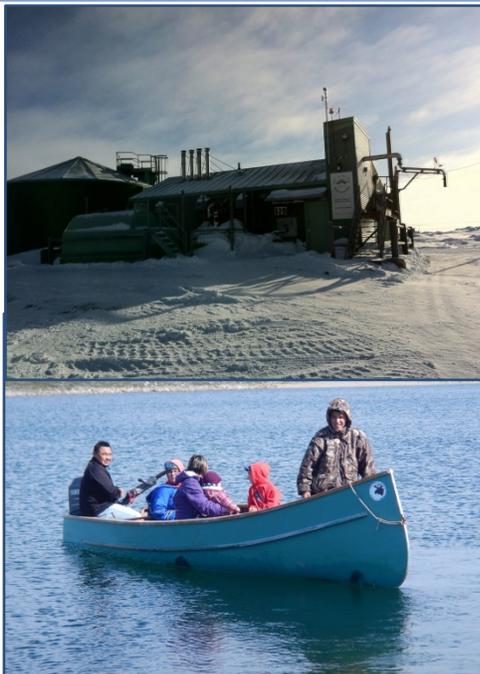


Gap Analysis: Mining Development in Canada

Thierry Rodon and Francis Lévesque, Université Laval
with the contribution of Josianne Grenier and Julien Keller



GAP ANALYSIS REPORT #2B

Lakehead
UNIVERSITY



Social Sciences and Humanities
Research Council of Canada

Conseil de recherches en
sciences humaines du Canada

Canada



CHAIRE DE RECHERCHE SUR LE DEVELOPPEMENT DURABLE DU NORD

NORTHERN SUSTAINABLE DEVELOPMENT RESEARCH CHAIR

ᑭᑭᑭᑭᑭᑭ ᑭᑭᑭᑭᑭᑭ ᑭᑭᑭᑭᑭᑭ ᑭᑭᑭᑭᑭᑭ ᑭᑭᑭᑭᑭᑭ ᑭᑭᑭᑭᑭᑭ



INTRODUCTION

Despite the fact of its potentially positive economic impacts, mining in the Canadian is not without consequences. Historically, mining activities have been responsible of many environmental, health and social impacts, and they will continue to do so in the future. Although many of those impacts have been documented and discussed by scientists, the industry and affected populations, many more have not.

There is, for example, a significant body of literature that deals with environmental impacts. Some of the key environmental impacts identified in the literature are land disturbance, emissions from smelting operations (Duhaime et al. 2003; Natural Resources Canada 2004), contamination of ground water and plants (MiningWatch Canada 2001), windblown dust (Winfield 2006), and the prospect of chemical spill. Closed mines and abandoned exploration sites also have long-term environmental impacts that have been documented (Laurence 2006; Duhaime et al. 2003; Duhaime et al. 2005) but that local residents still often underestimate (Kruse 2011: 16).

While they have not been as studied as extensively as environmental impacts, health impacts have been the focus of some publications recently (Bronson and Noble 2006; Noble et al. 2005; Shandro et al. 2011). It has been found that most health impacts suffered by local populations are indirectly caused by the impacts of mining activities on the environment. For example, by affecting animals and their environment, mining infrastructures (mining pit, roads, ports, etc.) have impacts on food consumption because they may reduce the capacity of local populations to hunt, fish and gather plants (Gibson & Klinck 2006). The lack of quality and fresh food may cause increases in diabetes, heart conditions, obesity and tooth decay (Buell 2006). Windblown dust may also increase cancer rates and cause skin problems (MiningWatch Canada 2001).

Social impacts are by far the least known, researched and theorised of all the impacts mineral activities have in the Canadian North. In order to get a broad understanding of how social impacts of mining activities in the Canadian North are being discussed, this report will

investigate this issue by exploring a wide array of literature: scientific publications (books, articles and reports), governmental guidelines, environmental impact assessments (EIA), impact benefits agreements (IBA), and monitoring reports. The objectives of this report are to:

- Present the results of a review of literature about what has been written on the social impacts of mining activities in Northern Canada,
- Highlight knowledge gaps are found in the literature, and
- Identify priority research for the future.

In order to systematize the analysis of the data found in this body of literature, the Northern Sustainable Development Research Chair's team created an observation grid which identifies three main themes to which are associated different variables (see Appendix I). The first theme, economy, was divide in two variables: employment and economic activities. The second theme, people, was made of several variables: demographics, health and well-being, education and training, housing, crime, social cohesion, as well as intragenerational and intergenerational equity. Cultural practices comprised variables like the Inuit language, traditional activities and skills, land use. Each of these variables was in turn divided in a series of indicators available in Appendix 1.

This comprehensive list is adapted to the present case and helps to perceive the wide range of social impacts. However, it also has some disadvantages. Some of the indicators, for instance, are not social impacts per say, but indicators that have to be considered in that they may or may not create social impacts depending on a community's unique social, cultural or economic context. Incidentally, what constitutes a social impact and which ones have made it to the list is subject to cultural and economic biases. Moreover, such lists tend to focus on the negative impacts, do not induce analytical thinking about indirect impacts, and do not take into consideration the effects of planned interventions (see Vanclay 2001: 184, 188, 189 and 200). We have made a conscious effort to avoid focusing on negative impacts only.

This report is not meant to be exhaustive: not all recent EIAs done in the Canadian North in the past decade or so will be assessed, and the secretive nature of IBAs will limit our analysis to a

single one (Raglan). Our analysis of monitoring reports will also be limited by the small number that has been released in the past decade. The report nevertheless highlights heavy tendencies and very meaningful gaps that will need to be addressed in future researches.

The first section will discuss the legal and political framework surrounding mining in the Canadian North. The Canadian North is not culturally nor politically unified and mines doing business in various northern regions of the country have different obligations that will be highlighted here. This section will also be used to define some important concepts employed throughout the report, such as environmental impact assessment (EIA), impact benefit agreements (IBA), and so on. The second section will explore the theoretical social impacts examined in the scientific publications (articles, books and grey literature). A third section will review the anticipated social impacts discussed in environmental impact assessments. A fourth one will deal with the observed social impacts identified in the few monitoring studies. A final one will discuss knowledge gaps identified in the previous three sections and will identify research priorities for the future.

1. CONTEXT: MINING IN NORTHERN CANADA

Mineral exploration and extraction have increased steadily in Northern Canada since World War II, when demand for base metals amplified for both defense and construction projects (Boutet 2012; Nassichuk 1987; Keeling 2009; Sandlos & Keeling 2012). Mining operations such as Con Mine (1938-2003) and Giant Mine (1948-2004) in Yellowknife, Rankin Inlet (1957-1962), Nanisivik (1979-2001), Polaris (1981-2002), and Jericho (2006-2008) and others, all paved the way for existing and future projects. Currently, several mines are in operation in the Canadian North, such as Raglan Nickel Mine (1999-present) and Nunavik Nickel (2012-present) in Nunavik, Diavik (2003-present) and Ekati (1999-present) diamond mines in the Northwest Territories, Voisey's Bay (2005-present) nickel mine in Labrador, Meadowbank (2010-present) gold mine in Nunavut, and Troilus (1996-2010) copper and gold mine in Quebec Subarctic.

The rapidly growing demand for non-renewable resources from China and other emerging economies coupled with changes in policies and laws in Canada (Campbell & Laforce 2012; Carter 2007; Gouvernement du Québec 2008; Isaac & Knox 2004; Laforce 2012; Laforce, Lapointe et Lebuis 2012; Lapointe 2010) are paving the way for a new wave of mining operations in the Canadian North. The scale of these planned projects is as never seen before. Dozens of mining projects are being discussed and developed all over Northern Canada. In Nunavut, ten potential projects could generate up to \$12 billion dollars in capital investment and create an estimated 4,000 jobs (Hoefler 2011). They include the Kiggavik uranium mine near Baker Lake as well as three major iron ore mines (Mary River, Roche Bay and Haig Inlet). In Northern Quebec, eleven potential projects, such as Hopes Advance and Lake Otelnuq (Nunatsiaq News 2012), could generate \$8.24 billion in investment and create 4,000 jobs a year (Gouvernement du Québec 2011). In Yukon, there are currently 58 advanced exploration projects (miningyukon.com) and 20 others in the Northwest Territories (Falk & Gauchnauer 2012).

Inuit and Crees are facing a “paradox of development” as many are torn between a desire to improve their material conditions and a fear of potential impacts (Bell 2010; Kucera 2009). On

one hand, the development of mining projects is encouraged by the industry, governments, communities and organizations. On the other, many in civil society are concerned with their potential impacts (Bernauer 2010a; Bernauer 2010b). For example, Adrianna Resources Inc. is planning to invest 15.5 billion dollars in the Lac Otehluk Iron Ore Mine in Nunavik. This project is set to create 2000 jobs during the exploitation phase. However, the project requires the development of an open pit mine, concentrator, and pelletizing facility with planned annual output of 50 million tons of pellet for up to 100 years. The project also necessitates the construction of a 815km railway that will connect the processing facilities at Otehluk to the port of Sept-Îles (Adrianna Resources Inc. 2013).

