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L'état des lieux et la gestion des résidus ultimes

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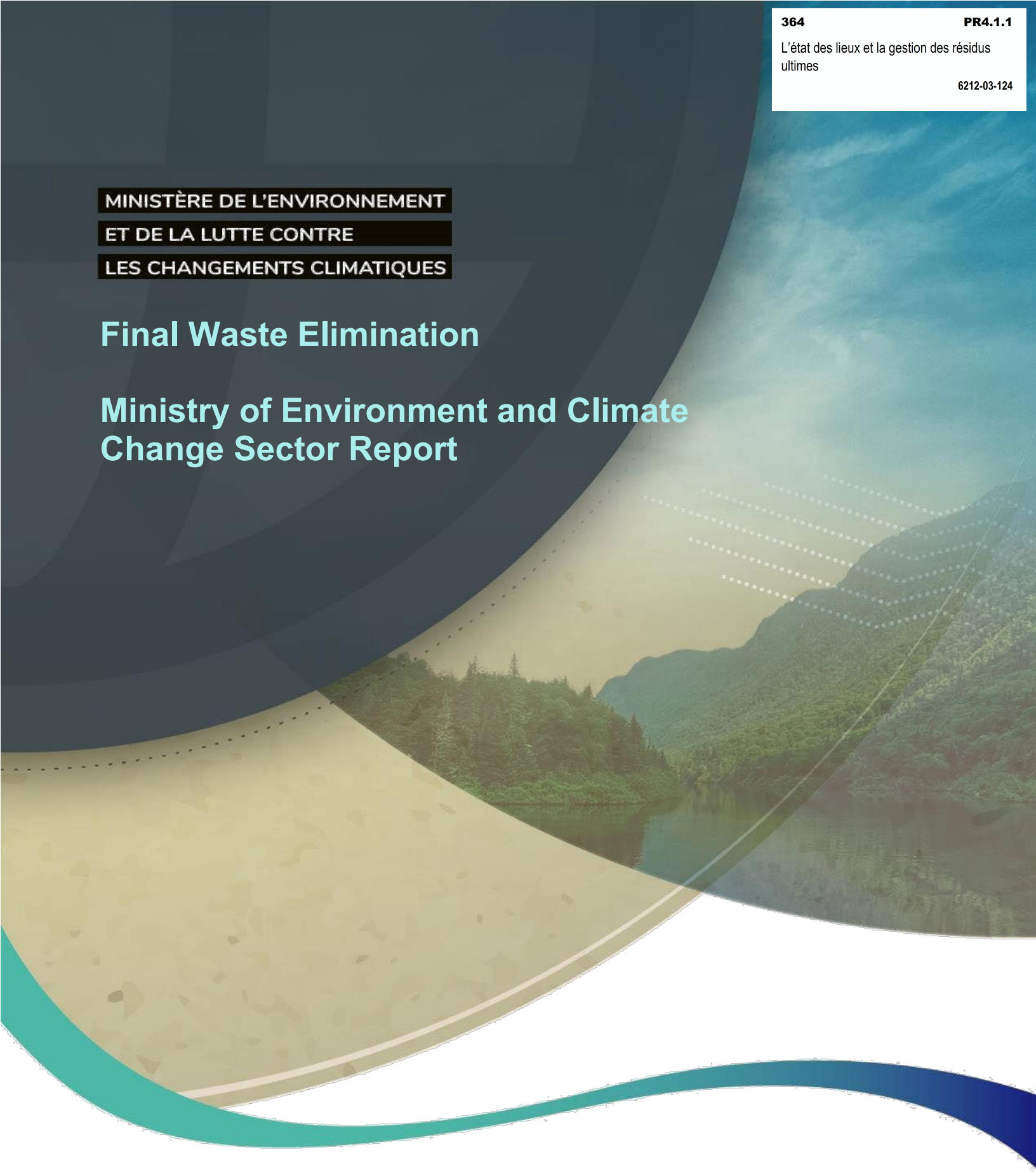
MINISTÈRE DE L'ENVIRONNEMENT
ET DE LA LUTTE CONTRE
LES CHANGEMENTS CLIMATIQUES

Final Waste Elimination

Ministry of Environment and Climate Change Sector Report



Votre gouvernement

Québec

RÉSUMÉ

Mise en contexte

Le terme « matière résiduelle » est défini à la Loi sur la qualité de l'environnement (LQE). Puisque ce terme générique vise l'ensemble des matières résiduelles, il importe de préciser que seulement celles qui sont régies par le Règlement sur l'enfouissement et l'incinération de matières résiduelles (REIMR) font l'objet du présent rapport.

Selon le principe de la hiérarchie des 3RV-E, la plus grande quantité possible de matières résiduelles doit être destinée, dans l'ordre, à la réduction à la source, au réemploi, au recyclage ou à d'autres formes de valorisation pour ainsi n'éliminer que le résidu ultime. Plus simplement, le résidu ultime représente les matières résiduelles qui ne sont pas valorisées et qui, par conséquent, doivent être éliminées.

La LQE fait d'ailleurs la distinction entre la valorisation et l'élimination des matières résiduelles. Tandis que le compostage, la biométhanisation et la valorisation énergétique sont considérés comme des modes de valorisation, l'enfouissement et l'incinération constituent quant à eux les modes d'élimination au Québec.

Le choix du mode d'élimination des matières résiduelles revient aux différents paliers municipaux (municipalités, MRC, communautés métropolitaines). En vertu de leurs compétences, elles peuvent exploiter une installation d'élimination de matières résiduelles ou confier ce processus à une entreprise privée.

Le ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC) n'intervient pas dans le choix des modes ou des technologies utilisés pour l'élimination des matières résiduelles. Il intervient plutôt dans l'encadrement réglementaire et le contrôle de ceux-ci pour assurer la protection des personnes et de l'environnement.

Depuis 2006, c'est le REIMR qui prévoit les exigences en matière d'aménagement, d'exploitation et de suivi environnemental des installations d'élimination de matières résiduelles. Les normes d'émission relatives aux installations d'incinération se retrouvent cependant dans le Règlement sur l'assainissement de l'atmosphère (RAA).

Les modes actuels d'élimination

En ce qui concerne l'enfouissement, le lieu d'enfouissement technique (LET) constitue le concept de base. Les autres types de lieux sont plutôt des modes d'exception pour certaines matières résiduelles [lieu d'enfouissement de débris de construction ou de démolition (LEDCD)] ou pour certains territoires [lieu d'enfouissement en tranchée (LEET), lieu d'enfouissement en milieu nordique (LEMN) ou lieu d'enfouissement en territoire isolé (LETI)].

Les LET sont des lieux étanches, avec captage et traitement des lixiviats et des biogaz, qui sont assujettis à un programme de suivi environnemental (eaux et biogaz) ainsi qu'à des valeurs limites à ne pas dépasser.

Les LEET ne sont permis que dans certains territoires faiblement peuplés et éloignés. Aucune exigence d'étanchéité à respecter ne s'applique. Sont cependant prévues des normes de localisation quant aux ouvrages de captage d'eau de même qu'un suivi de la qualité des eaux souterraines visant à assurer le respect des valeurs limites.

Les LEMN sont utilisés pour desservir de faibles populations dans des territoires où il y a présence de pergélisol ou rareté de dépôts meubles. Afin de diminuer le volume de matières résiduelles déposées directement sur le sol et de minimiser l'attrait des animaux et la contamination des eaux, le brûlage à ciel ouvert de ces matières est obligatoire. Aucun suivi environnemental n'est requis et aucune valeur limite pour la qualité des eaux souterraines et de surface n'est applicable.

Seuls les exploitants de dépôts de matériaux secs disposant d'une capacité résiduelle en janvier 2009 ont pu poursuivre leurs activités, à la condition toutefois de respecter toutes les nouvelles exigences du REIMR relatives au LEDCD s'appliquant aux zones exploitées après cette date. De plus, seuls des débris de construction ou de démolition (nouvelle définition) sont admissibles dans ces zones qui sont aussi assujetties à des normes de localisation plus sévères. Un suivi environnemental (eaux et biogaz) est requis et des valeurs limites sont applicables.

Les LETI ne peuvent être exploités que par certains organismes ou certaines personnes, afin d'essentiellement desservir des pourvoiries ou des campements industriels qui sont éloignés et isolés.

L'incinération, qui comprend également la pyrolyse, la gazéification et le plasma thermique sont visés par les normes d'émission du RAA. Ces normes sont fondées sur des standards pancanadiens et des lignes directrices du Conseil canadien des ministres de l'environnement (CCME). En outre, des exigences en matière d'échantillonnage à la source sont prévues pour les installations où ces traitements sont réalisés.

Pour assurer l'efficacité accrue du transport des matières résiduelles vers des installations d'élimination éloignées, l'exploitation de centres de transfert est possible. Les activités doivent se dérouler à l'intérieur d'un bâtiment. Aucune matière résiduelle ne doit être stockée à l'extérieur de celui-ci ni au-delà de 12 heures à l'intérieur. Pour satisfaire les besoins des petites communautés, des centres de transfert de faible capacité qui sont assujettis à moins d'exigences sont permis.

La procédure d'évaluation environnementale

Les activités à risque élevé constituent des projets assujettis à la procédure d'évaluation et d'examen des impacts sur l'environnement et sont encadrées par le Règlement relatif à l'évaluation et l'examen des impacts sur l'environnement de certains projets (RÉEIE). La procédure d'évaluation et d'examen des impacts vise à guider le gouvernement dans la prise de décisions éclairées à l'égard de projets à risque élevé ou suscitant des préoccupations importantes auprès du public. Les projets d'établissement ou d'agrandissement d'un LET de même que les projets de construction ou d'augmentation de la capacité d'un incinérateur sont assujettis à cette procédure.

L'élimination des matières résiduelles au Québec

Il n'y a présentement pas de surcapacité d'élimination autorisée au Québec, en ce qui a trait au flux annuel de matières résiduelles à éliminer. Or, lorsque les principaux lieux d'enfouissement du Québec arrivent à saturation (volume autorisé comblé), le renouvellement de leur autorisation devient une nécessité. Aucune autre installation d'élimination en exploitation n'est en mesure d'accepter une importante quantité supplémentaire de matières résiduelles.

Les limitations sur la durée d'exploitation, le tonnage annuel admissible et la provenance des matières résiduelles prévues dans les décrets gouvernementaux ou résultant de l'application du droit de regard accordé aux municipalités régionales de comté (MRC) quant à la quantité de matières résiduelles pouvant être éliminées dans une installation d'élimination localisée sur leur territoire et provenant de l'extérieur de ce territoire constituent un frein à la recherche de solutions de rechange lorsqu'un lieu d'enfouissement atteint sa capacité autorisée. L'absence de solution alternative exerce une pression sur le gouvernement lorsqu'il doit analyser les projets d'agrandissement ou d'établissement d'installations d'élimination au Québec, puisque c'est à lui qu'il revient d'autoriser ces projets.

Actuellement, plus de 90 % des matières résiduelles sont éliminées par enfouissement dans des LET. Le reste est éliminé dans des lieux d'enfouissement à usage spécifique ou pour des territoires éloignés faiblement peuplés. Moins de 5 % des matières résiduelles sont éliminées par incinération. Si on comptait plus de 400 installations d'élimination en exploitation en 2006 lors de l'entrée en vigueur du REIMR, on en compte maintenant une centaine (en excluant les LETI).

Certains territoires comme la Communauté métropolitaine de Montréal et la région de l'Outaouais éliminent, en grande partie ou en totalité, leurs matières résiduelles dans des installations situées à l'extérieur de leur territoire. Malgré des exigences réglementaires permettant l'élimination sécuritaire des matières résiduelles par enfouissement ou incinération, des enjeux d'acceptabilité sociale (syndrome « pas dans ma cour ») se manifestent lors du processus d'autorisation des projets qui visent à recevoir des matières résiduelles provenant de l'extérieur de la MRC où sont situés ces projets. De plus, l'incinération constitue un mode d'élimination qui a déjà été considéré par certains groupes environnementaux comme étant en conflit avec la valorisation des matières résiduelles.

Les règles actuelles concernant l'obligation pour un exploitant de LET de recevoir des matières résiduelles causent certains problèmes, étant donné le nombre limité de LET pour desservir tous les territoires. Divers problèmes associés à la présence de gypse dans les résidus issus du tri des débris de construction ou de démolition ont amené certains exploitants à refuser l'admission de ces résidus dans leur lieu. Ce secteur d'activité est donc fortement affecté présentement par l'inaccessibilité à un lieu d'élimination pour les rejets du tri.

Dans un lieu d'enfouissement, le recouvrement périodique des matières résiduelles est obligatoire. L'entrée en vigueur du REIMR a rendu possible l'utilisation de certaines matières résiduelles pour effectuer ce recouvrement. Cette forme de valorisation a permis de mettre en évidence les quantités de matières résiduelles utilisées à cette fin. Il ne s'agit toutefois pas d'un détournement de ces matières vers les lieux d'enfouissement; celles-ci étaient dirigées vers l'enfouissement par le passé, faute de moyens de les valoriser autrement comme c'est encore le cas de nos jours.

Les exigences à respecter pendant l'exploitation demeurent applicables après la fermeture des lieux d'enfouissement, et tous les frais d'entretien et de suivi sont à la charge de l'exploitant. Actuellement, seuls les exploitants de projets assujettis à la procédure d'évaluation environnementale (agrandissement ou établissement d'un LET) se voient obligés de verser une contribution pour chaque tonne de matières résiduelles éliminées dans une fiducie pour financer ces coûts de gestion postfermeture. Les clauses particulières relatives à l'établissement des fiducies et à la révision des coûts et de la contribution sont donc variables. De plus, rien ne vient encadrer la manière dont les sommes accumulées pourront être retirées de la fiducie, en période postfermeture, ni ce qu'il adviendra des sommes restantes dans le fonds, le cas échéant, lorsque la gestion postfermeture sera terminée.

L'état des lieux actuels au Québec

Au Québec, 38 LET, 7 LEDCD, 30 LEET, 25 LEMN, 114 LETI et 4 incinérateurs sont actuellement en exploitation, en plus de 35 centres de transfert. Deux projets d'établissement et cinq projets d'agrandissement de LET suivent actuellement la procédure d'évaluation environnementale.

La quantité totale de matières résiduelles éliminées (incluant celles utilisées pour le recouvrement) en 2019 dans les LET, les LEDCD et les incinérateurs est de 8,841 M tonnes. La quantité éliminée dans les LEET pour 2019 est de 45 654 tonnes.

Selon l'information disponible au MELCC, 44 % des matières résiduelles destinées à l'élimination sont passées par un centre de transfert avant d'être acheminées à une installation d'élimination et 21 % des matières résiduelles provenant des secteurs du résidentiel, des industries, des commerces et des institutions (ICI) et de la construction, de la rénovation et de la démolition (CRD) auraient été générées par des municipalités du territoire de référence de l'installation d'élimination.

L'élimination des matières résiduelles en territoires nordiques, éloignés et isolés

Le brûlage obligatoire dans les LEMN est à la fois une source de contamination de l'atmosphère et de nuisance potentielle pour la population qui habite à proximité. Le brûlage est aussi parfois difficile, les conditions optimales n'étant pas toujours au rendez-vous.

Pour les territoires de la Baie James et du Nunavik, des procédures particulières d'autorisation par évaluation environnementale des installations d'élimination de matières résiduelles sont prévues.

L'éloignement de ces populations et l'accès limité au transport des biens et des marchandises rendent très difficile la valorisation des matières résiduelles pour ces régions. L'absence de solution locale exige le transport des matières, ce qui augmente les coûts de manière très importante. D'importantes quantités de matières résiduelles sont donc entassées en attente d'une solution ou éliminées dans les LEMN.

Pour certains territoires isolés, comme l'île d'Anticosti, où l'accès au territoire est possible seulement par une desserte maritime, les exigences en matière d'exploitation (p. ex., le suivi environnemental) sont parfois difficiles à respecter. Les Îles-de-la-Madeleine représentent un autre territoire isolé et éloigné, où l'élimination des matières résiduelles est problématique. Il n'y a présentement aucune installation d'élimination en exploitation sur ce territoire. Pour ces endroits, la génération d'un grand volume de matières résiduelles à éliminer pour une activité donnée (p. ex., la destruction d'un bâtiment) devient ainsi problématique.

Les émissions de GES

Selon le dernier inventaire du Québec, en 2018, les émissions de GES du secteur des matières résiduelles se sont élevées à 4,13 millions de tonnes équivalent CO_2 (Mt. éq. CO_2), soit 5 % des émissions totales de l'inventaire. De 1990 à 2018, les émissions liées à ce secteur ont diminué de 7,1 à 4,1, soit une diminution de 3 Mt éq. CO_2 ou 42 %.

Depuis 2000, la principale baisse des émissions de GES représentant près de 0,7 Mt éq. CO_2 est attribuable à la réduction des émissions liées à l'enfouissement. Elle résulte principalement du captage et de la destruction des gaz d'enfouissement dans plusieurs lieux associé, dans certains cas, à la récupération de l'énergie pour produire de l'électricité ou de la chaleur ou encore pour substituer des combustibles fossiles.

Le captage du gaz d'enfouissement dans les lieux d'enfouissement, en 2018, a aidé à éviter des émissions de GES de près de 4,5 Mt éq. CO_2. L'estimation de la quantité de méthane générée dans les lieux d'enfouissement est relativement stable depuis une dizaine d'années. Toutefois, la quantité de méthane détruit ou valorisé au cours des dernières années est inférieure à celle de 2012. Ainsi, la quantité de méthane émis a augmenté de 2012 à 2016 et diminué légèrement par la suite.

Dans le cadre du programme Biogaz du Plan d'action sur les changements climatiques (PACC) de 2006-2012, le gouvernement du Québec a pu faire l'achat de réductions d'émissions de GES de près de 630 000 t éq. CO_2 pour huit projets volontaires de captage et de destruction du gaz d'enfouissement provenant de lieux d'enfouissement, de 2009 à 2013.

Le secteur des matières résiduelles est visé par un protocole de crédits compensatoires du système de plafonnement et d'échange des droits d'émission de GES (SPEDE). Des crédits compensatoires (CrC) peuvent être délivrés pour des projets volontaires de réduction des émissions de GES découlant de lieux d'enfouissement. Ainsi, grâce à ce protocole visant les lieux d'enfouissement admissibles, des projets relativement comparables à ceux du programme Biogaz (2009-2013) ont pu être réalisés depuis 2014.

En ce qui concerne l'incinération des matières résiduelles (incluant les boues de traitement des eaux), les émissions sont relativement stables de 2013 à 2018 (moyenne de 155 000 t éq. CO_2)

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La valorisation des matières résiduelles

En vertu de leurs compétences en matière d'environnement, la municipalité locale, la municipalité régionale de comté et la communauté métropolitaine jouent aussi un rôle important dans la valorisation des matières résiduelles. En vertu de la Loi sur la qualité de l'environnement (LQE), ces dernières doivent élaborer un Plan de gestion des matières résiduelles (PGMR) axé sur leur

réduction, leur réemploi et leur valorisation. Le PGMR doit être conforme aux orientations de la Politique québécoise de gestion des matières résiduelles et de ses plans d'action.

Le plus récent plan d'action de la Politique (2019-2024) met de l'avant des mesures et des actions qui serviront à réduire la quantité de matière éliminée par habitant et à augmenter le recyclage du papier, du carton, du verre, du plastique et du métal de même que des matières organiques et des résidus de construction, de rénovation et de démolition, notamment via la modernisation des systèmes de collecte sélective et de consigne.

La Stratégie de valorisation de la matière organique vise à détourner de l'élimination les résidus alimentaires, les résidus verts, le papier, le carton, le bois, les biosolides municipaux et les biosolides papetiers.

Les éléments économiques de la gestion des matières résiduelles

Depuis 2006, des redevances à l'élimination sont exigées pour chaque tonne de matière résiduelle éliminée. Ces redevances contribuent à augmenter le prix de l'élimination des matières résiduelles, rendant ainsi les autres modes de recyclage et de valorisation plus compétitifs par rapport à l'élimination. Or elles agissent comme premier frein à l'élimination des matières résiduelles au Québec.

Jusqu'à maintenant, c'est plus de 1,463 G$ en redevances qui ont été reçus. De ce montant, plus de 960 M$ ont été redistribués aux municipalités par le biais du Programme sur la redistribution aux municipalités des redevances pour l'élimination de matières résiduelles. Le solde a notamment servi au financement du Plan d'action 2011-2015 de la Politique québécoise de gestion des matières résiduelles et du Programme de traitement des matières organiques par biométhanisation et compostage (PTMOBC).

Les hypothèses et les projections des besoins d'élimination

Le portrait de la situation actuelle quant à la gestion des matières résiduelles sert de base à l'évaluation des besoins futurs. Les quantités totales de matières reçues dans les installations d'élimination, en incluant le recouvrement et les autres usages, pour la période de référence de 2015 à 2019 sont en moyenne de 1,01 tonne/habitant. Si l'on exclut le recouvrement et les autres usages, ce taux moyen est plutôt de 0,72 tonne/habitant.

Afin d'évaluer les besoins futurs, trois scénarios d'évolution potentielle ont été élaborés (pessimiste, réaliste, optimiste). Dans chacun de ces scénarios, une projection des taux d'élimination par habitant a été réalisée sur un horizon de 20 ans. Ces scénarios supposent des niveaux variés d'effort déployé pour réduire le taux d'élimination, en lien avec la mise en œuvre de la Politique québécoise de gestion des matières résiduelles, des plans d'action et des stratégies qui en découlent de même que des plans de gestion des matières résiduelles produits dans chaque territoire. Ces scénarios tiennent également compte des perspectives démographiques. Il ressort de cet exercice que les besoins en élimination du Québec se situeront vraisemblablement entre 6,1 et 9,4 millions de tonnes métriques en 2041, en incluant le recouvrement et les autres usages, comparativement aux 8,8 millions de tonnes métriques en 2019.

SUMMARY

Background

The *Environment Quality Act* (EQA) defines “residual material.” Since this generic term covers the entire array of residual materials, it is important to specify that this report covers only those governed by the *Regulation respecting the landfilling and incineration of residual materials* (RLIRM).

According to the 4 Rs principle, the largest quantity possible of residual materials must be destined, in order of importance, for reduction at the source, reuse, recycling, or other forms of recovery and conversion to thereby eliminate only the final waste. More simply, the final waste represents the residual materials that are not recovered and must, consequently, be eliminated.

The EQA also distinguishes between the recovery and conversion and the elimination of residual materials. While composting, biomethanization, and utilization for energy purposes are deemed reclamation methods, burial and incineration are elimination methods in Québec.

It is incumbent upon the municipalities, RCMS, and metropolitan communities to choose the elimination method. By virtue of their areas of competence, they can operate residual materials disposal facilities or entrust such materials to a private company.

The MELCC does not intervene in the choice of the methods or technologies used to eliminate residual materials but instead in the regulatory framework and control of such materials to protect individuals and the environment.

Since 2006, it is the RLIRM that specifies the requirements pertaining to the outfitting, operation, and environmental monitoring of residual materials disposal facilities. However, the *Clean Air Regulation* (CAR) stipulates the emission standards governing incineration facilities.

Current elimination methods

For burial, the engineered landfill (EL) is the basic concept while other types of site are exceptional methods for certain residual materials (construction or demolition waste landfill [CDWL] or certain territories (trench landfill [TL], northern landfill [NL], and remote landfill [RL]).

ELs are impermeable sites that capture and treat leachates and biogas, subject to an environmental monitoring program (water and biogas) and the limit values.

TLs are allowed in certain sparsely populated, remote areas. There is no watertightness requirement to be observed. However, location standards are specified for water catchment facilities and groundwater quality monitoring to ensure compliance with the limit values.

NLs serve small populations in territories where permafrost is present or unconsolidated deposits are rare. To reduce the volume of residual materials deposited directly on the ground and minimize the attraction of animals and water contamination, open burning of such materials is mandatory. No environmental monitoring is required, and no limit value respecting groundwater and surface water applies.

Only the operators of dry waste disposal sites with residual capacity in January 2009 have pursued their operations, subject, however, to compliance with all the new requirements of the RLIRM pertaining to CDWLs for zones used after that date.

Moreover, only construction or demolition debris (new definition) is allowable in such zones, which are also subject to more stringent location standards. Environmental monitoring of water and biogas is required, and limit values are applicable.

Only certain organizations or individuals can operate RLs to mainly service outfitting operations or remote, isolated industrial camps.

The *Clean Air Regulation* emission standards cover incineration, which also includes pyrolysis, gasification, and thermal plasma. The standards are based on Canada-wide standards and the guidelines of the Canadian Council of Ministers of the Environment (CCME). Source emissions testing requirements are stipulated for such facilities.

To facilitate the more efficient transportation of residual materials to remote disposal facilities, it is possible to operate a transfer centre. The operations must take place inside a building. Residual materials may not be stored outside the building nor for more than 12 hours inside the building. To meet the needs of small communities, low-capacity transfer centres subject to fewer requirements are permitted.

Environmental impact assessment procedure

High-risk activities are projects subject to the environmental impact assessment and review procedure pursuant to the *Regulation respecting the environmental impact assessment and review of certain projects* (REIAR). The environmental impact assessment and review procedure seeks to facilitate enlightened government decision-making with respect to high-risk projects or projects that arouse significant public concern. Projects to establish or expand an EL and incinerator construction or capacity expansion projects are subject to the procedure.

The disposal of residual materials in Québec

There is no disposal overcapacity in Québec in respect of the annual flow of residual materials to be eliminated. When the authorized volume of Québec's main landfill sites is reached, their authorization must be renewed. No other disposal facility in operation can accept a significant amount of additional residual materials.

Restrictions on the duration of operation, allowable annual tonnage, and the source of the residual materials provided for in government decrees or stemming from the application of the legal authority granted to the regional county municipalities (RCMs) on the amount of residual materials that can be eliminated in a disposal facility located in their territory and coming from outside the territory are an impediment to the search for alternative solutions when a landfill site reaches its authorized capacity. The lack of an alternative solution exerts pressure on the government when it must analyze expansion or disposal facility projects in Québec since it is responsible for authorizing them.

At present, more than 90% of residual materials eliminated through burial end up in ELs. The remaining residual materials are disposed of in specific-use landfill sites or for sparsely populated remote areas. Less than 5% of residual materials are eliminated through incineration. In 2006, when the RLIRM came into force, more than 400 disposal facilities were in operation, as against 100 today (excluding RLs).

Certain territories such as the Communauté métropolitaine de Montréal and the Outaouais region extensively or eliminate their residual materials in facilities situated outside their territory. Despite the regulatory requirements that allow for the safe elimination of residual materials through burial or incineration, social acceptability issues (the not in my backyard [NIMBY] syndrome) emerges during the process to authorize projects designed to accept residual materials from outside the RCM where the project is situated. Moreover, incineration as an elimination method has already been considered by some environmental groups to conflict with the reclamation of residual materials.

The current rules concerning the obligation for the operator of an EL to accept residual materials cause certain problems given the limited number of ELs to serve all the territories. Problems related to the presence of gypsum in the residues stemming from the sorting of construction and demolition debris have led certain operators to refuse such waste on their sites. This area of activity is thus significantly affected by the inaccessibility of sorting waste disposal sites.

The periodic recovery of residual materials is mandatory at landfill sites. The coming into force of the RLIRM has facilitated the use of certain residual materials to carry out such recovery. This form of recovery and conversion has highlighted the quantities of residual materials used for this purpose. However, it is not a question of diverting such materials to landfill sites, which were sent for burial in the past for want of being converted otherwise, as is still the case nowadays.

The requirements to be observed during operation remain applicable after the closure of landfill sites and the operator is responsible for all maintenance and monitoring expenses. At present, only projects subject to the environmental assessment procedure (expansion or establishment of an EL) are obliged to pay a contribution for each ton of residual materials eliminated to a trust to fund such post-closure management costs. The specific clauses pertaining to the establishment of the trusts, the revision of costs, and the contribution are, therefore, variable. Furthermore, no provision is made concerning the withdrawal from the trust of the funds accumulated during the post-closure period nor for the funds remaining, where applicable, when post-closure management ends.

The current situation in Québec

There are 38 ELs, 7 CDWLs, 30 TLs, 25 NLs, 114 RLs, 4 incinerators, and 35 transfer centres operating in Québec. Two EL construction projects and five expansion projects are in the environmental assessment procedure phase.

The total amount of residual materials eliminated (including those used for recovery) in 2019 in the ELs, CDWLs, and incinerators stood at 8.841 million tons. In 2019, 45,654 tons were eliminated in TLs.

According to the information available at the MELCC, 44% of the residual materials destined for elimination went through a transfer centre before being taken to a disposal facility and 21% of the residual materials in the residential, ICI, and CRD sectors appear to have been generated by the municipalities in the reference territory of the disposal facility.

The elimination of residual materials in northern, remote, isolated territories

Mandatory burning in NLs is a source of air pollution and of potential environmental nuisances for nearby residents. Burning is also sometimes difficult since optimum conditions are not always present.

In the James Bay and Nunavik territories, specific authorization procedures through environmental assessments of the residual materials disposal facilities are stipulated.

The remoteness of such populations and limited access to goods transportation make it very difficult to reclaim residual materials in the regions. The absence of a local solution requires the transportation of the materials, which significantly increases costs. Significant quantities of residual materials are thus piled up while awaiting a solution or eliminated in NLs.

For certain isolated territories, such as Île d'Anticosti, where access to the territory is possible only by maritime service, operating requirements such as environmental monitoring are sometimes difficult to observe. The Îles-de-la-Madeleine is another isolated, remote territory where the elimination of residual materials poses a problem. No disposal facility is now in operation in this territory. In these territories, the generation of large volumes of residual materials to be eliminated with respect to a given activity such as the demolition of a building becomes problematical.

GHG emissions

That most recent Québec inventory in 2018 indicates that GHG emissions from the residual materials sector stood at 4.13 million tons of CO_2 equivalent (MT CO_2e) i.e., 5% of total emissions in the inventory. Emissions in this sector declined by 3 MT CO_2e from 7.1 to 4.1 MT CO_2e or 42% between 1990 and 2018.

