TLILNUO'LTI'K - WEJI-SQALIA'TIMK - HOW WE WILL BE MI'KMAQ ON OUR LAND

WORKING TOGETHER WITH PICTOU LANDING FIRST NATION TO REDEFINE A HEALTHY COMMUNITY

by

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To the memory of my mother, Violet, who without her guidance, love, and nurturing for those few short years that she was in my life, I would not have had the fortitude to fulfill the dream that I am confident she held for my future. To my son, Sean Michael Campbell, who is an extension of her presence in this world, I treasure you with all of my being, as I know she would have.

From our first grandmother's heart, through my mother's heart, through to our grandchildren's hearts, I dedicate this as my enduring love and respect for you.

N'mit no'komaq.

(We'la'lin Catherine Martin for those beautiful words.)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

For decades Pictou Landing First Nation (PLFN), a small Mi'kmaq community on the northern shore of Nova Scotia, has been told that the health of their community has not been impacted by a pulp and paper mill dumping 85 million litres of effluent per day into a lagoon that was once a culturally significant body of water, known as *A'se'k,* which borders their community. Yet, based on lived experience, the community believes otherwise. Despite countless government and industry-sponsored studies, their concerns have not gone away. In 2010, the Pictou Landing Native Women's Group committed to find out whether their health was being affected by the Boat Harbour Effluent Treatment Facility (BHETF). This dissertation is a result of those efforts.

I employ biopolitical theory and biopower to explore the role of the state in maintaining a narrative that diminished the concerns raised by the community. I then use environmental and social justice theory to determine whether the (in)action of the state constitutes an environmental and social injustice. I use a *Piktukowaq* environmental health theoretical framework to explore the intimate and sacred connection of the *Piktukowaq* to *A'se'k.* Guided by *Etuaptmumk* (Two-Eyed Seeing), which brings together the strengths of western and Indigenous knowledge systems, I employ a community-based participatory research methodology to gather culturally appropriate health data, and use a *Piktukowaq* environmental health research methodology to guide the interpretation of oral histories coming from the Knowledge Holders in PLFN. Through this approach I was able to determine that the physical, mental, emotional, and spiritual health of PLFN has been impacted by the BHETF, which has been compounded by structural determinants of health reflective of the colonial relationship of the state to Indigenous peoples in Canada. The findings reveal that not only does methodology matter, but that a new approach to environmental health risk assessment is appropriate in instances where Indigenous communities may be impacted by land displacement and environmental dispossession.

LIST OF ABBREVIATIONS USED

AFN – Assembly of First Nations
AOX – Adsorable organic halides
BHETF – Boat Harbour Effluent Treatment Facility
CBPR – Community-based participatory research
CCHS – Canadian Community Health Survey
CCR – Canadian Cancer Registry
CWBI – Community Well-Being Index
DIA – Department of Indian Affairs
EHS –Environmental Health Survey
FNIGC – First Nation Information Governance Centre
FNIH – First Nations Inuit Health
FNIHB – First Nations Inuit Health Branch
H_2S – Hydrogen sulphide
HHH – Head of Household
INAC - Department of Indian (Indigenous) and Northern Affairs Canada
JEHMC - Joint Environmental Health Monitoring Committee
NAHO – National Aboriginal Health Organization
N.D. – No date
NSWA – Nova Scotia Water Authority
OCAP – Ownership, Control, Access, Possession
PHAC – Public Health Agency of Canada
PLFN _ Pictou Landing First Nation
PLNWG – Pictou Landing Native Women's Group
PPB – Parts per billion
RAs – Research Assistants
RCAP – Royal Commission on Aboriginal Peoples
RHS – Regional Health Survey
SDoH – Social Determinants of Health
SGC – Standard Geographical Classification
TRC – Truth and Reconciliation Commission
UNSI – Union of Nova Scotia Indians

GLOSSARY

A'se'k	Boat Harbour
Etuaptmumk	Two-Eyed Seeing
Kisu'lt melkiko'tin	The place of creation – Nature.
Ko'kmanaq	Our relations.
Mi'kma'ki	Traditional territory of the Mi'kmaw people.
Netukulimk	Values and norms of being on the land.
N'mit no'kmaq	All my relations.
Piktukowaq	Person from the traditional territory of *Piktuk.*
Piktuk	One of seven traditional territories of the Mi'kmaw.
Tiljim msi'ko'ltiek	We are so sorry.
Tlilnuo'lti'k	Encapsulates ontology.
Weji-sqalia'timk	Encapsulates epistemology.
W*elta'sulti'ji'k*	They were happy.

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Now, to answer that dreaded question, "Are you done yet?" The answer is "Yes".

CHAPTER 1 INTRODUCTION

On the evening of November 1, 2010, thirteen Mi'kmaw women from the Pictou Landing Native Women's Group (PLNWG) called a meeting in the community church kitchen of Pictou Landing First Nation (PLFN) with the President of the Nova Scotia Native Women's Association (NSNWA) and three academic women from Dalhousie University and together they made a decision. The PLFN women had had enough of the Government of Nova Scotia allowing an estuary bordering their community to be used as the site of a toxic wastewater treatment facility for a local pulp and paper mill. They had had enough of a federal inter-governmental committee, mandated by the *Pictou Landing Indian Band Agreement Act (Act*)[1] to oversee the health of the community, telling them that the health of their children and their families had not been affected by the pollution. The women agreed, "there have been lots of studies on trees, water…but none on us. Our health is our main concern" (Pictou Landing Native Women's Group, 2010b, p. 7). That evening, the group of PLFN women committed to do what needed to be done to find out whether their health was being affected by the Boat Harbour Effluent Treatment Facility (BHETF). I was one of the three academic women from Dalhousie University at that meeting… and I, like the women, am Mi'kmaq as well, but with family ties to the neighbouring community of Sipekne'katik First Nation.

[1] In 1986, PLFN sued the federal government for breach of fiduciary duty when the riparian rights (a right to access or use the shore, bed, and water (Merriam-Webster, 2017) for the portion of their shores bordering Boat Harbour were signed over to the province so that Boat Harbour could be used to receive the effluent from a local pulp and paper mill (Paul, 2006). In 1993, PLFN reached an out-of-court settlement of $35 million with Canada (Parliament of Canada, 1995). The *Act* was ratified in 1995 and formalized the *Pictou Landing Indian Band Settlement Agreement* (1993) (Parliament of Canada, 1995).

That meeting became the catalyst for me to eventually devote seven years towards participating in a community-based participatory research project and writing a doctoral dissertation in relation to the research I have undertaken with the PLNWG. I have struggled throughout this time with how to avoid perpetuating the harm that PLFN has endured for 50 years. My challenge would be to balance an analysis of the health of the community while respecting, within my research framework, an Indigenous knowledge system that places the relationship to land and environment as central to identity. What I would come to understand over the ensuing years, was that place-based epistemological and ontological understandings centre Indigenous[2] peoples, and their understandings of health are intimately connected to the health of the land and environment around them.

In Canada, Indigenous peoples' health has to also be framed within the historical, ideological, political, and socio-economic context of a colonial state that has kept Indigenous peoples marginalized and impoverished. The dominant society in Canada has been complicit in silencing Indigenous communities. Fundamentally, Indigenous and non-Indigenous people see the world differently, and ignoring this difference continues to put Indigenous peoples at risk in colonial states like Canada. Simpson (2007) argues that colonial nation states have used their power to subjugate, persecute, and dominate Indigenous peoples, to the point that Indigenous people are barely visible. Countering this erasure is becoming more of the norm in Indigenous research (see Castleden, Bennett,

[2] Indigenous is the term used throughout this dissertation instead of Aboriginal, First Nations, Native, or Indians. Indigenous is consistent with the terminology of the United Nations Declaration on the Rights of Indigenous Peoples, which Canada supports, without qualification (Indigenous and Northern Affairs Canada, 2016). The only time these terms - Aboriginal, First Nations, Native, or Indians - will be used is when the terminology is used in the historical context of a direct quote, in legal terminology, or is in the name of legislation.

Pictou Landing Native Women's Group, Lewis, & Martin, 2017; de Leeuw, Lindsay, & Greenwood, 2015; Richmond & Ross, 2009; Tobias & Richmond, 2014; Tuck, McKenzie, & McCoy, 2014). Meaningful research, then, respects Indigenous knowledge and brings to light how integral the relationship between land and environment is for Indigenous peoples (Tuck & Yang, 2012). I outline in the next sections how I have approached my research, mindful of the strong connection that PLFN would have had, and continues to have, to the land and environment around them, and the importance of this connection to the health of the community. What follows is an assessment of the health of the PLFN community, but one that gives voice to the Mi'kmaw community in the process.

1.1 Study Background

PLFN is a Mi'kmaw community on the northern shore of mainland Nova Scotia. As of 2018, there are 487 residents who live on-reserve in PLFN, with another 158 residents who reside off-reserve (Indigenous and Northern Affairs Canada, 2017). In 1967, the Nova Scotia government, with the sanction of the federal government, permitted a local pulp and paper mill located at Abercrombie Point, just outside of the Town of Pictou (Figure 1.1) to start dumping almost 85 million litres of the mill's effluent per day into a wastewater treatment lagoon and tidal estuary called Boat Harbour, bordering the Mi'kmaw community of PLFN, located on the Northumberland coast of the province (Jacques Whitford Environmental & Beak Consultants, 1992, as cited in Pictou Landing Native Women's Group et al., 2016).

Every day, for the past fifty years, the residents of PLFN are reminded that, what was once a culturally significant estuary known to the community as *A'se'k*, which

Figure 1.1 - Location of the Town of Pictou, Northern Pulp Mill, Boat Harbour Effluent Treatment Facility, and Pictou Landing First Nation (Source: PLNWG et al., 2016).

provided food, medicines, berries, and recreation, is the receptor for the wastewater treatment facility, and may be the source of harm to their members. *A'se'k* is a Mi'kmaw word that translates to mean 'the other side' or 'the other room', reinforcing the close connection PLFN residents felt to the area, an extension of their home and lands. The PLNWG suspect that the health of their community has been impacted, yet a federal inter-governmental committee, and the consultants that the committee hires, tell them otherwise.

The PLNWG is a collective of Mi'kmaw women in PLFN who meet regularly to address the needs of the women in the community (Lewis et al., 2016). The PLNWG is part of the provincial level NSNWA, which in turn is one of twelve provincial and territorial organizations that belong to the Native Women's Association of Canada (NWAC), a national political body that has been representing, promoting, and advocating

for the interests of all First Nation, Metis, and Inuit women in Canada since 1974 (Native Women's Association of Canada, 2017).

As an Indigenous researcher, I must situate myself in relation to the research that I am undertaking (Absolon & Willett 2005; Kovach, 2009; Tuhiwai Smith, 2012). I am a member of the Sipekne'katik First Nation, about an hour's drive from PLFN. My parents and grandparents are remembered by some of the Knowledge Holders[3] in the community. I have memories of going to PLFN when I was a young child and swimming at the beach, what I now have come to learn is called *Sitamuk* by the community, or is known to the settler population as Lighthouse Beach. This would have been around the time that things started to change in PLFN, when *A'se'k* became contaminated by the BHETF.

I made a commitment to the PLNWG in 2010 to undertake this dissertation, to ascertain if, as a consequence of siting the BHETF in *A'se'k*, the resultant land displacement and environmental dispossession is affecting the health of the community. Guided by an understanding that the health of PLFN is connected to the health of the land and environment around them, I present the research questions that I seek to answer, and the objectives that guide my dissertation.

1.2 The Research Questions and Objectives

Land displacement can include the loss of traditional lands, loss of access to traditional lands, or forced relocation from traditional lands, and is argued to be one of the most significant factors contributing to cultural stress and subsequent detrimental

[3] In the collection of oral histories, recruitment was opened up to younger people who had memories of *A'se'k* but would not be comfortable being identified as Elders. At a PLNWG meeting in November 2012, it was decided that the term Knowledge Holder would be used (Bennett, 2013). Furthermore, the Knowledge Holders that participated in the collection of oral histories consented to being identified (Bennett, 2013).

effects on the health and wellness of Indigenous communities (Cunsolo Willox et al., 2013; Higginbotham et al, 2007; Richmond & Ross, 2009; Windsor & McVey, 2005). Environmental dispossession[4], the process whereby access to the resources of the traditional environment is reduced, has uprooted Indigenous social, spiritual, and cultural ways of life around the world. PLFN is no different - the community is fearful of what losing their cultural connection to *A'se'k* means for their community, and what implications this may have for their language, practices, spirituality and traditions.

In the process of seeking to answer whether the land displacement and environmental dispossession are affecting the health of the members of the community, I have determined that a full accounting of Indigenous health has to include more than physical health, but must also include the mental, emotional, and spiritual aspects of health. Therefore, my first research question is: *As a consequence of siting the BHETF in A'se'k, is the land displacement and environmental dispossession affecting the physical, mental, emotional and spiritual health of the PLFN community?* Furthermore, I question whether the methodology matters in studies commissioned by the federal inter-governmental committee, since those studies always conclude that the health of the community has not been affected by the pollution, and yet the women continue to question the outcomes. Therefore, my second research question is: *As a consequence of siting the BHETF in A'se'k, does the methodology used to assess Indigenous health matter in order to have a full accounting of what land displacement and environmental*

[4] Environmental dispossession is characterized by displacement, environmental contamination, assimilation, unprecedented resource extraction, or land rights disputes (Big-Canoe & Richmond, 2014; Richmond & Ross, 2009; Tobias & Richmond, 2014).

dispossession means for the health of Indigenous communities, especially in instances like the one experienced by PLFN?

Given the research questions that I seek to answer, two interrelated objectives guide my dissertation: to determine the current physical, mental, emotional and spiritual health of the PLFN community; and, to assess the physical, mental, emotional and spiritual health status of the PLFN community from the perspective of the Knowledge Holders, as the community gets further away from the traditional lifestyle practiced before the BHETF began operating. To address the first objective, I compiled and analyzed data that reflect the health of the PLFN, collected in *Identifying, Documenting, Mapping, and Mobilizing Environment and Health Knowledge in Pictou Landing: An Environmental Health Survey* (EHS), and from data maintained by Statistics Canada, or is otherwise publicly available. To address the second objective, I use the knowledge shared in the oral histories to assess how, over time, the physical, mental, emotional and spiritual health status of the PLFN may have changed since 1967, as the pursuit of traditional practices and activities became more limited.

My dissertation is about giving voice to a community, where for once, the studies will not be about the health of the trees or water, but will be about the children and families that the PLNWG care about and are convinced have been hurt by exposure to the BHETF. What follows is how I have approached the research, in order to do so. I have designed the research project, to first present an overview of the historical, ideological, political, socio-economic context for Indigenous peoples' existence within a colonial state like Canada. I then present the theoretical and methodological choices I have made. I follow that with findings from the data about select aspects of the health status of the

community, and then from the stories of the Knowledge Holders in the community who have experienced the devastation over the years to their beloved *A'se'k.* I conclude with the contributions that the PLNWG have made possible by allowing this dissertation to be conducted in their community.

1.3 Thesis Design

In Chapter 2, I introduce the structural determinants of Indigenous health. Structural determinants are those factors that affect health, which are unique to the Indigenous experience in a colonial state like Canada. Indigenous people have been subjected to colonization, assimilative policies, and an imposed Indigenous-settler relationship that has been particularly detrimental to Indigenous health, and it is these structures that continue to oppress Indigenous peoples in their efforts to self-determine a positive way forward to resolve negative health outcomes in their communities (de Leeuw, Lindsay, & Greenwood, 2015). I then provide context for how the structural determinants of health have impeded a determination of health outcomes in PLFN.

In Chapter 3, I propose that Canada, as a colonial state, employs biopolitics and biopower to regulate and manage the health of Indigenous people in order to justify displacing them from their lands and environments. This can be contextualized by the historical, ideological, political, and socio-economic factors that are impacting PLFN. I then explore the consequences of governmental inaction on environmental and social injustice issues. Finally, I employ a Mi'kmaw environmental health theoretical framework to illustrate that a full accounting of environmental health impacts to PLFN can only be understood by articulating the deep and sacred relationship that Indigenous

people have to their lands and environment, and how from a Mi'kmaw perspective, the BHETF has, and continues to affect the PLFN community.

In Chapter 4, I propose that the methodology one employs is critical to conduct research that aims to understand Indigenous environmental health. The federal government enacted a Joint Environmental Health Monitoring Committee (JEHMC), comprised of representatives of Canada (Indigenous and Northern Affairs Canada, Health Canada, Department of Justice, and Environment Canada), as well as representatives of PLFN, to oversee the community's health, and monitor the water and air quality in the community. The JEHMC has, for the twenty-five years of its mandate, produced reports that continually emphasize that the health of PLFN has not been impacted; however, the women of PLFN believe otherwise, and have lost confidence in the work that JEHMC produces. Yet, the PLFN representatives on the JEHMC seemingly have had little influence in mandating studies that might address or, more appropriately, reflect the concerns of their community.

In Chapter 4, therefore, I employ *Etuaptmumk*, a Mi'kmaw-derived and integrative approach to Indigenous and western knowledge systems, used in the spirit of co-learning known in English as Two-Eyed Seeing, which is intended to give voice to PLFN as I seek to answer my research questions. I use a community-based participatory research methodology and a Mi'kmaw environmental health research methodology to guide the collection of data, in a way that is, as Castleden, Sloan Morgan, and Lamb (2012) would argue, respectful, relevant, and responsible. In this chapter, I re-imagine what PLFN health could be if we look to the strengths of both knowledge systems to

generate insights that, employing a strictly western approach, have not been achieved under the direction of the JEHMC.

In Chapter 5, I explore why the JEHMC has maintained that the health of PLFN has not been impacted by the BHETF and whether the narrative holds up under scrutiny. The position of the JEHMC prevents a full accounting of the health of the community that I seek to determine in this chapter. By using Statistics Canada data that was always available and accessible to the federal representatives on the JEHMC, I present health outcome data that can contextualize the health status of PLFN, in comparison to First Nations, both provincially and nationally, and to non-Indigenous Canadians at the local, provincial, and national levels.

I also begin to demonstrate, as a result of my findings in Chapter 5, why there is a need to rethink environmental health research in an Indigenous context, particularly in light of how the power relations that continue to exist in a colonial state like Canada, can silence Indigenous voices like PLFN. From an environmental and social justice perspective, I use data to explore two health concerns that should have been investigated by JEHMC. These findings will demonstrate how the structural determinants of health are detrimental to Indigenous health, and how they are used to oppress Indigenous peoples' voices and their efforts to resolve the fear and concerns they have for the health of their communities.

I continue in this chapter to further contextualize PLFN health by using data from the EHS which was developed and implemented under the guidance of the PLNWG, and reflects the concerns that the PLFN had about their health. Data collected in the EHS is from the perspective of the PLNWG, using a culturally appropriate definition of

Indigenous health. Notably, I also include data that reflects the structural determinants of health and the oppressive colonial structures that stand in the way of doing relevant environmental health research, when land displacement and environmental dispossession can potentially impact the health of the community.

In Chapter 6, I present an environmental health interpretive model built on the *Piktukowaq*[5] knowledge system. Battiste and Youngblood Henderson (2000) argue that researchers enact 'epistemic violence' (p. 96) when they attempt to fit the interpretation of Indigenous knowledge into western interpretive models, so I present the Indigenous knowledge within a *Piktukowaq* Environmental Health Interpretive Framework. Using oral histories as guidance, I worked with the Knowledge Holders to develop a conceptual framework of the *Piktukowaq* worldview. Developing this framework, and then working with the Knowledge Holders, led me to my understanding of how identity and health flows from *A'se'k*, in a way that can no longer flow from Boat Harbour. Thus, it is by presenting the *Piktukowaq* worldview, in terminology that highlights the norms, values, and constructs of the *Piktukowaq,* that allows me to convey how the sacred connection to *A'se'k* has been impacted by the land displacement and environmental dispossession they experienced as a result of siting the BHETF in *A'se'k*, and continues to be impacted. *Piktukowaq* identity is rooted in the landscape around *A'se'k* to this day. It is where the *Piktukowaq* sprouted from (*weji-sqalia'timk*), and they can only sustain their Piktukowaq identity (*tlilnuo'lti'k*) through the opportunities they are provided with by being out on healthy land and in a healthy environment.

[5] *Piktukowaq* translates to a "person from *Piktuk*", one of the seven traditional districts of *Mi'kma'ki* (Sable et al, 2012).

In Chapter 7, I conclude by presenting the theoretical, methodological, and substantive contributions that conducting this research can have to the Indigenous environmental health literature and provide some recommendations for further research going forward. I posit that an appropriate Indigenous environmental health risk assessment approach is warranted to ensure that the impacts of land displacement and environmental dispossession on Indigenous peoples are fully taken into account. Furthermore, this research must be made relevant to the group that is impacted, because each individual community will have their own unique relationship to the land and environment from which they emerge. Environmental governance structures that prevent Indigenous communities from meaningful engagement and participation in assessing their own health should no longer be acceptable, especially now that the federal government is looking to reconcile with Indigenous peoples in Canada. The very identity of Indigenous communities and their worldviews, cultures, traditions, and identities rests on this.

CHAPTER 2 STUDY CONTEXT

For decades, Pictou Landing First Nation (PLFN) has been told that scientific evidence, based on the western approach to science, indicates that the health of the community has not been impacted by exposures to the Boat Harbour Effluent Treatment Facility (BHETF) bordering their community. Yet, based on lived experience, the community knows otherwise. Countless dollars spent on government- and industry-sponsored research have not made their concerns go away. I argue that it is because there is a fundamental disconnect in how health is understood by the community, and the 'medicalized' definition of health that is privileged in the studies that have been conducted to date. Medicalization is viewed as negative for individuals and societies because it essentializes human conditions as medical problems to be treated, rather than as complex problems to be understood within the social, environmental, cultural, or psychological contexts in which they occur, thereby deflecting attention away from what is required to address the problem (Clark, 2014).

Indigenous health will never be adequately studied if the broader and unique structural factors which impact Indigenous health, are not given consideration. The impacts of colonial and racist policies and practices, and the persisting imposition of dominant societal values on Indigenous health are often overlooked, or misunderstood. This is the general context in which PLFN endures, and has done so since early European contact, and all the more distressingly so since 1965, when the treatment facility was built.

In this chapter, I begin by introducing the structural determinants of Indigenous health before providing an overview of Indigenous health in Canada, from past to

present, and touching on the forecast for the future. From there, I concentrate the remainder of the chapter on providing contextual information about the structural determinants of health in Pictou Landing First Nation. This overview and study context material is essential scaffolding for the dissertation's theoretical framework, which is covered in the following chapters.

2.1 Structural Determinants of Indigenous Health

In general, Indigenous people consistently report lower levels of health compared with other Canadians; they report higher rates of disease, and they die younger than their non-Indigenous counterparts (Castleden, Martin, & Lewis, 2016; de Leeuw, Greenwood, & Cameron, 2010; Reading & Wien, 2009). For example, according to the Canadian Community Health Survey (2014), 89% of Canadians ages 12 years and older report good to excellent health. Yet only 60% of Pictou Landing First Nation (PLFN) participants of the same age group report good to excellent health (PLFN Environmental Health Survey (EHS), 2014), a gap of almost 30%. In Canada, a true picture of First Nation health on-reserve has only emerged in the last twenty years (First Nations Information Governance Centre, 2016). This is because up to that point the federal government and academic research tended to exclude First Nations living on-reserve and the Inuit in northern Canada from national surveys (First Nation Information Governance Centre, 2016).

Indeed, in the early 1990s, Statistics Canada launched three major national longitudinal surveys – the Survey of Labour and Income Dynamics (1993), the National Longitudinal Survey of Children and Youth (1994), and the National Population Health Survey (1994) (Picot, Berthelot, & Webber, 2006) that specifically excluded First Nation

people living on-reserve (First Nation Information Governance Centre, 2018a). The relationship to government and their efforts to conduct censuses, has been marked by resistance, avoidance, and suspicion on the part of Indigenous communities, mainly because of the legacy of the colonial relationship with Canada (Hamilton, 2007). Moreover, Statistics Canada reported that they too were experiencing issues in the 1996, 2001 and 2006 census processes, with some Indian reserves and settlements refusing to participate in censuses, or censuses being interrupted before the processes were complete (Statistics Canada, 2009).

Since 1997, the FNIGC has been collecting data through national and regional longitudinal surveys so that First Nations living on-reserve and in northern First Nation communities can contribute to reflecting the reality of Indigenous health in Canada[6] (First Nations Information Governance Centre, 2016). Having data that allows First Nations to explore determinants of health that can explain disparities in health outcomes is important to unveil the factors that are contributing to those disparities and which negatively impact Indigenous peoples' overall health. Yet, FNIGC data only gives a descriptive view of on-reserve health, not a detailed explanation of individual community-level health gaps. So it is important to explore what determinants of health may not have been considered in determining why these gaps exist in the first place.

The Public Health Agency of Canada (2016) recognizes social determinants of health (SDoH) as influencing the health of populations. The SDoH include measures for income, social status, social support networks, education, employment/working

[6] In 1997, the Inuit of Labrador were included in the Regional Health Survey process (FNIGC, 2018a). Since then the Inuit conduct separate health surveys (Inuit Qaujisarvingat Knowledge Centre, n.d.).

conditions, social and physical environments, personal health practices and coping skills, healthy child development, gender, and culture (Public Health Agency of Canada, 2016, para. 1). To further an understanding of how the political and social history of Indigenous people in Canada affects their health, Reading and Wien (2009) developed the *Integrated Life Course and Social Determinants Model of Aboriginal Health* (*Life Course Model)* as a conceptual framework to recognize there are variations in SDoH over the course of a lifetime, and that one must include the social structures, systems, and institutions that are unique to the experience of Aboriginal health. Recognizing that the impact of social determinants manifests differently across Aboriginal groups in Canada, Reading and Wien (2009) organized data around social determinants of health at the proximal (micro), intermediate (meso), and distal (macro) levels. Proximal determinants are categorized as individual level health behaviours, as well as the physical and social environment; intermediate determinants are categorized as community infrastructure, resourcing (funding), and capacities, social and cultural cohesion, or restricted environmental stewardship; and distal determinants are categorized as the political, social and economic contexts, and include worldviews, spirituality, and the right to be self-determining (Reading & Wien, 2009; Reading, 2015).

de Leeuw, Lindsay, and Greenwood (2015) argue that while the SDoH approach may allow for a more nuanced understanding of the disparities in Indigenous health, it must also account for the impacts of colonialism as an underlying determinant of health because it is still impacting the health and well-being of Indigenous peoples today. Indigenous people have been subjected to the unique experiences of colonization and assimilative policies, and an imposed Indigenous-settler relationship that has been

particularly detrimental to their health (Wilk & Cooke, 2015).

Reading (2015) focuses on the oppressive colonial structural determinants, the historical, ideological, political, societal, and economic structures within which Indigenous people try to survive, as contributing to the ongoing health inequities. Reading argues that there are the deeply embedded health determinants at the structural (distal) level (Indigenous worldviews, spirituality, self-determination) that have been, and continue to be, harmed by these colonial structures (Reading, 2015).

I argue that it will be important to critically examine the structural determinants of Indigenous health in order to fully comprehend the lack of autonomy that Indigenous people have had, and continue to have, over the decisions that impact their health. It will be just as important to acknowledge that it will take an understanding of how Indigenous knowledge, worldviews, spirituality, relationship to land and environment, cultures, and languages, have been oppressed, but as determinants, can contribute to Indigenous health and well-being (de Leeuw, Lindsay, & Greenwood, 2015). Reading (2015) is not advocating that research move beyond the Life Course Model; she argues that the Life Course Model is an important starting point. What Reading (2015) does advocate however, is that there has to be a more systematic interrogation of how the structural determinants have created, and continue to perpetuate, the health inequities that Indigenous people endure. In the following section, I will address the colonial structural determinants – the historical, ideological, political, societal, and economic structures – within which Indigenous people in Canada have survived in the past.

2.1.1 Historical, Ideological, Political, Societal, and Economic Structures

Gracey and King (2009) note that colonization has impacted many Indigenous

societies and their ways of life, adversely affecting the health and wellbeing of entire communities from the very early beginnings of European contact. According to Reading and Wien (2009), Canada's formation as a nation-state saw a deliberate and profound imposition of colonial control over all aspects of Indigenous lives. Heralding the intrusiveness of control over Indigenous societies, in a *Report of the Parliamentary Select Committee on Aboriginal Tribes (British Settlements)* (Aborigines Protection Society, 1837), the Aborigines Protection Society[7] appealed to the British Parliament that there existed an "absolute necessity of adopting immediate measures for [the] protection and preservation" (p. xi) of the Aborigines in the British colonial settlements. The Society implored that it should be

> presumed that the native inhabitants of any land have an incontrovertible right to their own soil: a plain and sacred right…which seems not to have been understood" (p. 4) as "there was a proneness…in the new occupants…to regard the natives as an irreclaimable race…whom it was desirable ultimately wholly to remove. (Aborigines Protection Society, 1837, p. 8)

In the *Report on the Affairs of the Indians in Canada (1845)*, it is noted that

> the height, beauty of proportions, nobility of carriage, activity, strength and suppleness…have all decreased with civilization…In his [the Indian] half civilized state, he is indolent to excess, intemperate…therefore it is evident that in such cases the mode of their treatment has been defective, and calls for alteration. (Bagot, 1845, section II, para. 4-9)

[7] The Aborigines Protection Society (1836-1909) was an influential group who attempted to lobby the Colonial Office in London (UK) concerning policies that impacted aboriginal peoples in Britain's overseas territories (see McDonald, 2013).

This focus on the decreasing state of the 'Indian' was attributed to an inherent character fault and not the societal influences of the time, and would, therefore, require colonial intervention (Kelm, 1998; McCallum, 2017; Mosby, 2013; Reading, 2015). Foucault (1973) notes that at this time in Europe, medicine was becoming a technique that no longer just focused on curing ills, but was becoming a normative technology for what constituted a 'model man' (p. 34). Medicine was allowing a medical gaze that starts to become calculating, pathologizing, structuring, and normalizing (Foucault, 1973). I will address this in more detail in Chapter 3.

In 1867, Section 91(24) of the *British North America Act*, places Indians and lands reserved for Indians under the jurisdiction of the federal government. The *Indian Act, 1876* (*An Act to amend and consolidate the laws respecting Indians)*, is the first legal expression of colonial power over Indigenous bodies in Canada, as the Minister of Indian Affairs is empowered to make regulations over the health of Indians – to supress communicable disease, improve reserve sanitation, and provide medical treatment and health services (Kelm, 1998). Furthermore, the *Indian Act, 1876* provides that, in the event that a band does not care for its sick, disabled, aged, or destitute, the "Superintendent General…may furnish sufficient aid from the funds of the band for the [care] of such…persons (s. 73)", effectively placing the care of the sick and suffering Indians under the care of the federal government (Indigenous and Northern Affairs Canada, 2015).

A sustained effort to "re-form Aboriginal bodies" (Kelm, 1998, p. 57) came with the Indian residential school system in Canada. In 1879, Nicholas Flood Davin was commissioned by the federal government to advise whether the industrial school system

operating in the United States to educate Native Americans was appropriate for Canada, and in his report he noted that the "Indian was in a very early stage of development…and that if anything be done with the Indian, we must catch him very young..." (Truth and Reconciliation Commission of Canada, 2015b, p. 157). The strategy to colonize and assimilate, or more bluntly, "take the Indian out of the child" started in 1880 by then Prime Minister Sir John A. MacDonald, who was also Superintendent-General of Indian Affairs (Benjamin, 2014, p. 21).

In 1883, the Public Works Minister recommends that the government go ahead with funding the Canadian Indian Residential School system, and argues that it would be necessary to remove the children from the savage influence of the parents in order that they learn the habits of civilized people (Truth and Reconciliation Commission, 2015b). The Indian Residential School system is intended to produce 'Indians' that will be able to fit into western society (de Leeuw, Greenwood, & Cameron, 2010, p. 288). In 1887, Canadian Prime Minster Sir John A. Macdonald expresses the government position bluntly, stating that the government's objective for the imposition of colonial control was the total assimilation of Indians into settler society, and to achieve this as quickly as possible (Truth and Reconciliation Commission of Canada, 2015b, p. 126).

In 1907, Department of Indian Affairs (DIA) Chief Medical Officer, Dr. Peter Henderson Bryce, reported on the condition of the residential schools, and noted the defective sanitary condition of many schools which he claimed promotes the spread of tuberculosis and other diseases; but administrators and medical personnel downplayed his claims (Bryce, 1907). Despite the condition in many of the schools, by 1927 the *Indian Act* mandates punishment for parents who did not send their children to the Indian

residential schools (de Leeuw, Greenwood, & Cameron, 2010). In 1948, nutritional experiments under the guise of research were carried out in residential schools intended "to explore dietary methods that could be employed, as economically as possible, to maintain and improve the health of Indians" (Truth and Reconciliation Commission of Canada, 2015c, p. 253). The experiments used control groups to compare the effect of nutrition interventions on children, without parental consent (Truth and Reconciliation Commission of Canada, 2015c, p. 263). The Shubenacadie Indian Residential School in Nova Scotia, which Pictou Landing First Nation members would have attended, was one of the schools (Truth and Reconciliation Commission of Canada, 2015c). Today, it is widely recognized that the legacy of the residential school system continues to manifest in poorer physical, mental, emotional, and spiritual health outcomes for Indigenous people in Canada (de Leeuw, Greenwood, & Cameron, 2010, p. 289).

2.2 Indigenous Health: Past, Present and Future

Under the *Indian Act,* the federal government has had, and continues to have, the ability to regulate the health of Indians. In 1904, Indian Health Services, created under the umbrella of the federal DIA, was tasked with managing the Indian body (Kelm, 1998, p. 100). Indian Health Services defined and quantified the Indian body as a body in crisis, and focused on disease and dysfunction (Reading & Nowgesic, 2002). They emphasized indicators of disease, physical illness, and death, which substantiated and validated the kinds of policies that were being imposed on Indigenous people at the time (Kelm, 1998, p. xx). In 1945, National Health and Welfare, another federal agency, assumed control over Indian health, which was then taken over by the federal Medical Services Branch in

1962, and is now called the First Nations and Inuit Health Branch, under the federal jurisdictional authority of Health Canada (Health Canada, 2007).

The problem, according to Adelson (2005), is that the colonial structures that have been imposed in Canada, continue to generate and produce the contemporary health burdens being experienced by Indigenous people. The Public Health Agency of Canada (2013), and the SDoH approach, does not look at the structural determinants of health that colonization, assimilative policies, or Indigenous-settler relations have created. Consequently, going forward there needs to be a focus on determinants of health that center on how the structural or distal determinants of health, that is, the historical, ideological, political, societal and economic structures, have affected, and continue to impact, the health of Indigenous people in Canada (Reading, 2015).

The challenge, however, is that most Canadians are not even aware of what these structural determinants might be. To illustrate this, I use the following example from 2016, in which the Environics Institute for Survey Research conducted a national public opinion poll to gauge the level of public understanding about a number of issues that have impacted Indigenous peoples. When asked what some of those issues might be, only 17% of those surveyed recalled the negative legacy of Canada's mistreatment towards Indigenous peoples, 7% mentioned the legacy of assimilative institutional and cultural oppression, and only 2% mentioned the Indian residential school legacy (Environics Institute, 2016). Yet, the residential school system continues to create health disparities, not only in those who attended the schools, but in the generations who have followed (Bombay, Matheson, & Anisman, 2009, 2011, 2014b; Truth and Reconciliation Commission, 2015d). The results of the opinion poll suggest that health experts (who are

undoubtedly represented in such national polls) likely do not understand the factors that contribute to lower levels of health outcomes, if only 2% of the overall public, as represented by those interviewed in a nationwide survey, recall the legacy of the Indian residential school system.

The historical, ideological, political, societal, and economic experience of PLFN is similar to that of all Indigenous people who have undergone colonization and the imposition of colonial institutions, or have been dispossessed of their lands and environment. These oppressive colonial structures, I suggest, contribute to the 30% gap in health outcomes between non-Indigenous Canadians and members of PLFN, as mentioned earlier in this chapter. Therefore, having a more comprehensive definition of Indigenous health, one that interrogates the structural (distal) determinants of Indigenous health more fully, as suggested by Reading (2015), will allow research that can recognize how these structures interact with health at a local level. I now introduce structural determinants in the context that PLFN will have experienced them.

