

**Review of Community Health Issues in the Keeyask Generation Project  
Environmental Impact Statement**

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Prepared by:



Prepared for:

Public Interest Law Centre of Legal Aid Manitoba



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## A. Introduction

This report was produced by Habitat Health Impact Consulting Corp. at the request of the Public Interest Law Centre of Legal Aid Manitoba.

Development projects such as the Manitoba Hydro Keeyask Generation Project have well-characterized effects on biophysical, social and economic environments. They also exert a strong influence on health in nearby communities. Many, although not all, of these health effects are secondary to direct changes caused by the project—for example, changes in air quality, in wildlife availability or in the demographic makeup of towns. However, the health effects are themselves a lens through which affected stakeholders often view the benefits or costs of the project. As such, appropriately framing project impacts from a community health perspective can be essential in helping all stakeholders understand the trade-offs implicit in the project, through a common valued component.

The purpose of this report is to discuss the extent to which the Manitoba Hydro Keeyask Generation Project EIS (Keeyask EIS) appropriately examines the potential effects of the project on community health outcomes.

It should be noted that Manitoba Hydro produced a number of EIS documents related to the Keeyask Generation Project. This review focuses on the *Socio-Economic Environment, Resource Use and Heritage Resources Supporting Volume* as it presents the most thorough data regarding human health. This document was not required to be submitted for review by the CEA Act. The regulatory document, *Response to EIS Guidelines*, is a condensed version of the Supporting Volumes and therefore it was deemed less appropriate for review due to its reduced content; however it is reviewed in cases where data were only available in that document (e.g., Cumulative Effects).

## B. Health Impact Assessment (HIA)

The examination of the potential effects on health from proposed projects, programs or policies is commonly referred to as Health Impact Assessment or HIA. The field of HIA has been developing over the last 15 years within Canada and internationally, and HIAs are commonly applied to industrial development projects either as part of an EIA (which may be referred to as an environmental, social and health impact assessment (ESHIA) or an integrated assessment) or as a stand-alone study. The upswing in application of HIA has come from a number of instigators:

- communities demanding that health implications be explicitly considered in the decision making process;
- regulatory requirements enacted by some jurisdictions that HIA be used as part of the EIS process;
- requirements for HIA from international lending agencies;
- project proponent recognition of the financial and reputational implications of poorly addressing health effects; and
- industry-wide promotion of best practices and a business case for HIA.

## C. International Guidance and Standards for HIA

An increasing number of organizations including government agencies, project proponents and communities are requiring or requesting the use of HIA in the assessment of both public policy and industrial developments.

### HIA in Quebec

In Canada, the use of HIA has been sporadic and mainly applied within environmental impact assessment. However, in 2002, Quebec adopted Section 54 into their Public Health Act which states that “all government departments must ensure that their legislative bills and regulations will not have significant negative health impacts on the population.” This requirement essentially mandated the use of HIA as a tool to assess public policy within all government departments (planning, environmental, social services, transportation, etc.) to ensure that policies would be positive for health. HIA is now commonly used and requested within the provincial government and is being applied to municipal projects.<sup>1</sup>

### HIA in Alaska

Alaska has been a leader in pushing for the use of HIA alongside or within Environmental Impact Assessments for resource development projects. Two distinct developments have occurred:

a) The Alaska Department of Health and Social Services has been promoting the use of HIA for assessment of health effects associated with resource development projects. The use of HIA in the state is not currently required; however, the DHSS has produced a guide for when and how HIAs should be conducted for resource development projects. The guide provides technical information and methodological guidance for government agencies, project proponents and HIA practitioners.

b) The indigenous government of Alaska’s North Slope Borough (NSB) has successfully included HIA into Environmental Impact Statements prepared as part of the federal NEPA process. This inclusion began in response to community members who expressed that the traditional EIA public consultation processes were not considering the impacts that oil and gas activities would have on the health of animal populations, contamination of traditional foods and plants, access to hunting areas and safety on the land as well as the social, economic and health changes that would come with industrial development and movement away from traditional culture. In response, the Alaska Inter-Tribal Council and the NSB government pilot tested the use of HIA with the NEPA-regulated EIS process to demonstrate that HIA could be used as a tool to legitimately address community concerns and make project proponents responsible for the changes that were already occurring. The North Slope Borough now has an HIA program administrator position and completes HIA on major oil and gas development proposals in the North Slope.

### International Finance Corporation Requirements for HIA

The International Finance Corporation (IFC) requires that an HIA be done as part of funding requirements under Performance Standard 4: Community Health, Safety and Security. Although the IFC requirements only apply to lender-funded developments in non-OECD countries, a number of project proponents have voluntarily tried to meet these same standards in order to engage in best practices for impact assessment

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<sup>1</sup> Benoit, F., C. Druet, G. Hamel, and L. St-Pierre. 2012. Implementation of Section 54 of Quebec’s Public Health Act. National Collaborating Centre for Healthy Public Policy.

and effects mitigation. In 2009 the IFC produced a guidance document called *Introduction to Health Impact Assessment*.<sup>2</sup>

### International HIA Guidelines

In addition to the guidance documents mentioned above (Alaska, IFC), a number of other government and industry organizations have produced guidance supporting the use of HIA for resource development projects. These include:

- Environmental Health Assessment Services, Health Canada (2004). *Canadian Handbook on Health Impact Assessment*. Ottawa: Health Canada.
- ICMM (International Council on Mining and Metals), 2010. *Good Practice Guidance on Health Impact Assessment*. London, UK: International Council on Mining and Metals.
- International Petroleum Industry Environmental Conservation Association (IPIECA) and the International Association of Oil & Gas Producers (2005). *A Guide to Health Impact Assessments*. London: IPIECA.

