



Québec Residual Materials Management Policy, 1998-2008

The French version prevails

The Québec Residual Materials Management Policy replaces the Québec Action Plan for Waste Management, 1998-2002, made public in 1998. This Policy is in accordance with the Act to amend the Environment Quality Act and other legislation as regards the management of residual materials, adopted in 1999.

The expressions *residual materials* or *residues* used in the Policy designate any residue resulting from a production, treatment or utilization process and any substance, material or product or, more generally, any object that is discarded or that the holder intends to discard.

The present Policy does not apply to the following residues: gaseous substances, mine tailings or soils containing contaminants in quantities or concentrations exceeding those fixed by regulation under paragraph *a* of section 31.52 of the *Environment Quality Act*, biomedical waste, hazardous materials, except those of domestic origin and agricultural fertilizers (manure, liquid manure, manure liquid).

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Quebec Residual Materials Management Policy, 1998-2008

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Foreword

The Act to amend the Environment Quality Act and other legislation as regards the management of residual materials (1999, chapter 75) established that the Québec Action Plan for Waste Management, 1998-2008, made public by the Minister of the Environment and amended to comply with the provisions of the Act, makes up the government Residual Materials Management Policy.

Section 53 of this Act provides that once published in the *Gazette officielle* the Policy is deemed to satisfy the requirements of section 53.4 of the Environment Quality Act and remains into force until it is amended or replaced, in accordance with the provisions of this section.

The purpose of this document is to make known the government Residual Materials Management Policy made pursuant to section 53.4 of the Environment Quality Act.



1 – Background

In the 20th century, the industrial nations were devoted to satisfying our ever-growing consumer needs. To do so, they extracted and processed extensive natural resources. Today, we know that these resources are limited and that extractive and manufacturing activities are responsible for our major pollution problems: water pollution, global warming due to greenhouse gases, soil contamination and erosion, ecosystem degradation and loss of biodiversity. Part of the solution to these problems is sound residual materials management. Recovering useful materials and recycling them back into the production stream generally has the same effect as source reduction, namely, reducing the need for virgin materials along with pollution generated by their processing.

Putrescible materials are the main source of contamination in disposal sites. In landfills, their decomposition in the absence of oxygen produces malodorous, explosive gases that contribute to the greenhouse effect. The organic compounds released by the decomposition migrate with leachates and can contaminate surface and groundwaters, making them unfit for human

consumption and even harmful to aquatic life. Removing putrescible materials from the waste stream therefore reduces the pollutant load in disposal sites and can be a valuable source of compost, which helps improve soil quality while cutting back on the need for fertilizers and pesticides.

Minimizing the amount of waste entering landfills reduces the rate at which they are filled, thereby extending their life span and restricting the need for replacement sites.

It was to meet these challenges that, in 1989, the Québec government adopted an integrated solid waste management policy, which targeted a 50 percent reduction in the quantity of waste sent for disposal by the year 2000. In 1989, 5.7 million tonnes of residual materials, of the 7 million tonnes generated, went for disposal, leaving a recovered volume of just under 1.3 million tonnes. Ten years later, the total quantity generated had risen to 8.3 million tonnes, with 5.3 million tonnes being discarded. This meant that 3 million tonnes were being reused, more than double the 1989 amount. However, given the 1.3-million-tonne increase in total residual materials generated, the reduction rate had reached only 10.8 percent, a far cry from the 50 percent initially sought.

The 1989 policy also targeted safer disposal methods, but Québec's regulatory standards governing waste disposal were only reviewed for new disposal sites authorized from 1993 onward under the environmental assessment procedure.

The Québec Residual Materials Management Policy therefore proposes a management system that is more environmentally sound while supporting Québec's social and economic development.



2 – Principles

The actions proposed in this Policy are premised on the following fundamental principles of waste management:

4R-D

Unless an environmental analysis indicates otherwise, waste management options should be considered according to the following hierarchy: source reduction, reuse, recycling, resource recovery and disposal.

Greater producer responsibility

Manufacturers and importers assume greater responsibility for the environmental effects of their products throughout their life cycle, including the upstream effects inherent in the choice of product components, the effects of the manufacturing process as such and the downstream effects resulting from the product's use and disposal.

Citizen participation

Citizen participation in the development and monitoring of measures targeting ecologically sound waste management is essential to achieving our goals. The general public must have access to relevant information and to the appropriate forums during the decision-making process.

Regionalization

Waste management decisions and their implementation are made at the

regional municipality level in accordance with the powers of municipal authorities.

Partnership

By fully assuming their role, mission and responsibilities, all stakeholders contribute in a coherent, concerted and complementary manner to implementing the measures designed to achieve the set goals.

3 – Purpose

The purpose of the Québec Residual Materials Management Policy is:

1° to prevent or reduce the production of residual materials, particularly by targeting product manufacturing and marketing;

2° to promote residual materials recovery and reclamation;

3° to reduce the quantity of residual materials sent for disposal and ensure the safe management of disposal sites;

4° to make manufacturers and importers take into consideration the environmental effects of their products and the costs related to the recovery, reclamation and disposal of the residual materials generated by these products.



4 – Goals

One way to help ensure sustainable resource use is through better management of residual materials as a resource. The main goal of this Policy is to recover 65 percent of the 7.1 million tonnes of residual materials that can be reclaimed each year. This goal can only be reached, however, if all sectors of society do their part. The following recovery goals have therefore been set for each sector and material category¹.

Municipalities:

- 60 percent of glass, plastics, metals, fibres, bulky waste and putrescible material;
- 75 percent of oils, paints, and pesticides (household hazardous materials);
- 50 percent of textiles;
- 80 percent of non-refillable beer and soft drink containers.

Industrial, commercial and institutional establishments:

- 85 percent of tires²;
- 95 percent of metals and glass;
- 70 percent of plastics and fibres, including wood material;
- 60 percent of putrescible material.

Construction, renovation and demolition sector:

- 60 percent of all recoverable resources.

Attaining these targets will increase Québec's resource recovery rate from 3 086

590 tonnes in 1996 to 4 793 000 tonnes in 2008. By that time, only ultimate waste, i.e. materials that can no longer be reused, recycled or reclaimed, should be going for disposal.

The second fundamental goal of the Policy is to ensure that disposal methods are safe for public health and the environment.

¹ Appended is a table showing the recovery goals for 2008 and recovery rates in 1996 by source and container or materials category.

² Used tires are discarded just as much by consumers as industrial, commercial and institutional establishments. They have been included in the ICI category to simplify presentation.



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5 – Actions

5.1 Residual materials management planning

All Québec regional municipalities³ must have a residual materials management plan in place no later than two years following the coming into force of

appropriate legislative provisions. When a management plan is implemented, it binds the local municipalities which are required to abide by it without any possibility of dropping out. It is also binding on the government which must comply with its provisions when authorizing materials recovery, reclamation and disposal facilities.

Management plans are updated every five years and can be amended at any time. They target all residual materials with the exception of hazardous materials other than household materials, biomedical waste, mine tailings, contaminated soils containing contaminants in quantity or concentration above regulatory criteria, and gaseous materials. Management plans must contain the following information:

- 1° description of territory covered by the plan;
- 2° names of local municipalities targeted by the plan and a list of intermunicipal agreements pertaining to residual materials management applicable to the territory in whole or in part;
- 3° list of organizations and firms that carry out residual materials recovery, reclamation or disposal activities within the territory;
- 4° inventory of residual materials generated in the territory, whether of domestic, industrial, commercial, institutional or other source, by materials category;
- 5° statement of residual materials recovery, reclamation and disposal orientations and goals to be fulfilled, as well as a description of services required to achieve these goals;
- 6° list of recovery, reclamation and disposal facilities in the territory; where applicable, the need of any new facility to fulfill the aforementioned goals and, if need be, the possibility of using facilities outside the territory;
- 7° plan implementation proposal favouring citizen participation and the cooperation of organizations and firms involved in residual materials management;
- 8° budgetary proposals and a plan implementation timetable;
- 9° plan monitoring and follow-up system intended to verify the plan's application periodically, namely, goal fulfilment and efficiency of implementation measures taken by regional municipalities or local municipalities targeted by the plan.

Regional municipalities may restrict or prohibit the disposal of non-region material in their territory. If they choose to exercise this right, they must say so in their management plan and indicate, in the case of a restriction, the quantity of residual materials targeted. This measure will take effect at the same time as the management plans and apply to all new projects to establish or expand a disposal site, whether public or privately operated, to the exclusion of a disposal facility belonging to a firm which uses it exclusively to dispose of the residual materials it generates. In addition, this measure can not apply to residual materials generated by a pulp and paper mill.

Before taking effect, and whenever they are updated, management plans must be submitted to the Minister of the Environment for approval. The Minister may order that changes be made to the plan, if he deems it does not reflect the government's policy or if the right to restrict or prohibit the disposal of non-

region wastes is liable to compromise public health and safety. Where the regional municipality does not modify its plan to the satisfaction of the Minister, the Minister may exercise his regulatory powers in lieu of the municipality to make the plan consistent with the government policy or prevent any public health and safety hazard.

³ A regional municipality includes a metropolitan community, an urban community or a regional county municipality which is responsible for developing a residual materials management plan.



5.2 Citizen participation

Regional municipalities are required to establish adequate mechanisms to foster public participation early in the development and monitoring stages.

A public consultation on the proposed plan must be held via a commission set up by the regional municipal council and consisting of no more than ten members appointed by the council, with at least one business representative, one union representative, one community representative and one environmental protection group representative.

The commission must hold a public meeting in at least two local municipalities located in the territory of the regional municipality concerned. It is responsible for defining its modes of operation and consultation and must report to the public and the Minister.

When new disposal sites are authorized by order of the government, operators are required to set up watchdog committees and assume the cost. This requirement will be extended to existing disposal sites designated by regulation. The purpose of the committees is to ensure monitoring of the sites during operation, closure and post-closure and to inform the population.

5.3 Education and information

Environmental education activities and information on new ways to participate in sustainable residual materials management are crucial. Public information and educational materials adapted to the different stakeholder groups must be developed and made readily accessible to as many individuals and groups as possible.

5.4 Research and development

The materials recovery and reclamation industry must constantly adapt its methods and technologies in order to respond to the new challenges facing it all the time. In addition to continued access to regular support programs for technological innovation, firms require new forms of support to be able to evolve in pace with the industry.

5.5 Support for social economy businesses

A significant and increasing proportion of recovery, reuse and recycling is performed by social economy businesses that create lasting, quality jobs,

produce goods and services and help divert material from the waste stream for new purposes.

Many of these businesses have also taken it upon themselves to train, inform and sensitize their staff and customers to more environmentally responsible residual materials management practices. This makes them a valuable asset in our efforts to improve environmental health, preserve quality of life and create employment, which is why they must play a prominent role in our plans for sustainable residual materials management.

To help this sector of the Québec economy grow, the government will contribute financially to the establishment, development and consolidation of social economy businesses operating in the area of residual materials recovery and reclamation.



5.6 Residual materials recovery and reclamation

5.6.1 Strengthening of selective municipal collection

Businesses must be made responsible for the products they market and which become residual materials once used. That is why the government will adopt a regulation requiring of industrial or commercial businesses which manufacture or market or otherwise distribute in Québec containers, packaging or print material that they assume the major portion of the costs of selective waste collection. The regulation will set recovery targets, require businesses to report on their progress in meeting targets and provide for fines and sanctions in the event of non-compliance.

To meet this requirement, businesses targeted will have the choice of setting up their own recovery system or delegating an organization, accredited by the Minister of the Environment, to represent them and support financially selective municipal collection.