Since 2000, the main reduction in GHG emissions of nearly 0.7 MT CO_2e is attributable to reduced emissions from burial. It stems principally from the capture and destruction of burial gases at several sites and, in some instances, the recovery of energy to generate electricity, heat, or replace fossil fuels.

In 2018, landfill gas capture avoided nearly 4.5 MT CO_2e. Estimated methane generated in landfill sites has been relatively stable for 10 years. However, the quantity of methane destroyed or recovered in recent years falls below the 2012 figure. Accordingly, the methane emitted has increased from 2012 to 2016 and decreased slightly thereafter.

Under the *2006-2012 Climate Change Action Plan* (CCAP), the biogas program enabled the Québec government to purchase nearly 630 000 CO_2e for eight voluntary landfill gas capture or destruction projects at landfill sites between 2009 and 2013.

The residual materials sector is covered by an offset credits protocol under the GHG emission cap-and-trade system (C&T system). Offset credits can be issued for voluntary landfill site GHG emission reduction projects. Accordingly, since 2014, the protocol respecting eligible landfill sites has facilitated projects relatively comparable to those under the biogas program (2009-2013).

Emissions from the incineration of residual materials (including water treatment sludge) were relatively stable between 2013 and 2018 (an average of 155,000 T CO_2e).

The reclamation of residual materials

Given their jurisdiction in the realm of the environment, local municipalities, regional county municipalities, and metropolitan communities also play a key role in the reclamation of residual materials. Pursuant to the *Environment Quality Act* (EQA), they must elaborate a residual materials management plan (RMMP) centred on the reduction, reuse, and reclamation of residual materials. The RMMPs must be aligned with the orientations in the *Québec Residual Materials Management Policy* and the attendant action plans.

The most recent action plan under the policy (2019-2024) puts forward measures and initiatives that will reduce the quantity eliminated per capita and increase the recycling of paper, cardboard, glass, plastic, and metal, organic matter, and construction, renovation, and demolition waste,
including the modernization of deposit-return and curbside collection systems.

The *Stratégie de* valorisation *de la matière organique* seeks to divert from elimination food waste, green residue, paper, cardboard, wood, municipal biosolids, and paper mill biosolids.

Economic facets of the management of residual materials

Since 2006, elimination fees have been demanded for each ton of residual materials eliminated. The fees increase the price of eliminating residual materials to make recycling and recovery and conversion alternatives more competitive in relation to elimination. They are acting as an initial damper on the elimination of residual materials in Québec.

Until now, more than $1.463 billion has been collected. Of this amount, more than $960 million has been redistributed to the municipalities through the Programme sur la redistribution aux municipalités des redevances pour l'élimination de matières résiduelles. The balance has been used to fund the *2011-2015 Action Plan* of the *Québec Residual Materials Management Policy* and the Programme de traitement des matières organiques par biométhanisation et compostage (PTMOBC).

Hypotheses and forecasts concerning elimination needs

The overview of the current situation respecting the management of residual materials serves as a basis for assessing future needs. The total quantities of materials received in disposal facilities, including recovery and other uses, for the reference period 2015 to 2019 stand, on average, at 1.01 tons/inhabitant. When recovery and other uses are excluded, the average rate stands at 0.72 ton/inhabitant.

To evaluate future needs, three potential change scenarios (pessimistic, realistic, optimistic) have been elaborated. In each scenario, a projection of per capita elimination rates has been produced over a period of 20 years. The scenarios assume varied levels of effort to reduce elimination rates related to the implementation of the Québec *Residual Materials Management Policy,* the attendant action plans and strategies, and the residual materials management plans produced in each territory, and consider population forecasts. This exercise reveals that Québec's elimination needs will likely fall between 6.1 and 9.4 million tons by 2041, including recovery and other uses, compared to 8.8 million tons in 2019.

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INTRODUCTION

The analysis of several engineered landfill expansion projects over the past few months has raised several issues concerning the elimination of final waste in Québec, which vary depending on the regional context, the density of land use, the remoteness of certain communities and nordicity.

Several landfills are facing capacity issues in the short term. Although the various measures announced in recent months by the government are aimed at reducing the quantity of residual materials destined for elimination, they will require some time to come to fruition, leaving Québec society to deal with this type of facility for several years to come.

Furthermore, despite the adoption of requirements that facilitate environmentally and socially safe residual material disposal, projects to establish or expand disposal facilities regularly run up against issues of social acceptability.

Consequently, an in-depth reflection on the disposal of final waste throughout Québec is necessary. The government will thus be able to develop a long-term vision on the disposal of final waste that includes respect for the environment as well as the health and quality of life of the population.

As a result, the Minister of the Environment and the Fight Against Climate Change has mandated the Bureau d'audiences publiques sur l'environnement (BAPE) to hold an inquiry, with a public hearing, on the issue of final waste elimination in Québec.

For the successful completion of this mandate, the BAPE called upon the expertise, knowledge, and data available to the MELCC to contribute to its reflection.

This document thus offers an overview of the status of residual materials in Québec with respect to their elimination. It begins with the context of final waste elimination in Québec within the context of the major issues facing the MELCC. This is followed by a description of the various existing elimination methods within the authorization framework for these sites and the current situation in Québec, including a specific section on the elimination of residual materials in northern, remote, and isolated territories. The importance of climate change has led to a special section on GHG emissions related to residual materials management. The report discusses the valorization of residual materials in Québec, considering the economic elements, to develop hypotheses that will be used to project future disposal needs under various scenarios.

Glossary of Terms

« “4R-D”: source reduction, reuse, recycling, reclamation, and disposal

« “Biogas”: all gases generated by residual materials disposed of in a landfill - Biogas is primarily composed of methane and carbon dioxide and other compounds in low concentrations. It is a combustible gas resulting from the process of biological degradation (fermentation) of organic matter in the absence of oxygen. Its high methane content can vary depending on the materials and conditions. It is released naturally but can be produced under controlled conditions in digesters. Once captured, it can be valorized, as it constitutes a source of energy that can replace fossil energy. Biogas can be purified to make biomethane, which possesses properties like natural gas.

« “Biomethanization”: a process for treating organic matter by fermentation in the absence of oxygen - The biological degradation process takes place in one or more anaerobic digesters. The result is a digestate, a liquid fraction and biogas.

« “Transfer Centre”: any facility where residual materials are unloaded to prepare them for subsequent transportation for disposal at a different location; and

« “Sorting centre”: facilities where residual materials are sorted, packaged, and stored before being sent to recyclers - These facilities include sorting centre for curbside recycling and sorting centres for construction, renovation, and demolition wastes (CRD).

« “Composting”: a process for the aerobic biological treatment of organic material - Organic material is generally mixed with structuring material that promotes aeration.
(e.g., wood chips) and placed in windrows, piles, or reactors. Compost is obtained after an aerobic degradation phase followed by a maturation phase. For the tri-composting treatment of mixed materials, different sorting operations are planned before and/or after the initial aerobic degradation phase. When necessary, structuring material is added for maturation to obtain compost.

« “Curbside recycling”: a method of recovery that allows residual materials to be collected to promote their recovery - Curbside recycling is achieved through voluntary contributions to a drop-off point (point of sale, bell, container, waste disposal or recycling centre) or door-to-door.

« “Construction or demolition waste”: material resulting from the construction, repair or demolition of buildings, bridges, roads, or other structures, including stone, rubble or plaster, concrete, masonry or paving materials, surfacing materials, wood, metal, glass, textiles, and plastics.

« “Right of inspection”: the right to exercise control over something - Regional municipalities will have a right of inspection over the landfilling or incineration of residual materials from outside their territory. When the management plans come into force, they will limit or ban their use for new projects for the establishment or expansion of certain disposal sites.

« “Ecocentre”: a public place set up for the deposit of recyclable materials, bulky waste, household hazardous waste (HHW), construction, renovation, or demolition materials (CRD), organic materials (dead leaves, branches, etc.) and salvageable objects, to encourage reuse and recycling.

« “Disposal of Residual Materials”: any operation involving the deposit or final discharge of residual materials into the environment, including landfilling, storage, or incineration, and includes any processing or transfer of residual materials for disposal.

« “Landfill”: the permanent placement of waste materials on or in the ground; (Sec. 1 of the RLIRM).

« “Greenhouse gases”: gases present in the atmosphere that contribute to retaining heat near the earth's surface - GHGs are formed mainly of water vapour, carbon dioxide (CO_2), methane (CH_4) generated by the landfilling of organic matter, nitrous oxide (N_2O) from the combustion of biomass, among other things, and ozone (O_3).

« “4R-D hierarchy”: as outlined in section 53.4 of the EQA, the management of RM must give priority to source reduction, reuse, recycling, and any other reclamation operation in which residual materials are treated for use as a substitute
for materials and finally disposal.

« “Incinerator”: all equipment or apparatus designed and used to carry out the thermal treatment of residual materials, with or without heat recovery, including incineration, pyrolysis, gasification, and plasma treatment.

« “Construction or Demolition Waste Landfills (CDWL)”: means any site developed and operated in accordance with the provisions of Section 5 of Chapter II of the RLIRM - Only construction or demolition debris may be received in this type of site.

« “Engineered Landfill (EL)”: any site developed and operated in accordance with the provisions of Section 2 of Chapter II of the RLIRM - ELS are constructed to prevent contact between RMs and groundwater by means of impermeable membranes that are leak-tested by a leak detection system. A leachate collection system is installed at the bottom of the landfill cells to allow leachate to be recovered and then treated.

« Northern landfill (NL)”: any site developed and operated in accordance with the provisions of Section 4 of Chapter II of the RLIRM - In a northern environment, landfill sites may be established where only the residual materials generated there are eligible, including sludge which, although not generated in this environment, is otherwise treated.

« “Trench landfill (TL)”: in areas referred to in Section 87, TLs may be established in which only the residual materials generated in the area are eligible, including sludge that, although not generated in the area, is otherwise treated in the area. TLs must be developed and operated in accordance with the provisions of Section 3 of Chapter II of the RLIRM.

« “Remote landfill (RL)”: RLs must be developed and operated in accordance with the provisions of Section 6 of Chapter II.

« “Northern environment”: the territories referred to below:

1° The territory located north of the 55th parallel

2° the Municipality of Côte-Nord-du-Golfe-du-Saint-Laurent, the Municipalities of Blanc-Sablon, Bonne-Espérance, Gros-Mécatina and Saint-Augustin, the Town of Schefferville and the territory within a radius of 10 kilometres from the limits of that town, the Naskapi Village of Kawawachikamach and any other municipality constituted under the Act respecting municipal territorial organization of Côte-Nord-du-Golfe-du-Saint-Laurent (1988, chapter 55); 1996, chapter 2).

« “Composting site”: all composting facilities owned by the same owner where the distance between a facility or structure and the nearest facility or structure owned by the same owner is not more than 500 metres.

« “Leachate or leachate water" means the residual liquid produced by the infiltration of water or other liquids through a mass of material during storage or at any of the treatment stages.

« “Organic matter”: all food and green residues, paper and cardboard, wood and municipal biosolids.

« “Residual matter”: any residue from a production, transformation or use process, any substance, material, or product or, more generally, any personal property that is abandoned or that the holder intends to abandon (s. 1 of the EQA)

« “Covering”: in ELs, residual materials shall, at the end of each day of operation, be covered with a layer of soil or other material referred to in Section 42 of the MMER or be covered by some other means to minimize the release of odours, the spread of fire, the proliferation of animals or insects and the escape of light elements.

« “Recycling”: the use, in a manufacturing process, of a salvaged material to replace a virgin material - Composting and biomethanization are also considered recycling processes.

« “Recycling of residual organic matter”: a process that consists of direct land application or biological treatment by composting or biomethanization to improve soils - Materials can be recycled by spreading, particularly on agricultural soils, during horticultural, silvicultural or revegetation work.

« “Regionalization”: the regionalization of residual materials management is a major achievement of the Quebec Residual Materials Management Policy 1998-2008. It was implemented through an amendment to the EQA, which requires regional municipalities to have RMMPs, and through the implementation of a government financial assistance program for the regional municipalities concerned. The EQA has thus given these municipalities a regional management role by requiring that the RMMPs cover all residual materials produced on their territory, whether they are of domestic, industrial, commercial, institutional, or other origin. Since the RMMPs are a foundation for the management of residual materials, the government intends to ensure, after consulting the partners, that they comply with this policy and the requirements of the EQA.

« “Metal shredder residue”: material released from the sorting of ferrous and non-ferrous metals into shredded metals, commonly referred to as "fluff" -- Metal shredders process all types of metal-containing materials, including motor vehicle bodies and appliances.

« “Valorization”: a generic term that encompasses all techniques that allow for the reuse, recovery, or recycling of residual materials, with the goal of diverting them from disposal.

« “Biogas valorization”: biogas can be used according to several modes of valorization. There are three types: thermal energy, electrical energy, and biofuel.

« “Residual materials valorization": any operation aiming, through reuse, recycling, biological treatment, including composting and biomethanization, land application, regeneration

or any other action that does not constitute elimination, to obtain useful elements or products or energy from residual materials; (art. 1 of the EQA)

« “Energy recovery": the thermal destruction of residual materials constitutes energy recovery insofar as this treatment of the materials complies with the regulatory standards prescribed by the government, including a positive energy assessment and the minimum energy efficiency required, and that it contributes to the reduction of greenhouse gas emissions.

(Art. 53.4.1 of the EQA).

Abbreviations

« “BEC”: Bureau de l’expertise en contrôle

« “CMM”: Communauté métropolitaine de Montréal

« “CMQ”: Communauté métropolitaine de Québec

« “CRD”: construction, renovation, and demolition

« “OD”: Open dump

« TD Trench deposit

« “DMS”: Dry materials depot

« “GHG”: Greenhouse gas

« “RMM”: Residual Material Management

« “ICI”: Industries, commerces and institutions

« “EQA”: Environment Quality Act

« “CDWL”: Construction or Demolition Waste Landfills

« “TL”: Trench Landfill

« “NL”: Northern Landfill

« “SL”: Sanitary landfill

« “EL”: Engineered Landfill

« “RL”: Remote Landfill

« “MELCC”: Ministry of the Environment and the Fight against Climate Change

« “RM”: Residual materials

« “QRMMP”: Québec Residual Materials Management Policy

« “RMMP”: Residual Materials Management Plan

« “PTMOBC”: Programme de traitement des matières organiques par biométhanisation et compostage

« “CAR”: Clean Air Regulation

« “HHW”: Hazardous household waste

« “RECYC-QUÉBEC”: Société québécoise de récupération et de recyclage

« “RSW”: Regulation respecting solid waste

« “RLIRM”: Regulation respecting the landfilling and incineration of residual materials

« “RCPDRM”: Regulation respecting the charges payable for the disposal of residual materials

1. Final Waste Elimination

1.1 Setting the Context

1.1.1 Residual Materials

First, it is important to establish the scope of this report by the Ministry of the Environment and the Fight against Climate Change (MELCC) and to note that a generic BAPE hearing on the management of residual materials was already held in 1996. This ambitious undertaking led to the adoption of the Québec Residual Materials Management Policy (the Policy) and the implementation of several action plans that include various measures to promote the recovery of residual materials and thus reduce the quantity of eliminated residual materials.

Residual materials are defined in section 1 of the Environment Quality Act (EQA) as follows:

> « “residual materials”: 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.

This definition, which has replaced the definition of "waste," therefore includes several categories of materials, including hazardous and non-hazardous residual materials, pulp, and paper residual materials and mine tailings.

This report does not cover all residual materials, but only those that are subject to the Regulation respecting the landfilling and incineration of residual materials (RLIMR). They include household garbage, non-hazardous residual materials generated by industries, commerces and institutions (ICI), construction or demolition debris and municipal sludge. Therefore, hazardous residual materials, pulp and paper mill waste, sawmill residues and fibrous residues of the same nature as those from sawmills, contaminated soil and mine tailings are excluded.

1.1.2 Residual Materials Management

The concept of the "4R-D" hierarchy emerged in 1989,1 in Québec, so that priority would be given to management methods that would have the least impact on the environment. It means that as much residual material as possible must be destined, in order, for reduction at source, reuse, recycling or other forms of reclamation, to eliminate only the final waste. This concept is now set out in the EQA (section 53.4.1).

More recently, one of the Policy's stipulations, published by the government in 2011, deals with the disposal of a single residual material in Québec, namely **final waste**. Ultimate waste is defined as that which results from the sorting, conditioning, and reclamation of residual materials and which is no longer likely to be processed under the technical

[1] Integrated solid waste management policy

and economic conditions available to extract the recoverable portion or reduce its polluting or hazardous nature.

We can also more simply define final waste as “residual materials that are not recovered and therefore must be eliminated.”

Since the technical and economic conditions necessary for the valorization of residual materials vary over time and according to the location in Québec, the concept of final waste also varies according to these parameters. Thus, the nature and the quantities of residual materials that must be eliminated evolve according to the new recovery technologies available and implemented throughout Québec.

The EQA provides for two modes of waste management: valorization or elimination.

The EQA defines “valorization of residual materials” as “any operation aiming, through reuse, recycling, biological treatment, including composting and biomethanization, land application, regeneration or any other action that does not constitute elimination, to obtain useful elements or products or energy from residual materials.” This definition, in line with the hierarchy of management methods, refers to the 4Rs.

Composting and biomethanization are therefore considered to be waste valorization methods and, like all other valorization methods, they are not the focus of this report, which deals with the elimination of residual materials.

The same applies to energy valorization, which must first be distinguished from biogas valorization generated in landfill sites, as well as from the valorization of steam, which can be produced by an incinerator. Energy valorization, which must not be to the detriment of the other priority modes of reuse and recycling (including biological treatment by composting and biomethanization), also comes before disposal (section 53.4.1 of the EQA). Valorization of the biogas or steam that can be produced by an incinerator is an added value to the disposal of residual materials.

The information on residual materials management methods that are, according to the hierarchy, at the front end of the disposal hierarchy, and that are included in this report are presented
as complementary information, as they can help to better understand the needs for residual materials disposal.

Complementary to valorization, the EQA defines “disposal of residual materials” as “any operation that results in the deposit or final discharge of residual materials into the environment, including landfilling, storage or incineration, and includes the processing or transfer of residual materials for the purpose of disposal”.

For more information on the management of residual materials in Québec, visit the MELCC website. Under the tab matières résiduelles you will find information on données d’élimination, the matière organique, the modernisation de la consigne et de la collecte sélective, l’élimination des matières non dangereuses and la valorisation (réduction, réemploi, recyclage) des matières résiduelles non dangereuses.

1.1.3 Targeted Elimination Facilities

Elimination facilities covered in this report include the various landfills subject to the RLIMR, incineration facilities and centres where waste is transferred for disposal. Incineration facilities include any equipment or apparatus designed to perform thermal treatment, including but not limited to incineration, pyrolysis, gasification, and plasma processing.

1.2 Role and Responsibility of the MELCC Regarding the Elimination of Residual Materials

As mentioned in the Policy, the management of residual materials in Québec is based on planning for all residual materials produced on municipal territory, whether they are of domestic, industrial, commercial, or institutional origin, or whether they come from the construction, renovation, and demolition sector. Regional municipalities are responsible for this planning and must ensure that their management plan covers all generators of residual materials present on their territory.

The various municipal levels (municipalities, RCMs, metropolitan communities) thus have a major and prominent role and are key players in the disposal of residual materials. They are the ones who, especially for sanitary reasons, serve the population for the collection and disposal of household waste. They must also consider the presence on their territory of industries, commerces and institutions that generate residual materials that cannot be valorized and that are eliminated. The choice of the method of disposal of residual materials is up to them. By virtue of its environmental jurisdiction, any local municipality may establish and operate a residual materials disposal facility. It may also entrust a third party (private company) with the operation of its facility. Furthermore, such a contract may provide for the person to finance the work performed. The requirements, costs and objectives related to cost-effectiveness also encourage some municipalities to enter into an agreement between themselves or with the RCM to deal with the disposal of residual materials in a comprehensive manner or to acquire the necessary facilities. This type of agreement, if it provides for the creation of an inter-municipal board, requires the approval of the Ministry of Municipal Affairs and Housing.

Thus, there are disposal facilities operated by municipal entities (municipality, RCM, inter-municipal board), by private companies and mixed instances (municipal and private entities).

In all cases, the municipality provides for the payment of expenses either by a tax or by a rate that may be different for each category of use.

The Policy aims to discourage and reduce the disposal of residual materials. It also aims to ensure the safe management of disposal facilities for human health and the environment.

Thus, for the disposal of residual materials, the MELCC is responsible for the following items:

- The development and updating of regulatory requirements to ensure the safe and environmentally sound disposal of residual materials;
- Prior authorization of disposal facilities;
- Monitoring compliance with legal and regulatory obligations.

The MELCC therefore does not intervene in the choice of modes or technologies used for the disposal of residual materials, but rather in the regulatory framework and control of these to ensure environmental protection.

1.3 Legislation and Regulations Regarding the Development and Operation of Residual Materials Disposal Facilities

The EQA was passed in 1972. Initially subject to obtaining a certificate of compliance and an operating permit (private premises), the establishment and modification of a disposal facility became, over time, subject to prior ministerial authorization under section 22 of the Act. It should be noted that the specific authorization regime for the disposal of residual materials applies to any project and any modification, regardless of whether it is likely to affect the quality of the environment.

Certain projects for the establishment or expansion of disposal facilities (landfill and incineration) are subject to the environmental assessment procedure. A specific chapter of this report provides more information on this subject.

Section VII of the EQA deals with the management of residual materials and includes a specific subdivision (subdivision 5) on the disposal of residual materials. It contains mainly the powers of order conferred on the Minister as well as those conferred on the government to govern the disposal of residual materials.

The first regulation on the disposal of residual materials, the Regulation respecting solid waste, came into force on May 10, 1978. Its main objective was the closure of dump sites (more than 1,000 in operation) according to a specific schedule and the establishment of new disposal sites (sanitary landfill and incineration) that met new requirements. This regulation also allowed the operation of dry material deposits, trench deposits and deposits in northern areas.

In the early 1990s, a major review of the environmental requirements for the disposal of residual materials was undertaken. A first legal version of the draft regulation (March 1996) was made public and was the subject of the 1996 BAPE consultation on residual materials management. All this work led to the enactment of the RLIMR in 2005. This regulation, which came into force in January 2006, replaced the Regulation respecting solid waste.

This new regulation ensures the safe disposal of these materials, by landfilling or incinerating them, in a manner that is safe for people and the environment, through the application of stricter standards and conditions for the establishment, operation and à closure of disposal facilities and through tighter emission standards for these facilities.

The new regulatory requirements are primarily intended to permanently end the disposal of residual materials in leaky sanitary landfills. Sanitary landfill operators are required to construct landfill cells that provide adequate protection for groundwater and surface water. Leachate capture and treatment, as well as the capture and safe disposal of biogas and, in some cases, burning, are also mandatory.

The establishment or expansion of dry material depots is prohibited. Previously authorized depots may continue to operate until the land is rehabilitated if they are able to meet the new regulatory requirements. Operators

of sanitary landfills and dry material depots are also obliged to set up vigilance committees, at their expense and ensure their proper functioning, to properly inform the population concerned of compliance with environmental requirements.

The new regulation maintains waste disposal methods suitable for small municipalities and remote or isolated areas. However, it reduces the number of trench disposal sites located near urban centres where access to safer disposal sites is possible within a 100-kilometre radius. The smaller number of disposal facilities makes it easier for the MELCC to control them.

The new regulatory framework also requires owners of sanitary landfills, dry material depots and trench disposal sites to ensure environmental monitoring of the sites during operation and after closure. Finally, it requires operators of existing sites to retrofit their facilities to comply with the new requirements within three years, or to close them down at the end of that period.

At that time, there were close to 400 disposal facilities in Québec (excluding northern depots and waste pits), including 62 sanitary landfills, 5 incinerators, 56 dry material depots and 273 trench depots.

The RLIMR also introduces new terminology related to disposal sites to more easily distinguish between those that fall under the provisions of the Regulation respecting solid waste. For example, engineered landfills are replacing sanitary landfills, construction or demolition waste landfills are replacing dry material depots, trench landfills are replacing trench depots, northern landfills are replacing northern depots, remote landfills are replacing outfitter and industrial camp waste pits, and transfer centres are replacing transfer depots.

The RLIMR does not apply to residual materials collection activities. Furthermore, emission requirements for incineration facilities are contained in the Clean Air Regulation (CAR) that came into force in June 2011, also after an extensive review. Specific chapters of this report provide further explanation of the requirements for individual disposal facilities and the CAR.

To facilitate the application and understanding of the MIRR and to provide additional explanations of the various requirements, in 2007 the MELCC produced the Guide d'application du Règlement sur l'enfouissement et l'incinération de matières résiduelles, which is available on the ministry's website.

1.4 Rates for the Elimination of Residual Materials

It is up to the operator to set the prices (tariff) for their services. Certain rules are applicable, but only to EL operators (section 64.1 of the EQA and section 155.1 of the RLIMR). Tariff requirements are found in sections 64.1 to 64.12 of the EQA.

In general, the operator of an EL must publish their rate or amendment to the rate and meet a time limit for doing so. Furthermore, the amendment to the rate can only take effect on the first of January following the end of this period.

In particular, the operator must send a copy of their rate or an amendment to it to the municipality and the RCM where the site is located, as well as to any person or municipality required by contract to use their services. The operator must also display in plain view, at the entrance to his place, the prices payable for his services.

The Commission municipale du Québec may, at the request of any person or municipality, conduct an inquiry into the rate or the modification of a rate proposed by the operator of an EL. It is then up to the operator to justify their rate based on the investments they must make to operate their site and the specific measures they must take when receiving certain residual materials.

1.5 Elimination of Residual Materials in Québec

The application of legislation and regulations on the disposal of residual materials leads the MELCC to make certain observations.

1.5.1 Elimination Needs and Constraints

The measures put forward and those to come aimed at diverting as much residual material as possible from disposal, to eliminate only the final waste, have helped and will help increase the amount of valorized residual material.

However, the increase in Québec's population, mainly in the major centres, and the increase in consumption have the effect of maintaining or even increasing the total quantity of residual materials generated. Thus, the quantity of residual materials that must be landfilled or incinerated has remained relatively constant for several years and we expect that it will continue to be so for years to come.

Regarding the annual flow of residual materials to be disposed of, there is currently no excess disposal capacity authorized in Québec. Tables 1.5.1-A and 1.5.1-B in the appendix specify the residual capacities of the ELs and CDWLs, respectively. When Québec's main landfill sites reach saturation (authorized volume filled), renewal of their authorization becomes a necessity to meet the needs. No other disposal facility in operation can accept a significant additional quantity of residual materials. Furthermore, the need to cease the operation of residual materials valorization facilities or to proceed with the slaughter of large numbers of animals, such as in a pandemic situation, may result in the short-term generation of a surplus of residual materials to be eliminated.

Unlike in the past, where landfill volumes were authorized to meet the needs of at least 20 years, government authorizations issued in the last decade for the largest landfills have been limited in time (10 years or less). It is recognized, however, that this short-term disposal capacity does not meet long-term needs, as renewal of these authorizations is frequently on the agenda. Table 1.5.1-C in the appendix provides information on all orders in council issued for the establishment and expansion of ELs operating in Québec. It shows that several major landfill expansion projects, initially presented as having a long lifespan, have been issued several short-term authorizations that ultimately correspond to the initial project.

The reason often given for these short authorizations is that the need for disposal in Québec in the medium and long term is not precisely known. However, even if not precisely quantified, this need is present. It is important to note, in the case of landfill sites, that a decrease in long-term need will only result in the

extension of the useful life of the authorized sites. However, the development of these sites only takes place as they are operated. This has the effect of limiting the impact on the environment, if the future needs to be met are such that it is no longer necessary to use all the authorized volume.

The need to limit the authorized volume or annual traffic to encourage valorization is the other reason often cited. This is not the case, however, since there is no authorized disposal overcapacity and not all the infrastructures ensuring valorization are in place. Rather, this situation encourages the transfer of residual materials to other disposal sites or deposit in illegal locations. It is not by intervening at the end of the process (disposal) that this will reduce the generation of residual materials to be eliminated. Rather, it is necessary to act prior to the process, by first putting in place the necessary infrastructures for valorization. It will then be easier to push the use of these valorization facilities.

Moreover, short-term authorizations are likely to limit the financial interest of promoters in making the necessary investments to exceed the standards in place, since they are deprived of any medium- and long-term predictability.

The search for other solutions to the establishment or expansion of an EL has been carried out several times by the MELCC in the past and always leads to the same conclusion. When it comes to compensating for the closure of a landfill where a large amount of waste is buried (>100,000 t/year), it is very difficult to find another location. In fact, it is impossible to find one for sites that receive more than 300,000 t/year, given the many limitations (restricted authorization period, restricted annual tonnage, source of restricted residual materials, etc.) set out in government decrees when authorizing expansion projects or the establishment of ELs. The absence of a solution puts pressure on the government when it must analyze projects to expand or establish disposal facilities in Québec, since it is up to the government to authorize these projects.

Added to these constraints are the limitations associated with the right of control granted to regional county municipalities (RCMs) over the quantity of residual materials that can be disposed of in a disposal facility located on their territory and coming from outside that territory. These limitations hinder the search for alternatives when a landfill reaches its authorized capacity. Moreover, these limitations do not necessarily consider the disposal needs of the entire population of Québec for the years to come, as their identification and analysis is only carried out at the level of the RCM and the clientele currently served.

Table 1.5.1-D, in the Appendix, presents the various limitations associated with the ELs currently in operation.

The need to dispose of residual materials is therefore a reality that Québec will have to deal with for several years, despite all the measures implemented to reduce their quantity. It is also a reality that the government must deal with when exercising its powers to authorize projects. A long-term vision is necessary, and Québec must be able to count on a reception capacity for these materials that is sufficient, safe, and respectful of the environment.