## D. Areas of Potential Health Effect

Habitat Health Impact Consulting Corp. worked with the Public Interest Law Centre of Legal Aid Manitoba to review the Manitoba Hydro Bipole III EIS (released late 2012) for its inclusion of community health issues. In that report we outlined a number of health areas that are commonly affected by large development projects. These areas of potential health effect remain relevant for the Keeyask EIS and include:

Health effects associated with social and economic change. Employment and income can lead to health benefits for a local population. However, many communities have also experienced increases in drug and alcohol use and commensurate increases in prostitution, violence, and crime. This trend is particularly strong where social changes are also a result of economic change or a demographic shift as a result of the project.

Infectious disease transmission. Infectious disease in the context of development projects in Canada results from an influx of people (e.g., a project construction workforce) moving temporarily into a rural or remote area, combined with high density or overcrowding in homes or camps. Respiratory and gastrointestinal disease transmission is a concern; increases in sexually transmitted infection rates are very common.

Diet and nutrition. Where a project affects the availability of or access to wildlife, there may be implications for diet and nutrition among people who depend on the wildlife as a food source, including First Nations communities. Contamination of wildlife is a separate issue that may affect health outcomes; perceived contamination (with or without “real” contamination occurring) may also change dietary behaviours and drive nutritional outcomes.

Injury and public safety. Increases in traffic-related injuries and fatalities can occur where there is a project-related increase in the volume of traffic.

Stress and mental wellbeing are commonly affected in a subset of local residents. The degree to which effects manifest is affected by a number of project factors.

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<sup>2</sup> International Finance Corporation. 2009. *Introduction to Health Impact Assessment*. Washington, DC.

Emergency health response. Emergency response planning for a large project usually involves drawing on emergency response capabilities in the region, such as ground and air ambulance, emergency care and tertiary care. The way in which emergency response is coordinated or carried out will have an impact on the availability of services for other stakeholders.

Health care service provision. Several challenges face health care service providers that may be exacerbated by temporary or permanent project attributes. These challenges include a larger population that requires service; increased need for certain services (generally emergency services and drug/alcohol treatment); and difficulty in recruiting or retaining health personnel due to strained working conditions or a decrease in affordable or available housing.

In addition to these health areas described in our review of the Bipole III Project, our review of the Keeyask EIS also considers Aboriginal Health as a distinct area, as it was clear from the project description that the Keeyask Cree Nations (KCNs) were a key stakeholder group and a key affected population in the Keeyask Generation Project.

Aboriginal health. Aboriginal health can be impacted by project developments because projects commonly cross or are located proximate to Aboriginal traditional lands and because projects can affect ecosystem components that are highly valued by Aboriginal populations. Effects on health need to be examined from a perspective that resonates with the Cree and Metis communities.

The selection of health areas above is congruent with the health areas recommended for resource development projects in the other guidance documents referenced in Section C. Table 1 shows the alignment among these health areas to illustrate that the selection of health effects used for this review is widely accepted. It should be noted that different wording is sometimes used to describe the same health categories.

**Table 1. Matrix of HIA health areas commonly used in industrial projects**

Keyask Review Health Areas	IFC Environmental Health Areas	Alaska's Health Effects Categories
Socio-economic health effects	Social determinants of health	Social determinants of health
Infectious disease transmission	Sexually transmitted infections Soil and water sanitation related diseases Respiratory and housing issues	Infectious disease Water and sanitation
Diet and nutrition	Food and nutrition related issues	Food, nutrition and subsistence activity
Injury and public safety	Accidents and injuries	Accidents and injuries
Stress and mental wellbeing	Social determinants of health	Social determinants of health
Emergency health response	Health services, infrastructure and capacity	Health services, infrastructure and capacity
Health care service provision	Health services, infrastructure and capacity	Health services, infrastructure and capacity
Aboriginal health	Cultural health practices	Social determinants of health
Sources: IFC International Finance Corporation. 2009. <i>Introduction to Health Impact Assessment</i> . Washington, US: International Finance Corporation; State of Alaska HIA Program. 2011. <i>Technical Guidance for Health Impact Assessment in Alaska</i> . Department of Health and Social Services.		

These health areas, in addition to being suggested in international HIA guidance, were also important to the public in the context of the Keeyask Project, as evidenced by information requests that were submitted in Round 1 and 2 of public comment. The following table summarizes stakeholder concerns around public health and categorizes comments into the health areas that were identified as being important for the Keeyask Project. Specific IR comments can be found using the reference numbers provided in the third column. The questions and responses to these IRs have been considered in the review that follows in Section E.