Towards the end of the 1980s and the beginning of the 1990s, the mining industry had to address new environmental and social preoccupations and laws through sustainable development and the increasing acknowledgement of aboriginal rights over their territories (Laforge, Lapointe et Lebus 2010). Therefore, to mitigate potential impacts, the industry now negotiates impact benefit agreements (IBA) with affected communities and seeks approval with environmental boards by submitting environmental impact assessments (EIA) (Lebus & King-Ruel 2010; Knotsch & Warda 2009; Knotsch, Siebenmorgen & Bradshaw 2010; Laforge & Campbell 2012; Laforge & Tardif 2012; O’Faircheallaigh & Corbett 2005; Lawrence 2003). While the EIAs are required by law, the IBAs are not, but have nevertheless become institutionalized, offering the companies the opportunity to boost their reputation, ensure access to local manpower and gain social accessibility (Prno, Bradshaw & Lapierre 2012). While negotiations of EIA and IBA can be challenging (Bielawski 2004; Gibson 2006; Whiteman & Mamen 2005), this obligation has increased cooperation and knowledge sharing between the industry and Aboriginal communities (McPhail 2009; Duhaime, Bernard & Caron 2011; Couch 2002; Goldman 2000; Jenkins & Yakovleva 2006; Mills 2010; Picard 2010) and provide the industry with a “social license to operate” (Nelsen & Scoble 2006; Prno, Bradshaw & Lapierre 2012; Prno & Slocombe 2012). However, neither EIA nor IBA fulfill all their expectations. Although EIA are designed to support decision making concerning the potential impacts of resource development (Nunavut Impact Review Board 2012; Noble 2006), they fall short in building trust and capacity among stakeholders (Galbraith, Bradshaw & Rutherford 2007) and do not always yield expected results

(Whitmore 2006). This can be explained by the fact that while EIA need to incorporate Aboriginal traditional knowledge (Canadian Environmental Assessment Agency 2004; Fletcher nd), their technical language and scope make them inaccessible to most community members (Shadian 2011). This can also be caused by the fact that EIA only focus on one development project and therefore ignore the cumulative impacts of other development projects in the same area. IBA are private agreements negotiated between corporations and aboriginal organizations (Caine & Krogman 2010; Gibson & O’Faircheallaigh 2010; Sosa & Keenan 2001). While they focus on economic benefits and community capacity building, they do not guarantee economic prosperity because their “*narrow focus on direct economic benefits and payouts happens at the cost of neglecting social and health oriented investments*” (Knotsch & Warda 2009; Diges 2008; Nelsen & Scoble 2006; Dreyer & Myers 2004; Fidler & Hitch 2007; Roy, Lapointe & King-Ruel 2012). Their private nature explains why there is so little research about them and what research there is focuses on wages, spinoff spending, infrastructure pressures, royalties, and taxes (Gibson & Klinck 2005; Prno & Bradshaw 2008).

IBAs allow for direct negotiations between the companies and the communities to regulate the mining projects without the supervision of the government. They aim to reduce the expected impacts of the mining projects and to warrant maximal economic benefits for the surrounding communities (Laforge, Lapointe et Lebuis 2010).

2. THEORETICAL SOCIAL IMPACTS OF MINING IN THE CANADIAN NORTH: SCIENTIFIC AND GREY LITERATURE

Mining activities have both positive and negative impacts. It is essential to consider the relationship between these to get a better overview of how they impact aboriginal communities. So although this part of the report focuses on the social impacts identified in the scientific and grey literature, it will use a global and integrated approach and try to put them in relation with one another, as well as try to identify the gaps in published research.

2.1 Review of Theoretical Social Impacts of Mining found in Scientific and Grey Literature

The body of available literature on the topic is made of reports (grey literature) and very few peer-reviewed publications. The theoretical social impacts of mining are therefore limited.

On local economic activity and employment

The literature indicates that mining has the potential to create important economic benefits for local communities (Hilson 2002), because it increases economic activity, employment (Richards & McGee 2009; Fidler & Hitch 2007; Duhaime, Bernard et al. 2003), and collective wealth (O'Reilly & Eacott 199-2000; Waye, Young & al. 2009).

First, the construction and opening of mines offer unique employment opportunities in a sector where salaries are higher than in other extracting resources industries (MiningWatch Canada 2001; Gibson & Klinck 2005: 116-117, 131).

Second, mining creates business opportunities for people who are not working at the mine (creation of new business, new jobs, etc.) (Buell 2006: 3). Such opportunities may contribute to the long term durability and the sustainable development of communities (Duhaime et al. 2003).

Finally, royalties obtained through an IBA can contribute to increase collective wealth (O'Reilley & Eacott 1998-1999; O'Reilley & Eacott 1999-2000; Kennet 1999), plus companies can contribute the development of infrastructure, housing, etc. (Hilson 2002, Kennett 1999).

An increase of disposable income, however, can create or intensify already existing social issues (Buell 2006). For instance, a higher disposable income increases the chances an individual has to engage in high risk behavior, such as alcohol or drug abuse, gambling and prostitution (Gibson & Klinck 2005). Such behaviors can have important consequences in Artic communities because they can lead to violence, women's exploitation, mental illness, suicide (Berger 1977), casualization of labor, poor health and a high level of sexually transmitted infections (Buell

2006). The benefits of employment are often counterbalanced by social and familial perturbations (Noble & Bronson 2005) associated to an increase of disposable income.

Also, mining can create an economic dependence to rents and high inflation (Mann 1975) or even hyperinflation (Yakovleva 2005) that can paralyze growth in other sectors (Hilson 2002), especially in poor and underdeveloped countries and areas (Whitmore) like the Arctic.

On health and well-being

Peer-reviewed publications have barely addressed the health impacts of mining on Aboriginal communities (Bronson & Noble 2006; Bielowski 2004; Hurtig & San Sebastian 2002; Noble & Bronson 2005; Shandro, Veiga & al. 2011; Keller 2012). Because the mining impacts on Aboriginal health are still misunderstood, a joint SSHRC and CIHR project called *Mining & Aboriginal Community Health* (see: www.impactandbenefit.com/miningandhealth) whose intent it is to bridge our knowledge gaps about health impacts of mining activities has been recently funded.

As stated, higher income can mean exacerbation of already existing social issues like drug and alcohol consumption, gambling and prostitution because individuals have more money to get involve in those (Gibson & Klinck 2005: 122-125; Buell 2006: 17-19, 22; (Natural Resources Canada 2003; Fidler & Hitch 2007; Government of the Northwest Territories 2006; Government of the Northwest Territories 2009). This can have indirect impacts because these behaviours can lead to violence, the exploitation of women, mental illness and suicide, problem to go to work, poor health and sexually transmitted diseases (Archibald & Crkovich 1999; Buell 2006:18-19; Goldenberg, Schoveller et al. 2008).

On social cohesion

Mining can also indirectly affect social cohesion (Labrador West Status of women Council & Femmes francophones de l'Ouest du Labrador 2004; Barret-Wood, Knotsch et al. nd.). The

upsurge of workers from an environment where social, economic and cultural values are different cause pressures on the cultural identity, social integrity et individual self-esteem which can in turn create or amplify problems such as alcohol abuse or the imitation or unsustainable behaviors (Kenneth 1999). Moreover, the loss of social norms and structures regulating people's behavior which is attributed to the speed and extent of changes and to the instability that comes with mining projects can lead to social issues such as anomie and suicide (Parlee and O'Neill 2007).

Indigenous women in communities with growing economies are more likely to be the victims of sexual exploitation, violence and sexually transmitted infections, often through sexual abuse or prostitution (Gibson & Klinck 2005). Familial integrity is also deteriorating, threatened by the demands and stress related to work and the changes in familial roles (Gibson & Klinck 2005). The schedule of a mine worker is indeed long and demanding, leaving the women alone to care for the children, a dynamic that potentially creates additional tensions which can lead to violence and conflicts (Sosa & Keenan 2001).

The impacts of mining can also hinder the capacity of women to contribute to the community's well-being, especially through their capacity to care for resources and the environment and insure access to food and other subsistence goods (Kuokannen 2011). The lack of childcare services limits women's opportunities to work within the mining industry or to get an education (O'Faircheallaigh 1998) and explains why women are often excluded from the decisional process (Natural Resources Canada – Minerals and Metal Sector 2003). Also, indigenous women are more likely to suffer from poverty (Gibson & Klinck 2005) and households headed by women are more vulnerable to the inflation caused by mine exploitation (Sosa & Keenan 2001).

On intragenerational and intergenerational equity

Mining can also increase in intra- and intergenerational inequalities for some people receive benefits or work at the mine while others do not (O'Faircheallaigh 1998; Fidler & Hitch 2007; Irlbacher-Fox & Mills 2007; Davis 2009).

Regional inequalities can happen between communities of a same region, one that has benefits, the other not (far away communities are not a concern of mining companies (Gibson & Klinck 2005). Individuals in a same community can also experience inequalities between those that work and those that don't. There are also inequalities on a cultural level where whites earn more than aboriginal because of access to better jobs (Gibson & Klinck 2005: 131). All of these lead to an increase in social stratification. So the aboriginal people still feel that they don't benefit as much as that they are disadvantaged (Duhaime et al. 2003). This can lead to an increase in social tensions (O'Faircheallaigh 1998) and to unsocial behaviours like violence and substance abuse (Buell 2006: 17).

On traditional activities and land use

Traditional activities are a source of pride that allows the indigenous not only to face the hardships related to life on the beloved and respected land, but that also allows them to maintain their identity (Buell 2006). Depression and anxiety associated with a loss of identity can in turn lead to violence, drug addiction, exploitation of women and suicide (Berger 1977).