1.5.2 Servicing Disposal Facilities

The number of landfills in operation has decreased significantly since the implementation of the RLIMR. More than 90% of the residual materials disposed of in landfills are done in engineered landfills. The remainder is eliminated in

special purpose landfills (construction and demolition waste landfills (CDWLs) or for remote, sparsely populated areas, trench landfills (TLs), northern landfills (NLs) and remote landfills (RLs)). Less than 5% of residual materials are eliminated by incineration. Excluding waste pits, while there were more than 400 disposal facilities in operation in 2006, there are now about 100, including 38 ELs, 7 CDWLs, 4 incinerators, 30 TLs and 25 NLs, in addition to 114 RLs and 35 transfer centres.

The grouping of municipalities or RCMs to jointly operate a disposal facility creates an economy of scale that facilitates more effective implementation of environmental protection measures. Evidence shows that disposal costs increased considerably for sites with less than 50,000 t/year of traffic. The argument to the effect that this pooling is likely to increase greenhouse gas (GHG) emissions associated with the transportation of the waste to be eliminated is advantageously mitigated by better management of the biogases generated in larger sites. These landfills are subject to an obligation to destroy or valorize the biogas, resulting in significant reductions in GHG emissions that far surpass those associated with the transportation of residual materials.

However, this reduced number of disposal facilities can lead to certain residual materials management problems.

1.5.2.1 Serving Certain Territories

The current distribution of disposal facilities is leading some territories with a large population to dispose of residual materials outside their territory. This is the case for the Communauté métropolitaine de Montréal and the Outaouais region.

The Communauté métropolitaine de Montréal (CMM), which has a population of more than 4 million, or nearly half of the population of Québec, also generates the same proportion of residual materials to be eliminated.

Within the CMM territory, there are no municipal facilities for the disposal of residual materials generated by the population. In addition to the presence of a dedicated engineered landfill for municipal sludge incineration residues, there is only one facility, a private engineered landfill. This site, the largest in terms of annual traffic in Québec, is however unable to accept all the residual materials to be disposed of, which come from the CMM's territory and total nearly 3 Mt per year. Moreover, this site is currently in the process of expansion (request for authorization), but its useful life is only 10 years. Thus, more than half of the residual materials generated on the CMM's territory are currently disposed of outside, i.e., in the Laurentians, Lanaudière and Centre-du-Québec regions.

There is also no major facility (EL) to serve the Outaouais region. An EL project in Danford Lake, in the municipality of Alleyn-and-Cawood (RCM of Pontiac) was presented in 2006 by a private developer to serve this territory. This project was refused by the government in 2009. Residual materials are currently being transported and disposed of in the Laurentians region.

The authorization procedure for projects to establish or expand disposal facilities to meet the needs involves public consultation. Despite regulatory requirements allowing for the safe disposal of residual materials by landfilling or incineration, issues of social acceptability ("not in my backyard" syndrome) arise during these consultations, especially when the project aims to receive

residual materials from outside the RCM where the project is located. Moreover, regarding incineration, this method of disposal has already been considered by certain environmental groups as conflicting with the valorization of residual materials.

1.5.2.2 Servicing for the elimination of certain residual materials

The current regulations (RLIMR, sections 10 to 12) contain certain provisions regarding the obligation of an EL operator to receive residual materials. The general rule is that the operator is required to receive eligible residual materials that originate from the territory of the RCM in which the site is located. Québec has 87 MRCs. The same obligation applies to sites located in the 14 municipalities exercising certain RCM powers. Note also that this obligation to receive residual materials is not applicable to the territories of metropolitan communities.

As previously mentioned, 38 ELs are in operation in Québec, three of which are reserved exclusively for certain residual materials or for the exclusive use of an establishment.

It is therefore understandable that there are no ELs in all RCMs and municipalities exercising certain RCM powers. This situation sometimes leads to difficulties for certain generators of residual materials regarding their disposal. Occasionally, EL operators may refuse to accept residual materials when they come from outside their regional county municipality (RCM) where the site is located, as permitted by current regulations.

À For instance, a recent problem concerning residues from the sorting of construction or demolition waste can be cited. This sector of activity contributes significantly to the valorization of residual materials in Québec. Among the discharges from these facilities are residues resulting from the screening of construction or demolition waste prior to sorting. These residues are made up of fine pieces of the different types of construction and demolition waste as well as earth, sand, and dust from the various construction sites. Currently, gypsum is not (or very little) part of the recovered residual materials. Since gypsum is friable, it is therefore found in variable proportions in fine residues during screening. A few years ago, this non-recoverable waste material was used as an alternative covering material in engineered landfills. Various problems associated with the presence of gypsum in these residues (odour nuisance, reduced methane production) have led some operators to refuse to accept these residues in their facilities. This is possible because the generators are not necessarily located in the RCM where the site is located. This sector of activity is therefore currently strongly affected by the inaccessibility of a disposal site for sorting waste.

1.5.3 Disposal Methods

Even if incineration is a possible method of disposal, it remains a solution that is rarely used in Québec compared to landfilling. Only 5% of residual materials (other than municipal sludge) are incinerated in Québec. Two incinerators are located on the territory of the Communauté métropolitaine de Québec. Two others, exclusively for sewage plant sludge, are located on the territory of the Communauté métropolitaine de Montréal.

The use of disposal technologies other than landfilling certainly results in higher disposal costs. However, certain advantages appear plausible for densely populated areas, including a certain economy of scale and a significant reduction in the quantity of waste to be eliminated. The latter may also have properties that result in less impact on air and water during disposal.

For instance, despite the large quantity of residual materials to be disposed of on the CMM's densely populated territory, no project involving a technology other than landfilling has been submitted since the early 1990s. The City of Montreal operated an incinerator until 1992 and a project for an incinerator was proposed in 1990, but never materialized.

As noted above, the various levels of municipal government play a key role in the disposal of final waste, including the method of disposal and the destination of the waste.

1.5.4 Elimination Facility Layout Requirements

The coming into force of the MIRR has resulted in the closure of several sites subject to outdated requirements in favour of engineered landfills (ELs) that are impermeable, with capture and treatment of the water and biogas generated. These ELs are also subject to environmental monitoring and post-closure management obligations.

As a result, the number of landfills in operation has been significantly reduced, which is an environmental gain. It is in fact more advantageous to limit environmental impacts to a smaller number of locations, which are better located and generate fewer impacts than to maintain several scattered throughout Québec.

Moreover, the development requirements (e.g., location) of disposal facilities must consider the Québec context and the need to meet disposal needs for the entire territory and avoid making it impossible to develop and operate these facilities, since they are necessary.

1.5.5 Landfill Cover Materials

One of the operating requirements of a landfill site is the periodic covering of incoming waste to limit the release of odours, the spread of fire, the proliferation of animals and insects, and the escape of light elements.

In an EL, covering must be done at least at the end of each day of operation.

At the time of the Regulation respecting solid waste, cover material was primarily of natural origin, including soil containing less than 30% clay and sand.

Only certain residual materials could be used, including bottom ash, slag, incineration residues and metal shredder residue. Contaminated soils could also be used. However, because of the cost of covering these costs, several operators neglected this aspect, causing problems. In some cases, the use of low-permeability materials led to the resurgence of leachate on the peripheral slopes of landfill areas and contamination of surface water.

Thanks to the coming into force of the RLIMR, these problems have been corrected. New criteria for the use of permeable materials are planned. Furthermore, since many of the residual materials that are accepted for landfilling have adequate properties to be used for covering, the use of all these materials has been made possible. Therefore, in addition to soils, contaminated or not, any residual material that is eligible for landfilling, that allows the achievement of the goals of capping and that has the appropriate physical characteristics (granulometry and hydraulic conductivity) can be used for capping.

The use of residual materials for periodic capping is a form of valorization of these materials, by replacing the use of clean land from the borrow pit operator (sandpit). As such, these materials received in a landfill are not subject to the disposal charge. They are therefore accounted for separately from the residual materials accepted for disposal. This has the effect of highlighting the quantities of residual materials used for covering compared to those eliminated.

This is not in fact a diversion of these materials to landfills. Residual materials now used for covering were previously sent to landfill because they were not otherwise valorized, as is still the case today, but they were not accounted for separately. Therefore, this does not represent an increase in the amount of residual materials eliminated.

A knowledgeable operator must consider the fact that these materials occupy a certain volume in the landfill when determining the rate charged to customers.

Subject to certain conditions set out in the RLIMR, the use of alternative materials is also permitted for the various systems required in a landfill. For instance, residual materials can be proposed for the development of water drainage systems or for final covering. As for the latter, contaminated soils can also be used. It is important to make a distinction between the valorization of these materials for the development of a site and their valorization as a periodic covering material.

It remains necessary to pursue the search for other outlets for residual materials used for periodic covering, so that only those that cannot be valorized in any other way are sent to a landfill.

1.5.6 Post-Closure Management of ELs

The RLIMR includes requirements for the post-closure period of landfills.

The general rule is that all requirements during operation continue to apply after closure. This rule means that all required systems (e.g., water and biogas treatment) must be maintained and kept in operation. All environmental monitoring (groundwater and surface water, methane migration and emission, leachate discharge, etc.) must also be maintained.

All maintenance and monitoring costs are the responsibility of the landfill site operator. To fund the costs of maintenance and monitoring of the site after closure for a minimum of 30 years, the government requires the operator to contribute to a trust for each ton of disposed residual materials. Currently, only projects subject to the environmental assessment process (expansion or establishment of an EL) are subject to this condition, which is included in the decree issued by the government. This condition stipulates, among other things, what must be provided for in the trust indenture and the frequency of the review of the post-closure management costs and the contribution to be collected for each ton of residual materials eliminated at the site.

Some operating ELs (11 of 38 sites where 7% of the material is received) are not subject to this requirement, as they have not been subject to the environmental assessment procedure. These are sanitary landfills that were established prior to the implementation of the RLIMR in 2009 and that were converted to an EL at that time without being subject to the environmental assessment process (no expansion).

Since 2000, however, the authority to regulate this aspect has been provided for in the EQA (section 56). The specific clauses relating to the establishment of trusts and the review of costs and contribution are therefore variable depending on when the decree authorization was issued. Furthermore, there is no guidance as to how the accumulated amounts may be withdrawn from the trust in the post-closing period to pay for maintenance and monitoring costs, or what will happen to the remaining amounts in the fund, if any, when the post-closing management is completed.

2. DESCRIPTION OF CURRENT ELIMINATION METHODS

In Québec, two methods of eliminating non-hazardous residual materials are currently authorized under the Regulation respecting the landfilling and incineration of residual materials (RLIMR) under the Environment Quality Act (EQA): landfilling and incineration. Before arriving at the disposal location, residual materials may transit through transfer centers that are also covered by the RLIMR.

2.1 Landfilling

Residual materials disposed of by landfilling can only be accepted in regulated landfill sites, namely engineered landfills (ELs), trench landfills (TLs), northern landfills (NLs), construction or demolition waste landfills (CDWLs), or remote landfills (RLs).

The EL is the basic concept, while the other types of landfills are more of an exception for certain residual materials or certain territories.

2.1.1 Engineered Landfill

Generally speaking, an EL can be said to have the following characteristics:

- Waterproof (naturally or with the installation of a waterproofing system);
- With capture and treatment of leachate before discharge;
- With capture and treatment of biogas;
- Subject to an environmental monitoring program (ground and surface water, biogas) and to limit values not to be exceeded;
- Subject to closure and post-closure obligations.

With respect to general siting provisions, the waste disposal areas of any EL, leachate or leachate water treatment systems shall be located at least one kilometer from a surface water or groundwater collection facility when used to produce spring or mineral water or for the supply of water to an aqueduct.

An EL may not be established in any of the following locations:

- In the flood zone of a 0–100-year recurring watercourse
- In areas at risk of ground movement
- On land below which there is an open water table with a high aquifer potential.

Other pre-requisites for the implementation of an EL include the following:

- Its integration into the landscape based on the physical and visual characteristics of the landscape within a one-kilometre radius, the capacity of the landscape to absorb this facility, and the effectiveness of visual mitigation measures
- The development of a buffer zone of a minimum width of 50 metres around the site, which must be an integral part of the site
- Consideration of geotechnical constraints and hydrogeological conditions.
  With respect to the impermeability of an EL

- Unconsolidated deposits on which the residual materials will be deposited must consist of a homogeneous natural layer with a hydraulic conductivity equal to or less than 1 x 10^{-6} cm/s over a minimum thickness of 6 metres. Furthermore, the surface of this layer must have a minimum slope of 2% to facilitate the flow of leachate to the drains.
- If this layer is at depth, the areas where the waste is deposited must have a peripheral sealing screen made of materials with a maximum hydraulic conductivity of 1 x 10^{-6} cm/s.
- If it is impossible to meet these conditions, the bottom, and walls on which the waste will be deposited must be provided with a double-layer waterproofing system consisting of a lower layer of compacted clay materials at least 60 centimetres thick (or a bentonite mat of equivalent performance) and must be covered with a geomembrane at least 1.5 millimetres thick and a second geomembrane for the upper layer. In this case:
  - The base of the lower level must be above the groundwater level
  - Lowering of the water table is permitted for locations where unconsolidated deposits are composed of a natural layer with a maximum hydraulic conductivity of 5 x 10^{-5} cm/s over at least 3 metres. If this layer is found at depth, the deposition areas must also have a perimeter screen made of materials with a maximum hydraulic conductivity of 1 x 10-6 cm/s.
- To establish a TIL in an open pit or quarry, the floor of the excavation must be below the groundwater level and the average daily rate of groundwater infiltration must be equal to or less than 5 X 10^{-4} m^3 of water per square metre that the surface of the walls of the pit or quarry is below
  the groundwater level.

ELs must be equipped with a system to capture all leachate and discharge it to its treatment or disposal site. Table 2.1.1-A in the Appendix identifies the ELs for which leachate is treated at a municipal facility and, for those that are treated on-site, the location of the treated water discharge. The RLIMR requirements for leachate and water collection from the EL include the following:

- The collection system must include a drainage layer on the bottom and walls of the disposal areas and a piping system consisting of drains and collectors located within the drainage layer;
- Any EL that requires a dual layer waterproofing system must have a second leachate collection system located between the two geomembranes;
- The height of water that may accumulate at the base of the waste disposal areas must not reach the level of the waste;
- All components of the water treatment system must be watertight;
- Surface water must not penetrate waste disposal areas;

- Water collected (including leachate) by any collection system may only be released to the environment if it meets the limit values of section 53 of the RLIRM.

A system to ensure that all biogas produced in the landfill areas is captured and either released to the environment or directed to a valorization or disposal facility must be installed in all ELs. Table 2.1.1-B in the appendix identifies which landfill sites have active and passive capture of biogas. RLIRM requirements in this regard include:

- In quarry or mine ELs with a capacity of more than 1,500,000 m3 or where an EL receives at least 50,000 tonnes of residual materials annually, the biogas collection system must include a mechanical suction device
- If not reclaimed, the captured biogas must be disposed of using equipment that provides at least 98% thermal destruction of non-methane organic compounds and allows a minimum retention time of 0.3 seconds at a minimum temperature of 760°C
- Operation of the biogas collection system must begin no later than one year after final covering of a disposal area. However, in the case of a landfill that is required to have a mechanical vacuum system, the biogas collection systems and the equipment required for its disposal must be put into operation no later than five years after the landfilling of the material, for sites receiving 100,000 tons or less of residual materials per year, or no later than one year after the landfilling of the material, for sites receiving more than 100,000 tons per year.

With respect to environmental monitoring, an EL operator must, among other things:

- Analyze the leachate or water collected by each of the collection systems as well as the discharges from the leachate treatment system, in accordance with the procedures set out in section 63 of the RLIRM
- Establish a network of observation wells to facilitate the sampling of groundwater that may be affected by landfilling and leachate treatment activities
- Analyze the groundwater in each of the observation wells in accordance with the procedures set out in section 66 of the RLIRM
    - These waters must respect the limit values of the article 57 of the RLIRM
- Establish a network of observation wells to facilitate the monitoring of methane migration around landfill areas
    - The methane concentration in these wells must not exceed 1.25% (25% of the lower explosive limit)
- Verify the efficiency of the biogas capture system by monitoring fugitive methane emissions at the surface of landfill areas, in accordance with the procedures set out in section 68 of the RLIRM
    - The methane concentration must be less than 500 ppm
    - The results of this monitoring must be transmitted to the MELCC according to a set schedule.

To ensure the effectiveness of certain equipment and systems related to the operation of an EL, the operator must also:

- The installation of all systems and equipment must be subject to a quality assurance and quality control program
- Check the leachate collection system piping outside the sealed landfill area annually for leaks
- Check each component of the leachate or water treatment system for leaks before commissioning and every three years thereafter.

The general operating conditions of an EL are as follows:

- An EL operator must verify the eligibility of the residual materials received. Admissible materials must be weighed and radiologically inspected for the presence of radioactive materials
- The operator must keep an operating log that includes data on the nature, source and quantity of residual materials received, including those destined for covering
- Residual materials must be spread, compacted, and covered at the end of each operating day to reduce the release of odours, the spread of fires, the proliferation of animals or insects and the escape of light elements
- Covering materials must meet permeability requirements so as not to impede the flow of leachate and biogas
- Clean or contaminated soil and residual materials with the required properties can be used as covering materials
- The site must be operated in a manner that encourages its gradual redevelopment
- A barrier preventing access to the site outside of business hours must be installed
- Landfill operations in an EL shall not be visible from a public place or the main floor of a dwelling within a one-kilometre radius
- Burning of residual materials is prohibited there
- The operator is required to take the necessary measures to limit odour nuisances and the escape and scattering of residual materials and to prevent or eliminate any invasion of vermin, on the site and in the vicinity
- Each year, the operator must send a report to the MELCC, including the data compiled in the register, the progress of the site and the verifications or measures carried out as part of the environmental monitoring and the work carried out
- The operator of an EL shall, within six months of the commencement of operations, establish a vigilance committee to ensure that citizens or groups likely to be affected by the landfill activities, environmental protection groups and representatives of the municipalities where the site is located are kept informed of the activities taking place at the site, can ask questions and make recommendations to the operator with a view to limiting impacts and nuisances.

EL deposition areas must be subject to final cover. It should have a slope of not less than 2 % and not more than 30 % to encourage water runoff out of the deposition areas while limiting soil erosion. The multilayer cover should include the following from bottom to top:

- A soil drainage layer having, over a minimum thickness of 30 cm, a minimum hydraulic conductivity of 1×10^{-3} cm/s, intended to capture gases while allowing the circulation of liquids;
- An impermeable layer consisting either of soil with a maximum hydraulic conductivity of 1×10^{-5} cm/s over a minimum thickness of 45 centimetres after compaction, or of a geomembrane having a minimum thickness of 1 millimetre;
- A layer of soil with a minimum thickness of 45 centimetres whose characteristics allow to protect the impermeable layer
- A layer of soil suitable for vegetation, with a minimum thickness of 15 centimetres.

No later than one year after placement, the layer of material completing the final cover shall be vegetated with species not likely to damage the impermeable layer of the cover.

The operator shall permanently close the engineered landfill when it reaches its maximum capacity or when the landfilling of residual materials is

discontinued. RLIRM requirements for the closure of the EL include:

- The operator shall immediately notify the Minister in writing of the date on which the closure of the site begins, which is the day on which the operator permanently ceases to receive residual materials for disposal
- The operator shall, within a maximum of 18 months from that date, permanently close the site by installing the final cover and any other required amenities or equipment
- Within six months following the date on which the operator ceases to receive residual materials, the operator must have a closure statement prepared by third party experts and transmitted to the MELCC, attesting to the state of operation, efficiency and reliability of the systems at the site and compliance with the limit values applicable to the various discharges, as well as the site's compliance with the requirements of the regulation or authorization with respect to the final covering of the landfilled residual materials and the integration of the site into the landscape
- The operator shall notify the Minister of the date on which the site is permanently closed
- A sign shall be posted at the entrance of any permanently closed EL, indicating that the site is closed and that the disposal of residual materials is no longer permitted there.

All the obligations prescribed by the RLIRM remain applicable even after the closure of an EL. Thus, during the post-closure period, the operator is responsible, among other things, for:

- Maintaining the integrity of the final cover of landfilled residual materials
- Controlling and maintaining the leachate or water collection and treatment systems, the biogas collection and disposal system, and the groundwater monitoring well systems
- The execution of sampling, analysis and measurement campaigns for leachate, water, and biogas
- Checking leachate collection system pipes located outside of the disposal areas of the site and any components of the leachate or water treatment system for leaks.

The operator may apply to the Minister for a waiver of any prescribed environmental monitoring or maintenance obligations where, for a monitoring period of at least five years after site closure, the following conditions are met:

- None of the parameters or substances analyzed in the leachate or water samples taken prior to treatment have exceeded the limit values set out in the regulation
- None of the parameters or substances analyzed in the groundwater samples have contravened the provisions of the regulation;
- Methane concentration was measured in the components of the biogas collection system and all measurements indicated a methane concentration of less than 1.25% by volume.

To this end, the operator must have an assessment of the state of the site and, where appropriate,
its environmental impacts prepared by third party experts and transmitted to the Minister. If it is established that the conditions mentioned are met, that the EL complies in all respects with the applicable standards and that it is no longer likely to be a source of contamination, the Minister shall relieve the operator of the prescribed environmental monitoring and maintenance obligations.

2.1.1.1 Contaminant Prioritization and Assessment of Overall Toxicity of Treated Leachate Discharges

Within the MELCC, it is the Direction de la qualité des milieux aquatiques (DQMA) that is responsible for assessing the environmental risks associated with the release of treated leachate from the ELs into the environment. This assessment is done using Environmental Discharge Objectives (EDOs) and their effluent monitoring.

As the name implies, EDOs are to be considered as objectives and not as absolute, legally enforceable values. They cannot be interpreted directly as discharge standards and should never be cited directly as standards in a statutory instrument. EDOs are environmental risk assessment tools, and their use may result in recommendations for managing the risk of an effluent contaminant (e.g., treatment improvements, source reduction efforts, etc.). This risk management is generally done in stages as part of a continuous improvement process.

Initially, the list of parameters to be monitored for treated effluent included approximately 80 contaminants, including five toxicity tests. This number decreased to 25 in 2017, since most organic contaminants were found to be of no concern. One study revealed that several contaminants were virtually never detected or were detected at concentrations not of concern to the environment. The 25 contaminants currently targeted by an EDO include metals, inorganic substances, and the seven parameters set out in Section 53 of the Regulation respecting the landfilling and incineration of residual materials.

The DQMA recently completed an assessment to determine the level of environmental risk associated with the EDO target parameters. This assessment is based on the analysis of the magnitude and frequency of EDO exceedances for the assessed ELs. Of the 40 or so ELs in Québec, 23 ELs were selected for this assessment. The remaining ELs were not selected for the following reasons: effluent discharged to sanitary sewer, a site without EDOs, or a site receiving mostly industrial waste. Through analysis of the magnitude and frequency of EDO exceedances, some contaminants present in the treated leachate from the EL could be grouped into three classes based on their potential environmental impact risk. The following table shows the classification.

Table 2.1.1.1. - Classification of Contaminants in Treated Leachate by Environmental Risk

Risk environmental	High	Medium	Low
Parameter	Nitrates	Ammoniacal nitrogen Chlorides Phenolic compounds Copper BOD_5 MES Nickel Nitrites Phosphorus	Barium Chromium VI Fecal coliforms Fluorides Manganese Lead Zinc

In summary, nitrates stand out as the only contaminant in the high-risk group. The classification of fluorides, chromium VI and lead in the low-risk group is based, among other things, on the high frequency of results below the detection limit.

Polychlorinated biphenyls, cyanides, dioxins, chlorinated furans, and mercury will be analyzed in a later assessment due to peculiarities associated with the interpretation of their results. Based on the preliminary analysis of the monitoring results for cyanides and mercury, their high frequency of non-detection indicates that the risk level for these two parameters is between low and medium. On the other hand, hydrogen sulfide (H_2S) and C_{10}-C_{50} petroleum hydrocarbons have been assessed separately, concluding that their environmental risk is rather low.

Based on the 22 ELs assessed, the average frequency of exceeding the acute toxicity cut-off value of 1 TUa varied between 4% and 8%, depending on the species. In fact, a previous assessment based on the results of toxicity tests for the period 2006 to 2018 showed that acute toxicity is decreasing (Figure 2.1.1). Differences in sensitivity are relatively small in the three species associated with acute toxicity. Fathead minnow appears to be the most sensitive species, while trout appears to be slightly more sensitive than daphnia. It is interesting to note that acute effluent toxicity is limited to a few ELs, and of these, some have exhibited acute toxicity events for all three species.

With respect to chronic toxicity, the results show that toxicity on the algae is decreasing, while it is relatively stable for fathead minnows. According to the 22 ELs evaluated, the average frequencies of exceedance of the EDO for chronic toxicity observed were 20% and 7% for the alga and fathead minnow, respectively. These results show that the effluent from the ELs contains contaminants that are more toxic to the algae than to the fathead minnow.

It is important to note that, unlike acute toxicity where a result greater than 1 TUa means a short-term impact in the receiving environment, a result greater than
1 TUc does not necessarily mean an impact on the environment. Indeed, the EDO in chronic toxicity is dependent on the dilution allocated by the receiving environment and can therefore be greater than 1 TUc.

In summary, nitrates are formed during the treatment to remove ammonia nitrogen (nitrification), which is recognized as one of the main contaminants present in toxic concentrations in the leachate from the EL.

However, a working group including some MELCC branches was formed in 2018 to develop an action plan to address nitrate in EL effluent. This action plan includes the determination of the overall picture of nitrate discharges to the effluent of the EL. It also recommends that this issue be considered when the RLIRM is updated.

The analysis has shown that, for the same contaminant, not all ELs necessarily present the same level of risk. Regardless of the dilution allocated to the effluent, certain contaminants are problematic for some effluents, while they are not for others. The acute effluent toxicity of ELs is infrequent, depending on the analysis performed. However, the occurrence of an acute effluent toxicity event generates a high risk of environmental impact. With respect to chronic toxicity, the results show that toxicity on the daphnia is decreasing, while it is relatively stable for fathead minnows.