Businesses that choose to be represented by a government-accredited organization will have six months following the regulation's coming into effect to enter into an agreement with the Minister of the Environment. The agreement will set the recovery targets, which can not be lower than those provided for by regulation. The financing standards and criteria will be defined and approved by the Minister under the agreement and will be established on the basis of effective and efficient selective municipal collection programs.

5.6.2 Recovery of putrescible material

Putrescible material is most likely to cause major contamination in landfills. When composted, it can be used to improve the quality of soils. It is therefore important to progressively recover this material in as great a quantity as possible. Municipalities will be subject to the regulatory obligation to recover surplus grass clippings and leaves.

5.6.3 Recovery of households hazardous materials

Some residential wastes can be hazardous; for example, used oils, certain paints, solvents, pesticides, and batteries. Diverting them from the waste stream to reuse them whenever possible is therefore important.

The government will enact regulations making recovery and treatment of the hazardous materials manufactured and marketed by businesses mandatory. To

meet this requirement, businesses will have the choice of setting up their own recovery system or delegating an organization, accredited by the Minister of the Environment, to represent them.

5.6.4 Recovery of construction, renovation and demolition debris

More than 90 percent of construction, renovation and demolition debris can be used for other purposes, yet large quantities are still being sent, at low cost, to dry materials sites. In order to stimulate the recovery of these materials, the new regulation on the disposal of residual materials will prohibit the establishment and expansion of dry materials disposal sites in Québec. The gradual elimination of these sites will force construction and demolition waste generators who wish to get rid of these materials to direct them to a sanitary landfill, at a much higher cost.

Existing dry materials disposal sites will be allowed to continue receiving waste for the authorized term of operation in order to complete site rehabilitation. However, the standards governing their operation will be tightened. Projects that have already been submitted for environmental impact assessment and review will be studied on a case-by-case basis according to the recovery and disposal needs of the targeted community or communities.

Given that segregated concrete, asphalt and brick do not represent an environmental risk, their reuse will be encouraged. As long as they meet certain quality criteria, they can be reused for backfilling, repair or construction purposes. Construction, renovation or demolition debris containing wood, gypsum, textiles or any other non-inert material, will have to be directed, with the gradual closure of existing dry materials disposal sites, to either authorized processing centres or sanitary landfill sites.

5.6.5 Reduction and recovery of industrial, commercial and institutional materials

Industries, commercial establishments and institutions recover 66 percent of the residual materials with a potential for recovery that they generate in a year. They must be lauded for this strong performance and encouraged to continue their efforts.

An environmental program that recognizes reduction and recovery initiatives by industrial, commercial and institutional establishments will be set up and the results will be made public.

Those businesses that attain the reduction and recovery targets established with the Minister of the Environment will receive official recognition from the government, which they may use to promote their product(s) on domestic and export markets.

For its part, the government must set an example as a major institution whose agencies purchase and consume large quantities of goods and products. It must work towards waste reduction and recovery the same as any other institution and stimulate the market for recycled goods.

The government commits to making waste audits and reduction plans part of its regular management activities. It will also strengthen the environmental content of its procurement policy by giving priority to products that are better for the environment, such as recycled paint and oil, and construction, renovation and demolition debris, so as to support the markets for these secondary materials.

5.6.6 Recovery of non-refillable beer and soft drink containers

With a return rate of 76 percent on non-refillable beer and soft drink containers at retailers, the deposit-return system is no longer self-financing. Like other enterprises marketing products in Québec, the brewery industry and soft drink bottlers will be responsible for funding the recovery of waste generated by their products. The terms for financing will be established by agreement with the Minister of the Environment.

5.6.7 Recovery of used tires

Retailers apply a non-refundable levy to the sale of new tires. The monies generated by this program are used by the government to cover the costs of recycling used tires generated in Québec each year. They are also used to financially support businesses that reuse or recycle scrap tires, or burn them to produce energy. The program will also help to empty all used tire storage sites.

5.6.8 Reclamation of municipal and industrial sludge

Knowing the properties of sludge, which vary according to the source, is essential to assessing its recovery potential. Hence, regional municipalities will be required to establish master plans for managing industrial and municipal sewage sludges. These plans will be an integral part of the residual materials management plan and will aim to identify the source, quantity and quality of the different categories of sludge generated in the territory and determine, where environmentally beneficial, whether recovery is possible. The ultimate goal is to ensure that no sludge is landfilled until it has been demonstrated that recovery is not an economically viable option.



5.7 Disposal

As of June 14, 1993, when authorizing a disposal site the government may set standards different from those provided by regulation if it deems increased environmental protection is needed. These more stringent protection standards will be incorporated into the regulation governing disposal activities.

5.7.1 Technical landfill sites

Québec's landfill standards need to be tightened to ensure greater protection of human health and the environment. A new regulation on residual materials disposal will be adopted to that end.

New landfill requirements will mainly target:

- watertight landfill cells to ensure maximum protection of groundwater;
- leachate collection and, where necessary, treatment systems to protect groundwater, surface water and the quality of receiving environments;
- safe collection and release or burning of biogas.

5.7.2 Dry materials disposal sites

Dry materials disposal sites will be subject to more stringent safety standards. The new regulation respecting residual materials disposal will require site owners to monitor groundwater and surface water quality, among other things.

5.7.3 Post-closure monitoring of disposal sites

By order of the government, and under the authorizations it issues in

compliance with the environmental impact assessment and review procedure, operators are required to establish financial guarantees in the form of a trust fund for the post-closure monitoring of disposal sites. This requirement will be extended to existing disposal sites designated by regulation.

5.7.4 In-trench disposal sites

In order to reduce in-trench disposal of waste materials, given its impact on water quality, the number of in-trench sites will be limited.

Moreover, site owners will be required to monitor groundwater and surface water quality.

5.7.5 Incineration

Because incinerators require substantial capital expenditures to operate, a sustained supply of residuals is needed to make them profitable. This can slow the attainment of recovery goals.

Projects to operate or increase the capacity of an incinerator will be authorized only if the proponent can demonstrate that incineration does not conflict with the recovery targets. All new incinerators having a capacity of over two metric tons per hour must be designed to recover energy from the burning of waste.

Furthermore, tighter standards governing gas and particle emissions will be adopted.

5.7.6 Waste disposal in the North

Northern municipalities and communities generally manage their waste by depositing it in open dumps. Since the ground is frozen for most of the year, the waste piles up and is then burned at prescribed intervals.

The use of small incinerators would help to reduce reliance on this form of disposal which entails environmental and health hazards. A pilot project to assess the environmental acceptability of burning waste in small incinerators should be carried out. If the results are satisfactory, small-scale incineration will be allowed and encouraged.



5.8 Role of Recyc-Québec

Recyc-Québec is responsible for coordinating recovery initiatives proposed in this policy with a view to consistency and complementarity. More specifically, it will:

- help set up industrial residuals recovery and reclamation agencies accredited by the Minister and monitor agreements entered into with the Minister;
- develop and manage a knowledge system for tracking the achievement of sectoral and overall residual materials recovery goals;
- administer any financial assistance program upon request of the Minister or the government;
- foster the development of markets for secondary materials in partnership with the industries concerned;
- advise regional municipalities, management boards or any other body mandated by the municipalities on the establishment of residual materials management plans.

5.9 Implementation monitoring

A report on the implementation of this policy will be published every two years. Furthermore, the Policy itself will be reviewed five years after its coming into effect and the management directions revised as necessary based on the results of source reduction and recovery efforts.

Conclusion

This Residual Materials Management Policy 1998-2008 encourages all municipal, industrial and environmental stakeholders, along with Quebeckers in general, to join forces with the government to work towards greater protection of human health and the environment through sound residual materials management.



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Quebec Residual Materials Management Policy, 1998-2008

Appendix - Recovery goals, by source, material category and amounts recovered, 1996

MUNICIPAL	Recoverable volume (x 1000 tonnes)	Recovery rate		Materials recovered in 1996 (x 1000 tonnes)
		Goal (%)	Tonnage (x 1000 tonnes)	
<i>Recyclable materials</i>				
Total fibres	55	60%	333	198
Refundable containers	42	80%	34	29
Non-refundable containers	260	60%	156	62
Non-refundable aluminum	12	20%	2	N/A
SUBTOTAL	869	60%	525	289
<i>Putrescible materials</i>				
Putrescible waste	589	60%	353	N/A
Grass clippings	221	60%	133	N/A
SUBTOTAL	810	60%	486	84
<i>Reusable products</i>				
Textiles	54	50%	27	10
Bulky waste	273	60%	164	102
SUBTOTAL	327	58%	191	112
Hazardous materials	27	58%	16	3
TOTAL MUNICIPAL	2 033	60%	1 218	488

INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL	Recoverable volume (x 1000 tonnes)	Recovery rate		Materials recovered in 1996 (x 1000 tonnes)
		Goal (%)	Tonnage (x 1000 tonnes)	

		Goal (%)	Tonnage (x 1000 tonnes)	tonnes)
Recyclable materials				
Paper and packaging	882	70%	617	598
Glass	38	95%	36	36
Plastics	162	70%	113	26
Metals	1 081	95%	1 027	1 001
Textiles	N/A	70%	N/A	17
SUBTOTAL	2 162	83%	1 793	1 677
Putrescible materials				
Wood	202	70%	142	N/A
Putrescible waste	188	60%	113	N/A
SUBTOTAL	390	65%	254	30
Tires	63	85%	54	17
TOTAL ICI	2 615	80%	2 101	1 724

INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL	Recoverable volume (x 1000 tonnes)	Recovery rate		Materials recovered in 1996 (x 1000 tonnes)
		Goal (%)	Tonnage (x 1000 tonnes)	
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SUBTOTAL	390	65%	254	30
Tires	63	85%	54	17
TOTAL ICI	2 615	80%	2 101	1 724

GRAND TOTAL				
Waste generated (x 1000 tonnes)	Recoverable volume (x 1000 tonnes)	Recovery rate		Materials recovered in 1996 (x 1000 tonnes)
		Goal (%)	Tonnage (x 1000 tonnes)	
8 312	7 106	67%	4 793	3 088



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










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Introduction

In this day and age, recovery and recycling techniques give new life to many old products, including plastics, paper, used tires, and so on. Yet, despite outreach programs, our consumer oriented society continues to generate noticeable quantities of waste

(household, industrial, commercial and institutional) that are still being disposed of.

In 1998, of the 8.9 million tonnes of waste generated in Québec, 5.5 million went for disposal. To reverse this trend, the [Québec Action Plan for Waste Management, 1998-2008](#) proposes measures aimed at recovering 65% of useful materials that can be extracted from waste products each year. In the end, the only materials that should be sent for disposal will be those left over from the sorting, conditioning and reclamation of the broadest possible amount of wastes.

In addition to saving space at disposal sites, diverting residual materials from the waste stream extends their service life and slows the need for new ones.

The Action Plan's second fundamental goal is to make disposal activities safe for both persons and the environment.



Characteristics and Composition of Residual Materials

The 8.9 million tonnes of waste generated in Québec in 1998¹ represent 1200 kilogrammes per person. This amount, made up of 20% solid materials, is composed mainly of waste from industrial, commercial or agricultural activities, with the exception of hazardous materials, biomedical wastes, gaseous matter, tailings and contaminated soils.

- municipal (32.8%);
- industrial, commercial and institutional (34.8%);
- construction and demolition (32.4%).

Of this amount, 5.5 million tonnes of waste were disposed of, while 3.4 million tonnes were recovered and reintroduced in the production line.

