



2016-2020
Waste Management Plan for the
Kahnawà:ke Mohawk Territory

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Work Team

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Holly McComber
Environmental Technologist
Kahnawà:ke Environment Protection Office

In collaboration with

Monique Clément, B.Sc. DGE
Recycologue

*Gestion des matières résiduelles
formation - conférence – vulgarisation*

Téléphone : 819-835-0833
Courriel: info@moniqueclement.ca
www.moniqueclement.ca

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List of acronyms

EPA	Environmental protection agency
KEPO	Kahnawà:ke Environment Protection Office
MCK	Mohawk Council of Kahnawà:ke
ICI	Industry, commerce, Institution
CRD	Construction, Renovation and Demolition
HHW	Household Hazardous Waste
MDDELCC	Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques
TWIST	The Wastewater Information System Tool
Wmt	Wet metric ton (20 % of solid content)

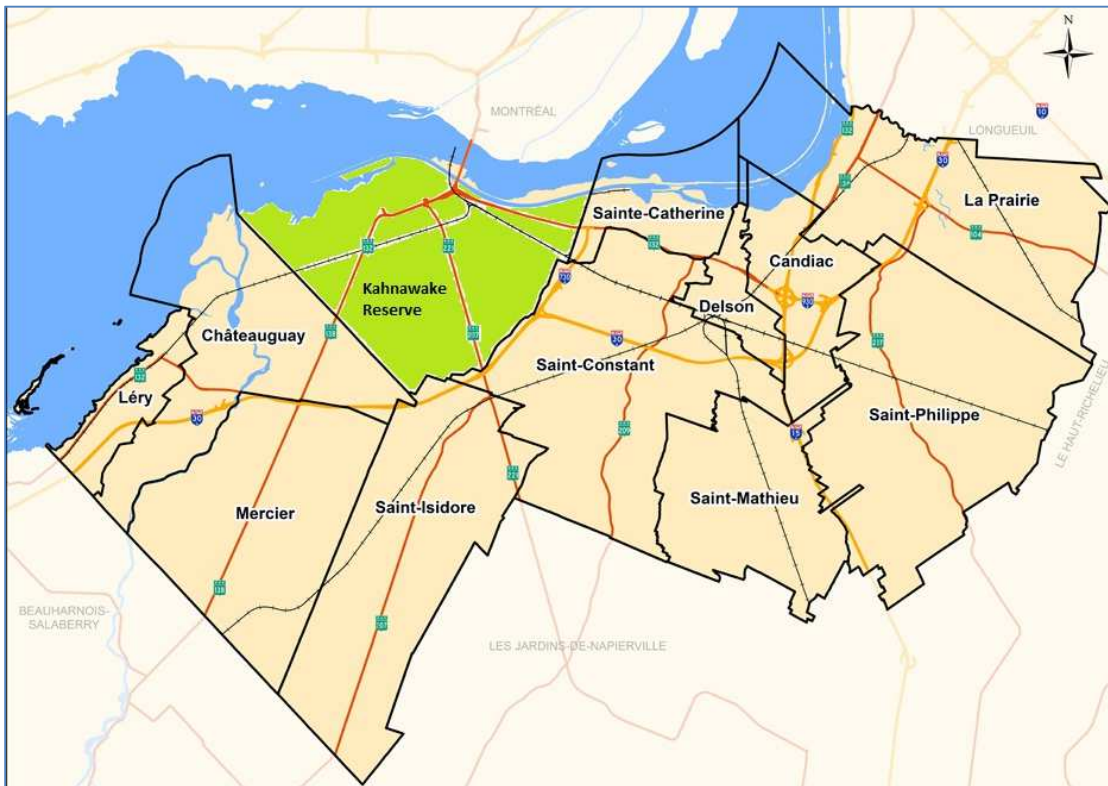
1 Geographic and socio-economic description of the community

1.1 Description of Kahnawà:ke Mohawk Territory

The Kahnawà:ke Mohawk Territory encompasses 48,5 km² and is located on the south shore of the St. Lawrence River within but not part of the MRC de Roussillon (Figure 1.1). The territory is accessible by Routes 132, 138 and 207, all of which lead to the Honoré Mercier Bridge.

Routes 132 and 138 creating both an urban and a rural area and physically divide the territory. The urban center north of the transportation arteries, referred to as the “Village Area”, is a high-density area with narrow streets making up the road network. The rural area, south of the transportation arteries, is predominately wooded with a small gravel road network. Housing development has greatly increased in this area immediately south of Route 132, and west of the Mercier Bridge.

Figure 1.1: Kahnawà:ke Territory within the MRC of Roussillon.



This development area is also densely populated and thereby creating two main residential areas within the Territory. Additional homes are located in small clusters throughout the remainder of the territory accessible by a gravel road network. There is approximately 65 kilometers of paved roads and 32 kilometers of gravel roads within the community.

1.2 Description of the community organization

The Mohawk Council of Kahnawà:ke (MCK) is the elected government which provides governmental, administrative and operational services to the community of Kahnawà:ke. Politically, Chief and Council comprise the elected body; the Office of the Council of Chiefs provides support and advisory services for the Chiefs.

As well, the MCK provides direct administrative and operational services for a number of programs, including housing, roads and infrastructure, finance, policing, a community insurance plan and much more.

Indirectly, the MCK is linked to many of the community's main organizations through the Executive Directors Committee. The Committee meets to network, to exchange information and ideas, and to improve efficiency.

The Kahnawà:ke Environment Protection Office (KEPO) is a department within the Lands Unit of the MCK Operations and Community Planning Division. KEPO is the body responsible for the waste management programs' administration, operation and fiscal management.

1.3 Community socio-economical profile

Kahnawà:ke is a Mohawk community of 10 164¹ people, of which about 2 600 are non-resident².

There are 2,421 households on the territory, primarily single dwelling homes. There are 14 duplexes and approximately 10 apartment buildings (4 units), and 5 apartment building (6 to 10 units)³. The average density is 49.9 households per square kilometer.

There are also approximately 209 businesses and 57 public institution buildings. In the absence of zoning regulations, commercial properties are dispersed throughout the residential areas.

The majority of the commercial units are small convenience stores, often attached to a residence. Those small units are similar to a family residence as far as waste generation and recycling habits go. There are two grocery stores, and many small stores, restaurants, garages, service stations, etc.

¹ According to decree no 1293-2013, December 11, 2013.

² Aboriginal population in Québec 2012, Secrétariat aux affaires autochtones.
http://www.autochtones.gouv.qc.ca/nations/population_en.htm

³ Information obtained by MCK housing

There are 56 institutional buildings on the territory with Kateri Memorial Hospital and the six schools³ being the largest. There are no industrial buildings of considerable size on the territory.

More than 80 % of dwellings are connected to the centralized water and sewage network. Five hundred and twenty (520) of the dwellings utilize individual septic systems, which include 93 commercial building.

The estimated regional population growth is at 2% over the next 5 years (0,4% per year).¹

There are many events occurring on a yearly basis within Kahnawà:ke. The largest of these events is the annual Powwow. Smaller events that take place include numerous awareness raising and fund raising events, such as the Harvest Fair, an annual Independent Living Center Community Picnic, craft fairs and various other events.

2 Existing Waste Management Infrastructure

2.1 Infrastructures within the community

2.1.1 Recycling Depot Operations

The Recycling Depot is centrally located within the village area. It is operated through the Kahnawà:ke Environment Protection Office (KEPO). Collected curbside recyclable material is transported to and sorted at the Recycling Depot. Residents and the ICI sector can also drop-off recyclable materials during opening hours: Monday to Friday, from 7 am to 3 pm. In addition, the facility has bins located within a sheltered area for after hour and holiday drop-off needs.

The Recycling depot is a 2,560 square foot garage type building used for further processing. There is no equipment, tables, or baler present. At the depot, the manually sorted material is categorized and placed in various types of 360 L bins and barrels. The material is then transported to various locations for further processing using the same vehicles that are used for curbside pick-up (Table 2.1). Depot staff consists of one supervisor and one full time employee, and an additional eight employees subsidized through the MCK Employment Enhancement Program.

¹ Institut de la statistique du Québec, Perspective démographiques, Québec et régions, 2001-2051, édition 2003 (région administrative de la Montérégie).

Table 2.1: Destination of the recyclable material, sorted at the recycling depot

Material category	Destination
Corrugated cardboard	MD Recycling (Tiru group) Chateauguay and Emballages Kruger Inc. LaSalle
Mixed paper	MD Recycling (Tiru group) Chateauguay
Mixed plastics and glass	MD Recycling (Tiru group) Chateauguay
Metal (cans and other objects)	Legault N Autos Démolisseurs Inc Sainte-Catherine
Refundable containers and beer bottles	Pepsi Company Grocery store (Beer bottles)
Clothing	Different clothing depots in Chateauguay
Electronics	Centre de recyclage électronique de la Montréal inc., Sainte-Catherine
Garbage	Regular pickup service (Matrec)

2.1.2 Transfer Depot Operation

The Transfer Depot is a drop-off Recycling/disposal facility located along the Seaway road, approximately 4.5 kilometers away from the village center. The depot hours of operation are from 8 am to 4 pm, Monday to Saturday. After operating hours, access is restricted with the use of a locked gate. Usage of this facility is available to all residents free of charge. Residential usage for household waste and commercial usage for Construction/Demolition not accepted. There are two employees at the Transfer Depot, one part time and one full time.

