Nunavik Residual Materials Management Plan 2021–2027

(draft)

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Renewable Resources, Environment, Lands and Parks Department

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Abbreviations

KRG: Kativik Regional Government
JBNQA: *James Bay and Northern Québec Agreement*
CRD: Construction, renovation and demolition
ELV: End-of-life vehicle
FCNQ: Federation of Cooperatives of Northern Québec
RMM: Residual materials management
ICI: Industrial, commercial and institutional
MERN: Ministère de l'Énergie et des Ressources naturelles (energy and natural resources)
MELCC: Ministère de l'Environnement et de la Lutte contre les changements climatiques (the environment and the fight against climate change)
MFFP: Ministère des Forêts, de la Faune et des Parcs (forests, wildlife and parks)
RMMP: Residual materials management plan
HHW: Household hazardous waste
EPR: Extended producer responsibility
SHQ : Société d'habitation du Québec (housing)

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Cover photo: Northern landfill at Salluit. Source: Claude Desrochers, KRG, 2019.

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Background Information

The KRG was created following the signing of the JBNQA in order to deliver public services to the residents of Nunavik, known as Nunavimmiut. The northern villages and the Québec government have since delegated further mandates to the KRG.

The KRG in particular delivers technical assistance to the 14 northern villages in the fields of: legal affairs, management and municipal accounting, land use planning and development, environmental management, engineering and public transportation. It is the primary interlocutor of the Québec government, and is recognized as an essential contributor to regional development projects.

It must be recognized that Nunavik is a remarkable region of Québec. The wildlife and vegetation are unique, permafrost is present, the territory is immense, and there are no roads connecting the northern villages. These are a few of the realities that differentiate Nunavik from Québec south of the 55th parallel, and that require adapted approaches.

For several years, the KRG has focused on improving residual materials management practices in the region. Although not required by law to produce a residual materials management plan, it voluntarily did so for the period from 2015 to 2019 and followed up with an assessment report in 2019.

The revised *Nunavik Residual Materials Management Plan 2021–2027* is intended to serve as a planning tool for the northern villages taking into account distinct regional and local characteristics. It will also serve to increase awareness of the importance to reduce, reuse, recycle and reclaim residual materials in order to protect the environment.

1. Description of the Territory

1.1 Territory Covered by the Nunavik RMMP

1.1.1 Geology and Climate

Nunavik is the region situated north of the 55th parallel in Québec. Covering 500,164 km^2, it represents a third of the province. Nunavik is bordered by Newfoundland and Labrador on the east and by Hudson Bay, Hudson Strait and Ungava Bay.

The region sits on the Canadian Shield, which holds ore-bearing minerals, most notably iron, nickel, asbestos, uranium and copper.

The glaciers of the Quaternary era helped shape the topography, which includes rounded and asymmetric hills, valleys, elongated lakes, striated rock surfaces and unconsolidated deposits. Nunavik possesses a wide range of landscapes: rugged mountains, cuestas, marine plains and interior plateaus.

The region's uniqueness is also reflected in its climate. Two climate types characterize the region: arctic in the north and subarctic in the south. From north to south, temperatures may reach as low as -50°C in winter and up to 30°C in summer. The presence of large water bodies (Hudson Bay and Ungava Bay) influences local weather conditions. Continuous permafrost (in the north) and discontinuous permafrost (in the south) is further evidence of the region's cold climate.

In the northern part of the region, the average total annual precipitation is 300 mm while, in the southern part, it is 700 mm. Compared with other regions of Québec, which can receive more than 1,000 mm of rain and snow annually, Nunavik is relatively dry and experiences less snow accumulation. On the other hand, several studies on climate change disturbances forecast increased precipitation in the region.

Ice covers seaways between November and July, greatly influencing the marine transportation of goods.

In the 20th century, climate change occurred three times more quickly in Nunavik than on average, according to the consortium Ouranos, and these variations increased beginning at the end of the 1980s. The Intergovernmental Panel on Climate Change has reported that, between 1990 and 2007, the temperature of the region increased by 3.5°C, or five to seven times more than the global average over the same period (KRG 2020).

1.1.2 Land Categories

Land development in Nunavik is governed by the *Act respecting Northern Villages and the Kativik Regional Government*, which stems from the JBNQA.

The JBNQA classifies Nunavik into three categories of land (figures 1 and 2):

- **Category I**: lands for the exclusive use and benefit of Inuit that are administered by landholding corporations in each community.
- **Category II**: provincial lands on which Inuit have exclusive hunting, fishing and trapping rights; Inuit and the KRG are jointly involved in their administration (hunting, fishing, trapping, tourism development).
- **Category III**: provincial public lands where Inuit have the exclusive right to harvest certain aquatic species and certain fur-bearing animals, and to participate in the administration and development of the territory with the KRG.

1.1.3 Land Development[1]

Land uses and land development policies correspond with choices made by the region's residents, local and regional organizations, as well as various regional stakeholders and users. They are based on past and current use of the region by the communities and desired uses for the coming years. They also take into account the existing natural and social environments, as well as potentials and constraints.

Sections 244 and 176 of the *Act respecting Northern Villages and the Kativik Regional Government* define town planning and land development rules. Section 244 grants the KRG municipal powers over all the region north of the 55th parallel, except for the municipal territories of the northern villages and the category IA and IB lands of the Cree community of Whapmagoostui. The Act provides two tools for regulating physical organization in the region: a master plan (section 176(1)) and a zoning bylaw (section 176(2)). The KRG is responsible for implementing the *Kativik Regional Master Plan*. In this manner, the KRG must be notified of any development project within its boundaries, whether or not the project is subject to the environmental and social assessment and review procedure established under the *Environment Quality Act*.

Lands for Subsistence Harvesting Activities

In accordance with input from residents and various stakeholders in order to preserve the region's culture and way of life, lands that are vital for the survival of the region's inhabitants and their subsistence activities, such as hunting, fishing and trapping, have been identified.

Most of the areas identified for subsistence activities are accessible to a majority of residents, either by water or land routes. The occupation of these lands is demonstrated by the presence of camps and tents. These lands include several wildlife species that are essential sources of food for the communities. The *Kativik Regional Master Plan* defines essential and important areas for subsistence activities (Figure 1). Essential areas situated on Category I and II lands are habitats of high biological productivity (spawning, calving and nesting grounds, migration corridors, etc.) and represent, so to speak, the kitchen pantries of the communities.

[1] Source: *Kativik Regional Master Plan* (KRG 2020).

Important areas for subsistence activities situated on Category II and III lands are habitats of lesser biological productivity that are used on a more extensive and seasonal basis.

Subsistence harvesting areas include a majority of the archaeological sites identified to date, as well as several areas of aesthetic and ecological interest described below.

Areas of Interest

Areas of interest are divided into two categories: historical and aesthetic or ecological. They comprise zones that are important for the harvesting or protection of biological resources, unique or representative regional landscapes, or areas with remarkable, rare or threatened elements. The goal of these territories is to preserve all areas of interest from the adverse effects of human activity in general and industrial activity more specifically.

Areas of historical interest

Areas of historical interest are areas that contain sites of historical, archaeological or cultural value. A large majority of the areas of historical interest identified to date are found along the coasts and around the communities. They possess characteristics of different periods of occupation by Pre-Dorset, Dorset, Thule and historic Inuit groups.

There are more than 1,200 archaeological sites documented along the coasts and near the Petite rivière de la Baleine, the Rivière George and Lac Bienville. Although certain sites are connected with the fur trade of the 17th and 18th centuries, a vast majority were created by Indigenous peoples and some are several thousand years old. The region also includes cultural and sacred sites.

Areas of aesthetic and ecological interest

The MELCC has given the KRG a mandate to be responsible for the management Québec national parks in Nunavik.

The KRG manages these parks through Nunavik Parks, ensuring the protection of areas with outstanding natural features and representative landscapes against human activity, such as mining and other non-renewable resource exploitation. Notwithstanding, wildlife harvesting rights are officially recognized for Inuit for their traditional and subsistence activities.

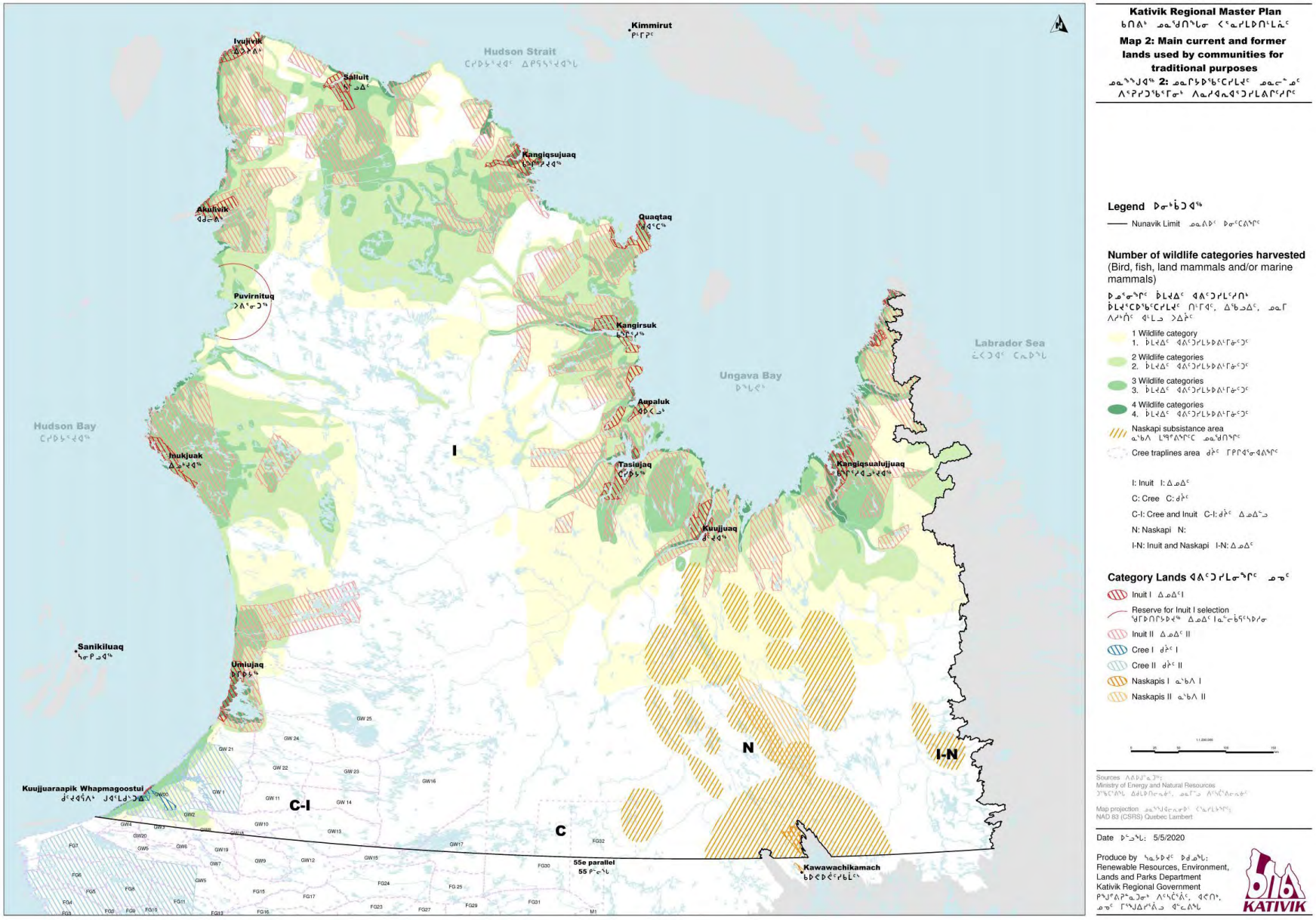

Figure 1: Traditional land uses by community (KRG 2020)

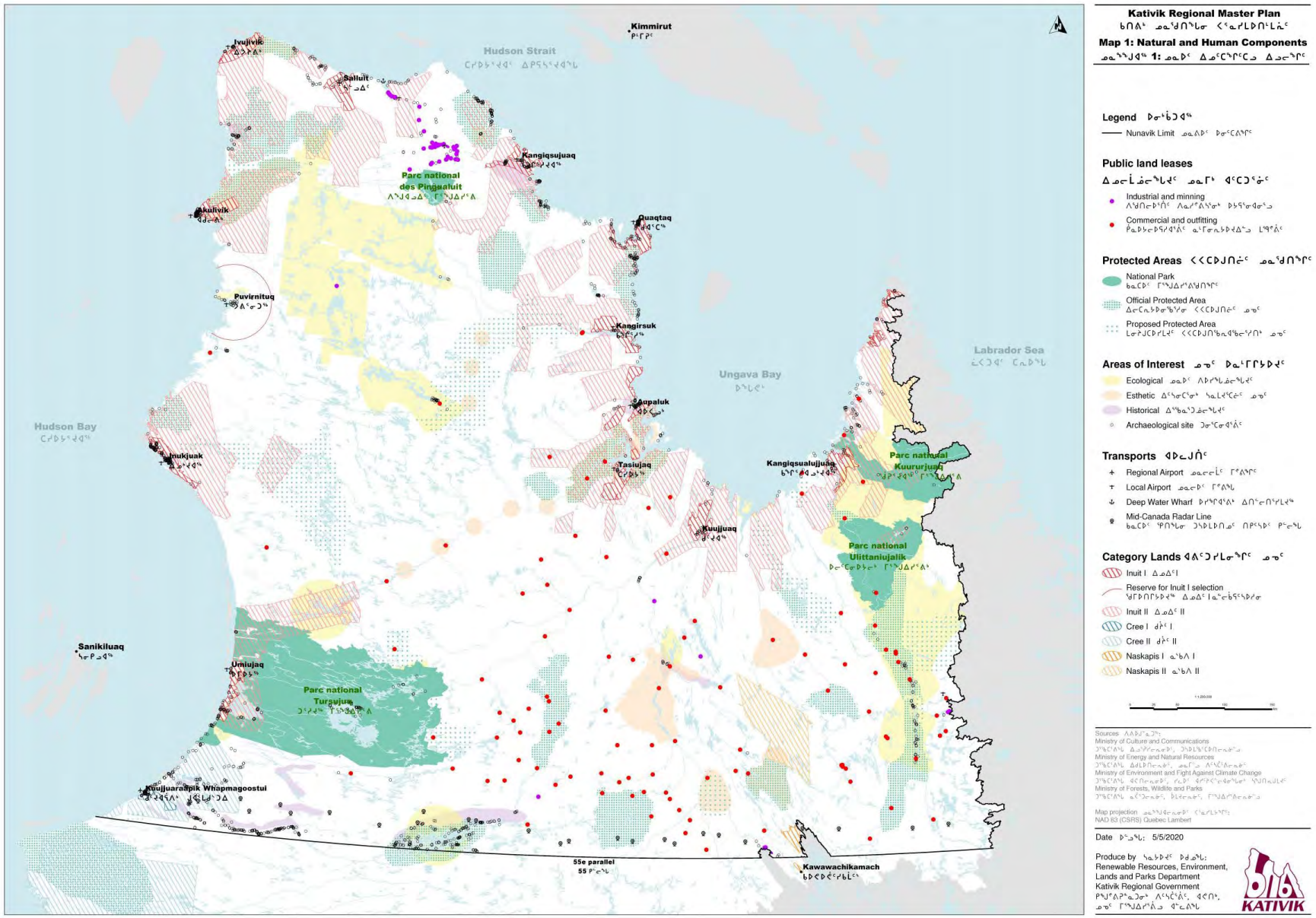

Figure 2: Category I and II lands and protected areas (KRG 2020)

Four parks have been officially created to date: Parc national des Pingualuit, Parc national Kuururjuaq, Parc national Tursujuq and Parc national Ulittaniujalik. Two park projects are in the process of being developed: the Cap-Wolstenholme national park reserve and the Baie-aux-Feuilles national park reserve. All are situated on Category II and III lands (Figure 2). Talks are ongoing regarding two park extension projects, one at Parc national Kuururjuaq and the other at Parc national des Pingualuit in the proposed Fjord-Tursukattaq biodiversity reserve. As well, seven proposed biodiversity reserve projects, one aquatic reserve project and three territories reserved for the creation of protected areas (Lac-Jeannin, the Rivière-George and the Rivière-Marralik) appear on the Québec *Registre des aires protégées* (protected areas register).

Figure 3: National park in Nunavik
Source: Fabrice Gaëtan, 2016

Lands for Multiple Uses

Areas designated for multiple uses occupy a vast inland portion of the region, mainly Category III lands, where different land-use activities are possible. Although the main land uses remain subsistence and sport activities, other land uses do exist. These areas cover half of the Kativik Region and include some areas of interest. These areas are characterized by the integrity of their natural environments.

Outfitting, tourism, holiday and industrial activities are sparse, and some are seasonal (tourism) or have limited operational lifetimes (mines). Among the activities that pose the greatest threat to the environment are three active mines and several decommissioned mining sites. Many mineral exploration camps are also having impacts on the environment.

Urban Land Use

The urban land use designation is given to areas mainly characterized by a permanent population and the buildings, services and infrastructure required to maintain and develop these communities.

The signing of the JBNQA in 1975 and the adoption of the *Act respecting Northern Villages and the Kativik Regional Government* in 1978 established a municipal regime in the northern villages, effectively creating boundaries for urban land use. The communities are all situated on self-selected Category I lands, except for Puvirnituq. This community has not yet selected its Category I and II lands, although an area has been set aside for this purpose covering a 40 km radius around the community, pursuant to the JBNQA (Section 6, Schedule 3). A

complementary agreement concerning the Category I and II lands selected by Ivujivik was signed on June 21, 2013.

Each of the 14 northern villages (Figure 4) is characterized by a built-up core (the village) and a surrounding area that includes public infrastructure, such as an airport, a northern landfill, a drinking water pumping station and a treatment plant, wastewater lagoons, infrastructure access roads, etc. Roads have been constructed beyond these areas to secondary residences or camps outside of municipal boundaries.

Figure 4: Northern villages
Source: KRG, 2020

Various services and urban activities are located within the built-up cores of each of the northern villages, including residential, commercial and industrial sectors (restaurants, retail stores, garages, warehouses, fuel reservoirs, etc.), public services (school, health centre or CLSC, police station, church, etc.), administrative services (offices for the municipality, the

landholding corporation, regional administration, etc.), and recreation infrastructure (arena, gymnasium, community centre, etc.).

Any development project or activity in a northern village must comply with the policies contained in the local master plan and the provisions of the local zoning bylaw. Prior to undertaking major development projects, the northern villages must consult with the KRG.

In 2016, there were a total of 3,625 dwelling in the northern villages, of which 3,555 were rental units. The average household size is 3.9 persons, and the average number of families per dwelling is 1.3. A majority of dwellings are duplexes (1,730) (Statistics Canada 2017).

1.2 Demographic Profile

1.2.1 Permanent Population

The territory of Nunavik under KRG jurisdiction has a total population of more than 14,161[2], of which more than 11,500 speak Inuktitut[3]. The region's population lives in 14 communities situated north of the 55th parallel along the coasts of Ungava Bay, Hudson Strait and Hudson Bay. All the communities, except for five, have populations of less than 1,000. The largest communities are Kuujjuaq, Puvirnituq, Salluit, Inukjuak and Kangiqsualujjuaq. Nunavik's population is divided into 3,630 households, of which close to a third include five persons or more. More than 60% of residents are younger than 30, which is to say twice the proportion of the population compared to southern Québec. (Statistics Canada 2017).

1.2.2 Seasonal Population

On a seasonal basis, activities in the construction, mineral exploration and tourism sectors expand the size of local populations. Notwithstanding, the number of jobs in these sectors can fluctuate greatly, and it is difficult to forecast the number of tourists who will visit different regional attractions.

Figure 5: Housing construction
Source: Makivik Construction

- Regarding the construction sector, a variable number of workers from outside of the region reside in the communities from June to November. These non-resident workers receive room and board in temporary or permanent camps set up for this purpose that are owned by either the local municipality or landholding corporation, or a construction company.

- Regarding the tourism sector, Nunavik Parks recorded 552 visitors in 2019, including 327 tourists from outside the region. It should be noted that tourists are travellers and

[2] According to the Québec *Répertoire des municipalités* (municipal directory), 2020. According to the 2016 Census, the population of Nunavik was 13,185.
[3] Exactly 11,535 persons according to the 2016 Census by Statistics Canada.

are accommodated in facilities close to the sites of their tourism activities (outfitting camps, parks, cruise ships, etc.).

1.2.3 Demographic Projections

Population growth in Nunavik is much stronger than in the rest of Québec. Between 1971 and 2001, the population more than doubled. Between 2001 and 2016, it grew by 41.4% (KRG 2020) and a growth rate of more than 25% is forecast by 2036 (Table 1). Among other consequences, this strong growth will exert more pressure on infrastructure and services, including increased quantities of residual materials.

Table 1: Population in 2020 and projections

Community	Population, 2020[4]	Population projection, 2026[5]	Variation 2016–2036[5]
Akulivik	678	691	13.3%
Aupaluk	224	254	21.5%
Inukjuak	1,887	2,016	24.9%
Ivujivik	460	464	12.1%
Kangiqsualujjuaq	1,028	1,055	19.7%
Kangiqsujuaq	832	835	17.7%
Kangirsuk	594	606	10.2%
Kuujjuaq	2,862	3,069	15.5%
Kuujjuaraapik	722	787	23.1%
Puvirnituq	1,902	2,037	24.5%
Quaqtaq	441	536	33.0%
Salluit	1,653	1,761	31.4%
Tasiujaq	395	454	23.0%
Umiujaq	483	571	29.2%
Total	14,161	15,000	25.5 %

1.3 Socioeconomc Profile

As is the case in other remote regions, the economic situation of Nunavik is very poor. The region is highly dependent on government assistance. Climate constraints, sparse resources, the large distance from urban centres and the shortage of qualified workers hinder development.

