

Nunavik :
Use and protection of the water resource

**BRIEF OF THE
KATIVIK REGIONAL GOVERNMENT
AND
MAKIVIK CORPORATION**

Submitted to the:

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Nunavik Region

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1. INTRODUCTION

This brief is submitted jointly by the Kativik Regional Government [KRG] and Makivik Corporation [Makivik]. These two organizations represent, each with its own mandate, the interests of Nunavik, the region that lies north of the 55th parallel in Quebec.

Allow us first to reaffirm that the James Bay and Northern Quebec Agreement [JBNQA] is a treaty protected under Section 35 of the Canadian Constitution, which confirms the rights of Nunavik Inuit to land and resources north of the 55th parallel in Quebec. Water being one of the main resources, the Inuit consider that their constitutional consent is a prerequisite to any significant governmental decisions regarding Nunavik water resources.

It should also be noted that Section 23 of the JBNQA provides for the Kativik Environmental Advisory Committee, which, as stipulated in Section 23.5.24:

"[...] shall be a consultative body to responsible governments and as such shall be the preferential and official forum for responsible governments in the Region concerning their involvement in the formulation of laws and regulations relating to the Environmental and Social Protection Regime [...]"

Consequently, the present consultation should have been carried out in Nunavik under the responsibility of the Advisory Committee. The marginal involvement of the Advisory Committee in this process is diminishing the role of a committee established by treaty and leaves out Inuit and non-Inuit expertise on 30% of Quebec land mass.

Public Consultation Document

This marginalizing is obvious in the *Public Consultation Document* which focuses on southern Quebec, and in the *Regional Water-Resources Profile*, which fails to mention major rivers of Nunavik, such as the Povungnituk and Deception Rivers.

In addition, Sections 5.1.1 and 5.1.2 of the *Regional Water-Resources Profile* imply that aqueduct and sewer systems could not be built in Nunavik because of permafrost, and that is what led to the cistern-truck system for the delivery of water in the entire region. In fact, aqueduct and sewer systems have been used for a long time in regions with permafrost. Iqaluit, the new capital of Nunavut, began using an aqueduct and sewer system nearly 30 years ago. Despite greater risks of contamination, the decision to use a cistern-truck system to deliver drinking water in Nunavik was based on economics, not on technological constraints. The current situation in Kuujjuarapik is a telling example.

Between 1955 and 1958, the American Army built an aqueduct and sewer system for their military base. In 1985, the adjoining Cree village of Whapmagoostui obtained funds from the federal government to link with that system. However, requests by the municipality of Kuujjuarapik to also connect to the aqueduct and sewer system were consistently denied by the Ministry of Municipal Affairs.

These documents also put Nunavik in the so-called Region 10. Such bureaucratic labeling does not reflect the social, political and economic reality of Nunavik. It lumps it together with areas that have little in common with our region and that fall under different jurisdictions. Yet, the JBNQA is very clear on this matter: the Kativik Regional

Government has jurisdiction over the territory north of the 55th parallel. Moreover, on November 5th 1999, the Inuit signed an accord with Quebec and the federal government concerning the creation of a commission on the establishment of a Nunavik self-government, not a Region-10 self-government.

Nevertheless, we believe that the work of the Commission on Water Management in Quebec is important not only to the Inuit but to the population of Quebec as a whole. Consequently, we decided to submit this brief to express our views on the matter.

2. NUNAVIK

Nunavik has little alternative but to face tremendous challenges. In a context of rapid, externally-driven change, the implementation of major development projects has raised fundamental questions in recent years. The pros and cons of the Great Whale River Hydroelectric Complex were discussed and debated from 1989 to 1995. This project would have impacted two watersheds and flooded thousands of square kilometers of land. In its own way, this Commission is now asking us to answer the same question: how should such a major resource as water be used? Before answering, it would be appropriate to describe the territory and its population.

2.1 The territory

Covering the territory north of the 55th parallel in Quebec, Nunavik has a surface area of 500,164.15 km² (see map No 1). It is bordered by Labrador, Hudson Bay, Hudson Strait and Ungava Bay. Its coastline stretches for some 2,500 km.

Population

There are 14 Inuit communities in Nunavik. The 1996 census projected a the total population of 9,420 for 1999¹. The non-Native population is approximately 700. At 2,6% per year, the net population growth rate is among the highest in the country and is expected to remain high for at least the next decade. The Inuit population is also very young, 41,3% being under 15 years of age². Inuit households have an average of 4,6 people³.

Kuujuaq (1,845 residents) and Kuujuarapik (625 residents) are distinct from the other villages in that they are gateways to Nunavik; they are home to numerous service and government organizations and have large community infrastructures. The other important villages are Inukjuak (1,270 residents), Puvirnituk (1,270 residents) and Salluit (1,015 residents). The remaining nine villages are smaller, with populations ranging from 705 to 195.