Figure 2.1.1.1-A - Trends in the occurrence of toxic (>1 TUa) results for the three sentinel species (2006 - 2018)

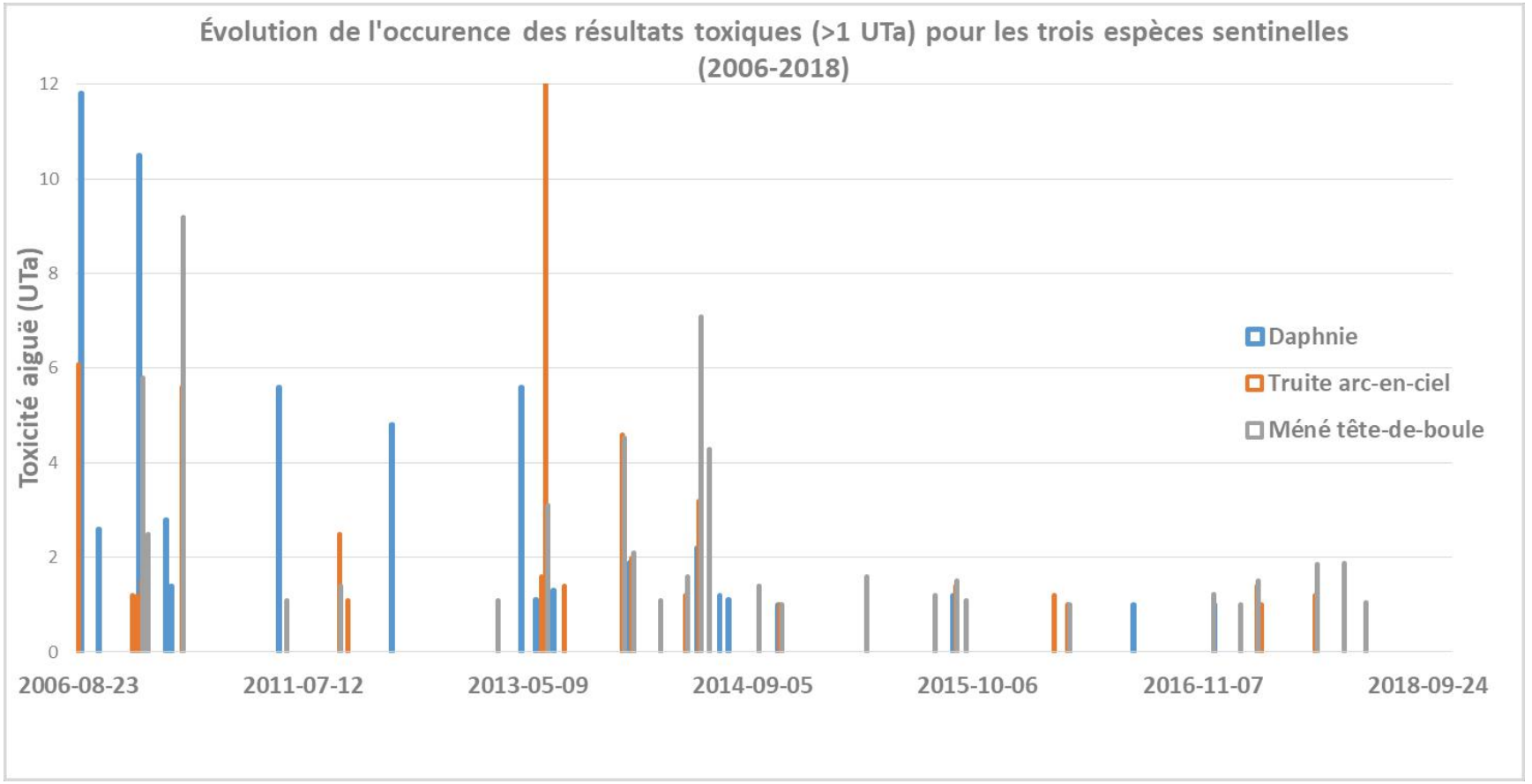
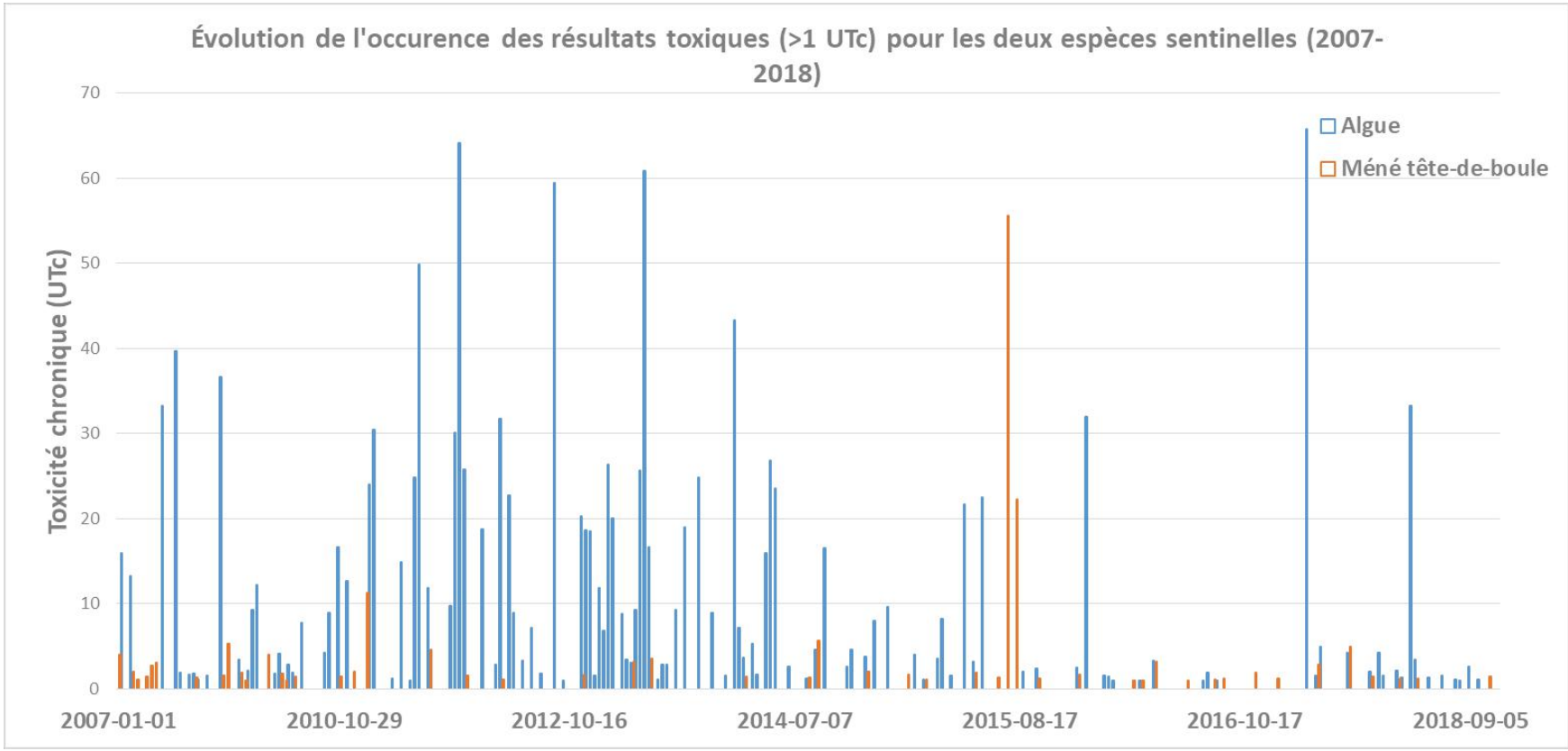


Figure 2.1.1.1-B - Trends in the occurrence of toxic (>1 TUc) results for the two sentinel species (2007 - 2018)



2.1.2 Trench Landfill

In accordance with the RLIMR, TLs are only permitted in the following territories:

- Northern Territory, as defined in the RLIMR
- Territory not organized as a local municipality that is more than 100 kilometres by year-round roadway from a EL that is not exclusively reserved for a establishment
- Territory of the James Bay region, excluding the towns of Chibougamau and Chapais
- Areas inaccessible by road year-round
- RCM of Minganie and Caniapiscau
- Territory of the city of La Tuque, located west of the 73rd meridian.

The provisions applicable to ELs with respect to their location in relation to water intakes, flood zones, areas at risk of land movement, and open aquifers with high aquifer potential are also applicable to TLs.

With respect to the development of a TL, there are no sealing requirements to be met. However, the following specific conditions must be met:

- A distance of at least 150 metres between the trench area and the nearest watercourse
- A distance of at least 500 metres between the trench area and any surface or groundwater catchment facilities for human consumption
- The bottom of the trenches to a depth of at least one metre above bedrock and groundwater level
- The construction of a buffer zone of a minimum width of 50 metres around the site.

Other aspects of TLs are addressed under the same provisions for ELs, namely:

- Control of permitted materials, records, annual report
- Visibility of operations and gradual redevelopment
- The prohibition of burning, the limitation of odours, emissions, and dust as well as the invasion by vermin
- Monitoring the quality of ground and surface water and compliance with applicable limit values
- Notice of closure, closure report, post-closure obligations and release from obligations.

It should be noted that TLs differ from ELs in certain aspects, namely:

- Groundwater observation wells may be installed a maximum distance of 300 metres from the trench zones, but not beyond the outer limits of the buffer zone
- The frequency of covering trench waste is at least once a week from May to October.

When the height of the waste deposited in a trench reaches the surface of the ground, the trench must be covered with soil at least 60 centimetres thick with at least 15 centimetres of topsoil suitable for vegetation. The final cover shall be graded to have a minimum slope of 2% without exceeding 5% or the percentage slope of the soil at the edge of the trench area.

2.1.3 Northern Landfill

In a northern environment, as defined in the RLIMR, it is possible to establish landfill sites where only the residual materials generated there are eligible, including sludge that, although not generated in this environment, is otherwise treated.

NLs must be set up at the following minimum distances:

- 150 metres from any watercourse, unless the NL is not likely to affect the quality of the watercourse;
- 500 metres from any surface or ground water intake facilities for human consumption.

RLIMR requirements for the establishment of a NL are:

- The NL must be surrounded by a fence or equivalent, surrounded by a firebreak of 15 metres minimum and free of vegetation
- The bottom of the deposit zones must be above the permafrost and a minimum distance of 30 centimetres above the groundwater level
- The materials removed must be placed around the perimeter of the site to be used for covering residual materials
- Sludge must be deposited in a separate area from other waste materials to facilitate its burning
- The NL must be equipped with a surface water catchment system for the disposal of surface water off-site
- Combustible waste deposited shall be burned at least once a week, weather permitting
- In the event of closure or non-use of a NL for a period of six months or more, the deposited combustible residual materials must, after being burned, be covered with at least 30 centimetres of soil.

These sites are permitted to serve small populations and in areas where there is permafrost or scarcity of unconsolidated deposits, which precludes the development of other types of sites, such as TLs. To reduce the volume of residual materials deposited directly on the ground and to minimize the attraction for animals and water contamination, open burning of these materials is mandatory. Finally, no environmental monitoring is required and no limit value for the quality of ground and surface water is applicable for this type of site.

2.1.4 Construction or Demolition Waste Landfill

Under the RLIMR, the establishment or expansion of an LEDCD is now prohibited. Only operators of sites (dry material depots) with residual capacity as of January 2009 were permitted to continue operations, if they meet all new RLIMR requirements for areas operated after that date.

This type of site can only receive construction or demolition waste, which is defined (section 101 of the RLIMR) as follows:

> “Construction or material resulting from the construction, repair or demolition of buildings, bridges, roads or other structures, including stone, rubble or plaster, concrete, masonry or paving materials, surfacing materials, wood, metal, glass, textiles and plastics, excluding:

1. materials rendered unrecognizable by burning, crushing, shredding or otherwise, containers of paint, solvent, sealant, glue or other similar materials, wood treated to prevent the growth of mold or to increase resistance to decay, plant debris such as grass, leaves and wood chips, and materials, other than asphalt mixes, containing asbestos
2. any material with which household waste, material from an industrial process or any of the materials mentioned in subsection 1 is mixed.

However, the following are construction or demolition waste:

- Trees, branches, or stumps that are removed to allow construction work to be carried out
- Soil removed from land, including soil containing one or more contaminants in concentrations less than or equal to the limits set out in Schedule I of the Land Protection and Rehabilitation Regulation
- Residual materials coming from a facility for the recovery or reclamation of construction or demolition debris or from another recovery or reclamation facility authorized under the Environment Quality Act, provided that in all cases it is material which, although similar in composition to construction or demolition debris, could not be recovered or reclaimed

The provisions applicable to ELs with respect to their location in relation to water intakes, flood zones, areas at risk of ground movement and high aquifer potential is also applicable to operating CDWLs. Other specific requirements for these

locations are as follows:

- A minimum distance of 150 metres between the deposit zones and any watercourse
- A distance of at least 1 metre above the groundwater level for the bottom of the deposit zones
- The maximum distance for the installation of wells used for groundwater quality control shall not exceed the site boundaries.

CDWLs shall meet the same requirements as ELs with respect to the following:

- Surface water drainage
- Quality assurance and quality control of the facilities and equipment to be installed
- The environmental monitoring program for ground and surface water as well as biogas migration
- The control of admitted materials, weighing and radiological control, record, and annual report
- Visibility of operations and gradual redevelopment
- The prohibition of burning, the limitation of odours, emissions, and dust as well as the invasion by vermin
- Monitoring of groundwater and surface water quality, monitoring of methane migration and compliance with applicable limit values
- The vigilance committee
- Notice of closure, closure report, post-closure obligations and release from obligations.

Construction or demolition debris deposited in a CDWL must be graded and covered with a layer of soil or material having the same properties as the daily cover soil in an EL once a month during the operating period.

Where the height of buried construction or demolition waste reaches a level that is 90 centimetres lower than the ground surface at the boundaries of a deposit area, the deposit area shall be subject to a final multi-layer cover consisting of the following, from bottom to top:

- An impermeable layer consisting of either soil having a maximum hydraulic conductivity of 1 X 10-5 cm/s, to a thickness of at least 45 centimetres after compaction, or a geomembrane at least 1 millimetre thick placed on a layer of soil at least 30 centimetres thick
- A layer of soil with a minimum thickness of 45 centimetres where the impermeable layer mentioned above consists of soil and 60 centimetres where the impermeable layer consists of a geomembrane. This layer must also, in its upper part and over a thickness of between 15 and 30 centimetres, consist of soil or materials suitable for vegetation. Finally, the characteristics of the soil or other materials used must protect the impermeable layer.

The final cover must be graded to present a slope of 2% or the percentage that the slope of the soil at the limits of the deposit zone presents if it exceeds 2%. No later than one year after its installation, the layer of material finishing the final covering must be vegetated. CDWLs must be provided with a system for the capture and evacuation of the biogas produced. This system must be in operation no later than one year after the final covering of a deposit area. A CDWL that has not been used for a 12-month period must be covered at the end of this period. This is the final covering that must be carried out as planned when a site is filled.

2.1.5 Remote Landfill

RLs can only be established in the following territories:

- Territories not organized as a local municipality
- Territories that are inaccessible by road and any island that is not connected to the mainland by a bridge or water route
- The James Bay region territory
- Northern territories as defined in the RLIMR
- Part of the territory of the City of La Tuque located west of the 73rd meridian.

Except for the northern territories, RLs cannot serve, on an annual basis, more than 100 people. Furthermore, only the following persons, entities or municipalities may develop and operate an RL:

- The Minister of Energy and Natural Resources or any other authority that, by law, is responsible for the management of Crown lands
- An RCM
- The manager of an outfitter or a structured territory within the meaning of the Act respecting the conservation and development of wildlife
- The manager of an industrial camp governed by the Regulation respecting sanitary conditions in industrial or other camps
- The municipality of James Bay
- A person appointed under section 166 of the EQA relating to Cree villages and bands in the territory referred to in section 133 of the EQA
- City of La Tuque

Only residual materials generated in authorized territories are eligible for inclusion in the RL. Furthermore, they may not receive residual materials from a dwelling or facility that is served by a residual materials

collection service or that is located within 100 kilometers by road from an EL not exclusively reserved for a facility or an incineration facility, if these disposal facilities remain accessible by road, or from a facility that houses more than 100 people annually. RLs must be located at a minimum distance of:

- 150 metres from any watercourse
- 500 metres from any surface or underground water catchment installation intended for human consumption, unless the RL is not likely to affect its quality.

It should be noted that the operating requirements of the RL have certain particularities, namely:

- Burning of residual materials is prohibited, unless the RL is in a northern environment
- The bottom of the deposit zones must be a minimum distance of 30 centimetres above bedrock and groundwater level
- During May to October, the deposited residual materials must, at the end of each day of use or at least once a week in the case of burning, be covered with a layer of soil at least 15 centimetres thick or with a layer of lime, or be covered with a system to limit the release of odours, the spread of fires, the proliferation of animals or insects and the escape of light elements
- The disposal of sludge with a dryness of less than 15% in an RL must be done in a separate pit reserved exclusively for this type of residual material;
- When the height of the deposited residual materials reaches the surface of the ground at the site boundaries or when it is unused for a period of 12 months, the RL is closed. This must be covered with a layer of material of a minimum thickness of 30 centimetres consisting of soil of which at least 15 centimetres is suitable for vegetation, or a thickness of not more than 30 centimetres of any other material suitable for vegetation. The final cover shall be graded to have a minimum slope of 2 % but not more than 5 % or the percentage slope of the soil at the site boundary
- In the event of a temporary closure of an RL for a period of three months or more, the residual material deposited there must be covered with a layer of soil at least 30 centimetres thick.

2.2 Incineration

Incineration is a thermal treatment of residual materials to reduce their volume, destroy hazardous chemicals present in the waste or destroy pathogenic substances present in these materials. Incineration may also be a means of valorizing the energy, mineral or chemical content of residual materials. These materials are generally very heterogeneous and composed of organic substances, minerals, and water.

An incinerator refers to all facilities used to treat residual materials by a thermal process. In addition to combustion, which consists of the oxidation of the organic matter contained in the residual materials, there are other thermal treatment processes, such as:

- **Pyrolysis,** which consists of the thermal decomposition of organic matter in the absence of oxygen or in an oxygen-poor atmosphere. With this technology, a combustible gas can be produced, or mixtures of liquid hydrocarbons (oils) or solids (charcoal or biochar, if the residual materials are composed of biomass). The proportion between gas, liquid and solid depends on the

composition of the waste material as well as process parameters such as temperature, operating pressure, and residence tome. For instance, rapid pyrolysis at temperatures between 500 and 650 °C promotes gas production, while slow pyrolysis at temperature temperatures between 300 and 400 °C maximizes solids production.

- **Gasification,** which is primarily a two-step process of pyrolysis followed by gasification - This technology consists of heat treatment of waste materials at temperatures between 900 and 1200 °C in the presence of a small amount of oxygen. The organic fraction of the waste is then converted into a gas called synthetic gas (syngas). This gas consists mainly of carbon monoxide (CO), hydrogen (H2) and some methane (CH4). Once purified, syngas can be used as a raw material for various syntheses (ammonia, methanol, etc.) or for energy production
- **Thermal plasma,** which uses a partially ionized, electrically conductive gaseous medium that is heated to temperatures above 3,000°C and pressures in the range of atmospheric pressure - Specific applications of thermal plasma used for waste incineration are found on ocean-going vessels.

These other heat treatment processes are rarely used, especially when it comes to the disposal of final waste.

The choice of heat treatment technology for residual materials depends mainly on the nature of these materials, their composition and the objectives sought (elimination, valorization, the destruction of hazardous materials). Residual materials incineration can be subdivided into the following sub-categories:

- Incineration of household waste
- Incineration of sewage sludge
- Incineration of industrial and commercial waste
- Incineration of biomedical waste
- Incineration of hazardous materials

The main purpose of incineration is to reduce the effects of residual materials on the environment. However, the operation of an incinerator has environmental impacts, notably through the emission of atmospheric contaminants. The composition and concentrations of the emissions depend on the nature and heterogeneity of the residual materials, the technology used, the design and operation of the equipment and the treatment systems.

The main design parameters influencing incineration performance and thus impacts on emissions include the following:

- Temperature: a suitably high temperature must be maintained for optimal destruction of organic compounds
- Residence time: to carry out a complete heat treatment, the residence time must be sufficient to create a perfect mixture between the air and the fuel, i.e., the organic matter present in the residual materials
- Air: the design of the incinerator should promote sufficient air distribution under the residual materials and good turbulence to facilitate complete combustion.

Waste incinerators can emit a variety of contaminants, including dioxins and furans (PCDD/PCDF), corrosive gases, heavy metals, particulate matter, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

Dioxins and furans are persistent organic pollutants (POPs), i.e., pollutants that bioaccumulate in the environment and have effects on health and the environment. They can also be transported over long distances. Dioxin and furan emissions are associated with the composition of the residual materials, inadequate incineration technology, poor operating conditions of the incinerator (temperature and residence time) and the performance of the emission control system.

Corrosive gases such as hydrogen chloride (HCl) and sulphur dioxide (SO2) are generated during the incineration of waste that contains high levels of chlorine and sulphur (such as plastics).

Mercury, lead, and cadmium are examples of heavy metals emitted from incinerators. Mercury is also a persistent pollutant in the environment. Metal emissions are directly related to the presence of these substances in certain residual materials such as electric batteries and used oil. Thus, the best way to reduce metal emissions is to restrict their presence in the residual materials sent to the incinerator.

Emissions of **particulate matter** (PM) and fine particles ($PM_{2.5}$) are mainly caused by incomplete combustion. A large air flow within the incinerator can also cause the entrainment of particulate matter. The amount of particles emitted depends greatly on the performance of the purification system.

Emissions of **CO** and **volatile organic compounds** are determined mainly by the technical parameters of the incinerator and the degree of heterogeneity of the waste.

2.2.1 Regulations Applicable to Incinerators

In Québec, air emissions from incinerators are subject to the requirements of the Clean Air Regulation (CAR).

The CAR came into effect on June 30, 2011. It is a framework regulation that affects all sectors of industrial, commercial, or institutional activity and covers all stationary sources of atmospheric emissions. In addition, the CAR aims to reduce and control contaminants that can cause smog, acid precipitation, the presence of toxic contaminants (such as mercury) in ambient air, or local air quality problems. The CAR does not cover substances responsible for the depletion of the ozone layer (halocarbons are subject to specific regulations) or greenhouse gases (CO2, methane, etc.).

The CAR prescribes standards for the emission of contaminants to the atmosphere for industrial activities, but also for certain commercial or institutional activities. It also prescribes air quality standards for several contaminants. With these standards, the support capacity of the environment can be considered.

The CAR also prescribes emission monitoring and restriction measures for most sectors of activity. Monitoring measures consist of the installation of equipment for continuous measurement and recording of emissions. The contaminants covered by these requirements vary from one industry sector to another. Emission control measures consist of periodic source sampling requirements, the frequency of which varies

according to the power of certain facilities, the size of the company and the nature of the contaminants emitted.

Chapter VII of Title II of the CAR prescribes the emission limit values and other standards applicable to incineration plants, i.e., emission standards and requirements on design and operation, monitoring equipment and emission control measures.

Note that in the case where a combustion device or industrial furnace uses household waste as fuel, the rules applicable to such device or furnace are those concerning incineration plants provided for in Chapter VII.

2.2.2 Standards and Requirements under the CAR

The following sections outline the key standards and requirements under the CAR. For legal and complete texts, please refer to the CAR.

2.2.2.1 Emission Standards

Emission limits, depending on the residual materials incinerated and the capacity of the incinerator, for carbon monoxide (CO), particulate matter (PM), hydrogen chloride (HCl), sulfur dioxide (SO2) and dioxins and furans (PCDD/PCDF).

Emission limits are generally based on Canada-wide Standards and Canadian Council of Ministers of the Environment (CCME) guidelines.

The emission limit for dioxins and furans is based on the Canada-wide Standards for Dioxins and Furans adopted by the CCME in 2001. The CCME also adopted the Canada-wide Standards for Mercury Emissions in 2000, which set limits on emissions of mercury from incinerators.

Other emission limits are primarily derived from the 1989 CCME Operating and Emission Guidelines for Municipal Waste Incinerators.

Emission limits are intended to reduce emissions of these contaminants and also consider the technical capabilities of the equipment and treatment systems. For example, emissions measurements carried out by Environment Canada in 2002 (http://publications.gc.ca/collections/collection_2010/ec/En14-17-1-2010-fra.pdf), on a waste incinerator that was manufactured in Canada show that this equipment, when properly operated and maintained, can meet the emission limits for dioxins/furans and mercury set by the Canada-wide Standards.

The following table summarizes the emission limits for incinerators, which are prescribed by the CAR.

Table 2.2.2.1-A - CAR Emission Limits for Incinerators

Contaminant (1)		CO mg/m³R	PM mg/m³R	HCl mg/m³R	SO_2 mg/m³R	(PCDD/ PCDF) (TEF) (2) ng/m³R	Hg g/m³R
Residual hazardous materials		100					
Waste Biomedical	Nominal Capacity ≥ 1 t/h	(20 min)	20	50	150	0.08	50
	Nominal Capacity <1 t / h	57 (4h)	20	50	-	0.08	20
Other Residual materials	Capacity nominal ≥ 1 t/h		20	50			40
	Capacity nominal <1 t / h	57 (4h)	50	100	-	0.08	20

(1) Concentrations are expressed on a dry basis, at reference conditions (R: 25°C and 101.325 kPa) and corrected to 11% oxygen.

(2) TEF: Toxicity Equivalency Factor

The following tables present comparisons between the CAR emission standards and those of other jurisdictions for hazardous waste and other waste incinerators.

Table 2.2.2.1-B - Comparison of CAR Emission Standards with Other Jurisdictions for Residual Materials Incinerators

Contaminant [1]	PM mg/m^3R	Dioxins and furans (total) ng/m^3R	Dioxins and furans	CO mg/m^3R	HCl mg/m^3R	Hg $\mu g/m^3R$
CAR						
Nominal capacity> 1 t / h	20	-	0.08	57	50	20
Nominal capacity <1 t / h	50	-	0.08	57	100	20
CCME Guidelines [3]	20	-	0,08 [4]	57	75	20 [5]
Urban Community of Montreal, Regulation 90	15	-	0.1	50	30	20
Ontario, Guidelines A-7	14	-	0.08	40	27	20
European Union, Directive 2010/75/UE	10	-	0.1	50	10	50
EPA						
Municipal waste:						
• Capacity <250 t / d	24	13	-	57-229[6]	47	80
• Capacity> 250 t / d	20	13	-	57-286[6]	47	50
Sewage sludge [6]	18-80	1.2-5	0.1-0.32	73	0.76-1.8	28-37
Other residual materials	30	33	-	45	23	74

(1) Concentrations are expressed on a dry basis, at reference conditions (R: 25°C and 101.325 kPa) and corrected to 11% oxygen.
(2) TEF: Toxicity Equivalency Factor
(3) CCME, Operating and Emission Guidelines for Municipal Solid Waste Incinerators, June 1989.
(4) CCME, Canada-wide Standards for Dioxins and Furans, May 2001
(5) CCME, Canada-wide Standards for Mercury Emissions, June 2000
(6) Emission limits vary depending on the technology used.

Table 2.2.2.1-C - Comparison of CAR Emission Standards with Other Jurisdictions for Residual Hazardous Materials Incinerators

Contaminant (1)	PM mg/m^3R	Dioxins and furans (TEF) (2) ng/m^3R	CO mg/m^3R	HCl mg/m^3R	Hg $\mu g/m^3R$	SO_2 mg/m^3R
CAR	20	0.08	100 (20 min)	50	50	150
CCME, Guidelines (3)	20	0,08 (4)	57 (10 min)	75	50 (5)	-
Urban Community of Montreal, Regulation 90	15	0.1	50	30	20	50
Ontario, Guidelines A-7	14	0.08	40	27	20	56
European Union, Directive 2010/75/UE	10	0.1	50	10	50	50
EPA (Environment Protection Agency of United States), 40 CFR, part 63, subpart EEE	34	0.2	100	30	45	-

(1) Concentrations are expressed on a dry basis, at reference conditions (R: 25°C and 101.325 kPa) and corrected to 11% oxygen.
(2) TEF: Toxicity Equivalency Factor
(3) CCME, Operating and Emission Guidelines for Municipal Solid Waste Incinerators, June 1989.
(4) CCME, Canada-wide Standards for Dioxins and Furans, May 2001
(5) CCME, Canada-wide Standards for Mercury Emissions, June 2000
(6) Emission limits vary depending on the technology used.

CCME (1989) and other jurisdictions' guidelines also suggested emission standards for polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, etc. These are managed through ambient air quality standards. In fact, since June 30, 2011, the CAR prohibits the construction of a new source (for example, an incinerator) or the modification or increase in capacity of an existing source, if it results in an increase in the concentration of a contaminant in the air beyond the value of the air quality standard (Appendix K of the CAR) or beyond the concentration of a contaminant for which this limit value is already exceeded.

It is therefore necessary to assess the impact on air quality of a new incinerator, a modification of an existing incinerator or an increase in its capacity. This impact must be assessed using atmospheric dispersion modelling.

Atmospheric quality standards have been determined to protect human health and to minimize nuisances and the effects of contaminants on the environment. They are based on studies and literature reviews conducted by organizations such as the

Environmental Protection Agency (United States), the World Health Organization and Health Canada.

2.2.3 Incinerator Installation and Operation Requirements

A secondary combustion chamber is required for any incinerator with a rated feed capacity of less than 1 ton per hour and for any incinerator that burns biomedical waste. The secondary combustion chamber must be capable of providing a residence time of at least 1 second at a temperature above 1000°C to ensure complete incineration and to minimize contaminant emissions including dioxins and furans. Furthermore, this temperature must be maintained for a period of at least 15 consecutive minutes before introducing material for incineration. To maintain temperatures at the minimum required, these incinerators must be equipped with auxiliary burners.

In the case of incineration of residual hazardous materials, the requirement to maintain the normal operating temperature of both the incinerator (primary and other combustion chambers) and associated equipment (including purification equipment) is increased to one hour (at least 60 consecutive minutes) at start-up. The minimum time for maintaining temperatures after the last residual hazardous materials have been added is set at 30 minutes.

The concentration of carbon monoxide (CO) in the emissions is a good indicator of the performance of the incineration process and, therefore, of the concentrations of other contaminants. In addition, the CAR requires that an emergency device be in place to interrupt the feeding of residual hazardous materials or biomedical waste when a certain carbon monoxide (CO) concentration is reached.

2.2.3.1 Monitoring Equipment

Continuous measurement and recording systems are used to continuously monitor emissions. They help to detect any operation that does not meet the standards so that corrective action can be taken as soon as possible or incineration can be stopped.

Parameters of interest to ensure proper combustion and destruction of certain contaminants are carbon monoxide and oxygen concentrations and gas temperature. All incinerators must be equipped with systems for continuous measurement of these parameters.

Furthermore, if the nominal feed capacity of the incinerator is ≥ 1 t/h, the continuous measurement and recording of the opacity or concentration of particles in the combustion gases is added.

The installation of a system for the continuous measurement and recording of the concentration of hydrogen chloride in the emissions is required if an incinerator with a nominal feed capacity ≥ 2 t/h burns halogenated materials.

In addition to continuous emission measurement and recording systems, the CAR prescribes continuous measurement and recording of the feed rate of residual hazardous materials for any incinerator with a rated feed capacity ≥ 1 t/h.

2.2.3.2 Emission Control Measures

To verify compliance with emission standards, the RAA prescribes source sampling requirements, once a year for an incinerator with a rated feed capacity ≥ 1 t/h and once every three years if the rated feed capacity is < 1 t/h, for the following contaminants:

- Carbon monoxide (CO)
- Particles
- Hydrogen chloride (HCl)
- Dioxins and furans
- Mercury
- Sulfur dioxide (SO2) if residual hazardous materials are incinerated.

2.2.3.2 Standards and Requirements under the RLIRM

Chapter III of the MMER applies to incineration facilities that incinerate at least one of the following residual materials:

1. Household waste, whether it has undergone a physical treatment such as sorting, drying, compacting or pressurization, a chemical treatment such as the addition of acid or liming agent, or a biological treatment
2. Sludge, whether biologically treated, from municipal water or sludge treatment or storage facilities, or from other facilities for the storage or treatment of sanitary sewage or the treatment of sludge from such facilities, or from the flushing of sewers.

Note that the term "incineration plant" has the meaning given to the term "incinerator" in Section 101 of the CAR.

The RLIRM contains design and operating standards for incineration facilities subject to its regulations.

These incineration facilities must be equipped with a handling area or a pit located inside a building for the reception of residual materials. The handling area and the pit must be watertight. The handling area must be cleaned at the end of each day of operation.

No unincinerated residual materials or incineration ashes may be stored outside the buildings of the incineration facility. No truck containing waste material, including ashes, may be parked on the property of this facility for more than one hour.

In the case where the incineration facility governed by the RLIRM receives biomedical waste referred to in subsections 1 to 3 of section 1 of the Regulation respecting biomedical waste (chapter Q-2, r. 12), or dead bodies or parts of animals, the unloading area must be arranged so that these residual materials are on the one hand unloaded in an area separate from the area where the other types of residual materials are deposited and, on the other hand, are conveyed to the combustion chamber or chambers by means of an independent feeding system. This obligation with respect to animals does not apply to dead bodies or parts of pets that do not come from establishments that breed, sell, care for, or protect them.

The materials that are not eligible to be accepted at these facilities are those listed in Section 4 of the RLIRM applicable to landfill sites, except for biomedical waste and mill waste, which are eligible. In the latter case, the dryness criterion becomes 15% for sludge, but there is no dryness limit for other mill wastes.

As with an EL, the operator of an incineration facility is required to monitor, record and report annually on eligible materials. Weighing and radiation monitoring equipment must be installed at the entrance to the incineration facility.

