"The Disease that Knowledge Must Cure"?: Sites of Uncertainty in Arctic Development

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After nearly eight years of formal environmental review, in July 2016, the Canadian federal government rejected the French multinational AREVA's proposal to construct a uranium mine 80 kilometers west of Qamani'tuaq/Baker Lake, a small inland and mainly Inuit hamlet in the Kivalliq region of Nunavut. The decision not to grant a license for resource development based on a technical uncertainty (AREVA was not able to provide a start-date for the mining project due to a depressed uranium market) underlies a far more complex and ongoing negotiation with uncertainty. Sites of uncertainty are spaces — physical, temporal, emotional, material, discursive and so on—that are occupied by a state of not knowing. Based on recent qualitative fieldwork in Baker Lake, this paper will identify key sites of uncertainty where AREVA, government officials, Inuit organizations, and community residents constructed, negotiated, expressed, transformed, experienced, and responded to uranium mining as a resource development controversy. Our analysis reveals how AREVA understood uncertainty as the "disease that knowledge must cure", that is, the view that uncertainty is something to be reduced through the acquisition of increased expertise (Jasanoff, 2007: 33). This paper will demonstrate how this epistemological approach resulted in claims to certainty that were deeply contested and deconstructed when positioned against the contextual and relational knowledge of local residents. It will conclude by detailing how local residents' calls for improvements in education can be understood as a strategic intervention, one that is reflective of an intermeshing of Inuit and western epistemologies.

Introduction

> You affect the land, the people, you affect everything, and at the same time it's not just the start-up of the mine it's what happens to the mine with the decommissioning, where they are being decommissioned… Once AREVA leaves it [is] not like we can go down the road and talk to them, once they are gone they are gone, so AREVA can't help us in that area, the government can't help us in that area, there are so many unknowns, so many more unknowns in Nunavut because nobody can say exactly what the answer is, we know exactly how to contain everything, it's never been done how could they say that? (Inuit Interviewee, December 12th, 2016, Baker Lake)

On July 15th 2016, the Honorable Carolyn Bennett, Minister of Indigenous and Northern Affairs Canada[1], rejected French mining conglomerate AREVA's proposal (known as the Kiggavik Project), to develop a uranium mine 80 kilometers west of Qamani'tuaq[2]/Baker Lake. The decision

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aligned with the Nunavut Impact Review Board[3] (NIRB)'s recommendation that the Kiggavik Project not proceed at the time. The recommendation pivoted on what might appear to be a technicality: prior to the NIRB's Final Hearings, AREVA stated that, due to the depressed uranium market[4], the Kiggavik Project was not currently economically viable. As a result, AREVA was not able to provide a specific start date or development schedule during the final review process. The NIRB contended that this served to amplify existing knowledge uncertainties in the assessment, stemming from current limitations in scientific data related to the impacts on caribou, fish, and marine wildlife (NIRB, 2015a). This said, the NIRB explicitly stated that its recommendation did not preclude future approval, as AREVA may resubmit their proposal once they are able to provide a start date.

In this paper, we will argue that the Kiggavik Project deliberations, hotly contested and at times acrimonious, demonstrate diverging engagements with uncertainty. It will explore how AREVA's understanding of uncertainty as the "disease that knowledge must cure", that is, the view that uncertainty is something to be reduced through the acquisition of increased expertise (Jasanoff, 2007: 33), resulted in claims to certainty that were deeply contested when positioned against the contextual and relational knowledge of local residents. Studies in Baker Lake have focused on exploring the diverse, heterogeneous, and conflicting socio-economic and socio-cultural impacts related to relatively recent experiences with the mineral economy, and more specifically focused on the development of the Meadowbank Mine (Czyzewski et al. 2014; Makisimowski, 2014; Nightingale et al. 2017; Peterson, 2012; Rixen and Blangley, 2016). While these studies have identified a key disconnect between community concerns related to resource development and what is addressed and captured in formal review processes (Jones & Bradshaw, 2015; Bernauer, 2016), our paper focuses on what we term *sites of uncertainty*, which are spaces occupied by a "state of not knowing" (Cameron, 2015: 34). This theoretical framework will enable an exploration of diverging engagements with, and responses to, uncertainty in the context of resource development conflicts. Our empirical study employed qualitative research methods, including archival research[5], participant observation, and semi-structured interviews. This paper draws on fieldwork conducted in Baker Lake during November and December of 2016. This study consisted of 22 interviews. All interviewees were Baker Lake residents, 19 identified as Inuit and three identified as Qablunaat.[6] The sites of uncertainty framework acted as a point of entry into the controversy. While uncertainty and not knowing guided the research process, data analysis was performed in an inductive thematic manner; themes and issues "emerged" from the data (Reeves et al. 2008), yet always within the scope of this framework.[7]

We begin by situating the controversy within its historical context. Following this, we introduce the concept of sites of uncertainty. Drawing on this theoretical framework, we then outline AREVA's approach to uncertainty and explain how local residents contested and deconstructed AREVA's knowledge claims. We conclude by exploring how local residents' calls for improvements in education can be understood as a strategic intervention with uncertainty, one that served to deflect the decision into the future.