**Table 2. Information requests relevant for community health in round one**

Health Area	Details	IR reference
Socio-economic health impacts	<ul style="list-style-type: none"> <li>• Economic impacts for the community including meeting basic needs, impacts on vulnerable populations, protecting vulnerable populations, long term economic development, maintaining Aboriginal traditional ways of life, and preventing boom-bust cycles</li> <li>• Flexible work schedules so that people can have time with families and ensuring local availability and training for jobs</li> <li>• Interventions to assist KCNs in obtaining employment</li> <li>• Worker-community interaction and worker activities during days off</li> <li>• Employment opportunities and economic benefits for KCNs</li> <li>• Economic impacts of damage done to environmental resources</li> <li>• Economic effects on Metis population to be included in socio-economic assessment</li> <li>• Possibility for KCNs to obtain higher skilled work positions when competing with employees from the south</li> </ul>	CAC 69, CAC 89g, CEC 4, CEC 17, CLFGC 21, KK 11, CLFCG 31 (Rd 2), MMF 067a, 68b (Rd 2), CAC 113 (Rd 2)
Diet and nutrition	<ul style="list-style-type: none"> <li>• Impacts to food quality and food security in FN communities due to mercury contamination of fish</li> <li>• Viability of offsetting programs/compensation to mitigate food security and nutrition impacts related to decreased access to and quality of subsistence foods</li> <li>• New roads increasing access to hunting and fishing areas;</li> <li>• Compensation/access agreements for hunters and trappers impacted by new road development</li> <li>• Costs to subsistence fisheries for loss of fish habitats and costs associated with replacement foods</li> <li>• Monitoring of increased usage of resource uses on new roads</li> <li>• Metis specific concerns and offsetting programs for moose and caribou harvesting.</li> <li>• Impacts to health from consumption of traditional foods despite advisories</li> </ul>	CAC 24a/b, CAC 82, CAC 90, CEC 9, CFLGC 19, MB Wildlands 57, 96, MMF 9a, MMF 8b, 11, 12b and 12c, CFLCG 32 (Rd 2), MB Wildlands 96 (Rd 2), CAC 24a (Rd 2)
Public safety	<ul style="list-style-type: none"> <li>• Addressing the concern of transportation to construction site</li> <li>• Fire protection services at work camps</li> </ul>	CAC 89a, CEC 2
Health care service capacity	<ul style="list-style-type: none"> <li>• Mitigation measures to address limited health care capacity in the KCN communities</li> </ul>	CAC 81b
Aboriginal health	<ul style="list-style-type: none"> <li>• Consideration of integrated impact on water systems and human health instead of separated analysis of impacts of each component</li> <li>• Weighing impact of “sorrow” against benefits of project for Aboriginal communities</li> <li>• Assessment of impacts on Kaweechiwasihk Kay-tay-a-tisuk rights and engagement in Keeyask planning, design, construction, operations and monitoring, business design, employment opportunities, etc.</li> <li>• Missing community health data and consultation with Metis populations</li> <li>• Impacts to medicinal plants and continued access to important water sources</li> <li>• Immediate access to medicinal plants in times of needing them</li> <li>• Ensuring all interested Aboriginal parties have access to medicinal plants</li> <li>• Greater understanding of how ATK was used in the assessment and development of mitigation measures and monitoring practices and how ATK changed project plans.</li> <li>• Replacement of borrow pits in culturally appropriate ways</li> <li>• Consideration of cumulative effects on traditional lands measured in a quantitative manner</li> <li>• Consideration of effects on intangible cultural heritage</li> <li>• Demonstrated effectiveness of off-setting programs for replacing culturally important plants and land</li> <li>• Inclusion of KCNs “worldview” in the assessment of impacts</li> </ul>	CAC 51a, CAC 85, KK 1, KK 2, KK 3, MMF 37, PFN 1a/1b, PFN 2, 3, 4, KK 7a/b, CEC 35, CFLGC 26 (Rd 2), PFN 58, 59 (Rd 2), PFN 60 (Rd 2), CAC 121 (Rd 2), CAC 127
Environmental health/	<ul style="list-style-type: none"> <li>• Concern about mercury contamination in fish at the commercial fishery</li> </ul>	CEC 3, CEC 49, CEC 50, CEC

perceived contamination	<ul style="list-style-type: none"> <li>• Mercury concentrations in other animals besides fish following a flood event</li> <li>• Discussion of mitigation measures to decrease mercury concentrations in reservoirs</li> <li>• Monitoring to provide accurate information for fish consumption advisories</li> <li>• Potential for acid metal leaching with granular fills</li> </ul>	51c, 52, 53, CEC 69a/b, CFLGC 13
Equity	<ul style="list-style-type: none"> <li>• Projects promotion of equity in terms of: distribution of benefits and risks, fair access to resources and opportunities, accounting of impacts from previous developments, shared responsibility to seek equitable outcomes and processes, promoting equity between generations</li> <li>• Job opportunities for people with disabilities</li> </ul>	CAC 70, CAC 89a

## E. Community health – inclusion and gaps in the Keeyask EIS

This section describes how community health issues are addressed in the Keeyask EIS as well as where more or different information could have been provided. The information is partitioned to correspond with different sections of the EIS: Environmental Setting and Environmental Effects Assessment. Mitigation strategies are included under Environmental Effects Assessment.