The installation is quite simple. There is a ramp to an elevated platform, which provided accessibility to two forty-cubic yard containers rented from Melimax for the collection of construction demolition from small home renovations. There is an additional forty-cubic yard container for the collection of scrap metal. The following items are recyclables and other items accepted at the Transfer Depot:

- Household Hazardous Waste (HHW) drop off
- Paint and other items collected through the Laurentide Re/Sources Eco-peinture program.
- Used motor oil and other items collected through the Laurentide Re/Sources SOGHU program
- Batteries (including car batteries)
- Fluo-compact and fluorescent lamps
- Metal and appliances

- Used tires (no rims or studs)
- Used cooking oil collected by Rothsay
- Bagged, fallen leaves.
- Tree and brush for chipping/composting
- Large household furniture items

Household waste is has not been accepted at the Transfer Depot since April 1st 2013.

The HHW are stored in a 12x12 concrete building. Used motor oil, residential paints and batteries are collected in bins provided by Laurentide Re/Sources. There is also a container to recover used cooking oil. Some free recovery services (ex. used motor oil and cooking oil) are also available on site for commercial use. Destinations of the recovered materials are presented in Table 2.2.

First initiated in 2011, the leaf collection is now an annual collection service, which has expanded to the collection on bales of straw and pumpkins. The Transfer depot receives and composts on site, the organics collected by the curbside collection service.

Brush and tree debris are other items accepted at the Transfer Depot with the larger logs and stumps placed inside construction demolition bins. A local contractor, at a cost to the MCK-KEPO, chips the bulk of woody debris. This material is composted on site at the transfer depot.

Collected woodchips, leaves, pumpkins, straw bales, grass clippings and yard debris are formed into windrows and turned periodically to facilitate composting. There is no estimate on the quantity of woodchips and other materials, however, there is an estimated 3 tons of leaves brought for composting each fall. The area is open to the community and receives material from spring to fall. Compost is used in the community, and an estimated 17 tons (1 x 10-wheel truckload) was removed from the transfer depot this past spring (2015).

Table 2.2: Destination of the material recovered at the Transfer depot

Material	Destination
Metal	Legault N Autos Démolisseurs Inc, Ste Catherine
Construction Debris	Melimax, sorting center
Branches	Chipped and composted on site
Tires	Recycled through the Recyc-Quebec Tire Recycling Program
Domestic paints and other products accepted by Eco-peinture	Laurentide Re-Source
Used motor & other oil products	SOGHU Program
Cooking oil	Rothsay/Laurenco
Batteries	Laurentide Re-Source
Fluorescent bulb	Recyclflu – Laurentide Re/sources
HHW	Clean Harbour

2.2 Infrastructures and organisations outside the community

There are many recyclers within the vicinity of the community. Presented in the following table are the business's main activities and accepted materials are:

Table 2.3: Main recycling company in the Kahnawà:ke area

Business company	Accepted material	Activity
Ali Excavation Inc. 760, boul. des Érables Valleyfield Tel. : 450-373-2010	Asphalt, concrete and used oil	Crunching material for reuse
Centre de Récupération GLG 437, rang St-Pierre Sud Saint-Constant Tel : 514 949-6992	Ferrous and non-ferrous metal Appliances	Metals recovery
Centre de recyclage électronique de la Montérégie Inc. 6685, route 132 Sainte-Catherine Tel : 450 632-9929 www.centrederecyclage.com	Electronic, electric, communications and computer equipment	Recycling of electronic and electric equipment
Complexe intermunicipal de valorisation des matières organiques de Beauharnois-Salaberry et de Roussillon Parc Industriel Beauharnois 450 638-1221, poste 341 www.monbiom.ca	Organic material	Biomethanation project in Beauharnois in progress. Start of operations planned for 2017

CRI Environnement Inc. 75, rue du Progrès Coteau-du-Lac Tel : 450 763-5541 http://www.cri-env.com	HHW, solvents, commercial and industrial hazardous waste	Treatment and disposal of hazardous waste
Écoservices Tria 1985, rue Jean-Marie-Langlois La Prairie Tel : 450 659-9333	CRD Waste	CRD sorting center LEDCC
Entreprises sanitaire FA Ltd (Raylobec) 325, Marie-Curie Vaudreuil-Dorion Tel : (450) 424-0060 http://entreprisesanitairefa.com	Municipal Waste	Waste transfer station; Capacity : 200 000 t per year
Industries associées de l'acier Ltd 7140, route 132 Sainte-Catherine Tel : 450 632-1881	Ferrous and non-ferrous metal, appliances, cars	Metals recovery and shredding
Lafarge Canada Inc. 1, chemin Lafarge Saint-Constant Tel : 450 632-7750	Tires	Cement manufacturer Energy recovery
Lafarge Canada 436, chemin de la Petite Côte Saint-Constant Tel : 450 638-0311	Concrete, foundation aggregates	Recycling
Legault N Autos Démolisseurs Inc 1505, des Quais Sainte-Catherine Tel : 450 632-2168	Ferrous and non-ferrous metal, appliances, cars	Metals recovery
Matrec / Saint-Hubert 5300, rue Albert-Mellichamps Saint-Hubert Tel : 450 656-2171 http://www.matrec.ca	Recyclable material from municipal curbside recycling program Municipal waste	Sorting center Waste transfer station Hauling service
MD Recycling (Tiru group) 235, Industrial Blvd. Chateauguay Tel :450 699-3425	Recyclable material from municipal curbside recycling program	Sorting center
Mélimax 224 boul. Industriel Chateauguay Tel : 450 699-9401	CRD waste, wood branches, cardboard, bricks, rocks, soil, concrete, asphalt, gypsum, asphalt shingles, metal	CRD sorting center
Newalta Corporation 1200, rue Garnier Sainte-Catherine Tel: 450 632-9910 http://www.newalta.com	Ferrous and non-ferrous metal (lead), car batteries, plastic (PP)	Recycling Manufacturing of synthetic rubber and resin

Business company	Accepted material	Activity
Newalta Corporation 125, rue Bélanger Chateauguay Tel : 450 699-9423 http://www.newalta.com	Ferrous and non-ferrous metal, hazardous waste : car batteries, pesticides, solvent.	Metals recovery
RCI Environment transfer station 112, boulevard Saint-Rémi Saint-Rémi Tel : 450 454-6904	Municipal waste	Waste transfer station Hauling service
Recyclage Equipmat Inc 166, boul. Industriel, Suite 120 Chateauguay Tel : 450 699-0329 http://www.recyclageequipmat.com	Steel structures, acoustic isolation, doors, tiles, other reusable deconstruction material Commercial equipment	Deconstruction Buy and sale of commercial equipment and building material
Recycle Gypse Québec Inc 81, boul. St Rémi Saint-Rémi Tel : 450 992-0628	Gypsum	Recycling
Rothsay/Laurencio div. Darling international Canada 605, 1 st Avenue Sainte-Catherine Tel : 450 632-3250 www.rothsay.ca	Animal products, cooking oils, cooking grease.	Recycling Bone meal manufacturer
Safety-Kleen 1455, Coulomb Boucherville Tel : 450 641-0610	Hazardous waste, solvents	Treatment and disposal of hazardous waste
Sintra Inc. (Métropole) 7, rang Saint-Régis Sud Saint-Isidore, J0L 2A0 Tel : 450 638-0172	Asphalt and concrete	Crunching material for reuse
Suntech Recycle Inc. 2955-A boul. Matte, Brossard Tel : 450 698-5757	Electronic waste	Computer and electronics recycling
Waste Management Transfer station 2457, chemin du Lac Longueuil Tel : 450 646-7870	Recyclable material Municipal waste	Sorting center Waste transfer station Hauling service

Municipal and septic sludge		
Sani Vac Inc 100, rue Huot Notre-Dame-de-l'île-Perrot Tel : 438896-1425	Municipal and septic sludge	Cleaning of septic tanks
Chayer Sanitaire 91 Rang du Cinq Saint-Stanislas-de-Kostka Tel : 1-800-567-3927	Municipal and septic sludge	Cleaning of septic tanks
Fosses septiques Sanibert 600 boul. des Érables Salaberry-de-Valleyfield 450-371-6850	Municipal and septic sludge	Cleaning of septic tanks

3 Current waste management services and practices

Residents of Kahnawà:ke have access to the services listed in Table 3.1 All services are free of charge and are further explains in the following subsection.