2.3 Structural Determinants of Health in Pictou Landing First Nation

As noted in Chapter 1, the Pictou Landing Native Women's Group (PLNWG) initiated a meeting in 2010 to discuss research on the potential impacts of the BHETF regarding the health of their community. Despite almost 50 years of being on the receiving end of toxic effluent into the estuary that borders their community, being exposed to mill emissions coming from the pulp and paper mill, watching as the paint turned black and peeled off their homes, and watching the health of their community deteriorate over the years, the women were adamant that no government body had adequately investigated the health concerns of the community. Even though a Joint

Environmental and Health Monitoring Committee (JEHMC) has been tasked with overseeing the community's health, as well as monitoring the water and air quality in the community, the women are unconvinced that their concerns are being heard. The JEHMC investigates human and animal health through examining exposure to toxins in the water they drink, the air they breathe, the food they eat, and through their skin (Joint Environmental and Health Monitoring Committee, 1996, p. 2). Research conducted by consultants, government agencies, and industry experts, under the auspices of JEHMC over the years, has consistently concluded that there have been no negative impacts on the health of the PLFN residents.

The women's skepticism in the findings of the JEHMC needs to be situated in the context of decades of unethical research on Indigenous peoples. In the words of Tuhiwai Smith (2012), when the term research is mentioned, "it stirs up silence, it conjures up bad memories, it raises a smile that is knowing and distrustful" (p. 1). The example I used previously of the nutrition experiments at the Shubenacadie Indian Residential School is only one instance of the kinds of research that have been conducted on Indigenous people in the name of science. Between 1942 to 1952, controlled experiments were conducted by nutrition experts in northern Manitoba using First Nation communities as their laboratories without the subjects' knowledge, and using control groups to assess the effect of specific nutrition interventions as potential solutions to the "Indian problem" (Mosby, 2013, p. 148).

Brant Castellano (2004) recalls when, as Co-Director of Research for the Royal Commission on Aboriginal Peoples (RCAP), she attended the initial meeting of Indigenous researchers who were brought together from across the country to help

establish the research agenda for RCAP, and in her audience were skeptical participants who voiced, “We’ve been researched to death” (Brant Castellano, 2004, p. 98). However, signifying the importance of being self-determining, an Elder stood up and said, “if we have been researched to death…maybe it’s time we started researching ourselves back to life” (Brant Castellano, 2004, p. 98). Research that has been done ‘on’ Indigenous people rather than ‘with’ Indigenous people is no longer acceptable. Researchers cannot ‘parachute’ or ‘helicopter’ in to conduct their research the way they used to, that is, collect their data, then neglect to report their research back to the community (Castleden, Garvin, & Huu-ay-aht First Nation, 2008; Moodie, 2010).

In a surge to decolonize research, the refrain “nothing about us without us” is now echoed in the context of Indigenous research across Canada. Policy responses have followed suit. The *Tri-Council Policy Statement Ethical Conduct for Research Involving Humans* (2014) dedicates an entire chapter to research involving First Nations, Inuit and Métis in Canada to ensure that research is conducted respectfully and collaboratively, and recognizes that Aboriginal peoples seek to preserve and maintain their collective knowledge and the knowledge that is generated from research partnerships (Panel on Research Ethics, 2015). The First Nations Principles of OCAP (ownership, control, access and possession), set out how First Nations data should be collected, protected, used, and shared (First Nation Information Governance Centre, 2017a). Together these policies and principles seek to ensure that research done with Indigenous peoples in Canada generates results that are meaningful to the communities that participate.

Beyond that, however, the Pictou Landing women’s skepticism in the findings of the JEHMC also needs to be situated in the context of the discussion around the structural

determinants of health - the historic, ideological, political, social and economic context of what led to the formation of JEHMC in the first place. During the 1970s, PLFN negotiates with the Province of Nova Scotia seeking compensation for the damages created by locating the BHETF on their lands. The province ends negotiations with PLFN in 1982 by refusing to recognize its claim (Parliament of Canada, 1995). In 1986, the First Nation filed a suit against the federal government alleging breach of fiduciary duty when the riparian rights[8] to Boat Harbour were signed over to the province under Section 35[9] of the *Indian Act,* so that Boat Harbour could be used to receive the effluent from the pulp and paper mill (Paul, 2006). The Band had received only $60,000 in exchange for these rights, in 1966 (Nova Scotia Legislature, 2017; Paul, 2006).

In 1993, PLFN reached an out-of-court settlement of $35 million (Parliament of Canada, 1995). The *Pictou Landing Indian Band Agreement Act (PLIBA),* ratified in Parliament on February 16, 1995, formalizes the *Pictou Landing Indian Band Settlement Agreement* (1993) (*Settlement Agreement*), which includes a $15 million fund to enable members of PLFN to relocate[10]. Furthermore, the *Act* ensures that the $35 million would be the full amount for which the Government of Canada could ever be held liable for damages related to the BHETF (Parliament of Canada, 1995).

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[8] Riparian rights - a right to access or use the shore, bed, and water (Merriam-Webster, 2017).

[9] Section 35 of the *Indian Act* regulates reserve lands taken for public purposes without the consent of the Band by allowing a provincial legislature to take reserve lands with the consent of the Governor in Council (Prime Minister and Cabinet), subject to an amount that is agreed upon by the parties, and set aside for the use of the Band (Justice Laws Website, 2017 – see http://laws-lois.justice.gc.ca/eng/acts/I-5/page-5.html#h-17).

[10] The colonial policy of relocation was never viewed in the context of how physical displacement from lands that were the traditional territories for millennia might impact health. I will address how inappropriate relocation is in the following chapters.

The *PLIBA* also established the JEHMC, which was initially comprised of representatives of Canada (DIA and Health Canada) as well as representatives of PLFN. The federal government, soon after their inaugural meeting in 1993, adds the federal Department of Justice and Environment Canada to their team (Joint Environmental and Health Monitoring Committee, 1996). The JEHMC was mandated with the task of establishing and implementing programs that would be "reasonably required to monitor the health of the band members, and the extent of environmental contamination on reserve lands and in Boat Harbour, including observation wells" (Joint Environmental and Health Monitoring Committee, 1996, p. 1) (Table 2.1). That the federal government would participate on a committee tasked with monitoring a situation that they contributed toward may seem astounding to some in terms of conflict of interest, but nonetheless, DIA had, and continues to have, authority over 'Indians and lands reserved for Indians'. Since the beginning, the PLNWG had never felt that the JEHMC had acknowledged, or adequately investigated their health concerns, and by 2010 were no longer confident in the reports that the JEHMC was producing. Table 2.1 provides a synthesis of the work that the JEHMC undertook, as reported in Activity Reports prepared by the Committee over the years.

Table 2.1: Activity Reports of the Joint Environmental Health Monitoring Committee 1993-2015 (Activity Reports synthesized by D. Lewis).

Report	Date	Details
Canada and Pictou Landing Micmac[11] Joint Environmental and	April, 1996	**Drinking Water:** Testing includes for dioxins and furans. Trace concentrations of organic compounds. Minor aesthetic concerns. Groundwater good in comparison to Canadian Drinking Water Quality Guidelines. No contamination detected.

[11] The term "Micmac" is a corruption in spelling of Mi'kmaq, as represented in the Smith-Francis Orthography (Eastern Woodland Publishing, 2007). I will use the term Micmac instead of Mi'kmaw or Mi'kmaq only when it is used in historical documents or direct quotes.

Report	Date	Details
Health Monitoring Committee (JEHMC) Report on Activities July 1993-March 1996		**Air:** Tested for dioxins and furans. Results compare well to levels in other commercial and industrial areas in the Atlantic and five hundred times better than ambient air quality guidelines established by the Canadian Council of Ministers of Environment. No abnormal indications for dioxin and furan contamination. **Soil:** Tested for range of metals including mercury, dioxins, and furans. Below normal environmental levels, well below Canadian guidelines for residential and recreational use of such lands. Sludge sampled above normal environmental levels but below Canadian guidelines levels. No general soil contamination. **Routes of Exposure:** Fish and wildlife: Local fish and wildlife are not considered as a route or source of contamination to humans. **Future Activities:** To include testing of wildlife organs, edible berries, plants and vegetation, the investigation of health concerns compared to other communities, and the assessment of environmental and health risks related to Boat Harbour (Joint Environmental and Health Monitoring Committee, 1996, p. 2-5). **Note:** In 1994, JEHMC discussed biomonitoring, and that testing for dioxins and furans in blood was considered. By June 1994, PLFN wanted to proceed but differed with Health Canada on how to do so.
CanTox Human Health Risk Assessment of Pictou Landing Community Exposures Associated with Boat Harbour	March 27, 1997	**Results:** • No measurable adverse effects on the health of the PLFN community "from current exposures to chemicals in the air, soil, groundwater, or local beach area, from eating fish caught within the Northumberland Strait, or from eating vegetables from local gardens (CanTox, 1997, p. iii). Specific community health studies not recommended, but baseline data should be gathered to allow for future assessment (op. cit., 1997, p. v). • Return of the "Boat Harbour stabilization lagoon and surrounding area for residential purposes, after pulp and paper wastes are no longer pumped into Boat Harbour, would not…result in measurable adverse health effects to local residents…" In the case of "exposures to chlorinated dioxins and furans… the predicted exposures substantially exceed recommended exposure limit…adverse health effects could possibly occur…[with] the assumption that local residents would catch and eat fish on a daily basis from the lagoon" (op. cit., 1997, p. iv). • Soil analysis be conducted in 2005; groundwater and air monitoring should continue (op. cit., 1997 p. v). • Future analysis of game not recommended, nor was there a need to study berries (op. cit., 1997, p. v;). • JEHMC should continue to monitor community concerns and gather health-related data as a basis for future assessment (op. cit., 1997, p. v).

Report	Date	Details
Canada and Pictou Landing First Nation Joint Environmental and Health Monitoring Committee (JEHMC) Second Report on Activities April 1996 – March 1998	May, 1998	**Drinking Water:** Water quality remains good with exception of manganese (minor) (Joint Environmental and Health Monitoring Committee, 1998, p. 3). Boil water advisory in 1997 due to bacterial contamination (op. cit., 1998, p. 3). **Air:** Concerns with smells related to total reduced sulphur compounds. Levels lower than 1970 levels (op. cit., 1998, p. 4). **Soil:** No contamination (JEHMC, 1998, p. 4). **Routes of Exposure:** Deer liver analyzed, no detectable levels of dioxins or furans (op. cit., 1998, p. 5). **Human Health Risk Assessment:** Reported on the CanTox study. **Note:** Discussions include concerns about ovarian cysts, asthma, skin rashes.
Canada and Pictou Landing First Nation Joint Environmental and Health Monitoring Committee (JEHMC) Third Report on Activities April 1998 – March 2004	March, 2005	**Drinking Water:** No significant issues of concern regarding the quality of the Pictou Landing aquifer were identified. Elevated iron and manganese levels, common in NS. pH lower, common in shallow aquifers. Lead (above in one 1999 sample, and three of the 2000 samples) and barium (above in one of the 2000 samples) not an issue of concern. Four instances of bacterial contamination and water boil orders were required (Joint Environmental and Health Monitoring Committee, 2005, p. 9-10). **Air:** No changes since last report. **Soil:** No studies undertaken since last report. **Human Health Risk Assessment:** No further work. **Other Activities:** Investigation of community members' human health concerns including comparison with other communities in Canada has been started (although there is no indication in Summary of Meetings).
Canada and Pictou Landing First Nation Joint Environmental and Health Monitoring Committee (JEHMC) Fourth Report on Activities April 2005 – March 2015	July, 2015	**Drinking Water:** Notes that in 2012 and 2013, trace amounts of AOX's (adsorable organic halides) were detected in drinking wells. Consultant concludes likely naturally occurring (Joint Environmental and Health Monitoring Committee, 2015, p. 5). **Air:** In 2007, hydrogen sulphide (H_2S) levels exceeded NS Environment's Air Quality Regulations for a one-hour period (30 ppb) 30 times (average time 2 hours; average level 42 ppb, highest level for a 5-minute sample period - 169 ppb) – 13 times in the month of September alone. Air quality levels exceeded regulations for a 24-hour period (6 ppb) 14 times (longest time 59 hours @ average of 10.5 ppb, highest level for 24-hour sample period 22.6 ppb) (op. cit., 2015, p. 58-59). There were no recorded events in the years 2009, 2010 and 2013, however, in 2007, 2008, and late 2011 to early 2012, there were periods of higher levels and more intense air quality levels. H_2S has the smell of rotten eggs and is detectable by the sense of smell at 0.47 ppb by 50% of the population (op. cit., 2015, p. 59-61). **Other activities:** Dillon Consulting Ltd. Data Review Project results in a 5-year Action Plan to guide monitoring programs. Dillon does not recommend conducting a Human Health Risk Assessment, but recommends the types of data that should be collected in the event that one is conducted in the future (op. cit., 2015).

Beyond the work of the JEHMC, consultant firm Jacques Whitford Environment Limited conducted a Risk Analysis for Decommissioning Boat Harbour Stabilization Lagoon Tidal Flushing Option in 2004 for the Nova Scotia Department of Transportation and Public Works, a study which looked at the human health risk of decommissioning the Boat Harbour effluent 'stabilization' lagoon and returning the lagoon to a tidal estuary (Jacques Whitford Environment Limited, 2004). Several scenarios were considered to remove and dispose of the sediments in the lagoon, none of which the consultants determined would be a cause for human health concern (Jacques Whitford Environment Limited, 2004).

In 2012, Dillon Consulting Limited submitted a report to the JEHMC that was a comprehensive review of all studies (i.e., academic, government, industry, and consultants)[12] ever done in and around Boat Harbour over the period since 1993, which was when the Pictou Landing Indian Band Settlement Agreement was signed (Dillon Consulting Limited, 2012). Dillon Consulting concludes that a study of current conditions in and around Boat Harbour would not result in different conclusions than what was reached in previous studies, but that a new human health risk assessment might allay concerns in the community. Hoffman et al. (2015) confirms that prior to submitting their report to the JEHMC in 2012, Dillon acknowledged that health concerns were raised by the community during the consultation phase of the study, and that, despite studies

[12] This included reports from the environmental monitoring programs and ecological and human health risk assessments (Dillon Consulting Limited, 2012).

showing environmental compliance, public confidence in those reports and the compliance activities was low (p. 766).

At issue with the Jacques Whitford's Risk Analysis and the Dillon Consulting report, however, is that the methodology used in both does not include a definition of Indigenous health that would make the studies relevant to PLFN. By 2004, the health literature established that Indigenous health is not only understood as the balance between the physical, mental, emotional and spiritual aspects of health (Kinnon, 2002; Royal Commission on Aboriginal Peoples, 1996b) but that there are distal determinants (although not called distal at that time) particular to Indigenous people that must be taken into consideration in order to make an appropriate determination as to whether health has been impacted or not (McCormick et al., 1997). Both consulting firms would have had access to the definition of Indigenous health had they done a review of the health literature relevant to Indigenous people in Canada. In fact, Health Canada, represented on the JEHMC, funded and contributed advice and support to the development of the 1997 First Nations and Inuit Regional Health Survey which had expanded the definition of Indigenous health to be inclusive of physical, mental, emotional, social, and spiritual aspects of health by this time (First Nation Information Governance Centre, 2016).

The first step in the PLNWG's community-based participatory research project is to conduct a gap analysis of 70 government funded or industry produced environmental and health reports from the period 1968-2007 which were provided by Health Canada[13]. The analysis reveals that the 70 studies, while evaluating cancer risks and acute effects,

[13] These studies would have been included in the comprehensive review conducted by Dillon Consulting Limited in 2012.

failed to consider chronic health outcomes and used western approaches which do not take into consideration Indigenous understandings of health (Wang, Castleden, & Pictou Landing Native Women's Association, 2012).

2.4 Conclusion

It should be clear that without the incorporation of an Indigenous definition of health and a full accounting of the structural determinants of health in the PLFN case, we will never fully understand how the health of the community has been impacted. Without a consideration of the imposition of the colonial *Indian Act,* the lack of self-determination over health, the intergenerational impacts of the Indian residential schools, and the impact of land displacement and environmental dispossession, a properly quantified assessment of the health of the PLFN community will not be achieved. Because Indigenous people have limited autonomy in determining and addressing their own health needs, disparities in health will persist (Adelson, 2005). Although self-determination is cited as the most important determinant of health among Indigenous peoples, colonial era-like institutional and political structures continue to impose authority over the ability of Indigenous peoples to make their own decisions (Assembly of First Nations, 2013; Chandler & Lalonde, 1998; King, Smith & Gracey, 2009; Reading & Wien, 2009).

In the next chapter, I take stock of the existing literature around Indigenous health in Canada. From the colonial context, I explore how biopolitics and biopower serviced the colonial state to frame Indigenous health. Using a theoretical exploration of how PLFN was put in harm's way, I explore evidence of health inequities that may be connected to how they were displaced and dispossessed of their land and environment. Finally, using Mi'kmaw theory, grounded in the Mi'kmaw way of being in relationship to

place, I will frame the health outcomes in PLFN to reveal what has been overlooked by the work of the JEHMC.

CHAPTER 3 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Historically, Indigenous health policy in Canada was based on the premise that the Indian body was a body in decline (Reading & Nowgesic, 2002). Up until less than forty years ago, the federal government was continuing a narrative, in the 1979 Indian Health Policy, that states that Indian[14] health is rooted in poverty, community decline, and apathy, for which only the Indian community itself can change in order to achieve physical, mental, and social well-being (Health Canada, 2007). This is within the life-span of the existence of the Boat Harbour Effluent Treatment Facility (BHETF). The 1979 Indian Health Policy evolved to the 1989 Health Transfer Policy, which was intended to devolve more autonomy to First Nations for the administrative and decision-making control over the delivery of health services (Adelson, 2005). This might have allowed communities to start to address the factors that contribute to poor health outcomes. However, First Nation autonomy was restricted by non-enrichment clauses which mean no additional funding was provided to enhance the services which might start to address the health inequities that Indigenous people face (op. cit., 2005).

This has not lead to significant improvements in the health outcomes because, for Indigenous peoples, control of economic resources is maintained by the state, and a change in non-Indigenous Canadian attitudes towards Indigenous people, and their health, is absent (op. cit., 2005). In this Chapter, I challenge that the nearly 30% gap in health outcomes noted at the beginning of Chapter 2, between the 89% of Canadians and 60% of those in Pictou Landing First Nation (PLFN) who report good to excellent health, cannot be attributed just to poverty, community decline, or apathy, but can be further

[14] Term in use in the current 1979 Indian Health Policy.

contextualized by the historical, ideological, political, societal, and economic factors that the PLFN community is subjected to, and has been subjected to, since the BHETF was built fifty years ago. Furthermore, I argue, a full understanding of what has happened to PLFN and what constitutes a healthy Indigenous community can only be achieved by acknowledging and privileging the intimate relationship that PLFN had to *A'se'k*, which no longer exists.

I do that by exploring how, in a colonial state like Canada, health policy continues to obscure what keeps the Indian body in decline. I will use biopolitical theory to examine if and how the Joint Environmental Health Management Committee (JEHMC), is maintaining the biopolitical order of the state by maintaining since 1993 that the health of the community has not been impacted by the BHETF. I will use the theory of biopower to explore whether the oversight of the JEHMC could be viewed as a political strategy to enable the province to continue to displace PLFN from, and dispossess them of their lands and environment. Because the PLNWG is skeptical of the findings of the JEHMC, I will explore whether concerns in the community are environmental and social justice issues, as these are issues that could have been readily assessed. Finally, I will argue that if the health of the community has been impacted, there will only be a true understanding of the extent of the impacts if I go beyond what current health policy in Canada can reveal. Therefore, I will present a *Piktukowaq*[15] environmental health theoretical framework that will allow me to explore and to gain a better understanding of the intimate and sacred nature of the relationship that PLFN had to the land and

[15] *Piktukowaq* translates as a "person from *Piktuk'*, one of the seven traditional districts of *Mi'kma'ki* (Sable et al., 2012).

environment before it was destroyed by the treatment facility. I start by providing an overview of biopolitics and biopower, and demonstrate how these forces have played out in the experience of PLFN.

3.1 Biopolitics and Biopower

Michel Foucault, a post-structural theorist, is concerned with the relationship between power and knowledge, and the ways in which truth, knowledge, meaning, and reason, are employed in society (Schirato, Danaher, & Webb, 2012). Foucault theorizes beyond structural theorists who argue that structures operate below the level of consciousness that generate and produce patterned behaviours (Allan, 2006). Foucault objects to efforts to explain issues of domination or resistance, like racial, gender, or sexuality conflicts, through general social theories such as Marxism, as he views these theories to be reductionist, prescriptive, exclusionary, and marginalizing (Seidman, 2013).

Foucault saw that the problems of life become targeted as political problems, or as power problems, around the eighteenth century (Foucault, Bertani, & Ewald, 2004). In 1976, Foucault argued that power becomes focused at a population level—problems such as the reproductive or morbidity rates of the population—that are viewed as economic and political problems to be managed by the state (Foucault, Bertani, & Ewald, 2004). Foucault terms this biopolitics, which he defines as "the attempt, starting in the eighteenth century, to rationalize the problems posed to governmental practice [in the modern state] by phenomena characteristic of a set of living beings forming a population…" (Foucault, Senellart, & Collège de France, 2008, p. 317).

Beyond that, he argues, there is an emergence of what he terms biopower, normalizing or regularizing mechanisms, like racism, where there is now a hierarchy of races, which allows a notion to prevail where some races are good and others are inferior (Foucault, Bertani, & Ewald, 2004). Biopolitics provides the theoretical framework for looking to the macro social forces at play under settler colonialism (ideology) that start to target Indigenous people as an economic and political problem to be managed. It was in his 1976 lectures that Foucault talks of racism developing with colonization, which he referred to as colonizing genocide (Foucault, Bertani, & Ewald, 2004, p. 257). Foucault defines biopower as the techniques (mechanisms, instruments, practices) of power that bring life under the power of calculation, management, subjugation, and regulation, allowing life to become the object of political strategy as a way of preserving the security of a whole population from the risk of internal threats (Foucault, 1978, p. 143). Biopower provides the theoretical framework to explore the nature of colonialism, from racism, to the contemporary examples of biopower, which I suggest are land displacement and environmental dispossession that Indigenous peoples face.

Foucault died in 1984, leaving much of his writings on biopolitics and biopower largely unpublished. Therefore, it is necessary to rely on the work of others who have elaborated his concepts further. Biopolitics and biopower are useful in the context of the colonial history of Canada, and the historical, ideological, political, societal, and economic relationships of the state to Indigenous peoples in this country. Biopolitics and biopower are particularly useful to explain how, in a colonial state like Canada, Indigenous people have become excluded and marginalized, or as Simpson (2007) notes, barely visible.

Biopolitics uses biopower to target different scales, targeting identity or episteme for example, where in a colonial state, the colonized are presented as less civilized or less developed (Legg, 2005). Targeting Indigenous identity under biopolitics is achieved through practices, measures, and regulations with the end game of adaptation and assimilation, intended in Canada to alienate Indigenous people from their lands, under the guise of civilizing them (Lindroth & Sinevaara-Niskanen, 2014; Morgensen, 2011). In fact, Morgensen (2011) argues, settler colonialism is "exemplary of the processes of biopower" (p. 52), with a focus on Indigenous identity and land, the basis of which episteme is derived. How this process unfolds in Canada is mapped out, building on the context provided in Chapter 2.

After the *Report of the Parliamentary Select Committee on Aboriginal Tribes (British Settlements)* was tabled by the Aborigines Protection Society in 1837, rather than protect and preserve the 'Aborigines' of the British colonial settlements (Aborigines Protection Society, 1837), the British Parliament, believing that their treatment of the Indians to date had been defective, enacted the *Crown Lands Protection Act* in 1839, which declares Indian lands in British North America to be Crown lands, promoted as a way to protect Indian lands against trespass of settlers who were expanding into Indian territories (Miller, 2009). Until then, the *Royal Proclamation of 1763* recognized that all lands not formally ceded to the British Crown, were still Indigenous lands (Lawrence, 2003). The 1839 Act is further strengthened by *An Act for the Protection of Indians of Upper Canada* (1850) (enacted in Lower Canada as *An Act for the Better Protection of the Lands and Property of the Indians of Lower Canada* (1851) (Miller, 2009). What is unusual about the 1850 and 1851 legislation is that it puts Indian lands under the

authority of a colonial regime that had no legislative authority yet to do so, because the British Crown had not yet transferred authority to the colonial government, which it would not do for another sixteen (16) years (Lawrence, 2003). The focus on lands then turns to identity.

Techniques of biopower that continue the relations of domination are "subject to constant tactical and strategic modification" in order to achieve policy aims (Lindroth & Sinevaara-Niskanen, 2014; Venn, 2009, p. 225), so that after the actions of 1839, 1850, and 1851, an *Act to encourage the gradual civilization of Indian Tribes in the Province* (*Gradual Civilization Act*) (1857) (Canada Legislative Assembly, 1857), starts to assault and regulate Indigenous identity. In 1867, the *British North America Act* makes Indians, and lands reserved for Indians, a federal responsibility. *An Act for the Gradual Enfranchisement of Indians* passed by Canada's Parliament in 1869, clearly intends to advance assimilation efforts of the state by regulating identity (RCAP, 1996a). The legislation provides that non-Indian women who marry Indian men gain Indian status, while Indian women who marry non-Indian men lose status, as did their children (RCAP, 1996a).

The *Indian Act* (1876) includes a legal definition of who is 'Indian' as "any male person of Indian blood reputed to belong to a particular band; any child of such person; and, any woman who is lawfully married to such a person" (Indigenous and Northern Affairs Canada, 2015, para. 3[3]). An external race descriptor was imposed on Indigenous peoples who saw themselves comprised of wholly separate and distinct cultures and nations (Lawrence, 2003). The *Indian Act* (1876) further "[p]rovides that any Indian woman marrying any other than an Indian or a non-treaty Indian shall cease to be

an Indian" (INAC, 2015, Ch. 18(3c)). These provisions effectively remove a large segment of Indigenous societies from their lands (Lawrence, 2003). The *Indian Act* (1876) also defines 'reserve' lands, as "any tract or tracts of land set apart by treaty or otherwise for the use or benefit of or granted to a particular band of Indians, of which the legal title is in the Crown, but which is unsurrendered" (op. cit., 2015, para. 6).

In 1883, the state creates the Indian residential school system, which the Truth and Reconciliation Commission (2015b) has labelled as promoting cultural genocide. Mandatory attendance of children at Indian residential schools under the *Indian Act* is recognized by de Leeuw, Greenwood, and Cameron (2010) as "one of the most…egregious examples of colonial intervention" on the body and psyche (p. 289). It is a sustained focus on episteme, interventions we know now to have intergenerational impacts. Biopolitics still continues today, as evidenced by legislation like Bill C-31, enacted in 1985, which revised the *Indian Act* to create Section 6(1) and 6(2) status Indians, the latter no longer being considered a legal Indian after two generations (Kielland & Tiedemann, 2017).

In this dissertation I want to particularly focus on the technology, the statistical surveys, and the way that the colonial state uses surveys to create a problematic that needs to be managed by the colonial state. Under colonialism, statistics, as an instrument of biopolitical domination, reveal where biopolitical interventions are required to keep what is constituted as a risk, or problematic, from posing a threat to the entire population (Holmer Nadesan, 2008; Legg, 2005). Settler colonial biopolitics relied on the continued reproduction of the deficit construction of Indigenous peoples, a colonial discourse that presents Indigenous peoples as less human, or savage, which justified their assimilation

or erasure (Greensmith, 2016; Harkin, 1994). Therefore, in Canada, statistical surveys are employed as a technology (instrument) of biopolitics, starting in the early twentieth century to create a crisis in Indigenous health. Officials focus on diseases, such as tuberculosis or influenza, that pose a risk to the rest of society, or they focus on the dysfunction they perceive in aboriginal communities (Kelm, 1998; O'Neil, Reading, & Leader, 1998; Reading & Nowgesic, 2002).

O'Neil (1993) notes how both the Medical Services Branch and Department of Indian Affairs become centralized surveillance systems, powerful social instruments for the construction of Indigenous identity, and tools for problem identification. O'Neil (1993) recognizes how knowledge is constructed, how the image of sick, disorganized communities reinforces the unequal power relationships and justifies the paternalistic treatment of Indigenous people in Canada. It is through this active process of inscription, Fox (1999) argues, that people come to understand their place within the systems of power and knowledge.

While indicators of Indigenous disease and death are often the focus of colonial survey analysis, the positive indicators that speak to health strengths are overlooked (Kelm, 1998). Tuck and Yang (2014) argue that knowledge production from the survey data is intended to reinforce the biopolitical norm that justifies the biopolitical intervention in Indigenous populations. The way that the data is presented, what is highlighted, and what is obscured, is a manifestation of the biopolitical project that dictates knowledge formation about Indigenous peoples (Legg, 2005). Health problems that are not necessarily endemic to Indigenous communities, such as infectious diseases, are statistically presented as if they are, and the decline of Indigenous people dominates

the health literature at this time (Kelm, 1998). For example, O'Neil (1993) reports that prior to 1925, Indigenous infant mortality is presented as high, but there is no evidence to support this assertion, because Indigenous deaths are not even being counted at this time.

Medical experts seldom focus their analysis on data that would indicate that Indigenous people are healthier and stronger than their non-Indigenous counterparts in respect to many diseases such as cancer, heart, and circulatory diseases, which are much higher in the settler populations (Kelm, 1998). The naturalization of disease in medical reports validates societal expectations of Indigenous populations (op. cit., 1998). The effect then is to create a narrative that justifies the necessity of state intervention and regulation because Indigenous people are a risk that justifies state control (Brigg, 2007). In fact, when Dr. Bryce alerts officials in 1907 that the deplorable conditions of the residential schools are responsible for the spread of tuberculosis and other diseases in the schools, his report is downplayed by government officials (Bryce, 1907), and Bryce's attempt to counter the narrative of the "inevitability of disease" is rewarded with forced retirement from his role as Chief Medical Officer for the Department of Indian Affairs (Kelm, 1998, p. 113), This example speaks to what Tuck and Yang (2014) call the 'discourse of objectivity' in knowledge production, 'code' for power, where meaning is derived from the dominant narrative, not necessarily from what is observed (p. 812).

Contemporary manifestations of both biopolitics and biopower can be found in current health policy in Canada. At the federal level, health care policy for all Canadians falls under the Public Health Agency of Canada (2012), which has a mandate to promote good health by looking at the key underlying social, economic, and environmental determinants, both inside and outside the health care system, that affect the level of

individual health and well-being. Yet, in a biopolitical state like Canada, Indian health policy does not account for the impacts of colonization, such as the intergenerational trauma that residential school survivors and their families have experienced, and are still recovering from, trauma which is known to linger for generations (Bombay, Matheson, & Anisman, 2014b). The social determinants of health (SDoH) approach, as recognized by the PHAC, includes measures for income, social status, social support networks, education, employment/working conditions, social and physical environments, personal health practices and coping skills, healthy child development, gender, and culture (Public Health Agency of Canada, 2016, para. 1), and establishes the standard of health and wellness, the biopolitical norm, that the federal government hopes to achieve for all of its citizens. Yet, there continues to be a misunderstanding of how current health policy may not be appropriate to the realities that Indigenous peoples face, and may continue to diminish the lives of Indigenous people in this country.

For example, under a SDoH approach, health care professionals will direct interventions needed for the promotion of health and disease prevention in a way that encourages population conformity. For instance, tobacco control and cessation programs are interventions targeted to whole populations. The biopolitical technology employed is the rhetoric around the dangers of tobacco use, the rhetoric that discourages smoking as a way to reduce disease in populations, and makes smoking socially unacceptable (Carro-Ripalda et al., 2013). These broadly targeted tobacco control and cessation programs, however, are culturally inappropriate to Indigenous peoples, because in Indigenous cultures, tobacco is a sacred medicine used in ceremonies (Lavallée, 2009). Making the

use of tobacco unacceptable is problematic for Indigenous people who may want to present tobacco as a demonstration of respect, or burn tobacco for spiritual cleansing.

Similarly, Health Canada promotes breastfeeding as beneficial to newborns, and new mothers are encouraged by health professionals to breastfeed (Perron, Fluet, & Holmes, 2005). In PLFN, however, mothers express their fears around breastfeeding (PLNWG, 2010b) because they are concerned that they may have been exposed to toxins through pathways such as eating wild foods and berries, or using medicines collected in or near their community—and they fear that they pass those toxins on to their newborns through their breast milk (PLNWG, 2010b). The women express their reluctance to breastfeed, and feel inadequate for not doing so (PLNWG, 2010b). When the women ask that their health be investigated, they are motivated by concerns such as this.

In this dissertation, I explore how biopolitics and biopower might be countered, and what instruments can be used to do so. In the next section, I present a theoretical framework for exploring how, as a result of biopolitics and biopower, Indigenous people are made so invisible that decisions are made that can put them in harms way. Miller and Wesley (2016) suggest that a person's biology predisposes them to biopolitical risks, therefore, biopolitical decision-making and its consequences must be addressed as the environmental and social (in)justices they are. In the next section, I look at what happened at *A'se'k,* and the consequences it has had to the PLFN, through the lens of environmental and social justice.

3.2 Environmental and Social Justice Theory

The environmental justice movement saw its genesis in 1982 when residents of Warren County, North Carolina, mobilized in their opposition to the siting of a

polychlorinated biphenyl (PCB) disposal site in their communities (United Church of Christ Commission for Racial Justice, 1987). As a consequence of their involvement in the Warren County mobilization efforts, the United Church of Christ Commission for Racial Justice set out in 1986 to determine the socio-economic and racial profile of communities within the United States that were exposed to hazardous waste disposal facilities, and determined that these sites were predominantly in racialized communities—that three out of five black and Hispanic Americans, and half of all American Indians, lived in communities with uncontrolled toxic waste sites (United Church of Christ Commission for Racial Justice, 1987). Environmental racism is defined as "any policy, practice, or directive, that differentially affects or disadvantages individuals, groups, or communities, based on race or colour…[I]t occurs in a regressive and disproportionate pattern, with those at the top gaining the most benefit, while those at the bottom gain the least (Bullard, 1994, p. 3).

In the early years of the environmental movement, it is argued that little consideration was given to the social inequity aspects of differential exposures to environmental harms. However, by 1991, environmental justice included an emphasis on social issues (Mohai, Pellow, & Roberts, 2009). By the early 2000s, the environmental justice literature was significantly broadened to include social justice and equity issues into the realm of consideration of impacts (Mohai, Pellow, & Roberts, 2009). Environmental justice has evolved to include an investigation of the structural processes that allow the exclusionary environmental practices, policies, and regulations that result in proportionately more marginalized communities being placed in environmental harm's way in the first place (Masuda & Crabtree, 2010; Masuda, Poland, & Baxter, 2010).

In Canada, we can look to several examples that have been framed in the environmental justice literature as examples where socio-economic status or environmental racism resulted in greater exposure of communities to environmental harm. For example, Deacon and Baxter (2013) determined that environmental racism played a role in what was perceived as procedural barriers that challenged the ability of the predominantly black community of Lincolnville, Nova Scotia, from effectively participating in the 2006 public consultation stages of the environmental assessment process that resulted in the second generation Guysborough County Landfill Site being located near their town. The Aamjiwnaang First Nation, just outside of Sarnia, Ontario, is another example where the convergence of socio-economic status and environmental racism factored into the First Nation being exposed to the densest concentration of chemical manufacturing in Canada, resulting today in declining male birth rates, abnormal rates of miscarriages, cancers, and respiratory issues (Wiebe, 2016). In my research, I explore environmental justice from a structural perspective, to look at how colonialism or racism may have factored into decision-making, that is, were there laws and regulations in place to protect PLFN from environmental harm. Environmental justice requires that all people be equitably protected from environmental harms, regardless of race, national origin, or socio-economic status (Brulle & Pellow, 2006; Bullard, 1996).

In my research, I also approach the research from a social justice perspective. Clingerman (2011) states that social justice is a framework to ensure fairness, tolerance, equity, and respect for human dignity, and requires that we identify how one group is situated relative to another. Fu, Exeter, and Anderson (2015) state that social justice is

achieved when all people are free from socially produced harms such as poverty, marginalization, or structural violence. Leong, Pickren, & Vasquez (2017) argue that human rights are the foundation for social justice, that social justice promotes the goal of a common humanity for all groups, where all benefit from equality and justice. As I looked at what happened at PLFN, I asked if this is a human rights issue. If inequities exist between the health outcomes of a socially dominant group and a socially disadvantaged group, then they are based on processes that are unjust and morally wrong (Carr, 2014).