This review focuses mostly on section 5.0 Personal, Family and Community Life but also includes components of: 3.0 Economy and 4.0 Population, Infrastructure and Services as well as the Response to EIS Guidelines.

It should be noted that in the previous review of the Bipole III EIS, Habitat had outlined numerous gaps in both the baseline and assessment of impacts including: examining health from a narrow perspective, lack of justification for certain conclusions, and lack of specific public health mitigation measures. We are pleased to report that the authors of the Keeyask EIS have used an approach that is congruent with many of these recommendations and the Keeyask EIS presents a much broader examination of the Project’s effects on health of the local population. This is a considerable improvement from the Bipole III EIS which defined health very narrowly.

### APPROACH AND METHODOLOGY

In Section 5.2 (Approach and Methodology – Personal, Family and Community Life), it is noted that the environmental setting and effects assessment drew heavily on community-based research including: key person interviews (KPI); workshops for targeted groups in each community; reports authored by the Keeyask Cree Nations (KCNs); and Aboriginal traditional knowledge (ATK). In addition statistical data sources and literature were also considered.

As well, Section 5.2.2 (Community Health) provides a very broad definition of health including a table outlining determinants of health and identifies Aboriginal status as a key determinant of health. This section also describes *mino pimatisowin* – the Cree concept of well-being.

### HEALTH EFFECTS ASSOCIATED WITH SOCIAL AND ECONOMIC CHANGE

#### Environmental Setting

- Baseline birth rates for Gillam and Thompson are presented in Part 1, Sections 5.3.2.2.1 and 5.3.2.3.1 (Health Characteristics Associated with Population Characteristics) respectively.
- Section 5.3.4.1 (Public Safety Issues from Past Hydroelectric Projects) discusses past experiences with influx of workers into the communities of Gilliam and Thompson. Impacts noted include increased

alcohol-related incidents, sale of drugs, violence, sexual assault, infidelity, pregnancy, and paternal abandonment.

- Section 5.3.4.2 (Public Safety Indicators in the Local Study Area) reports on crime statistics for Gilliam and Thompson
- Section 5.3.4.3 (Keeyask Cree Nations) discusses existing key concerns in the KCN communities regarding public safety, including: crime, violence, drug and alcohol abuse, self-injurious behavior, and vandalism. Support programs aimed to deal with these issues are also listed.

### **Environmental Effects Assessment**

- Part 1, Section 5.4.2.1 (Construction Phase) shows that increased availability of income among the construction workers may result in increased opportunity for spending on alcohol and drugs.
- Part 1, Section 5.4.2.1 (Construction Phase) highlights the potential for an increase in violence and associated injury within the community due to the presence of a non-local construction workforce.
- Section 5.4.1.4.1 explores Project effects from worker interactions and increases in disposable income on KCNs
- Part 1, Section 5.4.1.4.2 (Gillam) discusses project-related effects to public safety in Gillam during the construction phase. It is noted that some workers are likely to make trips to Gillam, and a proportion of the visits could result in some adverse public safety effects due to interactions between construction workers and residents. It is also noted that construction worker visits to Gillam and/or Split Lake may cause an increase in traffic, which could result in increased traffic accidents.
- Part 1, Section 5.4.1.4.3 (Thompson) explores project-related effects to public safety in Thompson during construction.
- Part 1, Section 5.4.1.4.4 (Mitigation) describes proposed mitigation measures to address the concerns of the KCNs in relation to public safety and worker interaction. Mitigation includes preventive measures, mechanisms to assist people in coping should negative effects arise, and monitoring to determine if further mitigation measures are required. Examples of the measures include providing on-site recreational options for construction workers, thereby minimizing the attractiveness of going to the neighboring town for entertainment, and restrictions on using company vehicles for personal purposes.
- In addition to the health indicators outlined above, other determinants of health that are relevant to this health area (e.g., employment and income) are also discussed in other sections of this report

### **Gaps**

- Gaps in Environmental Setting:
  - Baseline data on community-level indicators of alcohol and drug misuse were not provided and should be.
- Gaps in Environmental Effects Assessment:
  - Section 5.4.2.2.2 (Community Well-Being Indirectly Associated with Project Operation) discusses impact of the operation phase activities of the project on employment and income. It is noted that the health benefits associated with higher income is expected to be more pronounced during operation; examples of those health benefits could be provided.
  - Equitable distribution of socio-economic benefits was a concern brought up through information requests. Since equity is a key value of HIA and a determinant of health, it is also a concern of the reviewers. Manitoba Hydro should understand how impacts will be distributed across lower income and higher income populations.

## **INFECTIOUS DISEASE TRANSMISSION**

### **Environmental Setting**

- In Part 1, Section 5.4.1.2.2 (Community Well-Being), it is noted that sexually transmitted infection rates were not presented earlier in the report to respect the confidentiality of communities in the Local Study Area.