Table 3.1: Waste management residential services, including sludge management

Type of waste	Service	Frequency	Responsible	Destination of the material
Recyclable material	Curbside pickup service in 64 L Blue box Implemented in 1985	Once a week	KEPO	Recycling Depot in Kahnawà:ke
	Drop-off at Recycling depot	Available 7 days a week 24 hrs/day		
Leaves	Curbside pick-up service. Leaves have to be bagged in clear or orange plastic bags or in paper bags	Twice a year in the Fall. This service has been implemented since 2011	KEPO started in 2014 (Previously managed by Matrec)	Composted at the Transfer Depot (2014).
Christmas tree	Curbside pick-up service.	Once a year in early January	KEPO	Trees are binned and transported out for recycling by Melimax
Waste	Door to door service. Max 4 bags per household	Once a week	Matrec	Transfer station in St. Hubert, then sent to the Lachenaie landfill site operated by BFI
HHW	Annual collection day And Drop off service	In April / May Year-round	KEPO	Transfer Depot in Kahnawà:ke
Sludge	From wastewater treatment plant	Every week	Mélimax	Landfill site off community - BFI
	From Septic System	As needed	Sanibert	Centre de traitement Sud-Ouest Inc. (C.T.S.O.) located in Saint-Stanislas-de-Kostka.

3.1 Residential recycling services

The curbside recycling pickup service was implemented since 1993 (recycling drop off since 1985) in Kahnawà:ke. The Recycling Depot facility, operated by KEPO, provides the community with a curbside and drop-off recycling program. The program includes residential, commercial and institutional pickup once a week. The fleet consists of four pickup trucks and four trailers, which facilitates the pick-up service.

Community members use 64 liter blue recycling bins, clear garbage bags or other types of recycling bins. The blue bins can be purchased at the Recycling depot to community members at a cost that reflects the purchase price. The collection and sorting of the recyclables is a manual operation. There is little, if any, sorting at the source; the bulk of the sorting occurs during collection, and the remainder is carried out at the Recycling Depot.

The following recyclable items accepted, as announced on the web site include:

- Metal cans, aluminum foil; are
- Small metal items;
- Plastic containers (1, 2, 3, 4, 5, 7);
- Glass bottles and jars;
- Cardboard and paper;
- Plastic bags;
- Newspapers and magazines;
- Snack food/chip bag foils;
- Household Rechargeable & non-rechargeable Batteries (pack them separately);
- Cell Phones (packed separately);
- Ink Cartridges;
- Electronics (no TVs or computer monitors);
- Clean reusable clothing.

3.2 Residential composting services

Leaf collection: A curbside autumn leaf collection service was implemented in 2011 by KEPO. Leaves have to be bagged in clear or orange plastic bags or in paper bag. The amount of leaves collected has increased each year. The employees of the Recycling Depot using the operations pick-up trucks and trailers now execute the collection. Leaves are transported to and composted at the Transfer depot. Pumpkins and straw bales have been included in 2014 pick-up.

Christmas trees: A new curbside Christmas tree collection Service was implemented in January 2014 by KEPO. Matrec collected and transported the trees to a composting facility. In 2015, Recycling Depot Operation carried out the Christmas tree collection. Trees were transported to the transfer depot to be placed in a bin rented from Melimax. Lac Magentic, TAFISA decorative panels received the wood chips for further processing.

Home composting: Back yard composting is encouraged by KEPO for all homeowners, businesses and offices, and supported by composting workshops hosted by KEPO. Composting bins are not available at KEPO, however, instructions for the construction of homemade bins is readily available.

KEPO has also organized Composting/vermicomposting Workshops throughout the summer months and at the Harvest Fair and other community gathering events. In addition, Workshops are also available for local schools, and youth groups to both staff and students.

3.3 Residential waste service

KEPO has a contract with Services Matrec Inc., to service the residential solid waste pick-up. This contract recently renewed for 3 years which is based on an annual (January to December 2015, 2016 & 2017). This contract includes roadside collection, transportation and disposal of solid waste, once a week with a 4-bag limit. All homes within the territory receive this waste disposal service at no charge to the user. The St-Hubert Transfer station receives the waste and then sent to the Lachenaie landfill site operated by BFI.

Kahnawà:ke's waste collection contract includes waste produced by households only. The MCK does not contribute financially to waste disposal services for commercial enterprises, or other private waste bin contracts.

3.4 Household hazardous waste (HHW)

Household hazardous waste (HHW) is accepted 6 days a week at the Transfer Depot.

Some HHW, such as electronics, cell phones, ink cartridges, and household batteries are also collected within the curbside recycling program. These materials are sorted and transported to the Transfer Depot. These items are acceptable as dropped off items at the Recycling Depot.

KEPO also organizes an annual HHW collection event, which coincides with the Annual Kahnawà:ke Clean-up event held in April of each year. Items collected in the recycling operation's truck & trailer on site are transported to the Transfer Depot.

3.5 Industrial, Commercial and Institutional (ICI) Sector

The industrial, commercial and institutional (ICI) sectors are responsible for their own waste disposal. They usually have a contract with a private company. Waste is collected in 2 to 8 cubic yard front-load containers, rented by the service supplier. In some cases, small businesses use the residential services, since it is difficult to distinguish their waste from residential waste. However, the maximum of four bags per household applies.

On the other hand, ICI has access to the residential curbside recycling service and they are able to drop off additional materials at the Recycling Depot. The transfer depot is another location to dispose of recyclable materials free of charge.

3.6 Construction Renovation and Demolition (CRD) Sector

Construction Renovation demolition materials come from two main streams: road and public infrastructures, and buildings. Waste generated from road and public infrastructure sectors generally consist of asphalt, concrete, and fill materials (earth, gravel, sand, etc.), while waste coming from the building sector includes bricks, asphalt shingles, vinyl cladding, ceramics, plumbing, insulation, wood, glass (windows, etc.), and metal and aluminum (girders, rebar siding, doors, etc.).

CRD is acceptable at the Transfer Depot if a homeowner has completed his own small home renovation. When a contractor completes the work, however, CRD is not accepted and they are required to obtain their own bin. Construction contractors are responsible for the disposal of their residual material. Since a construction or renovation permit is not necessary on the reserve, it is difficult to estimate the quantity of waste coming from this sector. According to the Kahnawake Business Directory, there are approximately 50 businesses working in this field.

Capital Construction, a department within the MCK Technical Services, on Territory, does the road infrastructure work. In previous years, the asphalt removed from road works is used as road base by the Landfill Department. In 2014, the material was stock piled, crushed, and again reused as backfill for driveways and parking lots. Only a small fraction is used and the remainder remains stock piled. A long-term disposal solution is necessary for this material, as well as for concrete and rocks.

The 2015 Interim Landfill Policy for Clean Soil contains many rules concerning land filling with Landfill material defined as uncontaminated, non-water soluble, non-decomposable, inert material. Uncontaminated soil and gravel is accepted. The Interim Landfill Policy for Clean Soil (APPENDIX 2) provides procedures to monitor landfill material coming into the community as well as the monitoring of landfill material moving from one area of the community to another.

3.7 Waste Water and Sludge Sector

3.7.1 From wastewater treatment plant

The Kahnawà:ke wastewater treatment facility was re-built in 2003. It is located near the community center, along the St Lawrence Seaway canal, with more than 80 % of dwellings in the community connected to the sewage and water network.

The average flow rate is approximately 14 000 m³ per day. The plant is equipped with a dewatering press and the biosolids are free of industrial contaminants since there is no heavy industry operating on the territory. The weekly average tonnage of sludge hauled away is 9 tons/week (468 tons/year), with an average solid content of 34 %¹.

The sludge, currently hauled away by Melimax, is sent to BFI landfill site located outside the community.

A sludge analysis performed in December 2012 determined it could be recycled for agricultural use. The study concluded that the sludge is suitable for agricultural recycling with additional treatment to reduce the amount of pathogen, and to decrease odours. However, some further investigation is underway to find a farm that can accept the material without further treatment.

3.7.2 From individual septic system

There are approximately 552 individual septic systems on the Kahnawà:ke territory, including 94 for commercial and institutional building².

In the rural area of the community, the sanitary treatment systems usually consist of a septic tank connected to a leaching pit. The Technical Services Unit (the engineering department of the community) maintains an Inventory of the individual septic tanks since 1988. They are also responsible for the construction of new installations.

Sanibert, in Valleyfield, contracts the residential Septic cleaning on an «as needed» basis while Sanivac of Ile Perrot empties the lift stations. The EPA data management tool called "TWIST" The Wastewater Information System Tool is in the process of being modified and considered for recording the date of cleaning and other information. The sludge brought to the Centre de traitement Sud-Ouest Inc. (C.T.S.O.) located in Saint-Stanislas-de-Kostka, undergoes dehydration treatment and agricultural use.

¹ Peter Stacey, email as on February 15, 2013.

² Housing Inventory 2015, updated by Harold Skye as of March 18, 2015.