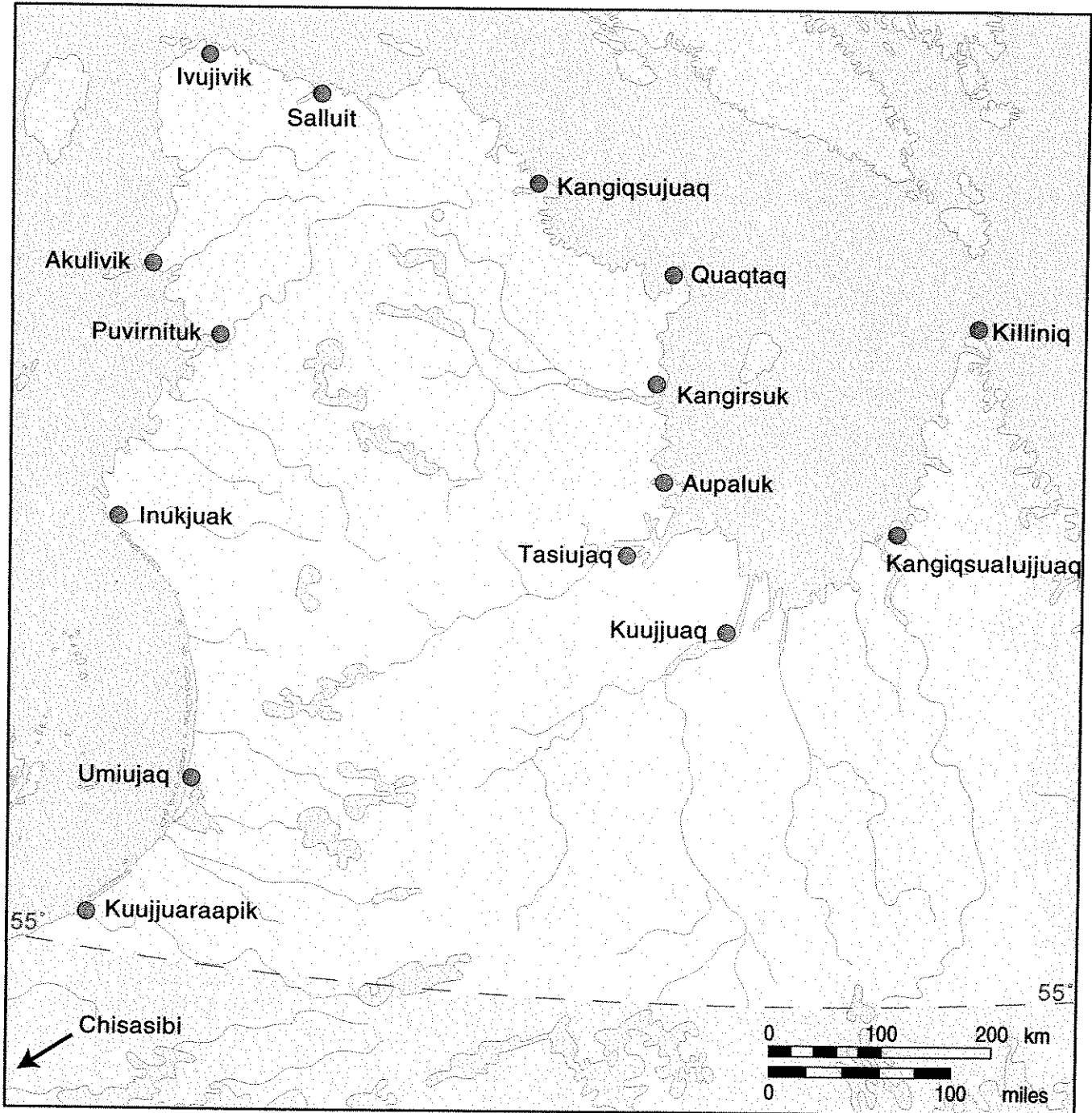
The Inuit have been inhabiting the area now known as Nunavik for centuries. As nomadic hunters, they roamed over the whole territory, from North to South and East to West. They also used the offshore areas of Hudson Bay, Hudson Strait and Ungava Bay, going as far as the Labrador Coast to fish and hunt seal, walrus and polar bear. In the 1950s, the process of settling in villages led to major changes within the Inuit society. The subsistence economy centered on hunting, fishing and trapping that Inuit had known gave way to a mixed economy, in which wage earning began playing an increasingly important role.

¹Schnarch, Brian (1999). Nunavik Regional Board of Health and Social Services, Kuujuaq.

²KRG (1991). *Schooling, Vocational Training and Economic Activity in Nunavik*, Kuujuaq, p. 4.

³Statistics Canada, 1991 Census (Cat. n° 93-304).

Nunavik Region



Produced by Makivik, Cartographic Service, 1999.

Transportation

There are no roads in Nunavik outside the villages. The communities are linked to southern Quebec by air year round and by sea during the summer. Communities are linked to one another by air transport — provided by an Inuit-owned airline — as well as by snowmobile in winter and by boat in summer.

Makivik and the KRG have begun the first phase of a construction program of marine infrastructures in the communities of Kangiqsualujjuaq and Quaqtaq. The goals of Phase 1 are safety of and access to navigable waters. If funding is made available for the completion of Phase 2, which would include building facilities for the sealift, the risk of water-polluting accidents would be reduced.

Hydrography

The main watersheds of Nunavik are that of the Koksoak, George, Leaf, Whale, Arnaud (Payne) and Le Pellé Rivers, which flow into Ungava Bay, and that of the Great Whale, Little Whale, Nastapoka, and Povungnituk Rivers, which flow into Hudson Bay. Map No 2 indicates their location and the extent of the territory they cover. These rivers play an important role in the natural cycle of the ecological zones that transect them. The valleys of the large waterways in these zones contain a relatively dense concentration of unique ecosystems and habitats that are essential to the survival of wildlife. These watersheds also have potential for hydroelectric development.

As mentioned above, Nunavik is bordered by Hudson Bay, Hudson Strait and Ungava Bay. Although coastal waters of Nunavik fall under the jurisdiction of Canada and Nunavut, it is important to note that it is home to a multitude of wildlife species essential to the pursuit of subsistence activities.

Climate

The region's distinctiveness is also reflected in its climate. Two types have been identified: an Arctic climate in the northern part, and a sub-Arctic climate in the southern section. From north to south, the annual average temperature rises from -7.5°C to -2.5°C . Large bodies of water (Hudson and Ungava Bays) influence the local climates. Continuous in the north, and discontinuous in the south, permafrost is another characteristic of Nunavik cold climates.