### **Environmental Effects Assessment**

- In Part 1, Section 5.2.2.1 (Construction Phase), increase in sexually transmitted infections is identified as a potential result of the presence of non-local workforce.
- It is also noted in Part 1, Section 5.4.1.2.2 (Community Well-Being) that worker-interaction presents the risk of inappropriate sexual behaviour between construction workers and community members.
- Part 1, Section 5.4.1.4.4 (Mitigation) describes proposed mitigation measures to address the concerns of the KCNs in relation to public safety and worker interaction. Mitigation includes preventive measures, mechanisms to assist people in coping should negative effects arise, and monitoring to determine if further mitigation measures are required. An example of the measures include providing on-site recreational options for construction workers, thereby minimizing the attractiveness of going to the neighboring town for entertainment.

### **Gaps**

- Gaps in Environmental Setting:
  - Rates of STIs could have been provided on a larger population level.
  - Other types of infectious disease outbreaks can be caused by projects of this kind, the first relates to changing water quality and the second relates to creating situations of crowding and close quarter living conditions. Baseline rates of campylobacteriosis, cryptosporidiosis, E. Coli, Giardiasis, Hepatitis A and Salmonellosis should be reported. Also, baseline rates of tuberculosis, influenza, pertussis, and streptococcol disease should be reported on.
- Gaps in Environmental Effects Assessment:
  - Infectious diseases related to living in close quarters or crowded housing were not explored. Mitigation measures related to camp conditions were not provided.
  - Infectious diseases related to poor sanitary conditions or cooking facilities at the camps were not explored. Mitigation measures are important to control the spread of these diseases throughout the camps and into the community.
  - Mitigation measures related specifically to STI prevention were not provided.

## **IMPACTS ON DIET AND NUTRITION**

### **Environmental Setting**

- Part 1, Section 5.3.2.2.1 (Health Characteristics Associated with Population Characteristics) provides baseline data for diabetes for the town of Gillam.
- Part 1, Section 5.3.2.3.1 (Health Characteristics Associated with Population Characteristics) provides baseline data for diabetes for the city of Thompson.
- Part 2, Section 1.2 (Domestic Resource Use) discusses the financial, social and cultural importance of resource use activities. It describes traditional resource use to include hunting, fishing, trapping, and

gathering for domestic/subsistence purposes, and identifies times of the year when the different activities are conducted.

- Current mercury concentration in traditional food is presented in Part 1, Section 5.3.3.2, and it applies to Gillam (5.3.3.3) and Thompson (5.3.3.4).

### **Environmental Effects Assessment**

- Part 1, Section 5.4.1.3 (Mercury and Human Health) includes a discussion of risks to human health due to mercury exposure (from the consumption of contaminated fish during the operation phase).
- Part 1, Section 5.4.2.2.1 (Community Health Issues Directly Associated with Project Operation) includes a discussion of changes to water quality during the operation phase and the potential effects of the changes. A potential effect that was identified is the perception of contamination of the fish by the members of the York Factory First Nation.
- In Part 1, Section 5.4.2.3.2 (Post-Impoundment Risks and Recommendations) young children and women of child-bearing age are identified as being the most susceptible to the adverse effect from mercury exposure.
- Part 1, Section 5.4.2.3.3 (Mitigation) describes measures to minimize the risk of exposure to mercury as a result of project operations.

### **Gaps**

- Gaps in Environmental Setting:
  - One of the main health issues related to changing diet and nutrition patterns is food insecurity. Baseline rates of food insecurity in affected populations should be provided in order to understand number of people that are especially vulnerable to changes in traditional food availability.
- Gaps in Environmental Effects Assessment:
  - Part 1, Section 5.4.1.2.2 (Community Well-Being) describes potential project effects to community wellbeing. Under the first sub-heading (Ability to Access Country Foods), the EIS notes that the project may have negative effects on health as a result of less availability of healthy traditional foods. Examples of the negative health effects could be provided (e.g. food insecurity)
  - Part 1, Section 5.4.2.2.2 (Community Well-Being Indirectly Associated with Project Operation). Impact on the affected communities' ability to access country foods is discussed. The section notes the impact of the operation phase activities on access to and availability of food, but does not indicate the potential health issues that could arise.

## **INJURY AND PUBLIC SAFETY**

### **Environmental Setting**

- Part 1, Section 5.3.2.2.1 (Health Characteristics Associated with Population Characteristics) provides baseline data for injury for the town of Gillam.
- Part 1, Section 5.3.2.3.1 (Health Characteristics Associated with Population Characteristics) provides baseline data for injury for the city of Thompson.
- Section 5.3.5.1 (Existing Water/Ice-based Travel Conditions) describes the importance of river travel for KCN members in the winter and summer months and how the conditions for travel have been changing over the years.

- Section 5.3.5.2 (Existing Road Conditions and Traffic) discusses road conditions, current traffic levels and traffic accident statistics for key roadways in the project area.
- Part 1, Section 4.3.3 (Infrastructure and Services – Local Study Area) discusses policing services within the Local Study Area.