Little is known on the real impacts of mining on traditional economies in the Arctic (Haley, Szymoniak & al. 2011). Some say participation in harvesting activities decreases because extractive projects use physical space which can cause hostile changes and environmental damages to territories (Bjerregaard & Young 1998; Bjerregaard, Young & al. 2004; Duhaime, Bernard et al. 2003; Bernauer 2011) and that Aboriginals are forced to adapt their practices to the effects of industrialization (Bernauer 2011; Kruse 2011).

However, recent research in Nunavik (Québec) and Alaska have shown that mining projects in remote communities of the North do not necessarily lead to a decline in traditional values or in local populations' participation in traditional activities (Koke 2008). Indeed, while some claim that an increased participation in an economy based on salaries can lead to a decreased participation in in the traditional subsistence-based economy (Buell 2006), others claim that

well-paid jobs allow workers to increase their harvesting activities (Landry, Bouvier & Waaub 2009).

2.2 Toward a Global and Integrated Approach of Social Impacts

Trying to understand impacts in relationship to others requires the creation of typologies which is difficult (Hilson 2002; Buell 2006; Duhaime et al. 2003). Two models have been considered. The firsts talks about primary and secondary impacts (Yakovlena 2008), while the second, and preferred, one is more precise and is based on a typology that uses the following 4 categories (Joyce & MacFarlane 2001: 10-11):

- **Direct impacts** are due to a specific project related activity - resettlement, employment, road construction, etc.;
- **Indirect impacts** are due to actions resulting from direct impacts, such as increased income to carpenters as local employees improve their houses;
- **Induced impacts** are those whose cause is several times removed from project actions, such as loss of access to land by poor local squatters due to land speculation; and,
- **Cumulative Impacts** are the combined impacts of various projects, rather than the impacts of any specific project, which is usually subject to regulatory assessment on the basis of its own impacts only. Therefore, they lie somewhat outside of the regulatory framework.

The following table emphasises the relationship between different impacts and shows how social impacts, environmental and health impacts are interdependent. The choice of how to categorize the impacts is sometimes subjective.

TABLE 1

DIRECT IMPACTS	INDIRECT IMPACTS	INDUCED IMPACTS	CUMULATIVE IMPACTS
<p>Environmental damage to sites with cultural importance or territories on which local populations practice traditional subsistence activities...</p>	<p>... may have negative impacts on biodiversity and the landscape... (Haley et al., 2011; Worrall et al., 2009)</p>	<p>...that can create negative emotions (<i>deathscape, topophobia, memoricide</i>)... (Parlee and O’Neil, 2007)</p>	<p>... and create traumatic social and cultural effects (O’Faircheallaigh, 1997).</p>
	<p>... can create changes to subsistence activities (Bernauer, 2011; Kruse, 2011) or to the way in which local populations practice them... (Koke, 2008)</p>	<p>... and therefore contribute to a loss of identity, depression, and anxiety...</p>	<p>... which may result in violence, drug abuse, the exploitation of women, and suicide (Berger, 1977; Buell, 2006).</p>
		<p>... and therefore negatively affect women’s potential to contribute to the well-being of the community, notably through their inability to look after resources and the environment or to ensure access to food and other subsistence materials (Kuokkanen, 2011).</p>	
<p>Air pollution created by mining... (Worrall et al. 2009; MiningWatch Canada, 2003).</p>	<p>...increases the possibility of cancer, skin and eye diseases, and urinary infections (MiningWatch Canada, 2001).</p>	<p>... and therefore create health problems related to changes in diet (for example, an increased risk of diabetes, heart problems, obesity and dental carries) (Gibson and Klinck, 2005; Buell, 2006).</p>	

DIRECT IMPACTS	INDIRECT IMPACTS	INDUCED IMPACTS	CUMULATIVE IMPACTS
<p>Economic benefits (work opportunities, indirect economic spin-offs, royalties, etc).</p> <p>↓</p> <p>Job opportunities in a sector where wages are generally higher than in other resource extraction industries (Mann, 1975; Kennett, 1999; MiningWatch Canada, 2001; Hilson, 2002; Gibson and Klink, 2005).</p> <p>↓</p> <p>Indirect economic spinoffs, such as business opportunities for local populations, which may result in the creation of local businesses and economic spinoffs in related industries (Buell, 2006).</p> <p>↓</p> <p>Royalties through negotiated agreements or compensation (O’Faircheallaigh, 1997; O’Reilly and Eacott, 1998; Kennett, 1999; O’Reilly and Eacott, 1999; Storey and Hamilton, 2003; Gibson and Klinck, 2005; Yakovleva, 2005; Buell, 2006; Fidler and Hitch, 2007; O’Faircheallaigh and Ali, 2008; Fidler, 2010; Haley et al. 2011).</p> <p>↓</p> <p>Mining companies may contribute to the development of key socio-economic infrastructure such as roads, schools and housing, as well as to the</p>	<p>Higher disposable income increases the chance that an individual will engage in high-risk activities, such as drug and alcohol consumption, gambling and prostitution... (Gibson and Klinck, 2005; Buell, 2006)</p> <p>The economic benefits created by mineral development may create or exacerbate community and regional inequality... (O’Faircheallaigh, 1998; Gibson et Klinck, 2005).</p> <p>The profits created by mining may create an economic dependance and generate inflation... (Mann, 1975; O’Faircheallaigh, 1998; Ross 2001; Hilson 2002)</p> <p>In addition to the environmental impacts discussed at the top of this table, a more active participation in a wage-based economy can affect participation rates in the traditional subsistence</p>	<p>... which can lead to violence, mental problems, suicide, job instability, a poor state of health, the exploitation of women and a high rate of sexually transmitted infections. (Berger, 1977; Gibson and Klinck, 2005; Buell, 2006).</p> <p>...which may contribute to maintaining geographic and racially defined hierarchies as well as to an increase in social stratification, inequity in wealth distribution and perceived deprivation (Gibson and Klinck, 2005; Duhaime 2008).</p> <p>... which may stunt growth in other sectors (“Resource Curse”)... (Hilson, 2002; MiningWatch Canada, 2003; Diallo, 2009; Stammler, 2011)</p> <p>A decrease in participation in traditional subsistence activities may contribute to a loss of identity, depression, and anxiety... (Berger, 1977; Buell, 2006)</p>	<p>The exploitation of women is one of the many gender-specific impacts of mineral development, a category that also includes the deterioration of family integrity, threatened by exigencies and stress related to work and changes in family roles. This may contribute to violence and family conflicts (Sosa and Keenan, 2001; Gibson and Klinck, 2005; Noble and Bronson, 2005).</p> <p>This perception and the negative emotions it generates may contribute to an increase in social tensions (O’Faircheallaigh, 1998) and result in unhealthy behavior provoked/triggered by stress, such as smoking, violence and drug abuse (Buell, 2006).</p> <p>... and potentially generate exceptionally low living standards, higher poverty rates, high rates of child mortality and low life-expectancy, high rates of child malnutrition, low spending levels on health care, low enrollment rates in primary and secondary schools, and low rates of adult literacy, income inequality, vulnerability to economic shocks, high corruption, and government ineffectiveness (Ross, 2001).</p> <p>Moreover, women-led households seem to be more vulnerable to inflation generated by mining (Sosa and Keenan, 2001; Gibson and Klinck, 2005).</p> <p>... which may result in violence, drug abuse, the exploitation of women, and suicide (Berger, 1977; Buell, 2006).</p> <p>For women, not only must they adjust to a decrease in traditional</p>

<p>improvement of community infrastructure (Kennett, 1999; Hilson, 2002).</p> <p>DIRECT IMPACTS</p>	<p>economy, which is an integral part of Arctic indigenous peoples' identities (Buell, 2006; Bernauer, 2011).</p> <p>INDIRECT IMPACTS</p>	<p>INDUCED IMPACTS</p>	<p>subsistence activities, but the lack of child services limits their opportunity to work in the mining industry or to get</p> <p>CUMULATIVE IMPACTS</p>
			<p>educated and trained in prevision of an eventual job (O'Faircheallaigh, 1998, Natural Resources Canada, 2003; Buell, 2006). This also explains in part why women are often excluded from the decisional process (Natural Resources Canada, 2003) and why it may be difficult for them to contribute to the collective economy (Kuokkanen, 2011).</p>
<p>Demographic changes that stem from an influx of foreign workers that come from environments where social, economic, and cultural contexts and values are different...</p>	<p>... may put pressure on cultural identity, social integrity and self-esteem of local populations... (Joyce and MacFarlane, 2001; MiningWatch Canada, 2003; Natural Resources Canada, 2003; Gibson and Klinck, 2005; Noble and Bronson, 2005; Yakovleva, 2005; Buell, 2006).</p>	<p>... and create (or exacerbate) problems such as alcohol abuse and the imitation of unsustainable consumption patterns (Kennett, 1999).</p> <p>Furthermore, the loss of social norms and structures regulating individual behaviours attributed to the rapid pace and scope of changes and instability created by mining may lead to social woes such as anomie and suicide (Parlee and O'Neill, 2007).</p>	

From Keller (2012)

2.3 Knowledge Gaps about the Social Impacts of Mining in the Canadian North in the scientific and grey Literature

- Although the scientific and grey literature mentions employment as one of the main benefit of mining activities, there is little data available on the rate of this employment that is aimed at Aboriginals;
- Lack of information on health issues will be addressed by the *Mining & Aboriginal Community Health* project;

- There are also other gaps that need to be filled, namely regarding education, housing, community infrastructures and crime.
- The sustainability of the projects is said to be potentially brought by business opportunities, but other benefits for future generations are not mentioned;
- The actual impacts on traditional activities are also poorly documented, leading to contradictory predictions. The impacts on Inuit languages are not taken into consideration.