As regards jobs, the private business–cooperative sector and the public–parapublic sector each provide about half of the jobs available in the region. The activities that generate jobs and income are mostly found in the communities. Outside the communities, economic activities are characterized by wildlife resource harvesting for subsistence and tourism purposes, plus mining.

[4] Québec *Répertoire des municipalités* (municipal directory), April 2020.
[5] Institut de la statistique du Québec (statistics), 2019.

Each community possesses one or more schools offering elementary, secondary or adult education. School curriculum is adapted to local needs and emphasizes the preservation of Inuit culture and language. Although schooling has progressed considerably over the last decade, the region's residents continue to be at a disadvantage due to their lower levels of education. This shortcoming deprives Inuit society of the professional skills needed to foster development momentum internally and, at the same time, contribute to improving the quality of living.

The living cost differential is very high in the north. This harsh economic reality results in a cost of living that is 28.7% higher in Nunavik than in Quebec City and food prices that are 54.6% more expensive (KRG 2020). In this context, subsistence harvesting activities are especially important.

The labour force in 2016 totalled 6,170 persons aged 15 and older, the participation rate was 70.9%, and the unemployment rate was 15.4% (Statistics Canada 2017). Moreover, although 90% of the population in 2012 was Indigenous, its corresponding income represented only 70% of total income in the region. Per capita personal disposable income is lower for Inuit residents than for non-Indigenous residents and Québecers in general. This situation leads to certain inequalities: the highest paid job opportunities in the public and parapublic sectors are generally held by specialized non-Indigenous labourers (KRG 2020).

1.3.1 Private Businesses

Excluding mining-sector activities, there is little industry in Nunavik. Instead, the para-industrial sectors of energy, transportation, construction, and retail businesses and cooperatives are described in this subsection.

Mining sector

In August 2018, there were 35,000 mineral rights in Nunavik, of a total of 154,645 in Québec as a whole. Notwithstanding, there are only three major projects underway: the Raglan mine is operated by Glencore with 1,200 workers, 251 of whom are Inuit; the Nunavik Nickel mine is operated by Canadian Royalties with 450 workers, 62 of whom are Inuit; and Tata Steel Minerals Canada Ltd. The former two mines are located within a few kilometres of one another on the Ungava Peninsula and sit on one of the largest nickel sulphide deposits in the world. The third is an iron mine situated 50 km northwest of Schefferville (KRG 2020) (Figure 7). No other mines are in operation in Nunavik[6].

The Raglan and Nunavik Nickel mines were designed to minimize liquid effluents, water consumption and atmospheric emissions, and to progressively rehabilitate mine tailings. Each operates a northern landfill and manages residual materials independently. The Raglan mine has introduced different initiatives to reduce the quantity of residual materials generated. For example, a logistics consolidation centre in Quebec City is able to reduce by approximately 30% the volume of packaging needed to transport products to the mine by

[6] Mineral resource maps, MERN, https://mern.gouv.qc.ca/mines/publications/cartes-minieres/.

reducing or modifying packaging, which can moreover by recycled in Quebec City. As well, several kinds of residual materials are returned south for recycling, for example ink cartridges, certain metals, mercury lamps, as well as hazardous and other materials. The Nunavik Nickel mine carried out residual metal recovery activities in 2018–2019 and plans to recover this metal on a regular basis in the future. It burns used oil in its furnaces and plans to reduce the quantity of plastic waste in its cafeteria.

Figure 6: Raglan mine complex
Source: Glencore

A number of mineral exploration activities are being carried out in the region. According to the GESTIM website operated by the MERN, there are 7,605 active mining titles held by 146 different companies (April 2020). Ten mineral exploration sites were in operation in 2019 and activities on at least one of these sites has since ended. In total, these sites employed approximately 75 persons (30 by Orford and, on average, five at each of the other exploration camps). The two most advanced exploration sites are Ashram Deposit and Strange Lake[7]. None of these possess permanent infrastructure, except for access roads and landing strips that can be considered permanent. Although mineral exploration companies manage residual materials according to a variety of methods based on site terrain and proximity to a community, most transport their residual materials to the closest northern landfill or to the south.

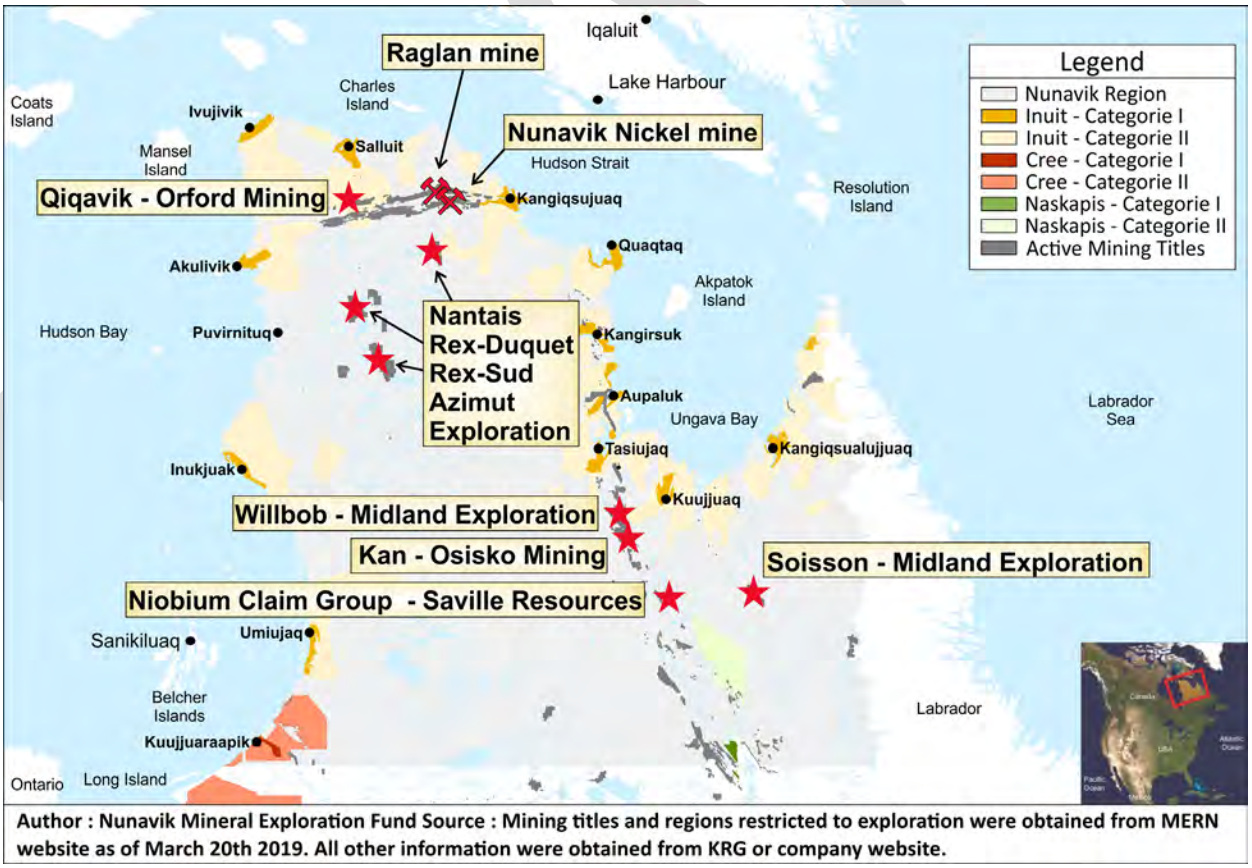

Figure 7: Active mines and mining titles in Nunavik
Source: Nunavik Mineral Exploration Fund

[7] According to the Nunavik Mineral Exploration Fund, 2019 data.

Energy sector

Hydro-Québec is responsible for generating power in the northern villages and, for this purpose, operates thermal power plants in each community. A hydroelectric dam is under construction in Inukjuak. Operations are expected to begin in 2022[8] and replace the use of oil-burning power generators in the community. The public corporation employs 31 workers throughout the region, including 26 Inuit[9].

Figure 8: Furnace-oil heating equipment
Source: SHQ

Buildings and homes are heated with oil-burning furnaces. Each community has oil tanks and delivery trucks. Nunavik Petro and Halutik are responsible for the supply and distribution of fuel products in the region.

Transportation sector

The transportation sector provides 270 jobs across the region (Statistics Canada 2017). The airline companies Air Inuit and Canadian North deliver daily air transportation services, offering scheduled and charter flights. Air Inuit alone employs 650 persons (in 2017), including 188 JBNQA beneficiaries, and operates 500 movements per week[10]. Other airlines also offer charter flights throughout the region.

Marine transportation is vital for the region due to the absence of road and railway links. Essential items, such as food, fuel and construction materials are transported by ship each summer and fall, and make it possible to resupply communities and remote or mining camps. NEAS and Desgagnés Transartik are the only two shipping companies that serve the region. All the communities possess marine infrastructure that permit the unloading of supplies.

Construction sector

A few contractors are involved in Nunavik's construction sector. The sector provides employment for 90 workers who live in the region (Statistics Canada 2017) and is largely paid for with government funding. Home costs in the region are excessively high due, among other reasons, to the high cost of shipping materials, accommodating workers (largely recruited from southern Québec) and construction techniques (in particular insulation and adapted designs) (KRG 2020).

Commercial and cooperative sector

[8] Hydro-Québec, Press release dated May 27, 2019, Construction of a hydroelectric generating station for the energy transition in the Inukjuak off-grid system, http://news.hydroquebec.com/en/press-releases/1499/construction-of-a-hydroelectric-generating-station-for-the-energy-transition-in-the-inukjuak-off-grid-system/.
[9] Information communicated by Frédéric Brassard, Hydro-Québec, 2020.
[10] Mapping the Way to Sustainable Employment, 25th anniversary symposium, KRG Sustainable Employment Department. https://www.krg.ca/en-CA/publications/employment-training.

Retail stores in most of the communities are operated by the FCNQ and Northern (a subsidiary of the Northwest Company), as well as Newviq'vi in Kuujjuaq. FCNQ retail stores alone provide jobs for 400 full-time and 140 part-time workers in the 14 communities (KRG 2020).

Figure 9: FCNQ hotel
Source: FCNQ

The FCNQ also owns and operates hotels in 13 communities. Some landholding corporations also own and operate hotels and restaurants in their respective community. These facilities provide services for the region's large number of business travellers (regional services, meetings, training, etc.) and tourists. The accommodations and restaurant sector generates 150 jobs (Statistics Canada 2017).

In Nunavik, only one banking institution offers services directly to clients: the CIBC in Kuujjuaq. In the other communities, the FCNQ retail stores deliver basic banking services.

Tourism sector

The tourism sector plays an important role in the regional economy. Tourism activity is divided into three main areas: outfitting, parks and adventure tourism.

Outfitting camps are mainly concentrated between Ungava Bay and the 55th parallel, and now offer salmon and arctic char fishing. The number of outfitting clients has plummeted since the 1990s. The steep decline in the size of the George River caribou herd led in 2011 to the introduction of a partial ban on hunting and, by 2018, a complete ban. According to 2019 data, 45 outfitters hold valid operating permits in Nunavik (although they are not delivering any services) and provide employment for 31 part-time and 45 full-time workers. In 2019, outfitters received 477 sport hunting or fishing clients, representing a significant drop in numbers due to the ban on caribou hunting[11]. Only eight Nunavik outfitters are active members of the Québec Outfitters Federation[12]. Some outfitting camps have remote landfills[13].

In 2018, the Québec government released a strategy for the vitality and enhancement of northern heritage, which included $6 million until 2022 for the clean-up of about 200 mobile camps that had been used for caribou sport hunting. Roughly 11 camps were cleaned up in 2019. The work is being carried out by the outfitters themselves, or by Inuit and Naskapi in accordance with agreements with the Québec government. The Makivik Corporation administers the Inuit agreement. Reusable equipment is shipped to the nearest communities, while hazardous materials are transported to the eco-centre at Schefferville, the trench landfill at Matagami or the south. Combustible materials are burned onsite pursuant to the protocol recognized by the Société de protection des forêts contre le feu (forest fire protection)[14].

[11] Information communicated by Karen Savard, MFFP.
[12] Not all outfitters are members of the Québec Outfitters Federation.
[13] It is not mandatory to report remote landfills to the MELCC. The exact number of active remote landfills in Nunavik is unknown.
[14] Information communicated by Andréanne Savard, MFFP.

Nunavik Parks employs about 30 staff in administrative positions and for activities at the four national parks, plus eight or nine seasonal workers[15]. The park network expects that the number of visitors will increase and lead to the creation of many more new jobs in the coming years. No landfills are present in any of the parks; residual materials are returned to the nearest community.

A few adventure tourism companies deliver guiding and technical support services for tourists and groups visiting the region (kayaking, trekking, snowmobiling, canoeing, dogsledding, etc.).

[15] Information communicated by Catherine Noiseux, Nunavik Parks.

1.3.2 Public and Parapublic Sector

The tertiary sector generates 74.7% of the jobs in Nunavik. It mainly consists of public and parapublic services (Duhaime et al. 2015):

- Drinking water delivery and wastewater collection are included in municipal services, inflating the number of municipal workers in each northern village.

- Provincial services are listed in Table 2. Basic services are delivered in every community, while regional services are, to a large extent, based in Kuujjuaq.

- Few federal services are delivered in Nunavik. Postal services are subcontracted to local businesses (FCNQ cooperatives or Northern retail stores) except in Kuujjuaq and Kuujjuaraapik. Other services (transportation, employment, public works, marine infrastructure, airports, etc.) are administered by the KRG.

Figure 10: Drinking water delivery in Quaqtaq
Source: Geneviève Vachon, Érudit

Table 2: Public and parapublic services in Nunavik

Community	Health												Education					Regional administration								Others				Federal				
	Health centre and social services	Service point (CLSC, youth protection)	Group home (6–12 year olds)	Group home (12–18 year olds)	Supervised residence (mental health)	Nunavik Regional Board of Health / Social Services	Youth rehabilitation centre (12–18 year olds)	Elders residence / loss of autonomy	Mental health residence	Treatment centre (addictions)	Women's shelter	Family house	Kativik Ilisarniliriniq (school board)	Primary and secondary school	Vocational training centre	Adult education centre	College preparatory centre	KRG	Sustainable employment centre	Childcare centre	Recreation centre	Nunavik Parks	Airport	KRPF detachment	Municipal office	Sûreté du Québec	Wildlife protection office	Court of justice	Kativik Municipal Housing Bureau	Meteorological service of Canada	Post office	NAV CANADA	Service Canada	Canada Post
Akulivik		√												√					√	√	√		√	√	√						√			
Aupaluk		√												√					√	√	√		√	√	√						√			
Inukjuak		√					√	√	√		√			√	√	√		√	√	√	√		√	√	√					√	√			
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Kangiqsujuaq		√						√				√		√			√		√	√	√	√	√	√	√						√			
Kangirsuk		√												√					√	√	√		√	√	√						√			
Kuujjuaq	√		√	√	√	√	√	√	√	√	√		√	√		√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Kuujjuaraapik		√	√				√					√		√					√	√	√		√	√	√			√			√			
Puvirnituq	√			√			√	√	√			√		√					√	√	√		√	√	√			√			√			
Quaqtaq		√												√					√	√	√		√	√	√						√			
Salluit		√					√				√	√		√					√	√	√		√	√	√						√			
Tasiujaq		√												√					√	√	√		√	√	√						√			
Umiujiaq		√												√					√	√	√	√	√	√	√						√			

2. Background Information

This section contains descriptions of current collection, recovery and disposal practices and infrastructure, as well as an inventory of residual materials generated in the region.

2.1 Current RMM Practices and Infrastructure

This subsection describes current RMM practices and infrastructure in Nunavik. The distribution of responsibilities between the KRG and the northern villages is presented, along with applicable regulations and municipal bylaws. Collection methods, facilities and reclamation initiatives are also explained.

Between 2013 and 2017, the eco-advisory research chair at the Université du Québec à Chicoutimi produced a portrait of RMM in the north including Nunavik, a research report, and tools for improving RMM. The study furthered knowledge in this sector and explored solutions. Some results were also applied to the development of measures under Section 3, Action Plan.

2.1.1 Distribution of Responsibilities and Applicable Regulations and Municipal Bylaws

The KRG is responsible for implementing the Nunavik RMMP and improving northern landfill and wastewater lagoon infrastructure across the region. The 14 northern villages are responsible for managing local landfills as well as for collecting residual materials and wastewater.

Laws and regulations regarding RMM and the environment in Québec are applicable in Nunavik. The core RMM regulation is the *Regulation respecting the Landfilling and Incineration of Residual Materials* (c. Q-2, r. 19). This regulation defines operational requirements for northern landfills. It prohibits northern landfills, except north of the 55th parallel (Nunavik) and in some Basse-Côte-Nord communities. It contains stipulations about the location and construction of northern landfills, the type of acceptable waste and how that waste must be burned. It also provides information on procedures applicable for the closing of northern landfills.

The *Act respecting Northern Villages and the Kativik Regional Government* (CQLR, c. V-6.1) gives each northern village jurisdiction over residual materials and northern landfill management. While each northern village is responsible for crafting its own bylaws (Table 3 and Appendix 1, Example of a Municipal RMM Bylaw), the goal of the Nunavik RMMP is to ensure more consistent management practices across the entire region.

In addition, two regional organizations have mandates to observe, analyze, provide feedback and make decisions on projects with environmental or social impacts in Nunavik, namely the Kativik Environmental Quality Commission and the Kativik Environmental Advisory Committee.

The Kativik Environmental Quality Commission assesses and reviews projects proposed in the territory under the JBNQA north of the 55th parallel. First, the Commission analyzes preliminary data submitted by the project proponent and transmitted by the provincial administrator of Section 23 of the JBNQA (the Deputy Minister of the MELCC) and decides whether the project is subject to or exempt from the environmental and social impact assessment and review procedure set out in Title II of the *Environment Quality Act*. When a project is subject to assessment, the Commission issues directives on the scope of the impact study to be carried out. When a project is exempt from assessment, the Commission issues an attestation of exemption. The Kativik Environmental Quality Commission analyzes the impact studies submitted to it and may hold public hearings with the communities affected by a project. Lastly, the Commission determines whether a project should be authorized or not.

The Kativik Environmental Advisory Committee has a mandate to monitor the application and administration of the environmental and social protection regime in accordance with Section 23 of the JBNQA. It is also responsible for advising governments on important matters related to the implementation of the environmental and social protection regime and the land use regime. The Committee studies and recommends amendments to laws, regulations, policies and administrative procedures related to the natural and social environments as well as land use. It plays an advisory role with the governments and the KRG when they develop or amend laws, regulations and policies regarding the natural and social environments as well as land use. Finally, the Committee studies and makes recommendations on environmental and social impact assessment and review mechanisms and procedures. The Kativik Environmental Advisory Committee may also provide technical assistance to the northern villages and the KRG. All Committee decisions and recommendations are transmitted to the governments of Québec and Canada, as well as to the KRG and concerned northern villages, for information purposes and appropriate action.

Table 3: Municipalities with bylaws

Village	Bylaw no.	Title
Kuujjuaq	2008-02	Concerning the use of the northern landfill and the disposal of waste
	2008-03	Concerning a ban on use single-use plastic shopping bags
	2017-04	Concerning the use of the solid waste disposal site and the dumping of waste
Kangiqsujuaq	2018-02	Concerning the use of the solid waste disposal site and the dumping of waste
Aupaluk	2012-02	Concerning the use of the solid waste disposal site and the dumping of waste
Kangirsuk	2015-01	Concerning the use of the solid waste disposal site and the dumping of waste
Quaqtaq	B2014-03	Concerning the use of the solid waste disposal site and the dumping of waste
Salluit	2016-03	Concerning the use of the solid waste disposal site and the dumping of waste

Ivujivik	2016-04	Concerning the use of the solid waste disposal site and the dumping of waste
Akulivik	2016-02	Concerning the use of the solid waste disposal site and the dumping of waste
Puvirnituq	2015-03	Concerning the use of the solid waste disposal site and the dumping of waste
Inukjuak	2015-02	Concerning the use of the solid waste disposal site and the dumping of waste
Umiujaq	2016-03	Concerning the use of the solid waste disposal site and the dumping of waste
Kuujjuaraapik	2016-02	Concerning the use of the solid waste disposal site and the dumping of waste
Tasiujaq	2018-03	Concerning the use of the solid waste disposal site and the dumping of waste
Kangiqsualujjuaq	2018-02	Concerning the use of the solid waste disposal site and the dumping of waste

2.1.2 Garbage Pick-Up and Waste Transportation

The northern villages deliver garbage pick-up services weekly for the residential and ICI sectors, i.e. five days per week as long as the garbage truck is available (not under repair) and weather conditions permit. Each home, business and institution has a waste bin made of wood, plastic or metal. All waste combined is collected and transported to the northern landfill, the only local infrastructure designated for RMM. While landfills have fenced perimeters, access is not always restricted and individuals and businesses may dispose of waste at any time. For their part, construction companies are responsible for transporting their waste to the local northern landfill. In theory, contractors are charged fees for this landfill service in accordance with local municipal bylaws but, since most sites do not have onsite staff to monitor disposal activities, contractors do not pay fees systematically.