### **Environmental Effects Assessment**

- Section 5.4.1.5 (Travel, Access and Safety) discusses the potential effects on accidents and injuries as a result of changes in water patterns on rivers and traffic patterns on roadways. Mitigation measures are proposed for both water and road travel to minimize injury and annoyance.
- Part 1, Section 5.4.2.2.1 (Community Health Issues Directly Associated with Project Operation) includes a discussion of impact on injury and travel, access and safety during the operation phase. Mitigation measures put in place are expected to reduce the overall potential for accidents and injury to occur.

### **Gaps**

- Gaps in Environmental Setting:
  - Although number of collisions is provided, baseline rates of injury as a result of motor vehicle collisions should also be provided if available.
- Gaps in Environmental Effects Assessment: No gaps identified during the review.

## **STRESS AND MENTAL WELLBEING**

### **Environmental Setting**

- Part 1, Section 5.3.2.2.1 (Health Characteristics Associated with Population Characteristics) provides baseline data for mental health disorders for the town of Gillam.
- Part 1, Section 5.3.2.2.1 (Health Characteristics Associated with Population Characteristics) provides baseline data for cardiovascular disease for the town of Gillam.
- Part 1, Section 5.3.2.3.1 (Health Characteristics Associated with Population Characteristics) provides baseline data for mental health disorders for the city of Thompson.
- Part 1, Section 5.3.2.3.1 (Health Characteristics Associated with Population Characteristics) provides baseline data for cardiovascular disease for the city of Thompson.
- Section 5.4.3.1 (Public Safety Issues from Past Hydroelectric Projects) discusses past experiences with influx of workers into the communities of Gilliam and Thompson. Much of the discussion focuses on experiences of racism between local Aboriginal populations and worker populations and the stress and anxiety that this caused these residents – discussed under Aboriginal Health as well.

### **Environmental Effects Assessment**

- See “Aboriginal Health” for a summary of project-related factors that could have an impact on the mental health on the KCNs.
- Part 1, Section 5.4.1.6.2 (Mitigation) includes a discussion of mitigation measures to address the potential for loss and grieving associated with project activities such as the loss of rapids.
- Part 1, Section 5.4.1.7 (The Way the Landscape Looks [Aesthetics]) describes measures to mitigate the effects of project activities on the way the landscape looks.
- Part 1, Section 5.4.2.6.2 (Mitigation) describes mitigation measures to offset the effects of losses to the cultural landscape.

- Part 1, Section 5.4.3.7.3 describes mitigation measures to address the effects of changes to the way the landscape looks.

### **Gaps**

- Gaps in Environmental Setting: No gaps identified during review
- Gaps in Environmental Effects Assessment:
  - Part 3, Section 1.6 (Summary of key project related effects) notes that the project will create physical changes that will adversely affect the conditions of sites within the Heritage Resources Core Study Area. It further states that the loss of land and important cultural landscapes which have sustained the transmission of culture and heritage from generation to generation will affect the ability of transmission of cultural knowledge. There is no discussion on the potential effect on the mental health of the KCNs.

## **IMPACTS ON EMERGENCY HEALTH RESPONSE**

### **Environmental Setting**

- Part 1, Section 4.3.3 (Infrastructure and Services – Local Study Area) provides an overview of availability and capacity of fire and ambulance services.

### **Environmental Effects Assessment**

- Part 1, Section 4.4.1.3. (Infrastructure and Services – Local Study Area) discusses potential project-related impact on emergency services within the Local Study Area. It is noted that the main construction camp will provide some health care services, largely in relation to emergency medical response.
- Part 1, Section 4.4.1.3.4 describes measures to mitigate project-related changes to infrastructure and services in Gillam and Thompson although there are no specific mitigation measures for emergency health response.
- Part 1, Section 5.4.1.2.3 notes that emergency health services will be provided on site for accidents and notes that the main construction camp will provide some healthcare services, largely in relation to emergency medical response.
- Response to Round one IR CAC 81b clearly articulates how Manitoba Hydro is attempting to mitigate impacts to emergency medical response.

### **Gaps**

- Gaps in Environmental Setting: No gaps currently observed
- Gaps in Environmental Effects Assessment: No gaps identified during review

## **IMPACTS ON HEALTH CARE SERVICE PROVISION**

### **Environmental Setting**

- Part 1, Section 4.3.3 (Infrastructure and Services – Local Study Area) provides an overview of availability and capacity of health and social services.
- Other baseline data include physician visits by selected cause, and hospitalization by selected cause.

### **Environmental Effects Assessment**

- Part 1, Section 4.4.1.3 (Infrastructure and Services – Local Study Area) discusses potential increased demand on health services due to the project.

- Part 1, Section 5.2.2 (Community Health) notes potential increase pressure on health services due to an increase in the population.
- In Part 1, Section 5.4.1.1.2 (Gillam), it is noted that the influx of construction workers into the area may result in increase pressures on the town of Gillam's government and increased demand for local services including health and social services.
- In Part 1, Section 5.4.2.2.2 (Community Well-Being Indirectly Associated with Project Operation) it is noted that during the operation phase, population growth may result in the need for expanded health services.
- Part 1, Section 4.4.1.3.4 describes measures to mitigate project-related changes to infrastructure and services in Gillam and Thompson.
- Part 1, Section 5.4.1.2.3 (Health Services) notes that the main construction camp will provide some healthcare services, largely in relation to emergency medical response.
- Response to Round one IR CAC 81b clearly articulates how Manitoba Hydro is attempting to mitigate impacts to health care services and work with the local health authority to enhance services.