Uranium Mining Proposals and Baker Lake

Baker Lake is a small inland and mainly Inuit community in the Kivalliq region of Nunavut. Nunavut is the largest northern territory in Canada. Baker Lake is located close to the geographic

centre of Canada and has a population of fewer than 2,000 people (Ladik, 2013). As an inland community, local residents rely heavily on terrestrial wildlife including barren-ground caribou and to a lesser extent muskox, as well as Arctic char, lake trout, and other fish from Baker Lake (Scottie, 1992).

Baker Lake shares with other communities in Canada's Arctic a colonial heritage as profound as it is recent. Between 1913 and 1931, a Hudson's Bay trading post, Anglican and Catholic missions, and a permanent Royal Canadian Mounted Police (RCMP) station established European trading in Baker Lake (Bernauer, 2011; Dana and Anderson, 2014). The introduction of the fur trade initiated a relationship of economic dependence by transforming the prevailing subsistence hunting economy into a mixed subsistence-trading economy (Bernauer, 2015; Légaré, 2008; Hird 2016; Hird & Zahara 2017; Zahara & Hird 2015). However, it was not until after the Second World War that Inuit experienced intensive Canadian government interest, control, and governance. By the end of the 1960s, most Inuit in the Kivalliq region had relocated into settlements in large part because of the forced settler colonial education of their children (Bernauer, 2011; McGregor, 2010). Increased dependency on government economic support, cultural and economic transformation, and loss of political autonomy, land and resource control has had acute and ongoing economic, social and cultural implications. Many Inuit communities, including Baker Lake, now face severe challenges such as marginal access to health services, overcrowded housing, and high rates of food insecurity, unemployment, substance abuse, and suicide (Billson, 2001).

The difficult path to some degree of Inuit self-determination is too lengthy to describe here (but see Hicks & White 2000; Ritsema et al., 2015). Yet, its entanglement with mineral exploration activities, caribou habitat, and the Kivalliq region is particularly relevant for contextualizing the Kiggavik Project controversy. Since the late 1960s the region has experienced extensive and ongoing uranium exploration, which has resulted in the identification of multiple high-grade uranium deposits beneath sensitive caribou habitat (McPherson, 2003). Opposition to mineral exploration began in the early 1970s, mostly out of concern that these activities were adversely impacting caribou herds. In 1978, the Hamlet of Baker Lake, the Baker Lake Hunters and Trappers Association, and many local residents launched a court case to halt mineral exploration on Inuit hunting grounds, based on the claim that exploration was infringing on Aboriginal rights, including the right to hunt, fish, and move freely on traditional Inuit land (Bernauer, 2015; Elliot, 1983). While this court case recognized Aboriginal title, setting the stage for future land claim negotiations, it highlighted that unless Inuit could prove that their rights were being infringed upon, they had little control over land use management in the region: mineral exploration continued in the Baker Lake area (Bernauer, 2015; McPherson, 2003). After years of negotiations between Inuit organizations and the federal government, the Nunavut Land Claims Agreement (NLCA), the largest land claims agreement settled in Canada to date, was signed in 1993 (Légaré, 2008). The Agreement stipulates that Inuit organizations receive defined rights and benefits in exchange for the abolishment of their Aboriginal title. These rights and benefits include 1.14 billion CAD in capital transfers, ongoing royalties, ownership of just over 353,000 square kilometers of land (18% of surface rights), and mineral rights to 36,000 square km of that land (2% of mineral rights) (Légaré, 2008; Price, 2000). The Agreement further outlines protocols for rights concerning non-Inuit lands, resource development environmental assessments, and land-use planning (Cameron, 2015).

It is in this compromised social and economic context that Baker Lake residents have repeatedly found themselves at the centre of multinational extraction industry attention. Globally, Canada is the second largest producer of uranium. Currently, Canada's only operational uranium mines are located in the resource-rich area of northern Saskatchewan where the French multinational AREVA corporation has been actively involved in uranium extraction and processing (World Nuclear Association, 2016), and up until recently intense international industry interest was focused on exploiting and discovering new deposits. Historically, uranium mining proposals have been met with resistance from Baker Lake residents. In 1989, the German company Urangesellschaft (UG) proposed the construction of two open-pit uranium mines, a transportation corridor, a work camp, and a two-kilometer-long airstrip (McPherson, 2003). The proposal met overwhelming opposition from local residents, over 90% of whom voted against the proposed project (ibid). Shortly afterwards, UG abandoned their proposal and sold the property, which was eventually acquired by AREVA.[8] While resistance to uranium mining is still very vocal in Baker Lake, local residents' perceptions of risks related to uranium mining are increasingly divided (Bernauer, 2011; Ladik, 2013). This shift has in part been attributed to increases in employment opportunities from Agnico Eagle's Meadowbank Mine as well as provisions outlined in the NLCA that intend to create opportunities for Inuit to exert more control over extractive projects (Bernauer, 2011).