In 1998, the amount of waste sent for disposal increased by 200,000 tonnes with respect to 1996, a rise of about 4%. The most significant increase occurred at dry material

deposits with 171,000 tonnes more than in 1996. This increase is explained mainly by the ice storm that struck early in 1998. Overall, waste sent to sanitary landfills has increased slightly while that sent for disposal in trenches has dropped. It can therefore be safely assumed that increased recovery rates have helped lower the quantities of waste eliminated in Québec.

Distribution of solid materials recovered (in tonnes) according to source²:

Material	Municipal and residential	Industrial, commercial & institutional
Paper	215,600	562,200
Glass	56,100	44,900
Ferrous metals	10,500	905,000
Non-ferrous metals	11,470	95,600
Plastics	17,300	33,200
Textiles	9,500	10,700
Organic waste	9,700	83,800
Household hazardous waste	2,500	---
Dry materials (construction and demolition)	10,700	1,146,200
Tires	---	43,500
Municipal sludges	22,000	---
Others *	---	1,400
Total	446,370	2,926,500

* Appliances and electronic devices, computer material, printer cartridges, etc.



Disposal Sites in Québec

Waste for disposal is directed to sanitary landfills, in-trench landfills, disposal sites in the North, dry material deposits and incinerators.

According to recent numbers published by Recyc-Québec, there are 480 distinct solid waste disposal sites in Québec, distributed as follows:

- 64 sanitary landfills;
- 323 in-trench landfills;
- 64 dry material deposits;
- 3 incinerators;
- 26 disposal sites in the North.

Distribution of disposal sites according to Québec's 17 administrative regions

Administrative region	Sanitary landfill		In-trench landfill	Disposal in the North	Dry material deposit	Incinerator	
	Number*	Population served	Number	Number	Number*	Number	Population served
Bas-Saint-Laurent	8	183,586	34	0	3	0	
Saguenay–Lac-Saint-Jean	4	280,472	38	0	9	0	

Capitale Nationale	6	138,124	3	0	5	1	506,067
Mauricie	3	275,050	15	0	5	0	
Estrie	7	359,048	0	0	6		
Montréal	1	1,170,114	0	0	2	0	
Outaouais	1	9,942	50	0	2	0	
Abitibi-Témiscamingue	2	43,000	63	0	1	0	
Côte-Nord	5	86,600	27	12	0	0	
Nord-du-Québec	2	11,000	44	14	3	0	
Gaspésie-Îles-de-la-Madeleine	5	69,339	25	0	1	1	13,800
Chaudière-Appalaches	10	314,108	9	0	4	1	47,336
Laval	0		0	0	1	0	
Lanaudière	2	689,000	2	0	5	0	
Laurentides	4	1,248,630	11	0	5	0	
Montérégie	2	> 50,000	2	0	8	0	
Centre-du-Québec	2	753,400	0	0	4	0	
Total	64	5,681,413	323	26	64	3	567,203

* The numbers in these columns were provided by Recyc-Québec in October 2000, while the numbers in the other columns are from local surveys carried out in 1999.

Québec's 64 sanitary landfills receive most of the solid waste discarded. Around 30 of these sites rely on the soil's natural filtration qualities to treat leachates (water

contaminated by wastes). The rest, which serve 71% of the population, have leachate collection and treatment systems.

In-trench landfills are used for waste from municipalities with less than 2000 inhabitants located more than 30 kilometres from a sanitary landfill. The requirements governing these sites are loose: hydrogeological studies and groundwater monitoring are not required, waste does not have to be compacted, and the trench only has to be covered once a week and only in summer. Moreover, open burning is both practised and allowed. While only small amounts of waste are directed to in-trench landfills, the operating standards make it difficult to ensure adequate protection of the environment.

Dry material deposits, for the most part former pits and quarries, receive construction and demolition debris. These wastes consist primarily of concrete, brick and asphalt, but may also include wood, drywall, textiles and insulation.

Northern communities generally manage their waste by depositing it in open dumps. Since the ground is frozen for most of the year, the waste piles up and is then burned at regular intervals.

When operated in compliance with recognized standards, incinerators are an environmentally safe means of waste disposal.

In Québec, the majority of waste disposal sites are owned by municipal or para-municipal bodies, but most of the waste, about 77%, is disposed of in privately operated sanitary landfills³. Hence, among the 64 sanitary landfills in operation, 56 are publicly owned and 8 belong to private enterprises (see Appendices 1 and 2), serving about 88% of the population. The three incinerators serve a little more than half a million people in the Capitale Nationale, Chaudière-Appalaches and Gaspésie-Îles-de-la-Madeleine regions. Of the 64 dry material deposits in operation, 12 only are municipal, while the remaining 52 are privately operated.

In June 1993, the government of Québec adopted the Act respecting the establishment and enlargement of certain waste elimination sites, which subjects proposals for the establishment and enlargement of sanitary landfills and dry material deposits to the

environmental impact assessment and review procedure. Moreover, where applicable under this Act, the government may set standards different from those in the Regulation respecting solid waste. As a result, eight sanitary landfills and four dry material deposits have been the subject of orders (see Appendices 1 and 2) imposing tighter standards for better protection of persons and the environment.

In December 1995, the Act to prohibit the establishment or enlargement of certain waste elimination sites came into force. Since then, the establishment or enlargement of sanitary landfill sites, dry material deposits and incinerators is prohibited, unless the prohibition is lifted by the government as provided by the Act prior to carrying out the project.

¹ RECYC-QUÉBEC. 1999. *Gestion des matières résiduelles au Québec : Bilan 1998*, July.

² RECYC-QUÉBEC. 1999. *Gestion des matières résiduelles au Québec : Bilan 1998*, July.

³ QUÉBEC.MINISTÈRE DE L'ENVIRONNEMENT ET DE LA FAUNE.1998. *The Earth isn't disposable. Think before you discard!*



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Québec Action Plan for Waste Management, 1998-2008

Fact sheet

Elimination of Residual Materials in Québec

Environmental Issues

The quality of the environment is likely to be affected by waste elimination, be it by landfilling or incineration. For the environment to be adequately protected, certain rules and principles must therefore be followed when establishing and operating a waste elimination site.

Rain percolating through the landfilled waste produces what is called leachates. Because these leachates have the potential to contaminate ground and surface waters, depending on the geological and hydrogeological conditions of the site, monitoring them is important.

Moreover, when it decomposes, the buried waste generates several gases known as biogas. Adequate management of these gases is also important to prevent them from escaping the site and to encourage their elimination, thereby reducing greenhouse gas emissions in the process.

Waste incineration requires sophisticated equipment to eliminate emissions of gases and particulate matter into the atmosphere. In addition, the safe elimination of incineration by-products, including bottom ash and fly ash, is necessary to safeguard the environment.



Québec Action Plan and Elimination of Residual Materials

The Québec Action Plan for Waste Management, 1998-2008 proposes 29 actions, seven of which are specifically aimed at ensuring the safety of elimination activities and reducing the amount of waste sent for disposal:

Actions	Objectives
4: Creation of watchdog committees by disposal facility operators.	Ensure compliance with environmental requirements.
12: Gradual elimination of dry material deposits.	Stimulate waste recovery to achieve a 60% objective.
20: Adoption of new sanitary landfill requirements to ensure greater protection of persons and the environment.	Reduce risks to the population and the environment.

21: Adoption of standards governing dry material deposits.	Protect groundwater and surface water quality.
23: Adoption of new siting criteria for in-trench landfills to reduce their numbers.	Reduce the number of in-trench landfills and standardize the location to 100 km from any other landfill.
24: Adoption of requirements for monitoring groundwater and surface water quality at in-trench landfills.	Prevent groundwater and surface water contamination; prohibit the artificial lowering of groundwater levels.
26: Adoption of tighter incinerator stack emissions standards.	Prevent the migration of biogases outside the disposal site; eliminate waste, bottom ash and fly ash in an environmentally safe manner.

On October 25, 2000 the Minister of the Environment announced the publication of the draft Regulation respecting the elimination of residual materials, which will replace the Regulation respecting solid waste (Q-2, r.14) that governs the different solid waste elimination and storage sites in Québec. This new regulation will make possible the implementation of several actions provided for in the Québec Action Plan for Waste Management, 1998-2008, particularly those pertaining to increased protection of persons and the environment.

The purpose of the proposed regulations is to put an end to the elimination of residual materials in permeable sanitary landfills. Henceforward, in order to provide greater protection to groundwater and surface water, operators will be required to lay out tighter cells. The collection and, where necessary, the treatment of leachates, as well as the collection and safe disposal of biogases, including thermal destruction if any, will also be mandatory.

With the exception of certain projects currently under review, the enlargement or establishment of new dry material deposits will be prohibited. Moreover, the operators of sanitary landfills and dry material deposits will be required to form and support watchdog committees responsible for informing the population concerned of compliance with environmental standards.

In addition to these provisions, landfill sites laid out in rock quarries or open-pit mines will have to meet new and specific hydrogeological conditions to fulfil the objectives of the new regulation, particularly in terms of environmental monitoring and supervision.

Where small-sized municipalities are concerned, the new regulation maintains tailored elimination methods involving burial in trenches or isolated territory landfills. However, it aims to reduce the number of in-trench landfills near large centers where access to safer disposal sites within a radius of 100 kilometres is possible.

Lastly, operators of sanitary landfills, dry material deposits and in-trench landfills will be required to monitor the sites during operation and for a 30-year period following the date on which the sites were closed. Operators of existing sites will have three years to upgrade their facilities to comply with the new requirements or will be asked to shut down at the expiration of the deadline.



Conclusion

The challenge, in the years to come, will be to reduce as much as possible the amount of waste sent for disposal and to make sure elimination activities are carried out in total compliance with the protection of persons and the environment. In addition, to convince consumers of the advantages of judicious waste recovery, for the quality of life of both present and future generations, awareness building is a priority.