All residents of Kahnawà:ke are eligible for a one-time service connection at a cost of a \$500 for the water hook-up and sewage disposal services connected to the centralized system. In addition, there is an annual maintenance fee of \$59 to cover both of these services. In the rural areas, this installation fee covers septic system installation and maintenance and drinking water systems (submersible well pump, pressure tanks, water softeners, chlorine systems) and maintenance. Those who require a second installation require installation and servicing at their own cost.

3.8 Other type of waste

Street sweeping residues: Street sweeping occurs once a year during the spring or early summer. The sweeping residues, mostly sand, are sampled for PAH, PH and metals analysis, and depending on the results, the material is either re-used or disposed of at a licensed site. Last year, Récupération Mario Hart in Valleyfield recovered the material.

Events: Recycling encouraged at annual community events such as, Powwow, which could host up to 10 000 visitors over a two-day period; and other local events such as Young Adult community Fun Fair; MCK Picnic; and other fund raising or awareness raising events. This new Service offered to community event organizers assist organizers to incorporate recycling as part of the waste disposal needs. KEPO has purchased event recycling units and loan out these units to event coordinators.

4 Current administration of waste management

Kahnawà:ke maintains full waste management responsibilities and does not share any responsibilities with the neighbouring municipalities or MRC. KEPO is the responsible department for waste management within Kahnawà:ke. KEPO is responsible for the management and administrative duties related to solid waste disposal, recycling and transfer depot operations and organics management. KEPO also is responsible for all community outreach, educational events, and the development and distribution of educational materials.

4.1 Bylaws and regulation

KEPO operates within the framework of Kahnawà:ke's environmental legislation, which includes the Sanitary Conditions Law, and the Interim Landfill Policy for Clean Soil. The statutes outline waste management rules relating to landfills, refuse accumulation, collection and disposal, and associated penalties for non-conformity (Table 4.1).

Table 4.1: Bylaw and regulation regarding waste management

Title	Date	Subject
Kahnawà:ke Sanitary Conditions Law	Enacted on April 1968. Last amended April 2012	Prohibit accumulation of refuse Establish rules for collection, disposal and destruction of refuse Obligation to have an operating permit for landfill or demolition waste recycling activities
Landfill policy for clean soil and Landfill procedures for clean soil	Last amended June 2015	Ensure that the necessary procedures are in place to eliminate any risk of environmental contamination associated with landfill operations (the process of moving landfill material from a source site to a receptor site for remedial purposes). Monitoring and testing procedure for material moved to and from sites within the Territory, and for excavation material brought into the Territory of Kahnawà:ke.

4.2 Agreements and contracts

Since the community executes recycling operations in general, there are just a few agreements and contracts with external contractors regarding waste management. Contracts and agreements are presented in Table 4.2.

Table 4.2: Agreements with external contractors for waste management services

Contractor	Duration	Subject
Services Matrec Inc.	3 years on an annual renewal basis (January to December 2015, 2016 & 2017)	Roadside collection and transportation & disposal of residential solid waste.
Melimax	No contract, only pricing agreement	Transfer Depot Bins
Sanibert	NA	On-call agreement
Soghu Laurentide Re-Source Recyc-Fluo	NA	Agreement for being a drop-off point

4.3 Awareness raising and other initiatives

KEPO continues its efforts to educate and raise awareness among the community to encourage and support positive lifestyle changes that help further reduce negative environmental impacts. The main initiatives listed below include:

- Distribution of information and educational materials on what is recyclable is done during major events such as, Kahnawà:ke Clean-up events (April) Tree Give-way (May), Creek Clean-up (September) and Annual Harvest Fair (October). Examples of educational material include composting booklet, Waste Newsletter, etc.
- KEPO-MCK web site provides updated information on services, facility and contact information.
- A waste management booklet developed to provide information on all available services, and include an annual events listing, information on proper recycling and composting, and new initiatives and services at Transfer Depot.
- A Recycling signboard installed at the local arena to promote recycling.
- An events recycling booklet is also being developed.

Available media:

There are different ways to inform Kahnawà:ke's population:

- MCK Communications Unit
- Kahnawà:ke web site : <http://www.Kahnawake.com/>
- Onkwarihwa'shón:'a Newsletter : published twice a year by the Mohawk Council of Kahnawá:ke
- Online survey
- Mass mailing list: People have to register to receive up-to-date news release, public service announcements and community information from the MCK.

Kahnawá:ke media consists of radio, newspaper and television outlets that are independent from the MCK.

- The Eastern Door newspaper (www.easterndoor.com)
- Iorí:wase - Kahnawà:ke News (www.Kahnawakenews.com)
- K103 Radio - (www.k103radio.com)

5 Waste management results

5.1 Municipal waste

The following table describe the quantity of municipal residual material collected from all of the services. Statistics from KEPO for the year 2014-2015 (April to March) are then compared with the data from the inventory tools provided by Recyc-Quebec (Table 5.1).

Table 5.1: Type and quantity of residential residual material collected in Kahnawà:ke in 2014-15.

TYPE OF MATERIAL	Data from KEPO	Data from Recyc-Quebec Tool		
	Recycled (t)	Recycled (t)	Waste (t)	Generated (t)
RECYCLABLE MATERIAL				
Paper and Cardboard	292.86 t ¹	410 t	147 t	557 t
Metal	12.98 t	28 t	32 t	60 t
Plastic	386.42 t ²	66 t	123 t	189 t
Glass		111 t	38 t	150 t
Returnable containers	22.55 t ³	38.8 t	13.1 t	51.8 t
TOTAL	714.81 t	653.8 t	353.1 t	1007.8 t
ORGANIC MATERIAL				
Branches and Christmas trees	2.91 t ⁴	2 t	0 t	2 t
Leaf and Yard Waste	3.01 t	11 t	405 t	416 t
Food residues (home composting)	10 t	10 t	478 t	488 t
Other organic waste	0 t	0 t	315 t	315 t
TOTAL ORGANICS	15.92 t	23 t	1 198 t	1 221 t
END OF LIFE VEHICLES	Nd	354 t	0 t	354 t
TIRES	12.06 t⁵	71.8 t		71.8 t
TEXTILES	14.5 t⁶	25 t	82 t	107 t
OTHERS				
Residues from sorting center		0 t	53 t	53 t
• <i>Sorting center</i>	0 t	0 t	53 t	53 t
• <i>Treatment of organic material</i>	0 t	0 t	0 t	0 t
Household Hazardous Waste (HHW)	5.66 t ⁷	-----	4 t	4 t
Large Waste		166 t	32 t	198 t
• <i>Ferrous</i>	18.06 t ⁸	166 t	15 t	182 t
• <i>Non-ferrous</i>		-----	17 t	17 t
TOTAL OTHER	23.72 t	237.78 t	88 t	255 t
END WASTE	1 682 t⁹		14 t	
TOTAL (without Sludge)	2 463.01 t	1 293.6 t	1 736.1 t	3 016.6 t

¹ Cardboard Only

² Including paper, plastic and glass, excluding refundable containers.

³ Recycled through the curbside recycling program

⁴ Christmas trees only, in 2014

⁵ Collected at the Transfer Depot

⁶ An estimation from 1279 bags X 25 pounds per bags.

⁷ Report from Laurentide Resource for year 2014

⁸ Metal recovered at the Transfer Depot

⁹ This number refers to the quantity of waste collected door to door and sent to a landfill, according to MDDELCC, for year 2014-5. This is not only "end waste".

5.2 Municipal Sludge

Municipal sludge amounts are at 500 to 645 tons, on a wet base (20% of solid content). About 155 tons of the estimated amounts come from the septic tank system, according to Recyc-Quebec inventory tool (Table 5.2). The sludge from the treatment plant is roughly 340 tons per year¹ with an average solid content of 34 %. The amount converts to 20 % of solid content within the table for comparative purposes. The sludge continues to be landfilled while waiting for an agricultural use approval.

Table 5.2 : Municipal sludge generated in Kahnawà:ke , according to Recyc-Quebec Inventory tool at 20% solid content).

MUNICIPAL SLUDGE	Recycled	Waste	Generated
Municipal sludge from mechanized sewage treatment plant	N.A.	340 wmt	340 wmt
Municipal sludge from aerated lagoon	N.A.	N.A.	N.A.
Sludge from septic tanks	155 wmt	N.A.	155 wmt
TOTAL	155 wmt	340 wmt	495 wmt
TOTAL (estimated by the tool from population)	224 wmt	419 wmt	643 wmt

5.3 ICI waste

Recyc-Quebec's inventory Tool calculated type and the amount of waste generated and recycled from the ICI sector (Table 5.3). The data from the Monteregie region was used to populate the tool. However these data are not representative of the Kahnawà:ke ICI reality, because there are only small stores on the territory and there is no industry. The data from the MDDELCC website shows that in 2013, only 442 tons of ICI waste has been disposed of.

On the other hand, most of the cardboard and other recyclable materials from ICI are collected within the residential stream. Therefore, it is not possible to quantify the amount coming from the ICI Sector.

¹ Estimated from data collected from October 2014 to April 2015.

Table 5.3 : Inventory of ICI Waste, according to Recyc-Quebec Inventory Tool.