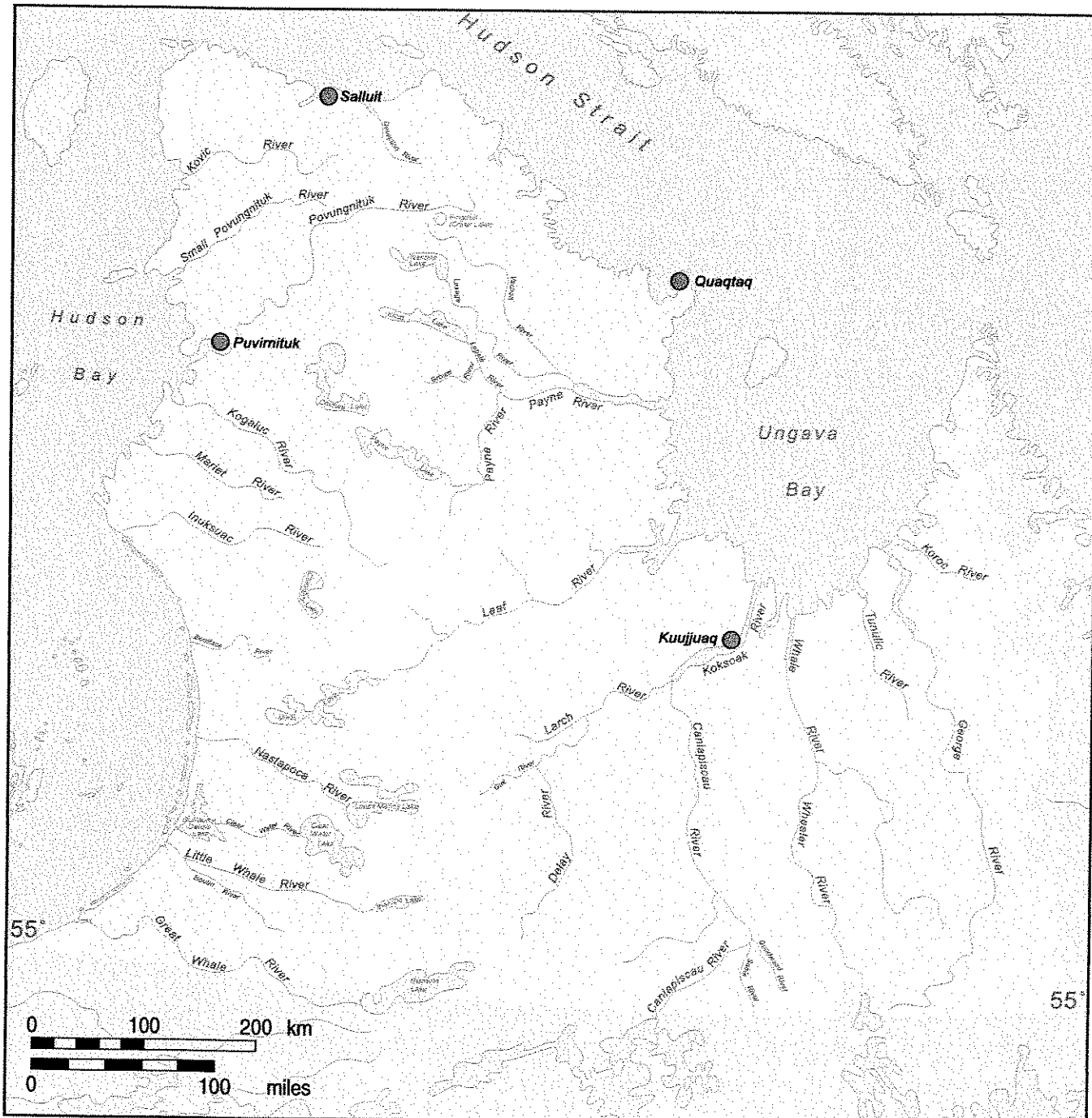
In the northern part of Nunavik, the average total annual precipitation is 300 mm, whereas it is 700 mm in the southern part. Compared with southern Quebec, which receives more than 1,000 mm of rain and snow each year, Nunavik can be characterized as having a rather dry climate.

Ice covers the sea from November to July and greatly influences the transportation of goods by sea.

Vegetation

In the sub-Arctic zone of southern Nunavik, the vegetation is characteristically taiga, while the Arctic zone in northern Nunavik is made up of elements representative of tundra. Between the two lies a semi-Arctic transition zone composed of a blend of vegetation from taiga and tundra.

Nunavik Hydrographic System



Produced by Makivik, Cartographic Service, 1999.

Wildlife

The wildlife of Nunavik can be grouped into four major categories: land mammals, marine mammals, birds, and fresh and saltwater fish. Although wildlife is present throughout the region, some environments offer a greater diversity of habitats, thereby favoring a concentration of different species. Such is the case in coastal areas and on banks of lakes and rivers. For example, the Hudson Bay coast lies along the geese migratory route and is an area where aquatic species congregate. Caribou are notable because of the size of the herds inland.

There are four salmon rivers: the George, Whale, Leaf and Koksoak (which includes the Mélèzes (Larch), Du Gué and Delay) Rivers. Arctic char, which live in some hundred rivers of Nunavik, is a highly-prized species for both subsistence and sport fishing.

The coastal area includes at least two zones where beluga gather in the summer: the estuaries of the Mucalic and the Nastapoka Rivers, which are protected as sanctuaries and are seasonally-closed by regulation. The coastal area is also home to other marine mammals such as walrus, harbor seal, bearded seal, ringed seal and harp seal.

2.2 Nunavik Administrative Structure

The JBNQA was signed in 1975. It is considered the first modern land claims agreement in Canada. It is a treaty within the terms of the Canadian Constitution, and serves as an economic, political and legal framework for the James Bay and Nunavik territories. Under the JBNQA, in exchange of far-reaching rights, the Crees and the Inuit surrendered their Native rights to the land, obtained monetary compensations and a variety of political and economic structures, all of which were to be managed by and on behalf of the Native Peoples.

The recognized rights pertained to: land, local and regional governments, health and social services, education, administration of justice, police, environment, economic and social development and finally hunting, fishing and trapping. In summary, a territory covering 500,164.15 km² north of the 55th parallel was divided into three categories: Category I land, covers an area of 8,417 km², which was allocated in ownership to the Inuit; Category II land covers 81,107 km² of land over which the Inuit exercise some form of control and where they have exclusive rights of hunting and fishing; Category III land is made up of the rest of the territory where Inuit enjoy year-round hunting and fishing rights.