Figure 11: Garbage truck in Aupaluk
Source: Pierre-Luc Dessureault, eco-advisory research chair

Figure 12: Garbage truck in Kuujjuaq
Source: Gaëlle Baïlon-Poujol, 2019

2.1.3 RMM Businesses

There are very few RMM businesses based either in or outside of the region with activities in Nunavik. Those that are present are listed in the following table:

Table 4: RMM businesses in Nunavik

Business/organization	Location	Activities	Materials
Avataani Environmental Inc.	5063 Stewart Lake Rd. P.O. 939 Kuujjuaq QC J0M 1C0	Assessment analysis Recovery (turn-key management projects) Product and equipment sales (e.g.: quatrex, barrels, absorbent materials)	Hazardous materials Used oil Containers for storing hazardous materials Contaminated soil (including treatment) Asbestos
I care. We care.	636 Akianut St. Kuujjuaq QC J0M 1C0	Reuse	Donated articles (clothing, books, household articles)
Nunatech-Englobe (joint venture)	Office: 1140 Immirtavik St. Kuujjuaq QC J0M1C0 Treatment site: Range Rd., Kuujjuaq	Treatment	Contaminated soil
Terrapure Environnement	1200 Garnier St. Ste-Catherine QC J5C 1B4	Recyclage	Vehicle batteries
Tivi Inc.	5205 Airport Rd. Kuujjuaq QC J0M1C0	Logistic support for mineral exploration projects (recovery and turn-key transportation)	Hazardous materials

2.1.4 RMM Infrastructure

Every community in Nunavik has an authorized local northern landfill. Several of these sites opened in the 1980s and are now almost filled to capacity. To correc this situation, the KRG Municipal Public Works Department has completed construction of a new site in Kangirsuk, which is scheduled to open in 2021. A new site is also under construction in Inukjuak and should be ready in five years. In Kuujjuaraapik, the Cree Nation Government is planning the construction of a new shared landfill in the Cree territory of Whapmagoostui; an opening date has not yet been set.

Generally speaking, northern landfills are located a few kilometres from each community, as shown in Appendix 4, Photos and Locations of the Northern Landfills in the Communities.

The local access road sometimes serves for other infrastructure, such as the airport, the boat launch and sealift unloading site, the power plant, etc. Site dimensions vary greatly, depending on the size of the community, as shown in the data in Table 5.

Figure 13: Northern landfill, Kuujjuaq
Source: Véronique St-Onge

Similarly, the equipment available for RMM depends on the size of the community. Each northern village possesses at least one of each of the following pieces of heavy equipment, although this equipment is not designated exclusively for use at the northern landfill, according to other local needs, such as residential construction:

- loader;
- garbage truck;
- excavator;
- bulldozer.

At the northern landfills, combustible residual materials are burned pursuant to *Regulation respecting the Landfilling and Incineration of Residual Materials* and then roughly compacted by heavy equipment. Covering material is added once or twice annually according to the availability of nearby material and the time of year. Contaminated soil is frequently used as covering material but must be analyzed prior to use, contain a contaminant concentration lower than C and be approved by the northern village. If the contaminant concentration is higher, the soil must be shipped to a treatment centre in the south or environmental authorization can be requested to treat the soil locally in biopiles.

For their part, non-combustible residual materials (metal waste) are stored separately. In Ivujivik and Kuujjuaraapik, these zones are located at different sites even though, according to site planning, all northern landfills include zones for the sorting of residual materials. Given the considerable accumulation of metal, that sites remain open at all times and that workers trained in northern landfill management are scarce, planned zoning is often ignored. By way of example, Figure 15 shows the different zones of the northern landfill in Kuujjuaq according to the characterization work performed in 2019 (St-Onge 2019).

Figure 14: Burning zone at the northern landfill in Kangiqsualujjuaq
Source: Gaëlle Baïlon-Poujol

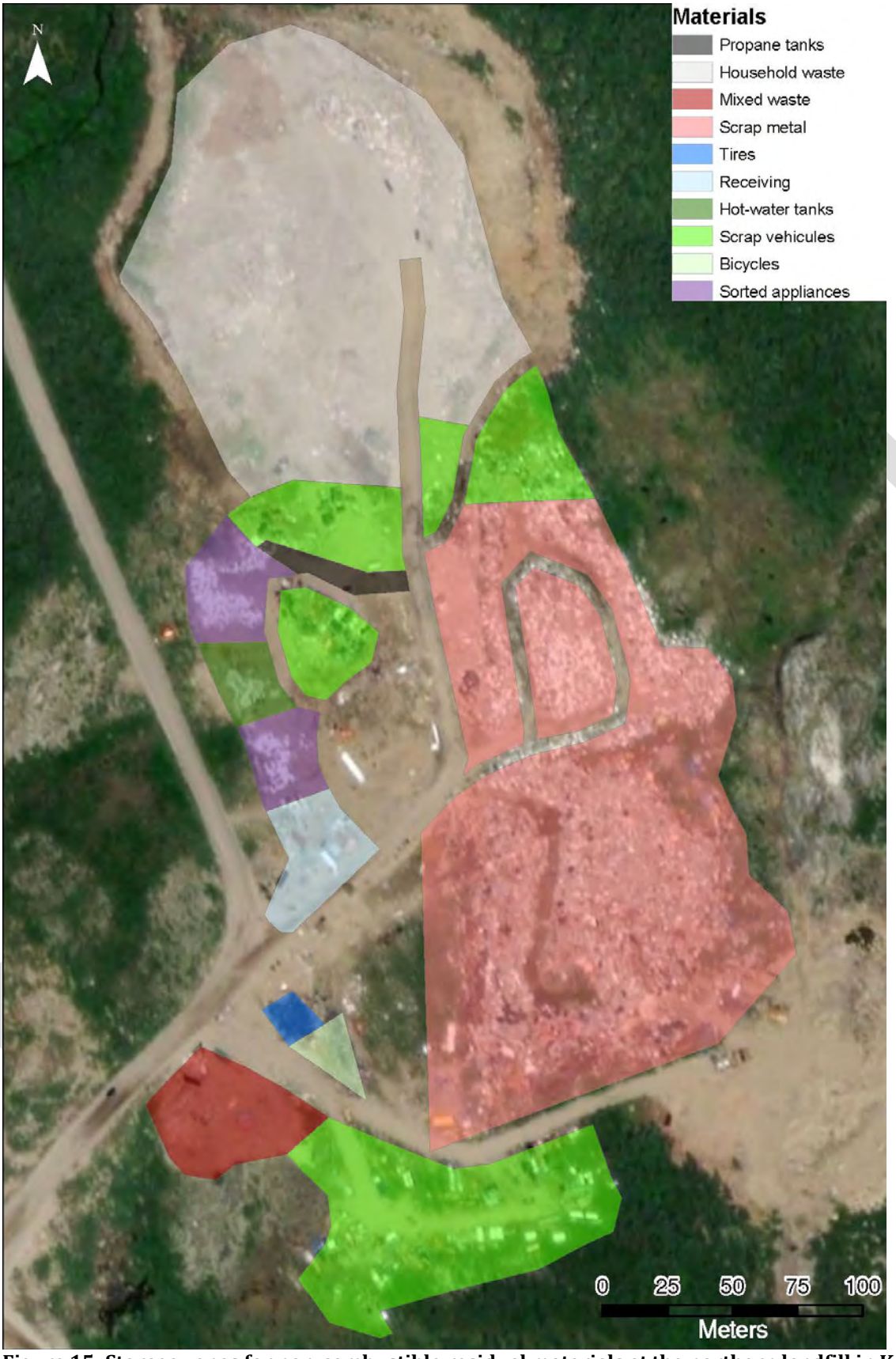

Figure 15: Storage zones for non-combustible residual materials at the northern landfill in Kuujjuaq
Source: Frédéric Coderre, 2020, KRG

Table 5: Assessment of residual materials coverage (m^2) by northern landfill

Village	Landfill area (fenced zone)	Residual materials coverage (inside fenced zone)	Residual materials coverage (outside fenced zone)
Akulivik	20,200	10,150	3,050
Aupaluk	12,100	9,240	2,300
Inukjuak	45,180	25,580	60
Ivujivik (site 1 = flammable)	6,720	3,890	0
Ivujivik (site 2 = nonflammable)	3,780	2,660	1,820
Kangiqsualujjuaq	7,600	4,490	480
Kangiqsujuaq	32,000	7,560	380
Kangirsuk (old)	19,000	13,360	6,060
Kangirsuk (new)	52,383		
Kuujjuaq	28,280	28,700	750
Kuujjuaraapik (site 1 = nonflammable)	24,000	14,900	0
Kuujjuaraapik (site 2 = inflammable)	23,150	11,490	0
Puvirnituq	33,670	15,390	5,030
Quaqtaq	11,900	7,070	370
Salluit	20,270	12,240	970
Tasiujaq	15,310	12,350	670
Umiujaq	16,220	6,290	160

Source: Table 1, characterization study, produced by Poly-géo, 2012[16]

With respect to the storage of hazardous materials, each northern village maintains a structure for this purpose, i.e. a container with a double bottom or a shed on a concrete slab base. Storage details for each community are shown in Table 6.

Table 6: Types of structures used for HHW storage by community

Villages	Structure details
Kangiqsualujjuaq	→ Double-bottomed container
Kuujjuaq	→ Double-bottomed container
Tasiujaq	→ Shelter with regulation concrete slab base near the municipal garage
Aupaluk	→ Double-bottomed container (delivery in 2020)
Kangirsuk	→ Shelter with regulation concrete slab base near the municipal garage
Quaqtaq	→ Double-bottomed container
Kangiqsujuaq	→ Shelter without concrete slab base
Salluit	→ Unheated municipal garage with regulation concrete slab base
Ivujivik	→ Double-bottomed container (delivery in 2020)
Akulivik	→ Double-bottomed container (delivery in 2020)
Puvirnituq	→ Double-bottomed container (delivery in 2020)
Inukjuak	→ Double-bottomed container

[16] Poly-géo was given a mandate in 2020 to update this data. The table will be updated in the final version.

Umiujaq	→ Double-bottomed container (delivery in 2020)
Kuujjuaraapik	→ Double-bottomed container

Avataani Environmental Inc. possesses an authorized site in Kuujjuaq for the temporary storage of hazardous materials between sealifts. This user-fee service is provided to businesses and public organizations. For its part, Nunatech-Englobe possesses a contaminated soil treatment site in Kuujjuaq for certain levels of contamination.

Figure 16: Hazardous materials storage site belonging to Avataani Inc. in Kuujjuaq
Source: Pierre-Luc Dessureault, eco-advisory research chair

2.1.5 Reclamation Practices

Very few reuse, recycling and other forms of reclamation activities are implemented in Nunavik. This situation is due to numerous logistical constraints, including the geographic remoteness of the region from urban centres, the absence of roads connecting the communities of the region and the high cost of shipping residual materials. The shortage of human resources assigned to recovery projects and a high turnover rate are other contributing factors.

Notwithstanding, a few recovery initiatives are implemented locally for certain types of materials. The absence of sorting and processing facilities however, except for drop-off centres for products covered by extended producer responsibility (refer to subsection 2.1.7, *Regulation respecting the Recovery and Reclamation of Products by Enterprises*), makes it difficult to quantify the materials actually recovered.

- FCNQ retail stores in each community and Newviq'vi in Kuujjuaq deliver recovery services for refundable beverage containers in accordance with the *Act respecting the Sale and Distribution of Beer and Soft Drinks in Non-Returnable Containers*. These retailers return refundable beverage containers to recyclers every year. Newviq'vi also recovers plastic bottles in special bags supplied by Boissons gazeuses Environnement. Northern also delivers recovery services for refundable beverage containers in its ten retail stores in Nunavik, but customers only return refundable beverage containers to its store in Kuujjuaq, apparently because they prefer the can crushers available in FCNQ stores.

- The quantities of non-returnable beverage containers that were shipped annually from Nunavik between 2015 and 2018, according to Boissons gazeuses Environnement, are shown in the following table.

Table 7: Quantities of recovered non-returnable beverage containers

	2015	2016	2017	2018	Subtotal	Total
FCNQ (no.)	2,520,488	3,315,987	3,659,504	3,640,180	13,136,159	14,374,495
Newviq'vi (no.)	150,000	387,811	362,214	338,311	1,238,336	

The maintenance of compacting equipment as well as the storage and shipping of refundable beverage containers involves complex and costly logistics. The revenue generated through the refund does not fully cover operation expenses.

- Newviq'vi returns to its suppliers the boxes used to ship bread and yogurt, and 1.5-L milk containers and the boxes used to ship chips are also sent south. All remaining cardboard boxes are placed at the front of the store for customers to carry their purchases. Newviq'vi has also substantially reduced in recent years the packaging of products it sells in store, in particular fruit and vegetables.

- Northern recovers milk crates and shipping pallets, and ships them south[17].

- Single-use plastic shopping bags are banned by municipal bylaw in Kuujjuaq, Puvirnituq and Kuujjuaraapik. Customers are asked instead to use reusable bags, cardboard boxes available in store or to pay for biodegradable bags. Alternatives to single-use plastic shopping bags vary:

    - Newviq'vi sells plastic bags and reusable bags, and makes cardboard boxes available for reuse for free.

    - A few FCNQ retail stores no longer carry plastic bags and, instead, offer reusable bags to customers: Kuujjuaq, Kuujjuaraapik, Umiujaq and Puvirnituq[18].

    - Three Northern retail stores no longer carry single-use plastic shopping bags: Umiujaq, Puvirnituq and Kuujjuaraapik. At the Northern store in Kuujjuaq, biodegradable bags are sold for $0.25/unit, as are regular plastic bags in the other Northern stores. The revenue generated in this manner is redistributed in the communities at the end of each year under the Greener Tomorrow Program to fund green initiatives.

- Used oil in Inukjuak is burned in a specially designed furnace installed at the municipal garage. The landholding corporation in Salluit also reclaims its own used oils at its garage, as does the Northern Village of Kuujjuaq. The Makivik Corporation has the capacity to

[17] Information transmitted by Steve Small and Mark Blake, Northern.
[18] Information transmitted by Daniel Lelièvre, FCNQ.

reclaim used oil to heat its hydroponic greenhouse in Kuujjuaq. Used oil from the power plants in all the communities is collected and shipped south annually by Hydro-Québec.

- Construction materials, vehicles and other re-usable items are roughly sorted at northern landfills, and certain parts and materials may be recovered by local residents for personal use. This informal recovery practice helps a little to reduce the accumulation of residual materials at landfills.

- Old asphalt is incorporated into the asphalt blend during new paving work in the communities.

- Since 2007, RECYC-QUÉBEC has funded the shipping and recycling of used tires through the Québec Integrated Used Tire Management Program. A procedure for the shipping of used tires was created by the KRG in 2012 (Figure 17) to facilitate the activities of the northern villages and ensure that the shipments meet the requirements set by recyclers. For example, the northern villages shipped 13 sealift containers of used tires to an authorized processing facility in southern Québec in 2019: nine from Kuujjuaq, three from Salluit and one from pour Kuujjuaraapik. The quantities shipped from 2015 to 2018 are shown in the following table.

Table 8: Quantities of recovered tires

	Weight (kg)	Car tires (no.)	Truck tires (no.)
2015	46,460	2,930	330
2016	33,650	1,675	325
2017	54,908	3,182	444
2018	27,040	1,300	270
TOTAL	162,058	9,087	1,369

Figure 17: Procedure for shipping used tires

- Textiles are collected daily in Kuujjuaq by the organization known as *I care*. *We care*. The quantities collected from 2016 to 2018 are shown in the following table. Residents may drop off old clothing directly at the centre or in a designated collection box. The clothing is sorted and reusable items are made available to the general public in Kuujjuaq or transported free of charge by Air Inuit to any of the 13 other communities. Other re-usable items collected include small household appliances, books, dishes and children's toys.

Table 9: Quantities of recovered textiles

	2016	2017	2018
Weight (kg)	4491.07	13,187.72	13,862.56
Unsuitable for reuse (%)	25	21	22
Total (kg)	3371.35	10,367.95	10,777.81

- A windrow composting site has been operated in Kuujjuaq since the summer of 2011. The organic waste from the grocery-store operations of Newviq'vi are collected daily and placed in windrows near the community greenhouse.

Figure 18: Composting site in Kuujjuaq
Source: Véronique Gilbert, 2020

Carbon is added to the windrows in the form of shredded paper and cardboard as no other adequate source of carbon is available; it is provided by the Nunavik Regional Board of Health and Social Services. In addition, compost bins were built to respond to the needs of residents and home gardeners and to store mature compost. This initiative responds to two urgent regional needs: productive soil for vegetable gardens and landscaping (revegetation of residential lots and roadsides) and a reduction in the quantity of residual materials being accumulated in the northern landfills. This project receives funding and support from the local supervised residence which is in charge of labour and operations, the KRG which provides the shredder and the Northern Village of Kuujjuaq which provides the rotary cultivator and maintains the equipment. A total of 11,762 L of organic matter was recovered in 2017–2018 and 9,922 L in 2018–2019.

2.1.6 Hazardous Materials Management

The KRG and the Kativik Environmental Advisory Committee make available various tools to improve hazardous materials management in Nunavik. These are available on the KRG website and include guides for the public, municipal workers and regional organizations. The northern villages are responsible for following the guides. Municipal workers received training from the KRG in 2016, 2017 and 2018 on how to monitor and manage contaminant spills as well as how to store and transport hazardous materials. Residents are responsible for bringing hazardous materials to their municipality or to a drop-off centre for products covered by extended producer responsibility. The Kativik Environmental Advisory Committee produced three easy-to-understand guides (Figure 19), as well as posters and refrigerator magnets (Figure 20) for the different stakeholders. The guides were updated in 2016.

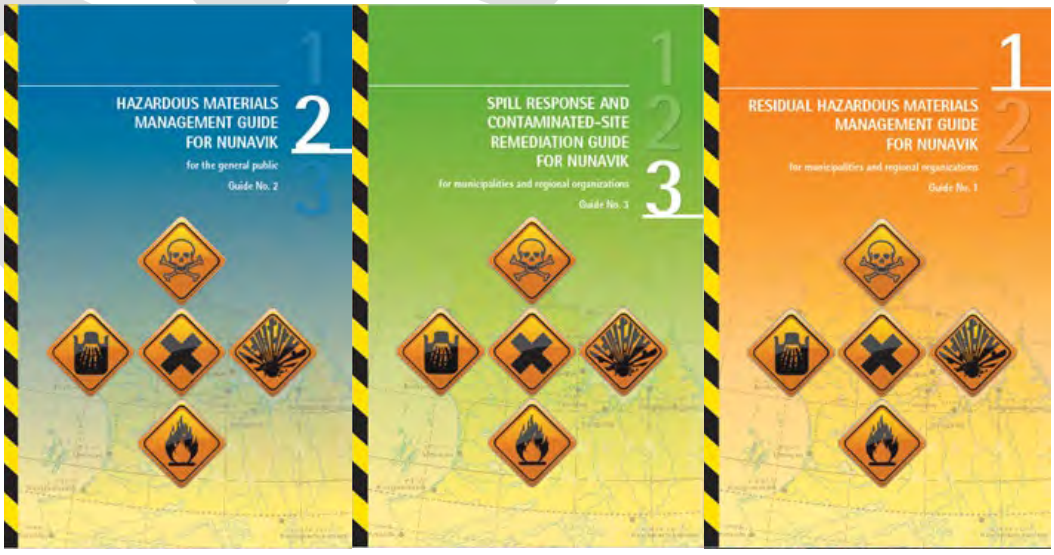

Figure 19: Guide nos. 1, 2 and 3 on how to manage hazardous materials in Nunavik

Figure 20: Refrigerator magnet on HHW

Used vehicle batteries and industrial batteries are collected and stored at northern landfills or municipal garages for shipment and processing. The quantities of batteries recovered are shown in the following table. A procedure to facilitate the shipment of used batteries to processing facilities was created by the KRG in 2014 and batteries have been shipped annually since that same year (Figure 21).

Table 10: Quantities of recovered used vehicle batteries

Year	Weight (kg)
2014	19,613
2015	35,746
2016	7,026
2017	11,018
2018	36,000
2019	18,531

The KRG supports the northern villages to implement the measures set out in guides and procedures.