There is a recognition of the need that environmental justice, from an Indigenous perspective, has to be contextualized by the colonial history and government policies that have sought the erasure of Indigenous peoples from their lands (Haluza-Delay, 2007; Vickery & Hunter, 2016). Understanding environmental justice within the purview of how Indigenous people hold land and nature sacred makes this issue more complicated because the state repeatedly fails to recognize that land and environmental degradation are direct assaults on Indigenous identity (Muir & Booth, 2012). Furthermore, Neimanis, Castleden, & Rainham (2012) suggest that since Indigenous people hold the view that all things are related, whether human or non-human, environmental justice needs to include the non-human species, the inanimate, which are exposed to these same hazards (p. 349).

Environmental justice in an Indigenous context must highlight that when development impacts land and resources, Indigenous communities, by the nature of their lifestyles and worldviews, are paying a disproportionate price of having to curtail their access to the air, land and water around them that sustain their communities and their identities (Harris & Harper, 2011). Land and environmental degradation, are therefore,

also direct assaults on the ability of Indigenous people to carry on and pass on a belief system and knowledge that is tied to place (Muir & Booth, 2012).

Social justice within an Indigenous context must balance the rights of an individual against the collective, and must recognize the right of nations, with distinct cultures, languages, worldviews, and spirituality to be economically, socially, and culturally self-determining (Johnston-Goodstar, 2013). Furthermore, a social justice approach for Indigenous peoples demands that there is a focus beyond the proximal determinants of health to the distal determinants (Carr, 2014). Social justice challenges biopolitics and its' techniques of biopower – the knowledge, discourses, and strategies of control – that create the social inequities in the first place (Fu, Exeter, & Anderson, 2015). Social justice will address the issues of systemic disadvantage that create the health inequities because they are preventable (Carr, 2014).

Framing my analysis within an environmental and social justice framework will highlight the political and institutional inequities, if they exist, that led to the land displacement and environmental dispossession that PLFN has endured, and will highlight any health inequities that may have resulted from these actions. Critiquing the colonial systems and structures that have created the inequity in the first place may create opportunity to counter the resistance within current environmental and health governance systems that structurally prevent more meaningful engagement around the issues of environmental health disparities in Indigenous communities (Griffiths et al., 2016).

3.3 *Piktukowaq* Environmental Health Theory

An Indigenous theory is grounded in the sense of who one is as an Indigenous person, that is, it should reflect the reality of an Indigenous person (Tuhiwai Smith,

2012). Weber-Pillwax (1999) argues that an Indigenous theoretical framework allows an effective scholarly critique of research that deals explicitly with some aspect of Indigenous reality. Goodman and Silverstein (2009) theorize that in instances where colonial structures of domination result in cultural upheavals, the shock of that upheaval alters and ruptures the foundation of that culture, and the entire social and cultural order falls apart. Therefore, I suggest that in order to understand the extent of the upheaval that the *Piktukowaq* experienced when *A'se'k* became the BHETF, one needs to have an adequate insight into the sense of who the *Piktukowaq* are, and were, prior to the colonizing events that brought the facility to *A'se'k.*

As a fundamental basis of understanding Indigenous health and well-being, it is necessary to acknowledge the importance of Indigenous knowledges, worldviews, spirituality, cultures, and languages, and relationships to land and environment (de Leeuw, Lindsay, & Greenwood, 2015). Indigenous peoples believe their relationship to the land goes beyond just being stewards of the land, they believe they are part of the land and that land is sacred (Pierotti & Wildcat, 2000). To convey the extent of the loss that the community of PLFN has experienced when they were displaced from their land and environment, I employ a *Piktukowaq* environmental health theoretical framework, one that centres a place-based epistemological, ontological, and axiological understanding of the *Piktukowaq* place in the world. Privileging the *Piktukowaq* knowledge in the oral histories, not just as a decolonizing approach, but as a way to orient the reader to how the *Piktukowaq* understand their world is the premise on which the *Piktukowaq* environmental health theory is based. I suggest that using a *Piktukowaq* environmental health theoretical approach allows for a broader, more nuanced and

contextualized analysis to understanding PLFN health outcomes than what has been used to date.

The western philosophical tradition that informs a western methodological norm (Walter & Andersen, 2013) has not generated a resolution to the concern that the PLFN express when they say their health has been impacted by the BHETF because the western philosophical tradition influences which data are generated. Kovach (2015) might argue that a *Piktukowaq* conceptual framework can counter that impasse because it is based on a *Piktukowaq* philosophical foundation that can include the relational epistemology of the *Piktukowaq*. It is grounded in Indigenous ways of being, knowing, and doing (Walter & Andersen, 2013) which can be found in the oral histories of the Knowledge Holders.

Oral histories are handed down by Elders[16] who are held in high esteem in Indigenous cultures and who are honoured for their role as keepers of knowledge (Calliou, 2004). Oral histories contribute to a collective story that reflects values and beliefs that are important to be handed down, as a way to connect the past to the future, to connect the land to the people, to connect bodies with place (Tuhiwai Smith, 2012). Pulpan and Rumbolt (2008) remind us that even the smallest story can reveal truth.

Oral history is an Indigenous way of sharing knowledge that is fundamental to how Indigenous history is documented and interpreted and how ancestral practices, spiritual beliefs, worldviews and cultural practices are evidenced and passed on (Louis, 2007; Ridington, 2014). Oral histories are repositories of historical knowledge that reflect

[16] When I refer to Elders in general, I will use the term 'Elders'. As noted in Chapter 1, those in PLFN who shared their wisdom were not comfortable being identified as Elders, but preferred the term 'Knowledge Holders', so if I am referring to PLFN, I will use Knowledge Holders.

the values and mores of specific Indigenous cultures (Calliou, 2004). The validity of oral histories has long been contested but oral histories are systems of knowledge - knowledge that is stored in genealogies, the landscape, within totems, in memories, and in the language (Tuhiwai Smith, 2012). Oral history is less concerned with a chronological recall of events than it is about relating something in the past that is useful and relevant for people today (Royal Commission on Aboriginal Peoples, 1996a).

It has to be recognized that oral history is valid. For instance, the Supreme Court of Canada gives oral history the same evidentiary weight as expert testimony in legal decisions, as evidenced in the past court decisions of *Delgamuukw v. British Columbia* (1997) and more recently in the *Tsilhqot'in Nation v. British Columbia* (2014) case (Foster, 2010; Newman, 2005). Oral history as a method is culturally appropriate because accessing the language within oral history can transform the way things are done; language helps recover the epistemological foundations of tribal societies (Kovach, 2009; Tuhiwai Smith, 2012). The oral histories contain narratives of experiences in place and teachings about the norms, protocols, and value systems of being on the land (Hart, 2010; Kovach, 2009; Louis, 2007; Prosper et al., 2011). Oral history is intergenerational knowledge transfer (Kovach, 2009, p. 95).

Indigenous people come to know (knowledge is a process) by being in nature, through modeling the practices of others, listening, dancing and participating in spiritual practices (Aikenhead & Ogawa, 2007; Berkes & Berkes, 2009). Understanding this relationship is foundational for Indigenous theory and practice (Pierotti & Wildcat 2000). Indigenous peoples think of nature as an extension of their home and there are norms for how one should behave which dictate social relations within Indigenous societies

(Graham, 1999). Pierotti and Wildcat (2000) note that when Indigenous people leave their homes and encounter nonhumans and natural physical features in nature, they are just moving into other parts of their home (p. 1336).

This is how the *Piktukowaq* related to *A'se'k*, the Mi'kmaw name for what is now referred to as Boat Harbour, which literally translates to the 'other room'. *A'se'k* reflects the close relationship the PLFN community had with the area that has become Boat Harbour. *A'se'k* is where the community members gathered their food and medicines, where the families gathered and socialized, and where individuals were taught the values and norms of being on the land. In order to understand the relationship that members of PLFN historically had to *A'se'k*, one has to appreciate that the relationship they had was, as Graham (1999) might argue, the basis of their society and their social relations.

With that in mind, one has to look to the language to guide us to Indigenous consciousness and understandings of the world, the tribal knowledge of how the world works (Battiste, 2000). The language is the repository of instructions, lessons, and guidance (Battiste, 1998). That being said, I do not want to imply that this process is transferrable to all Indigenous worldviews. *Piktukowaq* knowledge only applies to the place it was created (Battiste & Youngblood Henderson, 2000). Using Mi'kmaw words to convey the sacred relationship that the *Piktukowaq* have with nature will convey the profound impact that disrupting that relationship would have had on the community of PLFN. I start by explaining how the Piktukowaq are in the world.

3.3.1 *Piktukowaq* Ways of Being

In the Mi'kmaw language, the people from PLFN refer to themselves as *Piktukowaq*, which translates to a "person from *Piktuk*", one of the seven traditional

districts of *Mi'kma'ki* (Sable et al., 2012). The *Piktukowaq* relationship to *Piktuk* is the basis of their worldview. It is their vantage point. Those who live in this space consider themselves stewards of the traditional territory of *Piktuk*, of which *A'se'k* is a part. Indigenous people believe every part of the earth is to be protected, that nothing should be treated as expendable (Battiste & Youngblood Henderson, 2000), therefore, the *Piktukowaq* would have considered that their role was to protect *Piktuk* and *A'se'k* (Figure 3.1).

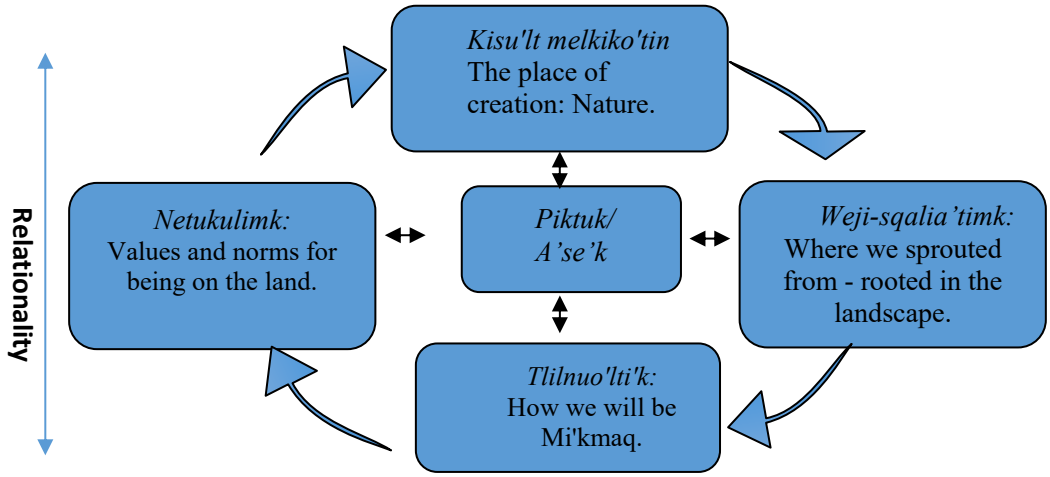

Figure 3.1 - Piktukowaq Ways of Being.

The Mi'kmaw word for the place of creation is *kisu'lt melkiko'tin*, meaning an "ecological order or vantage point from which [the Mi'kmaq] construct their worldview, language, knowledge and order" (Battiste & Youngblood Henderson, 2000; Youngblood Henderson, 2000, p. 257). This Mi'kmaw word is the basis of the *Piktukowaq* epistemology. How do the Mi'kmaq come to know? They come to know by interacting with the landscape and with each other. Epistemology is "the study of the nature of thinking or knowing…how we come to have knowledge" (Wilson, 2008, p. 33).

The Mi'kmaq come to have knowledge through experience, through observation, through oral history and legends, through dreams or visions. The knowledge and collective responsibility that is gained through shared experience and observation is called the tribal epistemology. It has developed over thousands of years of living on the land and is reflected in the languages (Battiste 1998; 2000; Edosdi, 2008; Getty, 2010; Kovach, 2009; Rains, Archibald, & Deyhle, 2000). Indigenous epistemology "cannot arise from the traditional disciplines of the social sciences and humanities" but must come from the Indigenous communities themselves (Turner, 2006, p. 105). It comes from a tribal understanding that is specific to place (Kovach, 2009). The *Piktukowaq* would have come to their knowledge by being in *Piktuk*. Any disruption of *Piktuk*, including *A'se'k*, would have disrupted the way that the *Piktukowaq* came to know their place. It would have disrupted their entire way of being in place.

Weji-sqalia'timk translates to "where we sprouted or emerged from" and expresses the Mi'kmaw understanding of the origin of its people as rooted in the landscape and nowhere else: [Mi'kmaq] cultural memory resides in the landscape (Sable et al., 2012). Landscape is integral to the cultural and spiritual psyche of the Mi'kmaq, to their language, to their social order, and to their way of being (Sable, et al., 2012; Youngblood Henderson, 2000). As with any Indigenous community, health and wellbeing are closely linked to cultural and spiritual connection to land - the ability to engage in traditional activities and take care of the earth are central to Indigenous identity and the basis of socialization (Ford et al., 2010; Greenwood & de Leeuw, 2007; Richmond, 2009). Cajete (2000) terms the relationship to the natural world "ensoulment", a metaphysical attachment at the deepest level of psychological involvement with the

land (p. 186). Further, he argues, any disassembly of this essential component of being has implications for the health and wellness of Indigenous people. When a community has lost its ability to live in harmony with the life processes of which it is part, it is left wounded (Duran & Duran, 2000). *Piktuk* is the landscape from which the *Piktukowaq* sprouted, where their cultural memory resides, and the landscape from where their language is derived. *A'se'k* is a part of the *Piktuk* landscape.

Mi'kmaw worldview emerges out of experiencing a space and living in an ecosystem for millennia (Youngblood Henderson, 2000). The Mi'kmaw worldview is relational, that is, everything exists in relation to something or someone else (animate or inanimate) and cannot exist outside of that relationship (Sable et al., 2012). Ontology in the western philosophical tradition is defined as ways of being, the nature of reality (Getty, 2010; Kovach, 2009; Wilson, 2008). For Indigenous people in general, the way of being, the reality, is in relationships to something else, including the inanimate and the spiritual (Wilson, 2008). Ontology is unique to each Indigenous group.

Tlilnuo'lti'k reflects Mi'kmaw ontology and translates in several ways. Battiste and Youngblood Henderson (2000) translate it to mean "how we maintain our consciousness" (p. 35). Battiste (2000) translates it as "the process of maintaining the Mi'kmaw worldview" (p. 263). It also translates to "how we will be Mi'kmaq" or "how the Mi'kmaq will maintain their worldview" (Sable et al., 2012; Youngblood Henderson, 2000). How the Mi'kmaq maintain their consciousness is in relation to something else, and it is reflected in what Sable et al. (2012) refer to as the relational and associative aspects of the Mi'kmaw language, which extends beyond the individual to the environment. *Tlilnuo'lti'k* reflects how the *Piktukowaq* would generate or maintain their

Piktukowaq identity. There are several Mi'kmaw words that encompass *tlilnuo'lti'k* – how generating and maintaining the *Piktukowaq* identity would be accomplished.

Netukulimk is one of those Mi'kmaw words, and reflects a value system that dictates the interaction between the Mi'kmaq and nature. As a set of rules and obligations, it embraces the cultural norms around being on the land and the sustainable use of resources for the collective (Prosper et al., 2011). *Netukulimk* embodies relational accountability, and within it, sanctions particular types of behaviour from its adherents (Prosper et al., 2011). It would require that, as Mi'kmaq, one honours the protocols that govern the relationship with the environment – the concept of taking what you need, giving back, and offering thanks (Hart, 2010; Kovach, 2015; Louis, 2007; Tuhiwai Smith, 2012). The reduction of involvement in traditional activities that came about as a result of the colonial actions that limited access to the land and environment (Myers et al., 2005; Takano, 2005) meant the *Piktukowaq* had less opportunity to engage in the value system embraced by *netukulimk*, to learn the appropriate behaviours and norms for being on the land around *A'se'k*, or to gain knowledge and values that others had already learned about living within the ecosystem.

The value system is encompassed in words like *ko'kmanaq* which means "our relations" and conveys how Mi'kmaq extend a relationship to both animate and inanimate objects, thereby creating a relationship of respect and kinship, a reciprocity that includes values and obligations (Sable et al., 2012). Reciprocity ensures that all life is respected "as we are in reciprocal relations with all life" (Hart, 2010, p. 8). Not being able to go out on the land to pursue traditional activities, such as hunting and fishing or collecting medicines, alters the ability of the Mi'kmaq to be able to convey their cultural norms,

values, and knowledge through subsequent generations. The Mi'kmaq have an expression for the kind of loss that was experienced at *A'se'k* and for the loss to all of those relations within *A'se'k*. The Mi'kmaq expression is *tiljim msi'ko'ltiek* – an expression that encompasses the feeling the *Piktukowaq* experienced, and continue to experience, with the loss of their traditional connection to *A'se'k*, and everything that *A'se'k* once represented to the community.

The *Piktukowaq*, as stewards of the land, had an obligation to ensure their relationship of respect and kinship to both the animate and inanimate objects of *A'se'k* were honoured. When they could not fulfill that obligation, the loss they felt was like losing a family member. The translation of *tilijm msi'ko'ltiek* is "we are so sorry" (Pictou Landing First Nation Knowledge Holders, personal communication, July 28, 2016). The words express the sorrow for all that was lost, words that are also used to express sorrow when a family member dies. The words express the loss of all my relations. In an Indigenous value system, everything is connected – from the past to the future, and between all living and non-living things (Castleden, Garvin, & Huu-ay-aht First Nation, 2009; Cram, Chilisa, & Mertens, 2013). The expression conveys how deep the impacts of land displacement and environmental dispossession have been felt, and continue to be felt, in PLFN.

I suggest that it is with this understanding, the research may reflect how deeply impacted the *Piktukowaq* were when the BHETF was sited at *A'se'k*. Understanding that the connection to land and environment is foundational to how the *Piktukowaq* orient themselves in the world reveals the sacredness of *A'se'k.* The colonial state has failed to address, despite repeated pleas from the community, the way that their decisions have

infringed PLFN's ability to carry on and pass on traditions and knowledge that come from living in this area. The colonial state has failed to protect the community from harm.

3.4 Conclusion

Canada might assert that the 30% disparity between Canadians and the *Piktukowaq* who report excellent to good health can be fully explained by conditions of poverty and community decline. I submit that the health of the *Piktukowaq* can and should be further contextualized by the historical, ideological, and political factors to which the community has been subjected. By drawing on biopolitics and biopower, environmental and social justice theory, and a *Piktukowaq environmental health* theoretical framework, I hope to be able to illustrate that the health of the community has never been adequately assessed or addressed. The next chapter details how I have designed my approach to study the health of the community and the methods I have employed in order to do so.

CHAPTER 4 METHODOLOGY MATTERS

The failure of the Joint Environmental Health Monitoring Committee's (JEHMC) studies to reflect the lived reality of the Pictou Landing First Nation (PLFN) cannot be ignored. Hoffman et al. (2015) note that the health concerns raised by the community during the Dillon consultation of 2012 demonstrate the low confidence that PLFN residents have in JEHMC produced studies (p. 766). In this chapter, I show that methodology matters, and that studies conducted under the guidance of the JEHMC will continue to be dismissed by the PLFN community, if they do not see their concerns reflected in the questions asked, or in any of the findings that are reported back.

In the previous chapter, I noted that biopolitics and biopower reproduce a narrative about First Nations people that protects the political and economic interests of the state by basing the causes of ill-health on poverty and community decline. Moreover, the Canadian state limits First Nations in their ability to address the causes of ill-health by under-funding programming intended to improve health conditions on-reserve, which is evidenced in the 1989 Health Transfer Policy; it devolved autonomy to First Nations over the decision-making and delivery of health services, but provided no additional funding with which to enhance their governance structures or services (Adelson, 2005). In fact, there was a 2% cap on annual funding increases for First Nation health care budgets imposed between 1996 and 2016 (Fontaine, 2015; Government of Canada, 2016), despite the widely-known discrepancy in health outcomes.

By not undertaking studies that could assess whether the health concerns of PLFN are justified, the JEHMC's inaction seemingly perpetuates a narrative that protects the interests of the state. This furthers a lack of confidence by PLFN in the work the

Committee has been mandated to lead. The Pictou Landing Native Women's Group (PLNWG) has maintained that the voices of the PLFN representatives have been marginalized within the JEHMC, and despite repeated efforts to have the Committee look at the health of the community, the JEHMC has never done so (Pictou Landing Native Women's Group, 2010a). In fact, the study by Hoffman et al. (2015) echoed those sentiments.

The PLNWG insist that the health of the community has in fact been impacted, based on observations within the community over decades. However, no one has ever collected baseline health data in PLFN to monitor changes in health over time, until the PLNWG took control over their own health and started to coordinate efforts to collect their own health data. Had baseline health data been collected, comparisons could have been made at any number of temporal or geographic scales, which could have been comparable with both Indigenous and non-Indigenous populations. This would have built confidence in the outcomes from the JEHMC.

At any point since 1993, federal government members of JEHMC had access to existing Statistics Canada datasets that could have been used in making those comparisons, since federal government employees can be granted access to data collected by their government agencies. Comparisons to other First Nations could have been made since 1999, since the first First Nations and Inuit Regional Health Survey (RHS) report was made public that year. In some cases, charitable health organizations, like the Asthma Society, also make reports available that present general statistics. The Asthma Society data could have been used to compare provincial and national rates of asthma, for

example, to PLFN. In other cases, data for PLFN health concerns are available within national databases like the Canadian Cancer Registry.

Furthermore, as Richmond and Ross (2009) would argue, in order for the research to be relevant to PLFN, the research approach needs to reflect the deep and sacred connection between Indigenous people and their traditional territory. Privileging Mi'kmaw knowledge to orient the reader to how the Mi'kmaq understand their world would increase an understanding of the relationship that the *Piktukowaq* had to *A'se'k,* all that was lost when *A'se'k* was destroyed, and how this has impacted individual and community health**.** I seek to accomplish this by embracing the principle of *Etuaptmumk* (Two-Eyed Seeing), which allows me to combine the best methodological approaches to answer my research questions and achieve my research objectives.

I suggest that by approaching the research in this way, I can demonstrate that acknowledging and privileging the perspectives of PLFN, allows us to see results that more accurately reflect the lived reality of the PLFN community members, and may highlight what typically gets overlooked in government-directed studies. In order to do this, I operationalize *Etuaptmumk* by using both community-based participatory research and Indigenous methodologies, which I explore in further detail in the following section.

4.1 *Etuaptmumk* (Two-Eyed Seeing): A Re-Imagined Health Approach Using Community-Based Participatory Research (CBPR) and Indigenous Methodologies

Etuaptmumk is a guiding principle that has garnered wide acceptance in recent years by Indigenous health and environmental researchers. *Etuaptmumk*, as envisioned by Mi'kmaw Elders Albert and Murdena Marshall, and Dr. Cheryl Bartlett (a Professor Emerita of Biology at Cape Breton University), brings together the strengths of both western and Indigenous knowledge systems to garner insights into complex issues around

health and environment that might otherwise escape our consideration (Bartlett, Marshall, & Marshall, 2012; Iwama et al., 2009). Martin (2012) argues that incorporating Indigenous knowledge is meant to elucidate how Indigenous peoples see and experience the world around them. *Etuaptmumk* is not meant to diminish the place of western research approaches. Rather, *Etuaptmumk* creates an ethical way forward to recognize and honour that there are multiple ways of knowing about the world, and that autonomous epistemologies and ontologies can complement each other in discovering new truths (Goulding, Steels, & McGarty, 2016; Greenwood et al., 2017; Hovey et al., 2017; Marsh et al., 2015; Martin, 2012; Rowan et al., 2015). Moreover, *Etuaptmumk* refocuses the understanding of the connection between Indigenous cosmologies, values, spirituality, and cultural beliefs that link humankind and the natural world and the important connection to the land and environment (Goulding, Steels, & McGarty, 2016; Marsh, et al., 2015; McKeon, 2012). These are important considerations for an adequate assessment of impacts on Indigenous health. *Etuaptmumk* is not about prioritizing or balancing the use of research methodologies, but knowing when one methodology might be more appropriate given the research questions one is trying to answer (Hall et al., (2015).

My research is an opportunity to employ the principle of *Etuaptmumk*, to revisit the work of the JEHMC, and re-imagine the outcome of research had they incorporated the insights that were coming from the community of PLFN. Therefore, given that *Etuaptmumk* provides the ethical space to incorporate multiple methodologies, I use CBPR methodology to guide the collection and analysis of health data in the community, in a way that respects the needs of the community, and honours a relational

accountability and responsibility back to PLFN. I use an Indigenous methodology, presented hereafter as the *Piktukowaq* Environmental Health Research Methodology**,** to guide the interpretation of oral histories collected within the community to increase an understanding of the *Piktukowaq* (person from *Piktuk*) place in the world, and the nature of their relationship to *A'se'k* (the other room)*,* and all that *A'se'k* meant for their health.

I argue that an *Etuaptmumk* approach, one that embraces both a CBPR methodology, which guided the collection of health data in the community, and an Indigenous methodology, which guided my collection of oral histories in 2015, and the subsequent analysis of all of the oral histories, will open up an 'ethical space[17]' (Ermine et al., 2004) that helps the reader understand what PLFN has experienced. The prevailing guidance for the research project is that this is a research project initiated by the PLNWG. The PLNWG felt their health had been impacted, and they knew that the JEHMC, for whatever reason, was not hearing them. The approach that they wanted had to ensure that their knowledge was privileged. Guided by the principal of *Etuaptmumk* ensures that the research looks to the strengths of both western and Indigenous Knowledge systems to acquire the insight to include measures of health that, as in the case of PLFN, might not otherwise be considered. I maintain that, taken together, the CBPR and Indigenous methodologies can achieve this.

4.1.1 Community-Based Participatory Research Methodology

Community-based participatory research (CBPR) is not just a methodology but is

[17] Ethical space, in Indigenous research, is conceived as a neutral bridging space that provides an opportunity for 'critical conversations' based on contrasting perspectives of the world, "separate realities of histories, knowledge traditions, values, interests, and social, economic and political imperatives" (Ermine et al., 2004, p. 20).

rather (or also) a philosophical approach or orientation to research that seeks to engage with research participants as equitable partners and co-researchers in a research process that is meaningful to them (Castleden, Garvin, & Huu-ay-aht First Nation, 2008; Flicker et al., 2007; Khanlou & Peter, 2005; Minkler & Wallerstein, 2003; Simonds & Christopher, 2013). CBPR as a methodology or philosophy involves communities as partners in decision-making, while building knowledge and experience in a bi-directional capacity to give the research back to the community in a way that is meaningful to their needs (Castleden et al., 2008; Castleden, Mulrennan, & Godlewska, 2012; Castleden et al., 2015; Flicker et al., 2007; Israel et al., 2010; Khanlou & Peter, 2005; Minkler & Wallerstein, 2003; Sterling, 2011). CBPR, therefore, is operationalized from the moment that the relationship is initiated, ideally by the community, through the design of the research tools, to the collection, analysis, and dissemination of the research findings (Castleden, Sloan Morgan, & Lamb, 2012).

CBPR is particularly useful for research with Indigenous groups on health, environmental, and social issues (Flicker et al., 2007; Israel et al., 2010). CBPR has emerged as a transformative approach (Wallerstein & Duran, 2010) that seeks to make space where culturally relevant theories are used to answer research questions of interest to the community (Castleden, Garvin, & Huu-ay-aht First Nation, 2008; Hall et al., 2015; Latulippe, 2015). This is not to say that the research outcomes meet predetermined conclusions, but rather that the data collected reflects the lived reality of the participants—that the participants can see themselves in the new knowledge that is generated.

4.1.2 *Piktukowaq* Environmental Health Research Methodology

Cram, Chilisa, and Mertens (2013) argue that if Indigenous peoples have different ways of knowing about the world around them, then it is only reasonable that their knowledge should be reflected in the research process. As noted in Chapter 3, Indigenous knowledge is gained through shared experience and observation, and it has developed, been measured, tested, and retested, over thousands of years of living on the land (Battiste 1998; 2000; Berkes & Berkes, 2009; Edosdi, 2008; Getty, 2010; Kovach, 2009; Rains, Archibald, & Deyhle, 2000). Centering Indigenous concepts in a methodology allows the researcher to come to know and understand the research from an Indigenous perspective (Porsanger, 2004). An Indigenous research methodology, therefore, will have to be grounded in explanations that come from an Indigenous way of knowing that then makes the research relevant because it makes sense from their particular tribal knowledge base (Hart, 2010; Kovach, 2010, 2015; Louis, 2007; Weber-Pillwax, 1999; Wilson, 2008). Variously referred to as a decolonizing methodology, a postcolonial Indigenous research paradigm, an Indigenous research paradigm, or Indigenous research, all variants of it access cultural knowledge to make the research outcome relevant to the community engaged in the research process (Chilisa, 2012; Chilisa & Tsehko, 2014; Kovach, 2010, 2015; Tuhiwai Smith, 2012; Wilson, 2008).

A *Piktukowaq* environmental health research methodology privileges *Piktukowaq* perceptions, worldview and knowledge. Doing so is not just a decolonizing approach, but is also a way to orient the reader to how the *Piktukowaq* understood their world before the forceful and coercive policies of the British, and then Canadian state, were imposed on them, and then alienated them from their lands and environment. As a result, my

research is grounded in the sense of who one is as *Piktukowaq*, that is, it reflects, as Tuhiwai Smith (2012) might argue, the *Piktukowaq* reality. By embracing a *Piktukowaq* epistemology, my research is reframed to prioritize and validate the reality of the PLFN community in the analysis, a reality they have lived for thousands of years. For the research to be useful to PLFN, the research approach has to reflect the deep and sacred connection between the *Piktukowaq* and *A'se'k* and all that was lost when *A'se'k* was destroyed. Moreover, this is an essential understanding for how the loss *of A'se'k* has come to impact the health of the community.

4.2 How Survey Data is Used to Understand Pictou Landing First Nation Health

Etuaptmumk requires that, on the one hand, researchers look to the strengths of western knowledge and ways of knowing, and on the other hand to Indigenous ways of knowing, to gain insights into complex issues around health and environment if it concerns Indigenous populations (Bartlett, Marshall, & Marshall, 2012, p. 336; Iwama et al., 2009; Martin, 2012). For this reason, I analyze survey data that was readily available to the JEHMC should they have decided to access it, but for reasons that are unknown, chose not to, or overlooked it. Specifically, I used the Canadian Community Health Survey (CCHS) data, data publicly available through the Asthma Society of Canada and the Canadian Cancer Registry (CCR) data. These are rich sources of information that allow for comparisons to non-Indigenous population health determinants, and provide up-to-date diagnosis of asthma and cancer, both of which are of particular concern to PLNWG. Below, I will briefly explain the CCHS, the Asthma Society data, and the CCR, and the health measures I have taken from each.

Etuaptmumk requires that we also look to the strengths of Indigenous knowledge. Thus, I also used the RHS, which was developed to ensure that First Nation data are collected and interpreted within a holistic framework that is culturally appropriate to Indigenous worldviews (First Nations Information Governance Centre, 2016). While the RHS could give me some contextual and culturally appropriate insight in the PLFN's health status, it did not provide household-level data. Thus, we (PLNWG and other members of the research team[18]) developed and administered a community-specific survey: *Identifying, Documenting, Mapping, and Mobilizing Environment and Health Knowledge in Pictou Landing: An Environmental Health Survey* (EHS). This became another source of data that was collected using an environmental health framework that privileges the *Piktukowaq* knowledge and perceptions of their environment, and therefore, in doing so, will respect the *Piktukowaq* relationship to *A'se'k* to assess the health of the community. I now present how each of these surveys could contribute to a re-imagined health approach that would allow me to answer my first research question: As a consequence of siting the Boat Harbour Effluent Treatment Facility (BHETF) in *A'se'k*, is the resultant land displacement and environmental dispossession affecting the physical, mental, emotional and spiritual health of the PLFN community?

In the sub-section that follows, I first present each of the sources of data I accessed. However, because the EHS is unique in that it privileges the *Piktukowaq* knowledge and perceptions of their environment and their relationship to *A'se'k,* I will

[18] While undertaking this thesis, the PLNWG and I were also part of a larger Canadian Institutes of Health Research (CIHR) funded project, *"Our ancestors are in our land, water, and air": A Two-Eyed Seeing approach to researching environmental health concerns with Pictou Landing First Nation*, led by Dr. Heather Castleden.

therefore devote more detail to the work that was done with the PLNWG, for without this data, I would not have been able to answer the research questions. In Section 4.3, I will present the measures that were used from each of the sources.

4.2.1 Data from the RHS, CCHS, Asthma Society, CCR, and the EHS

The RHS is the first national survey implemented to address health and well-being issues for the on-reserve First Nation population in Canada (First Nation Information Governance Centre, 2016). The RHS is governed by First Nations according to principles of ownership, control, access, and possession (OCAP®) as articulated by the First Nations Information Governance Centre (FNIGC).[19] Launched in 1997, the RHS is mandated by the Assembly of First Nation Chiefs to collect data every five years on First Nations who were typically excluded from other national surveys (First Nation Information Governance Centre, 2016). I use the RHS because it allows me to compare PFLN data from the EHS with that of other First Nations at the provincial and national levels. Survey weights are used to make the sample representative of the First Nation population at both levels (First Nation Information Governance Centre, 2016; Union of Nova Scotia Indians, 2013). For the purposes of this dissertation, I use the measures of income and health from the 2008/10 cycle of the RHS.

The Canadian Community Health Survey collects data every two years related to

[19] OCAP® is a registered trademark of the First Nations Information Governance Centre (FNIGC). OCAP®, established in 1998 under the National Steering Committee of the First Nations and Inuit Regional Longitudinal Survey (precursor to the First Nations RHS), respects the rights of First Nations communities to own, control, access, and possess information about their peoples, is fundamentally tied to self-determination and to the preservation and development of their culture (FNIGC, 2017a). OCAP® asserts that First Nations have control over data collection processes in their communities, and that they own and control how this information can be used (FNIGC, 2017a).

health status and health determinants for Canadians in general, but excludes on-reserve First Nation populations (Statistics Canada, 2015). The CCHS data is made available to federal health departments and researchers to conduct research to improve health and to investigate issues of concern to those who may be impacted (Statistics Canada, 2017c). The CCHS targets those who are ages 12 years and older, and uses a sample of 130,000 respondents. Survey weights are used to make the sample representative of the population. The weighted sample is 30,014,590. I accessed the 2014 CCHS microdata[20] file through the Atlantic Research Data Centre. The data are used to enable a comparison of health outcomes of the non-Indigenous population at the Pictou County District Health Authority, provincial, and national levels to the health outcomes of PLFN. I use the measures of health, education, employment, and asthma from the 2014 cycle of the CCHS.

The Asthma Society presents general statistics in publicly available reports. For example, in the 2014 study, *Severe Asthma: The Canadian Patient Journey – A study of the personal, social, medical, and economic burden of Severe Asthma in Canada*, the data that is presented is based on the CCHS (2010) and Public Health Agency data (Asthma Society, 2014). I use this data to compare with the EHS data, as the CCHS does not provide the information on the age group under 12 years, and the PLNWG was concerned about the rates of asthma in their children, as well as the rates in those over the ages of 12 years.

[20] Statistics Canada allows researchers to obtain access in secure settings to detailed microdata, which is data that is at the individual, household, or business level, depending on the survey. This level of data is beyond publicly available aggregate data, and public use microdata files (Statistics Canada, 2016).

The CCR is a patient-oriented administrative database that the Canadian Council of Cancer Registries maintains to provide the data on cancer diagnosis since 1992, and to help track patients who have been diagnosed with neoplasms, or tumours (Statistics Canada, 2017b). The CCR is housed by Statistics Canada, and is linked to provincial and territorial CCRs (Statistics Canada, 2017a). It has been suggested that cancer is understudied among Indigenous people because there are no ethnic identifiers in the CCR (Withrow et al., 2016). The Alberta First Nation Information Governance Centre (2015), Chiefs of Ontario (2016), and Institut National de Santé Publique Québec (2009) reports that the lack of identifiers in the CCR leads to gaps in information, which hamper the ability of these organizations to plan effective policy to reduce cancer risks and burdens in their communities (Chiefs of Ontario & Cancer Care Ontario, 2016). While it is true that the CCR does not include ethnic identifiers, I determined that I was able to get to the data at the First Nation level. I accessed the 2013 microfile data from the CCR through the Atlantic Research Data Centre.