A Landholding Corporation was created in each community, except for Puvirnituk and Ivujivik, to manage the land; each community was incorporated as a Northern Village with municipal status by virtue of the *Act respecting the Kativik Regional Government and the Northern Villages* (R.S.Q., c.V-6.1) and the relevant provisions of the JBNQA.

Kativik Regional Government

The Kativik Regional Government was incorporated in 1978 and has jurisdiction on the territory north of the 55th parallel. It provides technical assistance in a variety of fields to the municipalities of Nunavik and exercises municipal powers over the lands where there are no legally-constituted northern village corporations.

The KRG Council is composed of 16 members elected for a two-year term: one regional councilor drawn from the elected municipal council of each of the 14 northern villages, one

representative of the Naskapi and the Chairman of the Council. An executive committee of 5 members is elected by the Regional Council.

The KRG has an office in each of the 14 northern villages. It employs some one hundred and thirty employees, two-thirds of whom work at the head office in Kuujuaq.

The role of the KRG is:

- to advise municipal councils in the legal and financial aspects of managing a municipal corporation;
- to set up and maintain a regional police force;
- to provide technical assistance to the municipalities on areas such as housing, recreation, wildlife management, environment, land use and civil security;
- to administer federal and provincial vocational training programs and services and to manage home day-care services;
- to manage the funds for all infrastructure projects in the 14 northern villages and to provide the necessary technical assistance for the realization of these projects (engineering, purchase of material, delivery sea-lift);
- to foster economic development across Nunavik in cooperation with the Kativik Regional Development Council;
- to administer the support program for Inuit beneficiaries for their hunting fishing and trapping activities;
- to administer and operate 14 airports.

With regard to local administration in the villages, the KRG may:

- provide northern villages with assistance on any matter within their jurisdiction,
- develop standards for the construction of houses and buildings, the wholesomeness of properties, the prevention of water contamination and for water purification.

Makivik Corporation

Created in 1978, Makivik represents the Inuit with respect to all matters relating to their social, cultural, economic, and political rights, including treaty amendments and negotiations, environmental impact assessments, negotiation of impact and benefit agreements, social and environmental research, renewable resources development and a various local and regional economic development activities.

Among Makivik's current economic development strategies, one project is to develop the region as a destination for a growing number of tourists attracted to adventure tourism, also known as ecotourism. Nunavik has considerable potential for this type of development as it is blessed with numerous rivers and lakes, bountiful wildlife, more sunlight than the High Arctic, and is much closer to a major metropolitan center than most Arctic destinations.

The JBNQA defines the context for discussions with governments and development promoters. With this tool, the Nunavik Inuit can play a major role in the economic and social development, the protection of the environment and the management of renewable and non-renewable resources of their territory. Of course, this is done in coordination and in conjunction with other regional organizations such as the Kativik Regional Government, the Kativik Regional Development Council and the Nunavik Tourism Association.

Nunavik Regional Board of Health and Social Services

The Nunavik Regional Board of Health and Social Services [NRBHSS] was created in 1978 as the overall regional entity to preserve and improve the scope, extent, conditions and availability of existing health and social and related programs.

The NRBHSS also fosters the progressive training and education of native people in health and social services. Furthermore, the NRBHSS is responsible for the development of cohesive and strong policies that are relevant to the needs of the population and necessary for the growth of health and social services in Nunavik.

The NRBHSS, through its Department of Public Health, is involved in water management. Water must be managed to ensure physical, psychological and social health and wellbeing of our population. One crucial aspect of water management consists in the drinking water quality. Although municipalities have the responsibility to provide drinking water free of health risks (either microbiological or chemical), the Department of Public Health participates in the surveillance of the health effects in the application of the appropriate corrective measures when needed.

3. DRINKING WATER TREATMENT AND DISTRIBUTION

3.1 Water Plant Construction Program

In 1978, the Quebec Cabinet determined that the needs of northern villages with respect to sanitation and other infrastructures should be identified and short-term solutions proposed. This mandate was given to the Secrétariat des affaires gouvernementales en milieu amérindien et inuit [SAGMAI], which became in 1987 the Secrétariat aux affaires autochtones [SAA].

In November 1979, the Cabinet approved the resulting report, known as the *Jolicoeur Report* after its main author. The *Jolicoeur Report* included several recommendations to remedy the dismal sanitary conditions that prevailed in northern villages.

In most of the communities, water was then pumped directly from a river or a lake with a cistern-truck or a track vehicle called a "Muskeg" and distributed to each house. There were serious risks of contamination at every step of the process. Also, difficulties arose in winter when a different source of water further away from the community had to be used because the summer source had frozen over. The population was growing rapidly and so was the demand for safe drinking water.

The water plant construction program became a major component of the Northern Municipal Infrastructure Improvement Program (1981-1997) which stemmed from the *Jolicoeur Report*.

The main objectives of the water plant construction program were the following:

- insure the year-around availability of drinking water;
- reduce the health risks from pathogenic microorganisms;
- meet the growing demand of communities for water;
- provide an emergency water reserve for fire fighting purposes;
- improve the efficiency of the delivery system by minimizing commuting time for water trucks.

3.2 Description of the Water Distribution System

The main components of the water distribution system are:

- pumping stations with water intakes;
- water conveyance pipelines;
- water treatment and distribution plants;
- cistern-trucks.

Surface water from rivers or lakes is the sole source of water used by northern villages. From a pumping station, located at the water source, water is pumped and conveyed to the water plant via an insulated pipeline. Protection from freezing is usually achieved by keeping a constant flow in the pipe and by using heat exchangers and heating cables. These cables are essential to protect the pipeline and only they can succeed in thawing the pipe in the event of a total freeze-up.

At the water plant, a distribution reservoir holds both the operation and fire reserve. There is no pretreatment of the raw water (filtration or others), but this is also typical of smaller installations found in southern settings. An automated disinfecting unit, consisting of a sodium hypochlorite reservoir and a metered pump, feeds the chlorine solution directly into the pipe connected to the loading arm that fills up the cistern-trucks, which are also disinfected at regular intervals.