3 ANTICIPATED SOCIAL IMPACTS OF MINING IN THE CANADIAN NORTH: ENVIRONMENTAL IMPACT ASSESSMENTS

The different environmental impact assessment (EIA) reviewed are related to projects in 1) the Northwest Territories: Mackenzie Valley pipeline (Berger 1977); 2) in Labrador: Voisey's Bay (Voisey's Bay Nickel Company Ltd 1997); 3) in Nunavut: Jericho (Tahera Corporation 2003; Hornal & Associates Ltd 2003), Kiggavik (AREVA Resources Canada Inc 2011), Mary River (Baffinland Iron Mines Corporation 2012), and 4) in Quebec: Raglan (Makivik Corporation 1995) and Eastmain-1-A (Hydro-Québec 2004).

3.1 Review of Anticipated Social Impacts of Mining found in Environmental Impact Assessments

On local economic activity and employment

Rarely quantified, job opportunities (Baffinland Iron Mines Corporation 2012: 20; Tahera Corporation 2003: 92; Hornal & Associates Ltd 2003: 4-2; Hydro-Québec 2004: 21-16) and business opportunities (Baffinland Iron Mines Corporation 2012: 161; Tahera Corporation 2003: 95; Hydro-Québec 2004: 21-16; Makivik Corporation 1995: 54) are the principal benefits expected from mining projects. Their probability is seen as certain (Hornal & Associates Ltd

2003: 4-18) and they are also expected to have indirect effects on the economy (AREVA Resources Canada Inc 2011:8-18).

The Mackenzie River Pipeline assessment, however, stipulated that most of the job opportunities go to workers from the South (Berger 1977: 120) while Natives are “engaged mainly in low paid, unskilled, casual or seasonal employment” (Berger 1977: 133) and that projects tend to benefit the metropolis more than the local economy (Berger 1977: 118). The aboriginals are looking for ways to conciliate their participation in the growing wage economy without becoming entirely dependent and still earning a living from the land (Berger 1977:110). Incidentally, a later assessment suggests that the income from wage labor has become essential to the pursuit of the traditional activities associated to the land, since harvesters need disposable income to purchase and maintain equipment (Voisey’s Bay Nickel Company Ltd 1997: 22.1.5). Also, beyond the income, the pride of having a job is expected to have beneficial effects for the well-being of those concerned (Hornal & Associates Ltd 2003: 4-11).

The training opportunities, which often come in the form of on-the-job training, are emphasized in nearly every assessment, (Makivik Corporation 1995: 46-48; Baffinland Iron Mines Corporation 2012: 32; Berger 1977: 138; Tahera Corporation 2003: 96; Hornal & Associates Ltd 2003: 4-7; AREVA Resources Canada Inc 2011:8-16; Hydro-Québec 2004: 21-11).

The dependence on government transfers was considered to have increased in 1977 (Berger 1977: 151), while it was elsewhere noted to have decreased from 61% of personal income coming from government transfers in 1971, to 28% in 2001, a number higher than that of the general population, but similar to that found in other isolated areas (Hydro-Québec 2004: 16-93). Dependence on the government is expected to be lessened (Hornal & Associates Ltd 2003: 4-10).

Other anticipated impacts on the economy include an increased need for infrastructure (Baffinland Iron Mines Corporation 2012: 149) and a possible increase in the cost of living

during both the construction and operation phases of the project (Voisey's Bay Nickel Company Ltd 1997: 24.2.4; Hornal & Associates Ltd 2003: 4-11).

On health and well-being

The already high rates of suicide in the communities (Baffinland Iron Mines Corporation 2012: 102; Voisey's Bay Nickel Company Ltd 1997: 24.1.3.6; Berger 1977: 152; Tahera Corporation 2003: 94) may be increased by the poor management of incomes and stressors which also lead to domestic violence and divorce (AREVA Resources Canada Inc 2011:10-18).

The high rates of drug and alcohol addictions as well as gambling, which are recognized as already existing, widespread and increasing problems (Baffinland Iron Mines Corporation 2012: 102,103 Makivik Corporation 1995; Voisey's Bay Nickel Company Ltd 1997: 24.1.3.5; Berger 1977: 154; Tahera Corporation 2003: 94; Hydro-Québec 2004: 16-103), are expected to be exacerbated by increased income and lead to a series of related social problems (Hornal & Associates Ltd 2003: 4-10; AREVA Resources Canada Inc 2011: 10-17). Only the most recent EIA implies the creation of "Counselling and healing programs" (Baffinland Iron Mines Corporation 2012: 124).

The high rates of venereal disease (Berger 1977: 153; Tahera Corporation 2003: 94) are expected to increase AREVA 2011:10-17), while the high rates of mental illness (Tahera Corporation 2003:94) are expected to decrease thanks to the positive effects of employment and reduced economic stress (Baffinland Iron Mines Corporation 2012: 108; AREVA Resources Canada Inc 2011: 10-17).

On housing

If the population living in inadequate housing is growing at an alarming rate in some communities (Baffinland Iron Mines Corporation 2012: 104; Hydro-Québec 2004: 16-14) and stable in others such as Igloolik and Pond Inlet (Nunavut) (Baffinland Iron Mines Corporation

2012: 104), it is expected that new income will increase demand for new properties (Hornal & Associates Ltd 2003: 4-9) or for social housing from people wishing to leave over-crowded housing (AREVA Resources Canada Inc 2011: 11-4).

On crime

Already especially high in Nunavut and the Northwest Territories (Baffinland Iron Mines Corporation 2012: 103, Voisey's Bay Nickel Company Ltd 1997; Tahera Corporation 2003: 94), the crime rate is increasing (AREVA Resources Canada Inc 2011: 10-9).

The crime most discussed in EIAs is family violence (Baffinland Iron Mines Corporation 2012: 107; Tahera Corporation 2003: 94). The rate of reported spousal abuse is, in Nunavut, for instance, 6.5 times the national rate (Baffinland Iron Mines Corporation 2012: 107; Makivik Corporation 1995: 107) Some report an increase (Hornal & Associates Ltd 2003: 4-11 – AREVA Resources Canada Inc 2011: 10-9) while others noted a decline (Voisey's Bay Nickel Company Ltd 1997: 24.1.3.5).

On social cohesion and equity

Although migration of Inuit or non-Inuit in and out of the communities is expected, no numbers are stated (Baffinland Iron Mines Corporation 2012: 14, 15; Tahera Corporation 2003: 99; Hornal & Associates Ltd 2003: 4-12; AREVA Resources Canada Inc 2011: 8-2, 8-19; Hydro-Québec 2004: 16-3). It is expected that mines will remain dependent on workers from the South for many years (AREVA Resources Canada Inc 2011: 9-17).

The benefits announced for future generations include rent and royalties (Baffinland Iron Mines Corporation 2012: 242) and other benefits that will issue from IBAs (Tahera Corporation 2003: 100). A support for programs aiming to facilitate the transfer of traditional knowledge and skills is mentioned in the most recent report (Baffinland Iron Mines Corporation 2012: 225), acknowledging the importance given by the communities to leave something for the next

generations to harvest, but also to maintain existing values (AREVA Resources Canada Inc 2011; 9-1).

On traditional activities and Inuit languages

The anticipated impacts on traditional activities differ from one assessment to the next. While some expect that the project will have little impact on the hunting, fishing, and trapping activities of the local people (Tahera Corporation 2003: 96), some predict that less time, overall, may be available for hunting, trapping and fishing (Hornal & Associates Ltd 2003: 4-10), but point to the increased ability to buy hunting equipment (Hornal & Associates Ltd 2003: 4-8), while other admit not knowing if mining activities could lead to decreased or increased time engaging children in land-based activities (Baffinland Iron Mines Corporation 2012: 50).

A loss of the Inuktituk language is expected both because of the immersion in the English language at work and the increased contact of English speakers with the youth (AREVA Resources Canada Inc 2011: 9-9). Only the two most recent assessments address the issue. One plans to provide more services to Inuit in Inuktitut (AREVA Resources Canada Inc 2011: 8-18), while the other stipulates that, at the workplace, employees will be allowed to explain something in Inuktitut to each other, as long as it is then repeated in English, the primary language, for the benefit of the other employees (Baffinland Iron Mines Corporation 2012: 227).

3.2 Knowledge Gaps about the Social Impacts of Mining in the Canadian North in the Environmental Impact Assessments

- Many social impacts are poorly measured or not discussed in EIAs, be it by choice or because of the lack of data available. For instance, there are few actual numbers on employment of Aboriginals while actual numbers on education are completely absent from EIAs which limit their anticipated impacts to training opportunities;
- If mental health is addressed in most EIAs, other sicknesses are set aside;

- There is no data on housing and little on crime apart from family violence;
- Although they mention that workers from the South are likely to continue to migrate to work on the mines, they do not mention what impacts that situation is expected to bring on;
- While they were found in grey and scientific literature, there is nothing on the impacts that will specifically affect women in EIAs;
- Although they expect less dependence on government transfers, the EIAs mostly expect the IBAs to be the source of benefits for future generations (Baffinland Iron Mines Corporation 2012:242; Tahera Corporation 2003: 100) and therefore do not mention other potential benefits;
- Finally, different EIAs contain opposed anticipated impacts on traditional activities, highlighting the poor quality of information on the subject.