The EHS was the first time that baseline health data was ever collected for PLFN, since *A'se'k* became the BHETF in 1967, and more disconcertingly, since the JEHMC was mandated to monitor the health of the PLFN band members in 1993 (JEHMC, 1996). The EHS was developed with the PLNWG to assess the current health of the PLFN. Using a CBPR approach, I worked with the PLNWG to jointly develop the EHS[21],

[21] A portion of this section referring to the development of the EHS has been adapted from: Lewis, D. et al. (2016). Increasing Response Rates on Face-to-Face Surveys with Indigenous Communities in Canada: Lessons from Pictou Landing. *Progress in Community Health Partnerships: Research, Education, and Action*, 10(2), 197-205. (Copyright © 2016, Johns Hopkins University Press. This article first appeared in PROGRESS IN COMMUNITY HEALTH PARTNERSHIPS: RESEARCH, EDUCATION, AND ACTION, Volume 10, Issue 2, Summer, 2016, pages 197-205.)

starting from the National Aboriginal Health Organization's (NAHO) definition of health, which states that "health is understood as the balance among the physical, mental, emotional and spiritual realms, as well as the environment, culture, family, and community, and that Indigenous well-being flows from balance and harmony among all these elements of personal and collective life" (National Aboriginal Health Organization, 2007, p.1). Moreover, given the need to understand the extent to which siting the Boat Harbour Treatment Facility has resulted in land displacement and environmental dispossession, the EHS needed to capture the process through which the PLFN lost the ability to pursue traditional activities and the opportunity to be on their traditional land. Thus, we asked questions that dealt with cultural and traditional practices such as the ability to harvest wild foods, or gather medicines and berries around *A'se'k*, both in the past and in the present (Lewis et al., 2016). The EHS was developed adhering to the OCAP principles. Moreover, Mi'kmaw ethical responsibility requires that all research involving a Mi'kmaw community belongs to the community and must be returned to them (Cape Breton University, 2017), therefore, at the end of my dissertation, I will compile a report to present the data that was collected back to the community.

The EHS survey drew from two existing surveys - the Communities for a Better Environment Survey (Cohen et al., 2012) and the RHS, and included PLNWG-generated questions ((Lewis et al., 2016). In order to fully understand the effects that land displacement and environmental dispossession has had on the physical, mental, emotional, and spiritual health of the PLFN community, the PLNWG directed that the EHS also gather data on the perceptions and experiences around the impacts of environmental exposures from the BHETF, such as the impacts this could have on access

to traditional foods and medicine gathering (Lewis et al., 2016). There was a qualitative aspect to the EHS. Where predetermined categories were too restrictive for explaining such things as complex health issues, or locations where people may have pursued traditional activities in the past, the thirteen PLNWG research assistants (RAs), who were trained to administer the survey and collect the survey data, would respect all input by hand-recording responses that would be coded after the fact (Lewis et al., 2016). Feedback about this aspect of the approach was very positive, with the RAs sharing that this made people feel that their individual input was important regardless of whether there was a space to enter their information (Lewis et al., 2016, p. 202). And because, as noted in Chapter 3, any proper accounting of Indigenous health has to take into account the unique structural determinants of health created by colonialism, measures included familial attendance at residential school, experiences with racism, and loss of language.

Face validity was achieved when the items in the survey made sense, that is, would they measure what they were intended to measure based on the lived experience of those in the community without having to give detailed explanations (Barry, Bradshaw, & Noonan, 2013; Gaber & Gaber, 2010). The survey was pilot-tested among members of the PLNWG who volunteered to administer the survey on each other, and revisions were made based on their feedback before the instrument launched (Lewis et al., 2016). Community capacity-building is an important tenet of CBPR (Bull, 2010; Castleden, Garvin, & Huu-ay-aht First Nation, 2008; Castleden, Sloan Morgan, & Lamb, 2012), which is why all of the RAs hired to help with the gathering of data were members of the PLFN, as well as members of the PLNWG (Lewis et al., 2016).

Due to funding constraints, the PLNWG decided that they would limit the EHS to on-reserve residents only. The PLNWG took the lead on notifying the community that the survey was about to launch through the PLFN newsletter, a community Facebook page, door-to-door delivery of an information package, and an advance letter outlining information about the research, the team, and the community members who would be conducting the surveys (Lewis et al., 2016). The use of advance letters has been suggested to increase response rates in household surveys (de Leeuw et al., 2007; Fan & Yan, 2010; Groves, 2006).

The PLNWG directed that each of the approximately 130 homes in PLFN would be approached, and RAs could select the homes of their own families and friends. RAs went door-to-door, asking female heads of households to voluntarily participate as the PLNWG indicated that for PLFN residents, female heads of household might be more appropriate to speak to the health concerns of all of the members of their family (Lewis et al., 2016). During the door-to-door phase, RAs provided Information Sheets about the survey, allowed participants[22] to see a paper copy of the blank survey, and read from a Verbal Consent Form. Verbal consent was deemed by the PLNWG to be more culturally appropriate than written consent and a more reasonable form of consent in Indigenous communities (Lewis et al., 2016). The protocol that the PLNWG established encouraged in-home surveys, however, arrangements could have also been made to complete the survey at other community venues such as the Health Center or Band Office, should the participant wish (Lewis et al., 2016). Several people responded to this offer. Some

[22] In the context of the EHS, the PLFN members were participants in the development of the study, therefore, I will use the term participant, rather than respondent.

surveys were done in Mi'kmaq if the participants preferred to use their own language. Many of the RAs could speak or understand both Mi'kmaq and English; they were then able to translate the data into English after the survey was administered.

Respecting that there could be multiple family households[23], the PLNWG directed that all age of majority adults, single mothers or fathers (on behalf of their own family unit), and Knowledge Holders within the home would complete their own surveys to respect their privacy (Lewis et al., 2016). Female heads of families completed the survey as head of household, but included only their own underage children. However, if the female preferred a male to answer the survey on behalf of their family unit, that was respected, and the male would be invited to respond (Lewis et al., 2016).

As a matter of respectful protocol, preliminary data analysis was presented first to the PLNWG, and after discussion about the results, a second presentation was made to the community at a dinner (Lewis et al., 2016). This was an opportunity to remind community members that the survey was a community-driven research activity (Lewis et al., 2016). Both the PLNWG meetings, and the initial community presentation, served as an incentive to get to a higher response rate, once the community was comfortable that the data being collected was reflecting their concerns (Lewis et al., 2016). The data collection for the EHS, which commenced in November, 2012, concluded in December, 2013. The survey had a 59% response rate to the survey (n = 279) which gives valuable insight into the health status of the community. This is the benefit of using CBPR - the community has input into the design process so that the data collection ended when the

[23] As is typical in on-reserve communities, there is an acute shortage of housing and overcrowding is common, necessitating that often multiple family units, across two to four generations, live in one house (FNIGC, 2012; Optis et al., 2012).

community felt that the baseline data was adequate for their purposes.

In the next two sections, I present outcome and explanatory measures that will come from either the RHS, CCHS, CCR, or the EHS. As I present each of the measures, I will indicate the source of the data. Furthermore, the outcome measures will come from the NAHO definition (balance between the dimensions of physical, mental, emotional and spiritual health), and the two concerns that the PLNWG voiced from the beginning of our meetings – asthma and cancer. I then turn to explanatory measures, again coming from the NAHO definition which states that the four dimensions of Indigenous health (outcome measures) will be influenced by variances in the measures of environment, culture, family, and community. I conclude with the explanatory measures that reflect the impacts of the unique historical, ideological, political, societal, and economic structures that continue to impact Indigenous health in Canada.

4.3 Outcome Measures from Survey Data

The PLNWG has asserted that the health of the community has been impacted, but they never had the data that they viewed as trustworthy, or legitimate, to determine with any certainty what those impacts might be. The JEHMC presented studies that concluded that PLFN health had not been impacted, despite no one actually having gone into the community to gather health-related data to make this determination. Using the NAHO definition, I present four outcome health measures: physical health (health rating), mental health (depression), emotional health (happy), and spiritual health as dependent variables, and then I present the health outcomes of asthma and cancer.

Health Rating

In surveys on non-Indigenous Canadians, self-rated health is deemed a meaningful and reliable measure of current health that has been tested against mortality rates and results of clinical examinations (Bowling, 2005; Falconer & Quesnel-Vallée, 2017; Wu et al., 2013) and over the years, has maintained its reliability as a measure of current health (Mora et al., 2008). However, when an Indigenous person is asked to rate health, we have to ask if the single global question to measure health status is capturing what Sibthorpe, Anderson and Cunningham (2001) refer to as the 'phenomenologic' conceptualization of health as understood in an Indigenous context (p. 1662), one that includes, beyond the physical, emotional and personal aspects of health, the spiritual aspects of health, or the health of the family, the community, the land or the environment. Although there are challenges in capturing the phenomenological conceptualization of health across social groups (Angel & Thoits, 1987; Falconer & Quesnel-Vallée, 2017), the FNIGC has kept the self-reported health measure in their survey instruments for two decades as a measure that would allow, on a population health basis, comparability to other Canadian surveys, while incorporating additional measures that make the data culturally valid (First Nation Information Governance Centre, 2011). Having the self-reported health data would, as Graham and Stamler (2010) argue, make it possible to evaluate and compare health status across populations. In the EHS, self-reported health was used, along with other measures that were appropriate to the community experience.

In the CCHS, respondents were asked: "In general, would you say that your health is…?". Response choices were: excellent, very good, good, fair, poor, don't know, refuse to answer, and not stated. At the national level of the CCHS, only 0.10%

responded don't know, refusal, or not stated. At the provincial level only 0.13% responded don't know or refused, and at the Pictou County level 0.24% responded refused. Since these are such low non-response rates (below 1%), I recoded don't know or refusal, or not stated at all levels to missing. In the RHS, self-reported health was measured by the response to the question, "In general, would you say that your health is…?", and response choices were excellent, very good, good, fair, or poor. The RHS does not report non-responses. Self-reported physical health rating was measured in the EHS by a question that asked, "Overall, how would you rate the household member's health?" In the EHS, response choices included excellent, good, fair or poor, don't know, refused, or missing. I then collapsed self-reported health rating to poor to fair and good to excellent in the CCHS, RHS, and EHS. To compare the EHS to the RHS, which does not report non-responses, and to the CCHS, which has such low non-response rates, the responses of don't know, refused, or missing were then recoded to missing. When presenting the EHS data only, I collapsed don't know, refused, or missing to one category of DK/Ref/Missing.

Mental Health (Depression)

Mental health, according to the Canadian Mental Health Association (2015), is defined as psychiatric disorders ranging from anxiety and depression to panic disorders or post-traumatic stress disorder. Lower socio-economic status is linked to increased rates of mental health conditions, such that those who have lower levels of education, higher unemployment, and a lack of social supports exhibit higher rates of depression (Bombay, Matheson, & Anisman, 2009; Canadian Institute for Health Information, 2009; Payne et al., 2014). For Indigenous peoples, mental wellness is defined as the state in which an

individual can achieve his or her full potential, can cope with the normal stresses of life, and can make a contribution to their community, supported by culture, language, Knowledge Holders, families, and spirituality (First Nations and Inuit Health, 2015, p. 1). But these protective factors continue to be undermined by colonialism and the government policies of forced assimilation (Gone, 2013; Kirmayer, Simpson, & Cargo, 2003).

Indigenous peoples experience higher rates of mental health issues, including depression, than non-Indigenous peoples (Bombay, Matheson, & Anisman, 2009). Depression, as an indicator of mental health, can include feelings of sadness or hopelessness, and manifest in poor sleep patterns, poor moods, or recurrent thoughts of death (Bombay, Matheson, & Anisman, 2009; Payne et al., 2014). Moreover, the physical, mental, emotional and spiritual realms cannot be understood independent of one another. Mental states can only be understood in relation to physical, emotional and spiritual wellbeing, that is, if the spirit is broken, the physical, mental, and emotional conditions are broken (Lavalee & Poole, 2010). There are, however, limitations to using self-reported mental health measures that include the risk of omission or over-reporting as a result of exaggeration of symptoms, unrealistic self-appraisal, a lack of self-awareness, or deception (Kelley, Edens, & Morey, 2017).

Mental health (depression) in the EHS was measured by asking the participants, "In the past year, have you or a household member felt down or depressed?", with response choices being: often, sometimes, never, don't know, refused, and missing. The measure was recoded to a response of no or yes, and I collapsed don't know, refused, or missing one category of DK/Ref/Missing.

Emotional Health (Happy)

It is well documented that those who are grounded in their culture and traditions are happier, but that colonization, the residential school system, land displacement and environmental dispossession have impacted cultural values, sacred knowledge, language and practices, all of which are essential determinants of individual, family, and community wellbeing (Adelson, 2005; FNIH, 2015; Kant et al., 2014; Kelm 2008; Kirmayer, Simpson, & Cargo, 2003). Emotional health can be measured by asking how a respondent feels or if they are satisfied with life (Lee, Walker, & Shoup, 2001; Wallace & Herzog, 1995).

Connection to land is essential to emotional well-being in Indigenous communities (Cunsolo Willox et al., 2012, 2013; Rigby et al., 2011; Tobias & Richmond, 2014). Studies exploring the connection of Inuit to the land similarly note the positive benefits of being out on the land, and the negative responses, such as stress, anxiety, fear, or anger, to the changing landscape brought about by the effects of climate change (Cunsolo Willox et al., 2012, 2013; Durkalec et al., 2015). In Australia, caring for country (the land) has been associated with superior health outcomes extending to emotional wellbeing; conversely, not being able to care for country deepens feelings of grief and loss (Rigby et al., 2011). In Canada, Shandro et al. (2017) have assessed the emotional reaction of several First Nations in British Columbia who suffered a loss of salmon access in the Fraser River when the Mount Polley Mine Tailings Dam failed in 2014. Their findings revealed that band members who were impacted reported feelings of increased sadness, fear, anger, and confusion (Shandro et al., 2017). Solastalgia is a term used to capture the emotional distress people experience when land undergoes negative

changes, and is especially compounded if they lack control over the situation as it unfolds (Albrecht et al., 2007; Higginbotham et al., 2007).

Emotional health (happy) in the EHS was measured by asking the participant, "Do you or your household member normally feel happy, interested in things?", with response choices including no, yes, don't know, refused, and missing. The measure was recoded to a response of no or yes, and I collapsed don't know, refused, or missing to one category of DK/Ref/Missing. Two responses were somewhat, which I recoded to yes.

Spiritual Health

Spiritual health can be defined in terms of spiritual wellbeing, a sense of peace, purpose, or meaning in life, a feeling of being grounded or connected (Levesque & Li, 2014). Indigenous peoples' connection to land is important to maintain spiritual health, so it is critical to understand the ways in which colonial policies alter the ways that Indigenous people can relate to the land or practice their spiritual beliefs and teachings (McIvor, Napoleon, & Dickie, 2009; Richmond, 2015; Wilson, 2003). A spiritual connection to land - the ability to engage in traditional activities and take care of the earth - are central to Indigenous identity and the basis of socialization (Ford et al., 2010; Greenwood & de Leeuw, 2007; Richmond, 2009). Ensoulment is the termed coined by Cajete (2000) that captures the deep metaphysical and psychological attachment to the land, and any disconnection of that attachment leaves a community and its members wounded (Duran & Duran, 2000).

There are also spiritual aspects within the pursuit of traditional activities and gathering of wild foods (Wilson, 2003). Food gathering and harvest participation activities are an important aspect of spiritual health, not only for the individual, but for

the community as a whole, and are important aspects of cultural definition, social connection based on the ethics of sharing and reciprocity, and collective survival (Myers et al., 2005; Sharma, 2010; Takano, 2005). Landscape is integral to the spiritual psyche of the Mi'kmaq, to their language, to their social order, and to their way of being (Sable et al., 2012; Youngblood Henderson, 2000). In fact, in a study conducted by Levesque and Li (2014), First Nation respondents put more emphasis on spiritual health than physical health, compared to Canadian Francophones or Anglophones.

Spiritual health in the EHS was measured by asking the participants, "How important is traditional spirituality to you, or other household member?", with response choices including not important, important, somewhat important, very important, not applicable, don't know, refused, and missing. The measure was recoded to response choices of not important or important, and I collapsed not applicable, don't know, refused, or missing to one category of NA/DK/Ref/Missing.

Asthma

In the earliest meetings with the PLNWG, the women brought up their concerns about the exposure of their children to the air in PLFN. One woman had taken her child to a specialist in Halifax and was told that her son had chest issues possibly as a result of the hydrogen sulfide in the air around PLFN affecting the lung membranes (PLNWG Meeting October 4, 2010). Others talked about when they, or their children, left PLFN, their breathing issues seemed to clear up until they returned to the community, and they raised concerns about how many people in the community relied on puffers (PLNWG Meeting October 4, 2010).

According the Asthma Society of Canada (2014), asthma is a disease of the lungs in which the airways become blocked or narrowed causing breathing difficulty and is divided into two types: allergic (extrinsic) asthma and non-allergic (intrinsic) asthma. The exact cause is unknown with a number of potential causes, including heredity, the environment, or an impaired immune system (Asthma Society of Canada, 2014). Risk factors (triggers) include a family history of asthma/allergies, including eczema and allergic rhinitis, exposure to tobacco smoke, household mold, or pollen, or exposure to chemicals, odours, or pollution (Asthma Society of Canada, 2014; Castleden et al., 2016; Stewart et al., 2015; Watson et al., 2012). It should be noted however, that First Nation adults smoke at twice the rate of other Canadian adults, and over half are exposed to smoking in the home (Reading & Wien, 2009; Watson et al., 2012). Moreover, crowded and poor housing conditions and inadequate or no ventilation in many on-reserve homes leads to excessive mold growth, which are factors contributing to breathing conditions such as asthma (Castleden et al., 2016; Reading & Wien, 2009; Stewart et al., 2015; Watson et al., 2012).

Diagnosis begins with a thorough history and physical examination, and airflow to the lungs is measured using a spirometer to gauge the amount of air inhaled and exhaled. The airflow measure is used to determine the level of airway obstruction (Asthma Society of Canada, 2014). Asthma is a chronic condition that requires continuous medical management. In the EHS, participants if they have asthma "Was it symptom diagnosed?", with responses no, yes, don't know, refused, and missing. I report those who responded yes and don't know. The participants were then asked "Did you or household member get spirometry testing (i.e. blow into a machine to test lung

capacity)?", to which they could respond no, yes, don't know, refused, and missing. Again, I report those who responded yes and don't know.

I present comparative rates for asthma at the county, provincial, and national levels from the 2014 CCHS, and present the data for the age groups where data is available. Since this data is available from the CCHS, and the JEHMC could have collected data of asthma incidence in the community of PLFN, I present this as an environmental and social justice issue.

The Asthma Society presents the percentage of children ages 4 to 11 years who have been diagnosed with asthma, so I compare the same age groups from PLFN. According to the 2014 CCHS, which collects data for those ages 12 and older, respondents were asked, "Do you have asthma?", to which they could respond yes, no, don't know, or refuse (Statistics Canada, 2017d). At the national level, 0.12% responded don't know or refused. At the provincial level 0.05% responded don't know or refused. Lastly, at the Pictou County level 0.34% responded don't know or refused, so, since these were such low non-response rates, I recoded don't know or refused at all levels to missing. In the EHS, participants were asked, "Did a doctor or other health professional ever tell you or a household member that you/they had asthma?", to which they could answer no, yes, don't know, refused, or missing. For comparison to CCHS data, I recoded the responses in the EHS to no, yes, and recoded don't know and refused to missing.

Cancer

The CCR is a patient-oriented administrative database that tracks the diagnosis of neoplasms, or tumours (Statistics Canada, 2017b). The histological description of a neoplasm is coded according to the International Classification of Diseases of Oncology

(Statistics Canada, 2017b). As mentioned previously, it has been reported that the CCR is not useful for research on cancer diagnosis among Indigenous people, since there are no ethnic identifiers in the CCR. This is true. However, the CCR reports residence at diagnosis for patients, which is defined as the usual place of residence of the patient where they live most of the time (Statistics Canada, 2017a). The address is coded using the standard geographical classification (SGC), an official classification used by Statistics Canada for all addresses throughout Canada (Statistics Canada, 2017e). Each province is broken down into census divisions, and each census division is further subdivided into census subdivisions. Census subdivision is defined as an area that is a municipality, or is deemed to be equivalent to a municipality, such as an Indian reserve or settlement (Statistics Canada, 2011).

Taking the First Nation profiles, maintained by Indigenous and Northern Affairs Canada, I extracted the names of each of the thirteen Nova Scotia First Nations, and each of their respective reserves, settlements, and villages (Indigenous and Northern Affairs Canada, 2017). For example, PLFN is comprised of five reserves, settlements, or villages: Boat Harbour West 37, Fisher's Grant 24, Fisher's Grant 24G, Franklin Manor No. 22 (co-owned with Paq'tnkek First Nation), and Merigomish Harbour 31 (Indigenous and Northern Affairs Canada, 2017). Of the five, only two have residents, Fisher's Grant 24 and Merigomish Harbour 31, and both being assigned their own census subdivision codes. I was then able to extract data for each subdivision code. To access the data for all thirteen Nova Scotia First Nations, I did the same for each of the other twelve Nova Scotia First Nations.

Each cancer patient is given a unique number that is used throughout their

registration in the CCR (Statistics Canada, 2017b). I extracted gender, age, SGC including census, and census subdivision, year of diagnosis, and histology for each patient record, at the PLFN, Pictou County, Nova Scotia First Nation, provincial, and national levels. The CCR uses the World Health Organization International Classification of Diseases for Oncology, Third Edition (ICD-O-3) to classify human cancer sites (Statistics Canada, 2017b). I have grouped human cancers sites using the International Agency for Research on Cancer (IARC) classification system which groups cancer sites according to digestive organ cancers, respiratory organ cancers, breast and female genitalia cancers, male genital organ cancers, urinary tract cancers, or other (Statistics Canada, 2017b). Since this is a patient-oriented administrative database, there is no need to recode to missing. I present cancer as an environmental and social justice issue because this is data that could have been accessed since the CCR tracked diagnosis since 1992, one year before the JEHMCs inaugural meeting in 1993.

In the next section, I present the explanatory/independent variables that reflect the dominant narrative, that poverty and social conditions create poorer health outcomes in First Nation communities. I then go beyond the biopolitical narrative to include explanatory measures that are more reflective of First Nation health and their experiences in a colonial state.

4.4 Explanatory Measures from Survey Data

Health care policy for all Canadians falls under the mandate of the Public Health Agency of Canada (2012), which uses the SDoH approach that includes measures of income, social status, social support networks, education, employment/working conditions, social/physical/built environment, personal health practices, coping skills,

child development, and gender (Public Health Agency of Canada, 2016, para. 1). The acknowledgement that social conditions and life circumstances are somewhat responsible for health outcomes has only been more widely accepted in public health in the last decade (de Leeuw, Lindsay, & Greenwood, 2015). The Public Health Agency of Canada (2013) now recognizes that higher economic and social status are the most important determinants of health. Yet social status, associated with higher incomes, social position and hierarchy (Public Health Agency of Canada, 2013), under a biopolitical state like Canada, has historically been denied to Indigenous peoples who are one of the most economically disadvantaged and vulnerable groups of people in Canada (Palmater, 2011; Reading & Wien, 2009).

In this section I will compare PLFN income levels, educational attainment, and employment status to other First Nations and to non-Indigenous Canadians at the county, provincial and national levels. I do this to explore how social determinants can account for health outcomes. Building on the NAHO definition of health, I present environment, culture, family, and community, as explanatory factors for health outcomes in PLFN, and then look to the structural factors that uniquely impact Indigenous health, namely residential school experience, racism, and loss of language.

Income

The provincial and national RHS reports state that more than half of First Nation adults report incomes less than $20,000. I examine what percentage of those in PLFN are reporting incomes less than $20,000, to assess how PLFN compares to other First Nations. The RHS asks personal income only of adults ages eighteen years and older (First Nation Information Governance Centre, 2016). The national RHS and the Nova

Scotia version of the RHS ask respondents to provide total personal income from all sources and before deductions for the past calendar year. The national RHS response categories include no income or income loss, then income in increments of 4,999 up to 29,999, and then in increments of 9,999 above 30,000 to a maximum category of 80,000 and over (First Nation Information Governance Centre, 2016). The Nova Scotia RHS reports categories of no income, then income in increments of 9,999 up to 49,999, to a maximum category of 50,000 or more (Union of Nova Scotia Indians, 2013). The EHS asks "For each household member, what is current annual income (if working off-reserve, before taxes)?" Responses ranged from "less than $9,999" to "over $100,000" in increments of $9,999, not applicable, don't know, refused, and missing. Since the RHS did not include not applicable, don't know, refused, and missing, I recoded those categories in the EHS to missing.

Education

As a SDoH, I explore educational attainment in PLFN compared to educational attainment of all Pictou County residents, Nova Scotians, and Canadians. I do this, recognizing that overall First Nations experience low educational attainment rates (and high rates of unemployment), since First Nations are historically denied access to the conditions to improve their socio-economic status (Reading & Wien, 2009). I made the decision that comparing education as a social determinant among First Nations might not be as instructive as comparing to the non-Indigenous population.

In the CCHS, respondents ages 14 years and older are asked "What is the highest certificate, diploma or degree that [respondent name] has completed?" with response options including less than high school, high school, trade certificate or diploma, college

certificate or diploma, university certificate or diploma below bachelor's level, bachelor degree, university certificate or diploma or degree above bachelor's level, not applicable, don't know, refusal, or not stated. Respondents who answered grade 10 or lower, but had gone on to complete other education that could be counted toward a certificate, diploma, or degree were included. The categories were recoded to high school or less, and college and higher, and not applicable, don't know, refusal, or not stated recoded to one category of NA/DK/Ref. In the EHS, participants are asked "For each household member, what is the highest level of education completed?" with response choices being: less than high school, high school, college/trade school, bachelor degree, master's degree, or doctoral degree, don't know, refused, and missing. The responses were recoded to high school or less, and college and higher, with don't know, refused recoded to one category of NA/DK/Ref. Like the CCHS, I will only include the EHS data for ages 14 years and older.

Employment

Again, as a SDoH, I explore employment status and compare PLFN to Pictou County residents, Nova Scotians, and Canadians. In the CCHS, respondents between the ages of 15 and 75 were asked **"**Last week, did (you) work at a job or a business? Please include part-time jobs, seasonal work, contract work, self-employment, baby-sitting, and any other paid work, regardless of the number of hours worked", with responses including yes, no, permanently unable, not applicable, don't know, refusal, or not stated. Permanently unable was recoded to no, while not applicable, don't know, refusal, or not stated were recoded to one category of NA/DK/Ref. In the EHS, participants were asked "For each household member, what is your current employment status?" with responses

including full-time, part-time, unemployed, seasonal, retired, never worked, don't know, refused, missing. The EHS was recoded again to "Employment Status?" with responses working, not working, with don't know, refused, and missing recoded to one category of NA/DK/Ref. Working included those who are seasonal, as it did in the CCHS. Not working included those who are unemployed or retired. Not working/working were recoded to no and yes for those between the ages of 15 and 75.

Environment

When Mi'kmaq think of environment, they are encompassing their relations to the air, land, and water around them (Prosper et al., 2011). But this connection, as an important determinant of Indigenous health, has been repeatedly targeted by colonial policy, from the broad land displacement to the environmental dispossession of, and dislocation from, traditional territory. Indigenous health and well-being are linked to the sacred relationship and enduring connections to land and environment (Ford et al., 2010; Greenwood & de Leeuw, 2007; Pierotti & Wildcat, 2000; Richmond, 2009). According to King, Smith and Gracey (2009), Indigenous people who have lost the custodial role to protect their land have lost their primary reason for being. Land displacement can be characterized by environmental contamination or resource extraction that results in a physical separation from use of the land, or from disputes over land usage (Assembly of First Nations, 2013; Tobias & Richmond, 2014). Environmental dispossession is the process in which Indigenous people's cultural connections between land and resources is compromised such that environmental dispossession and loss of cultural identity undermines health (Richmond & Ross, 2009; Tobias & Richmond, 2014). These are not

just the colonial processes, but are contemporary processes that continue today (Tobias & Richmond, 2014).

Adding to the loss of the custodial role as protector of the land, destruction of the environment has to be understood as attacks on the individual (King, Smith, & Gracey, 2009). Activities such as harvesting and gathering are not only functional in terms of providing sustenance, but are activities that meet many Indigenous peoples' physical, spiritual, mental and emotional needs (Wilson, 2003). McAuley and Knopper (2011) note that the loss of Indigenous peoples' ability to procure, prepare, and consume traditional foods has important consequences for the maintenance of cultural activities, so that even when the quality and availability of traditional foods is impacted by industrial activities, some will continue to pursue these activities despite the dangers. Maintaining cultural knowledge however has been an important challenge, when impacted by land displacement and environmental dispossession.

In the EHS, environment was measured by asking the head of households only to reply to the following statement, "I feel the air, land, and water around me will hurt me." Response choices ranged from strongly agree, agree, neither agree or disagree, disagree, strongly disagree, don't know, refused, and missing. Strongly agree and agree were recoded to yes, neither agree or disagree recoded to neither, disagree and strongly disagree to no, and don't know, refused, and missing recoded to one category of NA/DK/Ref/Missing.

Culture

Defining culture is complex and contentious (Atkinson, 2004; Martin, 2003). Edward Tylor (1871) defined culture as "the complex whole, which includes knowledge,

belief, art, morals, law, custom, and any other capabilities and habits acquired by man" (as cited in Martin, 2003, p. 208). Stocking (1996) defined culture as the "progressive accumulation of characteristic manifestations of human creativity: art, science, knowledge, refinement", the things that freed people from nature (p. 870). Dockery (2010) defines culture as the beliefs and values that are transmitted over generations that remain relatively unchanged, and manifest in distinctive symbols, languages and practices. Coulthard (2014) defines culture in the Indigenous context as the "interconnected social totality of a distinct mode of life encompassing the economic, political, spiritual, and social…a life on/with the land that stress[es] individual autonomy, collective responsibility, nonhierarchical authority, communal land tenure and mutual aid" (p. 65). Regardless of the definition, the prevailing notion that there is one pan-Canadian Indigenous culture is problematic; in fact, there are many Indigenous cultures in Canada, based on many diverse knowledge systems (Alfred & Corntassel, 2005; Battiste & Youngblood Henderson, 2000). Furthermore, Indigenous people have a collective orientation to life, and cultural identity is considered part of a collective experience, with traditional teachings, knowledge, and language passed down through the collective (King, Smith, & Gracey, 2009; McCormick, 1997; Reading & Wien, 2009).

In the EHS, culture was measured by asking participants, "Is culture practiced by you or household member?" with response choices including no, yes, don't know, refused, and missing. This question was asked of all participants, so I recoded to use head of household responses only to be consistent with the measures for environment, family, and community, which were analyzed together in one table, and then I recoded don't know, refused, and missing to one category of NA/DK/Ref/Missing.

Family and Community

In many western cultures, family and community are treated as separate, with an emphasis placed on individualism and the nuclear family (Dockery, 2010; McCormick, 1997; Reading & Halseth, 2013). In many Indigenous cultures however, family means something broader, with an emphasis on the extended family and community, and kinship networks (RCAP, 1996b). In fact, non-Indigenous people often misconstrue the important role that extended families and community play in the caring of children, which has led to the inordinate number of Indigenous children that are in the care of child welfare agencies (Truth and Reconciliation Commission, 2015c). In short, individual well-being is connected to family and community wellbeing, and any disruption of them has implications for Indigenous health (Reading & Halseth, 2013; Reading & Wien, 2009).

In the EHS, family was measured by asking head of households only, "My family connections are in PLFN". Community was measured by asking head of households only to respond to the following statement "PLFN gives me my sense of community". For both family connections and sense of community, participants could answer strongly agree, agree, neither agree nor disagree, disagree, strongly disagree, don't know, refused, and missing. Strongly agree and agree were recoded to agree, neither agree or disagree recoded to neither, disagree and strongly disagree to disagree, and don't know, refused, and missing recoded to one category of NA/DK/Ref/Missing.

Residential School

Residential school attendance is used to represent a structural determinant of health, unique to Indigenous peoples in Canada, that came about as a result of biopolitics and biopower. Participants in the EHS were asked, "Did any of the following attend

residential school? Responses included male/female parent (in household), male parent's father/mother, male parent's grandfather/grandmother, male parent's great-grandfather/great-grandmother, or female parent, female parent's father/mother, female parent's grandfather/grandmother, female parent's great-grandfather/great-grandmother, don't know, refused, and missing. For any of the categories, responses were no, yes, not applicable, don't know, refused, and missing. Not applicable, don't know, refused, and missing were recoded to one category of NA/DK/Ref/Missing. If the response was yes for either the male/female parent, the children were coded as yes. If the response was no for both the male/female parent, the children were coded as no. Not applicable, don't know, refused, and missing were recoded to one category of NA/DK/Ref/Missing.

Racism

Racism, and the inevitable stress of being socially excluded, is shown to be damaging to health and wellbeing (Reading & Wien, 2009; Ziersch et al., 2011). Krieger (2001) defines racial discrimination as the process by which members of a socially defined racial group are treated unfairly because of membership in that group and can occur at three levels – institutional, interpersonal, and internalized. Racism is socially constructed and practiced (Durey, 2015), and develops in societies that function in the biopower mode (Bertani & Fontana, 1997, p. 257). Shilling (2012) notes that socially or ideologically fabricated constructions of difference, where biological similarities are suppressed and physical differences are stressed, becomes commonplace in the discourses around inequality and racism.

When Aboriginal youth experience social exclusion and racism, destructive behaviours increase (Reading & Wien, 2009). Experiences of racism are linked with

poorer mental and physical health and wellbeing outcomes (Bombay, Matheson, & Anisman, 2010, 2014a), and the more frequently someone experiences racial discrimination, the worse the health consequences (Krieger, 1999; Krieger & Sidney, 1996). Racial discrimination through the lifecourse can have lasting health effects (Naa Oyo et al., 2003). Shilling (2012) has argued that there is a learned reactivity related to these specific social relations, where negative evaluations and stereotypes become internalized. In the EHS, participants were asked if they had ever experienced racism with responses of no, yes, don't know, refused, and missing. Don't know, refused and missing were recoded to one category of NA/DK/Ref/Missing. Residential school was recoded for the response for HHH only, therefore, I will recode to only include HHH experiences with racism.

Loss of Language (as a measure of the impact of colonialism)

Beyond racism, colonization impacts languages and cultural practices. Language loss, as a measure of social stress, occurs within a matrix of social, political and economic relations of domination, for within languages lie the philosophical systems of a groups' existence (Alfred, 2009). Sending Indigenous children from the residential schools into the provincial education system in the 1960s was another means of depriving communities of their knowledges, languages, cultures, identities, value systems, and connections to land (Battiste, 1998; Kirkness, 1998; Kirmayer, Simpson, & Cargo, 2003; Norris, 2006; RCAP, 1996f). According to data from the 2001 Census, 25% of those who identified as Aboriginal had knowledge of and ability to converse in their language, but only 13% reported speaking their own language in their home (King, Smith, & Gracey, 2009; Norris, 2006). The vitality of a language is dependent on it being used on a daily

basis, ideally in the home (Norris, 2006). Indigenous Knowledge Holders worry that a loss of language means a loss of culture, as often, it is near to impossible to translate words and concepts into the language of another culture (RCAP, 1996f). It is widely understood that the combined forces of colonialism, the residential school system, and racism, have contributed to the loss of language, which disrupts connection to land and environment, depriving Indigenous people of their health, identities, and self-esteem (King, Smith, & Gracey, 2009; Kirmayer, Simpson, & Cargo, 2003).

In the EHS, loss of language was measured by asking participants, "For each household member, what language is spoken most frequently?", with response choices including English, Mi'kmaq, other, don't know, refused, and missing. Participants indicated if they spoke both English and Mi'kmaq, and were included with those who spoke Mi'kmaq. The responses were then recoded to answer the following question, "Do you speak the Mi'kmaw language?" with responses of no or yes, with don't know, refused, and missing recoded to one category of NA/DK/Ref/Missing. Again, as residential school was recoded for the response from HHH only, I will recode to only include HHH experiences for this category.