A redundancy design is used for both the pumping station and the water plant where backup units can be activated whenever the main unit has to be put off-line for scheduled maintenance, repairs, or in the event of a breakdown. The water plant is also equipped with a generator that will start automatically in the event of power failure.

3.3 Specific Difficulties

Protection of Water Pipeline from Freezing

The water conveyance pipeline is perhaps the most vulnerable component of the water distribution system. Unlike other components, it has no backup. For this reason, considerable effort was made at the design and construction stage to minimize the possibility of freezing. A constant flow is usually kept in the water line, heat exchangers are used, and heating cables turn on automatically when the water temperature falls below a set value. The current Hydro-Québec regulations on the use of heating cables in northern villages are, however, a major hindrance.

Electricity in Nunavik is produced by power plants using generators. A significant portion of energy (up to 65%) is lost in the process of converting fuel into electricity so, understandably, the use of electricity to heat houses or for water boilers is forbidden; oil furnaces and oil-fired water boilers are used instead. Hydro-Québec is denying Rate G (general rate) to municipalities that use heating cables to protect their water pipeline and hence the water supply of the community. This interdiction is based on the grounds that it would contravene Hydro-Québec by-law # 642 (Division XV) establishing electricity rates for customers using autonomous electrical systems. In 1996, a Hydro-Québec representative even went as far as threatening not to connect the two newly-built water plants in Ivujivik and Quaqtaq because heating cables were part of the system.

The regulation, however, clearly states that Rate G (7.18¢ per kilowatt/hour) applies to *industrial and commercial appliances [used to] to store food*, which water is, and *in appliances used by light industry for manufacturing applications*, which is what water

plants in Nunavik do by transforming raw water into drinking water through a treatment process. Hydro-Québec bills 58.57¢ per kilowatt/hour to municipalities where heating cables are used. The KRG has contested Hydro-Québec's interpretation of the regulations on several occasions but to no avail. It is important to emphasize that heating cables along municipal water pipelines are temperature-controlled; in other words they are activated only when necessary. It must also be understood that the use of heating cables cannot be avoided because there is simply no other technology on the market that could perform the same tasks under similar conditions. Finally, the power demand for heating cables along water lines, perhaps the equivalent of 10 stoves at most, would not put undue stress on the electric grid and in any case, simple systems can be put into place to cut off power from the electric grid and activate the generator at the water plant if need be.

Training of Water Plant Operators

Water plant operators in Nunavik have received a four- to six-week training in accordance with Guideline 006 of the Quebec Ministry of Environment. Although none of them had any formal technical training in water treatment, they quickly had to learn a variety of topics ranging from elementary chemistry to mechanics in order to understand how the process equipment operates, how to maintain it, and how to proceed with minor repairs.

That is a lot to learn in such a short time and, to make matters worse, there is no funding available for on-the-job training. There is also a high turnover of personnel and no funding to train new operators. As a result, some plant operators are experiencing difficulties in maintaining the adequate level of residual chlorine in the water delivered, thus making it more susceptible to bacterial contamination. Reinforcement of key elements, to insure a better understanding of the water treatment process and ultimately a safer water supply, cannot be achieved without the implementation of a comprehensive training program for both new and senior plant operators.

Preventive Maintenance

In Nunavik as elsewhere in Quebec, once an infrastructure has been transferred to a municipality, the municipality must bear operation and maintenance costs. However, northern villages in Nunavik do not have the taxation freedom enjoyed by their southern counterparts, and apart from the fixed funding coming from the MAMM, the only other source of revenue comes from the delivery of water and collection of sewage and garbage to non-governmental agencies. This leaves northern villages with little room to maneuver budget wise.

Although efforts have been made at the design stage to insure that the water distribution systems are as simple as possible, there remains a fair level of complexity. This problem is further compounded by the relatively low technical level usually found in northern communities. These factors: low funding, fairly complex equipment, lack of trained operators, and low technical level, result in a widespread deficiency in terms of preventive maintenance in Nunavik.

4. DRINKING WATER QUALITY ANALYSIS

4.1 Testing and Analysis Program

Municipalities must monitor the quality of drinking water they supply to residents and make the results of their analyses available to the public. In Nunavik, the Renewable Resources Department of the KRG manages the drinking water monitoring program and provides

assistance to the municipalities in this regard. Briefly, the drinking water monitoring program works as described below.

The KRG Environment Technician orders the water sampling bottles from the laboratories of the Quebec Ministry of Environment and supplies northern villages according to requests received from their managers. Water samples are taken on a weekly basis by the water-truck drivers at the following locations:

- at the source or the point where the water leaves the plant, as the case may be;
- from a randomly selected water-truck;
- from a randomly selected residential reservoir.

Two institutions serve the two coasts of Nunavik: municipalities from the Hudson coast (Kuujuarapik to Ivujivik) send their samples to the hospital in Val d'Or, while municipalities from the Ungava coast (Salluit to Kangiqsualujuaq) send theirs to the Ungava Tulattavik Health Center in Kuujuaq.

A maximum delay of 48 hours is allowed between the time the samples are taken and the beginning of the analysis. Samples received after this deadline are rejected in accordance with current regulations. Results are forwarded to the KRG Environment Technician, who then faxes them to municipal managers along with detailed instructions on measures to be taken: posting public notices to boil or suspending such notices, disinfecting water trucks or residential tanks, and so on.

The drinking water monitoring program has many irritants, several of which flow from current regulations that do not take into account the reality of the North. For instance, weather conditions and transport constraints are such that, too often, water samples cannot reach the lab within the prescribed 48 hours. As a result, the samples are rejected and a notice to boil water before drinking is issued. The notice to boil will be lifted only if the next shipment of samples reaches the lab in time and is found to be free of bacterial contamination as described in the regulations. Therefore, a notice to boil water will usually stay in effect a full week.