4 OBSERVED SOCIAL IMPACTS OF MINING IN THE CANADIAN NORTH: MONITORING REPORTS

Very few monitoring reports are available and most consist of qualitative interviews with workers and members of the communities. Their structure does not correspond with that of EIAs and they tend not to monitor anticipated impacts.

The monitoring reports reviewed are those from the following projects in 1) Labrador: Voisey's Bay (Archibald 1999; Labrador West Status of Women Council and Femmes Francophones de l'Ouest du Labrador 2004); 2) in Nunavut: Nanisivik (Brubacher & Associates 2002; Lim 2013), Nanisivik and Polaris (Bowes-Lyon, Richards & al. 2009), Jericho (Brubacher Development Strategies Inc. 2009); and in Quebec: Raglan (Salluit, Kangiqsujaq, Puvurnituk, Quaqaq, Kangirsuk) Lanari, Smith & al. 1999a; Lanari, Smith & al. 1999b; Lanari, Smith & al.

2000a; Lanari, Smith & al. 2000b; Lanari, Smith & al. 2000c) and Troilus (Penn & Roquet 2008; Krekshi 2009).

4.1 Review of Observed Social Impacts of Mining found in Monitoring Reports

First, the job opportunities have not been as numerous as was anticipated in the EIAs. The rate of Inuit or Cree employment rate promised in the agreements was not reached (Brubacher & Associates 2002: 17; Bowes-Lyon, Richards & al. 2009: 319) has declined after the construction phase (Brubacher & Associates 2002: 17; Bowes-Lyon, Richards & al. 2009: 319; Penn & Roquet 2008: 29,30; Krekshi 2009: 59), during which contracts were awarded to local companies in some cases (Bowes-Lyon, Richards & al. 2009: 383; Penn & Roquet 2008: 29,30), but not others (Brubacher 2002: 20; Lanari, Smith & al. 2000a: 8; Lanari, Smith & al. 2000b: 13; Krekshi 2009: 74).

Many reports mention the numerous family breakdowns occurring as a result of working on the mines (Lanari, Smith & al. 1999a: 13; Brubacher Development Strategies 2009: 52; Penn & Roquet 2008: 61, 113; Krekshi 2009: 74). The monitoring reports note an increase both in family violence (Labrador West Status of women Council & Femmes francophones de l'Ouest du Labrador 2004: 55; Krekshi 2009: 74) and sexually transmitted diseases (Krekshi 2009: 99).

As expected in EIAs, the issue of drug and alcohol addiction arises in a majority of the monitoring reports (Brubacher & Associates 2002: 12, 13; Bowes-Lyon, Richards & al. 2009: 384; Lanari, Smith & al. 1999a: 13; Lanari, Smith & al. 1999b: 12; Lanari, Smith & al. 2000a: 13; Lanari, Smith & al. 2000b: 58, 63; Krekshi 2009: 99).

Companies sometimes offer scholarships for students (Bowes-Lyon, Richards & al. 2009: p. 385) and on-the-job training for Inuit workers, although local people are not always interested in the positions available to them (Bowes-Lyon, Richards & al. 2009: p.379). Amongst the population, on-the-job training is valued as it offers not only opportunities for employment, but also for promotions (Brubacher Development Strategies 2009: 39-43).

The quality of housing is said to have improved in at least one case (Labrador West Status of women Council & Femmes francophones de l'Ouest du Labrador 2004: 28) while the shortage and overcrowding is still a reality (Brubacher & Associates 2002: 26; Krekshi 2009: 98). The reported benefits to the next generations are limited to the money made through the Raglan agreement, which is reportedly not always spent in such a way to actually benefit the whole community (Lanari, Smith & al. 1999a: 9; Lanari, Smith & al. 1999b: 6-7).

Also, as expected in at least some of the EIAs, the increased income is said to help with the purchase of hunting equipment which is perceived as a chance to increase hunting (Bowes-Lyon, Richards & al. 2009: 382; Lanari, Smith & al. 2000c: 10), although concerns over the impacts on wildlife resources were also raised (Lanari, Smith & al. 1999a: 5,6; Lanari, Smith & al. 1999b: 4; Lanari, Smith & al. 2000a: 5,6; Lanari, Smith & al. 2000b: 7,8,37). One report denotes a loss of words in Inuktituk (Brubacher & Associates 2002: 8).

Finally, often overlooked in the grey and scientific literature as well as in the EIAs, the importance of a mine's closure, be it planned or not, has only recently been acknowledged by mining companies and by regulators. What would happen at Nanisivik's closure, for instance, was not agreed in advance. After the closure of the mine was announced, long awaited discussions between the government and the company took place, but financial considerations outweighed any others. In 2004, a plan including the full demolition and reclamation of the town site, which was built next to the mine and approximately 30 km away from the community of Artic Bay, was approved by the Nunavut Water Board.

Residents of Artic Bay interviewed after the mine's closure mentioned the financial and emotional struggles of people who lost, along with their jobs, the ability to purchase hunting equipment, or even food, and, in a sense, their hopes for the future. A psychological impact was also experienced by those who were born in Nanisivik and lost their home, the place of birth being particularly important to the Inuit. The demolition of Nanisivik's town site infrastructure was widely seen as wasteful, especially in the case of houses, which the Mayor of Artic Bay had

suggested could be salvaged whole or for materials, since there was a shortage in his community. Some interviewees were also vexed that the company offered no compensation for the damage done to the environment (see Lim 2013: 52, 53, 54, 65, 77, 80, 81, 86).

4.2 Knowledge Gaps about the Social Impacts of Mining in the Canadian North in the monitoring reports

- The social impacts mentioned in monitoring reports mostly reflect the population's opinion on those which strike them, as opposed to actual numbers. For instance, the impacts on economic activity are not more detailed in the monitoring reports than in the EIAs. There are no mentions of the effects on the cost of living or the real numbers of job created directly or indirectly for Aboriginals by the mines;
- Moreover, monitoring reports contain no information on changes in life expectancy or reported sicknesses nor can they tell the number of deaths that are related to mining activities;
- In most cases, the shortage and poor quality of housing is not addressed and neither are changes in crime rates other than family violence, from theft to homicide;
- Changes in social cohesion, including migration of Inuit or non-Inuit in and out of the community and its impacts, are not discussed;
- Changing gender roles are not addressed either;
- Finally, no quantitative data on the participation in traditional activities or transmission of traditional knowledge and skills is available.

5 DISCUSSION: GAPS AND PRIORITY RESEARCH

- Gaps: what social impacts of mining in the North have not been or have barely been discussed:

- Hunting and fishing (real impact, amount of country food gathered, number of hunters, etc.)
- Socio-Economic inequalities within the communities before, during and after the project
- Impacts on women : impact of women working at the mine but also partners of miners in the communities
- Impact of fly-in/fly-out : impact on worker from out site, impact on worker from the communities, impact on families, impact on land based economy)
- Impact of the shift (based on fly in fly out)
- Aboriginal employment: rate (evolution) and turnover (see note Meadow Stat.)
- Impact of mine closure on Northern communities
- Priority Research for the future
 - Develop instruments to monitor better socio-economic impacts of mining project, including the gap mentioned above

6 BIBLIOGRAPHY

Adelson, N., (2005). The Embodiment of Inequity - Health Disparities in Aboriginal Canada. *Canadian Journal of Public Health – Revue canadienne de santé publique*, 96: S45-S61.

Adriana Resources Inc. (2013). Lac Otelnuk Iron Project, Quebec Retrieved May 1st, 2013, from: <http://www.adrianaresources.com/s/LacOtelnuk.asp>

Archibald, L., & Crkovich, M. (1999). *If Gender Mattered: A Case Study of Inuit Women, Land Claims and the Voisey's Bay Nickel Project*. Ottawa: Status of Woman Canada.

Archibald, L. and M. Crkovich (1999). *If Gender Mattered: A Case Study of Inuit Women, Land Claims and the Voisey's Bay Nickel Project*. Ottawa, Status of Woman Canada.

AREVA Resources Canada Inc. (2011). "Kiggavik Project. Draft Environmental Impact Statement." Retrieved July 11, 2012, from Nunavut Impact Review Board: <ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/09MN003-AREVA%20KIGGAVIK/2-REVIEW/06-DRAFT%20EIS%20&%20CONFORMITY%20REVIEW/02-DEIS%20SUBMISSION/>

Baffinland Iron Mines Corporation. (2012). Mary River Project - Final Environmental Impact Assessment Retrieved July 11, 2012, from Nunavut Impact Review Board: <ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/08MN053-BAFFINLAND%20MARY%20RIVER/2-REVIEW/08-FINAL%20EIS/FEIS/>

Barrett-Wood, Z., Knotsch, C., Davison, C., & Bradshaw, B. (nd). Translating Knowledge on Impacts of Mining for Aboriginal Community Health: The issue of rotational, two-week work shifts. National Aboriginal Health Organization. Poster Presentation.

Bell, J. (2010). A Paradox of Development. Web blog. Retrieved from: <http://titiraqti.wordpress.com/2010/01/03/a-paradox-of-development/>

Berger, T. (1977). "Northern Frontiers, Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry (1977) - Berger Report.". Retrieved June 22, 2012, from http://caid.ca/voll_mac-pip.html.