Age

The age of participants in the EHS ranged from one to 95 years. Age has been recoded in several ways, depending on the way that data is compared. For example, the RHS data that I use, is for adults ages 18 years and older, so I recode the data to exclude under 18 years. Education is coded for ages 14 years and older, so I recode the data to exclude under the age of 14 years. Working is coded for those between the ages of 15 and 75 years, so I recode the data to exclude under 15 years, and over 75 years of age.

Asthma is presented for those between the ages of four to 11 years, so I recode the data to exclude under four years, and older than 11 years. Asthma is again presented for those who are 12 years and older, so I recode the data to exclude under 12 years.

In the next section, I present measures that came from the Knowledge Holders in *Piktuk,* which further highlight how the health of PLFN may have been impacted.

4.5 *Piktukowaq* Ways of Being

I argue that the experience that PLFN has endured cannot be fully understood without acknowledging and privileging the intimate relationship that the *Piktukowaq* had to *A'se'k* and all that was destroyed by using *A'se'k* as the BHETF. To articulate the nature of the relationship, I have had to look to the Mi'kmaw language that contains the concepts, or as Battiste (2000) states, reflects the Mi'kmaw consciousness and understandings of the world, and contains the tribal knowledge of how the Mi'kmaw world works (Battiste, 2000). To make the research meaningful to the community, I then met with the Knowledge Holders of PLFN to further reflect on these concepts, and what the terms conveyed about the deep and sacred connection to *A'se'k*. What follows is a conceptual framework that will guide the analysis of the oral histories and provide the context for understanding how the health of the community has been impacted. This framework is an important aspect toward answering my second research question: As a consequence of siting the BHETF at *A'se'k,* does the methodology used to assess Indigenous health matter in order to have a full accounting of what land displacement and environmental dispossession means for the health of Indigenous communities, especially in instances like the one experienced by PLFN?

Etuaptmumk requires that we look to the strengths of Indigenous knowledge

systems to garner insights into the complex issues of health and environment (Bartlett, Marshall, & Marshall, 2012; Iwama et al., 2009; Martin, 2012). In Canada, it is broadly recognized how important it is for research to reflect Indigenous worldviews and to draw on Indigenous Knowledges to improve understandings of complex social, health, and environmental systems (Advisory Panel for the Review of Federal Support for Fundamental Science, 2017). Indigenous Knowledge is data that has been tested, operationalized continuously and cumulatively over time, and which is reflected in language, not numbers (Berkes & Berkes, 2009). Oral histories contain the beliefs and value systems (Tuhiwai Smith, 2012, p. 146), and contain the knowledge about social life, and about the relationships between and among the animate and inanimate (Battiste & Youngblood Henderson, 2000).

In PLFN, oral history interviews were conducted and transcribed as part of the data collection for a Master's dissertation (see Bennett, 2013), and as part of the larger CIHR funded CBPR project involving the community. The PLNWG knew which Knowledge Holders would have recollections of cultural practices and traditional activities before the BHETF was sited at *A'se'k.* The PLNWG shared the transcripts of the oral histories with me for this dissertation. Additionally, the PLNWG wanted to continue to collect more information from the Knowledge Holders after the EHS had been completed to better understand the health of the community prior to Boat Harbour (Pictou Landing Native Women's Group, 2011b). Thus, in late 2015, I re-interviewed two of the Knowledge Holders interviewed by Bennett, and I interviewed one additional Knowledge Holder. In total, there were ten (n =10) oral histories that were collected.

I continued with Bennett's unstructured conversational approach for collecting the oral history data, which allows the Knowledge Holders to guide the conversation, recognized by Kovach (2009) as a methodological necessity in Indigenous research when articulating a tribal epistemology. Bennett (2013) acknowledged the challenges she faced when trying to interview Knowledge Holders in PLFN using the formal structured western academic approach as dictated in her original university research ethics approval. Bennett (2013) was told by the Knowledge Holders that her engagement strategy and consent process were a barrier to getting to know people first, or as Castleden, Morgan, and Lamb (2012) conveyed, her approach became an obstacle in the time it takes to develop a relationship first with the community, even before research can begin.

As Wilson (2008) notes, when interviewing Elders, a researcher does not want to come with a list of questions—the researcher enters a conversation and relies on what is coming through the Elder—then extrapolates from what the Elder is saying to reflect back the knowledge in an accountable way. By 2015, I had worked with the PLNWG for five years and had established a strong relationship with the women and the community, including the Knowledge Holders. The three Knowledge Holders I worked with volunteered to meet with me. The oral histories were transcribed by a research assistant under the larger CIHR funded research project and copies were provided back to the Knowledge Holders, as well as to the PLNWG.

In July, 2016, I held a talking circle with a group of eight Knowledge Holders to ensure that I understood, and accurately captured and reflected, what had been shared with me. Knowledge that was shared is respectfully attributed to the respective Knowledge holder. All had consented to be identified under the research agreement

between the PLNWG and Dr. Heather Castleden (the lead investigator of the larger CIHR project). From the stories that were shared, I seek to illustrate the impact that land displacement and environmental dispossession has had on the health of the community. Making this explicit is essential to making the research meaningful to the community, because it can reflect the sacred connection of the *Piktukowaq* to *A'se'k,* and all that the community knows was lost when the BHETF was sited next to their community.

4.6 How the Data were Analyzed

In analyzing the survey data, I use descriptive statistics and cross tabulations of the variables outlined above. In Chapter 5, I present data on the health outcomes of children, youth, and adults in PLFN, Nova Scotia First Nations, First Nations at the national level, using data available in the RHS. I then present a cross-tabulation of health rating with educational attainment and employment status, using the PLFN data from the EHS, and data from the 2014 CCHS at the Pictou County, provincial, and national level. Because asthma was identified by the PLNWG as a concern to the community, I present comparative rates for asthma according to the age groups that the Asthma Society of Canada collects data, that is, children ages 4 to 11 years, and ages 12 years and older. I then present data to compare to the rates of asthma at the Pictou County, provincial, and national rates, using data from the 2014 CCHS. Cancer was also identified as a concern, so I present data taken from the 2013 CCR and compare the proportion of cancer diagnosis from the period 1992-2013 at the PLFN, Pictou County, Nova Scotia First Nation, provincial, and national levels.

Relying solely on data from the EHS, I present descriptive statistics to reflect NAHO's definition of health, that is, that Indigenous health is achieved when there is a

balance between the physical, mental, emotional, and spiritual aspects of health. I next present data for the four aspects of health that NAHO also defines as important to balance the health of Indigenous people, that of the environment, culture, family, and community. Then I present descriptive statistics using cross-tabulation for the structural determinants that Indigenous people experience as a result of their colonial experience, namely, residential school, racism, and loss of language, and how these determinants impact the physical, mental, emotional and spiritual aspects of health.

After the statistical data is examined, I conclude by analyzing and presenting the oral histories in Chapter 6. Knowledge Holders do not share stories in terms of worldviews, epistemology, or ontology, so the expectation that one would have extensive elaborations on these kinds of measures is unrealistic; it is up to the reader of the transcribed oral history to discern these concepts from the broader context of what is being shared. In the research on Mi'kmaw terminology, I found the words or concepts in the Mi'kmaw language that convey understandings of Mi'kmaw worldviews, epistemology, or ontology. The language is where the epistemological foundations of tribal societies are held (Kovach, 2009; Tuhiwai Smith, 2012). The oral histories will guide me as I reflect on a relational epistemology of living within the traditional territory of *Piktuk,* and reflect on all that *A'se'k* represents to the *Piktukowaq* community. Using the *Piktukowaq* environmental health theoretical framework (Figure 3.1), based on the *Piktukowaq* worldview and value system, will guide how the oral history data is analyzed.

Using a constant comparative method, I reviewed the transcripts for concepts consistent with *kisu'lt melkiko'tin* (nature, the place of creation – basis of Mi'kmaw/

Piktukowaq epistemology), *weji-sqalia'timk* (belief that one sprouted or emerged from the landscape), *tlilnuo'lti'k* (Mi'kmaw ontology - how the Mi'kmaq/*Piktukowaq* maintain their consciousness/worldview) and *netukulimk* (guided by a relational accountability, how the Mi'kmaq/*Piktukowaq* would maintain their norms and values system). Using a *Piktukowaq* centered framework foregrounds the values, attitudes and practices of PLFN, rather than, as Tuhuwai Smith (2012) would argue, disguising them within westernized labels. It is important to capture the deep and sacred connection to land and environment for Indigenous health and well-being (de Leeuw, Lindsay, & Greenwood, 2015).

The measures I use reflect a relational worldview and respect the values specific to the *Piktukowaq* to reflect what was lost when *A'se'k* was destroyed. *A'se'k* was where the *Piktukowaq* gathered their food and medicines, where the families gathered and socialized, and where traditions were passed down. To the *Piktukowaq, A'se'k* was part of where they constructed everything that was meaningful to their identity, as a collective, as families, and as individuals. The stark reality for the community is that *A'se'k* was destroyed—*A'se'k* no longer exists.

4.7 Conclusion

In the next two chapters, I present the findings from the statistical data analysis and the oral histories. I have been guided by *Etuaptmumk* to explore the complex question of how siting the BHETF in *A'se'k* may have harmed the health of PLFN. I have approached the research looking to utilize methodologies that might best be suited to answer my research questions. In Chapter 5, I look to the quantitative data to assess the current physical, mental, emotional, and spiritual health of the community. In Chapter 6, I look to the *Piktukowaq* knowledge to assess the physical, mental, emotional, and spiritual

health of the community as they get further away from being able to practice the traditional lifestyle they enjoyed, pre-Boat Harbour.

CHAPTER 5 THE NEED TO MOVE BEYOND THE DOMINANT BIOPOLITICAL NARRATIVE TO A SELF-DETERMINED NARRATIVE

This chapter first sets out to examine the health outcomes of Pictou Landing First Nation (PLFN) by using survey data that would have been, and still is, available to members of the Joint Environmental Health Monitoring Committee (JEHMC)[24]. It is data that could have been used had they decided to listen to the PLFN members on the Committee who represented the community and who carried the message that there was serious concern that the health of the First Nation had been impacted by the Boat Harbour Effluent Treatment Facility (BHETF). The dominant Canadian narrative attributes Indigenous health inequity to poverty. In Canada, it is recognized that First Nations do not enjoy comparative social status to their non-Indigenous counterparts because they are typically marginalized from achieving success in higher education, income, or employment opportunities. I, therefore, examine if poverty alone can explain the health outcomes in PLFN.

To do this, I first compare income of PLFN to other First Nations at both the provincial and national levels, given that all First Nations in Canada have a common history under colonialism, and are, as Palmater (2011) argues, one of the most economically disadvantaged and vulnerable groups of people in Canada. I then compare health outcomes of PLFN to First Nation health outcomes, again, at both the provincial and national levels. Using measures of education and employment, I then compare the outcomes of PLFN to non-Indigenous Canadian health outcomes at the county,

[24] When formed, the JEHMC was comprised of eight (8) members – four (4) for Canada and four (4) for PLFN (JEHMC, 1996). In 2015, the JEHMC consisted of seven members – three (3) for Canada, and four (4) for PLFN. The Committee only needs two (2) or more of the PLFN members to have a quorum (JEHMC, 2015).

provincial, and national levels. Finally, I explore two measures of health – asthma and cancer - that were among the concerns raised by the PLFN community, that as an environmental and social justice issue could have been investigated by the JEHMC, but were not.

Next, I assess what a more culturally appropriate model of health may reveal about the health of PLFN, using determinants developed by the Pictou Landing Native Women's Group (PLNWG). Using data collected under the direction of the PLNWG in the Environmental Health Survey (EHS), I start by introducing health outcomes in PLFN that come from the National Aboriginal Health Organization (NAHO) which defines health as a balance between the physical, mental, emotional, and physical realms (NAHO, 2007, p. 1). Continuing with the NAHO definition, I explore how the four measures of health balance with the environment, culture, family, and community measures. I then use measures from the EHS that reflect the structural determinants of health that have emanated from the oppressive historical, ideological, political, societal, and economic challenges that Indigenous communities like PLFN encounter, under colonialism, when faced with land displacement, and environmental dispossession.

In Chapter 2, I noted how Reading (2015) is advocating that there has to be a more systematic interrogation of how the structural determinants have created, and continue to perpetuate, the health inequities that Indigenous people endure. Where the biopolitical state has historically used data to harm Indigenous communities, my goals, by presenting measures in this way, are to use data in a more culturally appropriate manner to examine the lived reality of PLFN.

5.1 Poverty as a Causal Factor of Poor Health Outcomes

First Nation adults across Canada continue to live in poverty (First Nation Information Governance Centre, 2016; Reading & Wien, 2009; UNSI, 2013). In Canada, First Nations score 25 points lower than non-Indigenous communities on the Community Well-Being Index (CWBI), a composite measure of socio-economic wellbeing, educational outcomes, labour force activity, income levels, and housing conditions in Canadian communities (INAC, 2016). Conditions of poverty result in First Nation communities having minimal capacity to meet the basic needs of their membership, thereby contributing to poorer health outcomes and excluding individuals from pursuing the education and employment opportunities that could turn this situation around. Poverty unfortunately, creates a cyclical pattern that continues inter-generationally (Reading & Wien, 2009) and adds to the many layers of stress with which First Nation people must have to contend (King, Smith, & Gracey, 2009).

Income is a widely accepted social determinant of health, in fact, the Public Health Agency of Canada (2013) lists income and social status as two of the most significant determinants of health. The Public Health Agency of Canada (2013) notes that health improves with each step up the socio-economic ladder because those who are poorest have the least control over the things that can improve their health. For this reason, I explore how PLFN compares to other First Nations in terms of income. In order to compare First Nations at the national and provincial levels, I will use the Regional Health Surveys (RHS) which report the percentage of adults who receive income of less than $20,000 per year. I will do the same for PLFN using data coming from the Environmental Health Survey (EHS), and present the results in Figure 5.1.

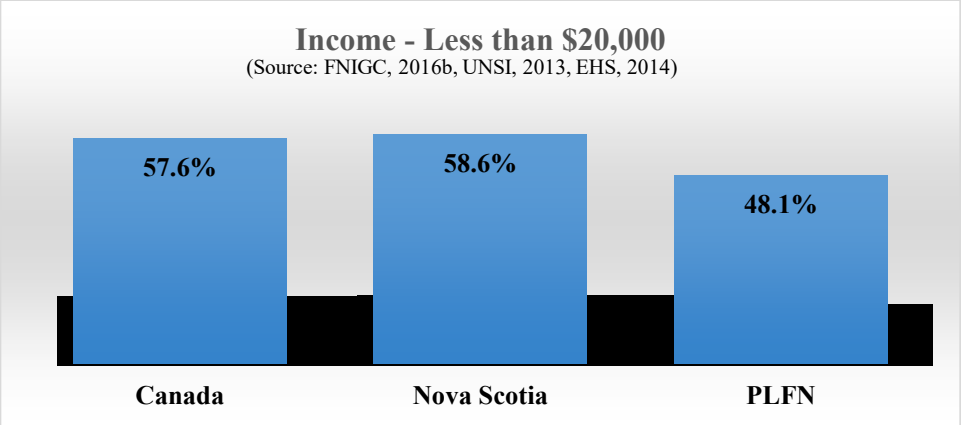

Figure 5.1 - First Nation Adults Earning Less Than $20,000.
(Source: FNIGC, 2016; UNSI, 2013; EHS, 2014).

According to the national RHS, 57.6% of First Nation adults in Canada report earning income of less than $20,000 compared to 58.6% of First Nation adults in Nova Scotia (First Nation Information Governance Centre, 2016; UNSI, 2013). In PLFN, however, only 48.1%, or almost 10% less than those at the national or provincial levels, earn under $20,000. According to the Indigenous health literature, therefore, I should expect that PLFN will have better health outcomes when compared to all other First Nations. In Table 5.1, I will examine whether this holds true for PLFN.

Table 5.1
Health Outcomes First Nation Adults.

	Adults (18 years and older)	
	Poor to Fair	Good to Excellent
	%	%
First Nations - Canada	23	77
First Nations – Nova Scotia	19	81
Pictou Landing First Nation	46	54

Note:
Sources: FNIGC, 2016; UNSI 2013; EHS, 2014
Health Rating: National RHS n = 11,043; NS RHS n = 710; EHS n = 174

The results in Table 5.1 suggest otherwise, that income alone is not sufficient to explain the health outcomes in PLFN. The proportion of adults reporting poor to fair health status in PLFN is 46%, which is double or more the percentage of adults reporting

poorer health outcomes for First Nation adults, at both the provincial level, which is 19%, and the national levels, which is 23%. The proportion of adults in PLFN reporting good to excellent health outcomes is 54%, which is at least 23% less than the 81% of Nova Scotia First Nation adults who report good to excellent health outcomes, and the 77% of First Nation adults nationally who report good to excellent health outcomes. Thus, I am able to conclude that other First Nations experience better health outcomes than PLFN, despite both the provincial and national levels having a higher percentage earning less than $20,000. Furthermore, the dominant biopolitical narrative that would suggest that poor health outcomes in PLFN could be attributed to poverty is not supported by the data coming from the EHS.

In the next section, I use data from the EHS and Canadian Community Health Survey (CCHS) to compare education and employment, and to examine if these two social determinants of health (SDoH) measures might contribute to a better understanding of the poorer health outcomes in PLFN.

5.2 Education and Employment as Causal Factors for Health Outcomes

Exploring two additional measures from the Community Well-Being Index (CWBI) in the next table (Table 5.2), I want to examine how education and employment as SDoH, impact health outcomes in PLFN. The SDoH literature would suggest that those with lower levels of education or employment will have poorer health outcomes. I will then compare the health outcomes for PLFN to the health outcomes for non-Indigenous Canadians at the Pictou County District Health Authority (PCDHA) level, and the provincial, and national levels using the same measures. A chi-square test of

independence is performed to examine the relationship between each of the dependent and independent variables.

Table 5.2
Education and Employment as Explanatory for Health Outcomes.

Measure	PLFN		PCDHA		Nova Scotia		Canada	
	Poor to Fair %	Good to Excellent %	Poor to Fair %	Good to Excellent %	Poor to Fair %	Good to Excellent %	Poor to Fair %	Good to Excellent %
Education								
High School or less	43	57	**45	**55	***15	***85	***9	***91
College/higher	42	58	**11	**89	***11	***89	***9	***91
Working								
No	42	58	**28	**72	***22	***78	***18	***82
Yes	46	54	**14	**86	***7	***93	***6	***94

***p< 0.001; **p <0.01; *p < 0.05
Note:
Source: PLFN EHS, 2014; CCHS, 2014
Education: PLFN *n* = 193; PCDHA *n* = 39,512; NS *n* = 808,959; Canada *n* = 29,982,131
Employment: PLFN *n* = 185; PCDHA *n* = 39,512; NS *n* = 808,959; Canada *n* = 29,982,131
Note: NA/DK/Ref/Missing are suppressed.

When I look at the data for PLFN, for those who had high school or less, versus college or higher education, there is very little difference in the health outcomes, in fact, it is only a 1% difference between those with both the poor/fair and good/excellent health. When compared to the outcomes reported for the non-Indigenous population at the PCDHA level, the poor/fair health outcomes are comparable, however, the difference that higher education has on good/excellent outcomes is evident. Those with higher education (college/higher) report better health outcomes more than those with high school or less, in that 89% of those with college or higher report better health compared to the 55% who report better health with less education, a difference of 34%. Using a chi-square statistic, the results are significant[25]. At both the provincial and national levels for

[25] Significant - the result is unlikely to occur by chance.

non-Indigenous Canadians, the difference between better health outcomes at both high school or less and college or higher is closer. For the provincial data, there is only a 4% difference between the two levels of education, and at the national level there is no difference. Again, the results are statistically significant.

When I look at working[26] as a determinant of health in PLFN, the data from the EHS suggests that working does not contribute to better health outcomes in PLFN, in fact, when working, those reporting good/excellent health outcomes (54%) decreases by 4% compared to those who report good/excellent health when not working (58%). However, consistent with what the SDoH literature, suggests, when I explore the health outcomes at the PCDHA, provincial, and national levels, health outcomes improve as working conditions improve. Those who report better health outcomes are 86% when working versus 72% when not working at the PCDHA level, are 93% when working and 78% when not working at the provincial level, and are 94% when working and 82% when not working at the national levels, results which are all statistically significant, using a chi-square statistic.

When exploring how higher education and working impact on health outcomes in PLFN, it is evident that these two SDoH, like the measure of income, do not operate as expected in PLFN. In the next section, I will examine two health concerns – asthma and cancer - that the PLNWG had voiced many times as issues that were very much a concern of the community, and were issues that the JEHMC could have investigated, had they

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[26] Working in the EHS includes full-time, part-time, and seasonal. Fishing and hunting were included in the job categories for working. Likewise, the CCHS includes full-time, part-time, seasonal, or any other paid work regardless of hours worked.

accessed the data that was available to them in order to determine if the concerns of the PLNWG were valid. I look at these two issues as environmental and social justice issues.

5.3 The Convergence of Environmental and Social Justice Issues

Both asthma and cancer are concerns that have been raised by the community for years – indeed, long before the PLNWG began our community-based research project. Asthma rates in PLFN could have been assessed, and comparisons could have been made to data from the CCHS, or with data available through the Asthma Society of Canada. Cancer data was always available through the Canadian Cancer Registry (CCR), and could have been accessed at any time since the CCR started collecting data in 1992, especially since the formation of the JEHMC a year later in 1993. Given the opportunities that were available for such health surveillance, and the failure of the JEHMC to do so, is a cause to bring the discourse of environmental justice and social justice together.

Asthma

Exposure to the air pollution in PLFN has been mentioned repeatedly as a concern by members of the community, especially as it concerns the children, and the number of PLFN residents who are reliant on puffers (also called inhalers) (PLNWG, 2010a). Asthma is the second most prevalent chronic disease in Aboriginal children (below 12 years of age) and is a prevalent chronic condition common to Aboriginal youth (Castleden et al., 2016; Stewart et al., 2015; Watson et al., 2012). Environment, including exposure to chemicals, odours, or pollution, has been cited by the Asthma Society of Canada (2014) as potential triggers for asthma.

In Figure 5.2 I present data for whether asthma in PLFN was diagnosed, and whether it was symptom-diagnosed and/or spirometry tested. In Figures 5.3 and 5.4, I

present comparative rates of asthma between PLFN and non-Indigenous Canadians, using data from the EHS (2014) and data provided by the Asthma Society of Canada (2014), and then compare between PLFN, Pictou County, Nova Scotia, and Canada, using data from the EHS (2014) and the 2014 CCHS. The data that I was able to retrieve from the CCHS was, and is, available to the JEHMC. I should remind the reader, that the asthma is self-reported in both the EHS and the CCHS, that is, participants were asked in the EHS, "Did a doctor or other health professional ever tell you or a household member that you/they had asthma?", or in the CCHS, "Do you have asthma?".

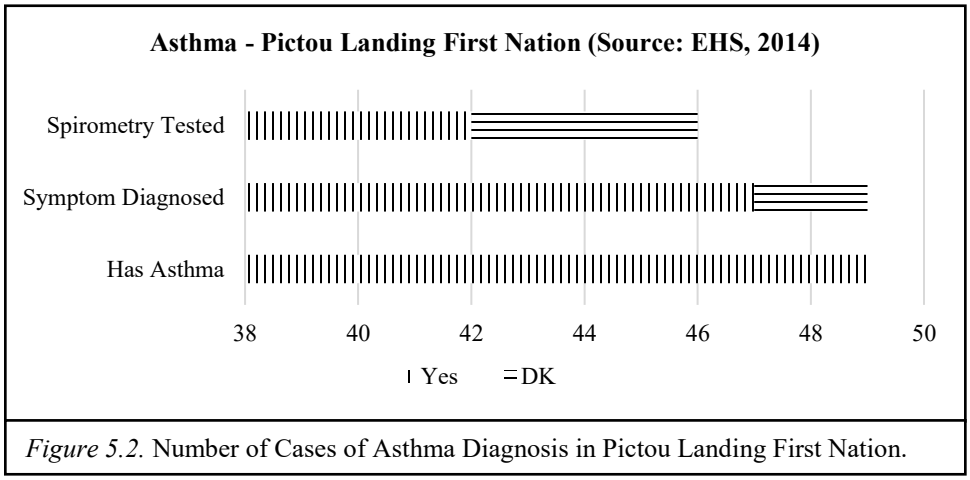

Figure 5.2. Number of Cases of Asthma Diagnosis in Pictou Landing First Nation.

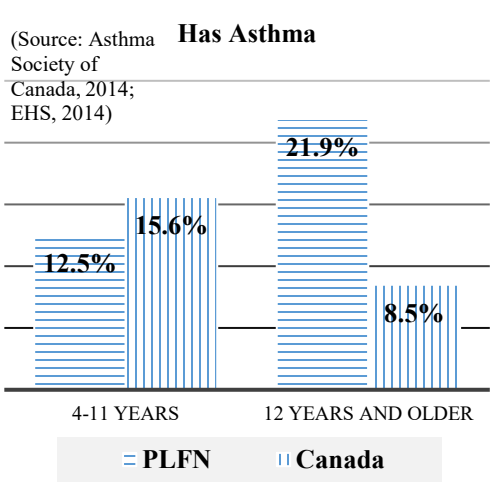

Figure 5.3. Asthma - PLFN and Canada Rates.

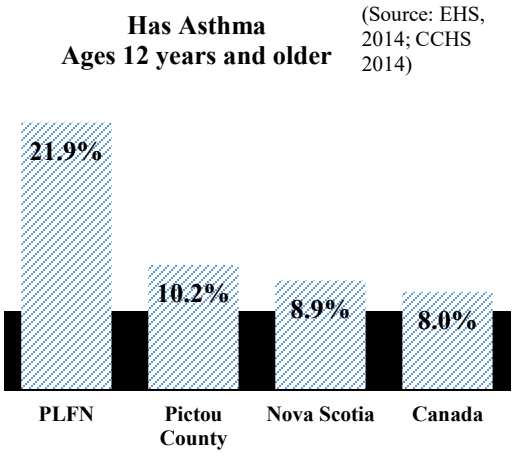

Figure 5.4. Comparison of Asthma at PLFN, Pictou County, NS, Canada levels.

According to the Asthma Society of Canada (2014), asthma affects 15.6% of Canadian children between the ages of 4-11 years, and 8.5% of Canadians ages 12 years and older. The Asthma Society of Canada (2014) reports these rates based on their use of 2010 CCHS data. By comparison, 12.5% of PLFN children between the ages of 4-11 years, and 21.9% of those 12 years and older self-report that they have asthma (EHS, 2014). There is a risk that these figures might be low, as asthma is often underdiagnosed, untreated, or hidden in Indigenous communities (Castleden et al., 2016). The data from the EHS also seems to indicate that asthma appears to onset at an older age in PLFN. Using the more recent 2014 CCHS data for the age group 12 years and older, the 21.9% rate of asthma in PLFN is twice the 10.1% rate of Pictou County, and over twice the 8.9% rate for Nova Scotia and the 8.0% rate for the Canadian population.

Cancer

The PLNWG raised cancer as a concern from our very first meeting in October 2010, worrying about the effects that the air emissions from the mill's stacks, the odours from the effluent facility, as well as exposure to the waters and sediments of Boat Harbour might have on the health of the community (PLNWG, 2010a). I present the cancer findings from data obtained in the CCR in Table 5.3, using the the International Agency for Research on Cancer (IARC) classification system to group the cancer sites according to digestive organ cancers, respiratory organ cancers, breast and female genitalia cancers, male genital organ cancers, urinary tract cancers, or other (Statistics Canada, 2017b).

Table 5.3
Comparative Cancer Rates by Cancer Site for Pictou Landing First Nation (1992-2013).

Measure	PLFN	NS First Nations	Pictou County	Nova Scotia	Canada
	%	%	%	%	%
Digestive Organs	18	9	7	7	6
Respiratory Organs	27	17	15	14	13
Breast and Female Genital Organs	9	12	11	12	10
Male Genital Organs	18	10	14	13	13
Urinary Tract	18	9	7	7	6
All others	-	43	46	47	52

Note: -- Statistics Canada does not permit the release of data that could potentially disclose the identity of respondents to surveys.
Source: CCR, 2013.
Cancer Diagnosis: Canada *N* = 3,097,870; NS *N* = 112,480; Pictou County *N* = 6,195; Nova Scotia First Nation *N* = 625; PLFN *N* = 55

Digestive organ cancer rates are at least, or more than, double the rates in PLFN at 18%, compared to the rate for all First Nations in Nova Scotia at 9%, the rate for residents of the county (excluding PLFN) at 7%, and the rates for the provincial level at 7% and for national levels at 6%. Respiratory organ cancers are 10% higher in PLFN at 27%, compared to 17% for NSFNs, and double, or close to double that of Pictou County at 15%, Nova Scotia at 14%, and Canada at 13%. However, female breast and genital organ cancers are 3% lower in PLFN than compared to the rate for all Nova Scotia First Nations at 12%, and one to three percent lower than rates of Canadians at the county of 11%, provincial at 12%, or national levels at 10%. This is an unexpected finding since the PLNWG were certain that they were experiencing higher rates of cancer in this area (PLNWG, 2011a). Male genital organ cancer is highest in PLFN at 18%, and is almost double that of NSFNs at 10%. It is four to five percent higher than the rates of Pictou County at 14%, Nova Scotia at 13%, and Canada at 13%. Lastly, urinary tract cancers are double or more in PLFN than the rate of those at all levels. The rate in PLFN is 18% compared to 9% at the NSFN level, 7% at the PCHDA and provincial levels, and 6% at

the national level. I could not include cancers that fell outside of these broad categories for PLFN, due to insufficient numbers of cases that are reported in PLFN.

Cancer rates in Indigenous populations are converging with the rates found in non-Indigenous populations in Canada today (Tobias, Richmond, & Luginaah, 2013). The more common cancer incidence patterns in Indigenous men are lung, prostate and colorectal, and breast, lung, and colorectal cancers are more prevalent for Indigenous women (Moore et al., 2015). In PLFN, we see a trend that almost doubles the incidence of cancer, in most cases.

Residents of Pictou County have long held the belief that they have a higher incidence of cancer, among other diseases such as cardio-vascular disease, chronic respiratory disease, and diabetes, than is experienced elsewhere in Nova Scotia (Hoffman et al., 2015, 2017; Reid, 1989). In 1989, Reid reported that according to the Nova Scotia Cancer Registry, Pictou County had a very high incidence of cancer, and he recommended that epidemiological studies be carried out by government to determine the health status of residents in the County. Again, as noted above and in previous chapters, that was never done. Table 5.3 shows that only in the case of breast and female genital cancers are the reported rates of cancer slightly higher elsewhere than the rates reported for PLFN. Respiratory organ cancers and male genital organ cancers are slightly higher in Pictou County than provincial or national rates.

In the next three sections, I explore the EHS data using a definition of health developed by the NAHO that starts to see health measures reflect what the PLNWG could accept as more appropriate to the reality they have experienced, and still are experiencing. What follows is a determination of what the EHS health data reveals if a

culturally appropriate framework is used in the analysis. I start by presenting the proximal determinants of health, those determinants that can be associated with health at an individual level. I then present the intermediate determinants, which measure the importance of community and family, cultural practices, and relationship to the environment. I then move on to an examination of the distal, or structural determinants of health, that are unique to the Indigenous experience in Canada as a colonial state.

5.4 National Aboriginal Health Organization (NAHO) Model of Indigenous Health

NAHO's creation came as a result of both a National Forum on Health, launched in 1994, and a Royal Commission on Aboriginal Peoples (RCAP) recommendation in 1996 that suggested an Aboriginal Health Institute was necessary to lead the way in developing a culturally appropriate approach to improve [Indigenous] health (Health Canada, 2004). This approach to [Indigenous] health would focus on equity, holism, [Indigenous] control, diversity, and healing (RCAP, 1996b). In 2000, the federal government funded the NAHO to promote the health and well-being of First Nation, Inuit, and Métis communities in Canada (NAHO, 2017). The NAHO's definition states that health for Indigenous people is a balance between the physical, mental, emotional and spiritual realms as well as the environment, culture, family, and community (NAHO, 2007). The NAHO definition says that ideal health is achieved when all of these aspects of health are in balance. Presenting determinants of health this way starts to get at the measures that the PLNWG deemed more relevant to their community.

For the proximal determinants, the head of household was asked to rate a household member's health status (health rating), whether the household member has felt down or depressed in the past year (depression/mental health), whether the household

member normally feels happy and interested in things (happy/emotional health), and whether traditional spirituality is important to the household member (spiritual health). The data presented in Table 5.4 assesses whether the four aspects of health are in balance in PLFN.

Table 5.4
National Aboriginal Health Organization – Proximal Determinants of Pictou Landing First Nation Health.

Measure	%
Health Rating	
Poor to Fair	32
Good to Excellent	64
DK/Ref/Missing	4
Depression	
No	37
Yes	50
DK/Ref/Missing	13
Happy	
No	7
Yes	84
DK/Ref/Missing	9
Spiritual Health	
Not Important	23
Important	64
NA/DK/Ref/Missing	13

Note: Source: EHS, 2014
n=279

For PLFN, the data reveals that the four aspects of health are not in balance. According to the EHS data, only 64% of all PLFN participants, including those under the age of twelve years, are rating their health as good to excellent. The data reveals however, that one-third, or 32%, of the participants in the EHS are experiencing poor to fair health outcomes. Added to that, 50% of the EHS participants report that they have felt down or depressed in the past year. Yet, according to the Mental Health Foundation of Nova Scotia (n.d.), mental health typically impacts only one in five people, or 20% of the population. It was noted earlier in the chapter that stresses associated with living in

poverty, or being unemployed, are contributing factors to mental health issues like depression, because these kinds of stress add to the many other stressors with which First Nation people have to contend (King, Smith, & Gracey, 2009). Furthermore, Bombay, Matheson, and Anisman (2009) have also determined that Indigenous people generally experience higher rates of mental health issues, including depression, than non-Indigenous peoples, due to the colonial experiences that Indigenous people have been subjected to, which I expand on in more detail further on in this chapter.

The data shows that 84% of PLFN participants report that they are happy or interested in things, which seems to contradict the findings that half of the participant's report that they have felt down or depressed in the past year. However, humour is often seen as a coping strategy (Samson & Gross, 2012). In fact, Luginaah, Smith, and Lockridge (2010) note how residents of the Aamjiwnaang First Nation, another environmentally impacted First Nation which is situated in the midst of the largest petrochemical industrial complex located just outside of Sarnia, Ontario, often joke and use humour when they talk about odours coming from emissions or hear the constant sound of emergency warning sirens that alert community residents of accidental chemical releases and warn residents to move indoors to avoid exposure. One Aamjiwnaang member jokingly noted how the city and industry tend to believe local police reporting unusual odours more than they believe the reports coming from residents of the First Nation (Luginaah, Smith, & Lockridge (2010). Elsewhere, Iwasaki and Bartlett (2006) have noted that, in the case of health, Indigenous people use humour as a stress-coping mechanism, often seeing laughter as culturally meaningful and healing.

Looking at the results for traditional spirituality, 64% of participant's report that they find traditional spirituality important. Upon reflection, I question if this accurately indicates what was intended by the question, that is, were people *practicing* traditional Mi'kmaw spirituality. In PLFN, many of the residents practice Catholicism, and the church plays a very central role in the community. In fact, Maligomish, or Merigomish Harbour 31 Indian Reserve, one of the five reserves belonging to PLFN, has been recognized as an important Catholic mission site to the Mi'kmaq since 1758 (Lelièvre, 2012). The Mi'kmaq, who have a fervent devotion to St. Anne, their patron saint, celebrate a mission every summer in her honour on Maligomish (Lelièvre, 2012). The mission serves as more than a religious event. It also serves as an important community event and has evolved to incorporate important cultural aspects that are seen as important to Mi'kmaw cultural identity (Lelièvre, 2012). One of the Knowledge Holders (Mary Ellen, 2015[27]), when asked about traditional spirituality, replied "there was a lot more people going to church." Mary Ellen's response might suggest that people connect traditional spirituality with religious spirituality, since the church has had such an important place in their lives for over 250 years.

I now turn my attention to the intermediate determinants of health, as defined by NAHO. The intermediate determinants include the connection to environment, the strength of culture, and the importance of having strong family and community connections.