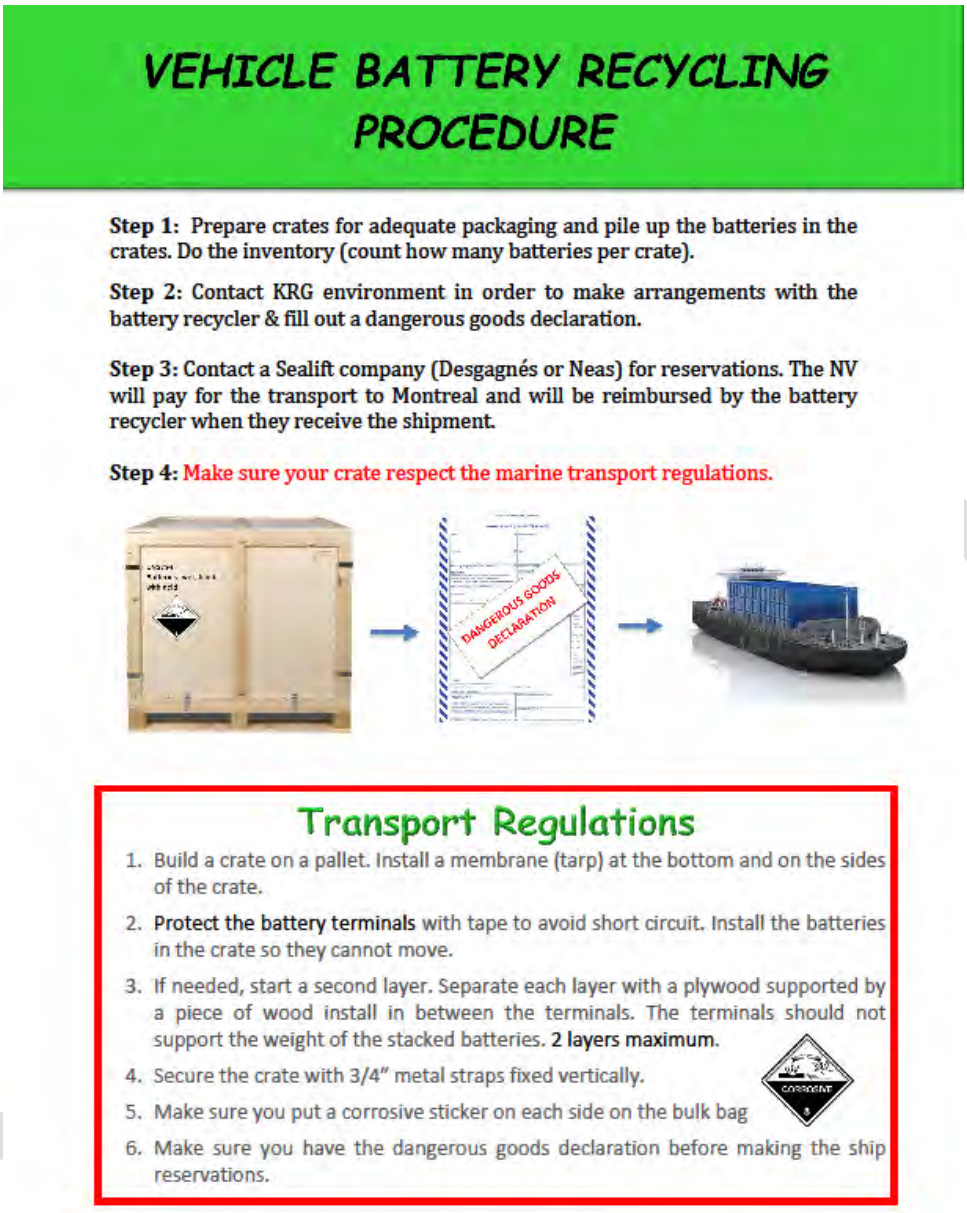

Figure 21: Procedure for the shipping of used vehicle batteries

2.1.7 Regulation respecting the Recovery and Reclamation of Products by Enterprises

Businesses that market the categories of products covered under the regulation are required to assume recovery costs and set up drop-off centres in every community in Nunavik.

The product categories covered are:

- paint and paint containers;
- mercury lamps;
- electronic products;
- oils, coolants, antifreeze, their filters and containers;
- alkaline batteries.

The most recent amendment to the regulation in 2019 added household appliances and air conditioners to the list of product categories. Unlike for the other product categories, businesses have not yet set up drop-off centres for these new products. In fact, recovery targets are set to take effect in 2024 for refrigerating and freezing appliances intended for domestic use, as well as air conditioners, heat pumps and dehumidifiers, and in 2026 for refrigerating and freezing appliances intended for commercial use, as well as ranges, built-in ovens, built-in cooking surfaces, dishwashers, washing machines and dryers intended for domestic use. Notwithstanding, recovery programs must be implemented in 2020, and drop-off centres in Nunavik must be identified by 2021 in communities with populations greater than 1,000 and by 2022 in communities with populations of less than 1,000.

Currently, there are six drop-off centres in Nunavik, specifically in Kangirsuk, Kuujjuaq, Salluit, Kuujjuaraapik, Inukjuak and Kangiqsujuaq. They are located at the local FCNQ retail store, except in Kuujjuaq where the drop-off centre is located at the local northern landfill and operated by the municipality. Products under the initial five categories have been collected in these communities since 2015, especially in Kuujjuaq. The KRG delivered training to municipal workers in 2015, 2016 and 2018 (KRG 2017).

2.1.8 Scrap Vehicles and Metal

At this point in time, scrap vehicles (cars, trucks, snowmobiles, all-terrain vehicles, motorcycles, boats and heavy equipment) are roughly sorted in designated zones at northern landfills. No protocol is in place for removing fluids, and most vehicles still have tires and batteries installed. In 2016 and 2017, Scout Environmental removed hazardous materials from a number of scrap vehicles in Kangirsuk, Inukjuak and Kuujjuaraapik. Municipal workers received training and a guide was produced to permit these activities to be replicated in other communities. Some of the recovered hazardous materials have been sent to treatment centres in the south while others are awaiting shipment.)

Figure 22: Scrap vehicle storage zone at the northern landfill in Kuujjuaraapik
Source: Véronique St-Onge

In addition, damaged vehicles are also stored next to homes and garages in the communities. Residents choose to keep these old vehicles close by in order to use them for spare parts. To date, no residual metal collection has been organized in Nunavik. This situation is a result of the geographic remoteness of the communities, the absence of recyclers in the region, the high cost of marine transportation and the lack of government funding. In 2019, a feasibility study was carried out for a residual metal recovery project, which is one of the measures detailed in Section 3, Action Plan.

2.1.9 Bulky Items Collection

Most northern villages organize annual summer collections for bulky waste, and residents may also contact their northern village to request collection. Bulky items are disposed of at northern landfills. In addition, organizations with staff housing (the Kativik Ilisarniliriniq (school board), health centres, etc.) are responsible for the transportation of defective appliances to the local northern landfill. For its part, the KRG ships its scrap appliances by sealift to a recycler in southern Québec. Repair services (for household appliances, in particular) and related storage space are not available in the communities, leading organizations to throw out defective appliances rather than repair them. In addition, halocarbons are not removed from refrigerating and freezing appliances at northern landfills.

2.1.10 Wastewater Collection and Sludge Disposal

Municipal services are greatly influenced by the climate in Nunavik. Since the ground is permanently frozen, there are no sewer or aqueduct systems in any community, except Kuujjuaraapik. Alternatively, all buildings have separate drinking water and wastewater tanks (insulated from the cold and bad weather) which must be, respectively, filled and emptied by specially-designed trucks. These services involve a variety of infrastructure and equipment (garages, trucks, wastewater lagoons, drinking water pumping plants).

Figure 23: Wastewater lagoon in Kangirsuk with the northern landfill in the background
Source: Gaëlle Baïlon-Poujol

For these reasons, all the northern villages operate one or more lagoons for the treatment of local wastewater. These are all settling lagoons, except in Kuujjuaraapik and Salluit which operate aerated lagoons. Construction of lagoons began in 1984 and is ongoing. Except in Aupaluk [19], no sludge will be reclaimed in the next five years. Sludge estimates calculated for certain communities in 2018 and 2019 are shown in the following table. The assessments certain communities will need to be redone within the next five years. The costs of wastewater collection is shown in Table 12. For their part, lagoon operating cost are almost nil.

Table 11: Quantities of lagoon sludge in certain communities

Villages	Quantity (m^3)
Aupaluk	1,620
Kangiqsualujjuaq	7,705
Kuujjuaq	15,970
Tasiujaq	1,790

[19] Sludge collection planning in Aupaluk is not yet complete, including whether the sludge will be disposed of or reclaimed.

2.1.11 Residual Materials and Wastewater Collection and Disposal Costs

The costs incurred to collect and manage municipal, commercial and institutional wastewater and residual materials are assumed fully by the northern villages. The costs for these services submitted by a few northern villages as part of a RMM survey are shown in the following table. Based on this data, it was possible to calculate for 2019 an average cost of $277,215/year for garbage pick-up and $715,101/year for wastewater collection[20].

Table 12: Costs for residual materials and wastewater management in certain northern villages

Northern village	Garbage pick-up ($)	Wastewater collection ($)
Kangiqsualujjuaq	236,531	478,913
Tasiujaq	121,747	190,267
Kangirsuk	126,212	391,416
Puvirnituq	424,538	1,118,707
Inukjuak	477,958	863,833
Kuujjuaraapik	150,000	63,000
Kuujjuaq	467,522	2,007,319
Salluit	213,215	607,353

These costs include the following expenses:

- taxable wages and benefits;
- telephone, internet and insurance;
- vehicle parts and maintenance;
- vehicle fuel.

[20] Appendix 2 – Detailed Costs of the Northern Village of Kuujjuaq for Residual Materials and Wastewater Management in 2019.

2.2 Inventory of Residual Materials Generated Annually in Nunavik

As weigh scales are not present at landfills in Nunavik, it is impossible to know precisely the quantity of residual materials disposed of. Characterization work was performed in Kuujjuaq in 2017 by Stantec for the Société du Plan Nord as part of a study on a residual materials energy reclamation project [21]. This work does not however provide an exhaustive characterization of the composition and quantity of residual materials sent annually to northern landfills in the region[22].

Moreover, the few categories of residual materials that are subject to RMM processing in the region (see the preceding subsection, Current RMM Practices and Infrastructure) have never been quantified. In this context, several studies conducted in Québec or elsewhere were used to estimate quantities of residual materials in the region. The reference year employed is 2019. Seasonal factors are not considered in the inventory, although they are referred to herein. In particular, it is important to remember that residual materials are not generated steadily over the course of a year. This is especially true for CRD waste which is generated especially between June and October.

2.2.1 Estimated Quantities and Composition of Residual Materials in the Residential Sector

Given similarities between communities in the Northwest Territories and Nunavik (population, geographic remoteness, etc.), the assessment of the residential sector is based on mathematical estimation models used in the study on solid waste landfills prepared for the Government of the Northwest Territories (Ferguson 2003). This methodology was adopted for the 2015–2020 Nunavik RMMP. It continues to be pertinent since management practices have not evolved a great deal since that time.

The composition of residential waste in Nunavik communities is unlike the composition of residential waste generated elsewhere in Québec (Éco Entreprises 2015). Several factors may explain these differences, namely differences in the categories of organic matter (absence of green plant waste and presence of Inuit traditional foods) and ultimate waste levels (absence of recovery practices to offset the quantity of ultimate waste). Although the methodology used in the Northwest Territories study was retained, the proportions of residual materials are the same as those identified under the characterization work performed in Kuujjuaq (Stantec 2018). These proportions are shown in Table 13 and Figure 24. Bulky items and the ICI sector are included in the CRD waste category.

[21] As this characterization work focused solely on the residential sector and a specific segment of the ICI sector (grocery stores), it does not provide a comprehensive portrait of the situation. While this characterization work contributed only partially to the preparation of the inventory, it remains a solid source of data for certain RMM measures under Section 3, Action Plan.

[22] Characterization work on accumulated residual metals was carried out in 2019 in four communities as part of a feasibility study for a residual metal recovery project in Nunavik (Appendix 3, Results of Residual Metal Characterization Work).

Table 13: Categories and proportions of residual materials, residential sector

Category	Proportion (%)[23]
Paper-cardboard	22
Glass	3
Metal	3
Plastic	13
Organic matter	33
Others	23.73
CRD	1.67
HHW	0.6
Total	100

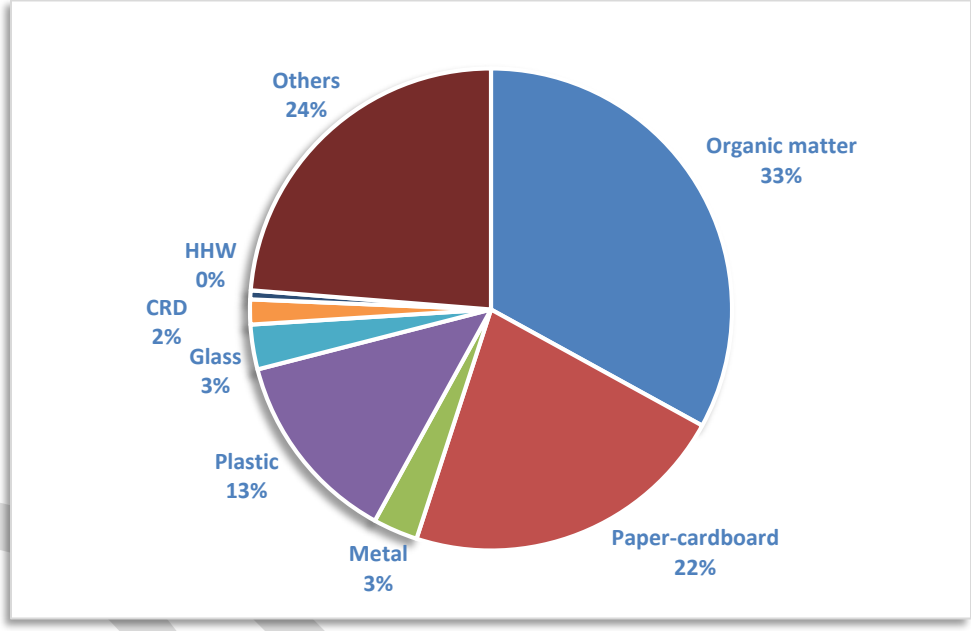

Figure 24: Categories and proportions of residual materials, residential sector

The authors of the study determined that each resident of the Northwest Territories produces an average of .015 m^3 of residential waste per day, with an uncompacted density of 0.099 t/m^3. In reality, the quality of waste compaction varies widely on sites and from one site to another. Applying the general formula **(population × 0.015 m^3 × 0.099 t/m^3 × 365 days/year)** to the population in Nunavik, the quantities of residual materials generated by the residential sector are estimated as follows in Table 14.

Table 14: Estimated quantities of residual materials by category, residential sector

Category	Proportion (%)	Volume (m^3)	Weight (t)

[23] Stantec 2018.

Organic matter	33	25,587	2,533
Paper-cardboard	22	17,056	1,689
Metal	3	2,325	230
Plastic	13	10,079	998
Glass	3	2,325	230
CRD	1.67	1,295	128
HHW	0.6	465	46
Others	23.73	18,398	1,821
Total	100	77,530	7,675

2.2.2 Estimated Quantities and Composition of Residual Materials in the ICI Sector

The ICI sector in Nunavik comprises the following subsectors: education, healthcare, public administration, commercial and financial. There is no industry in any of the communities.

The methodology used to estimate the quantities and composition of ICI waste in Nunavik is based on two studies, *Portrait de la gestion des matières résiduelles dans le sous-secteur institutionnel au Québec 2004-2009* (portrait of RMM in Québec's institutional subsector) and *Caractérisation des matières résiduelles du sous-secteur commercial au Québec, 2008-2009* (characterization of residual materials from Québec's commercial subsector). Although not recent, more current data for the ICI sector does not exist. Both studies identify the average quantity of residual materials generated per worker in different sectors. The categories for the commercial subsector were adjusted because several types of businesses referred to in the RECYC-QUÉBEC study are not present in Nunavik. The following types of businesses were included: hotels-motels, full-service restaurants, fast-food restaurants, grocery stores, service stations and others.

Given that the commercial subsector (based on the types of businesses present in Nunavik) represents an average of 190 kg/year/worker and that the institutional subsector (including all types of organizations) represents an average of 171.23 kg/year/worker, an overall average of 180 kg/year/worker was determined for the ICI sector. In accordance with the last census, 6,175 Nunavik residents are workers (Statistics Canada 2017). As it was not possible with census data to ascertain the number of workers for all subsectors, only the total number of workers was used for calculation purposes. In this manner, it is estimated that the ICI sector generated 1,111.5 t of residual materials in 2019.

The composition of residual materials in the ICI sector in Nunavik was also identified based on the same studies, adapted to the regional context. Figure 25 shows the proportion of the different categories. As no major changes in practices have occurred that might have altered the composition of residual materials in the ICI sector, these proportions are the same as those that appeared in the 2015–2020 Nunavik RMMP. The estimates are shown in Table 15.

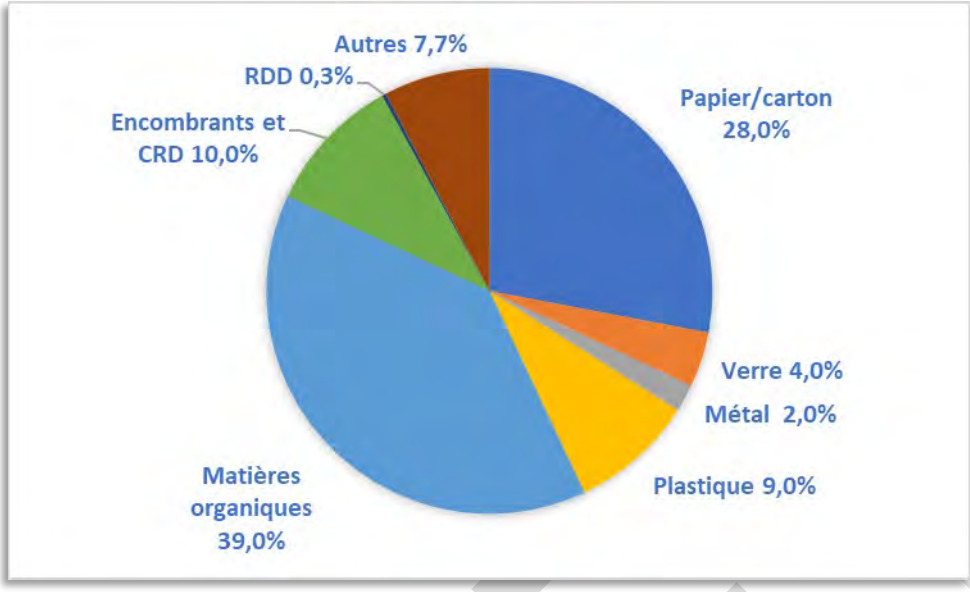

Figure 25: Categories and proportions of residual materials, ICI sector

Table 15: Estimated quantities of residual materials by category, ICI sector

Category / Quantities	Paper-cardboard	Glass	Metal	Plastic	Organic matter	Bulky items and CRD	HHW	Other	Total
Average of two the subsectors (kg/year/worker)	50.4	7.2	3.6	16.2	70.2	18	0.5	13.9	180
Residual materials generated (t/year)	311.2	44.4	22.2	100	433.5	111.2	3.3	85.8	1,111.5

2.2.3 Estimated Quantities and Composition of Residual Materials in the CRD Sector

The composition of CRD waste was determined in part in accordance with the RECYC-QUÉBEC study entitled *Profil de la gestion des débris de construction, rénovation et démolition au Québec* (profile of construction, renovation and demolition waste management in Québec), which is still the only study available in Québec on the topic. However, as differences exist between Nunavik and southern Québec, expertise held by the KRG was employed to estimate proportions more reflective of the residual materials actually generated in the region. Some types of heavy matter are almost completely absent, such as rock, brick and asphalt, while others are relatively infrequent, such as concrete and backfill. Instead, considerable quantities of wood are observed, generated to a large extent from packaging for sealift shipments. The net difference in heavy matter increases the proportions of the other categories, as shown in Table 16.

Table 16: Comparison of the approximate proportions of CRD waste in Québec and Nunavik (weight)

Category	Proportion in Québec [24] (%)	Proportion in Nunavik (%)
Rock, brick, asphalt, concrete (aggregates)	40 to 60	10
Wood	10 to 25	30
Metal	3 to 15	20
Paper-cardboard	3 to 10	5
Backfill	2 to 10	0
Others (plastic, shingles, gypsum)	10 to 20	35

The reasons for the small quantities of aggregates in the CRD waste generated in Nunavik are as follows:

- The use of asphalt to pave roadways is fairly recent in Nunavik. The first asphalting took place in 1994. As well, only roads in or near communities have been asphalted. Since the start of asphalting, the KRG has been in charge of this work (in partnership with the northern villages) and it possesses the equipment necessary for this purpose.
- The equipment employed for road reconditioning work permits 100% of the asphalt to be reused.
- Brick is not widely used for construction in Nunavik. Only a few institutional buildings are constructed with bricks and none of these have been demolished yet.
- Rock and backfill are also used infrequently. They are used for asphalting, building-pad construction, road construction and finally covering material in northern landfills.
- Concrete may be found in some communities but not in others, in accordance with local demolition work (building foundations).

Based on the RMMP inventory tool and the value of building permits in the James Bay region, which has a similar population[25], the estimated quantity of CRD waste totals 15,766 t. After subtracting aggregates (i.e. 10,455 t or 60% of the total), which are all but absent in northern landfills and represent the heaviest waste, less 10% (or 1,576 t), the result is 6,887 t. In accordance with the proportions shown in the preceding table for CRD waste, the quantities of residual materials generated by the CRD sector in Nunavik is estimated as follows in Table 17.

Table 17: Estimated quantities of residual materials by category, CRD sector

Category	Quantity (t/year)
Aggregates	689
Wood	2,066
Metal	1,377
Paper-cardboard	344
Others (plastic, shingles, gypsum)	2,410
Total	6,887

[24] Vachon et al. 2009.

[25] Building permits issued in Nunavik are not centralized. For comparison purposes, the population of the James Bay region is 13,633.

Construction and renovation work is not carried out every year in all the communities. For information purposes, the following table shows the construction work carried out by the Makivik Corporation in 2019 and the renovation work carried out by the Kativik Municipal Housing Bureau. As well, four private homes (three in Kuujjuaq and one in Kangiqsualujjuaq) were constructed, and the Kativik Ilisarniliriniq (school board) carried out eight major construction or renovation projects in 2019.