The operator of an incineration plant must take the necessary measures to limit the emission of odours that cause olfactory nuisance beyond the limits of the plant, as well as the flight or scattering of residual materials and the emission of visible dust into the atmosphere at more than 2 metres from the source of emission. It must also form a vigilance committee.

Incineration facilities located in territories entitled to TL and NL are exempt from the obligation to weigh and radiologically monitor the materials received and from the obligation to establish a vigilance committee unless these requirements are imposed on them because of the application of the environmental procedure in the northern territories.

2.3 Transfer Centres

The RLIRM also governs transfer centres where residual materials are unloaded to allow them to be prepared for subsequent transportation for disposal. The only residual materials that may be admitted to a transfer centre are those that can be disposed of in a landfill or incineration facility. However, sludge with a dryness of less than 25% is not accepted at such a centre.

In a transfer centre, the operations related to the unloading and reloading of residual materials must take place in a building; no residual materials must be stored outside the building. No truck containing residual materials shall be parked for more than one hour on the grounds of the transfer centre. Upon the cessation of waste transshipment activities for a period exceeding twelve hours, all waste received must be transported to its destination in such a way that no waste is left on the premises, either inside the building or on the transfer centre's property. However, this requirement does not apply if the building is equipped with an air collection and treatment system that prevents any nuisance due to odours generated by residual materials that remain there for more than twelve hours.

The provisions applicable to ELs with respect to the control of incoming materials, weighing and radiological monitoring, the operating register, and the compilation of register data for the annual report are also applicable to transfer centres.

To meet the needs of small communities that cannot or will not develop and operate a waste disposal facility, low-capacity transfer centres with fewer requirements are permitted.

The following table summarizes the characteristics of low-capacity transfer centres as compared to high-capacity transfer centres, which transfer more than 200 metric tons of residual materials each week. Low-capacity transfer centers divide

themselves into two categories, those transshipping between 30 and 200 metric tons and those transshipping 30 metric tons or less (very low capacity).

Table 2.3 - Summary of RLIRM Provisions Relating to Transfer Centers Based on their Residual Material Transshipment Capacity per Week

	High capacity (> 200 t / week)	**Low capacity (> 30 t / week, ≤ 200 t / week)**	**Very low capacity (≤ 30 t / week)**
Population served	No limit of people served - Grouping of possible municipalities	Identical to high-capacity centre, but only one centre per municipality	
Operators authorized	Municipalities or businesses private	Municipalities or persons on their behalf	
Capacity	No capacity limit	At more than 300 m^3 and transshipment of more than 200 tm / week, except in territory inaccessible from November to April	More than 100 m^3 and transshipment of at most of 30 tm / week, except in inaccessible territory from November to April
Location	According to municipal rules, but far enough away to prevent odours, unwanted animals, vermin, etc.		
Limitation of number of centres	None	Only one possible centre per municipality local; no limitation in territory no organized	One centre per local municipality for household waste - No limitation for centres not receiving any; no limitation in unorganized territory
Authorization ministerial	Mandatory	Mandatory	None, but obligation to notify the RCM and the Ministry regarding the location, capacity of facilities and of clients
Fees payable for File analysis	$1,000 indexed for the institution and $500 indexed for any modification		Not applicable

	High capacity (> 200 t / week)	Low capacity (> 30 t / week, ≤ 200 t / week)	Very low capacity (≤ 30 t / week)
Guarantee	Mandatory guarantee of 100,000 $		No guarantee required
Materials residual eligible (RM)	Applicable provisions of section 137 of the RLIRM		
Verification eligibility of MR	Required		None. Control carried out at the disposal site
Weighing and control radiological	Required	Not required - Weighing and radiological control carried out at the disposal site	
Register	Required		None
Poster	Required		
Nuisances and cleaning the site	Applicable provisions of sections 48 and 49 of the RLIRM		
Annual Report	Required		Not required
Liquids derived from	Applicable provisions of sections 53, 55, 63 and 69 to 71 of the RLIRM (where applicable, for very low capacity)		

	High capacity (> 200 t / week)	Low capacity (> 30 t / week, ≤ 200 t / week)	Very low capacity (≤ 30 t / week)
Handling area			
Building	Required	None required, if RMs are deposited directly into a **closed, leak-proof** container	
Waterproofing and cleanliness of centre	Required		Not required
RMs dispatched to a place elimination	To be dispatched upon termination of activities of transshipment for a period> 12 hours, unless the RMs are stored in a building with a collection system and air treatment preventing nuisance odours.	RMs placed in a closed, leak-proof container can stay for one week maximum during the months of May to October and if the capacity of the centre allows it during the months of November to April, except for installations in the territories inaccessible (see provisions in section 139.4 of the RLIRM). For RMs transferred to a building, they must be dispatched upon termination of activities of transshipment for a period> 12 hours.	

3 ENVIRONMENTAL IMPACT ASSESSMENT AND REVIEW PROCEDURE

With the coming into force of the new Environmental Quality Act on March 23, 2018, the government marked the beginning of the progressive implementation of a new environmental permitting regime based on environmental risk. Thus, while moderate-risk activities must be authorized under section 22 of the Environment Quality Act, low-risk activities must instead be subject to a declaration of compliance and negligible-risk activities are exempt from the authorization regime. As for high-risk activities, they constitute projects subject to the Environmental impact assessment and review procedure (the Procedure) and are governed by the Regulation respecting the environmental impact assessment and review of certain projects (REIAR). These projects must therefore be the subject of a government authorization issued in the form of a decree pursuant to section 31.5 of the EQA. Note that the Procedure applies to Southern Québec only.

The environmental impact assessment and review procedure is intended to guide the government in making informed decisions regarding projects that are high-risk or that raise significant concerns among indigenous communities or the public. It also helps to ensure that environmental and social concerns are addressed in all phases of project development, from inception to completion. It encourages proponents to design projects that, in addition to being economically and technically feasible, have been optimized to be more integrated into the receiving environment and are generally environmentally acceptable. In this sense, the Procedure constitutes an instrument of sustainable development.

3.1 Projects Subject to the Procedure

The REIAR specifies the terms and conditions for the application of the Procedure under the EQA and sets out the projects that are subject to it. With respect to projects intended for the disposal of residual materials, only projects for the establishment or expansion of an EL as well as projects for the construction or increase in the capacity of an incinerator are subject to the Procedure, and this, according to certain terms and conditions set out in sections 34 and 33 of the Regulation, respectively. The Procedure began to apply to landfill site projects in 1993 under the Act respecting the establishment and enlargement of certain waste elimination sites.

With the coming into force of the RLIRM in 2006, this Act was repealed and the REIAR has been in place since then.

No waste incinerator project has yet received government approval under the Procedure. As for the establishment or expansion of landfill sites, just over 30 projects have been authorized by the government since this type of project became subject to the procedure. Table 3.1 shows the landfill projects that are currently in compliance with the Procedure.

Table 3.1 - Landfill Projects Currently Following the Procedure

Location	Initiator	Type of Project	Comment
Terrebonne, sector of Lachenaie (Lanaudière)	Complexe Enviro Connexion Ltée	Extension	Environmental analysis In progress
Bury (Estrie)	Valoris	Extension	Mandate for public hearing: as of March, 2021
Dolbeau-Mistassini (Saguenay–Lac-Saint-Jean)	Excavation Dolbeau inc.	Establishment	Transmission of directive: August 2019
Saint-Moïse (Bas-Saint Laurent)	Régie intermunicipale de traitement des matières résiduelles of the RCMs of La Matapedia and La Mitis	Establishment	Transmission of directive: September 2020
Hébertville-Station (Saguenay–Lac-Saint-Jean)	Régie des matières résiduelles du Lac-Saint-Jean	Extension	Transmission of directive: August 2016
Rivière-du-Loup (Bas-Saint Laurent)	City of Rivière-du-Loup	Extension	Transmission of directive: August 2020
Mont-Laurier (Laurentides)	Régie intermunicipale des dechets of La Lièvre	Extension	Transmission of directive: July 2020

Other types of landfill projects such as trench landfills or remote landfills are not subject to the Procedure and instead require an authorization issued under section 22 of the EQA. It should be noted, however, that different terms and conditions apply to residual materials disposal projects if they are in a territory covered by the agreement. Chapter 5 of this report provides more information on this subject.

3.2 Main Steps of the Procedure

The impact assessment and review procedure include various stages during which the Ministry and the public are called upon to give their opinion on a proponent's project, with a view to a decision to be taken by the government. The following sections provide a summary of these steps and the subsequent stages. Figure 3.2 illustrates the Procedure as a whole.

Note that since March 23, 2018, the Minister must forward his recommendation to the government for a decision within a prescribed time frame to the REIAR. For landfill sites and waste incinerator projects, this deadline is set at 13 months and excludes any period during which the Minister is waiting for additional information requested from the project proponent.

Project Notice, Minister's Directive, and Issues Consultation

The initiator notifies the Minister of the Environment and Climate Change that they intend to carry out a project by filing a project notice. In the notice, the initiator presents a summary of their project, the anticipated impacts on the environment, the provisional schedule and the concerns raised during consultations with the public and Indigenous communities, which the initiator is invited to carry out beforehand.

The Minister then sends them a directive specifying the elements to be included in the impact statement, in particular the context of the project, the public information and consultation process, the description of the environment in which the project will be carried out, the description of the alternatives to carrying out the project, the analysis of the impacts, including the mitigation and compensation measures envisaged, and the preliminary environmental monitoring and follow-up programs.

No later than 15 days after the transmission of the ministerial directive, a 30-day period begins, during which any member of the public may submit comments to the Minister on the issues that the impact statement should address. They may do so by consulting the notice of project and the directive published in the Environmental Assessment Registry. Once this consultation is completed, the Minister will forward comments on the issues raised that are relevant enough to warrant their consideration in the impact statement.

Admissibility analysis and mandates of the Bureau d'audience publique sur l'environnement

When the project initiator deems the impact statement to be complete, it is sent to the Minister, who then publishes it on the Registry. With the cooperation of the various departments and agencies concerned, the Ministry then analyzes the admissibility of the impact statement. This analysis consists of determining whether the impact study satisfactorily addresses the subjects it must deal with according to the ministerial directive and whether it satisfactorily considers the observations and issues raised during the public consultation. If information is missing or incomplete, the Ministry may direct any questions and comments it deems appropriate to the initiator. In the case of a proposed extension of an EL, these may include, for example, questions to clarify the calculations made to justify the need for market waste disposal that the initiator intends to meet, to further document the impacts of the use of a particular technology in the operation of the landfill site, to provide additional inventory data on a wetland likely to be affected by the project, or to revise the assessment of the impact of a discharge of treated water into the receiving environment. The purpose of the acceptability analysis is not to determine the acceptability of the initiator's project, but rather to obtain all relevant information to subsequently make a judgment on the acceptability of the project during the environmental analysis.

Once the impact study is deemed admissible, the Minister informs the initiator, who must publish a notice announcing the beginning of the public information period in a newspaper in the region where the project is likely to be carried out. At the same time, the Minister asks the BAPE to announce, by press release, the beginning of the public information period. This period lasts 30 days. During this period, any person, municipality, or group may submit a written request to the Minister for a public hearing, targeted consultation, or mediation in relation to the project. When such requests are addressed to the Minister and are deemed not to be frivolous, it is then up to the BAPE to make a recommendation to the Minister on the type of mandate that should be assigned to it.

The duration of a public hearing mandate is four months, three months for a targeted consultation and two months for a mediation. When a mandate of this type is given to the BAPE, the BAPE reports its findings and the analysis it has drawn from them in a report that it submits to the Minister. The Minister makes the report public within fifteen days of receiving it.

Since March 23, 2018, the Minister may mandate the BAPE to hold a public hearing on a particular project without a prior public information period, when the holding of a public hearing appears unavoidable because of

the nature of the issues raised or where public concerns warrant it. With respect to projects to establish or expand landfill sites, it should be noted that nearly 70% of the projects that have been the subject of a government decision since 2000 have been the subject of a public hearing.

Ministry Environmental Analysis and Government Decision

During the environmental analysis, the Ministry, in collaboration with the other ministries and agencies concerned, analyzes the project to advise the Minister on its environmental acceptability, on the relevance of carrying it out or not and, if applicable, on its authorization conditions. This analysis considers, among other things, the rationale for the project, the issues at stake, the anticipated impacts on the receiving environment and the mitigation and compensation measures envisaged, if any. Similarly, at the admissibility analysis stage, if the Ministry considers that elements are missing to make a recommendation on the acceptability of the project, it may ask the initiator to provide additional answers.

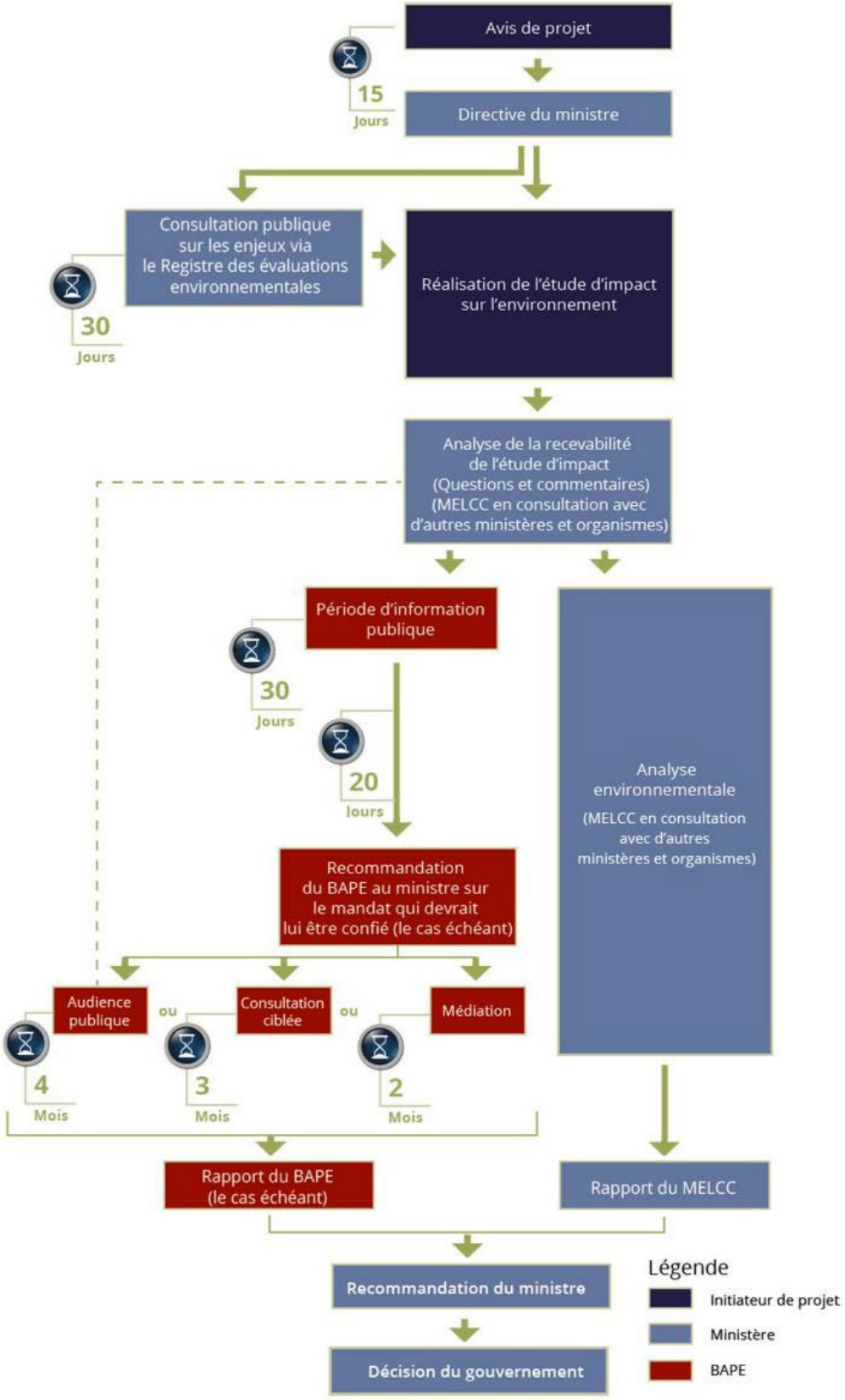
Once this step is completed, based on the environmental analysis report produced by the Ministry as well as the BAPE report, if applicable, the Minister conducts his analysis and submits his recommendation to the government, which then makes its decision by decree. The Minister may then authorize the project, with or without modifications and on the conditions he determines or refuse it.

Ministerial Authorization, Environmental Monitoring and Follow-Up

If the government authorization issued by a decree authorizes a project, the project initiator must nevertheless obtain, subject to the provisions of the decree and the Regulation respecting the supervision of activities based on their impact on the environment, the authorizations required under section 22 of the EQA for the activities arising from the project. When the Minister authorizes such activities, he is bound by the decree, i.e., he must ensure that the ministerial authorizations he issues comply with the conditions, restrictions and prohibitions set out in the decree.

It is generally at this stage that the environmental monitoring or follow-up programs that the initiator has committed to carry out or that the government has set out in its decree are finalized. Under the initiator's responsibility, the purpose of the monitoring is to ensure that the project is carried out in accordance with the decree and the ministerial authorization(s). The project initiator is also responsible for the follow-up programs, which are designed to verify the accuracy of the impacts predicted in the impact study, particularly where uncertainties remain, and to assess the effectiveness of the mitigation measures.

Figure 3.2 - Diagram of the Main Steps of the Procedure and Associated Deadlines



4. Current Site Inventory in Québec

4.1 Overview of Residual Materials Elimination Facilities Including Transfer Centres

The following two tables show the waste tonnage received by type of disposal facility for the calendar years 2015 to 2019. The data includes all materials received by disposal facility each year, including materials destined for cover or other uses (whether used in the year or stored for later use) and materials destined for disposal (whether subject to disposal charges or exempted).

Table 4.1-A - Materials Received by ELs, CDWLs and Incinerators (Including Capping and Other Uses), in Metric Tonnes

Name of Disposal Facility Operator	2015	2016	2017	2018	2019
Champlain EL - GFL Environmental (Matrec)	31,486	136,177	176,985	139,490	185,629
Enviro Connexions Complex EL	1,789,469	2,067,078	1,875,975	1,807,142	2,159,452
Armagh EL	39,551	38,695	38,667	33,110	32,543
Chicoutimi EL- Services Matrec inc. Division Centre technologique AES de Saguenay	148,816	98,191	130,394	0	0
Dégelis LET- Régie intermunicipal des dechets de Témiscouata	14,195	12,996	17,323	15,740	13,573
Charlevoix-Est RCM EL	15,722	12,020	12,176	13,814	15,663
RCM EL Vallée-de-L'Or	42,100	51,868	40,246	45,284	43,279
Lotbinière RCM EL	31,887	50,560	29,248	33,447	34,209
EL of the Municipality of Saint-Alphonse	25,125	46,209	22,754	30,281	19,655
EL of the intermunicipal board of waste management of Chutes de-la-Chaudière	81,792	94,038	93,848	85,439	87,350
EL of the intermunicipal board of residual materials management Brome-Missisquoi (R.I.G.M.R.B.M.)	73,642	113,134	83,772	123,861	95,209

EL of the Régie intermunicipale du centre de valorisation des matières résiduelles du Haut-Saint-François et de Sherbrooke	116,903	85,859	85,871	66,728	64,309
EL of the Régie intermunicipale du comté de Beauce-Sud	30,152	29,673	29,584	33,702	31,518
EL of RID de la Lièvre	15,738	12,429	14,128	12,752	17,907
EL of RID de la Rouge	34,477	43,590	51,560	48,130	40,873
EL of RIGDS of Coaticook	12,867	14,052	17,084	22,144	40,667
EL de la Société de développement durable d'Arthabaska (Gesterra)	118,330	131,894	156,731	151,174	187,896
EL of the City of Amos	25,531	22,487	18,035	23,395	21,633
EL of the City of Chibougamau	19,726	15,854	16,443	16,042	12,803
EL of the City of Gaspé	29,169	25,765	25,951	33,937	26,632
EL of the City of Matane	27,688	30,041	28,906	29,320	31,936
EL of the City of Québec	147,654	102,187	72,877	74,698	65,541
EL of the City of Rimouski	42,210	42,483	38,697	41,230	62,159
EL of the City of Rivière-du-Loup	75,733	73,896	70,265	82,024	64,310
EL of the City of Sept-Iles	56,953	80,128	73,915	117,351	68,562
EL of Lachute of RI Argenteuil/Deux-Montagnes	390,312	349,518	403,765	454,910	612,134
EL of Ragueneau of the RMM Manicouagan	32,561	61,006	28,293	39,615	24,251
EL of Saint-Édouard-de-Frampton	35,670	35,989	38,569	37,346	28,415
EL of Saint-Étienne-des-Grès la RMM of Mauricie	237,559	228,109	279,741	244,964	285,012
EL of WM Québec inc. de Sainte-Sophie	1,540,305	1,620,530	1,888,626	1,692,939	1,812,788
EL of WM Québec inc. de Saint-Nicéphore	471,001	482,939	692,431	689,558	575,331
EL Dépôt Rive-Nord	747,733	808,960	858,614	859,204	905,996

EL GFL Environmental (Matrec)	199,517	210,920	211,374	202,034	201,295
EL Hébertville-Station - Régie des matières résiduelles du Lac-Saint-Jean	90,085	70,765	75,551	149,703	162,282
EL of Neuville- Régie régionale des gestion des matières résiduelles de Portneuf	71,765	99,180	93,492	90,684	84,230
EL Olin Canada ULC	2,005	1,621	1,894	1,996	2,005
EL Rouyn-Noranda (Multitech Environnement) 3766063 Canada inc.)	48,781	45,698	49,428	57,192	52,823
Lieu d'enfouissement de déchets industriels Bécancour - Gestion 3 L B inc.	19,041	15,709	19,306	36,030	24,332
CDWL 9052-6757 Québec inc.	5,876	11,597	0		
CDWL of Pierrefonds-GFL Environmental (Matrec)	65,460	79,745	231,368	283,934	8,169
CDWL of Sainte-Julienne (2845 5103 Québec inc.)	10,738	12,663	11,371	8,532	14,541
CDWL Sorel-Tracy - Danis Construction	3,873	0	932	0	3,460
CDWL Enfoui-Bec	57,993	72,176	76,599	65,557	55,675
CDWL Excavation Dolbeau	12,590	9,138	11,283	15,094	16,206
CDWL Gestion intégrée de Matériaux secs Lanaudière	16,056	14,769	23,361	25,302	27,881
CDWL Léon Lavoie Entrepreneur general inc.	13,925	13,091	11,043	9,069	0
CDWL Les Entreprises Jean Tremblay et Fils	9,131	10,316	28,300	19,921	20,306
CDWL Récupération J. M. Langlois inc.	57,398	47,014	9,678		
CDWL Recyclage Sainte-Adèle	16,850	17,111	19,299	0	0
CDWL Sable des Forges	101,539	87,849	87,585	86,657	97,449
CDWL Thibault Demolition	5,226	3,874	3,691	3,979	2,505

Incinerator Aquacers, Société de gestion du CERS inc. of	7,328	6,449	6,924	7,240	5,656
the CERS inc. Incinerator of the Montreal Wastewater Treatment Plant Montréal	146,473	140,677	130,843	137,906	120,790
Lévis City Incinerator	13,553	15,744	17,401	17,298	21,833
Québec City Incinerator	219,530	244,083	256,927	257,423	252,934
Total	**7,696,793**	**8,248,545**	**8,789,125**	**8,574,319**	**8,841,608**

Table 4.1-B - Materials Received by TLs (Including capping and Other Uses) in metric tons

Name of the site operator elimination	2015	2016	2017	2018	2019
TL- Propriété Éléonore	48,246	990	1,245	1,790	1,179
TL - City of La Tuque - Baie Jean-Pierre	40	35	35	36	27
TL - City of La Tuque - Canton Bardy (Flamand)	163	163	163	160	160
TL - City of La Tuque - Lac Chateauvert	26	26	26	27	5
TL - City of La Tuque - Parent	769	675	688	642	276
TL of Longue-Pointe-de-Mingan	5,931	4,597	3,857	4,707	4,090
TL of Lebel-sur-Quévillon	1,555	1,779	1,437	460	2,064
TL of Anticosti Island	431	462	289	402	287
TL of Matagami	1,104	611	1,632	1,565	6,063
TL of Mistissini	1,410	2,044	4,631	3,316	3,216
TL of Natashquan	1,379	1,533	2,173		
TL of Nemaska	372	218	623		
TL of Nemaska				727	696
TL of Mount Wright	12,364				

TL Eastmain-1 (SEBJ)	201	226	189	196	816
TL km 4 of the La Romaine complex	4,446	3,487	1,982	1,689	2,442
TL LG4	277	280	255	261	231
TL MBJ - Miquelon	30	38	40		
TL MBJ - Radisson	812	1,319	1,100	940	879
TL MBJ - WB - (Villebois)	81	210	234	246	208
TL Troïlus Mine	2	1	1		5
TL of Mount - Wright		11,666	11,210	18,377	15,134
TL Natashquan - Régie intermunicipale de gestion des matières résiduelles de l'est de la Minganie	1,363	1,533	2,177	2,526	3,646
TL Nemiscau	709	2,430			
TL Nemiscau			592	43	126
TL Opitciwan				497	1,471
TL Oujé-Bougoumou (Cree Nation Oujé-Bougoumou)	885	885	844	1,090	1,133
TL Propriété Éléonore	233	765	517	512	831
TL - City of La Tuque - Route 10	198	163	163	164	164
TL Wemotaci	330	400	541	550	506
Rébec inc. (TL Camp Brooch)	82	100	68		
TL Total	**83,438**	**36,635**	**36,713**	**40,925**	**45,654**

4.2 Breakdown of Residual Materials Elimination by Territorial Divisions

It is not possible to provide a breakdown by municipality of all materials disposed of by facility. As part of the Program of redistribution to municipalities of charges payable for the disposal of residual materials, data is compiled by municipality for the main categories of waste disposed of, namely: residential (household and bulky waste), ICI and CRD. Overall, this compilation represents 5,037,004 metric tons of residual materials disposed of, or 57% of the total quantities of residual materials received (including recovery and other uses).

A total of 2,817,917 metric tons of residual materials were received directly at the disposal facilities (EL, INC, CDWL).

A total of 2,193,994 metric tons of residual materials destined for disposal passed through transfer centres. When a transfer centre sends material to more than one disposal facility, it is no longer possible to trace the municipality of origin and the nature of the material to its destination.

TLs are not covered by the RCPDRM, but they are required to file an annual declaration of residual materials eliminated. In total, these facilities received the equivalent of 25,092 metric tons.

For the tonnages attributable to Indigenous communities, the data that is compiled in this table presents the tonnages as reported by the disposal sites governed by the RLIRM. Therefore, if an Indigenous territory does not dispose of its materials at a location that has filed an annual declaration, no tonnage is reported. Also, tonnages from a community may be associated with a nearby municipality.

Table 4.2 shows the quantity of residual materials received from outside the disposal facility's territory and its proportion of the total. It is based on data specific to the residential, ICI and CRD sectors compiled in the previous table. For these three categories, nearly 44% of the residual materials destined for disposal passed through a transfer center before being sent to a disposal facility. When a transfer centre sends material to more than one disposal facility, it is no longer possible to trace the municipality of origin and the nature of the material to the destination. To address this situation, a tonnage allocation exercise was conducted for transfer centres based on the proportions received by each disposal facility. Overall, 21% of the residual materials disposed of by the residential, ICI and CRD sectors would have been generated by municipalities in the reference territory of the disposal facility.