Bernauer, W. (2010). Mining, Harvesting and Decision Making in Baker Lake, Nunavut: A Case Study of Uranium Mining in Baker Lake. *Journal of Aboriginal Economic Development*, 7(1), 19-33.

Bernauer, W. (2010). Uranium Mining, Primitive Accumulation and Resistance in Baker Lake, Nunavut: Recent Changes in Community Perspectives. M.A., University of Manitoba, Winnipeg.

Bernauer, W. (2011). Mining and the Social Economy in Baker Lake, Nunavut. University of Saskatchewan, Saskatoon: Prepared for the Northern Ontario, Manitoba, and Saskatchewan Regional Node of the Social Economy Suite.

Bernauer, W. (2012). Discussion Paper: Impacts on Caribou and Inuit Harvesting of Caribou in AREVA's Draft Environmental Impact Statement for the Proposed "Kiggavik" Uranium Mine. Baker Lake: Baker Lake Hunters and Trappers Organization.

Bielawski, E. (2004). *Rogue Diamonds: Northern Riches On Dene Land*. Seattle: University of Washington Press.

Bjerregaard, P., & Young, T. K. (1998). *The Circumpolar Inuit: Health of a Population in Transition*. Copenhagen: Munksgaard.

Bjerregaard, P., Young, T. K., Dewailly, É., & Ebbensson, S. O. (2004). Indigenous Health in the Arctic: An Overview of the Circumpolar Inuit Population. *Scandinavian Journal of Public Health*, 32(5), 390-395.

Boutet, J.-S. (2010). Développement ferrifère et mondes autochtones au Québec subarctique, 1954-1983. *Recherches amérindiennes au Québec*, XL(3), 35-52.

Bowes-Lyon, L.-M., Richards, J. P., & McGee, T. M. (2009). Socio-Economic Impacts of the Nanisivik and Polaris Mines, Nunavut, Canada. In J. P. Richards (Ed.), *Mining, Society, and a Sustainable World* (pp. 371-396). Berlin: Springer.

Bronson, J., & Noble, B. F. (2006). Health determinants in Canadian northern environmental impact assessment. *Polar Record*, 42(223), 315-324.

Brubacher & Associates. (2002). *The Nanisivik Legacy in Arctic Bay. A Socio-Economic Impact Study*. Ottawa: Department of Sustainable Development, Government of Nunavut.

Brubacher Development Strategies Inc. (2009). Kitikmeot Socio-Economic Monitoring Committee Jericho Diamond Mine. 2007 Socio-Economic Monitoring Report. Ottawa, Brubacher Development Strategies Inc.

Buell, M. (2006). Resource Extraction Development and Well-Being in the North. A Scan of the Unique Challenges of Development in Inuit Communities: Ajunnginiq Centre, National Aboriginal Health Organization.

Caine, K. J., & Krogman, N. (2010). Powerful or Just Plain Power-Full? A Power Analysis of Impact and Benefit Agreements in Canada's North. *Organization & Environment*, 23(1), 76-98.

Campbell, B., & Laforce, M. (2010). La réforme des cadres réglementaires dans le secteur minier: Les expériences canadienne et africaine mises en perspective. *Recherches amérindiennes au Québec*, XL(3), 69-84.

Canadian Environmental Assessment Agency. (2004). Considering Aboriginal Traditional Knowledge in Environmental Assessments Conducted Under the Canadian Environmental Assessment Act: Interim principles Retrieved June 7, 2012, from www.ceaa.gc.ca/default.asp?lang=En&n=4A795E76-1

Carter, R. A. (2007). Canadian Mining: A Crowded House. *Engineering & Mining Journal*, 208(7), 68-77.

Cornell, S., & Kalt, J. P. (2003). Reloading the Dice. Improving the Chances for Economic Development on American Indian Reservations Joint Occasional Papers on Native Affairs, No. 2003-02. Tucson: Native Nations Institute.

Couch, W. J. (2002). Two-Step Process – Strategic Resolution of Policy, Environmental and Socio-economic Impacts in Canadian Arctic Diamond Mining: BHP’s NWT Diamond Project. *Impact Assessment and Project Appraisal*, 20(4), 265-278.

Davis, G. A. (2009). Extractive Economies, Growth, and the Poor. In J. P. Richards (Ed.), *Mining, Society, and a Sustainable World* (pp. 37-60). Berlin: Springer.

Diges, C. (2008). *Sticks and Bones; Is Your IBA Working? Amending and Enforcing Impact Benefit Agreements*. Toronto: McMillan Binch Mendelsohn LLP.

Dreyer, D., & Myers, H. (2004). *Impact and Benefits Agreements: Do the Ross River Dena Benefit from Mineral Projects? Final Report: Northern Land Use Institute, University of Northern British Columbia*.

Duhaime, G., Bernard, N., & Caron, A. (2011). Mining on Aboriginals Lands. In C. J. Voyageur, D. R. Newhouse & D. Beavon (Eds.), *Hidden in Plain Sight, Contributions of Aboriginal Peoples to Canadian Identity and Culture* (Vol. 2, pp. 108-130). Toronto: University of Toronto Press.

Duhaime, G., Bernard, N., & Comtois, R. (2005). An Inventory of Abandoned Mining Exploration Sites in Nunavik, Canada. *The Canadian Geographer*, 43(3), 260-271.

Duhaime, G., Bernard, N., Fréchette, P., Maillé, M.-A., Morin, A. & Caron, A. (2003). *The Mining Industry and the Social Stakes of Development in the Arctic*. Québec: Chaire de recherche du Canada sur la condition autochtone comparée.

Fidler, C. (2010). Increasing the Sustainability of a Resource Development: Aboriginal Engagement and Negotiated Agreements. *Environmental Development Sustainability*, 12(1), 233-244.

Fidler, C., & Hitch, M. (2007). Impact and Benefit Agreements: A Contentious Issue for Environmental and Aboriginal Justice. *Environments Journal* Volume, 35(2), 49-69.

Fletcher, C. (2003). Community-Based Participatory Research in Northern Canadian Aboriginal Communities: An Overview of Context and Process. *Pimatzwin: A Journal of Aboriginal and Indigenous Community Health*, 1(1), 27-61.

Fletcher, C. (nd). Aboriginal Voice in the Environmental Impact Assessment in Canada's North Retrieved June 11, 2012, from <http://ra.tapor.ualberta.ca/Fletcher/>

Galbraith, L., Bradshaw, B., & Rutherford, M. B. (2007). Towards a new supraregulatory approach to environmental assessment in Northern Canada. *Impact Assessment and Project Appraisal*, 25(1), 27-41.

Gibson, G., & Klinck, J. (2005). Canada's Resilient North: The Impact of Mining on Aboriginal Communities. *Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health*, 3(1), 115-139.

Gibson, G., & O'Faircheallaigh, C. (2010). IBA Community Toolkit - Negotiation and Implementation of Impact and Benefit Agreements: Walter & Duncan Gordon Foundation.

Gibson, R. B. (2006). Sustainability Assessment and Conflict Resolution: Reaching Agreement to Proceed with the Voisey's Bay Nickel Mine. *Journal of Cleaner Production*, 14(3-4), 334-348.

Gibson, R.B. (2006). Sustainability Assessment: Basic Components of a Practical Approach. *Impact Assessment and Project Appraisal*, 24(3).

Gibson, R.B., (2006). Sustainability-Based Assessment Criteria and Associated Frameworks for Evaluations and Decisions. A report prepared for the Joint Review Panel for the Mackenzie Gas Project.

Goldenberg, S., Shoveller, J., Ostry, A., & Koehoorn, M. (2008). Youth sexual behaviour in a boomtown: implications for the control of sexually transmitted infections. *Sexually Transmitted Infections*, 84(3), 220-223. doi: 10.1136/sti.2007.027219

Goldman, L. R. (Ed.). (2000). *Social Impact Analysis. An Applied Anthropology Manual*. Oxford & New York: Berg.

Gouvernement du Québec. (2008). *Amérindiens et Inuits du Québec. Guide Intérimaire et matière de consultation des communautés autochtones*. Québec: Groupe interministériel de soutien sur la consultation des Autochtones.

Gouvernement du Québec. (2011). *Plan Nord. Faire le Nord ensemble. Le plan d'une génération*. Québec: Ministère des Ressources naturelles et de la Faune.

Government of Nunavut, & Department of Economic Development & Transportation. (2012). *Kitikmeot Socio-Economic Monitoring Committee*. Cambridge Bay: Government of Nunavut & Department of Economic Development & Transportation.

Government of Nunavut, & Department of Economic Development & Transportation. (2012). *Qikiqtaaluk Socio-Economic Monitoring Committee*. Pangnirtung: Government of Nunavut & Department of Economic Development & Transportation.

Government of the Northwest Territories. (2006). *Communities and Diamonds: 2005 Annual Report of the Government of the Northwest Territories under the BHP Billiton, Diavik and De Beers Socio-Economic Agreements*. Yellowknife: Government of the Northwest Territories.

Government of the Northwest Territories. (2009). *Communities and Diamonds. 2008 Annual Report of the Government of the Northwest Territories Under the BHP Billiton, Diavik and De Beers Socio-Economic Agreements*. Yellowknife: Government of the Northwest Territories.

Haley, S., Klick, M., Szymoniak, N., & Crow, A. (2011). Observing trends and assessing data for Arctic mining. *Polar Geography*, 34(1-2), 37-61.

Haley, S., Szymoniak, N., Crow, A., & Schwoerer, T. (2011). Social Indicators for Arctic Mining ISER Working Paper 2011.2. University of Alaska Anchorage: Institute of Social and Economic Research.