In 2008, AREVA submitted a proposal (the Kiggavik Project) to develop Nunavut's first uranium mine 80 kilometers west of Baker Lake. On two separate sites, the Kiggavik Project proposed to develop four open-pit mines and one underground mine. Had it been approved, the Project would have extracted and processed approximately 44,000 tonnes of uranium, consumed 1.4 billion tonnes of water per annum of operations, and produced a total of 11.5 million tonnes of tailings solids as waste, which would have remained on-site. All of this would have occurred in a permafrost environment with extremely high winds, which undermines the stability of long-term tailings storage and facilitates the rapid dispersion of contaminants if an accident were to occur. Moreover, the proposed site was located in close proximity to sensitive caribou habitat and the Thelon River, which flows directly into the community's drinking water source (AREVA, 2008; NIRB, 2015a).

The federal government's rejection of the proposal pivoted on AREVA's unwillingness to provide a start date for the mine's development, which AREVA claimed it was unable to specify due to the depressed uranium market. Essentially, AREVA wanted to secure extraction and long-term uranium tailings storage rights indefinitely and begin its operations in a more economically profitable climate. In the lead up to the federal government's rejection in 2016, the Kiggavik Project was highly contentious, uncertain, and faced significant community opposition. As this paper will demonstrate, this controversy underlies a complex and ongoing negotiation with uncertainty, one that calls for a cautionary and reflexive approach to claiming knowledge about the future.

Sites of Uncertainty

The federal government's decision regarding the Kiggavik Project is an outcome of what Callon, Lascoumes and Barthe refer to as a socio-technical controversy, which focuses on "situations of uncertainty" (2009: 21). These are situations in which:

> We cannot anticipate the consequences of decisions that are likely to be made; we do not have sufficiently precise knowledge of the conceivable options, the description of the constitution of possible worlds comes up against resistant cores of ignorance, and the behavior and interactions of the entities making them up remain enigmatic. The conditions required for it to be relevant to talk of risk are not met. *We know that we don't know, but that is almost all we know: there is no better definition of uncertainty* (p.21 (emphasis added)).

As Callon et al. (ibid) note, socio-technical controversies are engendered by both technical and social uncertainties whereby even the differentiation between what is technical and what is social may become the subject of controversy. Indeed, it is these shifting boundaries that drive the 'fluctuations' in the controversy depending on which actors enter the debate, what alliances are formed, what technological options are eliminated or revealed, and what type of information is being circulated. As such, the direction in which these controversies unfold is largely unknown and unpredictable; it depends not only on the nature and degree of these uncertainties, but also how some uncertainties are resolved through political, economic, social and/or cultural means (ibid).

Drawing on Callon et al.'s 'situations of uncertainty', in this paper we develop the concept of *sites of uncertainty* as an analytic framework with which to better understand the Kiggavik Project controversy. A site of uncertainty is a space—physical, temporal, emotional, material, relational, discursive and so on—that is occupied by a "state of not knowing" (Cameron, 2015: 34). As Cameron (2015) emphasizes, there are different ways of engaging with and relating to the 'unknown'; it is precisely these differences as well as their implications that will be explored through the sites of uncertainty framework. Indeed, this framework helps to reveal the unique and diverse dimensions of uncertainty that constitute these spaces and so too the controversy. More importantly, it helps us to trace the dimensions of uncertainty that are of interest (or not) to different actors and why.

In the following sections, we further refine this framework through an exploration of two key sites of uncertainty: the environmental impacts of the proposed project and its socio-economic costs and benefits. Through our empirical analysis, we identified these two sites as key areas of concern both at the community-level and during the environmental review process. We will investigate the various ways through which AREVA, government officials, Inuit organizations, and community residents negotiated, expressed, transformed, experienced, and responded to uncertainty at these sites. Our analysis contrasts two epistemological approaches to knowledge that were embedded in these sites: a western epistemology anchored by certainty gained through reason provisioned by a stable and unchanging environment, and an Inuit epistemology that forefronts provisional actions within the context of a constantly changing environment. First, we demonstrate how AREVA attempted to maintain a consistent western epistemological approach to uncertainty. Secondly, we explain how local residents' concerns revealed a complex and contradictory composite of western and Indigenous epistemological responses to uncertainty, as a consequence of a profound and recent history of settler colonialism. Lastly, we argue that local residents resolved this entangled response by *further* knotting together western and Inuit epistemologies – through calls for increased education – rather than by simply rejecting one or the other approach to knowledge.