Table 18: Construction and renovation work by the Makivik Corporation and the Kativik Municipal Housing Bureau in 2019

	Construction			
Community	**Dwellings**	**Buildings**	**Renovation**	**Notes**
Akulivik	16	4	--	
Salluit	18	6	--	Warehouse
Inukjuak	24	6	--	
Kangiqsualujjuaq	20	7	--	
Kangirsuk	12	3	--	
Kuujjuaraapik	20	5	--	
Quaqtaq	20	6	--	
Puvirnituq	--	--	--	Warehouse
Umiujaq	--	--	10	55 sheds
Total	130	37	10	

2.2.4 Summary of Estimated Quantities and Composition of Residual Materials in All Sectors

Figure 26 shows the proportion of residual materials generated by each sector. For its part, Table 19 provides a summary of the estimated quantities of residual materials generated by sector and category. Overall, Nunavik produces 15,742 t of residual materials annually, i.e. 1,112 t/resident. It is important to note that CRD waste, representing 50% of all waste, includes bulky items, which are present in large numbers in northern landfills due to the absence of repair services and RMM practices.

Given the small number of reclamation activities in the region, it can be argued that substantially all residual materials are disposed of. Since it is impossible to quantify the materials that are recovered (tires, vehicle batteries, products covered by extended producer responsibility, beverage cans) and these quantities are limited, it has been assumed for the purpose of this inventory that all residual materials are sent to northern landfills.

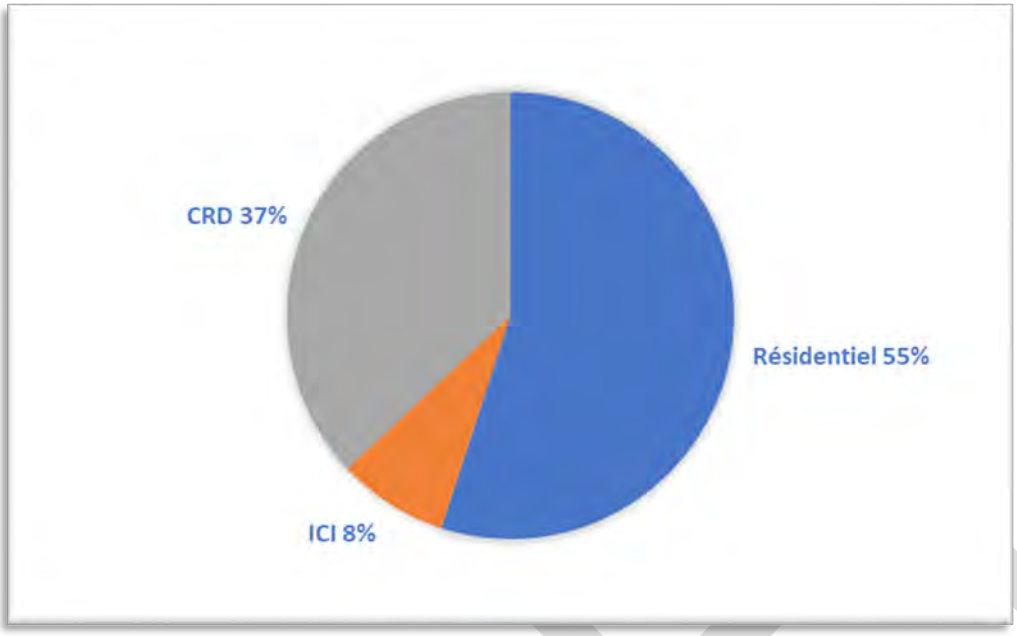

Figure 26: Sectors and proportions of residual materials

Table 19: Estimated quantities of residual materials by category and sector

Category (t) / Sector	Paper-cardboard	Glass	Metal	Plastic	CRD	HHW	Organic matter	Others	Total (t)
Residential	2,091	441	821	1,084	767	62	1,572	906	7,744
ICI	311	44	22	100	111	3	433	86	1,111
CRD	--	--	--	--	6,887	--	--	--	6,887
Total	2,402	485	843	1,184	7,765	65	2,005	992	15,742
Proportion (%)	15	3	5.5	7.5	49	0.5	13	6.5	100%

3. Action Plan

3.1 Issues, Orientations and Objectives

The objectives of the *2019-2024 Action Plan* under the *Québec Residual Materials Management Policy* have been adapted in this Nunavik RMMP to take into account distinct regional characteristics. A description of the issues impacting the implementation of this Action Plan is presented immediately below, followed by descriptions of the main orientations, Québec objectives and, then, Nunavik objectives.

Issues

The preparation of the report on the 2015–2020 Nunavik RMMP served to identify several implementation issues. These issues are detailed in the current Nunavik RMMP and strategies will need to be developed to resolve them in order to implement the measures contained in this Action Plan. Specifically, these issues are:

Funding

1. Shortage of funding specifically for regular operations at northern landfills;
2. Existing RMM funding programs poorly adapted to the Nunavik context, in particular for marine transportation;
3. Challenge of increasing taxation in the northern villages to fund new measures;

Human resources

4. Absence of a worker at each northern landfill during operating hours to supervise site access, enforce applicable regulations and bylaws, sort residual materials and oversee the storage of non-combustible waste;
5. Gaps in operating activities resulting from the absence of dedicated equipment and the scarcity of covering material;
6. Shortage of skilled and trained human resources to develop and implement RMM projects (including the measures in this Action Plan), and carry out regular operations;

CRD sector and shipping

7. The CRD season is short and intense (from May to November), placing enormous pressure on northern landfills and requiring considerable follow-up on the part of the northern villages;
8. The sealift is the only method for transporting residual materials; yet, it is infrequent, costly and complex.

Orientations

The orientations of this Nunavik RMMP take into account the implementation issues and the concerns expressed by participants at the public consultations conducted in the fall of 2019

as part of the preparation of the implementation report on the 2015–2020 Nunavik RMMP. The orientations serve as a framework for the objectives and measures in this Action Plan.

Orientation 1: Build interest among all waste generators about the importance of residual materials management

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Orientation 3: Monitor implementation of the action plan and global innovations in residual materials management

Québec objectives

The *2019-2024 Action Plan* under the *Québec Residual Materials Management Policy* has the following objectives:

- Reduce the quantity of residual materials per capita to 525 kg or less;
- Recycle 75% of residual paper, cardboard, plastic, glass and metal;
- Recycle 60% of residual putrescible organic matter;
- Recycle and reclaim 70% of construction, renovation and demolition waste.

Nunavik is obliged to contribute to the achievement of these objectives keeping in mind its specific context, i.e. it is geographically remote from urban centres. Indeed, any improvements in the current situation will represent a contribution to these Québec-wide objectives, given the scale of the RMM issues in the region and the current very limited level of reclamation.

Nunavik objectives

The objectives of this Nunavik RMMP derive from the three main orientations. Since data collection is complex in the region (i.e. there are no weigh scales or monitoring measures), not to mention the implementation issues described above, these objectives are more qualitative. Notwithstanding, they are intended to effect real progress in current RMM practices. The timeframe for each Nunavik objective is the end of the Nunavik RMMP, i.e. 2027.

Orientation 1: Build interest among all waste generators about the importance of residual materials management

a) Conduct information and awareness-building activities on topics related to residual materials management;
b) Promote partnerships in every sector of activity with a view to implementing measures.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

a) Improve the management of northern landfills;
b) Develop projects to divert more residual materials away from northern landfills;
c) Maintain and develop existing reclamation activities.

Orientation 3: Monitor implementation of the action plan and global innovations in residual materials management

a) Monitor residual materials management;
b) Conduct follow-up on the implementation of the Nunavik Residual Materials Management Plan.

3.2 Action Plan

This section contains information sheets for each measure under this Action Plan. Each sheet identifies the applicable orientations and objectives, provides background information and explains how implementation issues will be taken into account, specifies which generators are targeted, identifies a lead organization and when possible a budget estimate, and sets suitable targets and timetables. A summary table in subsection 3.3 (Estimated Implementation Costs and Potential Funding Sources) shows Action Plan costs by orientation and objective. A chart of the timetables for the different measures completes the information.

As Nunavik covers such a large region and the absence of connecting roads prevents communities from developing joint RMM methods, the Nunavik RMMP can sometimes appear disconnected from local realities, which must juggle the many issues posed by RMM. In order to alleviate this problem and encourage constructive changes in community practices, local RMMPs have been prepared for every community (Appendix 5, Local RMMPs). Although several of the measures are similar (since the type of landfill is the same and the residual materials similar), an effort was made to focus on local issues and challenges. Each municipality was contacted to validate local problems and specific needs. The information collected was used to model the local RMMPs. Appendix 5 also contains detailed descriptions of the measures contained in the local RMMPs and a summary table of the measures for each community.

Orientation 1: Build interest among all waste generators about the importance of residual materials management

Measure No. 1

Carry out an awareness-building campaign for each new project that introduces a change in practices.

Objective

Conduct public information and awareness-building activities on topics related to residual materials management.

Description, background information and implementation issues

The Action Plan contains measures involving the implementation of projects that introduce changes in practices in order to improve RMM, for both residential and ICI generators. The purpose of this measure is to ensure that an adapted awareness-building campaign is planned from the onset of every project. In response to implementation issues, funding for the awareness-building campaign must be included in the project costs, and the contributions of resources (including partners) should be indicated. When possible, a local resource-person should be involved in the design and implementation of the campaign. The awareness-building campaign should be carried out prior to the implementation of the project in order to enhance understanding and participation among the target generators. The KRG may also produce material that can be adapted by the northern villages for the implementation of Measure No. 4 of their local RMMPs.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☒ Construction, renovation and demolition (CRD)

Lead

The KRG in cooperation with the concerned northern villages and other partners, as required.

Budget

An estimated amount of $40,000 is required per awareness-building campaign for large-scale projects: to purchase material and to cover the time and travel of those involved. Given that a minimum of seven projects will require awareness-building campaigns, including two for which costs are already integrated in the concerned projects, a total of $200,000 is estimated.

Target

Carry out an awareness-building campaign for each new project introducing a change in practices.

Timetable

Ongoing during implementation of the Nunavik RMMP.

Orientation 1: Build interest among all waste generators about the importance of residual materials management

Measure No. 2

Develop partnerships with ICI- and CRD-sector stakeholders.

Objective

Promote partnerships in every sector of activity with a view to implementing measures.

Description, background information and implementation issues

In order to enable ICI- and CRD-sector stakeholders to better assume their responsibilities, partnerships will be developed through certain measures under the Action Plan for concrete projects intended to improve RMM in general. In many cases, participating organizations will also benefit from these projects that facilitate internal management of residual materials or that reduce disposal costs at northern landfills. In other cases, involvement in projects under the Action Plan will entail new expenses but serve to enhance organizations' social and environmental performance through the integration of eco-conscious practices.

Although ICI partners are already identified as leads for certain other measures, this measure will ensure that the search for partners remains a priority for the duration of the Action Plan. It will serve to promote new partnerships and new projects.

Generators

☐ Residential
☒ Industrial, commercial and institutional (ICI)
☒ Construction, renovation and demolition (CRD)

Lead

The KRG and the northern villages.

Budget

Variable.

Target

Develop at least one partnership between a northern village and an ICI- or CRD-sector organization that produces a concrete and transferable process.

Timetable

2023.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 3

Provide training to municipal workers in order to improve residual materials management.

Objective

Improve the management of northern landfills.

Description, background information and implementation issues

The purpose of this measure is to deliver training to the municipal workers in charge of northern landfill operations in the 14 communities in order to improve RMM. Training will cover, among other topics, regulations and municipal bylaws, effective northern landfill management practices that meet regulations and promote the sorting of waste, HHW management with a view to marine transportation to southern Québec, and hazardous materials spill management. The workers identified by the northern villages will travel to one of two planned training sessions: one on the Hudson coast and the other on the Ungava coast. This project includes updating of the *Guide for the Operation and the Management of Solid Waste Sites in Nunavik* which will be used during training.

Generators

- ☒ Residential
- ☒ Industrial, commercial and institutional (ICI)
- ☒ Construction, renovation and demolition (CRD)

Lead

The KRG in cooperation with the northern villages.

Budget

An amount of $220,000 is required for initial training and updating of the Guide. The funding has been secured under the Programme de gestion des matières résiduelles en territoire nordique (northern residual materials management program).

Target

Organize two training sessions for a majority of the targeted municipal workers.

Timetable

Initial training delivered in 2021.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 4 **Explore alternatives to the open-air burning of waste.**
Objective Improve the management of northern landfills.
Description, background information and implementation issues During public consultations on the implementation of the 2015–2020 Nunavik RMMP, several participants expressed reservations about the open-air burning of waste. Among all the concerns raised by Nunavimmiut, this was the most important. This measure involves, in cooperation with the northern villages, exploring alternatives to the burning of waste and starting discussions with the MELCC to have this practice changed. The study will propose viable and applicable solutions for the next Nunavik RMMP in order to limit or even prohibit the open-air burning of waste.
Generators ☒ Residential ☒ Industrial, commercial and institutional (ICI) ☒ Construction, renovation and demolition (CRD)
Lead The KRG in cooperation with the MELCC, RECYC-QUÉBEC, the northern villages and interested regional organizations.
Budget An amount of $40,000 is required for the production of a study and to cover the time and travel of those involved ($10,000).
Target Agree on an alternative to the burning of waste that is acceptable to all concerned parties.
Timetable 2027.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 5

Prepare a procedure for the management of end-of-life vehicles.

Objective

Improve the management of northern landfills.

Description, background information and implementation issues

In most cases, end-of-life vehicles are transported to northern landfills and stored as is, except in Inukjuak, Umiujaq and Kuujjuaraapik where hazardous materials are sometimes removed first at the municipal garage. This practice creates a serious risk of environmental contamination. Fluids may leak into the ground due to weathering or compaction performed to make more space available at the northern landfill.

The new regional procedure will require end-of-life vehicles to be brought to a local designated decontamination site (municipal garage or eco-centre[26]) where all hazardous materials and tires will be removed. The scrap vehicles will subsequently be transported by the northern village to the designated storage sites (Measure No. 6). A process will also be introduced to generate funding for the procedure and to improve the tracking of vehicle owners. Organizations that purchase new vehicles will in particular be targeted for this purpose since they often sell their used vehicles to residents and avoid end-of-life management responsibilities.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☒ Construction, renovation and demolition (CRD)

Lead

The KRG in cooperation with marine carriers.

Budget

An estimated amount of $30,000 is required to draft the procedure, consult stakeholders and build consensus around the proposed procedure.

Target

Release the finalized procedure, approved by the appropriate authorities.

Timetable

2023.

[26] In communities with eco-centres, decontamination work on end-of-life vehicles will include the recovery of spare parts for resale. The parts will be stored at the eco-centre and sold to residents who will have access to a parts list. This method will eliminate the practice of scavenging in scrap metal piles and will generate revenue for the northern villages to fund this new activity.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 6

Develop storage sites for scrap vehicles outside of northern landfills.

Objective

Improve the management of northern landfills.

Description, background information and implementation issues

Currently, due to the absence of other appropriate sites, end-of-life vehicles are stored at northern landfills, even though this is prohibited under the *Regulation respecting the Landfilling and Incineration of Residual Materials*. Since northern landfills are already contaminated, this practice has to date served to limit contamination to northern landfills. However, the zones of northern landfills designated for non-combustible residual materials are nearing capacity. End-of-life vehicles take up a great deal of space, and the northern villages are eager to recover parts from the used vehicles. It would therefore be safer to designate a separate site for the storage of scrap vehicles.

This measure is complementary to Measure No. 5. The removal of hazardous materials and metal compacting activities will not be performed at these sites.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☐ Construction, renovation and demolition (CRD)

Lead

The KRG.

Budget

Sites for this purpose must receive environmental authorization from the regional branch of the MELCC, which may apply specific requirements. An amount of $100,000 is estimated per site with a thin gravel base but no concrete slab gravel (total, $200,000). If geomembrane lining is required, costs will be higher. This assessment will depend on the selected site. In some communities, a previously developed site may be available. Since such sites are considered infrastructure, funding could be obtained from the Isurruutiit Program for municipal infrastructure improvements.

Target

Create separate storage sites for decontaminated scrap vehicles in two communities.

Timetable

2027.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 7 **Support the northern villages to implement RMM bylaws.**
Objective Improve the management of northern landfills.
Description, background information and implementation issues All the northern villages have bylaws concerning RMM. In particular, these include fees payable by ICI and CRD generators for the disposal of residual materials at northern landfills. In several communities, however, these bylaws may be enforced only partially, or not at all. This measure involves the delivery of technical and legal assistance to local authorities to enable them to strengthen implementation of RMM bylaws.
Generators ☐ Residential ☒ Industrial, commercial and institutional (ICI) ☒ Construction, renovation and demolition (CRD)
Lead The KRG through the delivery of technical and legal assistance to the northern villages.
Budget Variable according to the assistance requested.
Target Enable at least five northern villages to implement RMM bylaws by 2023 and all northern villages by 2027.
Timetable 2027.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 8

Implement a residual metal recovery project in one or two communities.

Objective

Develop projects to divert more residual materials away from northern landfills.

Description, background information and implementation issues

Following up on a feasibility study performed in 2019 on the recovery of residual metals, the KRG plans to implement a recovery project for accumulated metal in the northern landfills of one or two communities. This project will validate the processes and costs associated with this kind of activity. Communities for this project have not yet been selected; those eventually selected, however, will be closest to having full capacity in the scrap metal zones of their northern landfills in order to permit the closure of the local landfill or extend its service life.

The project includes the recovery of hazardous materials from end-of-life vehicles and refrigerating and freezing appliances, and the disassembly of propane tanks. The metal will be compacted in bales and transported by ship to a metal recycler in southern Québec.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☒ Construction, renovation and demolition (CRD)

Lead

The KRG in cooperation with the concerned northern villages and local organizations.

Budget

A funding agreement was signed with the MELCC on March 26, 2020, to fund a project for $4,825,000, which must be completed no later than March 31, 2024.

Target

Recover in at least one community and transport to a recycler accumulated residual metal and the hazardous materials contained in this metal waste.

Timetable

2024.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 9

Implement a thermophilic composting project in Inukjuak.

Objective

Develop projects to divert more residual materials away from northern landfills.

Description, background information and implementation issues

A feasibility study was performed in 2019 with a view to developing a thermophilic composting project in a first community, i.e. in Inukjuak. The project involves collecting organic matter from the residential and ICI sectors, combining it with cardboard (bulking agent) in a mixer, and placing the mixture in a thermophilic composter during the active decomposition phase. Following a curing process (in curing bags), the compost produced may be used as covering material at the northern landfill or for site revegetation. Once conclusive quality analysis has been performed, it will also be possible to use the compost at community garden greenhouses.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☐ Construction, renovation and demolition (CRD)

Lead

The Northern Village of Inukjuak with the support of the KRG and in cooperation with local organizations (FCNQ and Northern retail stores, schools, CLSC, landholding corporation, etc.).

Budget

Applications for financial assistance were submitted in 2019 and confirmed (Programme de gestion des matières résiduelles en territoire nordique (northern residual materials management program), Isurruutiit Program for municipal infrastructure improvements, sustainable employment program, Territories Development Fund). The total estimated cost of the project is $1 million.

Target

Operate a thermophilic composter in one community.

Timetable

2021.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 10

Implement an eco-centre and resource recovery station project in Kuujjuaq.

Objective

Develop projects to divert more residual materials away from northern landfills.

Description, background information and implementation issues

A feasibility study was performed in 2019 with a view to developing an eco-centre and resource recovery station in a first community, i.e. in Kuujjuaq. The project involves preparing a flat, fenced area with gravel base, except for the CRD residual materials sorting zone which will have concrete slab base to facilitate the movements of heavy equipment. A garage will be used to remove hazardous materials from end-of-life vehicles and reusable vehicle parts which will be stored for resale locally. A section of the site will be designated as resource recovery station, where residential and ICI generators can bring various reusable objects, tools and equipment for resale locally. Access to the site will be supervised so users can be directed to the proper sorting zones and to facilitate subsequent storage work at the northern landfill for recycling or disposal purposes.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☒ Construction, renovation and demolition (CRD)

Lead

The Northern Village of Kuujjuaq in cooperation with the KRG.

Budget

Applications for financial assistance were submitted in 2019 and confirmed (Programme de gestion des matières résiduelles en territoire nordique (northern residual materials management program), Isurruutiit Program for municipal infrastructure improvements, sustainable employment program, Territories Development Fund). The total estimated cost of the project is $1.5 million.

Target

Open a first eco-centre and resource recovery station in Nunavik.

Timetable

2021.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 11

Implement a recovery project for recyclable materials.

Objective

Develop projects to divert more residual materials away from northern landfills.

Description, background information and implementation issues

This measure involves developing a recovery model for non-refundable recyclable materials that is adapted to the specific characteristics of Nunavik. In particular, the types of materials to be recovered, optimal methods and required equipment will be identified. A pilot project will be carried out in one small community (less than 500 residents) focusing on the recovery of recyclable materials from the residential and ICI sectors. The method proposed by the the eco-advisory research chair at the Université du Québec à Chicoutimi in appendix 2 of the *Gestion des matières résiduelles en milieu nordique : rapport final* (RMM in the north: final report) will be followed. Since this project requires considerable investment, a single community will be selected for the pilot. As well, additional funding will need to be secured (funding programs, specific agreements, etc.).