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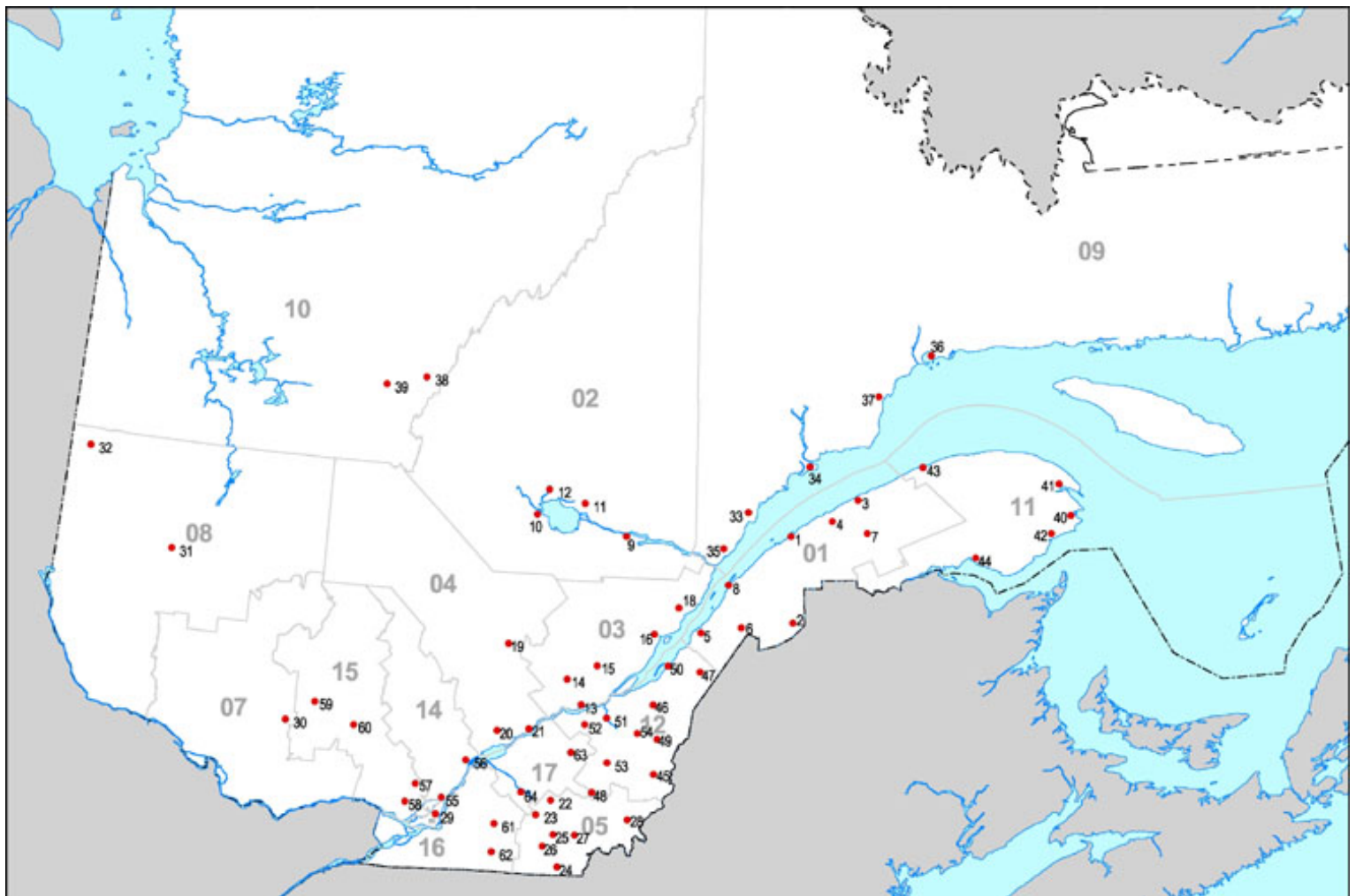


Québec Action Plan for Waste Management, 1998-2008

Fact Sheet

Elimination of Residual Materials in Québec

Appendix 1 / Sanitary Landfills by Region⁴



- | | |
|------------------------------------|--|
| Bas-Saint-Laurent (01) | 1. Notre-Dame-du-Sacré-Cœur (Rimouski)
2. Dégelis
3. Saint-Jérôme-de-Matane
4. Padoue
5. Saint-Philippe-de-Néri
6. Pohénégamook
7. Amqui
8. Saint-Georges-de-Cacouna |
| Saguenay–Lac-Saint-Jean (02) | 9. Chicoutimi * D
10. Saint-Prime (Domaine du Roy)
11. L'Ascension-de-Notre-Seigneur
12. Dolbeau |
| Québec (03) | 13. Neuville
14. Saint-Raymond
15. Stoneham
16. Baie-Saint-Paul
17. Saint-Tite-des-Caps et Saint-Joachim *
18. Clermont |
| Mauricie (04) | 19. La Tuque
20. Saint-Étienne-des-Grès
21. Champlain D |
| Estrie (05) | 22. Shipton
23. Melbourne
24. Coaticook
25. Sherbrooke
26. Canton de Magog *
27. Bury
28. Lac-Mégantic |
| Montréal (06) | 29. Montréal |
| Outaouais (07) | 30. Déléage |
| Abitibi-Témiscamingue (08) | 31. Val-d'Or
32. La Sarre |
| Côte-Nord (09) | 33. Sainte-Anne-de-Portneuf
34. Manicouagan
35. Les Bergeronnes
36. Sept-Îles
37. Rivière-Pentecôte |
| Nord-du-Québec (10) | 38. Chibougamau
39. Chapais D |
| Gaspésie–Îles-de-la-Madeleine (11) | 40. Percé
41. Gaspé
42. Saint-François-de-Pabos
43. Sainte-Anne-des-Monts
44. New Richmond |
| Chaudière-Appalaches (12) | 45. Saint-Côme-Linière
46. Saint-Cajetan-d'Armagh
47. Sainte-Perpétue
48. Garthby
49. Lac-Etchemin
50. L'Islet-sur-Mer
51. Saint-Lambert-de-Lauzon D
52. Saint-Flavien D
53. Robertsonville
54. Saint-Édouard-de-Frampton D |

Lanaudière (14)	55. Lachenaie * D
	56. Sainte-Geneviève-de-Berthier *
Laurentides (15)	57. Sainte-Sophie *
	58. Mirabel
	59. Mont-Laurier
	60. Marchand
Montérégie (16)	61. Sainte-Cécile-de-Milton *
	62. Cowansville D
Centre-du-Québec (17)	63. Plessisville
	64. Saint-Nicéphore *

⁴RECYC-QUÉBEC. *Bilan 1998*, revised in January 2000.

* privately operated sites; others are municipal

[D](#) sites for which an order was issued



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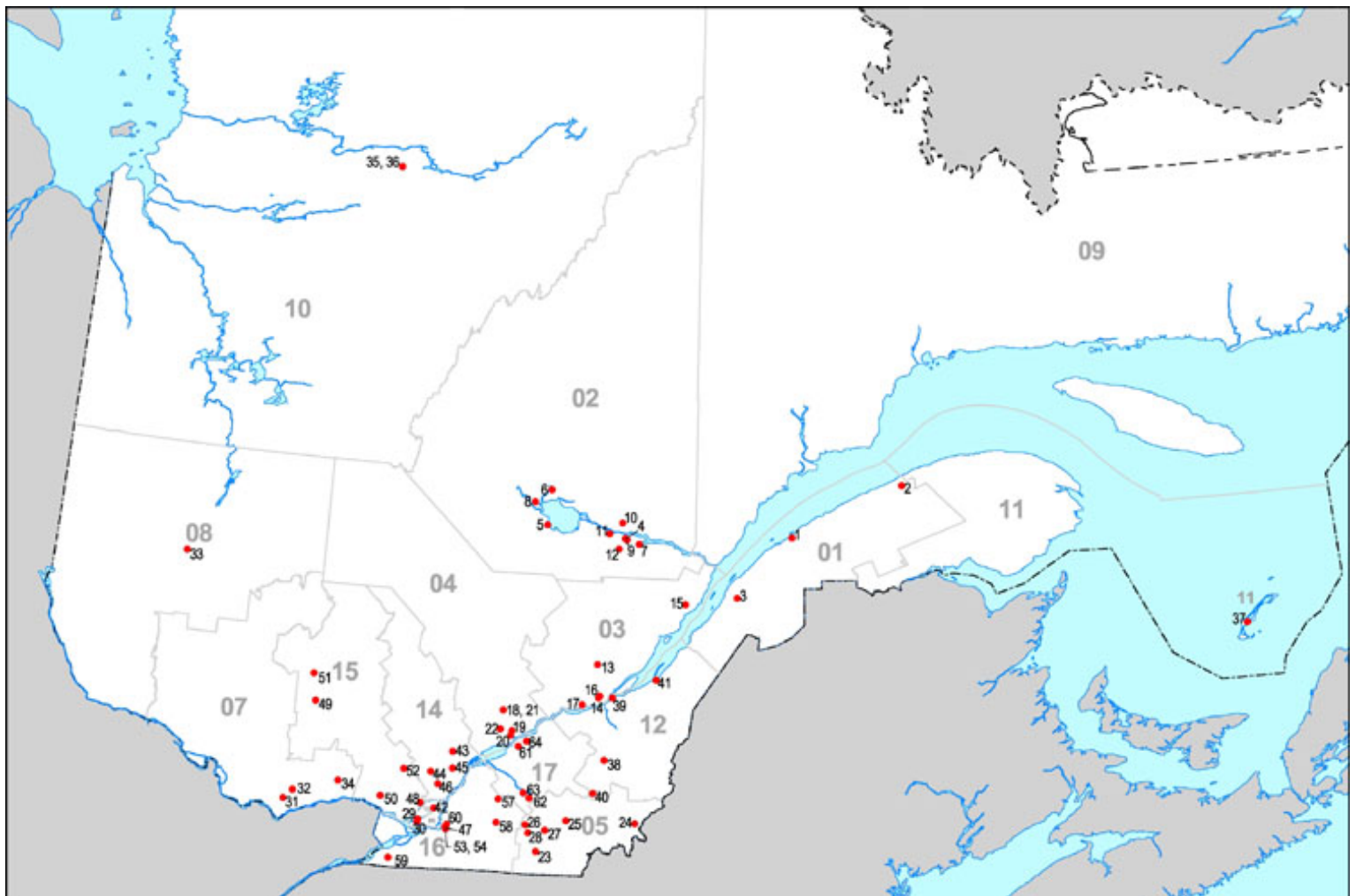


Québec Action Plan for Waste Management, 1998-2008

Fact Sheet

Elimination of Residual Materials in Québec

Appendix 2 / Dry Material Deposits by Region⁵



Bas-Saint-Laurent (01)	1. Rimouski * 2. Les Méchins * 3. Saint-Modeste
Saguenay–Lac-Saint-Jean (02)	4. Canton de Chicoutimi 5. Roberval 6. Dolbeau 7. La Baie 8. Saint-Félicien 9. Chicoutimi (paroisse Saint-Alphonse) 10. Saint-Honoré 11. Jonquière 12. Canton Laterrière
Québec (03)	13. Stoneham-et-Tewkesbury * 14. Sainte-Foy 15. La Malbaie 16. Ancienne-Lorette 17. Paroisse de Pointe-aux-Trembles (Portneuf) *
Mauricie (04)	18. Grand-Mère 19. Saint-Louis-de-France 20. Trois-Rivières 21. Grand-Mère 22. Saint-Étienne-des-Grès
Estrie (05)	23. Canton de Magog 24. Frontenac 25. Canton de Stoke 26. Canton de Valcourt 27. Saint-Denis-de-Brompton 28. Bonsecours
Montréal (06)	29. Pierrefonds D 30. Kirkland
Outaouais (07)	31. Cantley 32. Canton de Templeton
Abitibi-Témiscamingue (08)	33. Val d'Or *
Nord-du-Québec (10)	34. Municipalité de la Baie-James (Canton Daubrée) * 35. Municipalité de la Baie-James 36. Municipalité de la Baie-James
Gaspésie–Îles-de-la-Madeleine (11)	37. Cap-aux-Meules
Chaudière-Appalaches (12)	38. Pontbriand 39. Lévis * 40. Garthby * 41. Saint-Thomas de Montmagny
Laval (13)	42. Laval (Paroisse Saint-Vincent de Paul) *
Lanaudière (14)	43. Saint-Félix-de-Valois 44. Sainte-Julienne D 45. Joliette 46. Saint-Roch-de-l'Achigan D 47. Saint-Louis-de-Terrebonne
Laurentides (15)	48. Sainte-Thérèse * 49. Mont-Laurier * 50. Chatham 51. Ferme-Neuve * 52. Sainte-Adèle

Montérégie (16)

- 53. La Prairie ^D
- 54. La Prairie
- 55. Tracy
- 56. Tracy
- 57. Sainte-Hélène-de-Bagot
- 58. Sainte-Cécile-de-Milton
- 59. Canton de Godmanchester
- 60. Brossard

Centre-du-Québec (17)

- 61. Saint-Grégoire
- 62. L'Avenir
- 63. Saint-Nicéphore
- 64. Ville de Bécancour

⁵RECYC-QU ÉBEC. *Bilan 1998*, revised in January 2000.