### **Gaps**

- Gaps in Environmental Setting: No gaps identified during review
- Gaps in Environmental Effects Assessment: No gaps identified during review

## **ABORIGINAL HEALTH**

### **Environmental Setting**

- Part 1, Section 5.2.2 (Community Health) highlights inequalities in the determinants of health between Aboriginal Peoples and the general Canadian population.
- Part 1, Section 5.2.6 (Culture and Spirituality) lays out a framework for assessing impacts to culture and spirituality of the KCNs. Nine indicators are selected for analysis: worldview, language, traditional knowledge, cultural practices, health and wellness, kinship, leisure, law and order, and cultural products.
- Section 5.3.6 (Culture and Spirituality) reviews the nine cultural indicators as outlined in section 5.2.6 for each of the KCNs.
- Part 1, Section 5.3.2 discusses organization of First Nations health care services.
- Part 1, Section 5.3.2.1 discusses perspectives of health and wellbeing as told by the Keeyask Cree Nations (5.3.2.1.1), and discusses baseline health indicators that are of importance to the KCNs and the Project (5.3.2.1.2; 5.3.2.1.3; 5.3.2.1.4). Baseline data is provided for population growth, birth rates, cardiovascular disease, diabetes, injury, mental health, skin infections, and main causes of mortality.
- Part 1, Section 5.3.3.1 (Mercury in Northern Manitoba) provides baseline data on blood mercury for communities at Split Lake, York Landing and other First Nation communities. This includes baseline data of blood mercury levels for youth and women of child-bearing age in those communities.
- Part 1, Section 5.3.3.2 (Keeyask Cree Nations) provides baseline information on current levels of mercury in traditional foods of the KCNs.
- Part 1, Section 5.3.2.1.3 (Health Characteristics Associated with Population Characteristics) provides baseline pregnancy rates between 1984 and 2006 for females between the ages of 15 to 49.

- Section 5.3.3.1 (Public Safety Issues from Past Hydroelectric Projects) discusses past experiences with influx of workers into the communities of Gilliam and Thompson. Much of the discussion focuses on experiences of racism between local Aboriginal populations and worker populations.
- Section 5.3.7.1 discusses the interrelationship between aesthetics of land and the KCNs understanding of the environment and the importance of the environment to KCN traditions.

### **Environmental Effects Assessment**

- Part 1, Section 5.4.1.4.1 (Keeyask Cree Nations) discusses combined effects of worker interaction and increased disposable income. This includes increased alcohol and drug use which pose a potential risk to public safety.
- Part 1, Section 5.4.1.6.1 (Keeyask Cree Nations) discusses the potential effects of project construction and operation on Cree culture and spirituality. Anticipated construction effects with respect to health and wellness is identified, and includes possibility of stress resulting from the destruction of *Askiy*.<sup>3</sup>
- In Chapter 6 of the Response to EIS Guidelines, potential effects of the construction and operation phases of the project on the health of KCNs individuals, families and communities are identified. These potential effects include increased opportunity for alcohol and drug use (due to increase income during construction), increase in sexually transmitted infections (due to worker interaction during construction), increased in anxiety (due to environmental changes during construction and operation), and increased demand on health and social services in Gillam (due to increased population).
- Part 1, Section 5.4.1.4.4 (Mitigation) describes mitigation proposed mitigation measures to address the concerns of the KCNs in relation to public safety and worker interaction. Mitigation includes mandatory participation in a cultural awareness training provided by the KCNs.
- Part 1, Section 5.4.1.6.2 includes a discussion of mitigation measures to address the potential for loss and grieving associated with project activities such as the loss of rapids.
- Part 1, Section 5.4.2.6.2 (Mitigation) describes mitigation measures to offset the effects of losses to the cultural landscape.
- Part 1, Section 5.4.1.7 (The Way the Landscape Looks [Aesthetics]) describes measures to mitigate the effects of project activities on the way the landscape looks.
- Part 1, Section 5.4.2.7.3 describes mitigation measures to address the effects of changes to the way the landscape looks.

### **Gaps**

- Gaps in Environmental Setting: No gaps identified during review
- Gaps in Environmental Effects Assessment:
  - Part 1, Section 5.4.2.6.1 (Keeyask Cree Nations) discusses operation effects on known intangible culture and spirituality within the Core, Local and Regional Study Areas according to nine cultural indicators, including health and wellness. With respect to health and wellness, it is noted that the impact on health and wellness may be in a positive direction. Examples of the positive impacts on health could be given.
  - Part 1, Section 5.2.7 (The way the landscape looks – Aesthetics) discusses the physical changes to the Local Study Area that result from the construction and operation of the project. Given the KCNs communities’ connection to the land, it will be helpful to mention potential impact on the mental wellbeing of the KCNs as a result of the alteration of the land.

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<sup>3</sup> In the EIS, *Askiy* is defined as the whole of the land, water, animals, plants, people and all other living and non-living things, including the interconnection between them (i.e., all things are related).