Hilson, G. (2002). An Overview of Land Use Conflicts in Mining Communities. *Land Use Policy*, 19, 65-73.

Hoefler, T. (2011). Mining in Nunavut. Getting Your Share of Major Developments. Paper presented at the Nunavut Trade Show, Iqaluit, Nunavut.

Hornal, R. & Associates Ltd. (2003). Socio-economic Baseline Study of the Kitikmeot Communities, Nunavut and Yellowknife, Northwest Territories. Prepared for Tahera Corporation's Jericho Diamond Project.

Hurtig, A., San Sebastian, M., (2002). Geographical Differences in Cancer Incidence in the Amazon Basin of Ecuador in Relation to Residence Near Oil Fields. *International Journal of Epidemiology*, 31(5): 1021-1027.

Hydro Québec (2004). "Projet de l'Eastmain-1-A-Sarcelle-Rupert. Étude d'impact sur l'environnement." Retrieved July 11, 2012, from <http://www.hydroquebec.com/rupert/fr/etudes.html>.

Irlbacher-Fox, S., & Mills, S. J. (2007). Devolution and Resource Revenue Sharing in the Canadian North: Achieving Fairness Across Generations: Walter and Duncan Foundation Discussion Paper.

Isaac, T., & Knox, A. (2004). Canadian Aboriginal Law: Creating Certainty in Resource Development. *University of New Brunswick Law Journal*, 53(3), 3-42.

Jenkins, H., & Yakovleva, N. (2006). Corporate Social Responsibility in the Mining Industry: Exploring Trends in Social and Environmental Disclosure. *Journal of Cleaner Production*, 14, 271-284.

Joyce, S. A., & McacFarlane, M. (2001). Social Impact Assessment in the Mining Industry: Current Situation and Future Directions. *Mining, Minerals and Sustainable Development*(46), 1-28.

Keeling, A., & Sandlos, J. (2009). Environmental Justice Goes Underground? Historical Notes from Canada's Northern Mining Frontier. *Environmental Justice*, 2(3), 117-125.

Keller, J. (2012). Les impacts socio-économiques de l'exploitation minière sur les communautés autochtones de l'Arctique. Québec: Ministère des Ressources naturelles et de la Faune du Québec et Géologie Québec.

Keller, J. (2013). The Potential Socio-Economic Impacts of Mining on Arctic Indigenous Communities, Master essay, Université Laval.

Kindon, S., Pain, R., & Mike, K. (2008). *Participatory Action Research Approaches and Methods: Connecting People, Participation and Place*. New York: Routledge.

Knotsch, C., & Warda, J. (2009). *Impact Benefit Agreements: A Tool for Healthy Inuit Communities?* : National Aboriginal Health Organization.

Knotsch, C., & Warda, J. (2009). *Impact Benefit Agreements: A Tool for Healthy Inuit Communities?* : National Aboriginal Health Organization.

Knotsch, C., Siebenmorgen, P., & Bradshaw, B. (2010). Les "ententes sur les répercussions et les avantages" et le bien-être des communautés : des occasions ratées? *Recherches amérindiennes au Québec*, XL(3), 59-68.

Koke, P. E. (2008). *The Impact Of Mining Development On Subsistence Practices Of Indigenous Peoples: Lessons Learned From Northern Quebec And Alaska*. M.A., The University of Northern British-Columbia.

Krekshi, L. E. N. P. F. C. (2009). *Indigenous Peoples' Perspectives on Participation in Mining. The Case of James Bay Cree First Nation in Canada*. Department of Urban Planning and Environment. Division of Urban and Regional Studies, Kungliga Tekniska högskolan (Royal Institute of Technology, Sweden).

Kruse, P. (2011). Developing an Arctic Subsistence Observation System. *Polar Geography*, 34(1-2), 9-35.

Kucera, J. (2009). Oil on Ice. *The Atlantic*, (November). Retrieved from <http://www.theatlantic.com/magazine/archive/2009/11/oil-on-ice/7716/>

Labrador West Status of Women Council, & Femmes Francophones de l'Ouest du Labrador. (2004). *Effects of Mining on Women's Health in Labrador West: In collaboration with MiningWatch Canada and the Steelworkers Humanity Fund, with generous assistance from the Lupina Foundation*.

Laforce, M. (2012). Régulation du projet minier de Voisey's Bay au Labrador. Vers un rééquilibrage des pouvoirs dans certains contextes politiques et institutionnels. In M. Laforce, B. Campbell & B. Sarrazin (Eds.), *Pouvoir et régulation dans le secteur minier. Leçons à partir de l'expérience canadienne* (pp. 157-189). Québec: Presses de l'Université du Québec.

Laforce, M., & Campbell, B. (2012). Conclusion. In M. Laforce, B. Campbell & B. Sarrazin (Eds.), *Pouvoir et régulation dans le secteur minier. Leçons à partir de l'expérience canadienne* (pp. 255-264). Québec: Presses de l'Université du Québec.

Laforce, M., & Tardif, J. (2012). Modes de régulation de l'investissement minier au Canada. Quelle ouverture à l'égard des positions autochtones? Une étude du projet Ekati dans les Territoires du Nord-Ouest. In M. Laforce, B. Campbell & B. Sarrazin (Eds.), *Pouvoir et régulation dans le secteur minier. Leçons à partir de l'expérience canadienne* (pp. 51-110). Québec: Presses de l'Université du Québec.

Laforce, M., Lapointe, U., & Lebus, V. (2012). Régulation du secteur minier au Québec et au Canada. Une redéfinition des rapports asymétriques est-elle possible? In M. Laforce, B. Campbell & B. Sarrazin (Eds.), *Pouvoir et régulation dans le secteur minier. Leçons à partir de l'expérience canadienne* (pp. 9-50). Québec: Presses de l'Université du Québec.

Lanari, R., Smith, S., & Okituk, P. (1999a). A report to the community of Salluit. Raglan Mine: Action-oriented social research program: Makivik Corporation.

Lanari, R., Smith, S., & Okituk, P. (1999b). A report to the community of Kangiqsujuaq. Raglan Mine: Action-oriented social research program: Makivik Corporation.

Lanari, R., Smith, S., & Okituk, P. (2000a). A report to the community of Puvirnituk. Raglan Mine: Action-oriented social research program: Makivik Corporation.

Lanari, R., Smith, S., & Okituk, P. (2000b). A report to the community of Quaqtak. Raglan Mine: Action-oriented social research program: Makivik Corporation.

Lanari, R., Smith, S., & Okituk, P. (2000c). A report to the community of Kangirsuk. Raglan Mine: Action-oriented social research program: Makivik Corporation.

Landry, V., Bouvier, A.-L., & Waaub, J.-P. (2009). La planification territoriale autochtone au Canada : Le rôle de l'évaluation environnementale stratégique dans la cogestion adaptative. Montréal: GEIGER (Groupe d'études interdisciplinaires en géographie et environnement régional).

Lapointe, U. (2010). L'héritage du principe de free mining au Québec et au Canada. *Recherches amérindiennes au Québec*, XL(3), 9-25

Laurence, D. (2006). Optimisation of the Mine Closure Process. *Journal of Cleaner Production*, 14, 285-298.

Lawrence, D. P. (2003). *Environmental Impact Assessment. Practical Solutions to Recurrent Problems*. Hoboken: John Wiley & Sons, Inc.

Lebuis, V., & King-Ruel, G. (2010). Le consentement libre, préalable et informé : une norme internationale en émergence pour la protection des populations locales autochtones. *Recherches amérindiennes au Québec*, XL(3), 85-99.

Lim, T. W. (2013). Inuit Encounters with Colonial Capital: Nanisivik – Canada's First High Arctic Mine. Retrieved February 5, 2013 from circle.ubc.ca.

Makivik Corporation (1995). The Raglan Agreement entered into between Makivik Corporation, Qarqalik Landholding Corporation of Salluit, Northern Village Corporation of Salluit, Nunatulik Landholding Corporation of Kangiqsujuaq, Northern Village Corporation of Kangiqsujuaq and Société Minière Raglan du Québec Ltée to which intervened Falconbridge Limited.

McPhail, K. (2009). The Challenge of Mineral Wealth: Using Resource Endowments to Foster Sustainable Development. In J. P. Richards (Ed.), *Mining, Society, and a Sustainable World* (pp. 61-74). Berlin: Springer.

Mills, S. E. (2010). Beyond the Blue and Green: The Need to Consider Aboriginal Peoples' Relationships to Resource Development in Labor-Environment Campaigns. *Labor Studies Journal*, 36(1), 1-18.

Nassichuk, W. W. (1987). Forty Years of Northern Non-Renewable Natural Resource Development. *Arctic*, 40(4), 274-284.

Natural Resources Canada. (2003). *The Social Dimension of Sustainable Development and the Mining Industry. A Background Paper*. Ottawa: Natural Resources Canada, Minerals and Metals Sector.

Natural Resources Canada. (2004). *CSR Case Study: Teck Cominco Building a Culture of Responsibility*. Ottawa: Natural Resources Canada.

Nelsen, J., & Scoble, M. (2006). *Social License to Operate Mines: Issues of Situational Analysis and Process*. Paper presented at the Mine Planning and Equipment Selection Conference Paper.

Noble, B. F. (2006). *Introduction to Environmental Impact Assessment: Guide to Principles and Practice*. Toronto: Oxford University Press Canada.