* municipal sites, others are privately operated

^D sites for which an order was issued



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Québec Residual Materials Management Policy, 1998-2008

Agronomic utilization of residuals : making the most of residues

- [The agronomic utilization of residuals is not a new idea!](#)
- [A new wave of recycling... industrial and municipal residues](#)
- [A winning combination](#)
- [A proven agricultural value](#)
- [Rigorous quality control](#)
- [The question of odours...](#)
- [Residuals and manure management](#)
- [For information](#)

Other information

[Interim Criteria for the Reclamation of Fertilizing Residuals](#)

[Agricultural Utilization of Fertilizing Residual Materials: Questions and Answers](#)

[Odours from Manure and Fertilizing Residuals](#)

The agronomic utilization of residuals is not a new idea!

The agronomic utilization of residuals is by no means a recent phenomenon. Québec's farm producers have long been using manure and harvest residues as fertilizers on their farms. The spreading of other types of residues, such as wood ash and fishing waste, has been recommended and practiced since the beginning of the century. Nearer to home, bone meal, animal flours and compost are used extensively as fertilizers by professional and amateur horticulturists.



A new wave of recycling... industrial and municipal residues



Today, new residuals with useful properties are becoming available, and there has been a revival of interest in recovery. The materials in question include sludge (also known as biosolids) from municipal and industrial wastewater

treatment plants, cement kiln dust, wood ash and compost. Their use, especially in agriculture, is a logical outcome of the efforts and choices made by Québec society in water and air purification and the selective collection of leaves and grass. Agronomic utilization of residuals is part of the [Québec Residual Materials Management Policy, 1998-2008](#). The goal of the plan is to develop 60% of recoverable putrescible residuals every year until the year 2008. It promotes alternative methods that are feasible from an environmental standpoint and profitable for both the economy and job creation.

A winning combination

There are three main benefits to be derived from the recovery of residuals. First, farm producers gain access to new fertilizers and soil conditioners that help improve crop production, reduce costs and promote soil conservation. Second, recycling helps industries and municipalities to reduce the cost of managing and eliminating some of their waste materials. And third, development has the environmental benefit of limiting resource wastage and the use of techniques such as sanitary landfill or incineration, by diverting approximately a million tons of good quality residuals away from elimination sites every year.



A proven agricultural value

Fertilizer residues, once spread on the land, have recognized fertilizing or soil conditioning properties. Research carried out in Québec by various groups, including universities, the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation, Agriculture and Agro-Food Canada and the industry, have shown that these substances have a positive effect on crop and soils. These findings confirm the results of research in the United States and Ontario, where residuals have been recycled for many years.

In practice, the exact value of residuals is established from product analysis and agronomic studies. It varies according to the type of residue and its water content. For example, some paper mill residues are valued at approximately \$4 per ton, as a source of NPK, but this does not take into account the value of organic matter added to soil. The comparison must also consider spreading costs, which vary according to the type of residue, the distances to be travelled and the spreading equipment required.

Residuals can be used in many different ways – for example, fertilizing and enriching soils in agriculture, horticulture and forest management, restoring vegetation to damaged sites, and so on.

Rigorous quality control

Fertilizer residues can be judged to be quality by-products, not waste for burial, when they are used according to criteria established by the Ministère de l'Environnement.



The agriculture value of residuals is not sufficient, on its own, for the Ministère de l'Environnement to authorize spreading. The residues must also meet a range of environmental quality criteria that are among the most severe in the world. The municipalities and industries producing the residues are required to perform complete and systematic analyses. Commercial standards established by Québec's Bureau de normalisation apply to some of these by-products. Fertilization with unstabilized sewage sludge or any other similar residue is prohibited.

Moreover, the spreading of the residues must be carried out in compliance with established practices, and when a certificate of authorization is required for the spreading and the storage of these residues, supervision by an agronomist or a forestry engineer is required. Farm producers who agree to use the residues on their land also agree to comply with established conditions and practices for the greater advantage to their operation and the environment. If you have any doubts about the source or the quality of the products proposed, contact one of the Ministère de l'Environnement's [regional offices](#).



The question of odours...

Some residues emit very little odour. This is the case, for example, of wood ash, cement kiln dust and mature compost. However, this may not be the case of other organic residues. This latter group must undergo treatment to reduce odour, and if this is not possible, they are subject to more severe spreading requirements than farm manure. For example, the spreading of some residues is prohibited on Saturdays, Sundays or public holidays. During the summer season, the local population must be informed before spreading takes place, and these residues may not be spread within a certain distance of neighbouring homes. Residents who, despite of all these measures, suffer serious inconvenience as a result of residue odour can contact one of the Ministère de l'Environnement's [regional offices](#).

Residuals and manure management

In 1998, approximately a million ton of residuals were spread over cultivated land in Québec, compared to 31 tons of farm manure. Residuals provided less than two percent of the phosphorous input to farmland, and are unlikely to provide more than five percent in the future.

The residues must be spread in accordance with the criteria stipulated in various regulations and technical guides. These criteria determine, among other things, which fertilizers and soil conditioners to use depending on agronomic needs.



For example, some residues poor in nitrogen and phosphorous, such as primary paper mill sludges and cement kiln dust, have properties that complement manure and mineral fertilizers. They are used mainly as soil conditioners, to counter soil deterioration.

Other residues, richer in phosphorous and nitrogen, such as mixed sludges from paper mills, have characteristics more consistent with manure. They are used in priority by plant-producing farms (corn, potatoes, etc.) that do not have easy access to solid manure or that are experiencing soil deterioration problems. Moreover, as provided by the [Regulation respecting the reduction of pollution from agricultural sources](#), livestock farms required to produce agro-environmental fertilization plans may use fertilizer residues only if they do not have a sufficient amount of manure for their needs. In 1998, farm producers spread industrial and municipal biosolids over about one percent of all cultivated land in Québec¹.

For information

To submit a project on agronomic utilization of residuals, or for more information on the criteria and to obtain substantiating documents, please contact your nearest [regional office](#).

You may also contact the [reception and information service](#) of the Ministère de l'Environnement.

¹ Data taken from Portrait agroenvironnemental des fermes du Québec, Union des producteurs agricoles du Québec, ministère de l'Agriculture, des Pêcheries et de l'Alimentation et Institut de recherche et de développement en agroenvironnement inc., 1999.



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Interim Criteria for the Reclamation of Fertilizing Residuals

**(Land application, storing, composting, manufacture
and use of soil mixes)**

Notice

As of May 1, 2004, the document entitled "Interim Criteria for the Reclamation of Fertilizing Residuals" will be replaced by the "Reclamation of Fertilizing Residuals Handbook". This guide, which includes the applicable standards and criteria, is used to determine whether or not the reclamation of specific fertilizing residuals requires a certificate of authorization. The guide is currently [available in French](#).

This document is a reissue of a document first published in April 1997, in French and then again in February 2001. It essentially integrates modifications made since February 2001, the September 2001 addendum concerning heaps on soil, the January 2002 addendum on limed abattoir sludge, the June 2002 addendum on odour categories, the standards governing the *Regulation respecting groundwater catchment* and the *Regulation respecting agricultural operations* adopted in June 2002. The modifications mainly affect tables 3.5, 4.2, 4.4, 4.5, 6.1, and 6.2. A revised version (not interim) of this document is envisaged for the end of 2003.

This document is intended primarily for regional branches of the *Ministère de l'Environnement du Québec* (Ministry) for regulatory verification purposes and for professionals involved in fertilizing residuals¹ (FR) reclamation projects requiring a certificate of authorization (CA) from the Ministry. The interim criteria deal mainly with environmental aspects. For best practices related to agriculture, silviculture, etc., the reader is encouraged to consult other relevant works, some of which have been included in the references.

The originality of Québec's FR reclamation criteria resides in the fact that they govern reclamation of a wide range of FRs -- industrial and municipal biosolids, ash, compost, soil mixes, etc. -- for a wide range of possible uses -- agricultural, silvicultural, horticultural, etc. These criteria synthesize extensive recent research and standardization data from Québec, Canada and the world over.

Section 1 of this document sets out the purpose of the criteria, the conditions requiring their application and the regulatory context. It can be used to establish whether a given reclamation project requires a CA. Section 2 covers the general content of a CA application and the attendant responsibilities. Section 3 deals with residual value and quality. Section 4 sets out land application criteria. Section 5 addresses the manufacture and use of commercial soil mixes. Section 6 covers requirements governing composting and temporary

field storage before land application. Section 7 presents sampling and analysis requirements and Section 8 outlines communications plan content. References and appendices are included to help users understand and apply the criteria.

Further information on FRs can be obtained by visiting the [Ministry's website](#) or calling a [regional branch office](#).

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Agricultural Utilization of Fertilizing Residual Materials: Questions and Answers

Introduction

There's been some debate in recent year over the benefits and safety of spreading fertilizing residual materials (FRMs) on agricultural land. The Ministère de l'Environnement, along with other public and private-sector organizations, has released a number of information documents on the subject. To that same end, the following aims to provide clear answers to the main questions raised by the public, farmers and other stakeholders.

- [Q: What are FRMs?](#)
- [Q: How much FRM spreading is there in Québec?](#)
- [Q: Is land application of FRMs really a form of reclamation or just low-cost waste disposal in disguise?](#)
- [Q: Does reclamation hinder surplus manure management?](#)
- [Q: Do FRMs contain contaminants?](#)
- [Q: Can FRMs harm crops?](#)
- [Q: Can spreading residuals contaminate well water?](#)
- [Q: Will FRM application contaminate agricultural soils?](#)
- [Q: Is it possible for an unknown contaminant to be present in FRMs and cause irreversible damage to soil over time?](#)
- [Q: Several fertilizing residuals can generate offensive odours. Why not prevent this problem by simply composting all residual materials?](#)
- [Q: Can FRM utilization cause health problems in farmers and consumers?](#)
- [Q: The reclamation criteria may be very restrictive, but are they actually respected on the ground?](#)
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Q: What are FRMs?

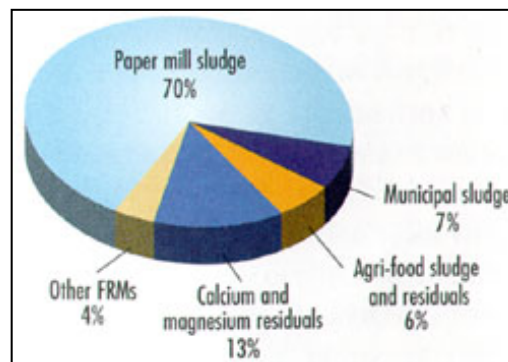
A: Fertilizing residual materials (FRMs) are industrial and municipal wastes such as sewage sludge (biosolids), cement kiln dust and wood ash that have beneficial effects on crops or soil. Manure is generally not considered an FRM,

because it is an agricultural waste and is governed by special regulations.

Q: How much FRM spreading is there in Québec?

A: Nearly one million tonnes of FRMs are spread on approximately 2.5% of agricultural soils in Québec each year. In fact, land application is one of the main forms of industrial and municipal waste reclamation, making it crucial to the achievement of the goals of the Québec Residual Materials Management Policy 1998-2008. Paper mill sludge accounts for roughly two thirds of all FRMs applied to agricultural land in Québec.