From the moment the samples are taken, it takes five to seven days to obtain the results. In northern villages, water samples are taken once a week, as opposed to once a day or more often in their southern counterparts. If the water supply was to be contaminated on the day following the collection of samples, it could take up to 12 days before the problem is detected and proper action taken to protect the health of the population. This undue delay is unavoidable and is a direct consequence of current regulations. One would be hard pressed to assert that the current monitoring program and regulations do the job in protecting the health of the Nunavik population.

In fact, not only are current regulations inadequate to protect the health of northern residents, they also unduly undermine the confidence of the population in the quality of the drinking water being delivered to them. Because of extreme weather conditions, some communities have to constantly issue notices to boil water because their samples could not reach the laboratory in time. The time period required to lift a notice to boil is also too long. The end result is that the residents of some communities spend most of the year boiling their water even though the problem may very well be one of procedure rather than contamination.

4.2 Results from 1998 Monitoring Program

Results from the 1998 monitoring program indicated that 19% of all analyzed samples were contaminated. Contamination within residential reservoirs (23%) was significantly higher than within water delivery trucks (14%). This is to be expected since house reservoirs may be conducive to bacterial growth because they are located in a warm environment, usually a furnace room.

Statistical analyses also indicated that 334 samples were rejected in 1998, mainly due to late arrival at the laboratories. This represents 20% of all samples collected and some communities had a much higher rejection rate because of poor weather conditions and/or difficult transportation routes. For instance, Ivujivik had 42% of its samples rejected, Kangirsuk 41%, and Aupaluk 39%. A notice to boil had to be issued in these communities each time the samples were rejected. As stated above, this is a major irritant and a direct consequence of current regulations; these may work fine in southern municipalities for which they were intended, but fail to provide adequate health protection in northern communities.

4.3 Alternate Testing and Analysis Method

Northern villages do not have the means at their disposal to check in a timely fashion the salubrity of their drinking water. To correct this situation, we suggest that each water plant be equipped with a Colilert system, which allows to perform 24-hour tests for total coliforms and E. Coli. This technology, approved by the US-EPA and Health Canada, is currently in used in:

- 46 American states;
- several Canadian provinces, including New Brunswick and Nova Scotia since 1995;
- 235 Aboriginal communities under federal jurisdiction in Canada.

In fact, the most telling number may be that between 60 and 70% of all water samples collected in North America are tested using this technology. The main advantages of this method are as follows.

- A flexible and simple method

The method requires minimal equipment and its inherent simplicity makes it ideal for anyone to learn procedures and interpret results. The use of this technology could improve current monitoring of the water supply and would provide northern villages with a tool to respond adequately to a variety of situations, including requests from residents worried that their own reservoir may be contaminated.

- Results obtained in 24 hours

As stated previously, obtaining the results from laboratory analysis may take up to a week. With the Colilert method, a sample may be taken at any time, and the results known the next day. This means that a notice to boil could be lifted within 48 hours instead of the present minimal period of seven days.

- No more samples rejected because of transportation delay

The use of the Colilert method would eliminate countless notices to boil water because the samples could not reach the laboratory in time.

This technology has been on the market since 1992 and has proven its worth across the entire continent. However, unlike its neighboring counterparts in New Brunswick and

Nova Scotia, or the federal regulating bodies, the Government of Quebec has been slow in adjusting its regulations to the advent of new technologies.

5. WASTE WATER TREATMENT

5.1 Overview

The situation in Nunavik in terms of waste water treatment is dismal to say the least. Only a handful of the 14 northern villages have an engineered waste water treatment facility, usually a facultative lagoon. Several municipalities still discharge their raw sewage directly on the ground, usually at the local garbage dump.

Unhappy with this state of affairs, some municipalities went ahead and built their own sewage lagoon. Although these municipal works lack in many ways from a technical standpoint, they nevertheless remain an eloquent proof that northern villages are very concerned with the potential impact of the raw sewage on their health and their environment.

5.2 Future Plans

The northern villages of Nunavik should all be entitled to an engineered waste water treatment facility that would insure the protection of both human health and the environment. A new municipal infrastructure program, called Isurruutinik, will help to achieve this goal. This program is funded by the MAMM and managed by the KRG.

The technology favored in northern communities for the biological stabilization of waste water is the use of facultative lagoons. Their construction are for the most part simple enough to be undertaken using the local resources, and their operation and maintenance costs are low enough not to burden the municipalities. Where geographical or other constraints prevent the construction of lagoons, other technologies will be used.

6. INTEGRATED MANAGEMENT

6.1 The Use and Potential Use of Water in Nunavik

For centuries the Inuit have used Nunavik's numerous waterways and lakes not only for fishing but also as routes to access hunting grounds. Today, the Inuit still hunt and fish for subsistence and use rivers and lakes for commercial fishing, outfitting and tourism.

Subsistence activities play a fundamental role in the use of resources. As much as 70% of the meat intake comes from harvesting activities. Rivers and lakes are productive; for instance, the Arctic char population of Deception River in the northernmost part of the region was estimated to be over 100,000. The Koksoak, Whale and George Rivers also have a large Arctic char population. The salmon of the Koksoak River is harvested for subsistence, sport and commercial purposes.

For at least 40 years, Hydro-Québec has taken an interest in many of these rivers. Studies have been carried out to assess the hydroelectric potential of the region and many project proposals have been put forward: the Great Whale River Complex, which has recently been postponed, the Churchill Falls project and others on the George, Koksoak, the Méléze (Larch) and Arnaud (Payne) are at various stages of study. Up to now, only the James Bay

Hydroelectric project has been completed and, even though located south of the 55th parallel, it affects Nunavik economically and socially. It had a direct impact on the Caniapiscou River, which was diverted to create the Caniapiscou reservoir, a major part of the La Grande Project (1975).