"The Disease that Knowledge Must Cure": AREVA's Response to Uncertainty

Western cosmologies claim that uncertainty stems from the absence of human intervention and that the environment responds to human will (Qitsualik, 2013). This anthropocentric worldview

considers nature to be both separate from humans and ultimately amenable to human intervention and control (Klein, 2000). In western epistemologies, not knowing tends to refer to an absence, lack, or failure of knowledge (Cameron, 2015). Therefore, the response to uncertainty is to enhance the quality and scope of the knowledge base, as Shelia Jasanoff (2007) emphasizes:

> The great mystery of modernity is that we think of certainty as an attainable state. Uncertainty has become the threat to collective action, *the disease that knowledge must cure*. It is the condition that poses cruel dilemmas for decision-makers; that must be reduced at any cost; that is tamed with scenarios and assessments; and that feeds the frenzy for new knowledge, much of it scientific. (2007: 33, emphasis added)

Uncertainty is understood to be both a threat and a barrier to rational decision-making and effective action. As such, predictive methods, such as those used by the extractive industry, have been developed to manage, control, and ultimately reduce what is deemed to be uncertain (Jasanoff, 2003). Yet, as Callon et al. (2009) note, in the context of socio-technical controversies, predictive methods may intend to reduce technical uncertainties, but as new actors and information enters a controversy, uncertainties often amplify. Predictive methods are valuable insofar as they can quantify, organize and conceptualize what, from an industry, government and/or community perspective, is known and unknown, but these methods suffer from significant limitations (Jasanoff, 1999). For instance, the approaches are overly fixated on what can be known, and, consequently, downplay uncertainties that escape prediction and calculation (Jasanoff, 1999, 2003). As such, these methods fail to address and adequately respond to uncertainties that exist outside of their explicit as well as tacit framing assumptions (Jasanoff, 2003).

According to AREVA (2014), its framework for environmental protection and management was based on the view that inadequate control over environmental uncertainties is largely related to knowledge inadequacies, and, consequently, focuses on increasing that knowledge (i.e. through predictive methods, follow-up programs, and monitoring schemes) (Wynne, 1992). For example, during the Final Hearings, AREVA did acknowledge the uncertainty contained within their assessment of the potential impacts on caribou populations:

> We're uncertain about the overall effect on mortality of animals, because, again, our effects assessment and the cumulative impact on mortality is based on hunter access and how many caribou those hunters will take and the redistribution of harvest. We don't know exactly how that's going to happen. We don't know exactly what's going to happen to caribou movement. Again, we've learned that through our baseline studies and through the community and members of the HTO telling us that caribou movement is variable within the year, year to year, over the long term. So, again, we don't have strong confidence in exactly how the caribou are going to behave in the future. (NIRB, 2015b: 223-224)

AREVA attributed this state of not knowing to "information uncertainties" (NIRB, 2015b: 194), reflecting a western representation of uncertainty as a state that can be rectified with more information. In order to address this (temporary) state of not knowing, AREVA represented uncertainty in such a way that it is amenable to reduction, control, and management through the acquisition of more and better knowledge, or as Jasanoff puts it, "the disease that knowledge must cure" (2007: 33). Brian Wynne (2007) contends that this "artificial reduction of uncertainties" results in the "externalization of unknowns" (7). For instance, AREVA represented uncertainty in a way that shifted the responsibility for the uncertainties onto other actors (Shackley & Wynne, 1996). Specifically, AREVA displaced the uncertainties concerning the effects on caribou mortality and movement onto the harvesting practices of local residents and the variability in caribou migration patterns. Paradoxically, while this externalizing technique meant that AREVA

necessarily acknowledged (ongoing) uncertainty, it also determined that the Kiggavik Project would not have significant impacts on caribou herds. For instance, in the impact assessment's Final Hearings, AREVA stated:

> That's how we come up with our conclusion of not significant, presuming that mitigation will work, because *it's proven to have worked in other areas*, and *we have faith* that it will work here as well too and that people will collaborate (NIRB, 2015b: 225).

What is so interesting about AREVA's statement is its dependence upon non-rational measures: experience and faith. This invocation of reason *and* faith amounts to what Wynne argues is an "implicit projection of an exaggerated degree of control" (2007: 7) over both humans and nature. Here, AREVA's conclusion that their proposal would not have significant impacts on caribou herds relies heavily on their ability (and confidence) to 'manage' any adverse effects through ongoing collaboration and mitigation.

AREVA's response to the socio-economic uncertainties of their proposal focused on establishing certainty between the proposed project and potential benefits, while again externalizing the unpredictable and uncontrollable uncertainties onto a catch-all category of "other forces of change" (NIRB, 2015c: 456). In the Final Hearings, an AREVA representative recognized the complex nature of the socio-economic environment:

> Socioeconomic change is ongoing. It is the result not only of a given project, but of the interaction of that project with the broader, continuously evolving economic, social, and cultural environment. Other projects, government initiatives, improved technologies, and other factors continuously influence the socioeconomic environment. It is important to recognize that any future changes in the socioeconomic environment will not be the result only of the project but also of other forces of change. (in NIRB, 2015c: 455-456)

While this statement appears to recognize the difficulty in establishing causal relationships between the proposed project and socio-economic impacts, AREVA was nevertheless confident in their determination that the project would have overall positive and significant socio-economic impacts. AREVA contended that this determination was based on their assessment of positive and significant effects within the following major socio-economic components: community economies; community well-being; public infrastructure and services; non-traditional land use and land use planning; and the economy of Nunavut (ibid). And although AREVA noted that Inuit traditional culture would be negatively affected by the Project, it nonetheless argued that this negative impact would be outweighed by local residents' increased opportunities to participate in the (settler colonial) wage economy (NIRB, 2015c).