Agricultural spreading of reclaimed FRMs in 1999 (%)



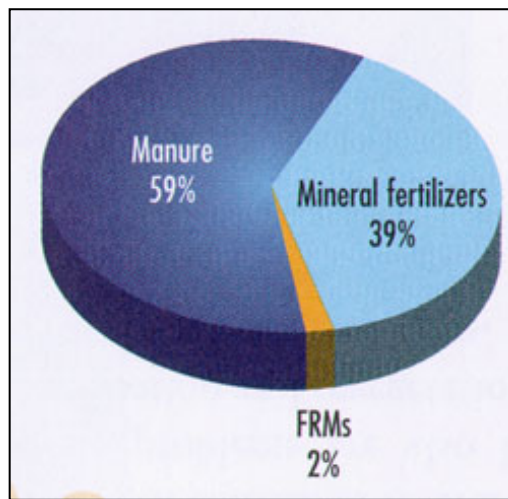
Q: Is land application of FRMs really a form of reclamation or just low-cost waste disposal in disguise?

A: Not all residuals can be converted into fertilizing material. The value of a given residual as a fertilizer or soil amendment must first be demonstrated through agronomic research. Then, analyses must demonstrate that the contaminant concentrations in the residual are within the permissible limits set by the Ministère de l'Environnement, which are among the most stringent in the world. So fertilizing residuals are, in effect, useful material and not just waste, which is why their reclamation is not only possible, but beneficial.

Q: Does reclamation hinder surplus manure management?

A: Based on statistics, the answer is "no." According to the agro-environmental portrait of Québec farms, only 1% of agricultural soils in the main regions with a manure surplus received FRMs in 1998. And FRMs contributed only around 2% of the total nitrogen and phosphorus application in Québec as a whole, well below the amount added by mineral fertilizers, which are also non-agricultural products. Although FRM-derived loads could increase in the future, they should not account for much more than 5% of the phosphorus and nitrogen added to soil, given the limited amounts of potentially reclaimable residuals. That maximum contribution will be lower for regions with surplus manure, since FRMs tend to be used more in regions with a lack of solid manure. In fact, several kinds of FRMs are of special interest to these regions as a means of offsetting agricultural soil degradation through the addition of organic amendments.

Distribution of nitrogen and phosphorus loads on agricultural lands in Québec in 1999 (%)



Q: Do FRMs contain contaminants?

A: Yes, the same as manure, mineral fertilizers and agricultural lime. Some of the contaminants found in FRMs occur naturally. Cadmium, for example, is a heavy metal that occurs naturally in wood and is therefore found in paper mill sludge. Other contaminants are caused by human activity, such as the presence of copper in municipal sludge, which is mainly the result of corrosion of copper pipes and fittings in household plumbing. However, the Ministère de l'Environnement has adopted very stringent quality criteria, which has encouraged several industries and municipalities to streamline their processes in order to decrease the contaminant content of residuals ever further for the purposes of agricultural utilization. Interestingly enough, half of the "contaminants" commonly analyzed in FRMs, including copper, chromium, cobalt, iron, zinc, molybdenum, nickel and selenium, are also considered essential trace elements for plants or essential minerals for animals and humans. Their presence in FRMs or manure is therefore not a problem in itself, provided the maximum concentrations are not exceeded.



Q: Can FRMs harm crops?

A: Agronomic research and the number of farmers applying FRMs to their fields tend to show the beneficial effects fertilizing residuals have on crop productivity and quality. Although there have been a few reported incidents of FRM application resulting in lower yields, subsequent assessment showed that the decreased yields were generally due to agronomic errors rather than to the presence of particular contaminants. Moreover, fertilizer, lime and even manure application can lead to similar problems under certain conditions. Municipal compost made from grass clippings may contain residues of persistent herbicides, such as Clopyralid. These herbicides damage susceptible market crops such as potatoes. Although no incidents of this type have been reported in Québec, an agronomist should be consulted when in doubt. Clopyralid residues in compost are not considered a threat to either human or animal health.

Q: Can spreading residuals contaminate well water?

A: Based on the results of recent risk modelling, the *Institut national de santé publique du Québec* deems that repeated spreading of FRMs is not liable to cause significant groundwater contamination from such pollutants as cadmium, dioxins and furans. And nitrate contamination of groundwater can be prevented by avoiding overfertilization, by making the participation of agronomists in fertilization plans mandatory, and by respecting the width of buffer zones

around wells. Pathogen-related risks are also low when the recommended spreading practices are followed. In fact, there have been no reported cases of water contamination from FRM application in Québec. In spring 2001, the media reported cases of residents of Clarendon, in the Outaouais region, feeling sick, allegedly as a result of private well contamination from the spreading of paper mill sludge. However, after analyzing the well water and assessing the complaints, the regional health and social services board issued a news release saying that no wells had actually been contaminated.

Q: Will FRM application contaminate agricultural soils?

A: Research conducted by Agriculture and Agri-Food Canada, the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Université Laval and other research organizations indicate that agricultural utilization of FRMs does not result in soil and crop contamination in the short term. As for the long-term risks, the *Institut national de santé publique du Québec* considers that normal FRM spreading on the same parcels over a period of 100 years would not cause significant soil contamination from arsenic, cadmium, chromium, copper, mercury, lead or zinc. Theoretically, significant contamination could result if three heavily contaminated fertilizing residuals, each containing maximum contaminant concentrations permitted, were simultaneously applied to the same parcel over a 100-year period. Statistically speaking, however, only around 0.017% of agricultural land, or 345 hectares in Québec as a whole, would receive three heavily contaminated fertilizing residuals in the first year. And the probability of this scenario occurring for 100 consecutive years and of three fertilizing residuals containing the highest level of contaminants is very low.

Q: Is it possible for an unknown contaminant to be present in FRMs and cause irreversible damage to soil over time?

A: Theoretically, yes. However, the probability of that happening is very low. The German experience with municipal biosolids (municipal sludge) is very enlightening in this regard. Germany created a fund to compensate farmers for possible damage caused by land application of municipal biosolids. After eight years of biosolids spreading by 900 participating farmers, no compensation has been paid for either "unknown contaminants" or unforeseeable damage. A number of "safety nets" exist in Québec for minimizing the risk of unknown contaminants. To begin with, FRM characterization studies, particularly of paper mill sludge, were conducted to determine the highest-risk contaminants liable to require regular monitoring. Second, several FRM treatment processes (aerobic digestion, alkalization, heat drying, composting, etc.) help break down organic contaminants. Receiving soils, which are biologically active, can also purify many organic pollutants. Third, the *Centre d'expertise en analyse environnementale du Québec* is currently developing toxicity tests (laboratory analyses) to detect the presence of contaminants that are not detectable through standard chemical analyses. These tools will be used for additional protection against unknown contaminants.

Q: Several fertilizing residuals can generate offensive odours. Why not prevent this problem by simply composting all residual materials?

A: The Ministère de l'Environnement has received numerous complaints about FRM spreading. These complaints concern residuals that are particularly malodorous, such as certain biosolids generated by slaughterhouses and paper mills. The nuisances are generally caused by noncompliance with the prescribed criteria, such as inadequate treatment, too long of a period between application and incorporation into the soil, spreading on holidays or the weekend, etc. Notices of offence were issued, and investigations are under way. Choosing to

take a precautionary approach, the Ministère recently required that a lime treatment, frequently used with slaughterhouse sludge, be carried out on site so as to reduce the problem at the source. And paper mills recently implemented additional treatments (including composting and acidification), on a voluntary basis, to substantially decrease odours and biosolids. The Ministère is contemplating making some of these treatments mandatory for strong-smelling FRMs. However, it should be pointed out that composting can also cause odorous emissions, in addition to reducing the nitrogen content of several residuals. Other solutions to odour problems are also being explored, including forest utilization and revegetation of abandoned sandpits located far from inhabited areas.

Q: Can FRM utilization cause health problems in farmers and consumers?

A: According to a recent study by the *Institut national de santé publique du Québec*, intensive use of FRMs with normal contaminant concentrations does not present a health risk to farmers or the general population where cadmium, dioxins, furans and other such pollutants are concerned. However, highly exposed farmers (intensive and simultaneous use of four FRMs with maximum contaminant concentrations for 100 years, consumption of products produced on the farm, etc.) could theoretically face a slightly higher risk in the long term. In the worst-case scenario, cadmium, which can cause kidney problems, would exceed the US reference dose by 5%, but would not exceed the Health Canada criterion. At the request of the *Institut national de santé publique du Québec*, the Ministère de l'Environnement is considering introducing additional restrictions on FRM utilization to ensure the US reference dose is never exceeded in the most highly exposed people. The proposed measures are currently the subject of consultations. The *Institut national de santé publique du Québec* also warned of a theoretical long-term risk in dioxins and furans for highly exposed farmers (intensive and simultaneous use of four FRMs with high contaminant concentrations for 100 years, consumption of products produced on the farm, etc.). However, in the worst-case scenario, the additional estimated risk of cancer is relatively low (1 in 2500 chance to 1 in 435 000 chance among highly exposed farmers, according to the risk estimator used by the INSP). Moreover, the probability of high exposure in farmers is very low, notably because the dioxin and furan content of the main FRMs actually spread in Québec is well below the permissible limits.



Q: The reclamation criteria may be very restrictive, but are they actually respected on the ground?

A: There are three types of regulatory violations: application of residuals without a certificate of authorization, application of residuals that do not meet the quality criteria (contaminant concentrations) and noncompliance with spreading conditions and limits.



According to the available data, nearly 100% of paper mill sludge spreading is carried out under a certificate of authorization. On the other hand, a not-

insignificant amount of septic sludge is spread without being authorized, either through direct spreading or application following disposal into slurry tanks. This practice is not only illegal, but it is also dangerous, because septic sludge contains pathogens and has not undergone the required treatment. The Ministère de l'Environnement and several member federations of the *Union des producteurs agricoles du Québec* have published non-scientific articles sensitizing farmers to the associated risks.

In an independent quality control of nearly 30% of residuals spread with authorization on agricultural land, the Ministère de l'Environnement found that all of the residuals sampled met the minimum quality criteria, and the majority of analyses performed by plants and municipalities were reliable. The findings are to be published in a detailed report. Eight other FRMs were also submitted to an independent quality control by the *Bureau de normalisation du Québec*, and certificates of compliance were issued to all of the producers concerned.

In the controls performed by the Ministère de l'Environnement, noncompliant spreading practices resulted from failure to comply in full with some of the conditions and limits; for example, the minimum distance from wells and ditches, not spreading malodorous residuals on the weekend, etc. In some cases, the noncompliance was attributable to negligence on the part of the person spreading; in others, the responsible agronomist had neglected to inform the farmer properly. To remedy these problems, the Ministère is contemplating increasing on-the-ground controls and sensitizing farmers' representatives and the *Ordre des agronomes* to the importance of complying with spreading conditions and limits, the same as for manure spreading and pesticide use.

Q: Should BNQ certification be required for all FRMs?

A: To date, eight fertilizing residuals have been certified by the *Bureau de normalisation du Québec* (BNQ), including six liming materials and two types of compost. Together, they represent around 10% of all FRMs reclaimed. BNQ certification of FRMs is a progressive approach on the world scale, and one with which the Ministère de l'Environnement and the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation have been actively associated since 1993. However, some residuals remain difficult to certify, such as those produced in limited quantities. Therefore, their spreading still requires authorization from the Ministère de l'Environnement.

Q: Can FRMs be used in organic farming?

A: The Ministère de l'Environnement considers land application of FRMs to be safe and in keeping with the principles of sustainable development when carried out in accordance with the Québec criteria. However, certain organic certification bodies may prohibit FRM use, as they have done with synthetic fertilizers and pesticides. Farmers who have or wish to obtain organic certification should therefore contact the certification body to inquire about FRM application.

Q: Can FRMs be spread after October 1?