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☐ Construction, renovation and demolition (CRD)

Lead

The KRG in cooperation with the northern village selected for the first project, and local organizations with the support of RECYC-QUÉBEC and the designated managing agency which will be created through the selective collection system modernization process taking place in Québec (2021).

Budget

An estimated amount of $275,000 is required to fund the first year of the project, using a basic structure in accordance with the recommendations of the eco-advisory research chair at the Université du Québec à Chicoutimi. If the option of a permanent structure with foundations is selected instead (because, for example, no existing structure is available to house the press needed to compact corrugated cardboard), the project's costs will be much higher. Construction costs in Nunavik are greater than identical work performed in southern Québec.

Target

Implement a recovery project for recyclable materials in one small community.

Timetable

2024: Start planning a collection method with partners.
2027: Complete the first year of recovery activities.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 12 **Support food retail stores to expand the deposit-refund program.**
Objective Develop projects to divert more residual materials away from northern landfills.
Description, background information and implementation issues As of 2022, the deposit-refund program will be expanded to cover all beverage containers sold in Québec. The program will require all retailers to charge consumers for the deposit and, then, to recover beverage containers and refund the deposits. Retailers will also be responsible for shipping the beverage containers to a managing agency, such as Boissons gazeuses Environnement for beverage cans. Although this requirement is imposed on retailers, the KRG will deliver technical assistance for the implementation of the new practice. Once fully implemented, the expanded deposit-refund program will divert a considerable quantity of residual materials from landfills to recycling. The deposit-refund program will be included in Measure No. 1 under this Action Plan and Measure No. 4 of local RMMPs.
Generators ☒ Residential ☒ Industrial, commercial and institutional (ICI) ☐ Construction, renovation and demolition (CRD)
Lead The KRG with the support of RECYC-QUÉBEC.
Budget $180,000.
Target Assist food retail stores to implement the deposit-refund program.
Timetable 2022.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 13

Implement local initiatives to reduce the wastage of construction materials.

Objective

Develop projects to divert more residual materials away from northern landfills.

Description, background information and implementation issues

Every year, a good deal of new construction materials (reusable and that may be deteriorated due to poor management) are disposed of at northern landfills and burned. As marine transportation is very costly, it is often less expensive for contractors to ship extra materials and send any surplus to a landfill than to risk a shortage of materials during the construction season. In order to reduce the wastage of these materials, projects will be organized in different communities. A procedure will be developed to allow CRD contractors to share their surplus materials. In this manner, it should be possible to reduce the disposal of new and reusable materials with expiry dates (such as insulation), and prevent the deterioration of materials stored outside for excessively long periods of time (such as paint and gypsum). The construction of new storage sites is key to the solution. Discussions will need to be undertaken with the main organizations, which might take the form of a working group established by the follow-up committee (Measure No. 19).

Generators

☐ Residential
☐ Industrial, commercial and institutional (ICI)
☒ Construction, renovation and demolition (CRD)

Lead

The main organizations and contractors involved in CRD activities (Kativik Municipal Housing Bureau, Nunavik Regional Board of Health and Social Services, Kativik Ilisarniliriniq (school board), Makivik Corporation, KRG, FCNQ Construction, and others).

Budget

To be determined according to the projects selected.

Target

Implement projects to reduce the wastage of construction materials in two communities.

Timetable

2027.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 14

Explore possible projects to reduce packaging at source.

Objective

Develop projects to divert more residual materials away from northern landfills.

Description, background information and implementation issues

A significant portion of the waste disposed of at northern landfills is transportation packaging. Additional packaging is used to protect food, articles and materials during shipping; this packaging is sometimes bulky and is rarely recycled, except for wood which is generally made available for reuse. Solutions for reducing the quantity of packaging, making it easier to recycle or reuse, and enabling it to be returned south are often complex. Although studies do exist on how to reduce packaging in general or in other contexts, none deal specifically with the issues encountered in Nunavik. These studies could be compiled in a list and developed to produce a detailed study on reduction-at-source solutions for Nunavik that are workable for retailers and transporters. Following up on this study, measures could be tested with interested partners. The issue of food waste would be taken into account in order to reduce food losses during transportation.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☒ Construction, renovation and demolition (CRD)

Lead

The KRG in cooperation with major retailers (FCNQ, Northern, Newviq'vi), air and marine carriers, and the Nunavik Regional Board of Health and Social Services.

Budget

An estimated amount of $40,000 is required to carry out this study.

Target

Implement a study on possible projects to reduce packaging at source.

Timetable

2024.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 15

Optimize existing drop-off centres and open new drop-off centres for products covered by extended producer responsibility.

Objective

Maintain and develop existing reclamation activities.

Description, background information and implementation issues

Six drop-off centres have been set up in six communities with approval from designated managing agencies for products covered by extended producer responsibility. Household appliances will be added to this list before the end of this Action Plan and a new designated managing agency will be created. Given the size of appliance products, appropriate drop-off centres will need to be set up. Recovery rates are very low and management problems hinder smooth operation. The purpose of this measure is to identify solutions to optimize existing drop-off centres and increase recovery rates. To this end, the operating model will be adapted to specific regional conditions, in cooperation with all the concerned stakeholders: designated managing agencies RECYC-QUÉBEC, the FCNQ, the northern villages and the KRG. The ultimate objective is to operate one drop-off centre in each community for all products covered by extended producer responsibility.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☐ Construction, renovation and demolition (CRD)

Lead

The KRG in cooperation with the FCNQ, designated managing agencies (Société de gestion des huiles usagées, Appel à recycler, RecycFluo, Association pour le recyclage des produits électroniques–Québec, Écopeinture and the future designated managing agency for household appliances), RECYC-QUÉBEC and the northern villages.

Budget

Costs will vary for the shipping of materials not covered under recovery programs, worker training, the handling of products and containers, etc.

Target

Operate one drop-off centre in every community.

Timetable

Establish a permanent working group with the concerned organizations: 2021.
Improve the operation of existing drop-off centres: 2023.
Operate one drop-off centre in every community: 2027.

Orientation 2: Develop management methods for Nunavik based on the concepts of sustainable development

Measure No. 16 **Promote bans on single-use plastic shopping bags.**
Objective Maintain and develop existing reclamation activities.
Description, background information and implementation issues In parallel with the measure to support the northern villages to implement RMM bylaws (Measure No. 7), this measure is intended to encourage all the northern villages to adopt bylaws to ban the distribution of single-use plastic shopping bags in their communities. Subsequently, a regional awareness-building campaign will be organized in partnership with the retailers affected by the bylaw, in order to ensure that bags are removed from distribution and residents are informed of this change.
Generators ☐ Residential ☒ Industrial, commercial and institutional (ICI) ☐ Construction, renovation and demolition (CRD)
Lead The KRG in cooperation with all the northern villages and regional retailers.
Budget An estimated budget of $30,000 is required to produce and distribute awareness-building material (social media, radio).
Target Carry out an awareness-building campaign concerning bans on single-use plastic shopping bags in communities with related municipal bylaws.
Timetable 2025.

Orientation 3: Monitor implementation of the action plan and global innovations in residual materials management

Measure No. 17 **Monitor developments in the field of residual materials management and disseminate relevant information.**
Objective Monitor residual materials management.
Description, background information and implementation issues The field of RMM is constantly evolving. Recent research has led to changes in practices and the creation of new opportunities, while new technologies are transforming waste into resources. New programs have also been established to permit new projects, which are sometimes only available for short periods. The purpose of this measure is to ensure monitoring of RMM issues related specifically to the north and distribution of this information to all concerned stakeholders, in particular the northern villages and the working group. For example, an information bulletin on these issues could be prepared twice annually, transmitted to the northern villages and interested individuals, and posted on the website designed to share other RMM tools. This would ensure that past bulletins remain accessible to stakeholders, as needed. This communication tool could also be used to educate readers about specific issues, to showcase available tools, and to publicize upcoming events.
Generators ☒ Residential ☒ Industrial, commercial and institutional (ICI) ☒ Construction, renovation and demolition (CRD)
Lead The KRG.
Budget $180,000.
Target Distribute a communications tool twice annually and develop a website for sharing other available tools.
Timetable 2021.

Orientation 3: Monitor implementation of the action plan and global innovations in residual materials management

Measure No. 18 **Develop a mechanism for assessing the achievement of targets.**
Objective Conduct follow-up on the implementation of the Nunavik Residual Materials Management Plan.
Description, background information and implementation issues In order to ensure the fulfilment of the regional objectives under the Nunavik RMMP, a mechanism for assessing the implementation of measures on an annual basis should be developed. The tool could take the form of an *Excel* file to compile over time all the progress made on each measure. As the identified targets are more qualitative, the tool would need to include space for explanatory notes.
Generators ☒ Residential ☒ Industrial, commercial and institutional (ICI) ☒ Construction, renovation and demolition (CRD)
Lead The KRG in cooperation with all stakeholders involved with the implementation of the Nunavik RMMP.
Budget $180,000.
Target Production of a monitoring mechanism.
Timetable 2021.

Orientation 3: Monitor implementation of the action plan and global innovations in residual materials management

Measure No. 19

Establish a committee to follow up on the implementation of the Action Plan.

Objective

Conduct follow-up on the implementation of the Nunavik Residual Materials Management Plan.

Description, background information and implementation issues

Pursuant to the *Environment Quality Act*, a system to supervise and monitor the implementation of the Nunavik RMMP must be put in place. In order to foster participation in the system, a committee will be established comprising a variety of representation: residents, regional organizations, businesses, institutions, construction contractors, etc. The committee will track the progress of actions under the Nunavik RMMP by providing information necessary to monitor the measures, sharing information to improve practices, discussing any difficulties encountered, and issuing recommendations. The website designed to share RMM tools and bulletins (Measure No. 17) may be used by the committee. The committee may also undertake additional mandates, through working groups for example, to study certain issues such as the expansion of the deposit-refund program and the reduction-at-source of transportation packaging. The mechanism for assessing the implementation of measures on an annual basis (Measure No. 18) would also be presented to the committee, which could provide feedback and input.

Generators

☒ Residential
☒ Industrial, commercial and institutional (ICI)
☒ Construction, renovation and demolition (CRD)

Lead

The KRG will be responsible for establishing and chairing the follow-up committee.

Budget

An amount of $500/meeting is required for members in Kuujjuaq (food, drink and equipment) for a total of $3,000. Other members would join by telephone or videoconference.

Target

One follow-up committee meeting organized every year.

Timetable

Meetings beginning in 2022.

Orientation 3: Monitor implementation of the action plan and global innovations in residual materials management

Measure No. 20 **Prepare progress reports on the implementation of the Nunavik RMMP every three years.**
Objective Conduct follow-up on the implementation of the Nunavik Residual Materials Management Plan.
Description, background information and implementation issues The report on the implementation of the first Nunavik RMMP was released in 2019, during the plan's fifth year. In accordance with this same spirit of transparency, a report on the implementation of this Nunavik RMMP will be prepared every three years in order to keep residents informed of all the progress made over that period. The implementation report is also intended to be an awareness-building tool on RMM and to publically report on the state of RMM. It will also be used to publicize progress and also question delays thus enhancing the implementation of the Nunavik RMMP. The implementation reports will be posted on the KRG website and the website designed to share RMM tools and bulletins (Measure No. 17).
Generators ☒ Residential ☒ Industrial, commercial and institutional (ICI) ☒ Construction, renovation and demolition (CRD)
Lead The KRG in cooperation with all the stakeholders involved in the implementation of the Nunavik RMMP.
Budget $40,000.
Target Prepare two progress reports during the implementation of the Nunavik RMMP.
Timetable First report: 2024. Second report: 2027.

3.3 Estimated Implementation Costs and Potential Funding Sources

The majority of the costs contemplated in the information sheets for each measure are estimates based on the best available data. Actual costs at the time of the implementation of the projects may not be the same, in addition to inflation over the seven-year period. The costs that could be estimated for projects are compiled for information purposes in Table 20. The total estimated costs of the Action Plan under the Nunavik RMMP are $8,943,000. In those instances where funding has already been confirmed, the source is indicated in the relevant information sheet and a mention in bold appears in Table 22. Of the total estimated costs, funding worth $7,545,000 has already been confirmed for four measures, which means that not less than $1,358,000 is still needed to fully implement the Action Plan, plus variable costs. For the costs involved to implement local RMMPs, several measures have variable costs which are still impossible to estimate.

Nunavik does not have access to the same sources of funding as municipalities in southern Québec. For example, neither the KRG nor the northern villages are eligible under the program that allocates residual materials disposal fees for the implementation of RMMPs, because the fee is not charged. As well, as described in the subsection on implementation issues, it is impossible to increase municipal taxes (already at their maximum) and no budget is specifically allocated for RMM planning. In this context, it will be important to identify complementary sources of funding. However, because these sources are limited and include a number of administrative constraints, securing funding for the entire Action Plan represents a major challenge.

A list of potential funding sources that would permit the implementation of some measures of the Action Plan are as follows:

- the Isurruutiit Program for municipal infrastructure improvements;
- the Fonds d'investissement nordique (northern investment fund) administered by the Société du Plan Nord that will be announced in the fall of 2020;
- specific RECYC-QUÉBEC programs and Action No. 23 of the *2019-2024 Action Plan* under the *Québec Residual Materials Management Policy* ($20 million);
- the MELCC's Programme de la gestion des matières résiduelles en territoire nordique (northern residual materials management program), if extended;
- RECYC-QUÉBEC's Aide au compostage domestique et communautaire (household and community composting assistance program);
- the Green Municipal Fund administered by the Federaton of Canadian Municipalities which can be used for studies and pilot projects as well as for loans for municipal RMM infrastructure projects.

As all the amounts available under these different sources have not yet been announced, it is not possible to forecast a resource envelope for the implementation of the remaining measures of the Action Plan. In addition, other funding sources may yet be identified to complete funding, for example from the federal government. In this respect, it is important to note that, while Inuit are Indigenous, they are not always included in federal government funding programs for Indigenous communities. In order to support development of the RMM sector in Nunavik, a new long-term funding source is required not only to pay for the construction of municipal infrastructure and the purchase of equipment, as is the case with the Isurruutiit Program for municipal infrastructure improvements, but also to pay for operations, maintenance and staff training.

Table 20: Summary of costs for the implementation of the orientations, objectives and measures under the Nunavik RMMP

Orientations	Objectives	Measures	Total costs
1) Build interest among all waste generators about the importance of residual materials management	**a) Conduct information and awareness-building activities on topics related to residual materials management**	1. Carry out an awareness-building campaign for each new project that introduces a change in practices	**$200,000**
	b) Promote partnerships in every sector of activity with a view to implementing measures	2. Develop partnerships with ICI- and CRD-sector stakeholders – **variable**	**Variable costs**
2) Develop management methods for Nunavik based on the concepts of sustainable development	**a) Improve the management of northern landfills**	3. Provide training to municipal workers in order to improve residual materials management – **funded** 4. Explore alternatives to the open-air burning of waste 5. Prepare a procedure for the management of end-of-life vehicles 6. Develop storage sites for scrap vehicles outside of northern landfills 7. Support the northern villages to implement RMM bylaws – **variable**	**$490,000 ($220,000 confirmed)**
	b) Develop projects to divert more residual materials away from northern landfills	8. Implement a residual metal recovery project in one or two communities – **funded** 9. Implement a thermophilic composting project in Inukjuak – **funded** 10. Implement an eco-centre and resource recovery station project in Kuujjuaq – **funded** 11. Implement a recovery project for recyclable materials 12. Support food retail stores to expand the deposit-refund program 13. Implement local initiatives to reduce the wastage of construction materials – **variable** 14. Explore possible projects to reduce packaging at source	**$7,820,000 ($7,325,000 funded)**
	c) Maintain and develop existing reclamation activities	15. Optimize existing drop-off centres and open new drop-off centres for products covered by extended producer responsibility – **variable** 16. Promote bans on single-use plastic shopping bags	$30,000
3) Monitor implementation of the action plan and global innovations in residual materials management	**a) Monitor residual materials management**	17. Monitor developments in the field of residual materials management and disseminate relevant information	**$403,000**
	b) Conduct follow-up on the implementation of the Nunavik Residual Materials Management Plan	18. Develop a mechanism for assessing the achievement of targets 19. Establish a committee to follow up on the implementation of the Action Plan 20. Prepare progress reports on the implementation of the Nunavik RMMP every three years	
		Total	**$8,943,000 ($7,545,000 funded)**

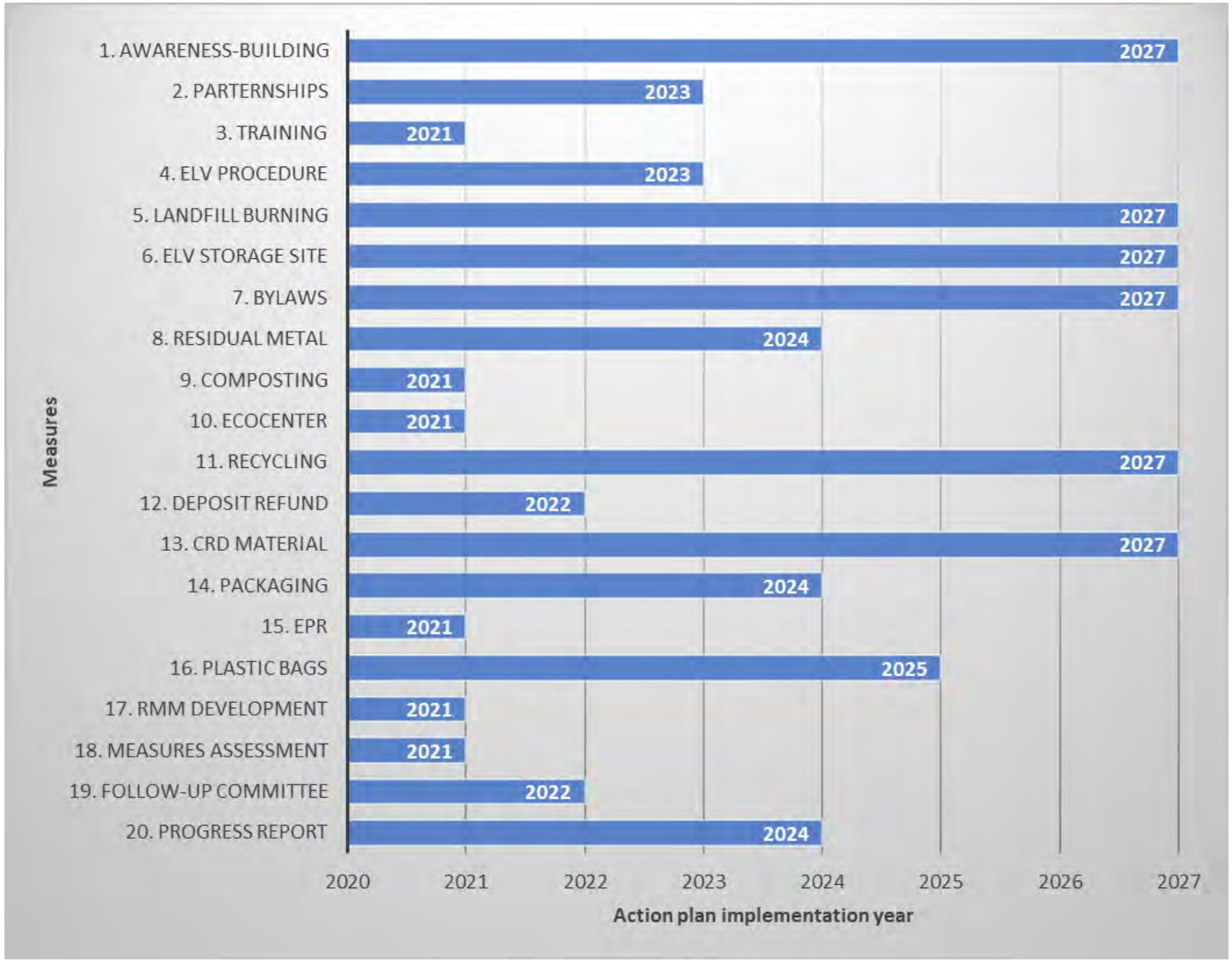

Figure 27 : Timetable for measures under the Action Plan

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Appendices

Appendix 1: Example of a Municipal RMM Bylaw

NORTHERN VILLAGE
F KANGIQSUALUJJUAQ
P.O. Box 120, Kangiqsualujjuaq
Quebec JOM IN0
Tel: 819-337-5271
Fax: 819-337-5200

By-law No. 2018- 02

Concerning the use of the municipal solid waste disposal site and the dumping of waste.

WHEREAS the Municipal Council (hereinafter the Council) has the power to secure the peace, order, good government, health and general welfare in the territory of the municipality pursuant to section 166 of *An Act respecting Northern villages and the Kativik Regional Government* (CQLR, c. V-6.1; hereinafter the Kativik Act);

WHEREAS the Council has the power to construct, equip and operate plants for the elimination or recycling of waste and to regulate or prohibit the use of places as dumps pursuant to subsection 174 (12) of the Kativik Act;

WHEREAS the Council has the power to prohibit the dumping of waste or garbage pursuant to subsection 174 (11) a) of the Kativik Act;

WHEREAS this by-law must be adopted and interpreted in light of the laws and regulations in effect in the Province of Québec;

WHEREAS a notice of motion for this by-law was duly given during the preceding sitting of the Council held on June 6, 2018.

THEREFORE, the Council of the Northern Village of Kangiqsualujjuaq, by this by-law, enacts and decrees as follow:

1. DEFINITIONS

1.1 **"At cost"** shall mean the equipment rental and manpower municipal rates, as adjusted from time to time, and any administrative overhead costs plus 15%.