TYPE OF ICI WASTE	Recycled (t)	Waste (t)	Generated (t)
Paper and Cardboard	708 t	560 t	1 268 t
Metal	64 t	77 t	141 t
Plastic	62 t	290 t	352 t
Glass	34 t	82 t	115 t
Residues from Food Processing Industries	1 699 t	37 t	1 736 t
Sludge from Pulp and Paper Mill	0 t	0 t	0 t
Yard Waste	0 t	72 t	72 t
Food Waste	0 t	504 t	504 t
Other Organic Waste	0 t	105 t	105 t
Other Marine Waste			
Sands from Foundry			
Dust from Cement Plant			
Drilling Mud			
Steel Slag			
Lime Dust			
Other Lime Residues			
Ashlar			
Other Waste			
Residues from ICI recyclable sorting center	0 t	74 t	74 t
Residues from ICI organics treatment	0 t	0 t	0 t
Residues from metal recyclers (Bulky and End of Live Vehicles)	0 t	244 t	244 t
End Waste	0 t	66 t	66 t
TOTAL	2 566 t	2 111 t	4 677 t

5.4 CRD waste

Construction permits are currently not required on the reserve. It is therefore difficult to estimate the quantity of CRD waste generated from Recyc-Quebec's tool. However, Kahnawake housing programs invested \$4,120,302 in construction and renovation projects. This amount does not include other works done either exclusively through the bank or in the absence a loan. This partial estimate was used in the Recyc-Québec tool to estimate the amount of CRD waste (Table 5.4)

The bins at the Transfer depot are for construction renovation and demolition, but for individual homeowners only. In the fiscal year 2014-15, 441 tons of material was collected. Contractors are required to dispose of waste using other means, and no data is available. The data from the MDDELCC website shows that only 16 tons of CRD waste from Kahnawà:ke has been disposed of in 2013. The amount of material sent to a recycling center is unknown.

Table 5.4 : Inventory of CRD Waste, according to Recyc-Quebec Inventory Tool (Partial data)

TYPE OF CRD WASTE	Recycled (t)	Wasted (t)	Generated (t)
Aggregate	834 t	52 t	886 t
Gypsum	2 t	50 t	52 t
Asphalt Shingles	5 t	42 t	47 t
Other	0 t	43 t	43 t
Construction wood	198 t	110 t	307 t
Industrial processing wood residues	0 t	0 t	0 t
TOTAL from residential works (partial)	1 039 t	297 t	1 336 t
Other known data			
CRD collected at Transfer Depot (2014-15)	441 t		
CRD eliminated according to MDDELCC (2013)		16 t	

6 Identification of challenges and issues

Some actions planned in the first PGMR have been implemented, while others are still pending (see Annual progress Report for Redevance Funding in appendix 3).

The main issues identified in the Kahnawà:ke waste management programs are presented below. These will need to be addressed in the present action plan in order to comply with the Quebec waste management Policy.

A. Organic material

One of the main priorities is the valorization of the organic material. Currently, leaves, pumpkins, straw bales are collected twice a year and Christmas trees are collected and recycled once a year. These items as well as grass clippings and brush are accepted and dropped off at the Transfer Depot. In addition, many community residence and a few institutions do back yard composting, however the percentage has not been calculated.

A survey is necessary to determine the number of homes and institutions that are currently composting, how the existing services are being used, and what improvements could be made. This information is necessary to evaluate the need for a curbside collection program or other initiatives that would be required to achieve Quebec objectives for organic material.

B. Municipal sludge

Municipal sludge is currently sent to landfill. This sludge has been deemed appropriate for agricultural use in limited applications. Additional processing to reduce odour would increase marketability. KEPO is currently investigating agricultural applications for the sludge in its current state. Once a suitable location is found, an application will be submitted to the ministry.

C. Septic tank sludge

Septic systems are not emptied on a regular basis; this may lead to malfunctioning and clogging of spill pit, which will then have to be replaced at high cost. There is some record keeping of the septic tank cleaning, but there is a lack of information about the installations built before 1988, and compliance status. There is no annual report completed on the number of systems cleaned, and the volume of sludge vacuumed. KEPO is currently working with other MCK Departments to improve maintenance procedures and reporting for septic systems.

D. Recycling program

The cost of the curbside recycling program is relatively high due to manual hauling and sorting of materials. As well, the measure of certain types of recovered material is difficult to determine with the lack of a weighing scale. Implementation of a monitoring and tracking system is necessary to improve statistical data and to identify any progress and weaknesses. The efficiency (cost vs. quantity) of the recycling program also requires improvement.

E. Transfer depot services

The Transfer depot serves as an eco-center facility. It is located outside of the main village area making accessibility difficult for some residents. Residential clients have access to this free service, and non-residences have limited access, such as for hazardous material collected by Re-sources Laurentide.

An improvement on statistics, quantity of recovered material and number of users, is necessary as the information is not systematically counted or compiled. It is therefore difficult to have accurate statistics, and to follow trends of use.

A number of waste items are accepted at the Transfer Depot, but those excluded include CRD waste from contractors, including concrete, brick, and cinderblocks. Services offered may be expanded to include CRD waste, and increased accessibility for the ICI

and CRD sectors with the development of a Usage fee. Finally, improvements on the data collection are under review.

F. Data collection

There is no comprehensive and centralized system in place to keep track of all of the waste management statistics. Some information is easily available from recyclers or collectors. However, there is no statistical data on clothes and refundable containers. A system has to be developed and a person has to be responsible for data gathering and compilation.

G. ICI Waste and Recycling

The community does not have any data on waste management in the ICI. Almost all businesses have their own waste removal contract. An exhaustive inventory is necessary to better gauge the challenges and issues of this sector. It will then be possible to give them access to a proper recycling program, if appropriate, or inform them about better alternatives to manage their waste.

H. Recycling for CRD Residues

Asphalt and concrete from road infrastructure have been re-used or stored to date, but more sustainable solution is being investigated. Reuse or recycling of other aggregates such as bricks and rocks are also an issue.

It will also be important to find a recycling solution for wood infested with emerald ash borer.

I. Communication plan to ICI and CRD

There is no specific communications plan for the ICI and CRD sectors. They are probably not well informed about the available recycling programs and resources. They also have to be made aware of the future recycling/waste reduction objectives set by the ministry.

J. Illegal Dumping

Illegal dumping occurs in the community within the isolated areas. It is an ongoing and recurrent issue, and is perpetrated by both non-community and community members. A variety of items can be found, but the majority of the items include large household furniture and CRD. Individuals caught receive tickets, and are responsible to clean up the debris. Increased patrols of the area act as a deterrent, however additional measures are necessary

K. Eligibility to some programs

Kahnawà:ke's community is offered only a reduced grant or is totally ineligible to funding programs, such as the PTMOBC and "programme de compensation pour la collecte selective" even though Kahnawà:ke offers a door-to-door recycling program, similar to other neighbouring communities.

The Recycling compensation program; paid entirely by the companies and organizations that market containers, packaging and printed material in Quebec; aims to compensate municipalities for the costs associated with the recovery and reclamation of residual material. The community of Kahnawake buys and disposes of the same material as the rest of the population of Quebec. Therefore, the ineligibility of Kahnawà:ke's community goes against the purpose of the Regulation and the spirit of the program, which is to finance the net costs of municipal curbside recycling to recover and reclaim "containers and packaging" and "printed matter."

Political representations are necessary. The MCK is requesting the province to reconsider of this decision and adopt the necessary measures to allow the MCK access to the recycling compensation program as is provided to other municipal entities in the short term. Longer term, MCK is also asking that the necessary amendments to the Regulation be made in order to explicitly include First Nations so as to eliminate this inequity.

7 Objectives and guidelines

The Quebec residual material policy seeks to create a waste-free society that looks to maximize benefit through intelligent management of its residual materials. The main goal of the Policy is as follows:

- Make end waste the only residual material sent for disposal in Québec.

End waste is the waste that results after residual materials have been sorted, processed, and reclaimed and cannot be processed any further under existing technical and economic conditions to extract reclaimable content or reduce its polluting or hazardous character.

The Policy applies to all residual materials generated by Quebec households, industries, businesses, and institutions, including those produced by construction, renovation, and demolition (CRD) activities. These residual materials also include municipal and industrial sludge and out-of-service vehicles and their waste. The Policy also applies to household hazardous materials.

The intermediate quantitative goals of the first action plan are as follows:

By the end of 2015:

- Reduce the quantity of residual materials sent for disposal to 700 kilograms per capita, 110 kilograms less per capita than in 2008;
- Recycle 70 % of paper, cardboard, plastic, glass, and metal waste;
- Process 60 % of organic putrescible waste;
- Recycle or reclaim 80 % of concrete, brick, and asphalt waste;
- Sort at the source or send to a sorting center 70 % of construction, renovation, and demolition waste from the building segment.

This action plan also plans to ban the disposal of organic material. The intermediate target timelines are:

- paper and cardboard by 2013,
- wood by 2014,
- all organic material by 2020.