A: The main risk associated with FRM application in the fall is nitrogen leaching into watercourses or groundwater. That is why spreading in the fall is permitted only for FRMs with a lower ammonia nitrogen content than solid and liquid manures. Residuals with a similar ammonia nitrogen content to manure may be applied only during the growing season. Spreading conditions and limits are also very stringent.

Q: Can municipalities adopt a by-law restricting or banning the use of

FRMs?

A: Actually, some municipalities have adopted by-laws banning or restricting the use of FRMs within their territory. However, there has been some debate over the legality of such by-laws given that the Ministère de l'Environnement oversees the environmental aspects of FRM reclamation. The courts have not yet ruled definitely on the matter. Nevertheless, municipal managers must see to it that these by-laws do not compromise the waste reclamation objectives imposed on municipalities by the Québec government and do not go against user rights.

Q: Shouldn't the issue of agricultural utilization of FRMs be debated publicly?

A: In 1996, the *Bureau d'audiences publiques sur l'environnement du Québec* (BAPE) conducted vast consultations on waste management. It even devoted separate sessions to composting and FRM spreading. The final report highlighted the need to restrict landfilling of residual materials and increase reclamation in various forms. In response to the BAPE's recommendations, the Québec Residual Materials Management Policy 1998-2008 sets reclamation objectives and calls for the development of agricultural utilization and composting. In 1998, the Ministère de l'Environnement submitted its FRM reclamation criteria to its main partners, including the *Union des producteurs agricoles* and the Ministère de la Santé et des Services sociaux (MSSS), for consultation. Acting on their recommendations, the Ministère de l'Environnement made substantial changes to the criteria, and is currently considering making further changes to give the criteria a more permanent character. To that end, the Québec government held consultations on the principle of agricultural utilization and the reasons underpinning its reclamation criteria.

Q: When all is said and done, what are the primary risks associated with FRM use?

Every human activity involves some degree of risk. That being said, the risks inherent in agricultural utilization of FRMs would appear to be relatively low in Québec. The primary risks arise from illegal practices, particularly unauthorized spreading of septic sludge. As for odours, improvements have been or will be made to ensure that FRMs do not create a nuisance for neighbours.

For further information, contact the Ministère de l'Environnement information centre

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Québec 

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**QUÉBEC RESIDUAL MATERIALS MANAGEMENT
POLICY**

1998-2008

(The French version prevails)

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FOREWORD

The Act to amend the Environment Quality Act and other legislation as regards the management of residual materials (1999, chapter 75) established that the Québec Action Plan for Waste Management, 1998-2008, made public by the Minister of the Environment and amended to comply with the provisions of the Act, makes up the government Residual Materials Management Policy.

Section 53 of this Act provides that once published in the *Gazette officielle* the Policy is deemed to satisfy the requirements of section 53.4 of the Environment Quality Act and remains into force until it is amended or replaced, in accordance with the provisions of this section.

The purpose of this document is to make known the government Residual Materials Management Policy made pursuant to section 53.4 of the Environment Quality Act.

I – Background

In the 20th century, the industrial nations were devoted to satisfying our ever-growing consumer needs. To do so, they extracted and processed extensive natural resources. Today, we know that these resources are limited and that extractive and manufacturing activities are responsible for our major pollution problems: water pollution, global warming due to greenhouse gases, soil contamination and erosion, ecosystem degradation and loss of biodiversity. Part of the solution to these problems is sound residual materials management. Recovering useful materials and recycling them back into the production stream generally has the same effect as source reduction, namely, reducing the need for virgin materials along with pollution generated by their processing.

Putrescible materials are the main source of contamination in disposal sites. In landfills, their decomposition in the absence of oxygen produces malodorous, explosive gases that contribute to the greenhouse effect. The organic compounds released by the decomposition migrate with leachates and can contaminate surface and groundwaters, making them unfit for human consumption and even harmful to aquatic life. Removing putrescible materials from the waste stream therefore reduces the pollutant load in disposal sites and can be a valuable source of compost, which helps improve soil quality while cutting back on the need for fertilizers and pesticides.

Minimizing the amount of waste entering landfills reduces the rate at which they are filled, thereby extending their life span and restricting the need for replacement sites.

It was to meet these challenges that, in 1989, the Québec government adopted an integrated solid waste management policy, which targeted a 50 percent reduction in the quantity of waste sent for disposal by the year 2000. In 1989, 5.7 million tonnes of residual materials, of the 7 million tonnes generated, went for disposal, leaving a recovered volume of just under 1.3 million tonnes. Ten years later, the total quantity generated had risen to 8.3 million tonnes, with 5.3 million tonnes being discarded. This meant that 3 million tonnes were being reused, more than double the 1989 amount. However, given the 1.3-million-tonne increase in total residual materials generated, the reduction rate had reached only 10.8 percent, a far cry from the 50 percent initially sought.

The 1989 policy also targeted safer disposal methods, but Québec's regulatory standards governing waste disposal were only reviewed for new disposal sites authorized from 1993 onward under the environmental assessment procedure.

The Québec Residual Materials Management Policy therefore proposes a management system that is more environmentally sound while supporting Québec's social and economic development.

2 – Principles

The actions proposed in this Policy are premised on the following fundamental principles of waste management:

4R-D

Unless an environmental analysis indicates otherwise, waste management options should be considered according to the following hierarchy: source reduction, reuse, recycling, resource recovery and disposal.

Greater producer responsibility

Manufacturers and importers assume greater responsibility for the environmental effects of their products throughout their life cycle, including the upstream effects inherent in the choice of product components, the effects of the manufacturing process as such and the downstream effects resulting from the product's use and disposal.

Citizen participation

Citizen participation in the development and monitoring of measures targeting ecologically sound waste management is essential to achieving our goals. The general public must have access to relevant information and to the appropriate forums during the decision-making process.

Regionalization

Waste management decisions and their implementation are made at the regional municipality level in accordance with the powers of municipal authorities.

Partnership

By fully assuming their role, mission and responsibilities, all stakeholders contribute in a coherent, concerted and complementary manner to implementing the measures designed to achieve the set goals.

3 – Purpose

The purpose of the Québec Residual Materials Management Policy is:

- 1° to prevent or reduce the production of residual materials, particularly by targeting product manufacturing and marketing;
- 2° to promote residual materials recovery and reclamation;
- 3° to reduce the quantity of residual materials sent for disposal and ensure the safe management of disposal sites;
- 4° to make manufacturers and importers take into consideration the environmental effects of their products and the costs related to the recovery, reclamation and disposal of the residual materials generated by these products.

4 – Goals

One way to help ensure sustainable resource use is through better management of residual materials as a resource. The main goal of this Policy is to recover 65 percent of the 7.1 million tonnes of residual materials that can be reclaimed each year. This goal can only be reached, however, if all sectors of society do their part. The following recovery goals have therefore been set for each sector and material category¹.

Municipalities:

- 60 percent of glass, plastics, metals, fibres, bulky waste and putrescible material;
- 75 percent of oils, paints, and pesticides (household hazardous materials);
- 50 percent of textiles;
- 80 percent of non-refillable beer and soft drink containers.

Industrial, commercial and institutional establishments:

- 85 percent of tires²;
- 95 percent of metals and glass;
- 70 percent of plastics and fibres, including wood material;
- 60 percent of putrescible material.

Construction, renovation and demolition sector:

- 60 percent of all recoverable resources.

Attaining these targets will increase Québec's resource recovery rate from 3 086 590 tonnes in 1996 to 4 793 000 tonnes in 2008. By that time, only ultimate waste, i.e. materials that can no longer be reused, recycled or reclaimed, should be going for disposal.

The second fundamental goal of the Policy is to ensure that disposal methods are safe for public health and the environment.

¹ Appended is a table showing the recovery goals for 2008 and recovery rates in 1996 by source and container or materials category.

² Used tires are discarded just as much by consumers as industrial, commercial and institutional establishments. They have been included in the ICI category to simplify presentation.

5 – Actions

5.1 Residual materials management planning

All Québec regional municipalities³ must have a residual materials management plan in place no later than two years following the coming into force of appropriate legislative provisions. When a management plan is implemented, it binds the local municipalities which are required to abide by it without any possibility of dropping out. It is also binding on the government which must comply with its provisions when authorizing materials recovery, reclamation and disposal facilities.

Management plans are updated every five years and can be amended at any time. They target all residual materials with the exception of hazardous materials other than household materials, biomedical waste, mine tailings, contaminated soils containing contaminants in quantity or concentration above regulatory criteria, and gaseous materials. Management plans must contain the following information:

- 1° description of territory covered by the plan;
- 2° names of local municipalities targeted by the plan and a list of intermunicipal agreements pertaining to residual materials management applicable to the territory in whole or in part;
- 3° list of organizations and firms that carry out residual materials recovery, reclamation or disposal activities within the territory;
- 4° inventory of residual materials generated in the territory, whether of domestic, industrial, commercial, institutional or other source, by materials category;
- 5° statement of residual materials recovery, reclamation and disposal orientations and goals to be fulfilled, as well as a description of services required to achieve these goals;
- 6° list of recovery, reclamation and disposal facilities in the territory; where applicable, the need of any new facility to fulfill the aforementioned goals and, if need be, the possibility of using facilities outside the territory;
- 7° plan implementation proposal favouring citizen participation and the cooperation of organizations and firms involved in residual materials management;
- 8° budgetary proposals and a plan implementation timetable;
- 9° plan monitoring and follow-up system intended to verify the plan's application periodically, namely, goal fulfilment and efficiency of implementation measures taken by regional municipalities or local municipalities targeted by the plan.

Regional municipalities may restrict or prohibit the disposal of non-region material in their territory. If they choose to exercise this right, they must say so in their management plan and indicate, in the case of a restriction, the quantity of residual materials targeted. This measure will take effect at the same time as the management plans and apply to all new projects to establish or expand a disposal site, whether public or privately operated, to the exclusion of a disposal facility belonging to a firm which uses it exclusively to dispose of the residual materials it generates. In addition, this measure can not apply to residual materials generated by a pulp and paper mill.

Before taking effect, and whenever they are updated, management plans must be submitted to the Minister of the Environment for approval. The Minister may order that

³ A regional municipality includes a metropolitan community, an urban community or a regional county municipality which is responsible for developing a residual materials management plan.

changes be made to the plan, if he deems it does not reflect the government's policy or if the right to restrict or prohibit the disposal of non-region wastes is liable to compromise public health and safety. Where the regional municipality does not modify its plan to the satisfaction of the Minister, the Minister may exercise his regulatory powers in lieu of the municipality to make the plan consistent with the government policy or prevent any public health and safety hazard.

5.2 Citizen participation

Regional municipalities are required to establish adequate mechanisms to foster public participation early in the development and monitoring stages.

A public consultation on the proposed plan must be held via a commission set up by the regional municipal council and consisting of no more than ten members appointed by the council, with at least one business representative, one union representative, one community representative and one environmental protection group representative.

The commission must hold a public meeting in at least two local municipalities located in the territory of the regional municipality concerned. It is responsible for defining its modes of operation and consultation and must report to the public and the Minister.

When new disposal sites are authorized by order of the government, operators are required to set up watchdog committees and assume the cost. This requirement will be extended to existing disposal sites designated by regulation. The purpose of the committees is to ensure monitoring of the sites during operation, closure and post-closure and to inform the population.

5.3 Education and information

Environmental education activities and information on new ways to participate in sustainable residual materials management are crucial. Public information and educational materials adapted to the different stakeholder groups must be developed and made readily accessible to as many individuals and groups as possible.