The positive and significant impacts attributed to community economies were related to predicted (which became certain) increases in employment, income, contracting, education and training opportunities (AREVA, 2014). AREVA (2014) contended that the Kiggavik Project's "primary effect is the creation of economic opportunities for Kivalliq labour and businesses" (131); the company emphasized how these "direct benefits" would have ripple effects throughout the regional economy (ibid). This strategy attempts to create certainty surrounding the positive benefits, specifically employment and the consequential increases in income. This certainty permeated AREVA's determination that the proposed project would have significantly positive effects on local resident well-being. In the Final Hearings, an AREVA representative expanded upon their determinants of well-being:

> The effects on well-being were predicted to be overall positive and significant. The negative effects on culture may erode well-being for some people but broadening choices and opportunities for livelihoods are

> counteracting factors. Generally, reductions in income poverty are associated with improved well-being. Well-being is influenced by many factors including culture, employment, education, personal-health habitats, but socioeconomic status is generally agreed to be the most important determinant to well-being (NIRB, 2015c: 457).

As such, AREVA conceptualized well-being in a way that emphasizes the importance of employment, while minimizing the importance of culture, enabling AREVA to determine that the project would have overall positive and significant effects on community well-being. It is important to note that AREVA's assessment of community economies did not include harvesting activities, which along with food security were assessed under traditional culture. This demonstrates how AREVA's claims to certainty were highly selective and deeply embedded with cultural biases.

Deconstructing Certainty: Contextual and Relational Sites of Uncertainty

In Inuktitut, Nunavut means "Our Land" or "Our Home" (Kusugak, 2000). Inuit have lived in the Arctic for thousands of years and have developed practices that support an intimate relationship with a changing environment (Kuptana, 1993). Jose Kusugak emphasizes how Inuit cosmologies do not view humans and nature as separate entities:

> The Arctic has sustained us and defined us. We are part of the Arctic landscape and seascape and the Arctic landscape are a part of us (2000: 20).

As such, Inuit cosmology reflects an awareness of "the impossibility of actual independence" (Qitsualik, 2013: 24) between humans and other living and non-living entities; an inextricable connection and deep respect for the land, weather, and wildlife (Price, 2007). The epistemological approach that follows characterizes the environment as constantly changing, which requires ongoing human adaptation. Knowledge (of the land, of living) is always, therefore, provisional and based on experience. The Inuktitut word *qaujimanngit* aligns closely with the western understanding of lack of knowledge. But *nalunaq* refers to not knowing; it signifies a "relationship with an uncertain state" (Cameron, 2015: 31). According to Emilie Cameron, the appropriate response to (or interaction with) this perennial state of uncertainty is to take time:

> First, to acknowledge the way things are. It is foolhardy to pretend to know or understand when one does not. Similarly, to act quickly without understanding a situation is to risk a great danger; acting without keen knowledge and understanding is worse than doing nothing at all…it is to remain open, attentive, and prepared to respond to the moment. Importantly, there is no value attached to being in a state of not knowing. It simply is, and one simply responds to the situation (ibid: 34).

As such, what is certain ("the ways things are") is that knowledge is uncertain. Cameron emphasizes that responding to uncertainty in this way is based on an epistemology that does not imply a need to master a set of circumstances. Rather, it reflects a patient engagement with the future and an acceptance of the confusion, and limits that necessarily accompanies living within, and as part of, permanently changing (and therefore uncertain) environments (ibid).

Traditional Inuit knowledge has not, of course, evaded settler colonial influence and erasure. Inuit ways of knowing (which means acknowledging and working with uncertainty) have been threatened by globalization, neoliberal policies, capitalist modes of production, and Inuit communities' profound experience of settler colonialization (failure to implement the NLCA; the introduction of lethal diseases, and so on). In contemporary Nunavut, these two diverging epistemologies have, and continue to, operate in uneasy and often conflicted parallel (Zahara & Hird, 2015).

Uncertainties Concerning Caribou Harvesting and Inuit Ways of Living

Thus, while AREVA's assessment of its proposed project's impact on caribou populations was isolated from the effects on those who harvest caribou (AREVA, 2014), local organizations and residents of Baker Lake were attentive to the complexity and interconnected nature of these potential impacts not only in the short- but also the long-term. In the Final Hearings, the Government of Nunavut, the Beverly Qamanirjuaq Caribou Management Board, and the Baker Lake Hunters and Trappers Organization noted that changes in movement, both seasonal migration and localized movement, would constitute a significant impact for many Nunavummiut in the region (NIRB, 2015a). Critically analyzing AREVA's own in-house scientific reports, and drawing on their own inter-generational experience of caribou hunting and migration patterns, two interviewees noted:

> Also, a big thing, is caribou migration patterns, they've studied where the caribou migrate through and it's quite close to where the mines would open and so the mining companies themselves have stated that if anything the impact that the migration pattern would go further away from the community to avoid, to avoid the noise or you know activity that is happening in the area, and that would directly impact our community too (Female Inuit Interviewee, November 27th, 2016, Baker Lake).