1.2 **"Authorized officer"** shall mean any officer or municipal by-laws enforcement officer of the municipality whose duty is notably to be in charge of the enforcement of the present by-law within the territory under the jurisdiction of the municipality.

1.3 **"Construction debris and waste"** shall mean any unwanted, useless, abandoned, discarded or rejected goods or materials of any kind that are normally generated on a construction site other than hazardous materials.

1.4 **"Hazardous material"** shall mean a material which, by reason of its properties, is a hazard to health or to the environment and which is explosive, gaseous, flammable, poisonous, radioactive, corrosive, oxidizing or leachable or is designated as a hazardous material, and any object classed by any law or regulation as a hazardous material.

1.5 **"Household hazardous material"** shall mean a hazardous material generated by residential domiciles.

1.6 **"Household waste"** shall be used in its usual meaning and includes, without in any way limiting the generality of the foregoing, any solid residue from a house, store or building generated in or from residential domiciles other than hazardous materials.

1.7 **"Industrial hazardous material"** shall mean all hazardous material that are not generated by residential domiciles.

1.8 **"Industrial waste"** shall mean any garbage other than household waste and hazardous material and includes, without in any way limiting the generality of the foregoing, general construction debris and waste as well as industrial, commercial and institutional waste.

1.9 **"Person"** shall mean any physical person, whether a municipal citizen or not, a company, partnership, firm, corporation, association or public body.

1.10 **"Waste container"** shall mean a garbage box, garbage room or dumpster.

1.11 **"Waste generator"** shall mean the person, both natural and legal, that produces waste.

2. MUNICIPAL SOLID WASTE DISPOSAL SITE

2.1 A municipal solid waste disposal site is hereby officially created.

3. HOURS OF OPERATION

3.1 The hours of operation of the municipal solid waste disposal site shall be as follows:

Summer hours (from May to November)

Monday to Friday: from 9:00 a.m. to 6:00 p.m.
Saturday: from 10:00 a.m. to 4:00 p.m.

Winter hours (from December to April)

Monday to Friday: from 9:00 a.m. to 4:00 p.m.
Saturday: from 10:00 a.m. to 4:00 p.m.

3.2 The municipal solid waste disposal site shall be closed on Sundays and any statutory holiday.

3.3 Service outside regular hours shall be referred to as a recall, and each recall shall be subject to an extra charge of one hundred fifty dollars ($150).

4. OPERATION OF THE MUNICIPAL SOLID WASTE DISPOSAL SITE

4.1 The municipality is in charge of the operation of the municipal solid waste disposal site and, without in any way limiting the generality of the foregoing, the only person allowed to monitor the burning of garbage.

4.2 Whoever wants to personally dump household waste into the municipal solid waste disposal site must obtain the prior written approval of the authorized officer.

4.3 Whoever wants to personally dump industrial waste at the municipal solid waste disposal site must obtain the prior written approval of the authorized officer and must pay the rate set forth in Appendix I, which forms an integral part of this by-law.

4.4 All recoverable or salvageable materials must be stored by type of material in the identified areas within the municipal solid waste disposal site.

4.5 Whoever damages the roads, signage, fencing or the infrastructures found within the municipal solid waste disposal site will be held responsible and will be charged "at cost" for work performed by or on behalf of the municipality in order to repair the damages.

5. OBLIGATIONS

5.1 Every waste generator shall maintain, in good condition, in each location he/she uses, sufficient covered or enclosed waste containers to contain the solid waste normally originating at that location during the course of one week.

5.2 All waste containers shall be accessible from the public roadway.

5.3 All waste deposited in a waste container must first be placed in a garbage bag.

5.4 Each person shall maintain, at his own expense, unimpeded access to his waste containers.

6. CONSTRUCTION DEBRIS AND WASTE

6.1 Any construction or building material being used or stored on private property must be stored on the said property, in a neat and orderly fashion otherwise it will be defined as construction debris and waste under the terms of this by-law.

6.2 All reusable construction debris and waste must be offered and advertised to the general public for a minimum period of 48 hours prior to disposal at the municipal solid waste disposal site in accordance with the following dispositions.

6.3 Whoever is required to dump construction debris and waste at the municipal solid waste disposal site must obtain the prior written approval of the authorized officer and must pay the rate set forth in Appendix 1, which forms an integral part of this by-law and may be modified by a resolution of the Council.

6.4 Except as provided under subsection 6.5, all debris and waste on a construction or work site must be segregated and placed in covered containers, on a daily basis, then hauled in a covered conveyance to the municipal solid waste disposal site within reasonable delay.

6.5 Where a waste container is not available, all debris and waste on a construction or demolition site shall be segregated, hauled in a covered conveyance and disposed of at the municipal solid waste disposal site on a daily basis.

6.6 If the waste generator fails to dispose properly of said construction debris and waste within 48 hours of a written notice from the authorized officer, the municipality may dispose of the construction debris and waste at the expense of the waste generator.

7. HAZARDOUS MATERIAL

7.1 No one shall indiscriminately dispose of hazardous material.

7.2 No one is allowed to dump hazardous material into the municipal solid waste disposal site.

7.3 No person shall dispose of hazardous material in any waste container or any other place without the express authority of the authorized officer who shall designate the manner and place in which it shall be disposed of.

7.4 Collection, transportation, handling, storage and disposal of industrial hazardous material is the sole responsibility of the waste generator and must be done in accordance with the laws and regulations in effect in the Province of Québec. Centers for collection, storage and handling of industrial hazardous material are available in Nunavik prior to transportation and disposal south of the 55th parallel.

7.5 Household hazardous material shall be stored by the waste generator until the municipality holds a "household hazardous material collection" when these wastes shall be brought to an area prescribed by the authorized officer for disposal.

7.6 Domestic and commercial appliances must be emptied of all hazardous materials (including gases and oils) before being sent to the municipal solid waste disposal site. These hazardous materials must be contained, stored and disposed of in accordance with federal and provincial regulations.

7.7 If the waste generator fails to dispose properly of said hazardous material within 48 hours of a written notice from the authorized officer, the municipality may dispose of the hazardous material at the expense of the waste generator.

8. CONTAMINATED SOIL

8.1 No one shall dispose of contaminated soil at the municipal solid waste disposal site.

8.2 All contaminated soil must be sent to a treatment center for decontamination according to the laws and regulations in effect in the Province of Quebec. Treatment centers for decontamination are available in Nunavik and south of the 55th parallel.

8.3 Collection, transportation, handling, storage and disposal of contaminated soil is the sole responsibility of the waste generator and must be done in accordance with the laws and regulations in effect in the Province of Québec.

9. MOTORIZED VEHICLES

9.1 No one shall dispose of a motorized vehicle without the prior written approval of the authorized officer.

9.2 All motorized vehicles must be emptied of all hazardous materials prior to disposal at the municipal solid waste disposal site.

9.3 No one shall keep on its lot one or several motorized vehicles which are not in working condition fabricated more than seven (7) years previously.

9.4 No person shall keep tires outside of a building.

10. NUISANCE CAUSED ON PUBLIC PROPERTY

10.1 Any person who soils public property, including, but not limited to roads or streets, laneways, alleys, or public buildings, by depositing there or throwing waste, paper, empty bottles, empty cans, foul substances, scrap metal, dirty waters, oil, contaminants, construction materials or any other object, material or substance shall constitute a nuisance.

10.2 Any person who soils public property must clean the said premises.

10.3 Cleaning must be immediately performed or, depending on circumstances, within a

deadline prescribed by the authorized officer.

10.4 If the person who soiled public property fails to clean up the soiled public property within 48 hours of a written notice from the authorized officer, the municipality may clean up the soiled public property at the expense of the person responsible.

11. INSPECTION OF PROPERTY

11.1 An authorized officer has the right, if he believes on reasonable grounds that an offence against this by-law has been committed, to visit and examine all moveable and immovable property, as also the interior or exterior of any house, building or edifice, in order to ascertain whether his by-law has been contravened.

11.2 The owner, lessees or occupants of the property shall allow the authorized officer to make such a visit or examination within normal business hours.

12. PENALTIES

12.1 Every person who contravenes any of sections 5.1 to 5.4 and 10.1 of this by-law commits an offence and is liable, upon penal proceedings, to a minimum fine of fifty dollars ($50), with costs. Each day of infringement constitutes a separate offence.

12.2 Every person who contravenes any of sections 4.1 to 4.4, 6.1 to 6.4, 7.1 to 7.6, 8.1 and 9.1 to 9.4 of this by-law commits an offence and is liable, upon penal proceedings, to a fine of three hundred dollars ($300), with costs. Each day of infringement constitutes a separate offence.

12.3 The Court convicting a person for the breach of any section of this by-law may, in addition to any fine it may impose, issue an order to enjoin that person to refrain from committing any further such offence and/or cease to carry on any activity specified in the order and/or, if such person is the holder of a permit, license or certificate granted under this by-law, suspend such permit, license or certificate for the period that it deems appropriate, or revoke the same, or prohibit the renewal thereof during the period that it deems appropriate.

12.4 An authorized officer may issue a statement of offence pursuant to this by-law.

12.5 Delays for the payment of penalties and costs imposed by virtue of the present section and consequences of failure to pay aforementioned penalties and costs are established in accordance with the provisions of the *Code of penal procedure of Québec* (CQLR, c. C-25.1).

13. APPLICATION

13.1 The provisions of this by-law apply to the whole territory under the jurisdiction of the municipality.

14. REPEAL OF PREVIOUS BY-LAW

14.1 This by-law supersedes and replaces any previous by-law enacted by the Council, for the same purposes, and any such by-law is hereby repealed.

15. COMING INTO EFFECT

15.1 Should any section of this by-law be totally or partially voided by a Court, its other provisions shall remain valid and in force.

15.2 The present by-law shall come into effect the date of its publication in accordance with section 138 of the Kativik Act.

16. VERSIONS

16.1 In the event of a discrepancy between the English, French and Inuktitut versions, the English version shall prevail.

17. COPY

17.1 Once published, the Secretary-Treasurer shall transmit a copy of the present by-law without delay to the Kativik Regional Government as per section 160 of the Kativik Act.

IN FAVOUR:	**6**
OPPOSED:	**0**
ABSTENTIONS:	**0**
ABSENTEES:	**1**
DATE OF ADOPTION:	**June 27, 2018**
MAYOR'S SIGNATURE:	
SECRETARY-TREASURER'S SIGNATURE:	
DATE OF PUBLICATION:	**June 28, 2018**

APPENDIX I

RATES APPLICABLE TO INDUSTRIAL, COMMERCIAL, INSTITUTIONAL (ICI) AND CONSTRUCTION WASTE DUMPING UNDER SECTION 4.5, 6.2 and 7.4

RATES FOR DISPOSAL OF SEGREGATED CONSTRUCTION DEBRIS ($50/m^3)

1.	Pick-up truck (4 X 8 X 2 feet) ±2m^3	$100/load
2.	Pick-up extension (Trailer or equivalent)	$100/load
3.	Six-wheel truck (±6m^3)	$300/load
4.	Ten-wheel truck (±12m^3)	$600/load
5.	Articulated truck (±24m^3)	$1,200/load
6.	Loader (Bucket)	$100/load
7.	Contained construction material	$50/$m^3$
8.	General rate for bulky waste	$50/$m^3$

OTHER RATE PER ITEM

9.	Car / Truck body	$200
10.	Snowmobile / ATV	$100
11.	Large Appliances (white goods including water heater tanks)	$75
11.	Fridge/ Freezer /Air Conditioning Units (including Freon Removal)	$100
12.	Automotive Battery	$25
13.	Oil tank	$50
14.	Drum (empty)	$10
14.	Tires	$25
15.	Oversized tires (≥48.5")	$500
16.	Water and sewage reservoir (empty)	$100

OTHER INDUSTRIAL HAZARDOUS MATERIAL DISPOSAL IS THE SOLE RESPONSIBILITY OF THE WASTE GENERATOR

N.B.: The above does not include rates for equipment rental and manpower.

Contract prices available upon request.

Appendix 2: Detailed Costs of the Northern Village of Kuujjuaq for Residual Materials and Wastewater Management in 2019

WATER, SEWAGE, GARBAGE & DUMP EXPANSION COSTS

Period: 01/01/19 to 12/31/19

	Reporting-period amount	Year-to-date amount
SALARY - WATER DISTRIBUTION	$ 1,463,754	$ 1,463,754
NORTHERN ALLOWANCES - WATER	261,217	261,217
FRINGE BENEFITS - WATER DIST.	207,199	207,199
GROUP INSURANCE	1,361	1,361
PAID TRAVEL - WATER	59,530	59,530
VACATION PAY	2,894	2,894
GPP EMPLOYER CONTRIBUTION	36,197	36,197
TELEPHONE - WATER DISTRIBUTION	2,977	2,977
VEHICLE INSURANCE - WATER	9,622	9,622
VEHICLE REGISTRATION - WATER	628	628
INSURANCE - WATER PLANT	498	498
INSURANCE - NEW WATER PLANT	3,350	3,350
INSURANCE - NEW STORAGE GARAGE	5,146	5,146
LAND LEASE	8,131	8,131
MAINTENANCE - WATER PLANT	1,475	1,475
MATERIALS - WATER TRTMNT PLANT	78,854	78,854
VEHICLE PARTS - WATER DIST	165,194	165,194
ACCIDENT EXPENSE - WATER	5,309	5,309
ELECTRICITY - WATER TRTMT PLNT	162	162
ELECTRICITY - NEW WATER PLANT	16,025	16,025
ELECTRICITY - NEW STORAGE	872	872
HEATING - WATER TRTMNT PLANT	85,965	85,965
HEATING - NEW WATER PLANT	77,469	77,469
HEATING - NEW STORAGE GARAGE	41,636	41,636
FUEL - VEHICLE WATER DIST	326,630	326,630
OTHER EXPENSES - WATER DIST.	9,383	9,383
TOTAL - WATER	$ 2,871,478	$ 2,871,478
SALARY - SEWAGE COLLECTION	$ 1,171,430	$ 1,171,430
NORTHERN ALLOWANCES - SEWAGE	145,922	145,922
FRINGE BENEFITS - SEWAGE COLL	170,429	170,429
GROUP INSURANCE	4,600	4,600
PAID TRAVEL - SEWAGE	40,434	40,434
VACATION PAY	2,958	2,958
GPP EMPLOYER CONTRIBUTION	14,286	14,286
VEHICLE INSURANCE - SEWAGE	8,545	8,545
VEHICLE REGISTRATION - SEWAGE	574	574
LAND LEASE	2	2
MATERIAL - SEWAGE COLLECTION	17,033	17,033
VEHICLE PARTS - SEWAGE COLLN	112,700	112,700
ACCIDENT EXPENSE - SEWAGE	263	263
FUEL - VEHICLE SEWAGE COLLN	308,582	308,582
OTHER EXPENSES - SEWAGE	9,561	9,561
TOTAL - SEWAGE	$ 2,007,319	$ 2,007,319

SALARY - GARBAGE COLLECTION	$	280,266	$	280,266
NORTHERN ALLOWANCES - GARBAGE		36,391		36,391
FRINGE BENEFITS - GARBAGE COLL		40,339		40,339
GROUP INSURANCE		3,617		3,617
PAID TRAVEL - GARBAGE		10,480		10,480
VACATION PAY		(8,917)		(8,917)
GPP EMPLOYER CONTRIBUTION		3,940		3,940
VEHICLE INSURANCE - GARBAGE		1,614		1,614
VEHICLE REGISTRATION - GARBAGE		55		55
VEHICLE PARTS - GARBAGE		19,794		19,794
ACCIDENT EXPENSE - GARBAGE		3,240		3,240
FUEL - VEHICLE GARBAGE COLLN		62,482		62,482
OTHER EXPENSES - GARBAGE		14,221		14,221
TOTAL - GARBAGE	$	467,522	$	467,522
SALARY - DUMP EXPANSION	$	137,781	$	137,781
NORTHERN ALLOWANCES - DUMP EXP		18,453		18,453
FRINGE BENEFITS - DUMP EXPAN.		19,177		19,177
GROUP INSURANCE		(180)		(180)
PAID TRAVEL - DUMP EXPANSION		5,662		5,662
VACATION PAY		(1,001)		(1,001)
GPP EMPLOYER CONTRIBUTION		3,000		3,000
MATERIAL - DUMP EXPANSION		66,103		66,103
ELECTRICITY - DUMP EXPANSION		411		411
FUEL - DUMP EXPANSION		26,301		26,301
OTHER EXPENSE - DUMP EXPANSION		4,040		4,040
TOTAL - DUMP EXPANSION	$	279,747	$	279,747
TOTAL WATER & WASTE MANAGEMENT	$	5,626,066	$	5,626,066

Appendix 3: Results of Residual Metal Characterization Work

Table 21: Compilation of estimated quantities of metal by community

Northern village	Estimated weight by volume (T)	Estimated weight by number of items (T)	Total (T)
Akulivik	1,268	421	1,689
Kangirsuk	2,650	505	3,155
Kuujjuaq	8,925	1,210	10,134
Kuujjuaraapik	5,353	352	5,705

(extracted from St-Onge 2019)

Appendix 4: Photos and Locations of the Northern Landfills in the Communities[27]

[27] Source (photos): ESRI, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS user community.

Akulivik (2019-06-23)

Aupaluk (2019-06-23)

Inukjuak (2019-06-18)

Ivujivik (2018-08-09)

Kangiqsualujjuaq (2019-06-24)

Kangiqsujuaq (2012-07-19)[28]

[28] Source of the photo enlargement: MERN, 2016.

Kangirsuk (former northern landfill) (2019-06-29)

Kuujjuaq (2019-06-24)

Kuujjuaraapik (2017-08-23)

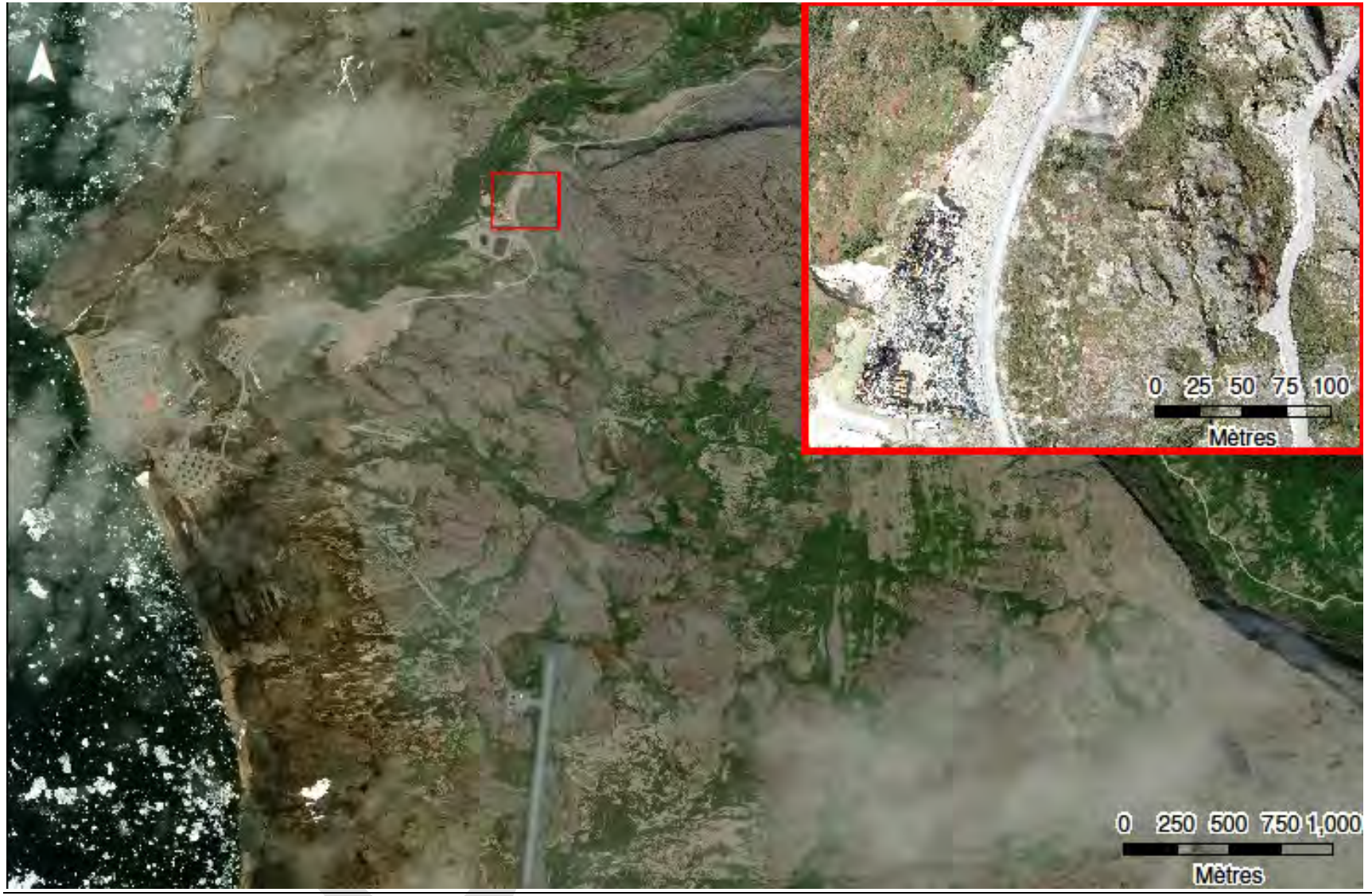
Puvirnituq (2018-08-17)

Quaqtaq (2019-07-12)

Salluit (2017-08-19)

Tasiujaq (2017-07-30)

Umiujaq (2013-06-08)[29]



[29] Source of the photo enlargement: MERN, 2015.