These goals represent a national average to which everyone must contribute. Each residual materials management plan must include measures that are compatible and that will ensure achievement of all goals in the area covered by the plan.

There are additional objectives stated in the *Regulation respecting the recovery and reclamation of products by enterprises* for many products such as paint, oil, electronics, batteries, and mercury lamps. The Quebec Government will eventually add more products.

7.1 Kahnawà:ke objectives

Based on the Quebec objectives and the main issues described in the previous chapter, the main goals of the community of Kahnawà:ke are the following:

1. Reduce by 30% the volume of residential solid waste sent to landfill.
2. Recover 60 % of organic material, through home composting initiatives and organic collection service.
3. Recycle 100 % of municipal biosolids (municipal and septic tank sludge).
4. Improve efficiency of the recycling program in order to recycle 70 % of paper, cardboard, plastic, glass, and metal.
5. Improve efficiency of other recycling programs, especially for household hazardous waste (HHW), electronics, and textile.
6. Recycle 70 % of CRD waste (including wood) coming from the building segment and infrastructure works.
7. Enhance information and awareness about waste recovery services and programs for residential, ICI and CRD sectors.
8. Improve data collection system for all type of residential, ICI and CRD residual materials.

8 Proposed action plan, including cost and schedule

In order to achieve these goals, it is important to pursue an action plan that will involve all parties involved, which include residents, the ICI and the CRD sectors, as well as the community's administration.

The action plan presented below identifies each objective, the lead agency, the time line and an estimated cost. Much of the information on education measures are listed under the objective 7, even if they contribute to achieve other objectives.

1. Reduce by 30% the volume of the residential solid waste sent to landfill.				
No	Actions	Target sector and issue	Responsible	Schedule
1.1	Evaluate the possibility to reduce waste collection frequency to once every two weeks after implementation of the curbside organic collection program, or other recommended process identified following the completion of a survey. This action aims to encourage people to further use the recycling program and therefore reduce their waste.	Residential	KEPO	2019-20
2. Recover 60 % of organic material, through home composting initiatives and organic collection service.				
2.1	Maintain backyard composting and grass-cycling and mulching program , through community workshops and at community events	Residential Issue A	KEPO	Every 2 years
2.2	Conduct a survey on the number of homes & ICI buildings that currently compost , that with the number of persons per house will allow us to extrapolate the current organics diversion tonnage. This survey would also evaluate how the existing services are used and how they could be improved.	Residential Issue A	KEPO and a student	2016
2.3	Continue to expand on the community composting pilot project that exists at the transfer depot - leaves, pumpkins, woodchips, yard clippings (small branches). Expansion will include increased frequency in turning of compost, increase in the material types accepted, and an increase in the quantity of incoming materials.	Residential Issue A	KEPO	Yearly
2.4	Evaluate the possibility of offering a source separated organics pick-up service , after the survey (2.2). The organic material could be sent to the new Bio-methanation plant in Beauharnois, when in service. This service could also be offered to the ICI sector, depending on the survey results (measure 2.2).	Residential Issue A	KEPO	2017
2.5	Inform and make the population aware of the organic recovering program. Organization of information session to explain the new program: why implementing the program, acceptable materials, how to reduce potential problems, and other change to come: reduction of waste collection frequency. Publication of all the information on the web site, on radio, TV and other medias.	Residential Issue A	KEPO	2016 and every 2 years

3. Recycle 100% of municipal biosolids				
No	Actions	Target sector and issue	Responsible	Schedule
3.1	<p>Recycle municipal sludge for agricultural use, with or without additional treatment. A contract will be signed with a company who will be in charge to find users for agricultural recycling. This company will also make sure that all the required authorizations are obtained; and the sludge application is done according to standards.</p>	Municipal sludge Issue B	KEPO	2016 and on
3.2	<p>Implement a septic tank cleaning program on a regular basis, based on needs (number of people and volume of the tank) database. The existing electronic registry will be improved to identify and quantify all septic systems within the community. Information such as location, capacity, last cleaning date, and functioning status will be compiled for each of them.</p> <p>Valorization of sludge will be required in the cleaning contract/ agreement. If the wastewater treatment plant is not used to its full capacity, the possibility to discharge the septic sludge at the treatment plant will be evaluated.</p>	Residential and ICI septic sludge Issue C	A student in conjunction with Martin Morris , Infrastructure Operations Maintenance Manager & KEPO	2018
3.3	<p>Develop a small booklet on appropriate septic system maintenance. This booklet will then be sent to all owners of an individual septic system, and publicized on the MCK website.</p>	Residential and ICI septic sludge Issue C	KEPO	2017

4. Improve efficiency of the recycling program in order to Recycle 70 % of paper, cardboard, plastic, glass, and metal				
No	Actions	Target sector and issue	Responsible	Schedule
4.1	Buy a rear load garbage truck in order to improve recyclable collection efficiency. Find solutions to recover valuable material (pop cans), and material currently collected but not accepted at the sorting center (clothes, electronics, batteries, etc.), and communicate changes.	Residential ICI Issue D	Public Work	2016
4.2	Collect cardboard separately and emphasize information to ICI in order to collect more.	Residential ICI Issue D	Public Work	2016
4.3	Purchase one hundred (100) of 360-liter bins for recyclable material for a pilot project. Evaluate how people respond to this new bin and how it affects quantity recovered. Depending on the results, phase in a bin replacement subsequent years.	Residential ICI Issue D	KEPO	2017 2018-2020
4.4	Install recyclable collection bins during community events: Powwow, Young Adult community Fun Fair, MCK Picnic, and other community events. This is a new service to be offered to community event organizers. A service offering has to be developed to assist event coordinators to incorporate recycling as part of the waste disposal needs.	Public Events Issue D	KEPO	Yearly
4.5	Install recycling bins in public areas , such as the community services building, sports fields, arena, and install a board to promote recycling.	Public areas Issue D	KEPO	2018-19
4.6	Continue political process in order to be eligible to the Quebec recycling funding programs. This new money would then help to improve the recycling program.	Political Issue K	MCK	In progress

5.	Improve efficiency of other recycling programs, especially for household hazardous waste (HHW), electronics and textile.			
No	Actions	Target sector and issue	Responsible	Schedule
5.1	Install an electronics drop-off point in collaboration with Electronic Products Recycling Association (EPRA) at the Transfer Depot or other convenient area. Inform people of the new service.	Residential ICI Electronics	KEPO	2016
5.2	Identify safe area where collection bin for small HHW (ex. Batteries, etc.) could be installed.	Residential Some HHW	KEPO	2017
5.3	Hold three seasonal HHW collection events – pick up days. There is already one pick up day per year. 2 events will be added in the summer and the fall in order to collect more material.	Residential HHW	KEPO	2016 (1/yr) 2017 (2/yr) 2018 (3/yr)
6.	Recycle 70% of CRD waste coming from the building segment and infrastructure work.			
No	Actions	Target sector and issue	Responsible	Schedule
6.1	Accept CRD waste from contractors at the Transfer Depot (with appropriate tipping fee). Implement a procedure to estimate the amount of incoming CRD waste, and conceive a pricing list based on volume and type of material.	CRD Issue E & J	KEPO	2019
6.2	Prepare a directory of available resources for CRD Waste recycling and disseminate the information to contractors and the population.	CRD Issue H, I, J	KEPO	2017
6.3	Find a recycling solution for asphalt and concrete residues from all road infrastructure work. Other solutions may have to be found for other materials such as wood infested by Emerald ash borer, or others) A registry has to be developed to keep track of the recycling statistics.	CRD Issue H	KEPO and Capital	2016 (solutions) 2020 (registry)

7. Enhance information and awareness about waste recovery services and programs for residential, ICI and CRD sectors				
No	Actions	Target sector and issue	Responsible	Schedule
7.1	Enhance communication Plan. Improve diffusion of information concerning waste recovery services and programs for residential, ICI and CRD sectors: Up-graded Web site, distribution of information and educational materials on what is recyclable during annual events, etc.	Residential ICI CRD Issue G, I, J	KEPO	2016 and actions every year
7.2	Create a waste management booklet to provide information on all available services, annual events listing, do's and do not's of recycling and composting, new initiatives and services at Transfer Depot, drop-off points, special collection day, 3R approach, etc. Update as needed.	Residential Issue A, D, E, J	KEPO	2017
7.3	Organize educational workshops in schools and for youth to promote recycling and composting programs to the students.	Schools and youth groups Issue A, D	KEPO	2016 and yearly
7.4	Conduct a survey to identify the needs of the ICI to improve waste management, and how the community could help them to reach the objectives.	ICI Issue G, J	KEPO and a student	2017
7.5	Promote recycling program to the ICI sector. Inform them about all the accepted items, and the procedure for larger quantity. Create an "ICI package" based on the needs identified in action 7.4. This package will include information on waste diversion options and available programs.	ICI Issue G, I, J	KEPO	2019