[27] From Mary Ellen's oral history shared in 2015.

5.4.1 Beyond the Physical, Mental, Emotional and Spiritual Aspects of Individual Health to Consider Environment, Culture, Family, and Community

To present determinants of health that the women in the community deemed more relevant to their community's experiences, in this section I continue my analysis using the NAHO definition of health, but now I move beyond the relationship between the physical, mental, emotional and spiritual realms of individual health to include the importance of the environment, culture, family, and community (NAHO, 2007). In Table 5.5, I examine whether a participant believes their environment will hurt them, or whether practicing culture, or having strong family and community connections in, and to PLFN, impact health outcomes. In this table, I would like to include the response of all 279 participants, however, the questions for environment, family, and community were only asked of head-of-household. Therefore, my sample is somewhat smaller than reported in the other tables. A chi-square test of independence is performed to examine the relationship between each of the dependent and independent variables.

Table 5.5
National Aboriginal Health Organization – Intermediate Determinants of Pictou Landing First Nation Health.

Measure	Health Rating		Depressed		Happy		Spiritual	
	Poor to Fair (%)	Good to Excellent (%)	No (%)	Yes (%)	No (%)	Yes (%)	Not Important (%)	Important (%)
Environment[28]								
No	12	88	*37	*63	12	88	**33	**67
Neither	50	50	*50	*50	9	91	**25	**75
Yes	55	45	*16	*84	15	85	**15	**85
Culture[29]								
No	41	59	26	74	20	80	**33	**67
Yes	59	41	17	83	9	91	**7	**93

[28] Respondents are asked to respond to the statement "I feel the air, land, and water around me will hurt me."
[29] Respondents are asked "Is culture practiced by you or household member?"

Measure	Health Rating		Depressed		Happy		Spiritual	
	Poor to Fair (%)	Good to Excellent (%)	No (%)	Yes (%)	No (%)	Yes (%)	Not Important (%)	Important (%)
Family[30]								
Don't agree	60	40	0	100	0	100	*20	*80
Neither	50	50	20	80	20	80	*0	*100
Agree	50	50	24	76	15	85	*18	*82
Community[31]								
Don't agree	75	25	7	93	*13	*87	13	87
Neither	52	48	33	67	*32	*68	17	83
Agree	46	54	23	77	*9	*91	20	80

***p< 0.001; **p <0.01; *p < 0.05
Note: Source: EHS, 2014
Note: NA/DK/Ref/Missing are suppressed.
n = 126

In Chapter 4, I noted that when Mi'kmaq think of environment, they are encompassing their relations to the air, land, and water around them (Prosper et al., 2011). Assessing the relationship between this variable and health, begins to illuminate how impactful siting the BHETF at *A'se'k* has been for the health of those who participated in the EHS. According to the data, participants who are not fearful of their environment report better health outcomes. Of those who are not fearful of the environment, 88% report better health outcomes. Of those who are fearful, only 45% report better health outcomes. Of those who are not fearful of the environment, 63% report being depressed. Of those who are fearful of the environment, 84% are depressed. Using a chi-square test, the results are significant. Being fearful or not does seem to

[30] In the EHS, family was measured by asking head of households only, "My family connections are in PLFN". Community was measured by asking head of households only to respond to the following statement "PLFN gives me my sense of community".
[31] Community was measured by asking head of households only to respond to the following statement "PLFN gives me my sense of community".

affect happiness as people in PLFN are generally happy, with only 3% more, or 88%, reporting being happy when not fearful. Of those who are fearful of their environment, 85% find spirituality important. Of those who are not fearful of their environment, only 67% find spirituality important. In this case, the results are statistically significant as well.

Of those who practice culture, 41% report better health outcomes. This is in comparison to 59% of those who report better health outcomes when they do not. Of those who practice their culture, 83% are depressed. Of those who do not practice their culture, only 74% are depressed. Of those who practice their culture, 91% are happy. Of those who do not practice their culture, only 80% are. Of those who practice their culture, 93% also find spirituality important. Of those who do not, only 67% find spirituality important. Using a chi-square test, the results are significant.

Indigenous people may extend cultural perceptions beyond the self to the family and community, because cultural identity is a collective experience, with knowledge, practices, and language passed down through the collective. Family in Indigenous communities is also much broader than a nuclear family concept, to include extended family and non-family members alike (RCAP, 1996b). Of those who have family connections in PLFN, 50% report better health outcomes. Of those who do not, only 40% report better health outcomes. Of those who have family connections in PLFN, 76% report being depressed. Of those who do not have family connections in PLFN, 100% are depressed, perhaps suggesting a protective factor that family can have on depression.

Of those who have family connections in PLFN, 85% report being happy. Of those who do not, 100% are happy. This finding may reflect the fact that the women of

PLFN asked for this research because they were worried about what impact the effluent facility was having on the health of their families, and this is, in turn, may be having an impact on their emotional well-being. Of those who have family connections in PLFN, 85% also report that spirituality is important to them. Of those who do not have family connections, slightly less, or 80%, do not find spirituality important. This is the only finding for family connections, where the findings are significant.

Of those who agree that PLFN gives them their sense of community, 54% report better health outcomes. This is in comparison for those who do not agree that PLFN gives them their sense of community, only 25% report better health outcomes. Of those who feel that PLFN gives them their sense of community, 77% report that they are depressed. Of those who do not feel PLFN gives them their sense of community, 93% report depression. Of those who agree that PLFN gives them their sense of community, 91% are happy, compared to only 87% who say they are happy when they do not feel that PLFN gives them a sense of community. Finally, of those who feel PLFN gives them their sense of community, 80% also find spirituality important. Of those who do not agree that PLFN gives them a sense of community, 87% find spirituality important.

What starts to become more evident from the results reported in this table, is that using an appropriate definition of health demonstrates that impacts do not operate uniformly across all dimensions of Indigenous health. This can have important implications for future research. These baseline findings suggest that building on those interventions known to have positive impacts on the various dimensions of health are worth measuring, to assess the extent to which interventions are positively contributing to the health outcomes in this community over time. For example, in PLFN, according to

these findings, helping people feel safer in their environment, has a positive affect on mental health, something that has been denied by the JEHMC, and something that the larger CIHR research project, co-led by the PLNWG and Dr. Heather Castleden, set out to do. The President of the PLNWG, Sheila Francis, remarked at the end of the large CIHR-funded research project, that the women of the community felt empowered and heard for the first time (PLNWG et al., 2016).

In the next section, I move beyond the proximal and intermediate determinants of health, to the distal determinants, in order to explore how the broader structural (macro) factors have impacted health. A determination of health outcomes in PLFN has to take into consideration how the historical, ideological, political, societal, and economic structures within which PLFN has been trying to survive have impacted the health of the community. I now explore the structural determinants.

5.5 Colonial Structural Determinants of Pictou Landing First Nation Health

Scholars of Indigenous health recognize that the oppressive colonial structural determinants – the historical, ideological, political, societal, and economic structures – within which Indigenous people try to survive, contribute to ongoing health inequities (de Leeuw, Lindsay, & Greenwood, 2015; Reading, 2015; Reading & Wien, 2009). Not only are they detrimental to health, these colonial structural determinants also contribute to the oppression of Indigenous worldviews, spirituality, and self-determination over the decisions that impact health (Reading, 2015). Understanding how Indigenous knowledge, worldviews, spirituality, relationship to land and environment, cultures and languages have been oppressed would in fact contribute to further understanding the inequities in Indigenous health and well-being (de Leeuw, Lindsay, & Greenwood, 2015).

Using a SDoH approach does not allow one to consider how the structural determinants of health such as colonization, assimilative policies, including land displacement and environmental dispossession, have uniquely impacted PLFN health (Reading, 2015). In Table 5.6, I will explore select determinants that reflect experiences of residential school, experiences of racism, and the loss of language in PLFN, as a result of their colonial relationship with the state. A chi-square test of independence is performed to examine the relationship between each of the dependent and independent variables.

Table 5.6
Interrogating the Impacts of the Structural Determinants on Pictou Landing First Nation Health.

Measure	Health Rating		Depressed		Happy		Spiritual	
	Poor to Fair (%)	Good to Excellent (%)	No (%)	Yes (%)	No (%)	Yes (%)	Not Important (%)	Important (%)
Residential School								
No	33	67	44	56	**3	**97	**20	**80
Yes	29	71	39	61	**9	**90	**40	**60
Racism								
No	***16	***84	***75	***25	*3	*97	***40	***60
Yes	***44	***56	***24	***76	*11	*89	***19	***81
Speak								
Mi'kmaq	***68	***32	**27	**73	9	91	*14	*86
English	***22	***78	**48	**52	8	92	*24	*76

***p< 0.001; **p <0.01; *p < 0.05
Note: Source: EHS, 2014
Note: NA/DK/Ref/Missing are suppressed.
n = 279

It is expected from the research efforts of scholars like Bombay, Matheson, and Anisman (2009; 2010; 2011; 2014b), that residential school has an intergenerational impact on those who attended the schools, and their families. PLFN has residential school survivors, some of whom participated in the data collection exercise. Of those who have a

history of residential school attendance in their families, 71% report better health outcomes. Of those who do not have a history of residential school attendance in their families, 67% report better health outcomes. Of those with a history of residential school attendance, 61% report feeling down or depressed in the past year, compared to 56% of those who do not have a history of residential school attendance in their families. Of those with residential school attendance history, fewer, or 90% of participants, report feeling happy, compared with 97% of those who do not. This finding is significant using a chi-square test. Finally, 60% of those with residential school attendance history find traditional spirituality to be important, compared to 80% of those who find spirituality important when they do not, results which are significant as well. This should not be surprising, given that traditional spirituality was specifically targeted by the Indian residential system.

Racism for PLFN is significant across all dimensions of health. When participants experience racism, only 56% report better health outcomes compared to 84% who have not experienced racism, 76% of the participant's report depression compared to only 25% who have not experienced racism, 89% report normally feeling happy and interested in things when they have experienced racism compared to 97% of those who have not. Racism tends to make spirituality important to the 81% those who experience it, compared to only 60% who have not.

I explore loss of language as a factor contributing to health outcomes in PLFN. Those who report they have lost their language (only speak English) report better health outcomes, in that 78% report better health, compared to 32% who speak Mi'kmaq and report better health, which, using a chi-square test, is significant. Those who speak

English are less depressed (52%) than those who speak Mi'kmaq (73%), again, a result which is significant. Those who speak English are only slightly happier, with 92% of English speakers reporting happiness, compared to 91% of Mi'kmaw speakers reporting happiness. However, only 76% of English speakers find traditional spirituality more important, compared to 86% of Mi'kmaq speakers, and in this case the results are again, statistically significant.

In order to contextualize these outcomes, I explore select determinants of health, as a factor of age. I present the results in Table 5.7. A chi-square test of independence is performed to examine the relationship between each of the variables.

Table 5.7
Determinants of Health as a Factor of Age in Pictou Landing First Nation.

	Age 0 to 19 years	Age 20 to 49 years	Over 50 years
Health rating ***			
Poor to Fair	10	52	38
Good to Excellent	50	43	7
Depressed***			
No	60	30	10
Yes	19	57	24
Happy			
No	16	68	16
Yes	39	44	17
Spiritual**			
Not important	46	45	9
Important	28	49	23
Residential School Attendance*			
No	39	41	20
Yes	41	48	11
Racism***			
No	58	29	13
Yes	23	57	20
Lost Language***			
No	3	39	58
Yes	48	48	4

***p< 0.001; **p <0.01; *p < 0.05
Note: Source: EHS, 2014
Note: NA/DK/Ref/Missing are suppressed.
n = 279

According to the data from the EHS, the youngest age group experiences the best health ratings, with 50% of the good to excellent health rating coming from under the age of 19 years, compared to only 7% from those over the age of 50. The youngest report the least depression, with 60% of those who say they have not been depressed in the past year coming from this age group. The middle aged group report the highest percentage in happiness. This age group also reports the highest percentage of finding spirituality important. Residential school experience is highest in the two youngest age groups, which may account for why more participants in Table 5.6 report good to excellent health outcomes with residential school attendance in their families. Likewise, the youngest age group report comprise 48% of those who have lost their language, yet are the healthiest, and therefore, may account for why a higher percentage of the participants reported in Table 5.6 report better health outcomes, despite having lost their language, when the Indigenous health literature suggests that language retention can be viewed as a health protective factor because it ensures the vitality of knowledge systems, identities, value systems, and connection to land and environment (Battiste, 1998; Kirkness, 1998; RCAP, 1996b).

5.6 Conclusion

To conclude, this chapter has assessed the health of PLFN from a number of perspectives. I first assessed health outcomes in PLFN using data that the JEHMC could easily have gathered and accessed to determine whether the health of the community had been impacted by the presence of the BHETF. It has. I was able to determine that income, education, and employment do not operate as expected, that is, income, education, and

employment are expected to lead to better health outcomes. For PLFN, this was not the case.

Furthermore, I highlighted two health issues that were of concern to the community that went unstudied by JEHMC, among many others that the PLNWG had raised. It appears that the onset of asthma is increasing as PLFN residents are aging, with the rate of asthma being reported at twice the rate, or more, of non-Indigenous Canadians at the PCDH, provincial, and national levels. Moreover, cancer is highest in PLFN in all cancer classification group sites compared to non-Indigenous Canadians at the PCDH, provincial, and national levels, with the exception of female cancers, which, interestingly, the PLNWG were certain, would be the highest.

Moving on to the use of data from the EHS, that reflected health concerns the PLNWG wanted to explore, it becomes evident that the outcomes more accurately start to reflect the lived reality of the PLFN, and all that they have endured for fifty years (and longer with respect to the colonial encounter). Most importantly, I was able to determine that impacts do not operate uniformly across the four dimensions of health, when employing a more culturally and experientially appropriate definition of health. Sadly, this has been the first time that the health of the community has ever been assessed. This data will become the benchmark for the health of PLFN moving forward.

In the next chapter, I will use oral histories to advance the theoretical perspective of how a Mi'kmaw worldview can further our understanding of how land displacement and environmental dispossession contribute to the inequities in PLFN health. Moving beyond the conventional SDoH approach to health, to include *Piktukowaq* ways of being and knowing is a more appropriate way to produce health research that reflects the

norms, social values, and mental constructs that help the *Piktukowaq* make sense of their world. Understanding Indigenous knowledge and worldviews, which have been oppressed by colonialism, are important to understand how devastating land displacement and environmental dispossession can be, and contributes to a more fulsome and contextualized understanding of Indigenous health and well-being (de Leeuw, Lindsay, & Greenwood, 2015).

CHAPTER 6 CONTRIBUTIONS FROM PICTOU LANDING FIRST NATION KNOWLEDGE HOLDERS' ORAL HISTORIES ABOUT *A'SE'K*

Marshall, Marshall, and Bartlett (2015) note that the pathway to health will be found within the Elders[32]. It is within the knowledge held by members of Pictou Landing First Nation (PLFN) that I convey a framework that will make the impacts of land displacement and environmental dispossession more explicit and, more importantly, relevant to the experiences of the community. The knowledge that is being shared through the oral histories[33] reflects not only the relationship to the land and environment, it is also about the norms and values that guide those relationships, the relationships that individuals have to each other, to all that is around them, and what it is to live a good life. This is the knowledge that has to be considered in order to understand the relationship that the community had to *A'se'k*[34], once a culturally significant body of water to PLFN. This is the knowledge that contributes, in part, to answer my second research question: *As a consequence of siting the BHETF in A'se'k, does the methodology used to assess Indigenous health matter in order to have a full accounting of what land displacement and environmental dispossession means for the health of Indigenous communities,*

[32] When I refer to Elders in general, I will use that term. However, as noted in Chapter 1, there were those who shared their wisdom in PLFN who were not comfortable being identified as Elders and preferred the use of the term Knowledge Holders. They have also consented to be identified. I will not use the term Knowledge Holder beside their individual names, but I acknowledge their contributions. The names of the Knowledge Holders include Diane Denny, Martha and Frank Denny, Mary Ellen Denny, Donald Francis, Ralph and Lorraine Francis, Sarah Francis, Caroline Martin, Mary Irene Nicholas, Noel Nicholas, and Louise Sappier.

[33] Further context for the oral histories that have been shared by the Knowledge Holders can be found in the article by Castleden et al. (2017). "Put It Near the Indians": Indigenous Perspectives on Pulp Mill Contaminants in Their Traditional Territories (Pictou Landing First Nation, Canada). *Progress in Community Health Partnerships: Research, Education, and Action*, *11*(1), 25-33.

[34] Translates as the 'the other room'.

especially in instances like the one experienced by PLFN? It is through the use of the oral histories that have been shared by the Knowledge Holders that I can assess, how over time, the physical, mental, emotional, and spiritual health status has changed since 1967, as since the pursuit of a traditional lifestyle of the *Piktukowaq* became more limited.

> *[M]aybe somebody with, you know – coming in from a different avenue, looking at it in a different style, may be able to piece it together and say 'oh ok, this is what's missing. Maybe we can correct it this way'.* [Sarah, 2012]

The objective of this chapter is to concentrate on the oral histories of twelve (12) respected Knowledge Holders from Pictou Landing to advance a theoretical understanding of the Mi'kmaw worldview, which I argue, will contribute to a better understanding of how land displacement and environmental dispossession have contributed to the health inequities in PLFN. Thus, I use the knowledge shared in the oral histories to assess how the physical, mental, emotional and spiritual health status of the PLFN may have changed since 1967, as the pursuit of traditional practices and activities became more limited.

As de Leeuw, Lindsay, and Greenwood (2015) suggest, researchers need to theorize 'beyond the social', or beyond current mainstream understandings of the social determinants of health (SDoH) approach, to include Indigenous ways of being and knowing, ways that have been suppressed by colonialism but are critical to understanding Indigenous health and well-being. Indigenous knowledge reflects the norms, social values, and mental constructs that help Indigenous peoples make sense of their world. Indigenous knowledge also provides insights into the challenges that Indigenous peoples face as they try to live in a nourishing relationship with their traditional lands and

ecosystems (Cajete, 2000; Ermine et al., 2005). In this chapter, I present Indigenous knowledge about the norms, social values, and mental constructs of the *Piktukowaq* as *Piktukowaq ways of being,* akin to the outcome measures presented earlier in Chapter 4. I then provide detail about *Piktukowaq* knowledge reflecting the days before *A'se'k* was impacted, the experiences of *A'se'k* becoming Boat Harbour, and the years after this event. *Piktukowaq* knowledge presented this way can be read as akin to explanatory measures, which will allow the reader to grasp how the Boat Harbour Effluent Treatment Facility (BHETF) has, and continues to, undermine the *Piktukowaq* ways of being.

As noted in Chapter 3, the Joint Environmental Health Monitoring Committee employed consultants over the years who, by using a western approach to their science, had never been able to generate a satisfactory response or resolution to the concerns expressed by PLFN. I reflect the importance of the *Piktukowaq* worldview, spirituality, their culture practices, and the importance of their relationship to their land and environment as fundamental to an understanding of their health. The *Piktukowaq* Environmental Health Interpretive Framework that I present in this chapter is based on a philosophical orientation that includes a relational epistemology as foundational to who the PLFN community members are as Mi'kmaq, and as *Piktukowaq*. It will be through these new insights, shared by the Knowledge Holders, that my research becomes responsive to the community's concerns.

The oral histories speak to the vibrancy and strength of the *Piktukowaq* community when they could enjoy *A'se'k*, and to the loss that was experienced when *A'se'k* was taken over by the state and turned into a site for industrial waste. I argue that it is through these oral histories that the sacred connection to *A'se'k* becomes evident, and

how uprooting that sacred connection has had a brutal impact on the health of the community. As I have already stated, Indigenous peoples' relationship with the land and nature is the basis of worldviews, knowledge systems, and languages (Battiste 1998; 2000; Edosdi, 2008; Getty, 2010; Kovach, 2009; Pierotti & Wildcat, 2000; Rains, Archibald & Deyhle, 2000; Sable et al., 2012; Youngblood Henderson, 2000). The following is provided, not to add to the historical overview of the relationship between the state and the *Piktukowaq,* but as context for the relationship of the *Piktukowaq* to their traditional lands and environment and, more importantly, to their relationship to *A'se'k.* It is essential to understand this evolution in the relationship between the *Piktukowaq* and *A'se'k* once it became known to the community as Boat Harbour. In the following section, I focus on how the relationship changed as a result of siting the BHETF in this location in order to convey how the enduring relationship was ruptured and severed and started to impact on the health of the community.

6.1 The Evolution from *A'se'k* to Boat Harbour

Connection to land and environment is an important determinant of Indigenous health, yet it has been targeted by colonial policies, projects, and practices intended to alienate Indigenous people from their traditional territories, and to limit their exercise of traditional activities on those territories (Tobias & Richmond, 2014), as has happened to PLFN. *Mi'kma'ki* is the traditional lands and homelands of the *Mi'kmaq* and has been for at least the last 11,000 years. *Mi'kma'ki* is divided into seven districts (Figure 6.1): *Kespukwitk, Sipekni'katik, Eskikewa'kik, Unama'kik, Epekwitk aq Piktuk, Siknikt,*

Figure 6.1 - Traditional Districts of Mi'kma'ki (Source: http://www.muiniskw.org/images/pgCulture1b_Mikmaki.jpg).

and *Kespek (*Sable et al., 2012*)*. *Piktuk* is the traditional territory of the *Piktukowaq*.

When settlers first arrived in Pictou County, the Merigomish area appeared to be the headquarters of the *Piktukowaq*, and their principal encampment was at the foot of Barney's River, east of Big Island (Patterson, 1877). Even though the Mi'kmaq have lived on this land for millennia, in 1783 the colonial government in Nova Scotia, granted the *Piktukowaq* a license of occupation to live on their own lands south-east of Merigomish Harbour, with the liberty to hunt and fish in the woods, rivers, and lakes of the district (Patterson, 1877). The map in Figure 6.2 gives one a sense of how extensive an area this would have been. *A'se'k* is reflected in this map by the name given to it by settlers – Boat Harbour (see arrow).

By the early1800s, sustained efforts are being made by government officials to induce the Mi'kmaw people in Nova Scotia into settled habits under the auspices of improving their social and spiritual condition (Patterson, 1877) with the intended effort,

as Lelièvre (2012) notes, “to civilize them and to curtail their wandering over the land” (p. 58).

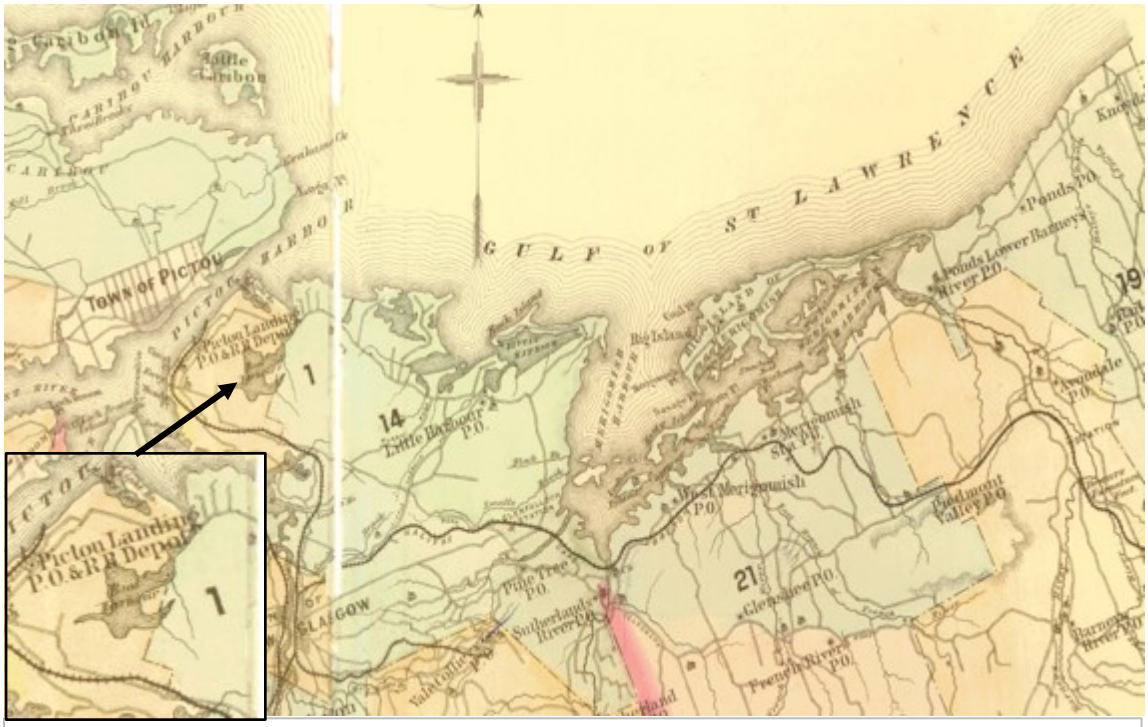

Figure 6.2 - Portion of Pictou County showing traditional lands of *Piktukowaq* (Source: Allan, C.R. 1879).

Settler discourse often projects frustration with the constant movement and wandering of Indigenous peoples, and the wish to remove them from settled colonial spaces (Lelièvre, 2012; Wolfe, 2006). Colonial authorities treated the Mi’kmaq as a nuisance (Cullen, Castleden, & Wien, 2018). For the Mi’kmaq, the wandering was in reality the cultural norm for being on the land, a sustainable and altering use of territory so as not to deplete available resources (Prosper et al., 2011). Sarah Francis [2012] recalls that “we did travel quite a bit…different places…different seasons…we didn’t settle into one spot like…this,

we were forced into this!"

Figure 6.3 - Land Ownership Around *A'se'k,* or Boat Harbour (1879) (Source: Allan, C.R., 1879).

In 1867, Fisher's Grant Indian Reserve No. 24, which is the current settled reserve of PLFN, was created (Pictou Landing First Nation, 2012). The map in Figure 6.3 shows how the traditional lands of the *Piktukowaq* have been parceled off to settlers by 1879, leaving *the Piktukowaq* with a small portion bordering on *A'se'k* (see arrow). This piece of land is 143 hectares in total (INAC, 2017), a significant reduction in the lands granted in 1783, and a gross reduction from the extent of the traditional territory of *Piktuk*. The establishment of the Fisher's Grant Indian Reserve would have inflicted another major assault on the relationship of the *Piktuk* to their lands and environment. The impact of forcing the *Piktukowaq* to live a less active and more sedentary lifestyle would have negatively impacted the health of the community in ways we are now just starting to fully appreciate, resulting in behaviors that were presented by officials as inherent, such as

shiftless, lazy, or lacking in ambition and motivation (Coffey, 1988; Cullen, Castleden, & Wien, 2018).

As the population of the county expanded, unemployment became a pressing issue for the non-Indigenous population in this area. Large industries, including pulp and paper mills, which were in a boom period of expansion throughout Canada, were enticed through tax incentives to locate in Pictou County (Barrett, 1980; Ballem, 1948; Bickerton, 1982; Clancy, 1997; Nova Scotia Voluntary Planning Board, 1966). A pulp and paper mill was built at Abercrombie Point just outside the town of Pictou and became operational in 1967 (Lewis et al., 2016). Once operational the mill required a site to dump its effluent, so a decision was made by officials to pipe the effluent under water and over land to a proposed treatment site at *A'se'k* (Figure 6.4).

The Nova Scotia Water Authority (1965) acknowledged in a 1965 report

Figure 6.4 - Current location of Northern Pulp Mill in relation to PLFN and *A'se'k* (Source: Google maps).

that the toxicity of the effluent from the pulp and paper mill would be quite high. In subsequent reports commissioned by the Nova Scotia Water Resources Commission, which replaces the NSWA in 1968 (Nova Scotia Environment, 2014), it is noted that when the decision was made to site the facility at *A'se'k*, decision-makers were aware that the natural habitat would be modified, but odours coming from the effluent would be of little concern since the site was remote from local development, residences, and habitation (Rust Associates Ltd., 1970).

No consideration was made that the impacts would be felt in PLFN located adjacent to the site, or that the Mi'kmaq still pursued important traditional activities in and around *A'se'k.* The stark reality was that the effluent would wash ashore on the very boundaries of PLFN, the scale of which threatened the health of the entire community and what remained of their traditional territory. Moreover, the *Piktukowaq* no longer recognize their beloved *A'se'k,* and they start to call it Boat Harbour as well. I now turn to the stories shared by the Knowledge Holders to add to the context of how this relationship changed and continues to change the health of the community.

6.2 Getting to *the Piktukowaq* Meaning of *A'se'k*

In this section I present a health framework that is culturally aligned and reflective of the relational knowledge system for how the *Piktukowaq* view themselves on the land and in their environment. A reconceptualization of the human/nature dichotomy (Battiste & Youngblood Henderson, 2000) requires a recognition that for Indigenous peoples the human/nature relationship is more profound and interconnected than most non-Indigenous people might be able to appreciate, therefore, the conceptual framework that I present is intended to illuminate the relational epistemology of the *Piktukowaq* to

A'se'k and is intended to bring the reader to a closer understanding of why, when *A'se'k* was destroyed, it was an assault on the very identity of the people living in the community of PLFN.

As presented in Chapter 3, many Indigenous peoples think of nature as an extension of their home (Graham, 1999). This is how the Knowledge Holders in *Piktukowaq* viewed *A'se'k*. It was the place where PLFN members gathered to collect and share food and medicines, where families socialized, and where individuals were taught the values and norms of being on the land. *A'se'k* had important connections to all of the individuals and families in the community, the memories of which are conveyed by the Knowledge Holders who were there to witness what happened in their community when the mill began operating. When the Knowledge Holders refer to *A'se'k*, it is consistently referred to in very positive terms – "such a beautiful place" [Mary Ellen, 2012], "like a playground" [Ralph and Lorraine, 2012], "that was our classroom" [Sarah Francis, 2012], "it's what kept you alive" [Donald, 2012]. Mary Irene [2012] shared that she was seventeen before she heard the word Boat Harbour, "we didn't know it as anything, any different than…*A'se'k,* and that's that". It is with this foundational understanding that I develop a *Piktukowaq* environmental health interpretive framework to reflect what the Knowledge Holders were sharing with me.

I present findings using the Mi'kmaw concepts as a translative tool to make it explicit how important *A'se'k* was and continues to be to the community and using a health framework that is meaningful to the community. As a Mi'kmaw researcher I am accountable to the Knowledge Holders who shared their data (stories) with me in a way that honours Mi'kmaw ontology and epistemology in respectful ways and is sensitive to

the foundational lessons that are inherent in these stories. I am mindful that there is knowledge, as Berkes and Berkes (2009) would argue, that has evolved over thousands of years of sampling, observing, measuring and testing/retesting and making empirical connections about the local environment.

The *Piktukowaq* environmental health interpretive framework that I present below provides a structure to present the findings in a way that reflects and respects that the relationship between Mi'kmaq and nature is profound and sacred. The words of the Knowledge Holders, and the Mi'kmaw language itself, will guide the reader to the *Piktukowaq* consciousness and understandings of their world, when *A'se'k* was destroyed. The Mi'kmaw language encapsulated within the *Piktukowaq* environmental health interpretive framework (Figure 6.5) will reveal, as Battiste (2000) would argue, the Mi'kmaw tribal knowledge, understandings, instructions, and lessons of how the world works. To the *Piktukowaq, A'se'k* was a part of the natural world from which they sprouted, and part of their home. *A'se'k* was part of the territory that was the basis of their society and social relations (Graham, 1999).

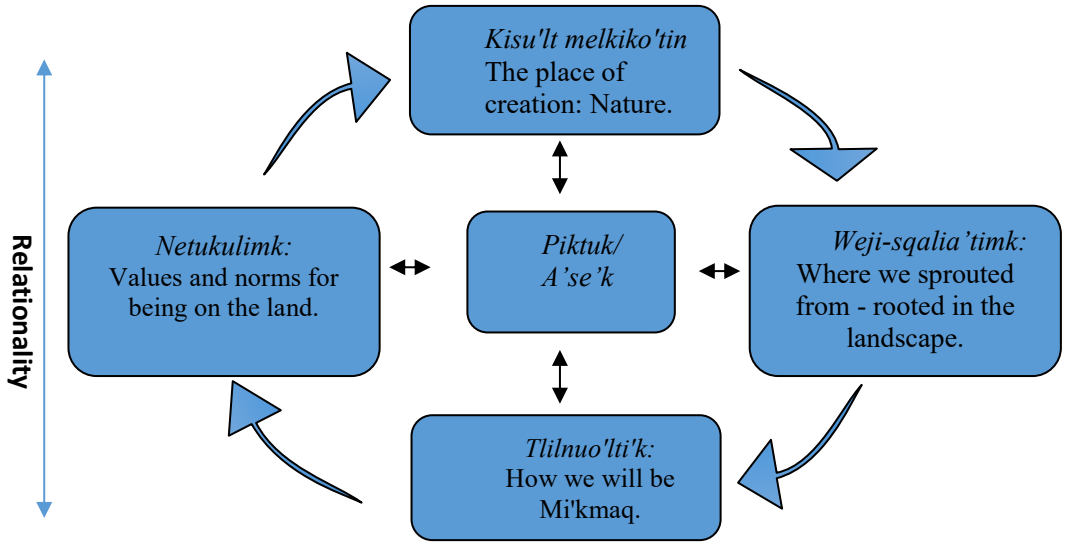

Figure 6.5 - Piktukowaq Environmental Health Interpretive Framework.

The Framework was reviewed by eight (8) Knowledge Holders at a meeting in July, 2016. We explored the Mi'kmaw words in more depth to ensure that I had an appropriate understanding of the concepts that are conveyed in these words. Starting from an orientation that *A'se'k* is central to how the PLFN community lived in relation to the land, I can then use the oral histories to determine how the land displacement and environmental dispossession would have had such a profound effect on the physical, mental, emotional and spiritual health of the individual. I will just briefly provide a general overview of the Mi'kmaw terminology again, so the reader can understand how the concepts apply.

Kisu'lt melkiko'tin is Mi'kmaq for describing nature as the place of creation, the vantage point from which the Mi'kmaq derive worldview, language, knowledge, and social order (Battiste & Youngblood Henderson, 2000; Youngblood Henderson, 2000). The *Piktukowaq* believe *A'se'k* is within the place of creation. It is therefore, the basis of tribal epistemology, a tribal understanding that is specific to place.

Weji-sqalia'timk expresses the Mi'kmaw understanding of the origin of its people as rooted in the landscape and nowhere else (Sable et al., 2012). For the *Piktukowaq* this would be *Piktuk,* their traditional land, which includes *A'se'k*. For the *Piktukowaq,* their cultural memory resides in this landscape and their worldview emerged out of experiencing and living in *Piktuk* for millennia.

Tlilnuo'lti'k, translates to the process of maintaining the Mi'kmaw worldview (Battiste, 2000; Sable et al., 2012; Youngblood Henderson, 2000). *Tlilnuo'lti'k,* as the Mi'kmaw ontology, is the way of being in the world in relation to everything else. In a relational worldview the *Piktukowaq* maintain relations with all of life, whether animate

or inanimate. They maintain a holistic relationship with the entire ecosystem of *Piktuk*, to all of the air, land, and water around them.

Netukulimk refers to the value system that is taught about how the Mi'kmaq interact with nature and conveys a reciprocal relationship with all of creation that carries responsibilities and obligations (Prosper et al., 2011). *Netukulimk* is about the rules and obligations of being on the land and about the sustainable use of the resources that *Piktuk* provided, lessons that would have been taught to the youth by the Elders (Prosper et al., 2011). *Netukulimk* embraces a relational accountability of taking only what you need, giving back, and offering thanks, a value system that is seen in many Indigenous contexts (Hart, 2010; Kovach, 2015; Louis, 2007; Tuhiwai Smith, 2012).

With the context provided for understanding the Mi'kmaw concepts, I now turn to the application of this *Piktukowaq* environmental health interpretive framework to identify, document, and understand the health affirming aspects of *A'se'k,* which can be conceived as outcomes measures, and the health supressing aspects of *Boat Harbour*, which can be conceived as explanatory measures.

6.2.1 Health Affirming Aspects of *A'se'k*

To be consistent with how health measures have been presented so far, I argue that the variables in this section are not unlike the dependent variables I presented in Chapters 5. The *Piktukowaq* had a deep and sacred connection to *A'se'k.* The Knowledge Holders have provided insight into what this connection might look like within their oral histories. What follows reflects what the PLNWG meant when they told the JEHMC that the health of PLFN has been impacted by the events that have transpired that turned *A'se'k* into Boat Harbour.