Appendix 5: Local RMMPs

The local RMMPs contained in this appendix comprise the sets of measures for all the northern villages. They are all described in detail in the information sheets that follow the plans.

Measures for all the northern villages

- Provide for the recovery of HHW:
  - dropped off by residents at the HHW shelter;
  - through annual collection drives.
- Carry out a campaign to build awareness about local RMM services.
- Remove hazardous materials from end-of-life vehicles.

Residual Materials Management Plan for Akulivik, 2021–2027

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Conditions at the northern landfill

- Scrap metal zone full, no designated sorting areas (except for vehicles).
- Nuisances caused by smoke and wildlife.
- The landfill should be relocated further from the community.

Local measures

- Open a drop-off centre for products covered by extended producer responsibility:
  - Oils, coolants, antifreeze, their filters and containers, paint and paint containers, alkaline batteries, mercury lamps, and electronic products.
- Promote the reuse of CRD residual materials sorted in a designated zone.
- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Aupaluk, 2021–2027

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Conditions at the northern landfill

- Scrap metal zone full, partially burned, no designated sorting areas.
- Too close to dwellings, smoke is bothersome.
- Waste is accumulating outside of the fenced area.

Local measures

- Reclaim organic matter through composting:
  - Residents;
  - Organizations.
- Open a drop-off centre for products covered by extended producer responsibility:
  - Oils, coolants, antifreeze, their filters and containers, paint and paint containers, alkaline batteries, mercury lamps, and electronic products.
- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Inukjuak, 2021–2027

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Conditions at the northern landfill

- Scrap metal zone full, no designated sorting areas.
- Burning impossible, too close to dwellings.
- New northern landfill under development – opening date to be announced.

Local measures

- Implement a thermophilic composting project for organic matter (Measure No. 9 of the Nunavik RMMP):
  - Residents;
  - Organizations.
- Set up an eco-centre to improve the sorting of residual materials and promote:
  - The reuse of CRD residual materials;
  - Metal recyclability by metal and scrap type;
  - The safe recovery of hazardous materials.
- Prepare for a metal recovery project:
  - In order to close the existing landfill site.
- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Ivujivik, 2021–2027
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Conditions at the northern landfill

- Scrap metal zone half-full, no designated sorting areas.
- Nuisances caused by smoke, contamination and wildlife.
- Problems with the fencing and end-of-life vehicle storage.

Local measures

- Open a drop-off centre for products covered by extended producer responsibility:
  - Oils, coolants, antifreeze, their filters and containers, paint and paint containers, alkaline batteries, mercury lamps, and electronic products.
- Promote the reuse of CRD residual materials sorted in a designated zone.
- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Kangiqsualujjuaq, 2021–2027
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Conditions at the northern landfill

- Scrap metal zone full.
- Nuisances caused by contamination and wildlife.
- No designated sorting areas.

Local measures

- Set up an eco-centre to improve the sorting of residual materials and promote:
  - The reuse of CRD residual materials;
  - Metal recyclability by metal and scrap type;
  - The safe recovery of hazardous materials.

- Reclaim organic matter through composting:
  - Residents;
  - Organizations.

- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Kangiqsujuaq, 2021–2027
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Conditions at the northern landfill

- Shortage of space, no designated sorting areas.
- Frequent use by residents.
- Nuisances caused by the smoke from burning and contamination.

Local measures

- Promote the reuse of CRD residual materials sorted in a designated zone.
- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Expand the duties of the worker responsible for supervision and upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Kangirsuk, 2021–2027
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Conditions at the northern landfill

- Scrap metal zone almost full, partially burned.
- New northern landfill under development – opening date to be announced.
- Temporary sorting zones set up at new northern landfill.

Local measures

- Set up an eco-centre to improve the sorting of residual materials and promote:
  - The reuse of CRD residual materials;
  - Metal recyclability by metal and scrap type;
  - The safe recovery of hazardous materials.
- Prepare for a metal recovery project:
  - In order to close the existing landfill site.
- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Kuujjuaq, 2021–2027
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Conditions at the northern landfill

- Scrap metal zone full.
- Nuisances caused by the smoke from burning.
- Large number of users: materials dumped randomly, safety issues.

Local measures

- Develop an intermediate drop-off station at Newviq'vi for certain residual materials.
- Set up an eco-centre to improve the sorting of residual materials and promote (Measure No. 10):
  - ➢ The reuse of CRD residual materials;
  - ➢ Metal recyclability by metal and scrap type;
  - ➢ The safe recovery of hazardous materials.

- Prepare for a metal recovery project:
  - ➢ In order to extend the service life of the northern landfill.

Residual Materials Management Plan
for Kuujjuaraapik, 2021–2027
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Conditions at the northern landfill

- Scrap metal zone full, no designated sorting areas.
- Burning zone too close to dwellings, smoke is bothersome.
- Waste dumped randomly, large number of users.

Local measures

- Reclaim organic matter through composting:
  - Residents;
  - Organizations.
- Prepare for a metal recovery project:
  - In order to close the existing landfill site.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Puvirnituq, 2021–2027
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Conditions at the northern landfill

- Scrap metal zone almost full.
- Nuisances caused by the smoke from burning and contamination.
- No designated sorting areas.

Local measures

- Open a drop-off centre for products covered by extended producer responsibility:
  - Oils, coolants, antifreeze, their filters and containers, paint and paint containers, alkaline batteries, mercury lamps, and electronic products.
- Promote the reuse of CRD residual materials sorted in a designated zone.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Quaqtaq, 2021–2027
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Conditions at the northern landfill

- Scrap metal zone half-full, no designated sorting areas.
- Nuisances caused by smoke, contamination and wildlife.
- Problems with the fencing and end-of-life vehicle storage.

Local measures

- Open a drop-off centre for products covered by extended producer responsibility:
    - Oils, coolants, antifreeze, their filters and containers, paint and paint containers, alkaline batteries, mercury lamps, and electronic products.
- Promote the reuse of CRD residual materials sorted in a designated zone.
- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
    - Supervise site access and charge disposal fees for organizations;
    - Maintain designated storage zones;
    - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Salluit, 2021–2027

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Conditions at the northern landfill

- Scrap metal zone half-full, no designated sorting areas.
- Nuisances caused by smoke and contamination.
- Lack of supervision.

Local measures

- Set up an eco-centre to improve the sorting of residual materials and promote:
  - The reuse of CRD residual materials;
  - Metal recyclability by metal and scrap type;
  - The safe recovery of hazardous materials.

- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Tasiujaq, 2021–2027

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Conditions at the northern landfill

- Scrap metal zone half-full.
- Designated piles for CRD residual materials.
- Waste scattered outside the site.

Local measures

- Reclaim organic matter through composting:
  - Residents;
  - Organizations.
- Open a drop-off centre for products covered by extended producer responsibility:
  - Oils, coolants, antifreeze, their filters and containers, paint and paint containers, alkaline batteries, mercury lamps, and electronic products.
- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Promote the reuse of CRD residual materials sorted in a designated zone.
- Expand the duties of the worker responsible for supervision and upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Residual Materials Management Plan for Umiujaq, 2021–2027

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Conditions at the northern landfill

- Scrap metal zone almost full, no designated sorting areas.
- Risk of contamination, too close to dwellings.
- Nearby storage zone for CRD residual materials.

Local measures

- Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags.
- Open a drop-off centre for products covered by extended producer responsibility:
  - Oils, coolants, antifreeze, their filters and containers, paint and paint containers, alkaline batteries, mercury lamps, and electronic products.
- Hire a worker to provide supervision and perform upkeep at the northern landfill:
  - Supervise site access and charge disposal fees for organizations;
  - Maintain designated storage zones;
  - Ensure compliance with environmental regulations.

Measure No. 1

Open a drop-off centre for products covered by extended producer responsibility.

Description, background information and implementation issues

In some communities, there are no drop-off centres for products covered by extended producer responsibility (Measure No. 15 of the Nunavik RMMP). The product categories are as follows: mercury lamps; paint and paint containers; oils, coolants, antifreeze, their filters and containers; alkaline batteries; and electronic products. Household appliances will be added to this list of categories by 2025. Recovery programs implemented by retail businesses serve to cover the cost of shipping products to treatment centres. Drop-off centres are open to residents and local organizations.

Similar to communities that already have drop-off centres, new drop-off centres could be set up at the local cooperative store. Discussions will be carried out to coordinate the opening of drop-off centres and plan in-store logistics. Information for residents about the new service will be integrated into the local awareness-building campaign (Measure No. 4 under local RMMPs).

Generators

☒ Residential

☒ Industrial, commercial and institutional (ICI)

☐ Construction, renovation and demolition (CRD)

Lead

The local cooperative retail store with KRG support.

Budget

Variable.

Target

Open a drop-off centre for products covered by extended producer responsibility.

Measure No. 2

Provide for the recovery of HHW.

Description, background information and implementation issues

Measure No. 1 under local RMMPs diverts five categories of popular products away from northern landfills. Due to an absence of recovery services, however, other HHW is regularly thrown out, such as propane tanks, vehicle batteries, chemical products, etc. Shelters for storing hazardous materials will now be used by the northern villages to accept HHW from residents and store it with municipal hazardous materials. In this manner, HHW will be prepared along with municipal hazardous materials for shipment to treatment centres in southern Québec. In order to increase the recovery rate and make drop-off easy, annual collection drives will be organized. Information for residents about the new service will be integrated into the local awareness-building campaign (Measure No. 4 under local RMMPs).

Generators

☒ Residential

☐ Industrial, commercial and institutional (ICI)

☐ Construction, renovation and demolition (CRD)

Lead

The northern village with KRG technical support.

Budget

Included in regular garbage pick-up costs; extra costs expected.

Target

Enable the recovery of HHW in the community.

Measure No. 3

Reclaim organic matter through composting.

Description, background information and implementation issues

A thermophilic composting project is to be implemented in Inukjuak (Measure No. 9 of the Nunavik RMMP). The results will serve to identify whether the method is effective in Nunavik and whether the project can be replicated in other communities. If the Inukjuak project proceeds according to schedule, the project results should be available as early as 2022.

In order to mitigate the risk of environmental contamination and nuisances in northern landfills and produce compost for site revegetation, composting projects will also be implemented in other communities. A different composting process or a different type of thermophilic composter could be identified according to the size of the community. Since different composting technologies do exist, the process selected should reflect the local context. The purpose of this measure is to determine an appropriate process and composting site, apply for the necessary environmental authorizations if any, and proceed with the purchase and installation of equipment. Training for workers will also need to be planned. Information for residents and organizations about the new service will be integrated into the local awareness-building campaign (Measure No. 4 under local RMMPs).

Generators

☒ Residential

☒ Industrial, commercial and institutional (ICI)

☐ Construction, renovation and demolition (CRD)

Lead

The northern village with possible collaboration of a local partner (to be determined) and KRG technical support.

Budget

Variable according to the selected technology. Aide au compostage domestique et communautaire (household and community composting assistance program) pays subsidies of up to $100,000, covering 80% of eligible expenses.

Target

Compost a significant portion of the organic matter generated locally.

Measure No. 4

Carry out a campaign to build awareness about local RMM services.

Description, background information and implementation issues

Certain measures require the development and implementation of an awareness-building campaign to encourage residents and organizations to avail themselves of the RMM services available locally. Existing services, such as drop-off centres for products under extended producer responsibility, will also be integrated into the campaign, as will reduction-at-source solutions (related, for example, to food waste issues). Organizations (institutions, businesses) will also be targeted to inform them of their obligations and provide advice on proper management methods [30]. Schools could be involved in the campaign in order to build awareness among young people on how to improve RMM.

Generators

☒ Residential

☒ Industrial, commercial and institutional (ICI)

☒ Construction, renovation and demolition (CRD)

Lead

The northern village, with technical support from the KRG and collaboration with the Nunavik Regional Board of Health and Social Services.

Budget

An estimated amount of approximately $40,000 per village to develop the awareness-building campaign. Material will be produced by the KRG that can be adapted by each northern village to local characteristics (Measure No. 1 of the Nunavik RMMP).

Target

Carry out an awareness-building campaign on local services with a view to improving RMM.

[30] Examples: ban on the disposal of hazardous materials at northern landfills and the fees payable to the northern village for the disposal of CRD waste.

Measure No. 5

Hire a worker to provide supervision and perform upkeep at the northern landfill.

Description, background information and implementation issues

Northern landfills must be maintained regularly in order to ensure compliance with the *Regulation respecting the Landfilling and Incineration of Residual Materials*, to supervise site access, to process disposal fees for organizations, and to maintain designated storage zones. As the residual metal recovery project will eventually be expanded to all the communities, it is important to begin the sorting of metal waste as soon as possible in order to facilitate future activities. This measure involves the creation of a permanent position to oversee various duties at the northern landfill. The worker might also be made responsible for composting activities, HHW management and the reuse of CRD residual materials, if applicable.

Generators

☒ Residential

☒ Industrial, commercial and institutional (ICI)

☒ Construction, renovation and demolition (CRD)

Lead

The northern village with KRG technical support. The KRG plans to provide training to municipal landfill workers.

Budget

The cost of this new worker will be added to the garbage pick-up budget (roughly $75,000/year). The frequency of garbage pick-up could also be reduced in order to add this new worker at no cost.

Target

Establish a permanent landfill worker position.

Measure No. 6

Prepare for a residual metal recovery project.

Description, background information and implementation issues

The metal storage zones at northern landfills in several communities are close to capacity. There is very little room for the storage of additional non-combustible residual materials, while populations continue to grow and consumption levels increase. In some communities, new landfills are under development and existing sites must be closed; to this end, the accumulated metal must be removed and final covering material applied over the site. In other communities, recovery of the accumulated metal would allow the service lives of the landfills to be extended.

This measure involves setting the order in which communities (with landfills that must be closed or are completely full) will implement residual metal recovery projects during the course of the current Nunavik RMMP. If not among the first two communities to test the project, the identified communities will be next in line.

Generators

☒ Residential

☒ Industrial, commercial and institutional (ICI)

☒ Construction, renovation and demolition (CRD)

Lead

The KRG in collaboration with the northern village.

Budget

It will be possible to confirm the cost of the project following the implementation of a residual metal recovery pilot project in a first community, as set out in the related feasibility study (Measure No. 8 of the Nunavik RMMP).

Target

Recover the metal accumulated in the storage zone for non-combustible residual materials at the northern landfill, and ship it to a metal recycler in southern Québec.

Measure No. 7

Promote the reuse of CRD residual materials by creating a designated sorting zone.

Description, background information and implementation issues

Currently at northern landfills, reusable CRD residual materials are generally not managed separately. These materials are mixed together with other waste and are accessible to residents only briefly before being burned. This measure involves designating a zone for materials that have good reuse potential, such as wood, windows and doors. If space permits, the zone could be located at the entrance to the northern landfill. A shelter, such as a sealift container, would increase the service lives of some materials. The municipal bylaw could be amended to require construction contractors to transport CRD residual materials to the designated zone. The purpose of this measure is to reduce the quantity of CRD waste sent to the landfill and to make surplus building materials more accessible to residents than is currently the case. Requiring construction contractors to sort their CRD waste will also result in higher-quality reusable materials. As wood is especially in demand, special attention could be focused on keeping it from becoming damaged or deteriorating.

Generators

☐ Residential

☐ Industrial, commercial and institutional (ICI)

☒ Construction, renovation and demolition (CRD)

Lead

The northern village, with the support of the KRG and in collaboration with key construction contractors.

Budget

Variable according to the selected storage site.

Target

Create a designated zone for CRD residual materials that can be reused by residents.

Measure No. 8

Set up an eco-centre to improve the sorting of residual materials.

Description, background information and implementation issues

The space available for the storage of residual metal, CRD residual materials and hazardous materials at northern landfills is often too limited to allow for the proper sorting of these materials on site. Current practices do not foster the reuse of CRD residual materials, which are often dumped randomly in burning zones and accessible only briefly before being burned. In order to improve sorting practices, an eco-centre will be set up. It could be located at or near the entrance to the northern landfill. The eco-centre pilot project in Kuujjuaq will determine the best type of facility (Measure No. 10 of the Nunavik RMMP). Adjustments could be made in accordance with the experience gained implementing the project planned for 2021. Preference will be given to performing decontamination work on end-of-life vehicles at the municipal garage. A sorting area will have to be set up for the main categories of residual materials and reusable construction materials. Similar to other eco-centres in Québec, the facility is not intended as a final destination, but as a transfer station for sorting residual materials by category and optimizing reclamation. Once the sorting areas are filled, the residual materials will be transported to the northern landfill (residual metal), to a treatment centre in the south (tires and hazardous materials), or to the burning zone (final waste). The municipal bylaw could be amended to require construction contractors to sort their CRD waste.

Generators

☐ Residential

☐ Industrial, commercial and institutional (ICI)

☒ Construction, renovation and demolition (CRD)

Lead

The northern village, with the support of the KRG and the collaboration of construction contractors.

Budget

Variable according to the selected infrastructure. An estimated amount of $1 million would be required if no garage or power is included.

Target

Set up a local eco-centre to sort residual materials not accepted through garbage pick-up.

Measure No. 9

Develop a drop-off station at Newviq'vi in Kuujjuaq for certain residual materials.

Description, background information and implementation issues

The northern landfill in Kuujjuaq is the official drop-off centre for products covered by extended producer responsibility and for other hazardous materials. Nonetheless, the site is far from the village for some residents, especially in winter. Intermediate drop-off stations serve to increase recovery rates by making it easier for residents to recycle these products. Many Kuujjuamiut regularly visit Newviq'vi to buy various consumer goods and could easily drop off certain types of residual materials at the same time. The categories of products that will be accepted and the type of container needed for storage remain to be determined jointly by Newviq'vi and the northern village. The latter will be responsible for periodically collecting the residual materials and transporting them to the northern landfill. Safety and cleanliness will be key to avoiding product spills. For example, used oil will not be accepted for this reason. Used consumer products previously purchased at the store will however be accepted, including alkaline batteries and electronic products. Although this measure will be implemented only in Kuujjuaq, intermediate drop-off stations could eventually be developed in other communities to increase recovery rates.

Generators

☒ Residential

☒ Industrial, commercial and institutional (ICI)

☐ Construction, renovation and demolition (CRD)

Lead

Newviq'vi and the Northern Village of Kuujjuaq.

Budget

The measure could be implemented cheaply if Newviq'vi and the northern village can agree on a work method that is beneficial for the two parties.

Target

Open an intermediate drop-off centre at Newviq'vi for certain categories of residual materials.

Measure No. 10

Remove hazardous materials from end-of-life vehicles.

Description, background information and implementation issues

Currently, end-of-life vehicles are stored at northern landfills, in most cases along with all of the vehicles' hazardous materials. Due to weathering and compaction, which is sometimes performed to permit more efficient use of space, fluids can leak and cause environmental contamination. This measure in conjunction with Measure No. 5 of the Nunavik RMMP involves the removal of all hazardous materials from vehicles at the municipal garage prior storage at the northern landfill and, eventually, at the scrap vehicle storage site (Measure No. 6 of the Nunavik RMMP). Specific training and tools are planned for municipal employees assigned to these duties.

Generators

☒ Residential

☒ Industrial, commercial and institutional (ICI)

☐ Construction, renovation and demolition (CRD)

Lead

The northern village in collaboration with the KRG.

Budget

Variable according to community size and the number of vehicles to be decontaminated annually.

Target

Ensure that all end-of-life vehicles are decontaminated prior to being placed in storage.

Measure No. 11

Adopt a bylaw banning the distribution and sale of single-use plastic shopping bags

Description, background information and implementation issues

Single-use plastic shopping bags are among the most common types of waste in nature, and are harmful to the environment. Some northern villages have already adopted bylaws banning retailers from distributing and selling single-use plastic shopping bags. These bylaws are not however enforced consistently. This measure involves encouraging northern villages that have not yet adopted such a bylaw to do so. Measure No. 16 of the Nunavik RMMP involves the implementation of an awareness-building campaign on single-use plastic shopping bags in those communities where the municipality has adopted an anti-plastic bag bylaw.

Generators

☒ Residential

☐ Industrial, commercial and institutional (ICI)

☐ Construction, renovation and demolition (CRD)

Lead

The northern village.

Budget

$0.

Target

Adopt a bylaw banning single-use plastic shopping bags (in every northern village were such a bylaw has not yet been adopted).

Compilation of measures in local RMMPs by community

	Measures							
Community	**Composting**	**Drop-off centre (EPR)**	**Reuse of CRD residual material**	**Eco-centre**	**Landfill worker**	**Metal recovery**	**Intermediate drop-off station**	**Anti-bag bylaw**
Kangiqsujuaq		In operation	x		On the job			x
Aupaluk	x	x			x			x
Kangirsuk		In operation		x	x	x		Adopted
Quaqtaq		x	x		x			x
Salluit		In operation		x	x			x
Ivujivik		x	x		x			x
Akulivik		x	x		x			x
Puvirnituq		x	x		x			Adopted
Inukjuak	x	In operation		x	x	x		x
Umiujaq		x			x			Adopted
Kuujjuaraapik	x	In operation			x	x		Adopted
Tasiujaq	x	x	x		On the job			x
Kangiqsualujjuaq	x	x		x	x			x
Kuujjuaq		In operation		x	On the job	x	X	Adopted