Table 4.2 - Quantity of Residual Materials (Residential, ICI and CRD) from Outside the Disposal Facility Jurisdiction for 2019 (in metric tons)

	Tonnage received directly at elimination facility		Tonnage From transfer centres				
Name of disposal facility	Materials generated by the territory	Materials generated outside territory	Materials generated by the territory	Materials generated out territory	TOTAL of materials generated by territory	TOTAL of materials generated outside territory	Total residual materials buried (including recovery and other uses)
EL of the City of Matane	11,464	1,151		3,627	11,464	4,779	31,936
EL of the City of Rimouski	31,272				31,272		62,159
EL of the City of Rivière-du-Loup	18,349	13,559		6,802	18,349	20,361	64,310
EL de Dégelis - Régie intermunicipale des déchets de Témiscouata	8,637	525			8,637	525	13,573
CDWL Les Entreprises Jean Tremblay et Fils	5,081	9,763			5,081	9,763	20,306
CDWL Excavation Dolbeau	2	11,053			2	11,053	16,206
EL Hébertville-Station - Régie of matières résiduelles du Lac-Saint-Jean	22,519	78,587	385	22,057	22,904	100,645	162,282
CDWL Léon Lavoie Entrepreneur général inc.							
Charlevoix-Est RCM EL	7,645				7,645		15,663
EL of the City of Québec	2,230	155			2,230	155	5,541
EL of Neuville- Régie régionale de gestion des matières résiduelles de Portneuf	23,685	18,254		3,971	23,685	22,225	84,230
Québec City Incinerator	239,266	6,368			239,266	6,368	252,934

CDWL Sable des Forges	11,611	54,894			11,611	54,894	97,449
EL Champlain - GFL Environmental (Matrec)	5,043	42,960		42,484	5,043	85,444	185,629
EL of Saint-Étienne-des-Grès the RMM from Mauricie	16,320	103,837		26,284	16,320	130,120	285,012
EL of the Régie intermunicipale centre du de valorisation des matières résiduelles du Haut-Saint-François and Sherbrooke	9,567	9,495	0	32,805	9,568	42,300	64,309
EL of RIGDS of Coaticook	4,492	10,768			4,492	10,768	40,667
CDWL of Pierrefonds-GFL Environmental (Matrec)							8,169
Montreal Sewage Treatment Plant Incinerator							120,790
CDWL Thibault Demolition							2,505
EL Rouyn-Noranda (Multitech Environnement) 3766063 Canada inc.)	25,240	2,914		16,727	25,240	19,642	52,823
EL of the City of Amos	15,032	363			15,032	363	21,633
EL of the RCM of Vallée-de-l'Or	29,987	1,577			29,987	1,577	43,279
EL of Ragueneau of RMM Manicouagan	14,023	591			14,023	591	24,251
EL of the City of Sept-Iles	28,094	2,663			28,094	2,663	68,562
EL of the City of Chibougamau	5,757	457			5,757	457	12,803
EL of the City of Gaspé	11,345	6,787			11,345	6,787	26,632
EL of the Municipality of Saint- Alphonse	9,933	8,513			9,933	8,513	19,655
Armagh EL	18,426	4,874			18,426	4,874	32,543

EL of Saint-Édouard-de-Frampton	18,767	7,909			18,767	7,909	28,415
EL of the Régie intermunicipale centre du des déchets des Chutes-de-la-Chaudière	2,608	35,148			2,608	35,148	87,350
EL of the Régie intermunicipale du comté de Beauce-Sud	21,426	2,789			21,426	2,789	31,518
Lotbinière RCM EL	16,813	1,191			6,813	1,191	34,209
Lévis City Incinerator	21,222				21,222		21,833
EL Dépôt Rive-Nord	51,730	199,337		325,055	51,730	524,392	905,996
CDWL Gestion intégrée de matériaux secs Lanaudière	9,318	13,794			9,318	13 79	27,881
CDWL of Sainte-Julienne (2845-5103 Québec inc.)	128	13,128			128	13,128	14,541
Enviro Connexions Complex EL	72,490	623,155	11	463,071	72,501	1,086,226	2,159,452
EL of WM Québec inc. de Sainte-Sophie	74,282	169,784	303	669,093	74,584	838,877	1,812,788
EL of Lachute de la RI Argenteuil / Deux-Montagnes	19,031	119,874	153	245,432	19,184	365,306	612,134
CDWL Recyclage Sainte-Adèle							
EL of RID de la Lièvre	11,559	122			11,559	122	17,907
EL of RID de la Rouge	3,136	28,579			3,136	28,579	40,873
EL of the Régie intermunicipale centre du des matières résiduelles de Brome-Missisquoi (R.I.G.M.R.B.M.)	44,854	17,411	9	2,426	44,863	19,837	95,209
EL GFL Environmental (Matrec)	40,528	33,249	419	67,045	40,947	100,293	201,295
Incinerator Aquacers, Société de gestion de CERS inc.							5,656

CDWL Enfoui-Bec	363	14,493			363	14,493	55,675
EL by WM Quebec inc. Saint-Nicéphore	30,491	87,337	1,049	158,257	31,541	245,595	575,331
site Landfill of Waste industriels Bécancour - Gestion 3 L B inc.	3,508	5,534			3,508	5,534	24,332
EL of the Société de développement durable d'Arthabaska (Gesterra)	11,163	26,540	24,933	50,553	36,096	77,093	187,896
EL Olin Canada ULC							2,005
Total	**1,028,437**	**1,789,480**	**27,262**	**2,135,690**	**1,055,699**	**3,925,171**	**8,838,148**
TL of Anticosti Island	283	0					287
TL Troïlus Mine	3	0					5
TL Nemiscau	126	0					126
TL Villebois	182	0					208
TL Radisson	847	0					879
TL of Mount Wright	3,269	0					15,134
TL of Longue-Pointe-de-Mingan	3,398	692					4,090
TL of James Bay municipality	816	0					816
TL of LG4	231	0					231
TL of Mistissini	2,917	0					3,216
TL of Nemaska	561	33					696
TL of Baie Saint-Pierre	27	0					27

TL Chateauvert	5	0					5
TL Flamand	160	0					160
TL Parent	276	0					276
TL route 10	164	0					164
TL Wemotaci	440	0					506
TL of Matagami	2,237	0					6,063
TL of Lebel-sur-Quévillon	1,026	116					2,064
TL of Oujé-Bougoumou	1,051	0					1,133
TL Complexe Romaine-2	1,728	0					2,442
TL Propriété Éléonore	0	0					1,179
TL Propriété Renard	741	0					831
TL Natashquan - Régie intermunicipale de gestion des matières résiduelles de l'est of Minganie	591	2,004					3,646
TL Opitciwan	1,170	0					1,471
TL Total	**22,247**	**2,845**					**45,654**

4.3 Overview of Non-Compliance Notices and Complaints by Type of Facility and Region

The Ministry ensures compliance with environmental legislation, by verifying the compliance of activities likely to cause damage to the environment.

It is through the Centre de contrôle environnemental du Québec (CCEQ) that the Ministry carries out, as part of control programs or following environmental complaints, field inspections and other audits to ensure the environmental compliance of activities.

All identified deficiencies are served by a Notice of Non-Compliance (NON) in accordance with the Directive sur le traitement des manquements.

For the period from April 1, 2015 to March 31, 2020, the CCEQ has notified 110 NONs regarding construction, renovation, and demolition (CRD) waste sorting centers and 396 NONs regarding waste disposal sites. The following table shows the number of NONs by administrative region for each type of location.

Table 4.3 - Notices of Non-Compliance for CRD Sorting Centres and Residual Materials Elimination Sites by Region, April 1, 2015 to March 31, 2020

	CRD sorting centre	DMS	TD	OD	CDWL	NL	TL	SL	EL	Sum
Bas-Saint-Laurent	4	2	1	0	0	0	0	2	28	**37**
Saguenay-Lac-Saint-Jean	1	12	0	1	0	0	0	2	3	**19**
Capitale-Nationale	4	3	0	0	0	0	0		7	**14**
Mauricie	6	1	5	0	19	0	16	5	40	**92**
Estrie	6	1	0	0	0	0	0	0	4	**11**
Montréal	2	0	0	0	1	0	0	0	0	**3**
Outaouais	15	1	3	0	12	0	0	0	0	**31**
Abitibi-Témiscamingue	0	0	2	0	0	0	3	0	2	**7**
Côte-Nord	3	0	0	0	0	12	18	2	10	**45**
Nord-du-Québec	0	0	0	0	0	0	12	1	7	**20**
Gaspésie--Îles-de-la-Madeleine	0	0	1	0	0	0	0	6	10	**17**
Chaudière-Appalaches	21	0	0	0	0	0	0	4	30	**55**
Laval	2	1	0	0	0	0	0	0	0	**3**
Lanaudière	10	4	0	0	7	0	0	1	3	**25**
Laurentides	6	7	0	0	0	0	0		1	**14**
Montérégie	28	13	0	6	9	0	0	7	3	**66**
Centre-du-Québec	2	0	0	0	8	0	0	2	35	**47**
Sum	**110**	**45**	**12**	**7**	**56**	**12**	**49**	**32**	**183**	**506**

With respect to complaints, the current data management system is not able to isolate environmental complaints received and processed at specific types of locations. It is therefore not possible to provide any data in this regard.

5. ELIMINATION OF RESIDUAL MATERIALS IN NORTHERN, REMOTE, AND ISOLATED TERRITORIES

The basic method of disposal provided for in the RLIRM is the engineered landfill (EL). However, exceptional disposal methods are also provided for, such as trench landfill (TL), to serve small, isolated communities, northern landfill (NL), to serve small communities in the far north of Quebec, and isolated landfill (RL), to serve isolated camps or very small, isolated settlements (less than 100 persons/year).

Thus, regarding the disposal of residual materials generated by the populations living in these territories, there are requirements adapted to this situation. A more complete description of the requirements for each type of disposal facility is provided in another chapter of this report.

NLs are permitted in northern environments and on the Basse Côte-Nord territory because of the presence of permafrost or the lack of unconsolidated deposits, which facilitate the development of other types of landfill sites. These unconsolidated deposits are a rare commodity in these areas and are reserved for other purposes (e.g., road, airport, and residential development).

To reduce the volume of waste deposited directly on the ground and minimize water contamination, open burning of these materials is mandatory. This burning is a source of atmospheric contamination and a potential nuisance for the population living near the NLs. Burning the materials is also sometimes difficult, as optimal conditions are not always present.

Incineration of residual materials in small facilities is possible. However, the requirements of the Clean Air Regulations make this option more difficult to implement and more costly.

The remoteness of these populations and the limited access to transportation of goods and merchandise makes waste valorization in these regions very difficult. The lack of a local solution requires the transportation of materials, which considerably increases costs. As a result, large quantities of waste materials are piled up waiting for a solution or disposed of in the NLs.

For other remote populations (e.g., the James Bay territory), it is possible to develop and operate a TL. The presence of unconsolidated deposits facilitates the digging or construction of trenches in which residual materials are deposited. These non-watertight sites are subject to groundwater and surface water quality standards, and the operator must monitor the quality of these waters. For certain isolated areas (e.g., Anticosti), where it is permitted to develop this type of site, access to the territory only possible by a water route makes it difficult for the operator to carry out the required environmental monitoring (analysis of groundwater and surface water quality). This type of disposal site is also sometimes ill-suited to certain specific needs, such as the generation of a large volume of residual materials for a given activity (e.g., the destruction of a building).

The Îles-de-la-Madeleine represents another isolated and remote territory where the disposal of residual materials is problematic. There are currently no disposal facilities in operation on this territory. Residual materials are currently transported by boat, in a refrigerated container, to Montreal and then disposed of in a landfill located in the Centre-du-Québec region. However, an incineration facility was in operation from 1994 to 2008. A project to develop a EL was already presented in 2006, but has never been

implemented. On this territory, the generation of a large volume of residual materials for a given activity (e.g., the destruction of a building) also represents a problem.

5.1 Detailed Description of the Territories covered by the Agreement

The territory of Québec known as Northern Québec corresponds largely to the administrative region of Nord-du-Québec, which is bounded by Hudson Bay and James Bay to the west, by Hudson Strait and Ungava Bay to the north, by Labrador to the east and by the administrative regions of Abitibi-Témiscamingue, Mauricie, Saguenay-Lac-Saint-Jean and Côte-Nord to the south and southeast. The Nord-du-Québec territory includes mainly the James Bay and Nunavik territories. For the purposes of this report, we will refer only to the territory covered by the agreement, which is located beyond the 49th parallel.

Title II of the Environment Quality Act (EQA) contains specific environmental assessment provisions applicable to James Bay and Nunavik, in accordance with the provisions of[1] the James Bay and Northern Québec Agreement (JBNQA) signed in 1975 and the Northeastern Québec Agreement (NEQA) signed in 1978, both of which were concluded with the Indigenous nations of the northern regions. These agreements establish, among other things, a land regime, a hunting, fishing and trapping[2] regime as well as environmental and social protection regimes. The JBNQA defines two environmental and social protection regimes on either side of the 55th parallel, which are different from those in southern Québec. These regimes are different in that they aim to make the development of natural resources, the conservation of the traditional way of life of Indigenous people and the economic development of communities compatible. Furthermore, the environmental assessment procedure specific to these regions is distinguished by the active participation of the Indigenous peoples (Cree, Inuit, and Naskapi) who live there.

In fact, under the JBNQA and the EQA, there are five northern committees that work on the application of environmental and social protection regimes in the territory covered by the JBNQA or that advise the governments in the development of laws, regulations, policies or strategies related to the protection regimes covered by the JBNQA.[3]. Indigenous people or members appointed by an indigenous organization sit on each of the northern committees and are therefore stakeholders in the recommendations, decisions and opinions issued by them.

More specifically, according to Schedule A of the EQA, any system for the removal and disposal of residual materials, excluding mine tailings and hazardous materials, is a project mandatorily subject to the environmental and social impact assessment and review procedure, requires the completion of an impact study and is examined by the committee responsible for doing so. Administratively, it is the MELCC which is responsible for applying the evaluation and examination procedure for projects located in the territory of application of chapters 22[4] and 23[5] of the JBNQA and Chapter 14 of the NEQA. In addition, these projects must obtain the necessary environmental authorizations under section 22 of the EQA.

5.1.1 James Bay Territory

5.1.1.1 Description of the Environmental Assessment Authorization Procedure

Regarding the James Bay territory,[6], three northern committees were formed by the JBNQA: the Environmental and Social Impact Assessment Committee (COMEV), the Environmental and Social Impact Review Committee (COMEX) and the James Bay Advisory Committee on the Environment (JBACE).

Each plays a role in the application of the environmental and social assessment procedure Each plays a role in the application of the environmental and social assessment procedure.

As for regulations, the specific territorial regime of the James Bay region as defined in the JBNQA has repercussions on the application of provincial laws in certain parts of the territory. More specifically, the Category IA lands on which the Cree communities are located have their own environmental regulations. However, many of the disposal facilities are located on Category Other lands (IB, II or III), where provincial environmental regulations apply,[7], such as the Regulation respecting the Burial and Incineration of Residual Materials (RLIMR).

5.1.1.2 Environmental and Social Impact Assessment Committee

COMEV[8] is responsible for reviewing preliminary information provided by a project proponent. Based on this information, COMEV recommends to the administrator concerned whether to subject the project to the environmental and social impact assessment and review procedure provided for in Title II of the EQA. When the project is subject to the procedure, COMEV prepares a directive on the scope of the impact study to be carried out and recommends that the administrator concerned forward it to the proponent. If the project is not subject to coverage, COMEV recommends that the administrator concerned issue an attestation of exemption. This is a tripartite committee with representatives appointed by the governments of Canada, Québec, and the Cree Nation.

5.1.1.3 Environmental and Social Impact Review Committee

When a project is subject to the environmental and social impact assessment and review procedure provided for in Title II of the EQA, the proponent must prepare an impact study and forward it to the administrator concerned. Upon receipt of the impact study, the COMEX analyzes the project and may recommend to the administrator concerned that the proponent be asked to conduct additional research or studies on the project. The COMEX may also publicly consult the communities affected by the project and may or may not recommend authorization of the project to the administrator concerned. This is a bipartite committee that includes representatives appointed by the governments of Québec and the Cree Nation.

5.1.1.4 James Bay Advisory Committee on the Environment

As a privileged and official interlocutor, the JBACE is consulted by the governments of Québec and Canada, the Cree Nation Government, the Cree villages, and the municipalities when they develop laws and regulations concerning the protection of the environment and the social environment in the territory governed by the JBNQA, south of the 55th parallel. One of the functions of the JBACE is to monitor, through the exchange of views and information, the application of Chapter 22 of the JBNQA. This is a tripartite committee with representatives appointed by the governments of Canada, Québec, and the Cree Nation.

5.1.1.5 Portrait of Current Establishment and Expansion Projects

Given the remoteness of the communities from one another, several small disposal facilities are present in James Bay. For the most part, the disposal sites of the Cree communities are located on Category IA lands, while those of the Jamesian communities are located on public lands.

A few projects to establish or expand landfill sites are currently under analysis, construction, or discussion, including:

- New trench landfill site in Wemindji - Impact study being analyzed by COMEX.
- Construction and operation of continuous trenches at the Oujé-Bougoumou trench landfill site (extension of the life of the landfill site) - Amendment to the certificate of authorization issued on September 16.
  2020
- Development of a new trench landfill site in Nemaska - Directive issued January 17, 2020 (pending impact study)
- Whapmagoostui new landfill - Certificate of approval issued November 13, 2019 (opening date unknown)
- Waswanipi municipal household waste landfill site - Certificate of approval issued March 10, 2017.

5.1.1.6 Overview of Issues Associated with the Elimination of Residual Materials

While curbside recycling is not practiced throughout the James Bay region, it is mostly used in Jamesian communities.

5.1.1.7 Other Residual Materials Management Initiatives

A few ecocentres are also present on the territory, namely in Chibougamau and Chapais. In addition, the Nemaska Cree Nation is planning to build an ecocentre and implement a waste composting pilot project. The completion schedule is not known.

Other waste management initiatives in James Bay include the possible reconstruction of a new incinerator in Wemindji after the existing incinerator caught fire. In this regard, a directive was issued on March 17, 2020, and an environmental and social impact study is expected for this project.

5.1.2 Nunavik Territory

5.1.2.1 Description of the Environmental Assessment Authorization Procedure

With respect to the Nunavik territory, two northern committees were formed by the JBNQA: the Kativik Environmental Quality Commission (KEQC) and the Kativik Environmental Advisory Committee (KEAC). Each plays a role in the application of the environmental and social assessment procedure.

With respect to regulations, the Act respecting Northern villages and the Kativik Regional Government (KRG) stipulates that each northern village has jurisdiction over the management of its residual materials and its northern landfill site. However, although each of the 14 northern villages is responsible for operations related to the NLs and can establish their own regulations, the residual materials management program[9] developed by the Kativik Regional Government (KRG) aims to facilitate uniform management throughout the territory.

In addition, the laws and regulations governing the management of residual materials in Québec remain applicable in Nunavik, the main one being the Règlement sur l'enfouissement et l'incinération de matières résiduelles (RLIMR). In particular, it defines the operational requirements for NLs, their location, the type of waste accepted, and their burning.[10].

5.1.2.2 Kativik Environmental Quality Commission

The KEQC is responsible for the assessment and review of projects located on Nunavik territory. After analyzing the preliminary information provided by the proponent and forwarded by the provincial administrator, the KEQC shall forward to the provincial administrator its decision on whether to subject the project to the environmental and social impact assessment and review procedure provided for in Title II of the EQA. Where the project is subject to the procedure, the KEQC shall forward to the provincial administrator a directive on the scope and content of the impact study to be carried out by the proponent. Where the project is not subject to the Act, the KEQC shall send the provincial administrator an attestation of exemption. The KEQC also analyzes the impact studies sent to it and may hold public consultations with the communities affected by a project. It also decides whether the Minister should authorize the project and, if so, under what conditions. It is a bipartite committee, with members appointed by the Gouvernement du Québec and the Kativik Regional Government. In addition, the KRG is responsible for ensuring that the rights and interests of the Naskapi of Kawawachikamach are represented within the KEQC.

5.1.2.3 Kativik Environmental Advisory Committee

The KEAC is consulted by the governments of Québec and Canada as well as by northern municipalities, as a privileged and official interlocutor, when they develop laws and regulations concerning the protection of the environment and the social environment in the territory governed by the JBNQA, which is located north of the 55th parallel. One of the functions of the KEAC is to monitor, through the exchange of views and information, the application of Chapter 23 of the JBNQA. It is a tripartite committee composed of representatives of the governments of Canada, Québec, and the Kativik Regional Government. In addition, the KRG is responsible for

The KRG is also responsible for ensuring that the rights and interests of the Naskapi of Kawawachikamach are represented on the KEAC.

5.1.2.4 Portrait of Current Establishment and Expansion Projects

Since the northern villages are not connected by road, each of the villages has its own disposal facility. Opened in the 1980s, most of these facilities are at full capacity.

A few projects to establish or expand landfill sites are currently under analysis, construction, or discussion, including:

- Whapmagoostui new landfill - Certificate of approval issued November 13, 2019 (opening date unknown)
    - Although this project is located south of the 55th parallel and is therefore not within the territory of application of Section 23 of the JBNQA, the Northern Village of Kuujjuarapik and the community of Whapmagoostui wish to use a single site for their residual materials. Thus, the new landfill site will be located in Whapmagoostui, but it is expected that the former site in Kuujjuarapik as well as various areas where materials are present will be cleaned up and rehabilitated.
- Construction of a new northern landfill site in Inukjuak - Certificate of approval issued March 6, 2015 (opening date unknown)
- Construction and operation of a northern landfill in the village of Kangirsuk - Certificate of approval issued June 23, 2014 (expected opening in 2021).

5.1.2.5 Overview of Issues Associated with the Elimination of Residual Materials

Since there is no curbside recycling in Nunavik, nearly all materials are disposed of and sent to northern landfills.

As stipulated in the RLIMR, combustible residual materials received (e.g., household waste, paper, cardboard, etc.) at the northern landfill must be burned at least once a week, weather permitting. Materials that cannot be burned are generally stacked in a separate section of the NL by material type (e.g., tires, metal, appliances, etc.).

Through local and regional initiatives, some materials can be diverted to southern Québec. However, the costs incurred to transport these materials by ship to this destination are very high. Furthermore, since transportation by boat is only possible between June and October, several issues arise, including long-term material storage, sanitation, and labour requirements.

5.1.2.6 Other Residual Materials Management Initiatives

Other waste management initiatives are underway in Nunavik, including a waste metal recovery project for all of Nunavik, a thermophilic composter project in Inukjuak and an ecocentre and resource center project in Kuujjuaq.

[1]These provisions take precedence over the provisions of the EQA, among others with respect to the environmental assessment mechanisms for projects in the territory covered by the agreement.

[2]Chapter 24 of the JBNQA and Chapter 15 of the NEQA.

[3]The territorial regime established by the JBNQA divides land into three categories. Category I lands are lands for the exclusive use of Indigenous peoples and are located near Indigenous villages. Category II lands are public lands on which Indigenous peoples have exclusive hunting, fishing, and trapping rights. Finally, Category III lands are public lands on which Indigenous peoples have the right to hunt, fish and trap without a license, without bag limits and always, subject to the principle of conservation.

[4] Applicable between the 49th and 55th parallels and on the lands of Whapmagoostui, territory commonly known as James Bay.

[5]Applicable north of the 55th parallel, a territory commonly known as Nunavik.

[6]The environmental and social assessment of projects under Cree or Québec jurisdiction is the responsibility of COMEV and COMEX, while COMEV and COFEX share responsibility for projects under federal jurisdiction. In both cases, COMEV recommends the subject matter and scope of a project's impact study. Then, upon receipt of the impact study, COMEX or COFEX takes over. Finally, COMEX reviews projects after they have been authorized if they are modified during implementation or operation. Similarly, COMEX reviews the follow-up reports produced by the proponents.

[7]JBACE. “Portrait of residual materials management in James Bay,” September 2007, page 8.

[8] COMEV reports to three levels of administrators: regional, provincial, and federal. The location and jurisdiction of a development project determine the administrator to whom a project must be proposed. Development projects located on Category I lands must be transmitted to the regional administrator. Projects under provincial jurisdiction, such as those related to natural resource development, must be referred to the provincial Administrator, while projects under federal jurisdiction, such as those related to air or marine transportation, must be referred to the federal Administrator.

[9] To access the KRG's RMMP 2021-2027: https://www.krg.ca/fr-CA/publications/environment.

[10]KRG. “Nunavik Residual Materials Management Plan 2021-2027”, December 2020, pages 18-19.

5.2 Kativik Regional Government (KRG) RMMP

In its 2021-2027 RMMP, the KRG stipulates that Nunavik produces more than 15,000 tons of waste per year, half of which includes CRD residues due to their large mass. This total represents 1.1 tons per person per year. Nearly 100% of this material is eliminated since there are few recovery systems. Each of the 14 villages has a by-law on the management of residual materials. Collection is generally carried out five times a week and waste is transported to a disposal site in northern territory (NL). Many of the NLs are almost full, and three projects to build new ones are underway: Kangirsuk (opening in 2021) as well as Inukjuak and Kuujjuarapik,

whose opening dates are undetermined. Combustible materials are burned in the open air periodically and metal waste is stacked in a separate section. Most villages have a shelter to store hazardous materials. The complete RMMP is available on their Web site at the following address : https://www.krg.ca/fr-CA/publications/environment.

6. OVERVIEW OF GMS EMISSIONS ASSOCIATED WITH RMM AND THEIR EVOLUTION IN THE LAST FEW YEARS

6.1 GHG Emissions and Québec's Commitments

Québec is committed to respecting the various international conventions on climate, in particular the United Nations Framework Convention on Climate Change, through the Kyoto Protocol and the Paris Accord. Moreover, it recently launched, in November 2020, the Plan for a Green Economy 2030 (2030 PGE) and its 2021-2026 implementation plan for electrifying the economy and fighting climate change[2].

Québec's GHG emission reduction targets to be achieved in 2020 and by 2030 compared to 1990 are minus 20% and 37.5% respectively. Moreover, in the 2030 PEG, the government intends to make a longer-term commitment to achieve carbon neutrality by 2050. According to Quebec's latest GHG emissions inventory, emissions for 2018[3] have decreased by only 6% compared to the base year.

6.2 Management of GHG emissions in Québec

6.2.1 Québec Inventory of GHG Emissions[4]

The inventory of GHG emissions produced by human activity in Québec has been updated annually since 1990 by the MELCC. This inventory is developed from data collected from companies and institutions, as well as from statistical data.

The inventory covers GHG emissions produced in Québec in the following sectors of activity: transportation, industry, residential, commercial, and institutional buildings, agriculture, residual materials, and electricity. It is a compilation of data in accordance with the United Nations Framework Convention on Climate Change (UNFCCC). This compilation is updated and made public annually by the MELCC, in accordance with section 46.18 of the Environment Quality Act (EQA). The most recent inventory was published on the Internet in December 2020 for data from 1990 to 2018.

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[2] https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/environnement/publications-adm/plan-economie-verte/plan-economie-verte-2030.pdf?1605540555

[3] http://www.environnement.gouv.qc.ca/changements/ges/

[4] https://www.environnement.gouv.qc.ca/changements/ges/index.htm

6.2.2 Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (RMRCECA)[5]

Under the RMRCECA, any person or municipality operating an establishment that emits into the atmosphere GHGs in a quantity equal to or greater than 10,000 metric tons of CO_2 equivalent (t eq. CO_2) is required to report its emissions annually.

6.2.3 Carbon Market or GHG Cap-and-Trade System (C&T System)[6]

The carbon market targets the following companies (the emitters):

- Industrial facilities, electricity producers and importers that emit 25,000 t CO_2 eq. or more GHGs per year, as well as distributors of fuels and fossil fuels (200 liters or more) used in Québec.

These companies are subject to tax, which covers approximately 80% of the GHGs emitted in Québec.

6.2.3.1 Offset Credits[7]

The residual materials sector is not subject to the ETS, but an offset credit protocol applies, as of 2014, to certain projects for the capture and destruction or treatment of landfill gas[8] from landfills. The MELCC's biogas program has previously purchased GHG emission reductions from relatively comparable projects from 2009 to 2013. More information on the biogas program as well as on the offset credit protocol of the C&T System is presented in section 3.3.2.

6.2.4 Regulations under the Environment Quality Act

Climate change considerations were integrated into the Act to amend the Environment Quality Act when it was passed in 2017, as well as into the two environmental authorization regimes, namely government authorization (Regulation respecting the environmental impact assessment and review of certain projects (REIAR) and ministerial authorization (Regulation respecting the supervision of activities based on their impact on the environment, or RSABIE). The REIAR came into force in 2018, and the consideration of climate change was then strengthened and standardized. The RSABIE came into force on December 31, 2020, and the provisions regarding GHG emissions will apply as of December 31, 2021.[9]

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[5] https://www.environnement.gouv.qc.ca/air/declar_contaminants/index.htm

[6] https://www.environnement.gouv.qc.ca/changementsclimatiques/marche-carbone.asp

[7] https://www.environnement.gouv.qc.ca/changements/carbone/credits-compensatoires/index.htm

[8] In this section, the term landfill gas is used to distinguish, according to RDOCECA, biogas from landfill sites from other treatments such as biomethanization and water treatment.

[9] Environmental Assessment in Southern Québec: https://www.environnement.gouv.qc.ca/evaluations/procedure.htm

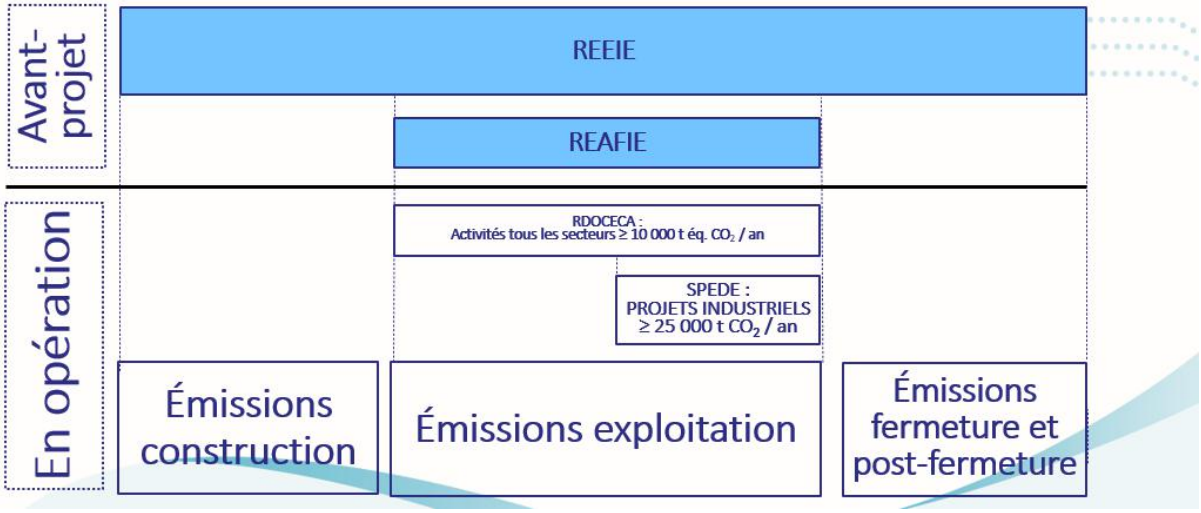
6.2.5 Guide to Quantification of GHG Emissions[10]

In 2019, the MELCC published a guide to quantifying GHG emissions. It presents proven methodologies for quantifying greenhouse gas (GHG) emissions resulting from an action or project carried out in sectors of activity that contribute to climate change.

The main GHG reporting regulations generally cover direct in-situ emissions, but in project assessments, the emission sources considered may include off-site, upstream, or downstream emission sources, such as in the case of an RMM project, transportation of waste materials, or biogas or landfill gas valorization.

Figure 6.2.5 provides a simplified schematic of the regulatory framework.