> The Kiggavik proposed mine was in a major migration route and we depend on caribou even if we are not fulltime hunters, that's our normal diet, its caribou, so that was the biggest thing. (Male Inuit Interviewee, December 12th, 2016, Baker Lake)

Local residents and organizations noted that AREVA's determination did not include information related to caribou movement: rather this determination was based on the long-term viability of the caribou population and delay to its recovery (NIRB, 2015a). AREVA did not include information related to caribou movement because, from a western perspective, this information would necessarily be provisional, and AREVA was interested in making statements of certainty. For their part, local residents contested AREVA's projected impacts, which residents saw contextually and relationally situated, not as separate and discrete biophysical impacts amenable to certain control. Moreover, for Baker Lake residents, caribou are intimately embedded in Inuit culture, traditions, and social relationships. One Inuit interviewee elaborated on the importance of caribou to the community:

> I guess the biggest impact to me, in my opinion, is via the caribou, we are so dependent on it as a people, and I think it will directly affect our caribou from what I have read, from what I understood from the Environmental Impact Statement, and having been a part of the process, I think it will directly affect our caribou and I think that will be the biggest impact, because our food is very much our culture in that many of our family members make garments out of it, we eat it, we love getting together as a family, all our family functions really surround the eating of caribou. That would be the biggest impact (Inuit Interviewee, November 27th, 2016, Baker Lake).

In Baker Lake, harvesting caribou represents a key point of intersection between Inuit culture, well-being, self-sufficiency, social cohesion, and the biophysical environment. The land is a site of cultural memory and collective identity; it is a source of Inuit history, knowledge, values, cultural practices, and language (Kushwaha, 2013). For many Inuit, well-being is intimately tied to the land (Kral et al. 2011) as it is "imbued with and provides for cultural connectivity" (Jones & Bradshaw, 2015: 89). Many interviewees described how land-based activities such as hunting, camping, drying caribou meat at one's cabin, and simply just "being out on the land" brought peace and ease to their lives. For instance:

> Being out on the land it's very peaceful, and there's family staying close together, spending a lot of time with each other, and learning how to hunt and fish and all the survival skills (Inuit Interviewee, December 5th, 2016, Baker Lake).
>
> So it's home, out there. If I didn't have to make money I would be out there all the time (Inuit Interviewee, December 12th, 2016, Baker Lake).

Thus while AREVA sought to isolate the impacts on caribou populations from myriad other issues, (as a technique used to increase certainty), for Inuit and other local residents, the uncertainty concerning caribou hunting – which is taken for granted within Inuit epistemology – is necessarily implicated in other issues including Inuit cultural traditions, food security, social connections as well as well-being, self-sufficiency, and identity.

Uncertainties Concerning Socio-economic Benefits

Thus, the local organizations questioning AREVA's certainty with regard to socio-economic benefits to the Baker Lake community focused on the necessarily provisional status of AREVA's claims. Makita (2012) emphasized that AREVA's determination that the proposed project would result in significant positive impacts on community well-being was isolated from their determination that the project would have significant negative impacts on Inuit traditional culture. In other words, local residents expressed concern that AREVA's presentation of the certainty of socio-economic benefits failed to capture the complex, diverse, and dynamic nature of Inuit well-being as well as the entanglement of values and modes of self-sufficiency experienced in contemporary Inuit society. For instance, interviewees describe the conflicted space that characterizes the controversy at the community-level:

> The fact that employment for families is very important and also full-time hunters need to be able to harvest their traditional diet, so that's where we are today we are caught in the middle of something like this...I wish we were able to have the best of both worlds where we can have a mining production open and traditional harvesting happening at the same time with no effects on the other (Inuit Interviewee, December 5th 2016, Baker Lake).
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> People that are working at the mine [Meadowbank] because they have to feed their family, to live, but they also don't want the caribou or the wildlife to be harmed, and so they are, they're stressed about it. They know that mining is playing a part in it, the mining industry, and it's also affecting the caribou and they are, they are stuck. They need the job to feed their family, but they also don't want to lose caribou or the fish. (Inuit Interviewee, December 4th 2016, Baker Lake)

Community residents repeatedly expressed that they felt torn between two ways of life, or "caught between two cultures" (Kral et al., 2011: 432).