5.4 Research and development

The materials recovery and reclamation industry must constantly adapt its methods and technologies in order to respond to the new challenges facing it all the time. In addition to continued access to regular support programs for technological innovation, firms require new forms of support to be able to evolve in pace with the industry.

5.5 Support for social economy businesses

A significant and increasing proportion of recovery, reuse and recycling is performed by social economy businesses that create lasting, quality jobs, produce goods and services and help divert material from the waste stream for new purposes.

Many of these businesses have also taken it upon themselves to train, inform and sensitize their staff and customers to more environmentally responsible residual materials management practices. This makes them a valuable asset in our efforts to improve environmental health, preserve quality of life and create employment, which is why they must play a prominent role in our plans for sustainable residual materials management.

To help this sector of the Québec economy grow, the government will contribute financially to the establishment, development and consolidation of social economy businesses operating in the area of residual materials recovery and reclamation.

5.6 Residual materials recovery and reclamation

5.6.1 Strengthening of selective municipal collection

Businesses must be made responsible for the products they market and which become residual materials once used. That is why the government will adopt a regulation requiring of industrial or commercial businesses which manufacture or market or otherwise distribute in Québec containers, packaging or print material that they assume the major portion of the costs of selective waste collection. The regulation will set recovery targets, require businesses to report on their progress in meeting targets and provide for fines and sanctions in the event of non-compliance.

To meet this requirement, businesses targeted will have the choice of setting up their own recovery system or delegating an organization, accredited by the Minister of the Environment, to represent them and support financially selective municipal collection.

Businesses that choose to be represented by a government-accredited organization will have six months following the regulation's coming into effect to enter into an agreement with the Minister of the Environment. The agreement will set the recovery targets, which can not be lower than those provided for by regulation. The financing standards and criteria will be defined and approved by the Minister under the agreement and will be established on the basis of effective and efficient selective municipal collection programs.

5.6.2 Recovery of putrescible material

Putrescible material is most likely to cause major contamination in landfills. When composted, it can be used to improve the quality of soils. It is therefore important to progressively recover this material in as great a quantity as possible. Municipalities will be subject to the regulatory obligation to recover surplus grass clippings and leaves.

5.6.3 Recovery of households hazardous materials

Some residential wastes can be hazardous; for example, used oils, certain paints, solvents, pesticides, and batteries. Diverting them from the waste stream to reuse them whenever possible is therefore important.

The government will enact regulations making recovery and treatment of the hazardous materials manufactured and marketed by businesses mandatory. To meet this requirement, businesses will have the choice of setting up their own recovery system or delegating an organization, accredited by the Minister of the Environment, to represent them.

5.6.4 Recovery of construction, renovation and demolition debris

More than 90 percent of construction, renovation and demolition debris can be used for other purposes, yet large quantities are still being sent, at low cost, to dry materials sites. In order to stimulate the recovery of these materials, the new regulation on the disposal of residual materials will prohibit the establishment and expansion of dry materials disposal sites in Québec. The gradual elimination of these sites will force construction and demolition waste generators who wish to get rid of these materials to direct them to a sanitary landfill, at a much higher cost.

Existing dry materials disposal sites will be allowed to continue receiving waste for the authorized term of operation in order to complete site rehabilitation. However, the standards governing their operation will be tightened. Projects that have already been submitted for environmental impact assessment and review will be studied on a case-by-case basis according to the recovery and disposal needs of the targeted community or communities.

Given that segregated concrete, asphalt and brick do not represent an environmental risk, their reuse will be encouraged. As long as they meet certain quality criteria, they can be reused for backfilling, repair or construction purposes. Construction, renovation or demolition debris containing wood, gypsum, textiles or any other non-inert material, will have to be directed, with the gradual closure of existing dry materials disposal sites, to either authorized processing centres or sanitary landfill sites.

5.6.5 Reduction and recovery of industrial, commercial and institutional materials

Industries, commercial establishments and institutions recover 66 percent of the residual materials with a potential for recovery that they generate in a year. They must be lauded for this strong performance and encouraged to continue their efforts.

An environmental program that recognizes reduction and recovery initiatives by industrial, commercial and institutional establishments will be set up and the results will be made public.

Those businesses that attain the reduction and recovery targets established with the Minister of the Environment will receive official recognition from the government, which they may use to promote their product(s) on domestic and export markets.

For its part, the government must set an example as a major institution whose agencies purchase and consume large quantities of goods and products. It must work towards waste reduction and recovery the same as any other institution and stimulate the market for recycled goods.

The government commits to making waste audits and reduction plans part of its regular management activities. It will also strengthen the environmental content of its procurement policy by giving priority to products that are better for the environment, such as recycled paint and oil, and construction, renovation and demolition debris, so as to support the markets for these secondary materials.

5.6.6 Recovery of non-refillable beer and soft drink containers

With a return rate of 76 percent on non-refillable beer and soft drink containers at retailers, the deposit-return system is no longer self-financing. Like other enterprises marketing products in Québec, the brewery industry and soft drink bottlers will be responsible for funding the recovery of waste generated by their products. The terms for financing will be established by agreement with the Minister of the Environment.

5.6.7 Recovery of used tires

Retailers apply a non-refundable levy to the sale of new tires. The monies generated by this program are used by the government to cover the costs of recycling used tires generated in Québec each year. They are also used to financially support businesses that reuse or recycle scrap tires, or burn them to produce energy. The program will also help to empty all used tire storage sites.

5.6.8 Reclamation of municipal and industrial sludge

Knowing the properties of sludge, which vary according to the source, is essential to assessing its recovery potential. Hence, regional municipalities will be required to establish master plans for managing industrial and municipal sewage sludges. These plans will be an integral part of the residual materials management plan and will aim to identify the source, quantity and quality of the different categories of sludge generated in the territory and determine, where environmentally beneficial, whether recovery is possible. The ultimate goal is to ensure that no sludge is landfilled until it has been demonstrated that recovery is not an economically viable option.

5.7 Disposal

As of June 14, 1993, when authorizing a disposal site the government may set standards different from those provided by regulation if it deems increased environmental

protection is needed. These more stringent protection standards will be incorporated into the regulation governing disposal activities.

5.7.1 Technical landfill sites

Québec's landfill standards need to be tightened to ensure greater protection of human health and the environment. A new regulation on residual materials disposal will be adopted to that end.

New landfill requirements will mainly target:

- watertight landfill cells to ensure maximum protection of groundwater;
- leachate collection and, where necessary, treatment systems to protect groundwater, surface water and the quality of receiving environments;
- safe collection and release or burning of biogas.

5.7.2 Dry materials disposal sites

Dry materials disposal sites will be subject to more stringent safety standards. The new regulation respecting residual materials disposal will require site owners to monitor groundwater and surface water quality, among other things.

5.7.3 Post-closure monitoring of disposal sites

By order of the government, and under the authorizations it issues in compliance with the environmental impact assessment and review procedure, operators are required to establish financial guarantees in the form of a trust fund for the post-closure monitoring of disposal sites. This requirement will be extended to existing disposal sites designated by regulation.

5.7.4 In-trench disposal sites

In order to reduce in-trench disposal of waste materials, given its impact on water quality, the number of in-trench sites will be limited.

Moreover, site owners will be required to monitor groundwater and surface water quality.

5.7.5 Incineration

Because incinerators require substantial capital expenditures to operate, a sustained supply of residuals is needed to make them profitable. This can slow the attainment of recovery goals.

Projects to operate or increase the capacity of an incinerator will be authorized only if the proponent can demonstrate that incineration does not conflict with the recovery targets. All new incinerators having a capacity of over two metric tons per hour must be designed to recover energy from the burning of waste.

Furthermore, tighter standards governing gas and particle emissions will be adopted.

5.7.6 Waste disposal in the North

Northern municipalities and communities generally manage their waste by depositing it in open dumps. Since the ground is frozen for most of the year, the waste piles up and is then burned at prescribed intervals.

The use of small incinerators would help to reduce reliance on this form of disposal which entails environmental and health hazards. A pilot project to assess the environmental acceptability of burning waste in small incinerators should be carried out. If the results are satisfactory, small-scale incineration will be allowed and encouraged.

5.8 Role of Recyc-Québec

Recyc-Québec is responsible for coordinating recovery initiatives proposed in this policy with a view to consistency and complementarity. More specifically, it will:

- help set up industrial residuals recovery and reclamation agencies accredited by the Minister and monitor agreements entered into with the Minister;
- develop and manage a knowledge system for tracking the achievement of sectoral and overall residual materials recovery goals;
- administer any financial assistance program upon request of the Minister or the government;
- foster the development of markets for secondary materials in partnership with the industries concerned;
- advise regional municipalities, management boards or any other body mandated by the municipalities on the establishment of residual materials management plans.

5.9 Implementation monitoring

A report on the implementation of this policy will be published every two years. Furthermore, the Policy itself will be reviewed five years after its coming into effect and the management directions revised as necessary based on the results of source reduction and recovery efforts.

CONCLUSION

This Residual Materials Management Policy 1998-2008 encourages all municipal, industrial and environmental stakeholders, along with Quebeckers in general, to join forces with the government to work towards greater protection of human health and the environment through sound residual materials management.

APPENDIX

RECOVERY GOALS FOR 2008 BY SOURCE AND MATERIAL RECOVERED, AND QUANTITIES RECOVERED IN 1996

MUNICIPAL	Recoverable volume (x 1000 tonnes)	Recovery rate		Materials recovered in 1996 (x 1000 tonnes)
		Goal (%)	Tonnage (x 1000 tonnes)	
Recyclable materials				
Total fibres	555	60%	333	198
Refundable containers	42	80%	34	29
Non-refundable containers	260	60%	156	62
Non-refundable aluminum	12	20%	2	N/A
SUBTOTAL	869	60%	525	289
Putrescible materials				
Putrescible residues	589	60%	353	N/A
Clippings, leaves	221	60%	133	N/A
SUBTOTAL	810	60%	486	84
Reusable products				
Textiles	54	50%	27	10
Bulky waste	273	60%	164	102
SUBTOTAL	327	58%	191	112
Hazardous materials	27	60%	16	3
TOTAL MUNICIPAL	2 033		1 218	488

INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL	Recoverable volume (x 1000 tonnes)	Recovery rate		Materials recovered in 1996 (x 1000 tonnes)
		Goal (%)	Tonnage (x 1000 tonnes)	
Recyclable materials				
Paper and packaging	882	70%	617	598
Glass	38	95%	36	36
Plastics	162	70%	113	26
Metals	1 081	95%	1 027	1 001
Textiles	N/A	70%	N/A	17
SUBTOTAL	2 162	83%	1 793	1 677
Putrescible materials				
Wood	202	70%	142	N/A
Putrescible residues	188	60%	113	N/A
SUBTOTAL	390	65%	254	30
Tires	63	85%	54	17
TOTAL ICI	2 615	80%	2 101	1 724

CONSTRUCTION AND DEMOLITION	Recoverable volume (x 1000 tonnes)	Recovery rate		Materials recovered in 1996 (x 1000 tonnes)
		Goal (%)	Tonnage (x 1000 tonnes)	
Recoverable				
Paper and packaging	75	60%	45	N/A
Steel	81	60%	49	N/A
Aggregate	1 908	60%	1 145	N/A
Wood	394	60%	236	N/A
TOTAL C & D	2 458	60%	1 475	875

GRAND TOTAL				
Quantity generated (x 1000 tonnes)	Recoverable volume (x 1000 tonnes)	Recovery rate Goal (%)	Tonnage (x 1000 tonnes)	Materials recovered in 1996 (x 1000 tonnes)
8 312	7 106	67%	4 793	3 088