Noble, B. F., & Bronson, J. (2005). Integrating Human Health into Environmental Impact Assessment: Case Studies of Canada's Northern Mining Resource Sector. *Arctic*, 58(4), 395-405.

Nunatsiaq News (2012). Nunavik's Lac Otelnuuk iron mine project on a fast track to production. Retrieved February 12, 2013 from http://www.nunatsiaqonline.ca/stories/article/65674nunaviks_lac_otelnuk_iron_mine_project_on_a_fast-track_to_production/.

Nunavut Impact Review Board. (2012). Draft Guidelines for the Preparation of an Environmental Impact Statement for Hope Bay Mining Ltd.'s Phase 2 Hope Bay Belt Project (NIRB File No. 12MN001). Cambridge Bay: Nunavut Impact Review Board.

O'Faircheallaigh, C. (1998). Resource Development and Inequality in Indigenous Societies: Aboriginal Politics and Public Sector Management.

O'Faircheallaigh, C., & Corbett, T. (2005). Indigenous Participation in Environmental Management of Mining Projects: The Role of Negotiated Agreements. *Environmental Politics*, 14(5), 629-647.

O'Reilly, K., & Eacott, E. (1999-2000). Aboriginal Peoples and Impact and Benefit Agreement: Summary of the Report of a National Workshop. *Northern Perspectives*, 25(4). Retrieved from <http://www.carc.org/pubs/v25no4/2.htm>

Penn, A. and V. N. P. C. Roquet (2008). Implementing the Troilus Agreement. A Joint Study of Cree Employment and Services Contracts in the Mining Sector. Montreal, Cree Nation of Mistissini, Cree Regional Authority and Inmet Mining Corporation.

Peterson, K. (2012). Community Experiences of Mining in Baker Lake, Nunavut. M.A., The University of Guelph, Guelph.

Picard, G. (2010). Premières Nations : des partenaires incontournables du développement territorial. *Recherches amérindiennes au Québec*, XL(3), 27-33.

Prno, J., & Bradshaw, B. (2008). Program Evaluation in a Northern Aboriginal Setting: Assessing Impact and Benefit Agreements. *Journal of Aboriginal Economic Development*, 6(1), 59-75.

Prno, J., & Slocombe, S. S. (2012). Exploring the Origins of ‘Social License to Operate’ in the Mining Sector: Perspectives from Governance and Sustainability Theories. *Resources Policy*, 37(2), 346-357.

Prno, J., Bradshaw, B., & Lapierre, D. (2012). *Impact and Benefit Agreements: Are they working?* Guelph: Impact and Benefit Agreement (IBA) Research Network.

Render, J. M. (2005). *Mining and Indigenous peoples Issues Review*. Virginia, USA: International Council on Mining and Metals.

Richard, J., (2009). *Mining, Society, and a Sustainable World*, Berlin: Springer.

Roy Grégoire, É., Lapointe, U., & King-Ruel, G. (2012). Régulation du secteur minier au Québec. Quelles contraintes et quelles ouvertures à l'égard des populations locales? Le cas du projet minier Raglan. In M. Laforce, B. Campbell & B. Sarrazin (Eds.), *Pouvoir et régulation dans le secteur minier. Leçons à partir de l'expérience canadienne* (pp. 111-155). Québec: Presses de l'Université du Québec.

Sandlos, J., & Keeling, A. (2012). Claiming the New North: Mining and Colonialism at the Pine Point Mine, Northwest Territories, Canada. *Environment and History*, 18(1), 5-34.

Shadian, J. (2011). *Post-Sovereign Governance: An Inuit framework for Arctic Resource Management*. Paper presented at the ICASS VII: Circumpolar Perspectives in Global Dialogue: Social Sciences beyond the International Polar Year, Akureyri, Iceland.

Shandro, J. A., Veiga, M. M., Shoveller, J., Scoble, M., & Koehoorn, M. (2011). Perspectives on Community Health Issues and the Mining Boom–Bust Cycle. *Resources Policy*, 36, 178-186.

Sosa, I., & Keenan, K. (2001). *Impact Benefit Agreements Between Aboriginal Communities and Mining Companies: Their Use in Canada*. Toronto: Environmental Mining Council of

British Columbia, Canadian Environmental Law Association and CooperAcción: Acción Solidaria para el Desarrollo.

Vanclay, F. (2002). Conceptualizing Social Impacts. *Environmental Impact Assessment Review*, 22, 193-211.

Vanclay, F. (2003). Social Impact Assessment. International Principles. In I. A. f. I. Assessment (Ed.). Fargo: Special Publication Series No. 2.

Veiga, M. M., Scoble, M., & McAllister, M. L. (2001). Mining with Communities. *Natural Resources Forum*, 25(3), 191-202.

Voisey's Bay Nickel Company Ltd. (1997). "Voisey's Bay Mine/Mill Project Environmental Impact Statement." Retrieved July 11, 2012, from <http://www.vbnc.com/eis/index.htm>.

Waye, A., Young, D., Richards, J. P., & Doucet, J. A. (2009). Sustainable Development and Mining: An Exploratory Examination of the Roles of Government and Industry. In J. P. Richards (Ed.), *Mining, Society, and a Sustainable World* (pp. 151-182). Berlin: Springer.

Whiteman, G., & Mamen, K. (2005). Meaningful Consultation and Participation in the Mining Sector? A Review of the Consultation and Participation of Indigenous Peoples within the International Mining Sector: The North-South Institute.

Whitmore, A. (2006). The Emperors' New Clothes: Sustainable Mining? *Journal of Cleaner Production*, 14, 309-314.

Winfield, M. S., Jamison, A., Wong, R., & Czajkowski, P. (2006). Nuclear Power in Canada: An Examination of Risks, Impacts and Sustainability. Calgary: The Pembina Institute.

7 APPENDIX 1: INDICATORS OF SOCIAL IMPACTS OF MINING PROJECTS

Theme	Variable	Indicators
People	Demographics	Age Structure Population growth Mobility Teen pregnancy Other
	Health & Well-being	Life expectancy Birth weight Infant mortality Suicide Addictions Addiction treatment programs Change in reported sicknesses Change in occurrences of sicknesses Change in exposition to toxic substances Number of deaths related to mining activities Other
	Education & Training	Secondary completion (actual number, gender and %) Post-secondary enrollment (actual number, gender and %) Post-secondary completion (actual number, gender and %) Trades enrollment (actual number, gender and %) Trades completion (actual number, gender and %) Other
	Housing	Total dwelling Dwellings rented Average household size Dwellings owned

		Quality of housing Other
	Crime	Homicide and attempted homicide Sexual assault Major Assault Common assault Robbery Uttering threats Break and enter Theft Mischief & Vandalism Disturbing the peace Other
	Social cohesion	In-migration of non-Inuit into community In-migration of Inuit into community Out-migration of Inuit and non-Inuit out of community Participation in local groups (Churches, coop, volunteer groups, etc.) Change in gender Roles Other
	Intragenerational equity	Income (Broken down by quintile, gender and origins) Influence in governance/Participation in elections (broken down by quintile, gender and origins) Education (highest degree obtained) (Broken down by quintile, gender and origins) % of employed (Broken down by quintile, gender and origins) Other

	Intergenerational equity	<p>Social and cultural benefits for future generations</p> <p>Economic benefits for future generations</p> <p>Political benefits for future generations</p> <p>Ecological benefits for future generations</p> <p>Other</p>
Cultural practices	Inuit language	<p>Mother tongue broken down by age</p> <p>Second language</p> <p>Dominant language in the home</p> <p>English</p> <p>French</p> <p>Other</p>
	Traditional Activities & Skills	<p>% of adults who hunts</p> <p>% of adults who take youth hunting with them</p> <p>% of adults who take youth who also work at the mine</p> <p>% of adults who fish</p> <p>% of adults who gather wild plants (berries, etc.)</p> <p>% of adults who trap</p> <p>% of adults who use Inuit traditional knowledge (IQ)</p> <p>Other</p>
	Land use	<p>Shift in hunting patterns: occasional, active, intensive</p> <p>Shift in frequency of land use</p> <p>Shift in travelling routes</p> <p>Changes in traditional harvest practice</p> <p>Change in country food consumption</p> <p>Change in country food sharing</p> <p>Change in time spent by children with elders</p> <p>Change in animals harvested/trapped</p> <p>Change in plants harvested</p> <p>Change in fish harvested</p>

		<p>Change in location of animals</p> <p>Change in location of fishes</p> <p>Change in location of plants</p> <p>Change in water uses (locations, routes, frequency)</p> <p>Other</p>
	Archaeological sites	<p># of archaeological sites affected</p> <p>Potential archaeological research (# of zones to be investigated)</p> <p>Research done (# of zone investigated)</p> <p>Other</p>
Economy	Employment	<p>Employed (actual numbers, gender and %)</p> <p>Employed by the mines (actual numbers, gender and %)</p> <p>Unemployed (actual numbers, gender and %)</p> <p>Participation rate (%) gender, labour force</p> <p>Not in the labour force</p> <p>Income (Broken down by quintile, gender and origins)</p> <p>Source of income</p> <p>Change in type of employment (fly-in, community, etc.)</p> <p>Other</p>
	Economic activity	<p>Consumer price index</p> <p>Cost of grocery/northern food basket</p> <p>Retail</p> <p>Project - Percentage of economy</p> <p>Building permits</p> <p># of new business linked to the project</p> <p>Other</p>