Figure 6.2.5 - Simplified Diagram of the Scope of Regulation in Relation to GHG Emissions in Québec



6.3 GHG Emissions Associated with RMM and their Evolution from 2000 to 2018

6.3.1 Introduction to RM Sector Emissions

According to Québec's latest inventory, in 2018, the quantity of GHG emissions associated with the RM sector amounted to 4.13 million tons of CO2 equivalent (Mt. eq. CO_2), or 5% of the total emissions in the inventory, 93% of which is in the form of methane (CH4). The emissions of this

(Regulation respecting the supervision of activities based on their impact on the environment, or RSABIE): https://www.environnement.gouv.qc.ca/lqe/autorisations/reafie/

[10] https://www.environnement.gouv.qc.ca/changements/ges/guide-quantification/index.htm

[11] Source: adapted from the Greenhouse gas emission quantification manual, MELCC, 2019

sector decreased from 7.1 to 4.1, a decrease of 3 Mt eq. CO_2 or 42%, between 1990 and 2018.

The GHG emissions in the inventory are divided into four sub-sectors: landfill of RM, biological treatment of organic matter, treatment of wastewater and incineration of RM. The landfill of RMs, including pulp and paper mill tailings, is the main emitter; on its own, it was responsible for 88.5% of emissions from this sector in 2018, i.e., 3.7 Mt eq. CO_2. Of these emissions, 32% are attributable to the landfill of pulp and paper mill residues (1.2 Mt eq. CO_2). For its part, wastewater treatment produced 5.7% of emissions from the RM sector in 2018 and waste incineration generated 3.7% of them, while biological waste treatment produced some. produces 2.0%.

In addition, certain emissions are not included in the total of the inventory. Carbon dioxide (CO_2) from biomass is not included as it is assumed that CO_2 released during the decomposition or combustion of biomass is recycled, in a short cycle, by forests and plant biomass, through photosynthesis.

6.3.2 GHG Emissions from 2000 to 2018 by Type of RMM Activity

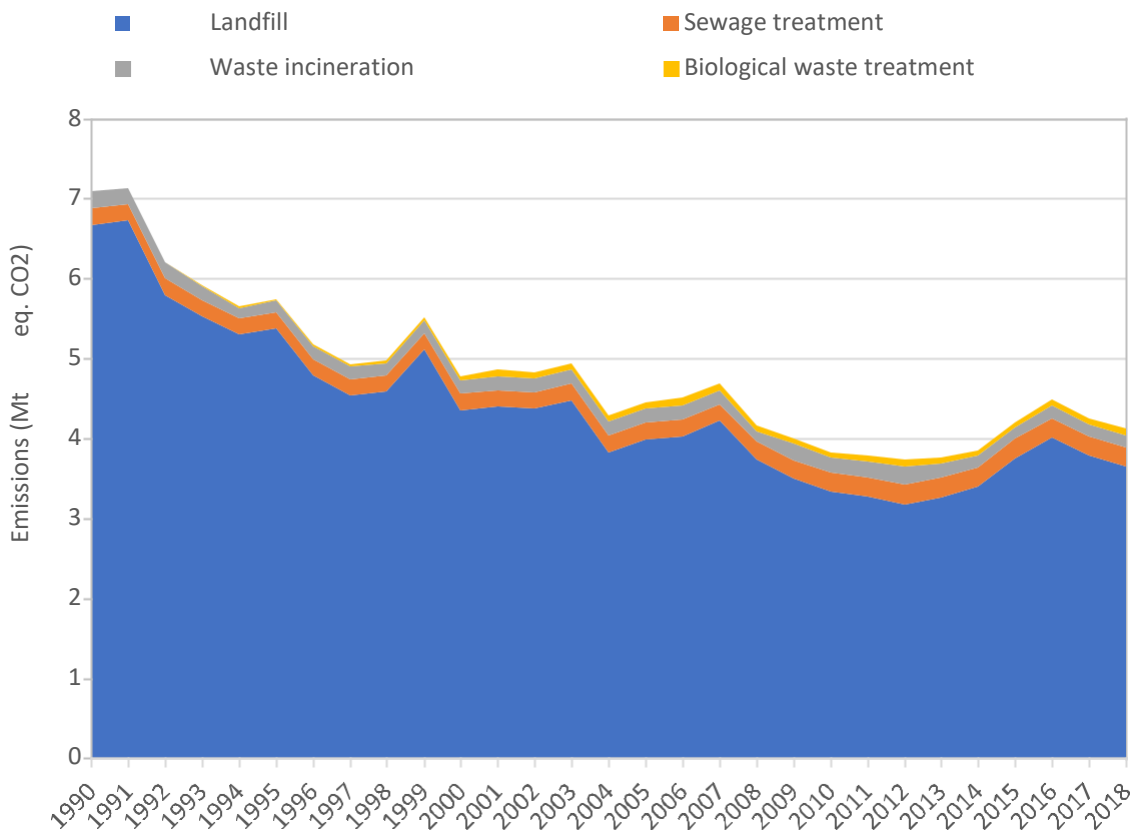
The following table presents emissions by type of activity since 2000, according to the Québec GHG emissions inventory.

Table 6.3.2 - GHG Emissions Associated with RM Management in Québec from 2000 to 2018

Activities	GHG emissions in kt eq. CO_2 Change in GHG emissions from 2000 to 2018									
Types of treatment	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
RM (total)	4,781	4,833	4,289	4,514	4,163	3,822	3,735	3,851	4,485	4,128
Landfill of RM	4,352	4,374	3,823	4,030	3,741	3,333	3,177	3,391	4,009	3,654
Biological Treatment of RM	53	81	80	100	75	57	81	70	72	84
Wastewater treatment	208	205	209	207	217	240	249	251	243	237
Incineration of RM	168	173	179	178	130	193	228	138	160	153

The following figure shows the distribution and evolution of GHG emissions since 1990. It shows the share and significant decrease in GHG emissions from this sector associated with landfilling.

Figure 6.3.2 - Evolution of GHG Emissions Associated with RMM by Sub-Sector between 1990-2018



6.3.2.1 Details on Activities, Emission Sources and GHGs Targeted.

- The activities (emission sources) presented in this section of the inventory relate to the activities of the various processes, but exclude emissions associated with the use of stationary or mobile equipment on fossil fuel consuming sites. These latter emission sources are grouped in other sectors of the inventory, such as buildings and transportation.
- Emissions associated with landfilling are characterized by material degradation over a long period of time. For the calculations of methane emissions, a history of the last 50 years is considered. Thus, current emissions come from operating sites, primarily landfills at ELs and pulp and paper mill landfills, and from various types of closed sites.
- These GHGs are considered for the following types of treatment:
    - Landfill: fugitive methane emissions released from the anaerobic (non-oxygenated) decomposition of RMs and emissions of
      methane and nitrous oxide from the combustion of landfill gas;
    - Biological treatment (composting): methane and nitrous oxide emissions

- Incineration: the CO2 emissions released by the combustion of non-biomass RMs and the methane and nitrous oxide emissions.
  released by the combustion of all RMs.
- Wastewater treatment: methane and nitrous oxide emissions
  from the degradation of organic matter in wastewater.

Excluded is CO_2 released from the combustion and fermentation of biomass.

6.3.2.2 Descriptions and Explanations of GHG Emissions

Since 2000, the main decrease in GHG emissions, by nearly 0.7 Mt eq. CO_2 is attributable to the reduction in emissions associated with landfilling. It is mainly the result of the capture and destruction of landfill gas at several sites, combined, in some cases, with the recovery of energy to produce electricity or substitute fossil fuels.

The next two sub-sections provide a little more detail on the GHG emissions from the two main methods of disposing of PM: landfilling and incineration.

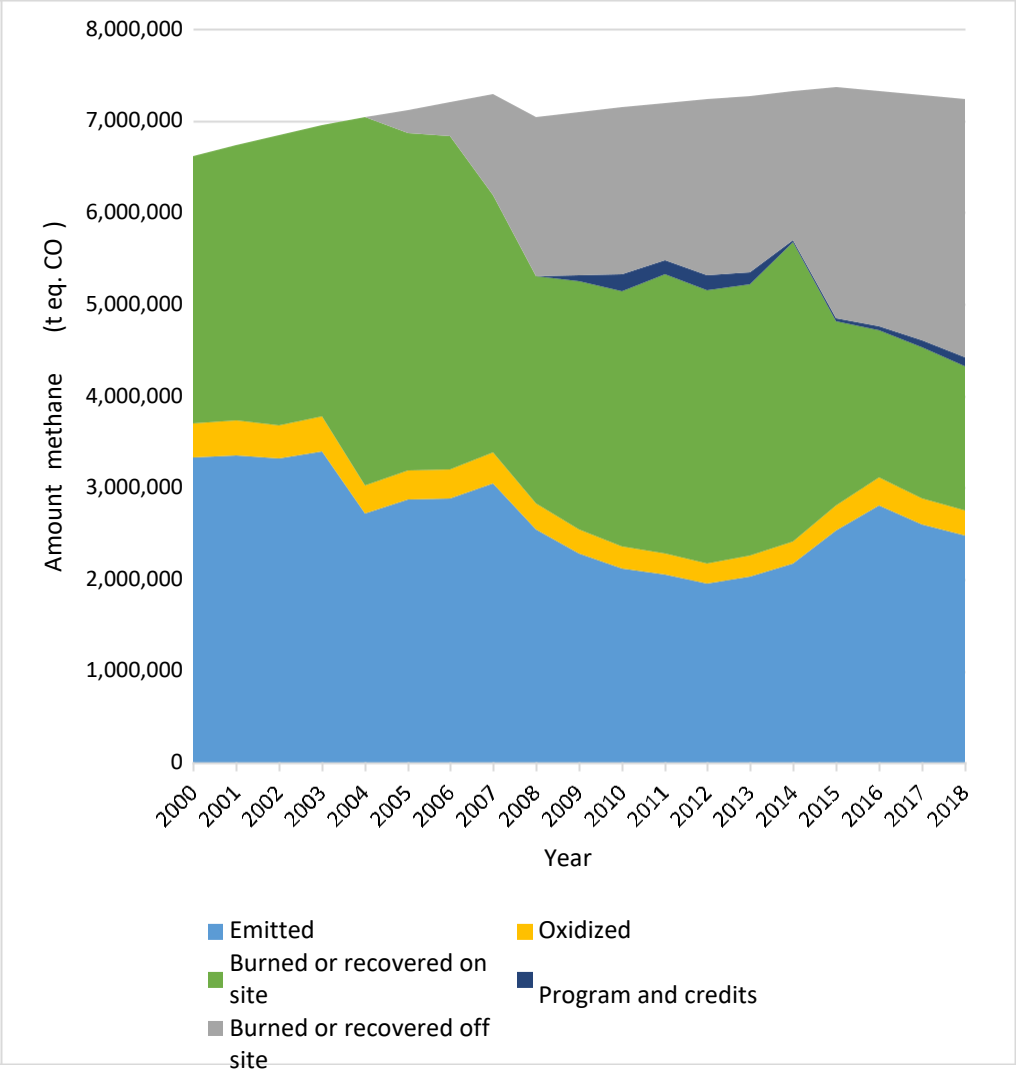
6.3.3 GHG Emissions Associated with Landfills

The GHG emissions associated with landfill mainly come from landfill gas emissions, which is mainly composed of methane (CH_4) and carbon dioxide.
The following information presents data on landfill sites, particularly those that have reported their GHG emissions under the RMRCECA or on a voluntary basis under Protocol 2 - Destruction of methane gas from landfill sites of the C&T System and the Biogas program.

6.3.3.1 Municipal Landfills

The following figure and table show the methane generated, destroyed, or upgraded, oxidized, and emitted from 2000 to 2018 from landfills receiving municipally generated RMs. Pulp and paper mill landfills, which are not subject to the RLIMR, are not included in the following subsections.

Figure 6.3.3.1-A - Municipal Landfill Methane Emissions and Treatment Evolution



In 2014, there was a decrease in the amount of methane emissions burned or recovered off-site in favor of the amount burned or recovered on site. In the same year, there was a marked decrease in landfill gas purchases by two facilities. From 2014 to 2016, there was a decrease in capture, mainly due to two sites where the amount of landfill gas available for capture would have decreased by 0.65 Mt eq. CO_2.

Table 6.3.3.1 - Municipal Landfill Methane Emissions and Treatment

Year	Methane generated	Methane valorized or destroyed	Methane oxidized	Methane emitted
	(t eq. CO_2)			
2000	6,617,631	2,915,124	370,251	3,332,256
2001	6,739,634	3,010,367	372,927	3,356,340
2002	6,849,513	3,166,552	368,296	3,314,665
2003	6,955,516	3,181,366	377,415	3,396,735
2004	7,045,315	4,020,696	302,462	2,722,157
2005	7,119,835	3,935,530	318,431	2,865,875
2006	7,202,229	3,999,728	320,250	2,882,250
2007	7,292,046	3,906,635	338,541	3,046,870
2008	7,037,852	4,208,833	282,902	2,546,117
2009	7,095,955	4,553,356	254,260	2,288,339
2010	7,149,286	4,789,372	235,991	2,123,923
2011	7,198,107	4,918,434	227,967	2,051,706
2012	7,237,603	5,061,745	217,586	1,958,272
2013	7,274,628	5,011,550	226,308	2,036,770
2014	7,328,751	4,913,866	241,488	2,173,396
2015	7,364,215	4,556,336	280,788	2,527,091
2016	7,328,628	4,212,853	311,578	2,804,198
2017	7,277,832	4,394,014	288,382	2,595,436
2018	7,237,485	4,483,972	275,351	2,478,161

* *Based on a Global Warming Potential (GWP) of 25 for methane, to be comparable to the Inventory.

The capture of landfill gas in landfills in 2018 helped to avoid a quantity of GHG emissions of nearly 4.5 Mt eq. CO_2. However, the estimate of methane generated in landfills has been relatively stable over the last ten years. However, the amount of methane destroyed or recovered in recent years is lower than in 2012. Thus, the amount of methane emitted increased from 2012 to 2016 and decreased slightly thereafter.

As previously mentioned, the reduction or avoidance of GHG emissions likely to result from the use of landfill gas as a substitute for fossil fuels is not accounted for in the RM sector of the Québec GHG emissions inventory. It is, however, accounted for in certain affected sectors, such as industries, buildings, etc.

The following figures present the emissions and types of methane treatment and recovery for the years 2000 and 2018 in relation to municipal landfills.

Figure 6.3.3.1-B - Municipal Landfill Methane Emissions, Treatment and Valorization in 2000

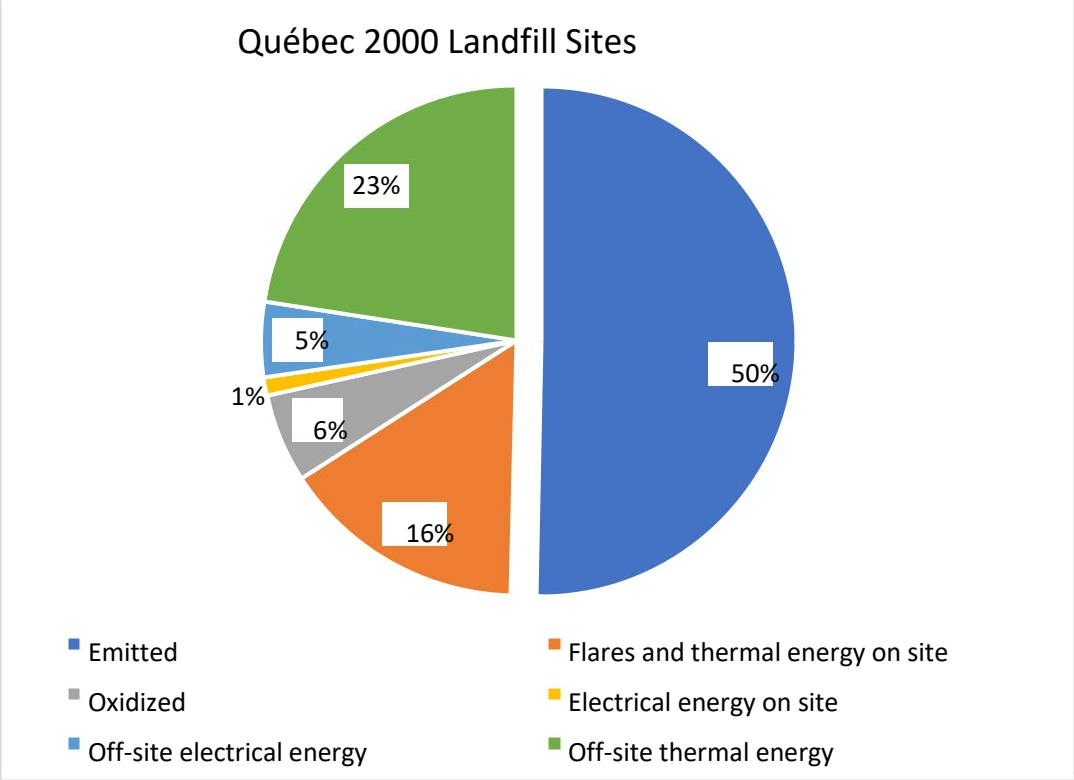
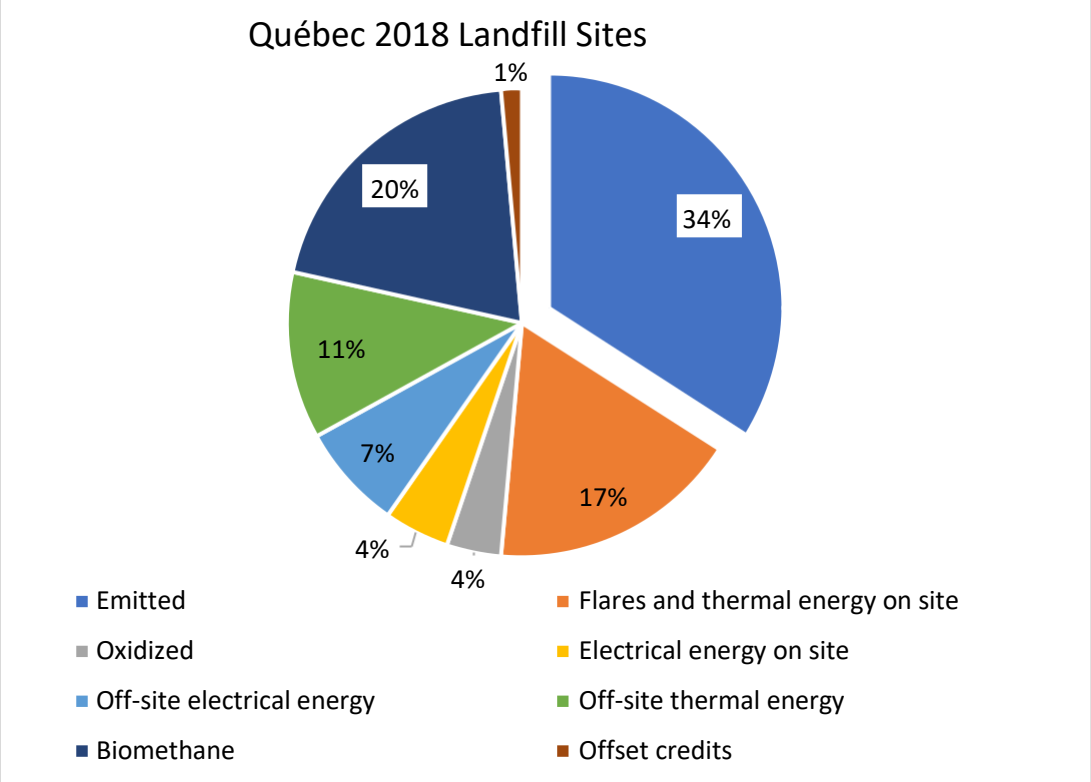


Figure 6.3.3.1-C - Municipal Landfill Methane Emissions, Treatment and Valorization in 2018



In 2000, 50% of the methane generated was emitted, 23% was recovered as off-site thermal energy and 16% was flared or recovered as on-site thermal energy. In 2018, the proportion of methane emitted decreased to 34%, of which 17% was flared or recovered as on-site thermal energy, 20% was recovered as biomethane[12] and 11% was recovered as off-site thermal energy. Despite the declining quantities of methane emitted, albeit still significant, there is a greater proportion of methane recovered that could facilitate the substitution of fossil fuels (thermal energy or biomethane).

6.3.3.2 Reducing Methane Emissions on a Voluntary Basis

The following sub-section presents a GHG emission reduction purchase program and offset protocol, under the C&T System, for methane emission reduction projects that are additional to the applicable regulations and that meet the requirements of the program or protocol.

6.3.3.2.1 Biogas Program

Under the Biogas program of the Climate Change Action Plan (CCAP) for 2006-2012, the Gouvernement du Québec was able to purchase GHG emission reductions of nearly 630,000 t eq. CO_2 for eight voluntary projects to capture and destroy landfill gas from landfill sites from 2009 to 2013.

Table 6.3.3.2.1 - GHG Emission Reductions Associated with Biogas Program Projects

Year	Quantity of methane captured and destroyed (t eq. CO_2)
2009	53,343
2010	159,005
2011	151,849
2012	155,338
2013	140,605

* Based on the Global Warming Potential (GWP) of 21 for methane

6.3.3.3 Offset Credits

The RM sector is covered by a C&T System offset credit protocol. Offset credits (CrCs) can be issued for voluntary projects that reduce GHG emissions associated with landfill sites. Thus, since 2014, this protocol for eligible landfill sites has contributed to the realization of projects that are relatively comparable to those of the Biogas program (2009-2013). To be eligible for the issuance of offset credits, GHG emission reductions must, among other things, be additional to regulatory requirements, including those of the RLIMR and of jurisdictions.

[12] Biomethane has the particularity that it can be treated and purified for injection into a gas network.

partners in the carbon market. The following table shows the CrCs issued for projects from 2014 to date.

Table 6.3.3.3 - Offset Credits Issued under the C&T System for Landfill Projects

Year	Number of projects	Quantity of methane captured and and destroyed (t eq. CO_2)
2014	2	16,151
2015	5	26,903
2016	6	36,486
2017	9	64,025
2018	9	85,234
2019	11	116,224

* Based on the Global Warming Potential (GWP) of 21 for methane

6.3.4 Emissions Associated with RM Incineration

The following table presents the GHG emissions associated with the four municipal waste and sludge incinerators in Québec.

Table 6.3.4 - GHG Emissions from Residual Materials Incineration Facilities

Year	Carbon dioxide * (t CO_2)	Methane (t CH_4)	Nitrous oxide (t N_2O)	Total GHG (t eq. CO_2)
2013	106,851	113.033	238.295	180,689
2014	77,828	108.007	193.035	138,053
2015	81,269	96.421	204.690	144,677
2016	94,655	90.596	213.190	160,450
2017	89,665	95.299	210.335	154,727
2018	81,355	100.315	232.802	153,238

* Excluded is CO_2 released from the combustion and fermentation of biomass.

There are two municipal waste incinerators and two water treatment sludge incinerators. Furthermore, as previously mentioned, emissions associated with the use of stationary or mobile in-situ fossil fuel-fired equipment are excluded. Furthermore, there is no mention of the heat produced which, in some cases, can be recovered as thermal energy and replace a fossil fuel.

6.4 Biogas Valorization

The valorization of biogas from residual materials represents a structuring measure for the reduction of GHG emissions in Québec when it contributes to the substitution of fossil fuels. Biogas can be valorized from landfill gas from municipal landfill sites, as presented in section 6.3.3.1 or from other types of processing.

The following sections present some additional elements concerning the valorization of biogas, other than landfill gas.

6.4.1 Biomethanization Projects

Projects to recover (recycle) organic materials through composting and biomethanization are being implemented in Québec, with the help of the Program for the Treatment of Organic Materials through Biomethanization and Composting (PTMOBC). These projects contribute to reducing the quantities of residual materials disposed of and the GHG emissions associated with landfilling. Biomethanization projects produce biogas in closed digesters that can be recovered to replace fossil fuels. This substitution contributes to reducing or avoiding GHG emissions associated with the consumption of fossil fuels in other sectors: industry, buildings, etc.

In 2019, the biogases produced by the projects in operation within the framework of the PTMOBC program were of the order of 10 Mm^3 of methane. Thanks to the implementation and deployment of the seven announced biomethanization projects, biogas production estimates amount to more than 40 Mm^3 of methane. These projects aim to recover biogas by replacing fossil fuels on site or by injecting it into a gas network. To give an order of magnitude, the potential for emissions reduced or avoided by the recovery of 40 Mm^3 of methane can represent approximately more than 75,000 tons of CO_2, as a substitute for natural gas. However, this approximation does not consider the quantities of biogas that can be used within the biomethanization process, mainly energy, which has the effect of reducing the total amount of production available for fossil fuel substitution and thus the associated reductions.

Moreover, other biomethanization projects are in the process of being approved by the PTMOBC.

Furthermore, agricultural biomethanization projects are under development, but they have not been listed here since they deal with liquid manure.

6.4.2 Other Components: Bioenergy-Related Measures

Moreover, biogas recovery is also linked to programs, orientations and regulations regulated by the MERN (Ministry of Energy and Natural Resources), which aim, among other things, to increase the use of bioenergy as provided for in Québec's energy policy.

7. VALORIZATION OF RESIDUAL MATERIALS

7.1 Roles and Responsibilities in Residual Materials Management

The government, RCMs, metropolitan communities, and local municipalities share responsibilities and powers in waste management.

When they intervene in the field of residual materials management, regional municipalities, local municipalities, and any other municipal entity authorized to act in this field must exercise the powers conferred on them by the Act, with a view to promoting the implementation of the Québec Residual Materials Management Policy.

The policy does not cover the following categories of residues: gaseous materials, mining residues, soils that contain contaminants in quantities or in concentrations greater than those fixed by regulation under paragraph a of section 31.52 of the EQA, biomedical waste, hazardous materials other than those of domestic origin, waste snow, wastewater, and agricultural fertilizers (manure, liquid manure).

The government has regulatory powers to govern the reduction of production, recovery, reclamation, and disposal of residual materials.

The Minister of the Environment and the Fight against Climate Change may also entrust RECYC-QUÉBEC with mandates related to the regional planning of residual materials management. In addition, RECYC-QUÉBEC develops any plan and program pursuant to the policy, which is subject to the prior approval of the Minister.

With respect to reduction, the Minister of the Environment may determine the conditions or prohibitions applicable to the manufacture of containers, packaging, packaging materials, printed matter, or other products that he designates, with a view to reducing the quantity of residual materials to be disposed of or facilitating their valorization.

With respect to recovery and reclamation, the Minister may, in particular, decide on the division into categories of residual materials to be recovered or reclaimed; prescribe or prohibit, with respect to one or more of those classes, any method of recovery or reclamation, prescribe the obligation of every municipality to recover or reclaim, on the conditions fixed, the classes of designated residual materials or to ensure the recovery or reclamation thereof, and determine the conditions or prohibitions applicable to the use, sale, storage and treatment of materials intended for reclamation or resulting therefrom.

Valorization activities are subject to obtaining ministerial authorization under the Environment Quality Act (section 22).

7.1.1 Local Municipality

By virtue of its expertise in environmental matters, any local municipality may, by regulation, establish and operate a system for the recovery of residual materials.

It may also entrust a person with the operation of its system. Such a contract may also provide that the person shall finance the work carried out under the contract. In such a case, the Municipal Works Act does not apply to this work.

Local municipalities can, among other things:

- Adopt a residual materials management policy
- Provide for their own collection in all or part of their territory or entrust the responsibility to a third party, while managing the rules and conditions to be respected by carriers
- Set up a curbside collection system
- Acquire, for sale or rental purposes, containers for curbside collection
- Establish and operate a sorting, recycling or recovery center or entrust the responsibility to a third party
- Establish a system for the periodic collection of household hazardous waste
- Provide for the removal of bulky solid waste at least twice a year
- Force an owner, tenant, or occupant of any building to remove unhealthy and nuisance materials and to dispose of them in the manner prescribed by council. In all cases, the municipality provides for the payment of expenses either by a tax or by a rate that may be different for each category of use. To do so, the municipality must adopt a regulation describing, among other things, the purpose of the process, the actions to be taken and the parts of the territory subject to the regulation.

The requirements, costs, and profitability objectives inherent to many activities related to the management of residual materials often lead municipalities to reach an agreement among themselves or with the RCM to adopt a global approach to the management of residual materials or to acquire the necessary facilities. If it provides for the creation of an inter-municipal management board, this type of agreement requires the approval of the Ministry of Municipal Affairs and Housing.

7.1.2 Regional County Municipality

An RCM may declare, by regulation, its jurisdiction over all or part of the field of waste management, without the possibility of withdrawal for the local municipalities subject to it. It is also required to prepare a residual materials management plan.

It is also required to develop, adopt, and maintain a residual materials management plan (RMMP). Several regional municipalities may, however, agree to jointly establish a RMMP. A local municipality may, however, with the consent of the regional municipality to which it belongs, be excluded from the management plan of that regional municipality and be subject to the management plan of another regional municipality, provided that the latter consents.

Finally, a regional municipality is authorized to delegate to an inter-municipal board or any other grouping of local municipalities the responsibility for developing the management plan.

7.1.3 Metropolitan Community

The metropolitan communities have jurisdiction over residual materials management planning on their territory.

7.2 Residual Materials Management Plan

The RMMP is a measure that promotes the achievement of the objectives of the Québec Residual Materials Management Policy, which focuses on the reduction, reuse, recycling and recovery of residual materials and the safe management of disposal facilities.

An RMMP must include:

- A description of the territory of application;
- A reference to the local municipalities covered by the plan and to the intermunicipal agreements relating to the management of residual materials that apply to all or part of the territory
- An inventory of the organizations and businesses working on the territory in the field of recovery, reclamation, or disposal of residual materials
- An inventory of residual materials produced on their territory, whether they are of domestic, industrial, commercial, institutional, or other origin, distinguishing by type of material
- A statement of the orientations and objectives to be achieved in terms of recovery, reclamation, and disposal of residual materials, which must be compatible with government policy, as well as a description of the services to be offered to achieve these objectives
- An inventory of the recovery, reclamation, and disposal facilities on the territory and, where applicable, a mention of any new facilities required to achieve the above-mentioned objectives and, if applicable, the possibility of using facilities located outside the territory
- A proposal for the implementation of the plan that promotes public participation and the collaboration of organizations and businesses working in the field of waste management
- Budget estimates and a schedule for the implementation of the plan
- A system for monitoring and following up the plan to periodically verify its application, including, among other things, the degree of attainment of the objectives set and the effectiveness of the measures for implementing the plan taken by the regional municipality, or
  local municipalities covered by the plan.