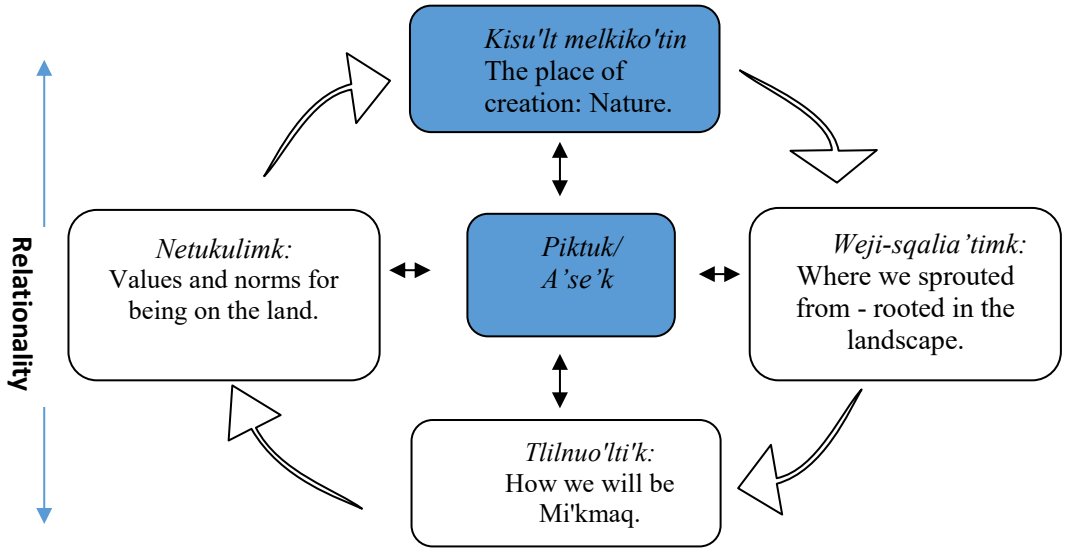

Figure 6.6- Piktukowaq Environmental Health Interpretive Model for *Kisu'lt melkiko'tin.*

Kisu'lt melkiko'tin

In the broadest sense of the word, *kisu'lt melkiko'tin* (Figure 6.6) conveys the Mi'kmaw belief that nature is the place of creation. As the *Piktukowaq* orient themselves to their land and environment, the traditional territory of *Piktuk,* they believe this is where they were created. *A'se'k,* as part of the territory that the *Piktukowaq* believe they sprung from, is integral to their identity. *Piktuk,* including *A'se'k,* is the vantage point from which the *Piktukowaq* would construct their worldview, language, and knowledge system. Any change in the local land and environment, therefore, would have an impact to how the *Piktukowaq* orient themselves in their world.

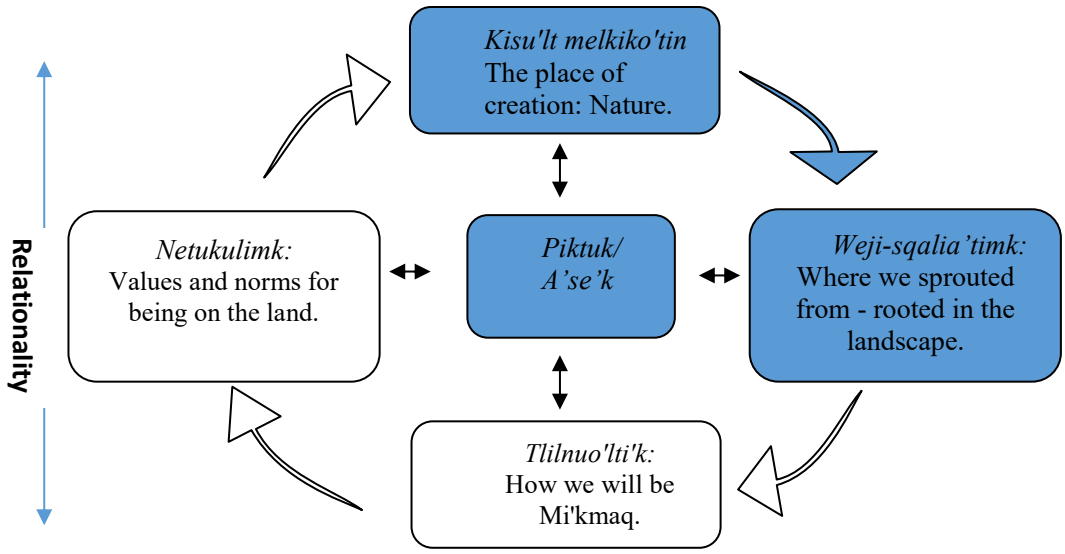

Figure 6.7 - Piktukowaq Environmental Health Interpretive Model for *Weji-sqalia'timk.*

Weji-sqalia'timk

The *Piktukowaq* would see themselves as rooted in *Piktuk* (Figure 6.7), as rooted in this landscape; this is where the cultural memory of the *Piktukowaq* resides, as it has forever (Sable et al., 2012). We can refer to the words of Sarah [2012] to illustrate this: The *Piktukowaq* "have occupied this area, generally, for thousands and thousands of years…this is where my roots are. The spirit of my people, is right here. You know, I feel that…I feel connected". When asked to think about how the older people in the community were prior to the BHETF installation, Mary Ellen [2015] recalled, "…they were running around, going in the woods…gathering whatever they can...I know they [were] hav[ing] fun what they were doing…[be]cause they were happy… they were '*welta'sulti'ji'k'*... That's a very important word. They were happy, everything was going the way they wanted…"

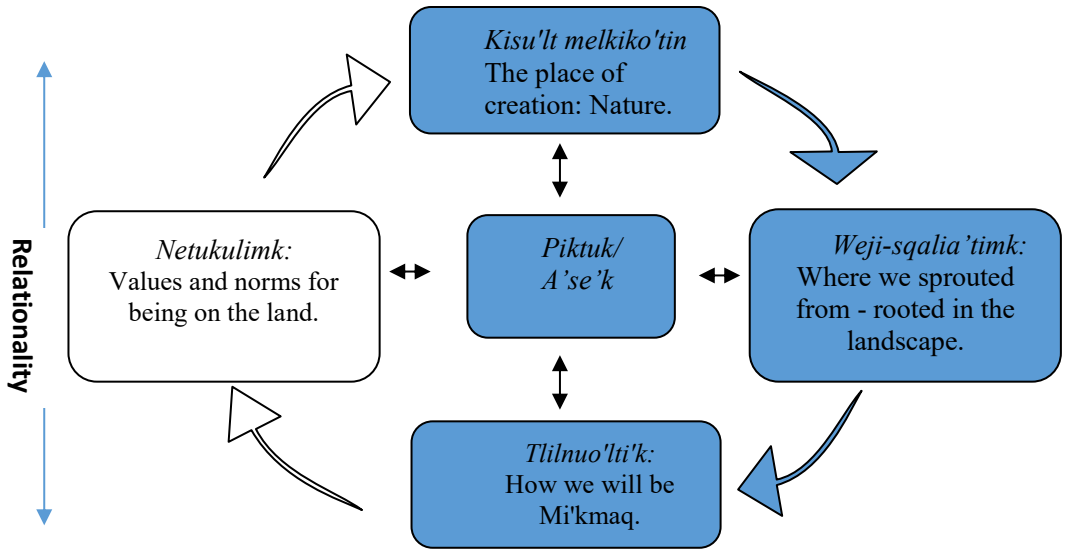

Figure 6.8 - Piktukowaq Environmental Health Interpretive Model for *Tlilnuo'lti'k*.

Tlilnuo'lti'k

Tlilnuo'lti'k reflects the *Piktukowaq* way of being in the world (Figure 6.8). If the way of being in the world is in relation to all of creation, the *Piktukowaq* would believe they are in relation with all of life within the air, land, and water around them. One of the most poignant stories that was shared by several Knowledge Holders conveys the essence of *tlilnuo'lti'k,* when they recall, in the first days of the effluent being pumped into Boat Harbour, how they went down to *A'se'k* and watched the fish "trying to breathe. [T]hey were] looking for oxygen" [Martha and Frank, and Sarah, 2012]. Their words convey an interconnectedness, which becomes more apparent as I continue their story in the next section.

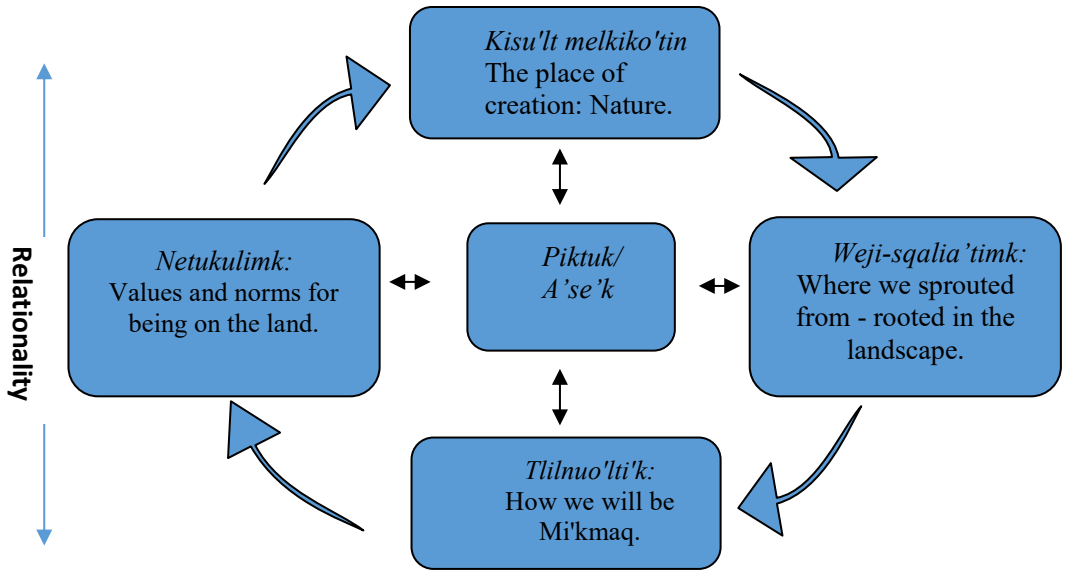

Figure 6.9 - Piktukowaq Environmental Health Interpretive Model for *Netukulimk*.

Netukulimk

From the Knowledge Holders, one can get a clear sense of how the *Piktukowaq* would conduct themselves on the land and in their local environment, how they would learn their values and practices, and how they would learn to live sustainably. *A'se'k* formed part of a territory where the *Piktukowaq* would acquire and attain the fundamental aspects of everything that *netukulimk* represents (Figure 6.9). Mary Irene [2012] recalled that "her brother was going out with my dad, and learning stuff… learning to get food…One time it was just our life! Being outside, being in the woods, doing stuff…". The Knowledge Holders conveyed their access to the local resources that were abundant around *A'se'k*. Caroline [2012] shared that her family never went hungry. Her brother would come home every day with one or two rabbits and her father would get eels in the wintertime.

Caroline [2012], and many of the Knowledge Holders, recalled the abundance of "…blueberries, strawberries, green apples, choke cherries, cranberries…We

ate…healthier food then…look at all the fruit we were eating". Several also talked about the smelts that they would catch by the handfuls in a little stream going down to *A'se'k* [Diane, 2012; Martha and Frank, 2012; Mary Ellen, 2012; Ralph and Lorraine, 2012]. Mary Ellen [2012] said they "would take home buckets and buckets of them". Mary Irene [2012] talked of salmon, so big "I could barely carry it, it was so heavy". Donald [2012] said that "everything you ate came from there…it's what kept people around you alive".

The value of living sustainably, taking only what was needed and sharing the resources amongst the community, is reflected in the stories shared by the Knowledge Holders. Sarah [2012] stated how her grandfather was one of the main food suppliers for the community. "…he would tell the guys…the community is low on food, now you guys go out and hunt". Then it was [her grandfather's] responsibility to ensure that "…the meat was divided accordingly…you'd have enough there for 3 or 4 days…nobody was left behind… Elders were looked after first" [Sarah, 2012]. Louise [2012] recalled how her father shared moose, "[H]e would…cut up the meat. Cause back then, when you caught a deer, or a moose or whatever…you share it…Back then you gave…a piece to every household". Sarah [2012] also conveyed how her father would use "every part of the moose…bones or antler… to make little holes, flutes…the fur of the animal was used for… clothing, and…[b]edding…" Diane [2012] recollected that "there was always deer around…". Ralph and Lorraine [2012] recalled that they would "go hunting during the fall and, springtime fishing and, winter ice fishing". Martha and Frank [2012] shared that "most of our food was from there".

Health of community and family

Thinking about social cohesion and wellbeing, it was striking to hear the sentiments expressed by the Knowledge Holders about how close-knit individuals, families, and the community were before Boat Harbour. Caroline [2012] recalled that "it seemed that people were closer in those days". Diane [2012] said "this used to be a family outing for us! My mom and dad used to take us down there, to fish, to swim, just to lay around".

Mary Irene [2015] remembered

> a great big picnic…there were lots of families from the reserve. That event wasn't planned, it was just spontaneous…fun, no groups, everybody together just brings back really good memories. It wasn't even separated, it wasn't like that family group and that family group, it was just simply lots of people there…I think that was the last time that I was with everybody - carefree, laughing, you know just laughing. I don't know why that was important to me then, I was just a kid but hearing the adults joking and laughing.

From the stories that are shared you get an overall sense that the Knowledge Holders yearn for the days when they could gather with their families and friends and just enjoy being out on the land and in the waters at *A'se'k*.

6.2.2 Health Supressing Aspects of Boat Harbour

Again, to be consistent with how health measures have been presented so far, I introduce variables akin to independent variables presented in Chapters 5. The stories that Knowledge Holders shared are presented as explanatory, that demonstrate how the health, as defined by the *Piktukowaq* environmental health interpretive framework, was

impacted. These stories convey the upheaval that the *Piktukowaq* experienced by being displaced from their lands and dispossessed of their environment.

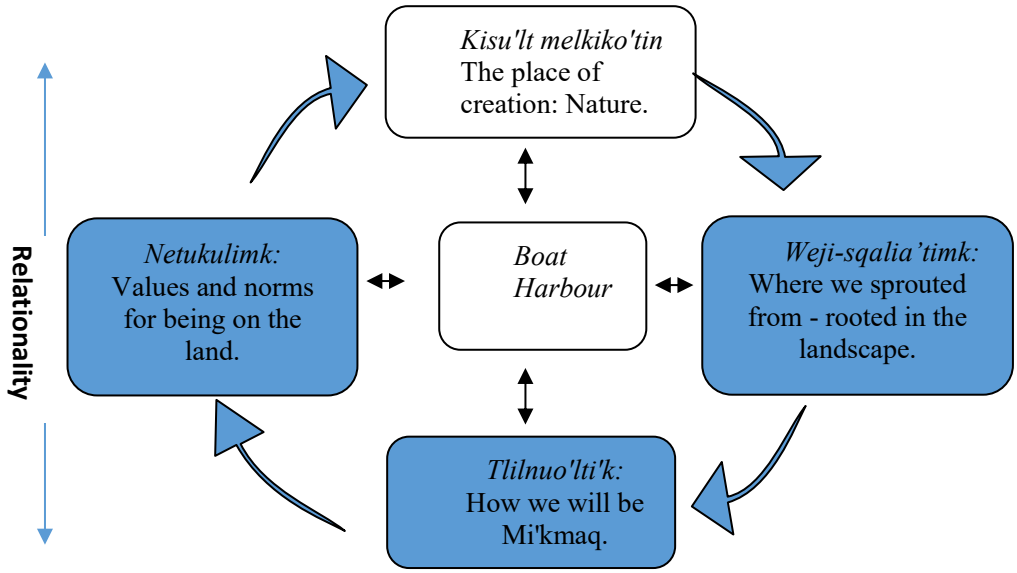

Figure 6.10 - Piktukowaq Environmental Health Interpretive Model as *Kisu'lt melkiko'tin* is Severed.

Kisu'lt melkiko'tin

It is important to convey how fast things changed once the effluent started to flow to Boat Harbour (Figure 6.10). The abrupt change would have an impact on *kisu'lt melkiko'tin,* that is, the vantage point from where the *Piktukowaq* orient themselves to the world, which has implications for their language and knowledge that come from the land, and, according to Battiste and Youngblood Henderson (2000), would alter their social order.

> Sadie [2012] shared this:
>
> The things that…we were accustomed to, thousands and thousands of years – those were all of a sudden not available to us anymore. So we had to resort to another way of life. And people say –it's [the pollution] in the air, it's in our land'.

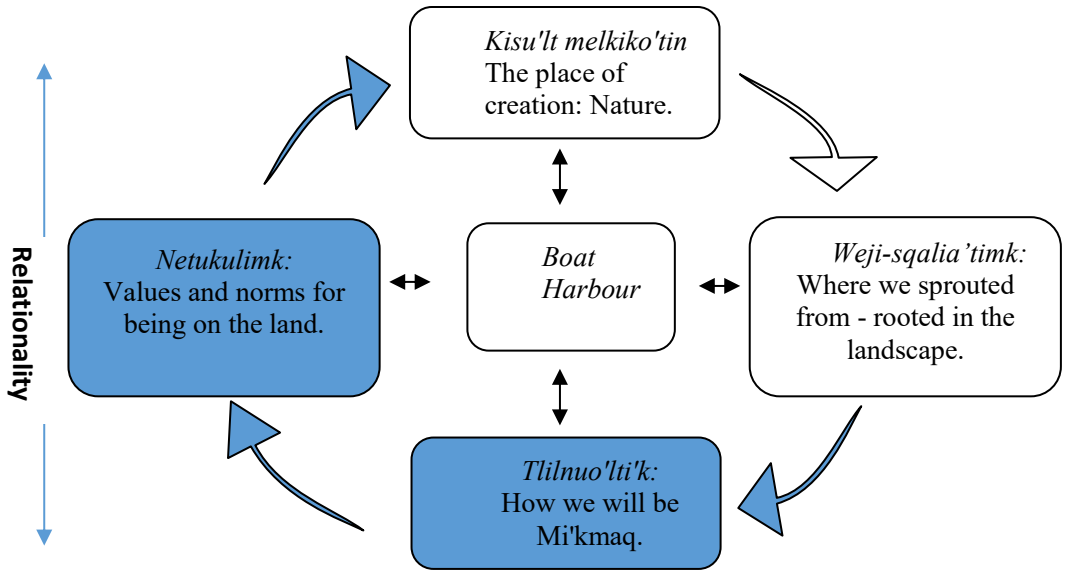

Figure 6.11 - Piktukowaq Environmental Health Interpretive Model as *Weji-sqalia'timk* is Severed.

Weji-sqalia'timk

The *Piktukowaq* believe *A'se'k* is within the place of their creation, it therefore, is the basis of their tribal epistemology, a tribal understanding that is specific to place. If the *Piktukowaq* believe they are rooted in the landscape, that their cultural memory is anchored here, displacing them from their lands, and dispossessing them of their environment impacts *weji-sqalia'timk* (Figure 6.11).

Mary Ellen [2015] talked about the joy that *A'se'k* brought to the community before it became contaminated, and "[T]then all of a sudden everything stopped, just stopped". And when asked if she could still use the word *welta'sulti'ji'k* today, Mary Ellen [2015] said, after a long pause, "no". Caroline [2012] echoed Mary Ellen, when she remembered how "fast things seemed to change…", a change that I perceive through the stories shared by the Knowledge Holders as being very jarring.

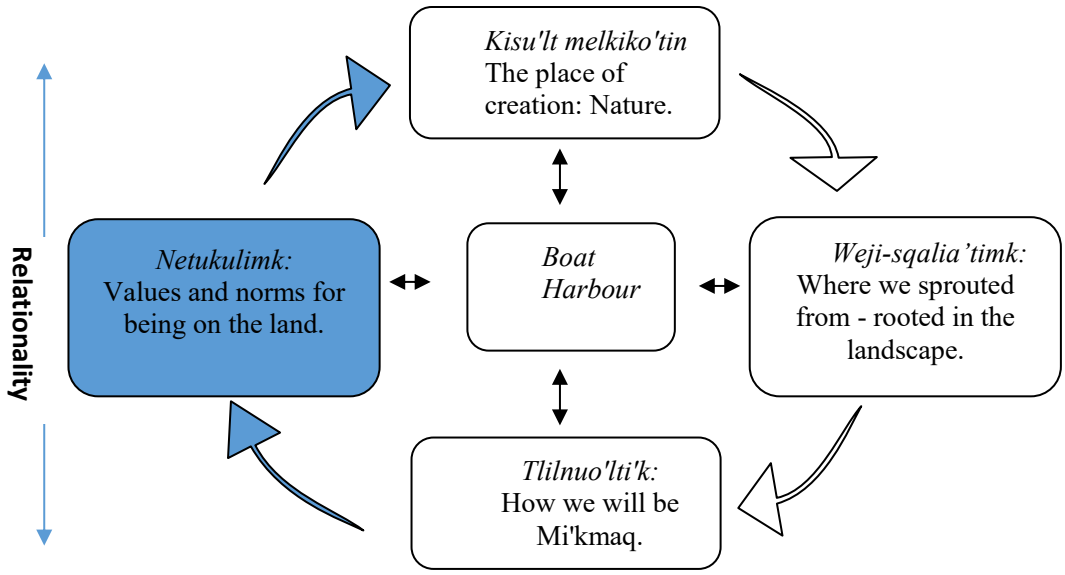

Figure 6.12 - Piktukowaq Environmental Health Interpretive Model as *Tlilnuo'lti'k* is Severed.

Tlilnuo'lti'k

Tlilnuo'lti'k reflects the *Piktukowaq* way of being in the world. How can the *Piktukowaq* maintain their worldview when the air, land, and water around them has been altered (Figure 6.12)? Diane [2012] conveyed how disrupted people felt, "I said our air is polluted, I said our water is polluted, I said our land is polluted…might as well say our minds are polluted! Or our beings". If the way of being in the world is in relation to all of creation, the *Piktukowaq* would believe they are in relation with all of life within the air, land, and water around them.

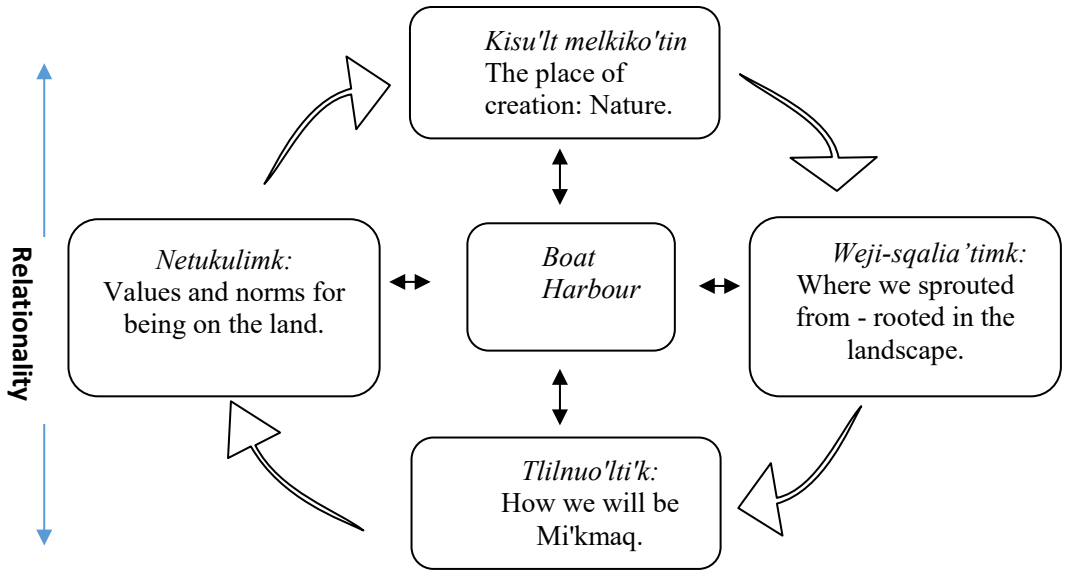

Figure 6.13 - Piktukowaq Environmental Health Interpretive Model as *Netukulimk* is Severed.

Netukulimk

What the Knowledge Holders talked about the most can be connected to *netukulimk* (Figure 6.13), the Mi'kmaw value system and cultural norms for interacting with nature, and the use of resources provided by the land and environment. Caroline [2012] recalled that "in the 50s, people had potato fields, corn, chickens, turkeys, horses, pigs…everyone had big gardens[35]. But now, I wouldn't trust anything coming from this part of the country". Mary Ellen [2015] remembered that "everybody had a garden, they grew potatoes and vegetables and the whole family looked after the garden… Nobody grows anything any more". This comment was made after soil sampling had been completed as part of the larger CIHR study, where the results indicated that the soil was generally safe for vegetable harvesting (Pictou Landing Native Women's Group et al.,

[35] Farming was incorporated into Mi'kmaw subsistence patterns by the end of the eighteenth century, and was becoming increasingly more important to livelihood. (see Cullen, Castleden, & Wien, 2018).

2016). Mary Irene [2012] stated "we stopped trusting berries…when things ran out, lots [of] times it just simply ran out. And – and that part about getting food, sometimes from the land, that's when you felt the impact". Diane [2012] shared that:

> The apple trees are dying; our apples are just about gone! There's no more cranberries, there's no more blackberries, there's no more raspberries… there's no more rabbits… there's no more deer…Everything's changed. Things don't grow there, animals don't run around anymore, because they got no place to drink.

Mary Ellen [2015] summed it up, "…[i]t's lost, everything that happened over there is gone". People became afraid of their medicines. Diane [2012] shared:

> …my dad knows where there's a lot of kinds of Indian medicines down that way… but we don't even know if those are good either because you got the stink and everything settling on to the leaves and stuff, so, and we don't know how much damage is down under the ground from all this paper mill, and nobody will tell us!

Mary Irene [2012] said that "the stuff we used to do around *A'se'k* has been replaced by doing those things now in other parts of Nova Scotia…[and] lobster fishing has…replaced the fishing part of it". "People don't know anymore about the trees, the stuff that your supposed to use to make this medicine for the eyes" says Diane [2012]. She believes that "the interest is gone! Take my grandson for instance, if I was to take him down there and tell him… go get some fish. I don't know if he'd really know what to do". A key result of land displacement and environmental dispossession in Pictou Landing has been a drastic decrease in the opportunity for intergenerational exchange of

Indigenous knowledge from Elders to subsequent generations while out on the land and water.

The assault on *A'se'k* has meant that the younger *Piktukowaq* have had less opportunity to engage with and be taught by the Elders about how they should conduct themselves on the land, how to learn the behaviors and the norms and values that others had learned before them about living within the ecosystem of *Piktuk*, lessons that had been passed down for millennia. When *netukulimk* is talked about today, Mary Irene [2012] reflected on how it is being taught:

> Well look at the school…they're teaching outdoor ed[ucation], or living classroom… whatever they call it. But – they're teaching it in school, where one time it was just our life! Being outside, being in the woods, doing stuff…collecting food, collecting things out there, recognizing what's good to eat, not good to eat. And – and today, kids they don't know [t]hat! So – now we're learning almost from the books, about nature, where before we just lived it!

Ralph [2015] shared, "[It] was … really fun! I'm sorry that my kids missed it." When I asked Ralph if he was ever able to teach anything to his children or grandchildren, he responded that "there was no place to go".

In 2016, Ralph's teenage granddaughter, Lexie Strickland, shared her feelings with an audience of over 100 people who had come to the Halifax Public Library to hear the PLNWG talk about the impacts of Boat Harbour (Strickland et al., 2016). Through tears, Lexie conveyed that she hoped people understood the magnitude of what was taken away from her, by what was done to *A'se'k,* that she had been deprived of an opportunity to go out on the land and water with her grandparents and learn from them (Strickland et

al., 2016). It was one of the most powerful presentations given by the PLNWG and left few in the audience with dry eyes. Lexie had no knowledge of what her grandfather had shared with me the year before, yet the intergenerational trauma was clear in her story.

Emotional distress

Returning to the story about the fish in *A'se'k* and the anguish that the Knowledge Holders experienced in simply conveying their recollections of watching the fish die as the effluent started to flow into Boat Harbour conveys, more than anything, the intensity and sacredness of a relational worldview that was still palpable fifty years later. The Knowledge Holders remember the "fish with their heads sticking up…they were trying to breathe… [they were] looking for oxygen…whatever was in the water was killing them. And…oh it was just a pitiful sight, really and truly [Martha and Frank, and Sarah, 2012]. The Knowledge Holders used the word *tilijm msi'ko 'ltiek* to convey how they felt watching the fish, which translates to 'we are so sorry' [Knowledge Holders, 2016]. *Tilijm msi'ko 'ltiek* is the same word used to express sorrow, when someone loses a family member.

Ko'kmanaq, which means "our relations", conveys the Mi'kmaw relationship to both animate and inanimate objects, a relationship of respect and kinship (Sable et al., 2012). The stories that were shared about the loss of the fish convey the depth of a relational worldview, where the *Piktukowaq* are required to honour all of their relations, and were not able to do so. The loss of the relationship to the fish is expressed the same way as one would express the loss of a relationship within family. Ralph and Lorraine [2012] emphasized, "they don't really understand everything that was lost there, I guess…"

Fear, Anger, and Loss

The Knowledge Holders were clear that the incidents that happened after Boat Harbour became operational were abrupt and disconcerting for them. Mary Ellen [2012] shared "how quickly that stink came in, and how quickly that water turned black... the church turned black overnight it seemed, and ... shingles on the old schoolhouse and the houses went black"[36]. Louise [2012] shared her worry about what they were breathing in.

> If it's heavy enough to draw out the lead in the paint, while we're breathing it in…what does that draw out of our bodies? If it can do a reaction like that to paint, it must be doing some kind of reaction in our system.

The Knowledge Holders talk about what they perceive to be the most widespread health issues in the community that were unheard of before Boat Harbour. Noel [2015] noted that "diabetes wasn't prevalent then," and Ralph [2012] concurred, "there was no such thing…maybe only a couple of people…" Mary Irene [2015] remembered that she "was in grade seven…in 1968 or 1969… [that a] teacher…had breast cancer... that's the first time I heard…the word cancer. And I didn't know what it meant…" Sarah [2012] noted that "cancer [was] something…nobody ever ever had…now its all around us…" Mary Ellen [2012] said "there seems to be a lot more cancer! Growing up, I never new what cancer was, you know… but all of a sudden there's so many different kinds of cancer down here". Caroline [2012] also shared that "[p]eople seem to have breathing problems, sinus headaches" while Mary Ellen [2012] noted that there "seems a lot of kids have breathing problems, nosebleeds".

[36] In the earliest years of the mill operation, the community was told that the sulphur in the mill emissions would draw the lead out of the paint on buildings, and turn the buildings black [Ralph and Lorraine, 2015].

After the events led the community to refer to *A'se'k* as Boat Harbour, Mary Irene [2012] recalled that "there seemed to be more anger…I'd hear that anger and the blame game…I think after Boat Harbour happened, I think [a] lot of us lost our innocence…not knowing if the things in the woods was safe for us anymore". Diane [2012] shared a story where she recalled seeing a group of older men in their sixties, who were futilely idling along the water's edge, "It's almost like you just… ripped the heart right outta them and it's like, there's no place for them to go anymore". When Ralph [2012] thought about what the young people missed, he said he is "brokenhearted…[and] it gets worse…[as] I get older".

Community and Family

The community as a whole has experienced the loss of connection to land and environment and within the community there has also been a loss of a connection that the enjoyment of the being out on the land and in the environment brought to relationships among the people of PLFN. Steinhauer and Lamouche (2015) recognize that the restoration of these relationships is important to health and well-being, that relationships are key in Indigenous worldviews and the maintenance of Indigenous epistemologies and ontologies. Diane [2012] stated that "… nobody knows how to talk to each other anymore!" Ralph and Lorraine [2015] remembered:

> …the change in the people. [I]t's like they…they were more bubbly and …more outgoing. Everybody would talk to everybody but after a while I noticed that they didn't seem to be communicating that much anymore…There used to be more gatherings. There was a lot of people going down [to] *A'se'k* because the…water

was so clean. So I don't know what happened after that. People seemed to stop getting together… a bad case of depression.

Their comments were particularly poignant because the quantitative data supported that having sense of community results in better health outcomes, results in people experiencing less depression, and being happier.

6.3 Conclusion

In all of the previous studies about Boat Harbour that have been conducted by government and industry, the notion that the connection to land and environment is foundational to how the *Piktukowaq* orient themselves to the world was never taken into consideration. But without this understanding, further studies are pointless. What happened at *A'se'k* has impacted the health of the community. It is threatening the very culture of the *Piktukowaq*. And, it will continue to impact future generations who might never know what it is to have that connection to land and environment.

In their seminal paper on 'Indigenous refusal in research', Tuck and Yang (2014) note that the biopolitical modes of control over Indigenous peoples in a settler state include the rupture of the epistemic, ontological, and cosmological orientation of Indigenous relationships to the air, land, and water around them and that in order to make research meaningful to Indigenous contexts we have to limit the institutions of power by interrogating the biopolitical architecture of their power and the processes they have used to control the data collection and knowledge production.

The *Piktukowaq* environmental health interpretive framework that was developed with the *Piktukowaq* Knowledge Holders intends to give some of the control back by conveying the sacred connection to the air, land, and water that was ruptured when *A'se'k*

became Boat Harbour. The framework makes the impacts of land displacement and environmental dispossession more explicit and, more importantly, relevant to the experiences of the community. The knowledge that is gained through the application of a culturally appropriate interpretive framework reflects not only the deep and sacred relationship to the land and environment but it also conveys the norms and values that guide those relationships. This framework is based on a relevant relational epistemology in which the *Piktukowaq* can translate their experience. In the final chapter, I will take the wisdom of the Knowledge Holders as the basis for making recommendations that can guide further environmental health research, not only with the *Piktukowaq,* but Indigenous peoples more generally. This framework, I would argue, has potential transferability to other Indigenous contexts and could ensure that any research findings are culturally appropriate and meaningful.

CHAPTER 7 DISCUSSION AND CONCLUSIONS: "…LONG SUFFERING IS A MASTERFUL UNDERSTATEMENT OF THE OBVIOUS"

In Canada, First Nations are burdened by a disproportionate share of waste streams and the associated environmental risks and harms (Mascarenhas, 2007). The Nova Scotia government has formally recognized this in the case of what has occurred at Pictou Landing First Nation (PLFN). In 2008, then Nova Scotia Minister of Transportation and Public Works, the Hon. Murray Scott, wrote a letter to then Chief Anne Francis-Muise recognizing the adverse impacts of the effluent treatment facility on the PLFN community members (Nova Scotia Legislature, 2017). In the letter, Scott pledged that the province was finally committed to closing the treatment facility "…to end the negative impacts on [the PLFN] community caused by the Boat Harbour Effluent Treatment Facility (BHETF)", the effects of which were echoed by Minister of Justice and Aboriginal Affairs, the Hon. Michael Baker, who stated "that the Band has been long suffering would be a masterful understatement of the obvious" (Nova Scotia Legislature, 2017, p. 11).

Not surprisingly, given the legacy of how Indigenous people are treated and, more specifically, how PLFN has been treated since 1965, by 2014 the province was no closer to following through on those commitments than it was at the time the minister wrote his letter, or for that matter, than decades earlier when concerns began to emerge. Fate intervened on June 10 of that year however when a pipe carrying effluent to the BHETF ruptured and released 47 million litres of untreated effluent on the Pictou Landing side of the East River (Figure 6.2), and into wetlands which included the traditional burial grounds of PLFN (*R. v. Northern Pulp Nova Scotia Corporation*, 2016). The Northern Pulp Mill could not operate without the effluent pipe being repaired, so the residents of

PLFN, including their Elders, banded together and prevented the mill and government officials from accessing and mending the pipeline until a commitment was made that the province would shut down the BHETF (Northern Pulp to Shut Boat Harbour, 2015). This resulted in economic impacts for the mill, its workers, their families, woodlot owners in the province, and the province itself. By June 14, 2014, the First Nation and the Province signed an agreement-in-principle which committed the Nova Scotia government to enact legislation by June, 2015 which would require them, by law, to close the BHETF and begin the remediation process by 2020 (Brannen, 2014).

