approach has benefits and challenges. The strategy will benefit the FNFN if it leads to a more inclusive and representative knowledge of the industry and its impacts on their territory. The challenge is ensuring that this "new" knowledge is indeed utilized and circulated by and amongst other users on the landbase and decision-makers. In an attempt to strengthen the relationship between knowledge production and decision-making at a landscape-scale to impact resource management decisions made across their territory, the FNFN is creating a community-based monitoring and stewardship program, as explored in Chapter 3. This program has the potential to maintain the FNFN's stewardship ethic, increase capacity and leadership in their community, utilize traditional and scientific knowledge in a more appropriate way and affect decision-making. Changing how science is produced and informed by their traditional knowledge can impact environmental management decisions at the project-level (as described in Chapter 2) and empower their community members, even if wider power relations aren't reshaped directly through their CBMS program. If the FNFN is able to use their program as leverage in negotiating a new environmental management and monitoring framework that strengthens the relationship between knowledge production and decision-making at a landscape-scale, they may be able to impact resource management decisions made across their territory. Changing the current political context of the shale gas industry may be the FNFN's greatest challenge but many of their initiatives have already worked to prove the inadequacies in the

current environmental management regime<sup>20</sup>. This research provided a critical perspective on current monitoring activities in northeast BC and a look into the benefits and challenges of engaging in knowledge politics as a strategy for the FNFN to protect their treaty rights.

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<sup>20</sup> Recent examples include (1) Success at the Environmental Appeal Board where a large-scale water license was rejected on that grounds that the science behind the license was fundamentally flawed and that the province failed to adequately consult the FNFN and consider the potential impacts on the FNFN. (2) Success in FNFN v. British Columbia (Environmental Assessment Office)

## Appendix A Interview Questions

1. Could you please introduce yourself – including your background and your connection to the community.
  - a. How are you involved with monitoring?
  - b. What is your relation to the land? How much time do you spend on the land?
  - c. How much time have you spent in the community – lived/operated in/visited?
2. What is your understanding of the current monitoring efforts occurring in the region?
  - a. What types of monitoring are occurring?
  - b. What would you consider to be the strengths and weaknesses of the current monitoring efforts?
  - c. Who is involved with current monitoring?
  - d. Where does the monitoring information go?
  - e. How is monitoring information connected to other processes such as approvals or permitting or enforcement action?
3. Outside of what is currently occurring, what monitoring do you think should be taking place, now or in the future?
4. Logistically, how would the type of monitoring you would like to see be carried out?
  - a. Who do you envision being involved; What would be monitored; Who collects monitoring data; Who is in charge of managing the data
  - b. How should it be linked to enforcement and thresholds (broader decision-making)
5. Have you heard of community-based monitoring? Have you ever been involved with a community-based monitoring program? What does that term mean to you?
6. What role do you think community-based monitoring could play in this region?
  - a. What do you consider to be the opportunities and challenges to using community-based monitoring in and around Fort Nelson?
  - b. How could the challenges you've mentioned be overcome?
7. What would your organization be willing to contribute to starting up and sustaining a community-based monitoring program?
8. Do you have any questions or is there anything else you would like to add?

## Appendix B Research Ethics Certificate



**University  
of Victoria**

**Human Research Ethics Board**  
Office of Research Services  
Administrative Services Building  
PO Box 1700 STN CSC  
Victoria, British Columbia V8W 2Y2, Canada  
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### Certificate of Renewed Approval

PRINCIPAL INVESTIGATOR: **Karena Shaw**

UVic STATUS: **Faculty**

UVic DEPARTMENT: **ENVI**

**ETHICS PROTOCOL NUMBER**     **12-131**  
Mammals - Delegated

ORIGINAL APPROVAL DATE:     **20-Apr-12**

RENEWED ON:                     **09-Apr-14**

APPROVAL EXPIRY DATE:       **19-Apr-15**

PROJECT TITLE: **Towards Effective Engagement: Assessing Public Engagement in the Development of the Shale Gas Industry in BC**

RESEARCH TEAM MEMBERS: **Co-Investigator: Dr. Michael Lee Macdonald  
Graduate Student Research Assistants: Matthew Murray (UVic), Christine Twerdt (UVic),  
Kathryn Garsie (UVic)**

DECLARED PROJECT FUNDING: **Carbon Management Canada (2011-2013); Water Economics, Governance and Policy Network (2013-2014)**

#### CONDITIONS OF APPROVAL

This Certificate of Approval is valid for the above term provided there is no change in the protocol.

##### Modifications

To make any changes to the approved research procedures in your study, please submit a "Request for Modification" form. You must receive ethics approval before proceeding with your modified protocol.

##### Renewals

Your ethics approval must be current for the period during which you are recruiting participants or collecting data. To renew your protocol, please submit a "Request for Renewal" form before the expiry date on your certificate. You will be sent an emailed reminder prompting you to renew your protocol about six weeks before your expiry date.

##### Project Closures

When you have completed all data collection activities and will have no further contact with participants, please notify the Human Research Ethics Board by submitting a "Notice of Project Completion" form.

### Certification

This certifies that the UVic Human Research Ethics Board has examined this research protocol and concluded that, in all respects, the proposed research meets the appropriate standards of ethics as outlined by the University of Victoria Research Regulations Involving Human Participants.

\_\_\_\_\_  
Dr. Rachael Scorth  
Associate Vice-President, Research Operations

Certificate Issued On:     **09-Apr-14**

**12-131 Shaw, Karena**