For local residents, even AREVA's narrowly defined category of socio-economic well-being proved problematic. While employment opportunities were important to local residents, the degree to which they would actually be realized by Inuit (and contribute to well-being) was questioned. Specifically, AREVA's Inuit employment target of 50% for later years of operations was highly contested during the Final Hearings. Inuit organizations and the territorial government were skeptical about this target, referring to experiences with other mines[9], the current labour shortage, turnover rates, and the all too common trend of southern labour filling these positions (NIRB, 2015a). These limitations, compounded with the lack of start date and the expansion of Agnico Eagles operations[10], made it difficult to predict whether or not the Kiggavik Project would compete with Agnico Eagle for human resources or result in staggered development. Baker Lake residents, referring to Meadowbank, stated:

> They have trained everybody in Baker Lake, like literally everybody that wanted a job up there had it (Baker Lake Resident, November 25th, 2016, Baker Lake).

> What we are seeing right now is almost a total saturation of the workforce…You are going to have a whole bunch of people from Baker Lake already employed there, so if there was a uranium mine you would see proportionally there would be less, less beneficiaries working in those roles because you would have essentially competition for human resources across you know two locations, so if there was going to be a uranium mine, thinking from a human resources perspective, I think it would need to be a staggered (Inuit Interviewee, December 4th, 2016, Baker Lake).

These statements question the extent to which Baker Lake residents would truly benefit from additional employment opportunities in the mineral sector, further challenging AREVA's claims to certainty.

Improving Education, Slowing Things Down

Faced with competing claims regarding the certainty of the projected benefits and harms to the people of Baker Lake and their environment, local residents developed a nuanced strategic response. This strategy consisted of calling for *improvements in education.* Education was mentioned by 17 of the 22 interviewees and 13 of the 17 Inuit interviewees. These interviewees referred to education in a decidedly western way, that is, they emphasized positive attributes of both increases in education in general and the southern Canadian school system. Moreover, interviewees problematized Inuit education and positioned it in a state of deficit. For instance:

> We are not educated...We need to get educated (Inuit Interviewee, December 12th, 2016, Baker Lake).

> I think that our community and every community can do a lot better encouraging our youth to get educated, that's bottom line (Inuit Interviewee, December 8th, 2016, Baker Lake).

Baker Lake residents noted that improving education would enhance the community's ability to capitalize on employment opportunities at all levels, not just non-skilled or semi-skilled positions. Additionally, this response was understood as a way to enhance the community's understanding of the potential impacts of uranium mining, and, through this acquisition of knowledge, enable them to make a more 'informed' decision.

> We need to be educated to understand the whole process, and the people at the hearing, the first round of interveners, there were no Inuit there, there were experts at the table and I said that maybe once we are ready and we have Inuit at all those levels of expertise then its time to make a decision about that (Inuit Interviewee, December 4th, 2016, Baker Lake).

> We as Inuit aren't prepared for in the way to have all the different types of jobs, not just the lower rung jobs, but the higher rung jobs like mechanical engineers, tailing pit management engineers, understanding the chemistry and the physics of uranium processing, extraction, a whole gamut of understanding uranium, I don't believe we as a people understand it yet (Inuit Interviewee, December 4th, 2016, Baker Lake).

> Hopefully in the future they will have of [sic] solved some of the issues we have in terms of the migration of caribou, what effect it has on the stocks we have in terms of fish, and you know people who have better education/are better educated to be able to work in the mine and understand what uranium mining really is and how it affects people and the environment (Inuit Interviewee, November 22nd 2016, Baker Lake).

Yet, while this response to uncertainty may well appear to conform to a western epistemology (that is, the "disease the knowledge must cure"), it simultaneously grounds an Inuit engagement with the future, one that is underpinned by patience and a cautionary relationship towards claiming knowledge in uncertain situations. In other words, calling for increased education was a way for the Baker Lake community to *slow the process down* in order to gain valuable time to further reflect, observe and experience a changing (uncertain) environment:

> The resource that is increasing rapidly within our territory is people, we have a young population and so we need to make sure we are educated in both English and Inuktitut to be able to get ahead. Otherwise I just felt that we were rushing into this game a little too soon, without really understanding what we were getting into…We are not ready, as people, educationally to be there, we don't need to just only have the mining jobs, the housekeeping jobs, and I said to the community that they need to wake their children up, have them go to school, finish their homework, keep on top of their education, and make sure they can be doing the best that they can do. Invest in our resource that is growing (Inuit Interviewee, December 4th 2016, Baker Lake).

> Wait another generation or so. Let these kids decide, today's kids decide, what they think…wait until we have 100 more college graduates, or 100 more college or university graduates, just wait for another few thousands in post-secondary, maybe they will have a better understanding on [sic] the environment. Since we are getting better every generation at voicing concerns, and life generally up here. I can't answer that right now (Inuit Interviewee, November 24th 2016, Baker Lake).