In 2016, Northern Pulp Nova Scotia Corporation, the current owner of the mill, was found guilty of dumping a deleterious substance into fish habitat under the *Fisheries Act* as a result of the spill in 2014 (*R. v. Northern Pulp Nova Scotia Corporation*, 2016). The presiding judge in the case said the decades of injustice that PLFN has suffered was so "conspicuous and notorious as to be beyond dispute" (para. 25) (*R. v. Northern Pulp Nova Scotia Corporation*, 2016). Further, he noted, the traditional structures of power need to listen to the truths of the Elders who have overcome "enforced silence" and are ready to be heard (para. 29) (*R. v. Northern Pulp Nova Scotia Corporation*, 2016).

In this final chapter, I highlight the theoretical, methodological, and substantive contributions that I might not have achieved without hearing the insight and having the guidance of the Pictou Landing Native Women's Group (PLNWG) and the Knowledge Holders of PLFN. In the process of seeking to answer whether the land displacement and environmental dispossession was affecting the physical, mental, emotional, and spiritual health of the community, I made a determination that methodology matters. It is important to hear how Indigenous people perceive health, to take into consideration their

Indigenous knowledge, and to hear their concerns. This is especially true in instances like the one experienced by PLFN. This dissertation is testament that they have been heard. The chapter concludes with recommendations on how to advance environmental health research with Indigenous communities. I end by reflecting on my research journey and leave the concluding remarks to one of the Knowledge Holders from PLFN.

7.1 Significance of the Research Contributions and the Implications for Environmental Health Research in Indigenous Communities

The research that I have undertaken in this dissertation makes a number of theoretical, methodological, and substantive contributions to the environmental health, environmental assessment, and research methodology literatures that may be of guidance to researchers when they undertake research in Indigenous communities. What follows is a summary of these contributions and a brief overview of how the research can contribute to improved environmental health in Indigenous communities. Theoretically, by focusing on the power structures that are responsible to oversee the impacts of the BHETF on the health of PLFN, I can demonstrate how decisions are still made that directly impact the health of the PLFN and continue to put them in harm's way. Tuck and Yang (2014) argue that to limit power, the biopolitical architecture of power needs to be interrogated. I then provide a new theoretical approach that builds on *Etuaptmumk* (Two-Eyed Seeing) to guide the development of appropriate determinants of health in situations where the health of Indigenous communities is impacted. Methodologically I suggest how this should be done from a *Piktukowaq* approach, but suggest that the approach can be applied in other Indigenous contexts where Indigenous communities have had similar experiences to PLFN. Substantively I provide new considerations for environmental health risk assessment involving Indigenous communities who may be impacted by land

displacement and environmental dispossession.

7.1.1 Theoretical Contributions

I draw on the need for the structural determinants of Indigenous health to be taken into consideration when researchers are investigating health outcomes in Indigenous communities, as put forth by de Leeuw, Lindsay, and Greenwood (2015). The Truth and Reconciliation Commission (2015b) recognizes that the political policies and mechanisms used within Canada's colonial history continue to impact the health of Indigenous peoples and their communities to this day. This is evident in the disruptions to family and social structures, in the degradation of cultures and languages, and in experiences such as the intense racism and discrimination that is aimed at Indigenous people (Truth and Reconciliation Commission of Canada, 2015d). Without such reports, the federal Indian Health Policy might still attribute poor health outcomes in Indigenous communities to poverty and community decline while underfunding the very actions they know would contribute to improving those outcomes.

In Chapter 2, I present how Canada has in the past, employed legislation such as the *Act to encourage the gradual civilization of Indian Tribes in the Province* (*Gradual Civilization Act*) (1857) or the *Indian Act* (1876), with membership provisions about Indian status, as a technology of power to regulate Indigenous identity (Brigg, 2007; Dietrich, 2017; Lindroth & Sinevaara-Niskanen, 2014; Morgensen, 2011; Stevenson, 2014). The state turned to survey data to focus on the Indigenous body as a body in crisis, as diseased and dysfunctional, in order to substantiate the interventions that were imposed on Indigenous populations (Kelm, 1998; O'Neil, Reading, & Leader, 1998; Reading & Nowgesic, 2002). In fact, in Chapter 3 I note how the state presented an

account of high infant mortality in Indigenous communities when the data did not even exist to make such a claim (O'Neil, 1993). This, as Legg (2005) argued, was a biopolitical project where knowledge formation about Indigenous peoples and their health validated the biopolitical narrative, a narrative that Foucault (1973) would refer to as a technology of power. The dominant narrative created a problematic that needed to be managed, and therefore, justified the interventions (Kelm, 1998; Morgensen, 2011).

This is still evident. The dominant narrative about Indigenous people does not come from what is observed and certainly does not come from what is observed by those who are oppressed (Tuck & Yang, 2014). I argue that biopolitics and biopower have continued into the actions of the Joint Environmental Health Monitoring Committee (JEHMC), tasked with overseeing the health of the PLFN. The JEHMC has maintained that the health of PLFN has not been impacted by the BHETF. Any impacts from the mill could be discounted by the impoverished conditions of the PLFN community, as it is clear in the health literature that First Nations are some of the most impoverished communities in Canada (Adelson, 2005; King, Smith, & Gracey, 2009; Reading & Wien, 2009). Yet, when I examine income as a determinant of health in Chapter 5 (Figure 5.1 and Table 5.1), PLFN has fewer people earning under $20,000 per year than First Nations at both the provincial and national levels, but experience poorer health outcomes.

If biopolitics and biopower are about silencing voices, the JEHMC has done so. If the federal government is in a relationship of reconciliation with Indigenous communities in Canada then committees like the JEHMC, comprised of four representatives of Canada (Indigenous Affairs, Health Canada, Environment Canada, and the Department of Justice) and four representatives of PLFN, should no longer be tenable. Holifield (2010)

calls the science that comes out of structures like the JEHMC 'regulatory science', that is, they produce science that is subject to judicial review, legislative oversight, political pressures, and socially constructed interpretations. Identifying the biopolitical regimes and the forces of biopower evident within government structured bodies like the JEHMC, make the decisions coming out of them less potent because it is possible to highlight how the studies conducted by structures like this exist only to further a narrative that can be approved by a colonial state still functioning in a biopolitical mode.

The government may continue studies that employ inappropriate frameworks like the *Risk Analysis for Decommissioning Boat Harbour Stabilization Lagoon Tidal Flushing Option* (Jacques Whitford Environment Limited, 2004) or the 2012 report tabled by Dillon Consulting Limited that I outlined in Chapter 2 (I address this further in Section 7.1.3 when I discuss the methodologies used in these studies) for research on the environmental health of Indigenous people, but this is where Indigenous leaders – elected, hereditary, and grassroots – along with the research community can hold these structures to account. Environmental health research involving Indigenous peoples that involves government agencies must be rethought and revisioned. As Reading (2015) argues, not enough attention is paid to the structural factors that impede Indigenous health which are linked to the colonial relationship that endures in Canada and in the many decisions that impact how Indigenous communities continue to live on their land and in their traditional territories. I conclude, that indeed, it may be the structural factors that are the most important determinants of health in an environmental context and especially in the context of PLFN.

I have demonstrated, by the findings in Chapter 5, that the knowledge produced by JEHMC had limited utility to PLFN because it did not reflect their lived reality. Had the JEHMC made use of data held at Statistics Canada and was accessible to the federal government members of the Committee, or made use of data that was publicly available, they could have made a determination just on the strength of that evidence alone that the health of PLFN was in fact being impacted. In Table 5.2 I was able to determine that despite higher education and employment, PLFN health outcomes were poorer compared to non-Indigenous Canadians at the county, provincial, and national levels.

More disconcerting, however, is that the JEHMC did not even consider some of the more serious issues that were being raised by the community like asthma or cancer. I explore these two issues as the environmental and social justice issues I believe them to be. In Figures 5.3 and 5.4, I present how asthma rates compare in the four to eleven-year age group and in the 12 years and older group. While PLFN suffers lower rates of asthma in the younger group, the rates increase to double or more in the older age group. The findings were consistent with what members of the PLNWG believed was happening in the community, that people were beginning to suffer asthma symptoms as they got older. In Table 5.3, I present cancer data that evidences the high rates of cancer in PLFN compared to the combined rate of all First Nation communities in Nova Scotia, and to non-Indigenous Canadians at the county, provincial, and national levels.

Moving beyond what was overlooked in the work of the JEHMC, I then analyze the health of PLFN using a culturally appropriate environmental health theoretical framework to look at the health outcomes of PLFN over time to assess the impacts of the land displacement and environmental dispossession caused by siting the BHETF at

A'se'k. The relationship between Indigenous peoples and the land and environment around them is sacred and central to identity. This is not new. Elders, traditional Knowledge Holders, and many others, have expounded on this (see Battiste, 1998, 2000; Battiste & Youngblood Henderson, 2000; Ermine et al., 2004; First Nations Centre, 2007; Pierotti, & Wildcat, 2000; Tuhiwai Smith, 2012). Yet the resistance to this reality is still evident, especially in decision-making structures of power like the JEHMC that have control over the decisions that affect the health of Indigenous communities.

Increasingly, environmental health researchers are developing innovative and inclusive approaches to ensure that research is reflective of place-based identities thereby making research outcomes more relevant to the needs of Indigenous communities (see Castleden, Garvin, & Huu-ay-aht First Nation, 2009; Cunsolo-Willox et al., 2012; Martin, 2012; Richmond & Ross 2009; Tobias & Richmond, 2014). Today it is expected that Indigenous health research must embrace an understanding of how Indigenous knowledge systems, worldviews, spiritualties, cultures, and languages depend on a strong relationship to land and environment, and how that relationship contributes to overall Indigenous health and well-being (de Leeuw, Lindsay, & Greenwood, 2015).

To this end, my dissertation makes a contribution to the Indigenous environmental health literature by presenting a *Piktukowaq* environmental health theoretical framework that privileges the place-based epistemological, ontological, and axiological understanding of the *Piktukowaq*[37] place in the world, using the Mi'kmaw language to convey the *Piktukowaq* understanding of how their world works (Figure 6.5). The

[37] A person from *Piktuk*, the Mi'kmaw name for the traditional territory of the *Piktukowaq*.

Piktukowaq environmental health theoretical framing allows for the development of appropriate measures that centre relationships to land and environment, and the importance of *A'se'k* to the physical, mental, emotional, and spiritual aspects of *Piktukowaq* health, as well as the health of their families and community and the health of their culture, language, and traditional practices.

The Indigenous knowledge generated from this framework allows me to orient the reader to how the *Piktukowaq* understand their place in the world so that there can be a deeper contextual understanding of how the effluent facility has impacted the *Piktukowaq* epistemological, ontological, and axiological foundations. In Figure 6.6 to Figure 6.9, I apply this theoretical framework to the interpretation of the oral histories to demonstrate the health enhancing aspects of the *Piktukowaq* relationship to *A'se'k.* Through the guidance of the Knowledge Holders in the community I was able to counter the biopolitical narrative of the JEHMC to articulate the extent of the alienation of the *Piktukowaq* to the air, land, and water of their traditional territory of *Piktuk*. In Figures 6.10 to Figure 6.13, I was able to illustrate the health suppressing aspects of Boat Harbour. Building on this framework has had important implications for the methodological choices I have made, which I now present.

7.1.2 Methodological Contributions

The failure of the JEHMC to produce studies that PLFN could be confident in is reflective of two problems with methodology. First, the western approach to science renders Indigenous knowledge unscientific because, from a western perspective, it is not considered universal or replicable (Holifield, 2010). Secondly, the western approach to science is unable to articulate the deep and sacred connection that Indigenous people

have to their land and environment in ways that are meaningful to the community. To be able to do so would require western trained scientists to privilege Indigenous knowledge in their methodologies, something that has not happened in the academy until very recently (and only in certain domains) and certainly not in the context of the environmental impacts at PLFN.

Making the dissertation meaningful to PLFN would require a new methodological approach. I employed an *Etuaptmumk* (Two-Eyed Seeing) approach to the research that embraced both a community-based participatory research (CBPR) methodology to collect baseline health data in the community, and a *Piktukowaq* environmental health research methodology which guided the collection and analysis of oral histories. The *Piktukowaq* environmental health research methodology is grounded in prioritizing and validating the *Piktukowaq* way of being in the world to reveal the sacred connection that the *Piktukowaq* have to *A'se'k*. It is, as I outline in Chapter 4, in taking such an approach that I can more accurately reflect the *Piktukowaq* way of being in the world that I am able to generate results that more accurately reflect the reality that they have lived for fifty years.

Using a culturally appropriate definition of health, I presented findings in Table 5.4 on the four dimension of health (physical, mental, emotional, spiritual), which indicate that in addition to poorer health outcomes, there are higher rates of depression in PLFN than what is expected in the general population. Moreover, when I interrogate the four dimensions of health with other aspects that are important to Indigenous people, like connection to environment, cultural practices, and the importance of connection to family and community, I find these measures do not operate uniformly across the four dimensions of health. This is an aspect of the methodology that is a unique contribution

to the environmental health literature, or Indigenous health literature more broadly, as I did not find that this approach to health had ever been explored elsewhere. Focusing on the structural determinants of health for PLFN (Table 5.6), it was evident in all instances, using the measures of residential school, racism, and loss of language, that these measures have varying degrees of impact across the four dimensions of their health (physical, mental, emotional, and spiritual). What I suggest is that in instances where communities are faced with limited resources to address the health inequities within their communities that may come about as result of land displacement and environmental dispossession, this methodological approach may inform decisions as to where the health interventions may become most effective.

Incorporating a *Piktukowaq* environmental health methodology makes the findings even more relevant because it grounds the understandings and perceptions of how land displacement and environmental dispossession have impacted the PLFN community. Re-imagining Indigenous environmental health research, especially when one is considering impacts of land displacement and environmental dispossession on Indigenous communities, requires that we build on the wisdom behind the principle of *Etuaptmumk*. Insights from the PLFN Knowledge Holders ensured that the research reflected the *Piktukowaq* place in the world and the nature of their relationship to *A'se'k* which illuminated health measures that had not been considered previously.

This is not to say that this approach can be translated universally to all Indigenous worldviews—*Piktukowaq* knowledge only applies to the place it was created, in *Piktuk* (Battiste & Youngblood Henderson, 2000). By using Mi'kmaw words to convey the sacred relationship that the *Piktukowaq* have with nature allowed me to convey the

profound impact that disrupting that relationship with *A'se'k* had on the community of PLFN. I suggest that by adapting this approach to the specific needs of individual Indigenous groups, it can illuminate attachment to place and the sacred relationship to traditional lands by using the knowledge systems about these places that are relevant to the individual communities.

7.1.3 Substantive Contributions

The reason that I was interested in whether methodology matters is that from the first meeting with the PLNWG in 2010 it was clear that the JEHMC reports were not reflecting the concerns in the community, and therefore, were not meaningful to them. Yet the work of the JEHMC continued unabated. In fact, Hoffman et al. (2015) confirm that Dillon Consulting raised the community health concerns in the 2012 study that they submitted to the JEHMC, reiterating that there was little confidence in the work that was coming out of the Committee. I set out to determine what would make the work of the JEHMC more relevant and more effective if they are to continue their oversight of the health of the PLFN community. To that end, I looked at the methodology guiding the JEHMC in assessing health and risk to the health of the PLFN community.

Environmental health risk assessment is a process of evaluating the magnitude and probability of exposure to an environmental health hazard to an individual or population with the goal of providing the best possible information to inform decision-making around risk management (Friendship & Furgal, 2012). Environmental health risk assessment in Indigenous contexts has evolved over the past two decades. For example, Harris and Harper (1997) recognized that the lifestyle of the Confederated Tribes of the Umatilla Indian Reservation in Oregon was a living religion that included an

environmental responsibility to the land. They set out to develop a scenario analysis tool that would capture the unique exposures of the Umatilla who continue to follow a traditional cultural-religious way of life (Harris & Harper, 1997). They developed appropriate measures to assess including being exposed to contaminants as a result of inhaling or absorbing steam in a sweat lodge, through smudging with local medicines, or by using local tree bark in basket making. Harper et al. (2002) worked with the Spokane Tribe in Washington state who follow a subsistence lifestyle and face exposures to uranium mining. Harper et al. (2002) developed a general risk assessment tool for a rural/remote mobile subsistence lifestyle, which included measures that reflected activities such as sitting on the ground during ceremonial activities or dancing outside during powwows and included community-level exposures in addition to the individual level exposures that are more relevant to collective societies. Furthermore, Harper et al. (2002) highlighted the importance of including non-site contamination as part of a cumulative total risk assessment for total toxicant burdens appropriate and analogous to hunting and gathering societies, and included measures to capture co-risk factors such as metabolic disorders like diabetes which are known to influence health response to chemical exposures, and cumulative psychological stress (Harper et al., 2002).

Arquette et al. (2002) noted deficiencies in health risk assessment models in their work with the Akwesasne First Nation whose members were concerned over exposures to polychlorinated biphenyls (PCBs) coming from industry along the St. Lawrence River. Akwesasne members were known to challenge researchers who made recommendations about the benefits of changing fish consumption patterns and the gathering of medicines as a positive step toward minimizing risk. In fact, researchers who made such

recommendations were surprised when Akwesasne members did not agree that a change in traditional cultural activities meant a reduction in adverse health effects (Arquette et al., 2002). When community members conveyed the adverse health effects that result from a reduction in cultural activities to the government agency personnel in risk assessment processes, they were often met with disinterest and "eye-rolling" and were told that their stories were of little relevance to scientific risk-based decision making (Arquette et al., 2002, p. 261).

Holifield (2010) notes how knowledge that is place-bound, or local, is deemed unscientific because under peer-review it may not be universal, it may not be able to be replicated everywhere, or it may not be otherwise verified, making it even more problematic when it becomes part of 'regulatory science'. Regulatory science, unlike academic science, has to go through judicial review and is potentially subject to intense political pressure (Holifield, 2010). Human health risk assessment is an exemplar of regulatory science, that is, scientific activities are conducted to provide the basis for public policy decision-making, usually in a cost-effective and timely manner, which is different from the goals of academic science, which is that of accuracy (Holifield, 2010, p. 231-232; Todt, Rodriguez, Alcázar, & Luján, 2010). I suggest that regulatory science is what we see approved in the JEHMC studies and is reflected in the oversight of the assessment process of risk to PLFN. In fact, as I noted in Chapter 2, soon after JEHMC was established the federal government added the Department of Justice to their team making the work of JEHMC subject to the oversight of federal government legal experts.

The Pictou Landing Risk Assessment conducted in 1997 employed human health risk assessment procedures used by the regulatory agencies such as Health Canada and

the United States Environmental Protection Agency (CanTox, 1997). Briefly, these procedures identify exposure limits for potential chemical exposure pathways to human receptors, in this case a female toddler (more sensitive because of body size and because females are more sensitive to chemical exposures than males) and adult female (because chemicals can pass from mother to infant through breast milk). Health Canada guidelines provide human receptor characteristics for Indigenous populations but limit them to those only for the ingestion of fish and wild game. Otherwise, exposure assessments are to be equivalent to those of the general Canadian population (Health Canada, 2010). Without being given further details on their methodology, I cannot determine what, or if any, aspects of the EPA guidelines CanTox might have applied. The CanTox Human Health Risk Assessment in PLFN's case used an aquatic food chain and fish-eating wildlife scenario, seemingly in line with Health Canada guidelines, to make a determination that because PLFN residents had stopped eating fish and wildlife from the area, they were not concerned that the health of PLFN would be impacted by chemical exposures coming from the BHETF (CanTox, 1997), much like the results that were given Akwesasne.

In this dissertation, I have shown that the human health risk assessment methodology currently in use by regulatory agencies such as Health Canada is insufficient to assess environmental health impacts in Indigenous communities because it does not capture the lived reality that many Indigenous communities are facing, especially in cases of land displacement and environmental dispossession. This is common in the use of regulatory science where there is a higher degree of 'under-determination' or uncertainty in the science that is produced for these purposes (Todt et al., 2010). In an Indigenous context, human health risk assessment must evolve to be

able to accommodate worldviews that do not separate the human community from the non-human environment and, therefore, must be able to recognize the number of human/non-human associations that are at risk (Holifield, 2010). Therefore, I suggest, there needs to be an Indigenous Environmental Health Risk Assessment approach developed that is adequate for assessing environmental health risk in an Indigenous context.

What should human health risk assessment in an Indigenous context look like? Human health risk assessment in an Indigenous context has to incorporate appropriate indicators for operationalizing and quantifying impacts in ways that capture the unique relationship to land and environment, but that also capture the unique structural determinants of health to reflect a history that possibly compounds the health inequities that most Indigenous communities experience. Based on these theoretical, methodological, and substantive contributions I have presented, I will now present some recommendations for advancing these contributions to further Indigenous environmental health research.

7.2 Recommendations

I propose several recommendations presented in a way that can instruct and inform policy and decision-makers, can support Indigenous communities as they move forward to protect their health, and can be guidance for further research when Indigenous communities are faced with land displacement and environmental displacement.

7.2.1 Indigenous Environmental Health Risk Assessment

The unique Indigenous cultural exposures are not taken into consideration in human health risk assessment because it is considered to be too expensive or time-

consuming to assess, and therefore, result in these kinds of considerations not being defined or prioritized (Holifield, 2010; Ranco et al., 2011; Todt et al., 2010). I was able to demonstrate in Tables 5.4 to 5.6, using a more culturally appropriate definition of health, how important it is to take these considerations into account because, as is determined in the case of PLFN, these impacts may not be operating as expected across all dimensions of health. The process does not have to be time-consuming, as this methodology could be replicated more broadly.

Shandro et al., (2017) conducted a health impact assessment using a more culturally appropriate approach to determine the health impacts of the Mount Polley Mine tailings storage facility breach on the Fraser River watershed and their potential impacts on the First Nations in the area. An assessment of the impacts conducted by the owners of the mine and the British Columbia government neglected to assess impacts to the First Nations in the area, or the potential impacts on their health (Shandro et al., 2017). Conducting their health impact assessment in an environmentally, socially, and culturally appropriate way, Shando and colleagues (2017) were able to identify impacts to traditional territories, fishing practices, emotional health, diets, and physical activity. They also identified the increased burdens placed on First Nation administrations to get an accounting of what had transpired as a result of the tailings breach, in order to be able to reassure their residents about the concerns they had expressed. Shandro et al. (2017) recognized that environmental dispossession and the ability to pursue traditional practices like salmon fishing are central to First Nation identity. They also noted that social and cultural impacts extend beyond the individual to family and community and advocated

for health, environment, and sociocultural baseline data collection in order to monitor change over time to the First Nations they studied.

Indigenous knowledge in environmental assessment processes is marginalized. The information contained in oral histories used to inform these processes is much more substantive than mapping where people pick berries or medicines or where people go to hunt or fish. Environmental assessment and health impact assessment processes must advance the incorporation of how Indigenous worldviews are disrupted and the cascading impacts this has on the health of the individuals and the collective. Land displacement and environmental dispossession contributes in a much more nuanced way to the health inequities experienced by Indigenous peoples, as I have shown. It is evident from this dissertation that human health risk assessment in an Indigenous context has to be inclusive of the appropriate definitions of Indigenous health, including the importance of, and the value and benefits for, the continuation of being on the land and opportunities to pursue traditional activities.

7.2.2 Achieving Environmental and Social Justice

When Wang et al. (2012) undertook the synthesis review and gap analysis of the seventy environmental studies that had been produced from 1968-2007 concerning Boat Harbour, the study concluded that between 1971, when the first Pulp and Paper Mill Effluent Regulations came into effect in Canada, and 1992, when the federal government enacted stricter enforcement of those regulations, the Boat Harbour facility was not compelled to comply because the mill had been built before 1971. In fact, when the pulp mill was first built in the 1960s, there were no environmental laws and regulations in place at all, either at the provincial or federal levels. So, when a representative of the

Nova Scotia Water Authority (precursor to the Nova Scotia Department of Environment), along with a federal representative of INAC, met with PLFN community members on August 25, 1965, to start the discussion about siting the BHETF next to their community, there were no environmental restrictions in place to ensure that the PLFN community was protected against environmental harms.

At that initial meeting, community members, as well as members of the local non-native community, expressed their concerns about the loss of access to fish and shellfish, the exposure to odours, the loss of use of Boat Harbour for recreation, and the loss of land that PLFN considered theirs (Nova Scotia Legislature, 2017). The officials assured those who were present at that meeting that after damming off Boat Harbour to Northumberland Strait, Boat Harbour would become a freshwater lake suitable for freshwater fish and boating (Nova Scotia Legislature, 2017). According to Knowledge Holder Mary Ellen [2012], "everything was supposed to be ok…[t]he water was supposed to be good… That's what they were saying…". Despite those assurances, all members of PLFN present at the meeting were against the BHETF (Nova Scotia Legislature, 2017). To further mislead the community about the impacts, representatives of the Nova Scotia Water Authority took then Chief Louis Francis and Band Councilor Martin Sappier to a sewage disposal system in Renforth, New Brunswick on October 10, 1965, and told the PLFN leaders that the sewage disposal system they were visiting was similar to the industrial effluent treatment facility that was being proposed at Boat Harbour (Nova Scotia Legislature, 2017). Smelling no odour and seeing that the water appeared to be of good quality, the Chief and Councilor signed an agreement that gave permission for the facility to be sited within Boat Harbour, a decision which brought the

effluent to the shores of PLFN (Nova Scotia Legislature, 2017).

One of the Knowledge Holders recalled of that time,

> Me and my brother…remember my uncle coming in, and [two] men dressed in black. The government man was…with the Indian Agent…And you have these guys coming into your house and you don't know who they are and… I remember my uncle really nervous and just uncomfortable, and…[he] didn't know what the heck was go[ing to] happen…Diane recalled that Martin Sappier said "they took us to Saint John to show us…what our water will be like". But what they were shown was clean water coming out of something. That's what they were shown. They were told, that's [how] our water will stay. But it wasn't like that at all. [Diane, 2012]

In 1992, regulations were enacted that required more stringent requirements for the discharge of dioxins (polychlorinated dibenzodioxins) and furans (polychlorinated dibenzofurans) (Wang et al., 2012). Dioxins and furans are highly persistent compounds found in pulp and paper mill effluent that can cause serious health issues (PLNWG et al., 2016). However, between 1967 and 1992, no environmental regulations applied at all to the discharge of the effluent from the facility, and it is this gap in regulatory oversight that concerns the PLNWG about the potential exposures to their community. When the JEHMC was structured in 1993, I would suggest that the 'regulatory science' employed to guide the work of the Committee prevented an adequate assessment of exposures, and I would argue that it placed PLFN in harm's way. The asthma data that I present in Figures 5.2 to 5.4 and the cancer data that I present in Table 5.3 could have been assessed, and more important, appropriately mitigated.

According to Withrow et al. (2016), cancer is understudied among Indigenous people since there are no ethnic identifiers in the Canadian Cancer Registry data collection process. This issue has also been raised by the Alberta First Nation Information Governance Centre (2015) and the Chiefs of Ontario Office and Cancer Care Ontario (2016). While this is true, I have found that by using census subdivision codes, I was able to get to the data for Indian reserves. This dissertation is the first to explore cancer diagnosis at the PLFN level and to provide the community with comparative data to rates of diagnosis in Nova Scotia First Nations as a whole, and non-Indigenous populations at the county, provincial, and national levels.

7.2.3 Reconciliation

Canada is in an era of reconciliation with Indigenous peoples. The Truth and Reconciliation Commission calls on government to recognize that the state of Indigenous health in Canada is a result of government policies and to recognize the health care rights of Indigenous people and to work towards closing the gap in health outcomes (Truth and Reconciliation Commission, 2015a). Furthermore, there are important legislative, constitutional, treaty, aboriginal, and human rights aspects to Indigenous groups being able to enjoy the continuation and protection of their lands and traditional practices. In August, 2016, then Minister of Indigenous and Northern Affairs Canada, Carolyn Bennett, addressed the United Nations Permanent Forum on Indigenous Issues to formally announce the removal of Canada's objector status to the United Nation Declaration on the Rights of Indigenous Peoples, and committed that Canada would endorse the Declaration without qualification (Fontaine, 2016). In December, 2016, the Prime Minister of Canada committed to a process that would advance reconciliation with

Indigenous peoples and would start to implement the Truth and Reconciliation Commission Calls to Action (Justin Trudeau, n.d.). A year later, in December, 2017, Canada announced the formation of an Interim Board of Directors for a National Council for Reconciliation (Government of Canada, 2018).

While the details of what this might mean for Indigenous peoples is still being worked out, I would argue that if Canada is truly interested in improving the health of Indigenous peoples in this country, structures like the JEHMC need to be dismantled, and Indigenous groups need to be given the autonomy to self-determine how environmental risk might more appropriately be assessed in the context of how they aspire to exist on their traditional lands. This dissertation should stand as powerful evidence of the inadequacy of the biopolitical structures that still exist, that seek only to advance a narrative that is no longer in line with a platform of reconciliation, and that actually are harmful to Indigenous communities. The work of the PLNWG has demonstrated that Indigenous communities are up to task of correcting the faulty 'regulatory science' produced by these biopolitical mechanisms like the JEHMC, which seemingly exist to further the position of the state and not the communities they are intended to protect.

7.2.4 Relocation is not an Option

This finally brings me to provide a comment in support of Indigenous groups remaining on their traditional lands. The federal government repeatedly offers the possibility of relocation when Indigenous communities are in the way of development. This has been offered to PLFN. In 1993, the *Pictou Landing Indian Band Settlement Agreement* included a $15 million fund to enable members of PLFN to relocate. Relocation is not the panacea for all the problems that Indigenous communities encounter

when faced with land displacement and environmental dispossession. First of all, as it is clear from the Environmental Health Survey (EHS) and oral history data, *A'se'k* was and is tied to the *Piktukowaq* identity. *A'se'k* is part of the traditional lands of *Piktuk.* Relocation has never been considered in the context of how it might harm the community even more, if in fact it was to happen.

Relocation is often considered as a reasonable alternative for many Indigenous groups who have been exposed to environmental harms by government decisions. The failure of relocations has been noted by the Royal Commission on Aboriginal Peoples (RCAP, 1996a), citing the example of the self-sufficient and independent Cheslatta Carrier Nation in northern British Columbia, one of many who were relocated to make way for hydroelectric development in the 1950s. In this instance, the Cheslatta Carrier lifestyle was drastically altered when their traditional land base was flooded and within a year of a forced move, what was formally a self-sufficient community, became totally dependent on welfare and experienced an increase in addiction-related deaths (RCAP, 1996a). This scenario has played out in the impacts of hydro-development over and over across Canada, with the same devastating effect on communities.

Relocation, like historical trauma, has been shown to be a highly disruptive and stressful event for Indigenous communities, effects which can endure for generations (Walls & Whitbeck, 2012). In fact, the impact of relocation, like the impacts of residential schools, may be cumulative over time with other historical cultural losses (Walls & Whitbeck, 2012). When asked to answer a statement posed in the EHS, "I would continue to live here even with the opportunity to leave," 42% of the heads of household who responded on behalf of their families (n = 126) indicated they would stay.

7.3 Challenges and Lessons Learned

That conducting human environmental health risk assessment using appropriate Indigenous cultural exposures is viewed as too expensive or time-consuming (Holifield, 2010; Ranco et al., 2011; Todt et al., 2010), will mean that assessments will continue to not reflect the lived reality of affected Indigenous groups who face land displacement and environmental dispossession. I do not believe that this rationale is acceptable for why culturally appropriate work cannot be done. The time it has taken, from first meeting the PLNWG in 2010, to develop the necessary tools to gather baseline health data from the on-reserve members of PLFN, to develop a health database, to produce data that could be analyzed, to then conduct the analysis and present the findings, has been seven years. Furthermore, the data collection exercise had to be limited to the on-reserve population because the resources to collect data from the both the on and off reserve population was limited. However, this study has laid the ground work for how community-level health data can be collected, how the impacts of land displacement and environmental dispossession should be assessed and, by also incorporating the structural determinants of health, provides a methodology that is more appropriate to assessing the overall health of Indigenous communities more broadly.

That PLFN has had to wait seven years for the conclusion of this dissertation to have definitive and trustworthy findings about their current health status has weighed heavily on me. I mentioned in the opening chapter, that I have been mindful of the harms that PLFN has endured for fifty 50 years. The process that the PLNWG committed to, and which has guided me throughout this dissertation, seeks to ensure that the harms end.

The fact that there was no data to start with speaks to the inequities that Indigenous communities in Canada experience and must deal with.

As is required in community-based participatory research, I presented this research to the PLNWG on June 4, 2018. The reaction of the PLNWG to the findings was what should be expected when you are dealing with the health of loved ones (PLNWG, 2018). The PLNWG then invited me to present to the Chief and Council, which I did on June 5, 2018. The reaction of the Chief and Council was that the community knew the outcomes already, and that my findings finally validated that their concerns were real (Pictou Landing First Nation, 2018). The Chief and Council then invited me to present to the entire community, and to present everything I had shared with them to the community. That meeting took place on June 11, 2018.

At the end of the community meeting, we asked for feedback, and a vote was taken on whether the work should continue. There was unanimous support. The community was very specific about the focus of future research, such as looking at the health of children and youth, or getting more recent data beyond what was collected in the Canadian Cancer Registry up until 2013, and in the Canadian Community Health Survey in 2014. One participant shared that they felt that the research needs to continue because without it, the community will continue to be discredited and left behind, as they have been. Sadly, another participant asked, “If the government could have accessed the asthma data, why didn’t they?”. This is exactly why I suggest that structures like the JEHMC are no longer tenable and need to be dismantled.

Guided by the needs of the community, I submit that it is no longer acceptable for government or regulatory agencies to say that doing appropriate human environmental

health risk assessment in Indigenous communities is too time consuming and expensive, because the approach that I have followed has finally given voice to the PLFN community, and now they see their lived reality reflected in the outcomes of the study.

7.4 Concluding Thoughts

In recent years, the province has committed to decommissioning the BHETF several times—in 1991, 1995, 1997, and 2005 (Nova Scotia Legislature, 2017). Things have only started to move in a more positive direction for PLFN in the past few years. In 2013, Chief Andrea Paul stated that the community has been carrying a heavy weight for decades and had lost all hope and trust that the province would ever live up to its commitments to deal with the effluent treatment facility that was dumping toxic waste on their shores (Nova Scotia Legislature, 2017).

In May 2015, it was announced that provincial legislation requiring the closure of Boat Harbour had received Royal Assent and therefore, by law, the Boat Harbour Waste Treatment Facility would be closed by January 31st, 2020, and full remediation efforts would commence (Northern Pulp to shut Boat Harbour, 2015). On April 27, 2018, Nova Scotia Minister of Environment Iain Rankin called the experience at Boat Harbour "one of the worst examples of environmental racism in the province, and possibly the country" and that rectifying the legacy of Boat Harbour would be one of the province's largest environmental remediation efforts ever undertaken (Bundale, 2018, para. 1). He announced that the remediation project would be registered for environmental assessment in the coming months, with remediation to be concluded by 2025 (Bundale, 2018). Let's hope that we do not have to add the years 2020 and 2025 to the list of commitments made that are then passed, unfulfilled.

I want to conclude my dissertation by recognizing the contribution that PLFN is making to the environmental health of other communities who may be going through similar experiences that they have had to endure. I have purposely not used the term wellness in relation to the health status of PLFN throughout the dissertation when I speak to the current health of PLFN, but will use the term when I speak to the health of the community when PLFN can self-determine their health. Wellness is what comes when a community can self-determine their own health, and put into place (or maybe in this case dismantle) the structures necessary to achieve wellness. I submit that wellness will be achieved through the use of this framework. The generosity of the PLFN spirit is reflected in the words that come from one of the Knowledge Holders in the community.

In the face of all that PLFN has endured, and the harms that have come to the health of individuals in their community, the concern for the health of others who may be impacted if the mill closes, or if the effluent is dumped elsewhere, is palpable.

> [I]f they're going to take that Boat Harbor away, where they going to put it? Exactly the same thing is going to happen somewhere else…[if] they close it they're going to have to start another one elsewhere. It's going to be the same story. I feel bad for [those] people too. (Mary Ellen, 2015)

In spite of everything that has happened at Boat Harbour, the sentiment was always evident that the PLNWG would not wish what happened to their community to happen to anyone else. May this dissertation, always under the guidance of the PLNWG, contribute to safeguarding against social injustice, environmental racism, and health inequities in Mi'kma'ki, across this nation, and around the world.

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