Water resources may also be used for exportation. While no specific projects involving Nunavik rivers are being carried out at the present time, exportation is a potential use that cannot be ignored. The Inuit are aware of the interest shown in the possibilities of using ocean tankers to ship water from Canada to foreign markets. In the early 1980s, a proposal was put forward to ship water from Sept-Iles to markets in the Middle East and recently similar types of projects have been publicly discussed. There is also the on-going debate as to the economic benefits and environmental impacts of the exportation of bottled water. For now, the debate centers on sub-surface water but eventually the pristine rivers of Nunavik may become attractive for the bottled-water market.

Over the years many projects have been proposed regarding the mass exportation of water. Among the many proposed water diversion schemes the GRAND Canal, the North America Water & Power Alliance, the Kuiper Plan and the Central North American Water Project are all projects that would affect in one way or another the coastal waters of James Bay and Hudson Bay.

As one can see, there are many uses and potential uses of the water resource, some conflicting, others reconcilable. In fact, the fundamental question should not be what to do with a particular river or lake, but who is in the best position to manage and insure the protection and sustainable development of the environment, wildlife and the Inuit Culture of Nunavik.

6.2 Sustainable Development

Sustainable development of Nunavik is our goal. The 1987 United Nations World Commission on Environment and Development — the Brundtland Commission — defined sustainable development as development which ensures that the use of resources and the environment today does not damage prospects for their use by future generations. This definition was adopted in the *Act to Amend the Auditor General Act* in 1995. In 1998, the Department of Indian and Northern Affairs used it as a starting point to formulate its sustainable development strategy. In Nunavik, however, we are also aiming for development that is sustainable in all its economic, environmental and social aspects.

Many options are available to achieve this goal, and quite a few have been considered over the years. For example, the Great Whale River Hydroelectric Complex or the Raglan Nickel Mine Project could have been categorically opposed. Instead, the Inuit tried to reconcile the needs of the Quebec society with their own needs.

The same approach is being proposed to this Commission. The Inuit would like to be part of a decision-making process that defines the future of Nunavik rivers.

6.3 Master Plan for Land Use in Nunavik

The Kativik Regional Government has drawn up a Master Plan for Land Use in the Kativik Region. It is the first step in a concerted management process of lands and resources, and constitutes the basis for the management of all activities in the territory.

The plan came into force following approval by the Minister of Municipal Affairs on October 29, 1998. The master plan is mandatory over all the territory that is not entrenched

within a municipal structure nor included in a municipality. Never before was a land management master plan implemented in Nunavik.

The plan advocates a global approach adapted to the unique scope of Nunavik, to the diversity of its environment and to the sometimes divergent interests of residents and various other users. It was established through consultations with the local communities, regional organizations, various user groups, as well as government and other public organizations.

The master plan contains:

- an overview of the region and its future prospects;
- guiding principles for land use and general goals of land development in matters of regional land use and management;
- general land use policies, more specifically, uses designated in the various areas of the region;
- areas of historic, esthetic and ecological interest and their main aspects;
- an implementation program.

6.4 Implementation of the Master Plan

The master plan will be implemented by adopting regulations and taking other non-regulatory actions flowing directly from its major orientations and objectives. The master plan does not bind the Government of Quebec, its departments and agencies, nor would any resulting regulation. Nevertheless, it was approved by the Minister of Municipal Affairs, and it is hoped that the government of Quebec will recognize at least a moral obligation with respect to its implementation.

Nunavik differs from all other regions of Quebec through its language, inhabitants, traditions, lifestyle, climate, and size. Ninety-eight percent of the land is in the public domain. In the absence of a real dialogue between Quebec and the KRG, the very compartmentalized and sometimes unilateral approach to land use management favored by the Quebec government could be perpetuated. The lack of commitment on the part of government organizations may render the plan useless, as you will see in the next section.

6.5 Mining and Outfitting Activities

Prior to the signing of the JBNQA in 1975, there was a series of camps established by companies engaged in mining activities north of the 55th parallel. Most of them seem to have been operated with little or no monitoring by the government of Quebec. In many cases, when exploration activities ceased, installations and materials in isolated sites were simply abandoned. Even with the implementation of the environmental regime and the municipal status of the Kativik Regional Government north of the 55th parallel, little or no resources have been provided for a systematic and comprehensive inspection and clean-up of old mining exploration sites.

There are likely to be hundreds of sites that have been abandoned since the 1950s, when mining exploration activities began in the region. The KRG, Makivik and the Inuit communities have identified a series of such sites, which contain abandoned buildings, equipment, materials, barrels, chemicals and debris from mining activities. In many cases, these sites have had or may be having detrimental impacts on wildlife and the environment (e.g. fuel spills), since nearly all of them are located in close proximity to water bodies.

This problem also applies to outfitting camps. Each year, the mobile camp policy of the Quebec government authorizes each outfitter to build a maximum of 12 mobile camps for

caribou hunting. The prescribed zone for erecting mobile camps is delimited by the 55th parallel, zone 22B, the 73rd degree of longitude West, the 58th parallel and Labrador. Zone 24 is not included. The location of these camps varies from year to year depending on migration patter of caribou herds. Since 1988, when the mobile camp policy was first implemented, some 2,000 sites have been operated by various outfitters within the prescribed zone. Since no resources have been made available for inspection and monitoring activities, it is unknown whether outfitters properly clean up the camp sites at the end of the hunting season.

The adoption of the Master Plan for Land Use was a major step taken by the KRG towards ensuring an orderly and sustainable development in Nunavik. Unfortunately, the lack of funding from the Quebec government for the implementation of the land use plan means that only the most rudimentary regulations will apply and little or no monitoring will be undertaken. One third of the territory of Quebec, which is home to Quebec's most fragile ecosystems, is left without adequate protection.

Cooperation and financial assistance from the Quebec government with respect to the implementation of the master plan is essential to improve management of activities in Nunavik. It would also ensure better protection of lakes and waterways.

7. LAKES AND RIVERS

7.1 Areas of Interest

The master plan proposes the establishment of a network of protected areas and sites deemed to be of regional interest, including parks, ecological reserves, wildlife sanctuaries or any other protected zone. This network would be comprised of areas that are important for the development or protection of biological resources, that include unique landscapes representative of Nunavik or that contain remarkable, rare or endangered plant or animal species.