As such, this highly creative response reflects a contemporary Inuit engagement with the future, one that connects Inuit and western worldviews and as such strategically responds to both industry and Canadian government (intense) pressures at the same time that it slows the whole mining approval process down, thereby benefiting from an Inuit epistemology that forefronts provisionality, caution, and long-term experience in living with the environment. While our Inuit interviewees emphasized the importance of education in terms of engagement in the wage economy and enhancing the community's knowledge related to uranium mining, using wording such as "rushing into this game", "we are not ready", "wait another generation", and "I can't answer that right now" suggest a response that is far more intentional than simply complying with settler colonial priorities. Insisting that current and future Baker Lake residents require 'more information' effectively stalls any assumption on the part of AREVA, other extraction industries, and/or the Canadian government that the Baker Lake community will accede to their priorities.

Conclusions

Sites of uncertainty developed in this paper provides a useful framework for the divergent ways in which AREVA, government officials, Inuit organizations, and local residents expressed, transformed, experienced, and responded to uncertainty during the Kiggavik controversy. In this paper, we have argued that AREVA represented uncertainty in a way that aligns with western epistemologies, that is as "the disease that knowledge must cure", and consequently focused on establishing certainty through techniques of control, prediction, management, externalization, and isolation. We have shown how these claims of certainty were deeply contested and deconstructed when positioned against local residents' relational and contextual knowledge, and failed to capture the complex, diverse, and dynamic nature of Inuit well-being, self-sufficiency, and identity. Indeed, local residents' concerns revealed a composite of Inuit and western epistemological responses to uncertainty. Local residents' calls for improvements in education is, we argue, a strategic

intervention, one that reflects a contemporary Inuit engagement with the world. Advocating for more education and increased knowledge strongly resonated with AREVA's (and the Canadian government's) emphasis on educating local residents (using a deficit model approach) as a way of increasing local support for the proposal. Local residents endorsed this solution because it also necessarily slowed the whole process, giving local residents time to reflect, deliberate, and imagine their future in ways that respect Inuit ways of understanding.

It might be argued that this strategy reflects Audre Lorde's contention that "the master's tools will never dismantle the master's house" (1984: 112). That is, we may view Inuit calls for more (settler colonial) education as validating the very system that continues to limit their own self-determination. However, this, as Lorde also points out, assumes that settler colonial knowledge is the only option, which the Baker Lake residents have proven to be unfounded through their successful opposition to the Kiggavik Proposal. Calling for improvements in education draws on other sources of support, including Inuit ways of knowing and being that have persisted, flourished, and creatively adapted to contemporary resource development.

Notes

1. The Honourable Carolyn Bennett was previously the Minister of Indigenous and Northern Affairs Canada. In August 2017, the department of Indigenous and Northern Affairs Canada was dissolved, and replaced by two new departments: The Department of Crown-Indigenous Relations and Northern Affairs and the Department of Indigenous Services. Carolyn Bennett is now the Minister of Crown-Indigenous Relations and Northern Affairs.
2. In Inuktitut, Qamani'tuaq means "where the river widens", referring to the mouth of the Thelon River, which ultimately drains into Hudson's Bay.
3. The NIRB is the institution of public government responsible for assessing, using both traditional knowledge and scientific methods, the potential biophysical and socio-economic impacts of proposed development in Nunavut, Canada (NIRB, 2015a).
4. In 2007, the price of uranium hit a high of just above US$135 per pound, however with the 2008 financial crisis prices fell to US$40 in 2009. While prices recovered to just above US$70 by 2011, the Fukushima Daiichi accident resulted in the shutdown of many nuclear reactors. This, combined with huge stockpiles of uranium and the long-production cycle, has resulted in a decrease in demand and consequently spot price (2018 prices are just above US$20 per pound) (De Clercq, 2016; UxC, 2018).
5. Transcripts from the Kiggavik Project's Final Hearings (accessed through the NIRB's public registry) as well as the *NIRB's Final Hearing Report on the Kiggavik Uranium Mine Project*, and AREVA's Kiggavik Project Proposal and Draft and Final Environmental Impact Statements were key archival sources as they provided insight into how the contemporary uranium mining controversy unfolded. Additionally, media reports, mainly from Nunastiaqonline, Northern News Service Ltd., and CBC North were critical to understanding the variety of viewpoints embedded in this controversy.

Lastly, non-governmental organizations that were involved in the controversy such as Makita, Mining Watch, and World Wildlife Foundation webpages also provided valuable contextual and positional information.

6. The term Qablunaat (singular Qablunaaq) refers to a "white" or "white person", more specifically it refers to non-Inuit, non-Indigenous, settlers; Cameron (2015) emphasizes how this is a relational term that is embedded in racialized, hierarchical power structures.
7. For more information see Metuzals (forthcoming).
8. In 1993, the property was acquired by AREVA, previously COGEMA (AREVA, 2008).
9. For comparison, in 2015, Meadowbank's Inuit employment rate was 37% (Stratos, 2016)
10. Meadowbank was expected to close in 2018, however with the discovery of the Amaruq satellite deposit, located 55 kilometers northwest of Meadowbank, in 2013, the life of Meadowbank has been extended by an additional seven years (Agnico Eagle, 2017). Additionally, Agnico Eagle's Meliadine Project, located just outside of Rankin Inlet in the Kivalliq region, commenced construction in 2017 (ibid).

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