8. Improve data collection system for all type of residential, ICI and CRD residual material.				
No	Actions	Target sector and issue	Responsible	Schedule
8.1	Improve data collection for recyclable materials. Buy a floor weighing scale for accurate results for material that is not otherwise weighed (refundable bottles and clothes for example).	Residential Issue D & F	KEPO	2016
8.2	Improve data collection at the Transfer Depot: number and category of users, quantity and type of recovered material, etc. Develop an electronic database for collection of the information.	CRD Issue E & F	KEPO	2016
8.3	Create a centralized database where all recycling, composting, and waste management data will be compiled by type of material, destination, and category of users. This will be helpful to follow improvement in the waste management system in the community, and to identify progress and areas for improvement.	All Issue F	KEPO	2017
8.4	Make an inventory of all ICI and the waste management services they use, including size and type of containers and collection frequency. This will draw a big picture of what is currently done and what could be improved. This inventory could then be used to estimate the amount of residual material generated by the ICI sector.	ICI Issue G	KEPO	2019-20
9. Monitoring and follow-up measures				
No	Actions	Target sector and issue	Responsible	Schedule
9.1	Prepare an annual report on recycling and waste disposal in order to see progress and trends. Keep population informed about the results to encourage them to continue their efforts.	Residential	KEPO	Yearly
9.2	Prepare an annual progress report of the waste management activities, transmit it to the MDDELCC and make it available on the MCK Web Site.	All	KEPO	Yearly
9.3	Update the PGMR	All	KEPO	2020

9 Cost, schedule and revenues

All cost calculations are explained in appendix 1. It is only a rough estimate, made from the assumptions presented in the appendix. The inflation rates, variation of the population, and other factors have not been considered in order to reflect the impact of each action, as compared to the current state. Obviously, many factors and choices among many options may influence costs.

No	Actions	Current	2016	2017	2018	2019	2020
1.1	Evaluate the possibility to reduce waste collection frequency to once every two weeks	\$ 304 317	\$ 304 317	\$ 304 317	\$ 304 317	\$ 304 617	\$228 000
2.1	Maintain backyard composting and grasscycling and mulching program , through community workshops and at community events.	\$750	\$750	-	\$750	-	\$750
2.2	Conduct a survey on home composting and composting programs.	-	\$ 4 000	-	-	-	-
2.3	Continue and expand the pilot project community composting existing at the transfer depot – leaves, pumpkins, woodchips, yard clippings, Christmas tree.	\$1 645	\$1 685	\$1725	\$1 765	\$1 805	\$1 845
2.4	Evaluate the possibility of offering a source separated organics pick-up service , after the survey (2.2). The organic material could be sent to the new Bio-methanation plant in Beauharnois, when in service.	-	-	\$1 500	Bins \$110 000 to \$190 000	Collection treatment \$ 126 000 to \$171 000	\$120 000 to \$165 000
2.5	Inform and make the population aware of the organic recovering program – information session. Publication of all the information on the web site, on radio, TV and other medias.	-	\$ 1 500	\$750	\$1 500	\$750	\$1 500

No	Actions	Current	2016	2017	2018	2019	2020
3.1	Recycle municipal sludge for agricultural use, with or without additional treatment.	\$28 805	\$22 000	\$22 000	\$22 000	\$22 000	\$22 000
3.2	Implement a septic tank cleaning program on a regular basis, based on needs (number of people and volume of the tank). Improve existing electronic registry . Require valorization of sludge in the cleaning contract/agreement.	\$10 000	\$10 000	\$10 000	\$49 500	\$45 500	\$45 500
3.3	Develop a small booklet on appropriate septic system maintenance.			\$2 150			
No	Actions	Current	2016	2017	2018	2019	2020
4.1	Buy a rear load garbage truck Find solutions for some materials and communicate changes.	\$ 441 994 ¹	\$84 100	\$82 000	\$82 000	\$82 000	\$82 000
4.2	Collect cardboard separately, and emphasize information to ICI in order to collect more.		\$20 475	\$20 475	\$20 475	\$20 475	\$20 475
4.3	Purchase one hundred of 360-liter bins for recyclable material for a pilot project. Evaluate how people respond to this new bin and how it affects quantity recovered. Depending on the results, phase in a bin replacement subsequent years.			\$8 000	\$47 000	\$47 000	\$47 000
4.4	Install recyclable collection bins during community events: This is a new service to be offered to community event organizers. A service offering has to be developed to assist.	\$1 825	\$1500 + \$350 bins \$1 825	\$1 500	\$1 500	\$1 500	\$1 500
4.5	Install recycling bins in public areas (10 recycling units in 2 years).	-	-	-	\$ 4 000	\$4 000	-
4.6	Continue political process in order to be eligible to the Quebec recycling funding programs. This new money would then help to improve the recycling program.	Political contact					
5.1	Install an electronics drop-off point in collaboration with Electronic Products Recycling Association (EPRA) at the Transfer Depot or other convenient area.	-	\$450	\$900 paid by program	\$900 paid by program	\$900 paid by program	\$900 paid by program
5.2	Identify safe area where collection bin for small HHW (ex. Batteries, etc.) could be installed.	-	-	\$1 950			
5.3	Hold three seasonal HHW collection events – pick up days.	\$2 840	\$2 840 (1/yr)	\$5 680 (2/yr)	\$8 520 (3/yr)	\$8 520 (3/yr)	\$8 520 (3/yr)

¹ Net cost of collection of recyclable materials (2013-2014)

No	Actions	Current	2016	2017	2018	2019	2020
6.1	Accept CRD waste from contractors at the Transfer Depot (with appropriate tipping fee). Implement a procedure to estimate the amount of incoming CRD waste, and conceive a pricing list based on volume and type of material.	-	-	-	-	\$2 100	-
6.2	Prepare a directory of available resources for CRD Waste recycling and disseminate the information to contractors and the population. Update every other year.	-	-	\$1 500	-	\$900	-
6.3	Find a recycling solution for asphalt and concrete residues from all road infrastructure work. Other solutions may have to be found for other materials such as wood infested by Emerald ash borer, or others) A register has to be developed to keep track of the recycling statistics.	-	\$300	Recycling cost	Recycling cost	Recycling cost	\$1 050 + Recycling cost
No	Actions	Current	2016	2017	2018	2019	2020
7.1	Enhance communication Plan. Improve diffusion of information concerning waste recovery services and programs for residential, ICI and CRD sectors: Up-graded Web site, distribution of information and educational materials on what is recyclable during annual events, etc.	\$2 100	\$8 400	\$8 400	\$8 400	\$8 400	\$8 400
7.2	Create a waste management booklet , Update as needed.	-	-	\$5 150	-	-	\$1 050 update
7.3	Organize educational workshops in schools and for youth to promote recycling and composting programs to the students.	-	\$750	\$750	\$750	\$750	\$750
7.4	Conduct a survey to identify the needs of the ICI to improve waste management and how the community could help them to reach the objectives.	-	-	4 000 \$	-	-	-
7.5	Promote recycling program to the ICI sector. Create an “ICI package” based on the needs identified in action 7.4. This package will include information on waste diversion options and available programs.	-	-	-	-	2 100 \$	-

No	Actions	Current	2016	2017	2018	2019	2020
8.1	Improve data collection for recyclable materials. Buy a floor weighing scale (500- 1000 \$) for accurate results for material that is not otherwise weighed (refundable bottles and clothes for example).	\$2 100	\$3 300	\$1 050	\$1 050	\$1 050	\$1 050
8.2	Improve data collection at the Transfer Depot: number and category of users, quantity and type of recovered material, etc. Develop an electronic database for collection of the information.	\$2 100	\$3 900	\$1 800	\$1 800	\$1 800	\$1 800
8.3	Create a centralized database where all recycling, composting, and waste management data will be compiled by type of material, destination, and category of users.	-	-	\$1 170	\$720	\$720	\$720
8.4	Make an inventory of all ICI and the waste management services they use.	-	-	-		\$4 000	\$4 000
No	Actions	Current	2016	2017	2018	2019	2020
9.1	Prepare an annual report on recycling and waste disposal in order to see progress and trends. Inform population.	-	\$2 100	\$2 100	\$2 100	\$2 100	\$2 100
9.2	Prepare an annual progress report of the waste management activities, transmit it to the MDDELCC and make it available on the MCK Web Site.	\$1 050	\$1 050	\$1 050	\$1 050	\$1 050	\$1 050
9.3	Update the PGMR	-					\$10 000
	TOTAL	\$799 526	\$475 592	\$ 489 917	\$708 097	\$ 710 537	\$631 960