Most of the areas of interest are made up of public lands that were identified by various departments within the context of the proposed Land Use Map for Lands in the Public Domain (PATP) of the Quebec Ministry of Natural Resources.

The goal of the network is to preserve these zones for the benefit of all by protecting them from the harmful impacts of human activity in general and industrial activity in particular.

The JBNQA provided for the creation of a park in Nunavik. Twenty-five years later, the Quebec Wildlife and Parks Corporation has finally undertaken to establish a park in the vicinity of Kangiqsujuaq. Pingualuit Park will encompass Crater Lake, a unique natural phenomenon of pure crystalline water that has to be protected and may become a tourist attraction. At the same time, a huge area of land, lakes and rivers will be protected for future generations. Major rivers like the Povungnituk will be at least partially protected from development projects.

Pingualuit Park will also, we hope, help develop the tourism industry in Nunavik. It is a growing but fragile industry; to develop it further serious considerations has to be given to the creation of more parks and reserve areas. Many other areas in Nunavik have been identified by Quebec, Canada and UNESCO as ideal areas for parks and natural reserves. A program should be put into place to further these preliminary studies.

7.2 Heritage Rivers

The Canadian Heritage Rivers System (CHRS) was officially created in 1984, and Quebec proposed that the Jacques-Cartier River be designated as a Heritage River in 1987. While this has not yet been done, we believe that some of the rivers in Nunavik merit the same consideration, since many of them are still in their natural and pristine state and should be protected.

The objectives of the Quebec portion of the Heritage program are as follows:

- To develop a system of heritage rivers that takes into account the natural, cultural and recreational attributes that Quebecers attach to their rivers;
- to protect and develop those rivers presenting significant natural, cultural and recreational values for the benefit of present and future generations;
- to prepare a planning process involving the relevant ministries and public and para-public agencies so that outstanding rivers be part of the Quebec system of heritage rivers;
- to actively involved the Quebec people in the implementation of this system and the management of heritage rivers.

Many of the rivers, like the Arnaud (Payne), the Leaf, the Whale, the Povungnituk, the Méléze (Larch) would be considered as outstanding rivers. They drain thousands of square kilometers of land. Not only are they part of the Inuit heritage, they are used by Inuit today, and must be preserved for future generations of Inuit.

As in the case of areas of interest, serious considerations must be given to these rivers becoming Heritage Rivers.

7.3 Subsistence Use of Lakes and Rivers

The KRG master plan indicates that many lakes and rivers are being used for subsistence activities (e.g. salmon and Arctic char fishing) and that these lakes and rivers have to be protected from development that would be detrimental to these activities.

Once again, the identification of these lakes, rivers and watersheds must be completed and means to protect them must be found.

7.4 Multiple-use of Lakes and Rivers

Except for the Koksoak and its tributary the Caniapiscau River, which was diverted by Hydro-Québec to create the reservoir of the same name, and the Deception River, which was dammed by Falconbridge for the Raglan mine project, few other lakes and rivers have been directly impacted by major development projects. These rivers are still being used for subsistence activities, outfitting and adventure tourism.

The Koksoak, the Caniapiscau and Deception Rivers are used for multiple purposes. This multiple-use concept is one that the Inuit are ready to study further and that could eventually be applied to certain areas of Nunavik, according to the Master Plan for Land Use in the Kativik Region.

7.5 Classification of Quebec Rivers

Following approval of the 1993 Hydro-Québec Development Plan, Quebec government decided to create an interdepartmental task force representing the Ministry of Natural Resources and the Ministry of Environment and Wildlife to design an integrated concept for river development. The purpose of this exercise is to identify the potential of rivers for various uses so that conflicts may be avoided, and to classify rivers according to either their heritage or conservation value or their cultural, recreational, energy production or multiple-use potential.

In the winter of 1998, the Quebec government initiated a consultation process concerning the classification of Quebec rivers. However, the KRG and Makivik received no other information on the project following this consultation.

Nunavik's vast river system is valued for its past and present use for Inuit subsistence activities. Given their ecological and cultural value as well as their potential for hydroelectric development, the rivers of the region should certainly be classified so as to prevent conflicts among user groups. Also, several rivers have great economic, recreational and tourism potential, particularly with respect to outfitting operations.

In short, a system combining all these categories should be developed for the rivers of the region.

8. RECOMMENDATIONS

In conclusion, we would like to make the following recommendations.

Drinking Water

With respect to drinking water, we recommend that:

- Hydro-Québec unconditionally approve “Rate G” for drinking water treatment plants operated in northern villages;
- Funding be provided to train water plant operators;
- The use of the Colilert method for bacterial monitoring of drinking water be approved;
- A preventive maintenance & mechanical upgrade program be created and supported;
- Government regulating bodies respond faster to the emergence of new technologies;
- Sufficient funding be provided to insure the construction of waste water facilities in all northern villages in Nunavik.

Sustainable Development

With respect to sustainable development, we recommend that:

- The Quebec Government provide funding, already identified by KRG and Quebec, in order to implement the Kativik Regional Master Plan;
- A Task Force be created, with adequate funding, comprised of representatives from the Ministry of Natural Resources, Ministry of Environment, Wildlife and Parks Corporation, Makivik and the KRG, to coordinate the authorization process for development projects in Nunavik, and to explore the possibility of delegating to the KRG the issuing of permits for mining exploration and outfitting activities;
- The Commission acknowledge in its report the mandate of the Kativik Environmental Advisory Committee so that it may play a leading role in any future consultation process;
- The Quebec Government establish, in collaboration with Makivik and the KRG, a three- to five-year program for the identification and clean-up of the many abandoned mining exploration sites;
- A mechanism be put into place for yearly inspection of mining exploration camps and outfitting operations to ensure compliance with basic environmental standards;
- Both levels of government undertake Phase 2 of the Marine Infrastructures Construction program.