- Part 1, Section 5.4.1.4.1 (Keeyask Cree Nations) discussed construction phase-related effects due to increased disposable income. The discussion noted that increased disposable income can result in increased spending on activities that are deleterious to the health, the activities and consequent health effects should be listed.
- Part 1, Section 5.4.1.6.1 (Keeyask Cree Nations) discusses the potential effects of project construction and operation on Cree culture and spirituality, and measures put in place to address these effects. Anticipated construction effects with respect to health and wellness is identified. It noted that loss of traditional medicines and knowledge of resource habitat may result in adverse health effects on health and wellness. It is recommended that the health effects be listed.
- In Part 1, Section 5.4.1.4.1 (Keeyask Cree Nations) the possible effects of worker interactions with community members were discussed. Although women and youth were identified as the vulnerable population most at risk for potential adverse effects of construction worker interaction, the adverse effects were not explicitly stated.
- Given the well-known inequalities in health between the Aboriginal population and the general Canadian population, a discussion on any impact of the project on the inequality could be beneficial.

## CUMULATIVE EFFECTS ASSESSMENT

Chapter 7 (in the Response to EIS guidelines) presents the cumulative effects likely to result from the Keeyask project on the environment in combination with the effects of other identified past, present or future projects or human activities.

In regard to examination of past and current projects, the Cumulative Effects section 7.6.2 summarized impacts that were explored in the assessment of impacts. Cumulative effects of past and current projects are noted for:

- Infrastructure and services
- Community health
- Mercury and human health (explored under the HHRA external review)
- Public safety and worker interaction
- Travel, access and safety
- Culture and spirituality

Each of these VECs were carried over to the assessment of cumulative effects for future projects or activities.

The following outlines gaps that remain for the assessment of cumulative effects for future projects or activities:

- Infrastructure and services – Increases in service usage expected for RCMP and social services; however, health care services are not discussed. Expected increase to emergency department usage by large change in non-local workforce populations during construction. Combined operations workforce may also result in long term increase in demand on health care services. Mitigation measures should include communication with health care services in Gillam to allow for proper planning.
- Community health – Adverse impacts related to communicable disease, alcohol and drug abuse and adverse interactions with community members (women and youth) are noted. Communicable disease related to close living quarters both at camps and a result of crowding in towns should be discussed. It is recommended that monitoring of communicable disease, injury

and potential years of life lost and communications strategies be conducted by Manitoba Health and FNIHB. Minimal adverse impacts are also noted for the operations phase.

- Mercury and human health (explored under the HHRA external review) – N/A
- Public safety and worker interaction – Cumulative impacts are rated the same as past and current projects after considering mitigation measures. Monitoring and communication with RCMP make up the majority of additional mitigation measures. This level of assessment and mitigation seems appropriate.
- Travel, access and safety – Large overlaps in traffic during the construction phase will increase potential for traffic accidents on the roadways; however no additional mitigation measures are provided. Traffic increases should be provided to give the reader the ability to understand how much more traffic will be on the road when considering future projects.
- Culture and spirituality – it is noted that culture and spirituality of KCNs will be even more greatly impacted with the addition of future projects. Communication and the revision of adverse effects agreements are proposed for mitigation with no change to the overall significance rating.

## **F. Summary of the Review**

Overall, this EIS provides a very detailed assessment of the potential impact of the Keeyask Generation Project. It includes information on important health determinants and predicts potential health effects that may be associated with the Project. In addition, valuable contextual information is provided, including the KCNs communities' perspectives on health and wellbeing. Furthermore, it is evident from the data collection approach that community members' input was important in the assessment process, and efforts were made to perform a very comprehensive evaluation of potential health effect of the project as well as to create mitigation measures that were protective of health.

There are still a few shortcomings that remain in terms of describing current conditions and potential effects. These are:

### 1) Environmental setting:

- alcohol and drug misuse
- infectious disease rates for water and contaminant related illnesses
- infectious disease rates for crowding and close quarter conditions
- food insecurity in affected communities
- baseline rates of injury as a result of motor-vehicle collisions including and not including substance misuse

### 2) Environmental effects assessment:

- effects related to water and contaminant related illnesses
- health effects related to crowding and close living quarters created in camps
- distribution of health effects amongst affected communities, especially Cree and Metis communities where health disparities already exist
- a more thorough assessment of health effects caused by changes to availability in traditional foods
- ensuring that all impacts to culture and spirituality in FN communities are brought out to a discussion of physical and mental health

### 3) Mitigation strategies:

- preventative measure for spread of infectious disease in the workplace and in regard to crowded housing in communities
- mitigation measures for STI prevention in the workplace

## **G. Conclusion**

Health Impact Assessment is an approach that is used to identify, understand and mitigate the potential effects of projects or policies on community health issues. HIA has been increasingly applied to resource development projects around the world and in Canada as a result of public demand, regulatory and lending agency requirements, and as good business practice. The approach to community health effects in the Keeyask EIS closely parallels HIA, and addresses a broad range of associated health issues and exemplifies the inclusion of stakeholders in the HIA/EIS process. While some small gaps remain in the assessment of health impacts and in the development of mitigation strategies, overall the quality of the assessment of community health impacts is high.