9.1 Revenues

Sources of revenues	Current	2016	2017	2018	2019	2020
Landfill Redevice return program	\$99 635	\$99 600	\$99 600	\$99 600	\$99 600	\$99 600
Tewa summer student program		\$4 000	\$4 000	\$4 000	\$4 000	\$4 000
Recycling (sale of material)	\$53 000 \$	\$15 000 Cardboard	\$15 000 Cardboard	\$15 000 Cardboard	\$15 000 Cardboard	\$15 000 Cardboard
Employment Enhancement Program	\$78 850	-	-	-	-	-
Compensation pour collecte selective: when the community will be eligible.				\$100 000	\$100 000	\$100 000
<i>Program pour la recuperation hors foyer : when the community will be eligible.</i>				\$2 800	\$2 800	
Subtotal	\$ 231 485	\$ 118 600	\$ 118 600	\$221 400	\$221 400	\$218 600
Remaining of the expenses are paid among the general budget of the community	\$568 041	\$356 992	\$371 317	\$ 486 697	\$489 137	\$413 360
TOTAL	\$799 526	\$475 592	\$ 489 917	\$708 097	\$ 710 537	\$631 960

Appendix

1 Detailed Estimated Costs – Action Plan

Some assumptions used for calculation:

- Coordinator: \$30/hr including benefits
- Student: \$500 /week including benefits
- Recycling workers : \$18/hr including benefits

Action	Human resources Cost	Material cost	Transportation or treatment cost	Total cost	Revenue sources
1.1	10 hrs *\$30 = \$300		25 % saving (less transportation and less waste)	\$300 (2019) \$228 000 (2020)	General WM budget
2.1	5 workshops x 5 hrs = 25 hrs x \$30/hr = \$750			\$750	General WM budget
2.2	500 \$/week x 8 weeks = \$4 000			\$4 000	Tewa summer student program
2.3	<u>Leaves</u> : 2 workers x 8 hrs/day x 2 days x \$18/hr = \$576 <u>Xmas tree</u> : 2 workers x 8 hrs/day x 1 day x \$18/hr = \$288		<u>Gas</u> : \$50/day = \$150 <u>Treatment</u> : - Leaves: \$72/t x 3 t = \$216 (increase of 0.5 ton/yr) - Xmas : \$415 (up to 5 tons)	\$1 645 (+\$40/yr)	General WM budget
2.4	2017 : evaluation of program 50 hr x 30 \$/hr= \$1 500 2018-19 : implementation of service: 6 weeks of work x 35 hr/wk X \$30/hr = \$6 300	2018 : kitchen collector (\$10) and a rolling carts (80 L (\$35) to 240L (\$70) X 2 300 units = \$103 500 – \$184 000	2019-20 : Collection and treatment: \$ 120 to 165 000 (Source: <i>Feasibility Study Kahnawà:ke Waste Management, 2013</i>).	\$1 500 (2017) \$110-190 000 (2018) \$126-171 000 (2019) \$120-165 000 (2020)	PTMOBC

Action	Human resources Cost	Material cost	Transportation or treatment cost	Total cost	Revenue sources
2.5	Information session (14 hr) and web maintenance (3 hr/mo)= 50 hr/yr x \$30/hr = \$1 500			\$1 500 (yr with information session) \$750 (yr (without information session))	General WM budget
3.1			Current cost :\$28 805 (extrapolated from period : oct 2014 to april 2015). Andana (agricultural use): 200 t x \$110/t = \$22 000	\$28 805 (current) \$22 000 (agri use)	General budget
3.2	2018: Implementation: 500 \$/week x 8 weeks = \$4 000		Current : 50 septic system x \$200/tank = \$10 000 2018-20 : 520 septic tank emptied once every 2 years (260 per year) x \$165/tank=45 500 \$	\$10 000 (current) \$49 500 (2018) \$45 500(2019-20)	Tewa summer student program and general budget
3.3	1 week of work x 35 hr/wk X \$30/hr = \$1 050	Print of booklet : \$2/ea x 550 = \$1 100		\$ 2 150	General WM budget

Action	Human resources Cost	Material cost	Transportation or treatment cost	Total cost	Revenue sources
4.1	\$18 x 2 workers x 7.5 hr/day x 3 days/wk x 52 wks = \$42 120 Solutions +communication : <u>2wks x 35 hrs/wk x \$30/h</u> <u>= \$2 100</u>	\$144 000 Rear Loader Truck (Leach Alpha III) ¹ depreciation calculated on 7 year = \$20 570/yr	Fuel: 15 L/hr x7.5 hrs x 3 days x 52x \$1.10/L = \$19 305	\$81 995 + \$2 100 (first yr)	General Budget,
4.2	\$18 x 2 workers x 7.5 hr/wk. x 52 wks = \$14 040		Fuel: 15 L/hr x7.5 hrs x 52x \$1.10/L = \$6 435	\$20 475	Sale of Cardboard (>\$15 000) and general WM budget
4.3		\$80/bin x 100 = \$8 000 \$75/bin X 600 = \$45 000/yr for 3 years		\$8 000 (pilot) \$45 000 (2018-2020)	General Budget
4.4	5 events x 10 hr x 30 \$/hr = \$1 500	Recycling Bins: 65 \$/unit x 5 = \$325		\$1 500 \$1 825 (with bins)	General WM budget
4.5		5 units x \$800 = \$4 000		\$ 4 000 (2018-19)	<i>Program pour la recuperation hors foyer : when the community will be eligible.</i>
4.6	Political actions				

¹ Source: Feasibility Study Kahnawà:ke Waste Management Business Models, by Monique Clement in partnership with Base Partners, April 2013.

Action	Human resources Cost	Material cost	Transportation or treatment cost	Total cost	Revenue sources
5.1	Implementation : 15 hr x \$30/hr = \$450 Handling cost : 1 workers x 1 hr/wk x 50 wk x \$18/hr = \$900			\$450 (2016) \$900 paid by program	General WM budget Revenues from the EPRA program for material handling
5.2	15 hr x \$30/hr = \$450	300 \$/collector ¹ x 5 = \$1 500		\$1 950	General WM budget
5.3	2 workers x 8 hrs/day x \$18/hr = \$290 /day		<u>Gas</u> : \$50/day <u>Treatment</u> : Estimation of \$5 000 for 2 collection days \$7 500 for 3 collection days	\$2 840 (1/yr) \$5 680 (2/yr) \$ 8 520 (3/yr)	General WM budget
6.1	Implementation of service (including database): 2 weeks of work x 35 hr/wk X \$30/h = \$2 100			\$2 100	General WM budget
6.2	50 h x \$30/hr = \$1 500 Update : 30 hr x \$30/hr = \$900			\$1 500 (2017) Update: \$900 (2019)	General WM budget
6.3	Solutions: 10hr x \$30= \$300 Register: 1 week of work x 35 hr/wk X \$30/hr = \$1 050		Recycling cost will depend on the solution.	\$300 (2016) \$1 050 (2020)	General WM budget
7.1	Current: 2 wks/yr x 35 hr/wk X \$30/h = \$2 100 An average of 8 weeks of work x 35 hr/wk X \$30/h = \$8 400			\$2 100 (current) \$8 400	General WM budget
7.2	3 week of work x 35 hr/wk X \$30/h = \$3 150 Update: 1 week of work x 35 hr/wk X \$30/hr = \$1 050	Print of booklet : \$2/ea x 1000 = \$2 000		\$5 150 (2017) \$1 050 (2020)	General WM budget
7.3	5 workshop x 5 hr x \$30/hr = \$750			\$750	General WM budget
7.4	500 \$/week x 8 weeks = \$4 000			\$4 000	Tewa summer student program
7.5	2 weeks of work x 35 hr/wk X \$30/hr = \$2 100			\$2 100	General WM budget

¹ http://www.novamobilier.com/ca_fr/collecteur-piles-15-litres-4-gallons-fixation-murale.html

Action	Human resources Cost	Material cost	Transportation or treatment cost	Total cost	Revenue sources
8.1	<u>Current:</u> 2 weeks of work x 35 hr/wk X \$30/hr = \$2 100 <u>Improve database:</u> 35hrs x \$30/hr = \$1 050 <u>Data compilation:</u> 1hr/wk x 50 wk x \$30/hr = \$1 500	Scale : \$500 - \$1 000		\$2 100 (current) \$3 300 (2016) \$1 050 (2017-20)	General WM budget
8.2	<u>Current:</u> 2 weeks of work x 35 hr/wk X \$30/hr = \$2 100 <u>implement database:</u> 70hrs x \$30/hr = \$2 100 <u>Data compilation:</u> 2hr/wk x 50 wk x \$18/hr = \$1 800			\$2 100 (current) \$3 900 (2016) \$1 800 (2017-20)	General WM budget
8.3	<u>implement database:</u> 15hrs x \$30/hr = \$450 <u>Data compilation:</u> 2hr/mo x 12 wk x \$30/hr = \$720			\$1 170 (2017) \$720 (2018-20)	General WM budget
8.4	500 \$/week x 8 weeks = \$4 000			\$4 000	Tewa summer student program
9.1	2 weeks of work x 35 hr/wk X \$30/hr = \$2 100			\$2 100	General WM budget
9.2	1 week of work x 35 hr/wk X \$30/hr = \$1 050			\$1 050	General WM budget
9.3	Consultant : \$10 000			\$10 000	General WM budget