Where a regional municipality intends to limit or prohibit the landfilling or incineration within its territory of residual materials from outside its territory, it must state its intention in the plan and indicate, in the case of a limitation, the quantity of residual materials concerned.

The Act does not provide for any obligation to take the land use and development plan into account. However, since the development of the RMMP is based on an integrated approach, which consists of carrying out a multidisciplinary approach that takes into account all the characteristics of the environment and, more specifically, the relationships and interactions between the various elements of the natural and human environments as well as their impacts, it is fundamental to consider the strategic vision statement and the objectives of the plan in terms of the allocation, protection and development of the various places of interest on the territory during its development.

The RCM must put in place adequate mechanisms for citizen participation in the development of the RMMP and the monitoring of its implementation. The consultation is held by a commission and followed by a report. Furthermore, the RMMP is binding on the municipalities within its territory of application. As a result, they are required to take the necessary measures to implement the plan on their territory and to harmonize their regulations with the provisions of the plan within 12 months of its coming into force.

The consultation must include at least one public meeting in the territory in which the plan applies and be followed by a report on the comments received from the public and the terms of the public consultation.

After the public consultation, the draft plan, modified, if necessary, to consider the notices received, is sent to RECYC-QUÉBEC and to each

regional municipality that is surrounding or served by a disposal facility located within the territory of application of the proposed plan.

Finally, a notice of compliance of the RMMP with the Québec Policy is transmitted, if applicable, by RECYC-QUÉBEC. The plan comes into force 120 days after it is served on RECYC-QUÉBEC, if it has not been the subject of a negative notice within this period. Furthermore, it may be modified at any time and must be reviewed every seven years.

Any RCM may, for the purpose of obtaining the information it deems necessary for the establishment and revision of the plan, require any municipality or any person on its territory to provide any information on the origin, nature, quantities, destination and terms and conditions of recovery, reclamation, or disposal of the residual materials that it produces, hands over to a third party or takes over.

The RMMP is binding on the municipalities within its territory of application. Municipalities are required to take the necessary measures to implement the plan in their territory and to harmonize their regulations with the provisions of the plan within 12 months of its coming into force.

7.3 Location of Residual Materials Management Facilities

The regional reflection on residual materials management planning should lead to the identification of existing facilities needs in terms of residual materials recovery and disposal and, subsequently, to the identification of spaces likely to accommodate these activities.

In addition to environmental standards and the environmental assessment process, the provisions of the land use and development plan and municipal by-laws governing the location of facilities and permitted uses in the vicinity may, from a sustainable development perspective, help protect ecologically sensitive areas or areas with significant potential for resource development.

For instance, a land use and development plan should indicate the nature and location of important infrastructure and facilities, whether existing or planned. These provisions can be used to mitigate risks to public health and safety, or nuisances associated with some of these activities, by introducing the principle of reciprocity. This principle requires that a person wishing to erect a building on his or her lot must respect, with respect to neighbouring infrastructures and facilities, any distance standards imposed on the latter during their construction. As a result, this may help to reduce the public's rejection of buildings ("not in my backyard" syndrome) and prolong their life.

Finally, it should be noted that section 118.3.3 of the EQA provides that regulation passed under the EQA (e.g., Regulation respecting the landfilling and incineration of residual materials) prevail over any regulation having the same purpose, unless the by-law is approved by the Minister of the Environment and Climate Change.

7.4 Overview of Policies, Action Plans and Strategies for Residual Materials Management

7.4.1 Québec Residual Materials Management Policy and Action Plans

The Québec Residual Materials Management Policy sets out the orientations aimed at achieving a waste-free society that seeks to maximize added value through sound management of its residual materials. Moreover, this policy fundamentally aims to ensure that the only residual material disposed of in Québec is final waste. The three main issues it raises are even more topical today than they were in 2011 when it was announced. They include in particular:

- Putting an end to the waste of resources
- Contributing to the fight against climate change
- Making all those involved in the management of residual materials accountable.

The policy sets out the major orientations to be favoured to address these issues, one of which is to ban organic matter from disposal sites, since it has a strong development potential.

The Policy is accompanied by five-year action plans, which aim to achieve intermediate objectives for the period in question, as well as actions to be implemented to achieve these objectives. In addition to supporting and developing a green industry and relying on the principle of the 4R-D (source reduction, reuse, recycling, reclamation, and disposal), the first action plan has contributed to making Québec one of North America's leaders in certain sectors of residual materials management. A second action plan covers the period 2019-2024 and will ensure the continuation of the efforts put in place since 2011. Its main areas of intervention are as follows:

- Modernization of recyclable materials management systems
- Reduction of plastics and single-use products
- Valorization of organic matter
- Development of different recovery channels
- Assistance to isolated communities.

7.4.1.1 QRMMP Action Plan 2011-2015

The 2011-2015 Action Plan contained five intermediate quantitative objectives to be achieved by 2015 at the latest, relating to the management of residual materials. The first objective was to reduce the amount of waste disposed of to 700 kg per capita, representing a reduction of 177 kg per capita from 2008 levels. It also made it easier to report on the results achieved by all the measures, since it considered the entire 4R-D hierarchy, i.e., reduction at source, reuse, recycling, other forms of residual materials recovery and disposal. This indicator also made it possible to judge the very effectiveness of the Québec Residual Materials Management Policy, which aims to eliminate only the final waste.

In 2015, 685 kg per inhabitant were eliminated in Québec, which represents a reduction of 192 kg per inhabitant between 2008 and 2015. It is therefore fair to say that the target of the 2011-2015 Action Plan has been reached, if not exceeded. In 2016, Québec ranked third in the country in terms of performance in terms of quantities eliminated per capita.

It is important to know that in 2015, approximately 3.3 million tons of organic materials were eliminated in Québec, which represents about 60% of all materials eliminated. In 2017, the residual materials sector was the fifth largest GHG emitter in Québec. Almost all the GHGs attributable to this sector are emitted by the landfilling of organic matter.

The complete report on the 2011-2015 Action Plan has been published on the MELCC website at the following address: https://www.environnement.gouv.qc.ca/matieres/pgmr/bilan-2011-2015.pdf.

7.4.1.1.1 Results of Action 37 of the 2011-2015 Action Plan

Due to their geographic and socio-economic reality, the northern territories of Québec present challenges with respect to the management of residual materials. To better document the issues faced by the residents of these territories and to acquire knowledge on the management of residual materials in northern territories, a two-phase research mandate has been given to the Research Chair in Eco-Counselling at the Université du Québec à Chicoutimi. The results of this research, namely a portrait of waste management in the North as well as tools intended for local and regional planners to support them in improving their waste management and to determine the solutions to be tackled in priority in the North, were published on MELCC website (action 37). From this study, dated May 8, 2017, seven findings were determined:

- The requirements related to the management of NLs would need to be reviewed
- Careful and prudent RMM planning is required
- Reclamation requirements and costs can be a hindrance to communities
- There is a lot of willingness and many local initiatives
- The magnitude of the liabilities hinders mobilization
- The diversity of opportunities identified in the literature is very low
- Climate change must be considered.

7.4.1.2 QRMMP Action Plan 2019-2024

A new action plan was unveiled in February 2020. With a budget of more than $100 million, the plan puts forward five major measures and 23 actions that will guide government action over the next few years. These measures and actions will serve to achieve the four main objectives of the Action Plan, which are as follows:

1. Reduce the amount of material disposed of per capita to 525 kg or less
2. Recycle 75% of paper, cardboard, glass, plastic and metal
3. Recycle 60% of organic materials
4. Recycle and reclaim 70% of construction, renovation, and demolition waste. Action 23 also offers $20 million in concrete assistance to isolated communities. To date, agreements have been signed with the Municipality of Anticosti Island ($500,000), the Municipality of the Îles-de-la-Madeleine ($4.825 million) and the Kativik Regional Government ($4.825 million) in March 2020, so that they can implement waste management projects related to issues specific to their environment.

The complete Plan is published at the following address

https://www.recyc-quebec.gouv.qc.ca/sites/default/files/documents/plan-action-2019-2024-pqgmr.pdf.

7.4.2 Organic Matter Valorization Strategy

The intention to remove organic matter from disposal was announced in 2011, as part of the RMMP. This government direction was to be accompanied by a concrete strategy that would serve as a pillar for the reflection and implementation of Québec municipalities' waste management plans. It was in July 2020, after a progressive and participatory approach was determined to be more likely to meet the objectives for reducing the disposal of organic matter, that the strategy for the recovery of organic matter was announced.

The strategy aims to divert targeted materials, including food waste, green waste, paper, cardboard, wood, municipal biosolids and paper biosolids. The strategy targets the following actions:

- Foster change through strong economic incentives
- Accelerate the implementation of regionally appropriate organic matter collection services and processing infrastructure
- Maintain and increase the quality of the material
- Support the development of markets that are profitable for the environment and create wealth and to promote promising technological innovations
- Strengthen information, awareness, and education efforts among the population.

7.4.2.1 Objectives

The strategy has the following ambitious targets:

- Establish organic matter management throughout the municipal territory by 2025
- Manage organic matter in all industries, businesses, and institutions by 2025
- Recycle or valorize 70% of organic matter with 2030 as a target
- Reduce GHG emissions by 270,000 tonnes of CO2 equivalent by 2030.

7.4.2.2 Key Actions of the Strategy

7.4.2.2.1 Structuring Regulatory Measures

- Charges payable for the disposal of residual materials will be increased by $30/ton, with an annual increase of $2/ton for subsequent years. The higher cost better reflects the adverse environmental impacts of this practice, while directly supporting the waste recovery and recycling industry.
- To avoid the use of excessive quantities of daily collection materials in landfills and to encourage recycling activities, a levy on residual materials used for collection will be charged at one-third of the cost of disposal charges.
- There are plans to introduce a regulatory obligation to take charge of organic materials (collection, in situ treatment, circular economy, other types of recovery and reclamation appropriate to sector-specific organic materials) for industries, businesses and institutions as well as multi-dwelling units. Organic materials may include food waste, green waste, paper, and cardboard.

- Penalties will be imposed on construction, renovation, and demolition residues when they are sent directly for disposal and have not been sorted by a so-called recognized sorting center, under the By-law respecting residual materials disposal charges and the RECYC-QUÉBEC CRD waste sorting centre recognition program.
- The landfilling of paper biosolids will be diverted by adding a recovery target on their authorizations (certificate of sanitation), in an individualized and progressive manner.

7.4.2.2.2 Financial Support

- A sum of $20 million is planned to support isolated communities in their management of residual materials in a manner adapted to their reality, considering limiting factors such as the lack of specialized manpower and the high costs of recovery, given the absence of nearby treatment facilities.
- The Program of redistribution to municipalities of charges payable for the disposal of residual materials pays approximately $79 million per year to Québec municipalities.
  The financial assistance will gradually be made conditional on the implementation of food and green waste management on their territory and on the availability of a network of ecocentres to receive citizens' wood residues.
- The budget for the Program for the treatment of organic matter through biomethanization and composting has been increased to accelerate the deployment of treatment facilities by both the municipal and private sectors.
- The home and community composting assistance program was also relaunched, and project funding was increased to encourage the implementation of home and community composters in smaller, less densely populated municipalities and Aboriginal communities.
- Funds will be set aside to support municipalities to purchase equipment for collecting food and green waste on their territory. These funds will encourage municipalities that have not yet implemented these collections to make this decisive shift in the short term and will help support those that have been proactive.
- The program to reduce the disposal of organic materials in the ICI sector administered by RECYC-QUÉBEC will provide support to the ICI to meet their new obligations. As a result of the increase in residual materials disposal levies, funds will be set aside annually to provide more support to the sector in implementing the means to achieve the objectives of the strategy.
- A $20-million sum is earmarked to support and modernize selective collection sorting centers, construction, renovation, and demolition waste sorting centers, as well as packaging and recycling facilities, among other things.

7.4.2.2.3 Measures to Promote the Preservation or Emergence of Valorization Opportunities

- Stimulate the market and support the development of outlets for digestate, compost and other residual fertilizer materials, to secure the recycling chain for these materials - Financial support for this purpose is also provided
- Modernize the selective collection system to better manage the materials value chain, promote the development of a circular economy, develop local and neighboring markets, and improve the quality of recovered materials
- Adopt best practices to support recycling and to promote the circularity of organic materials, through acquisitions and eco-responsible practices
  on the part of the Québec government

- Improve the performance of construction, renovation, and demolition (CRD) waste sorting centers, which will promote good practices and the quality of materials coming mainly from the private sector
- Promote the quality and development of recovered wood through source sorting and storage structures that will facilitate recycling
- Increase the recycling of incinerated municipal biosolids by implementing a formal collaboration mechanism based on knowledge sharing with the cities of Longueuil and Montreal
- Know and improve the quality of fertilizing residual materials, including those from municipal biosolids, to provide adequate support to stakeholders and thus promote market development
- Promote the recycling of paper biosolids, by proposing an action plan to encourage the use of residual fertilizing materials in silviculture, in collaboration with the Ministère des Forêts, de la Faune et des Parcs, RECYC-QUÉBEC and the forest industry.

Finally, for the second phase of the strategy, a mid-term review will help assess the need for additional efforts to increase the recovery of organic matter rather than the route to disposal. Among the possibilities, the implementation of a regulatory ban could be studied.

7.4.3 Modernization of Deposit and Curbside Recycling Systems

Deposit return and curbside collection systems are currently being modernized using an extended producer responsibility (EPR) approach. To this end, legislation and draft regulations are being developed.

7.4.3.1 Bill

The objective is to establish legislation giving the government the enabling powers necessary for both reforms.

The main changes relate to the possibility of providing by regulation:

- The obligation for certain persons to develop, implement and financially support, in the manner prescribed, a deposit or curbside collection system
- Assignment of this responsibility to a Designated Management Organization (DMO) by the Minister or by RECYC-QUÉBEC, which will act as manager
- The terms and conditions applicable to the designation of an organization and its operation as well as the minimum requirements it must meet
- The obligation for companies subject to the system to become members of a designated body, to transmit the required information to it and to pay the contributions necessary for the implementation of the system
- The conditions and procedures for the deployment of the systems and the obligations of certain persons
- The setting of a deposit payable on the purchase of a covered product or the parameters for setting such a deposit
- Certain transitional provisions to facilitate the evolution of the current systems towards an extended producer responsibility approach.

7.4.3.2 Proposed Regulation

The goal of the regulation is to achieve the modernization of both systems using an EPR approach.

7.4.3.2.1 Modernized Deposit System

The regulation will determine the parameters of the modernized deposit system:

- The containers covered, deposit values and companies subject to the regulations
- The conditions for designating a DMO
- The responsibilities and obligations of the companies covered and the DMO
- The conditions and terms and conditions applicable to the return, transportation, sorting, and packaging of returnable products, including accessibility and points of return, eco-design, traceability and accountability, research and development, and market opportunities
- The responsibilities of the players in the value chain for the collection, refund and return of containers
- The recovery and recycling rates to be achieved and the applicable penalties (if any)
- The mechanism for linking with the curbside recycling system
- Transitional provisions for the shift from the current system to the modernized system.

7.4.3.2.2 Modernized Curbside Recycling System

The regulation will also address the modernized curbside recycling system to determine the following parameters:

- The materials covered and the companies subject to the regulation
- Designation of a management authority for the transitional period overlapping with the period during which the current compensation system remains in place and for the start of the modernization
- The conditions for designating a DMO
- The responsibilities and obligations of the companies covered and the DMO
- The conditions and terms applicable to the collection, transportation, sorting, and packaging of materials, including servicing, eco-design, local management, traceability and accountability, research and development, and market opportunities
- The requirements, terms, and conditions applicable to agreements between the DMO and municipal agencies, including dispute resolution mechanisms, and contracts with service providers
- The recovery and recycling rates to be achieved and the applicable penalties (if any)
- The securing mechanism with the deposit system
- Transitional provisions for the shift from the current system to the modernized system.

The complete description of the modernization of Québec's deposit and curbside recycling systems is available at the following address:

https://www.environnement.gouv.qc.ca/matieres/consigne-collecte/index.htm

Other programs are under the responsibility of RECYC-QUÉBEC and are presented in the document produced by RECYC-QUÉBEC.

8. ECONOMIC ELEMENTS OF RESIDUAL MATERIALS MANAGEMENT

8.1 Disposal Charges

Disposal charges are levied on the operators of certain disposal facilities (engineered landfills, construction, or demolition waste landfills, RLIMR incineration facilities) for each ton of waste eliminated. These charges help to increase the price of residual material disposal, making the various recycling and recovery options more competitive with disposal. They are the first obstacle to the elimination of residual materials in Québec. As provided for in paragraphs 11 and 12 of section 95.1 of the Environment Quality Act, the charges are used as economic instruments to help achieve the environmental objectives of the Québec Residual Materials Management Policy

The charges are governed by the Regulation respecting the charges payable for the disposal of residual materials (RCPDRM) (http://legisquebec.gouv.qc.ca/fr/ShowDoc/cr/Q-2,%20r.%2043, which is intended to reduce the amount of residual materials being eliminated and, at the same time, to increase the life span of disposal sites. This regulation identifies the sites and materials to which the charges apply. Revenues collected are paid into the government's environmental and water protection fund.

The RCPDRM was adopted on June 23, 2006. It was amended in 2010 to introduce additional charges until October 31, 2023. In April 2020, the regulation was amended to merge the two charges effective January 1, 2021. This approach is intended to make the supplementary charges permanent, to avoid the consequences of a decrease in the cost of waste disposal after the requirement for the supplementary charges is no longer in effect. This decrease could have accentuated the difficulties experienced by the residual materials valorization industry in recent years. Combining the charges helps to free up sufficient funds to continue funding financial assistance programs in support of residual materials management, which are intended primarily for municipalities.

Charges are indexed on January 1 of each year according to the rate of change in the consumer price indexes for Canada. For 2021, charges are set at $23.75 per metric ton.

As provided for in the Act respecting the Ministère du Développement durable, de l'Environnement et des Parcs (c. M-30.001)
Parcs (c. M-30.001):

15.4. The following amounts are credited to the fund:

6° the revenues from the royalties referred to in the Regulation respecting the charges payable for the disposal of residual materials (Chapter Q-2, r. 43)

15.4.1.1. The sums referred to in subsection 6 of Section 15.4 shall be used to finance any measures for the management of residual materials.

Since the regulation came into effect in 2006, more than $1.463 billion has been received. Of this amount, more than $960 million has been redistributed to municipalities through the Program of redistribution to municipalities of charges payable for the disposal of residual materials since its inception in 2006. The balance was used to fund the 2011-2015

Action Plan of the Québec Residual Materials Management Policy, the Program for the Treatment of Organic Materials through Biomethanization and Composting (PTMOBC) and departmental activities related to residual materials management.

Table 8.1 in the Appendix presents the charges received per disposal facility for the 2019 calendar year. For the year 2020, the total charges received was $131,599,178. Charges were $23.07 per metric ton in 2019.

You can find more information here: Disposal charges .... for residual materials (gouv.qc.ca).

8.2 Program for the Treatment of Organic Matter through Biomethanization and Composting

The following table identifies the quantities of organic materials that will be processed in facilities that have received funding from the program or that will receive funding from the program if the project data remains unchanged.

Table 8.2 - Quantities of Organic Materials Treated (as of February 2021)

	Biomethanization (tons at 25% dryness)	Composting (tons at 25% dryness)
Facilities currently in operation	267,592	53,934
Facilities that have been granted financing and will soon be in operation	428,876	26,805
Facilities that have been determined to be eligible for the program	166,700	204,815
TOTAL	863,168	285,554

As a reminder, according to data from RECYC-QUÉBEC's Assessment of Residual Materials Management in Québec, 1.24 M tons of food and green residues were generated by the municipal sector in 2018 and 2.26 M tons were generated by the municipal, industrial, commercial, and institutional sectors. The facilities financed by the program contribute to the treatment of a wide variety of organic materials; most of these materials come from the municipal, commercial, industrial, institutional, and agri-food sectors.

8.3 Home and Community Composting Assistance Program

The Home and Community Composting Assistance (HCCA) program is designed to support municipalities and Indigenous communities to help divert organic materials from disposal and reduce greenhouse gas emissions through the establishment of home or community composting facilities.

It is intended for municipalities with fewer than 5,000 people, except those within the territory of the Communauté métropolitaine de Québec (CMQ) and the Communauté métropolitaine de Montréal (CMM), as well as regional county municipalities (RCMs) and Indigenous communities.

The (HCCA) program is directly in line with the implementation of the 2013-2020 Climate Change Action Plan and the Québec Residual Materials Management Policy. It is managed by RECYC-QUÉBEC.

8.4 Program of Redistribution to Municipalities of Charges Payable for the Disposal of Residual Materials

The Program for the redistribution to municipalities of charges payable for the disposal of residual materials essentially supports Québec's regional municipalities, which are required, under the Environment Quality Act (EQA), to produce and implement a residual materials management plan (RMMP) and to review it every seven years.

The Program is intended for all municipalities that must comply with the Québec Residual Materials Management Policy (QRMMP) and for Indigenous applicants wishing to participate in achieving the Program's objectives.

The objectives of the Program are to:

- support the development, revision, modification, and implementation of the RMMP by financing municipal activities.
- reduce the amount of residual materials destined for disposal.

The performance criteria applicable to the calculation of grants are recommended by the program management committee and approved within the framework of these standards, based on two parameters: population and performance.

- The amounts redistributed based on population are calculated based on the number of inhabitants per municipality. The population of the municipalities is that set annually by government decree and published by the Ministry of Municipal Affairs and Housing (MAMH).
- A municipality's performance is evaluated based on the quantities of residual materials disposed of per inhabitant. Hence, the lower the quantity of waste disposed of per inhabitant, the more efficient a municipality is and the higher the subsidy.

To encourage municipalities to reduce the quantities of residual materials sent for disposal, the percentage assigned to the performance criteria will have to be increased regularly, particularly the percentage assigned to organics management, in a manner consistent with the QRMMP. This is being done as part of the organic matter valorization strategy. The program's leverage effect helps send a clear message about the Québec government's orientations in terms of residual materials management and encourages municipalities, while respecting their skills, knowledge, and specific realities, to implement the measures necessary to reduce the disposal of their residual materials.

9. ASSUMPTIONS AND PROJECTIONS OF DISPOSAL REQUIREMENTS

9.1 Formulation of Assumptions and Projections of Disposal Requirements

This section provides background information and factors relating to disposal needs. It explains, among other things, forecasts of future needs over a 20-year horizon (2041), presenting a portrait of the current situation related to waste management and the factors that will influence its evolution over the corresponding period.

For data consistency purposes, the reference range selected for the analysis presented in this section is from 2015 to 2019, since this is the data available in the RCPDRM.

9.1.1 Overview of Current Residual Materials Management

The estimation of future disposal needs is based first on the assessment of the quantities currently being eliminated. Disposal needs are presented for the province of Québec in the following paragraphs.

The total quantities of material received at the disposal facilities, including recovery and other uses, for the 2015-2019 reference period are on average 1.01 tons/capita. If recovery and other uses are excluded, the average rate is 0.72 tons/capita.

Table 9.1.1. Historical Data Used for Forecasting

	2015	2016	2017	2018	2019
Population	8,144,883	8,263,600	8,342,200	8,447,000	8,557,000
Total qt received	7,696,793	8,248,545	8,789,125	8,574,319	8,841,608
Recovery and other uses	2,196,550	2,499,112	2,652,003	2,373,758	2,474,829
Qt received / inhab. (with recovery)	0.94	1.00	1.05	1.02	1.03
				Average	1.01
Qt received / inhab. (without recovery)	0.68	0.70	0.74	0.73	0.74
				Average	0.72

9.1.2 Forecasting Future Demand for Disposal Services

To assess future needs, three scenarios of potential evolution have been developed. In each of these scenarios, per capita disposal rates were projected over a 20-year horizon, i.e., by 2041. These scenarios assume various levels of effort to reduce the disposal rate, in connection with the implementation of the Québec Residual Materials Management Policy, the action plans and strategies that result from it, and the management plans for residual materials produced in each territory.

To obtain projections of the quantities of residual materials disposed of per year, these per capita disposal rates are then multiplied by the population projections published by the Institut de la statistique du Québec (ISQ) in the document entitled “Perspectives démographiques du Québec et des régions, 2016-2066.” Reference A has been selected for the purposes of this analysis and is detailed in the table below for each year of analysis.

Table 9.1.2. Population Projections from 2021 to 2041

YEAR	2021	2026	2031	2036	2041
POPULATION (ACCORDING TO ISQ REFERENCE A)	8,570,000	8,830,000	9,040,000	9,210,000	9,350,000

Source: Perspectives démographiques du Québec et des régions, 2016-2066. Édition 2019 (quebec.ca)

9.1.2.1 Pessimistic Scenario

The pessimistic scenario is dismal. It assumes that the implementation of the Québec Residual Materials Management Policy, the action plans and strategies resulting from it and the management plans for residual materials produced in each territory will not produce any results. It is therefore the status quo.

The pessimistic scenario is based on maintaining the current results of the source reduction, reuse, recycling, and recovery measures over time. The annual quantity of residual materials disposed of per inhabitant is therefore maintained at 0.72 tons/inhabitant, excluding recovery and other uses. This scenario assumes that economic growth will remain like that of recent years and will not result in any upward constraints on the rate of waste generation.

9.1.2.2 Realistic Scenario

The realistic scenario is an intermediate situation. It assumes that the implementation of the Québec Residual Materials Management Policy, the resulting action plans and strategies, and the management plans for residual materials produced in each territory will have a moderate impact.

In 2018, approximately 60% of the 5.8 million metric tons of material disposed of was organic material, or 3.48 million tons. We have therefore used this data for our calculations, and the figures for subsequent years are adjusted to reflect population growth. Given that residual organic matter is by far the main category of residual material on which development efforts must

be invested in the coming years, the realistic scenario is based mainly on encouraging results from the organic matter valorization strategy associated with a progressive detour reaching 60% of the organic waste deposit, all sectors combined, by 2031. This diversion rate would then be maintained until 2041.

Considering the additional measures that could be implemented to divert other categories of materials from disposal (recyclable materials, construction, renovation and demolition residues, materials used for covering, etc.), this scenario also proposes an overall phase-out efficiency of 7.5% by 2041.

It is therefore assumed that the measures in place, which already contribute to recovering a significant percentage of these materials, will continue to be applied in the coming years with the same efficiency and that the new measures put in place will promote an overall efficiency slightly higher than the current situation. This scenario assumes that economic growth will remain like that of recent years and will not result in any upward constraints on the rate of waste generation. In line with the MELCC's 2019-2023 strategic plan, the target of 0.625 tons of residual materials eliminated per inhabitant in 2021 will be reached. Under this scenario, the per capita disposal rate would be reduced by 0.2 tons/inhabitant from the historical average, to approximately 0.52 tons/inhabitant in 2041, excluding capping and other uses.

9.1.2.3 Optimistic Scenario

The optimistic scenario is an ideal situation. It assumes that the implementation of the Québec Residual Materials Management Policy, the resulting action plans and strategies, and the management plans for residual materials produced in each territory will continue at a steady pace and will result in concrete measures and results each year.

The same logic relating to the calculation of the quantity of organic matter has been applied for this scenario. Once again, considering that residual organic matter is the waste that will be most intensively diverted in the coming years, the optimistic scenario is based on the exceptional results of the organic matter valorization strategy, combined with a progressive detour that will reach 75% of the organic waste deposit, all sectors combined, in 2031 and 77% in 2041.

Considering the additional measures that could be implemented to divert other categories of materials from disposal, this scenario proposes an overall phase-down efficiency of up to 15% by 2041. As such, it is assumed that existing measures, which already contribute to recovering a significant percentage of these materials, will continue to be implemented in the coming years with improved efficiency and that the new measures put in place will promote an overall efficiency significantly higher than the current situation.

This scenario assumes that economic growth will remain like that of recent years and will not lead to any upward constraints on the rate of residual material generation. Also consistent with the QRMMP's 2019-2024 Action Plan and actual observed data, the target per capita waste disposal of 0.525 tons in 2023 could be achieved. Under this scenario, the per capita disposal rate would be reduced by 0.253 tons/inhabitant from the historical average to approximately 0.46 tons/inhabitant in 2041, excluding capping and other uses.

9.1.3 Disposal Projections

Based on these three per capita disposal rate scenarios, the projected disposal requirements for Québec were calculated. The table below presents the results of these estimates of requirements at the end of a 20-year horizon, i.e., in 2041.

Table 9.1.3 - Scenarios to Estimate Future Disposal Requirements for 2041

Scenario	**Elimination rate** (ton/inhab.) excluding the recovery	**Population in 2041**	**Disposal requirements** (metric ton) including recovery
Pessimistic Scenario	0.72	9,350,000	9,434,281
Realistic scenario	0.52	9,350,000	6,904,278
Optimistic scenario	0.46	9,350,000	6,103,687

Overall, considering all the assumptions considered, it therefore appears from this exercise that disposal requirements for Québec will likely be between 6.1 and 9.4 million metric tons in 2041, including recovery and other uses, compared to 8.8 million tons in 2019. While this data is accurate, we would like to specify that it is based on partial information and percentages determined based on preliminary observations. Therefore, these results cannot be interpreted as an actual forecast of projected material disposals over the next 20 years.

CONCLUSION

This MELCC report includes information and data that will contribute to reflection on the mandate given to the Bureau d'audiences publiques sur l'environnement (BAPE) to investigate, including public hearings, on the issue of final waste disposal in Québec.

The data indicate that there is currently no authorized disposal over-capacity in Québec in terms of the annual flow of residual materials to be eliminated, thus necessitating the expansion of facilities and the replacement of those that are closing. However, landfill sites do present social (the "not in my backyard" syndrome) and environmental (GHG emissions, odours, rejected materials, etc.) problems.

The measures implemented and future ones aimed at diverting as much residual material as possible from disposal to eliminate only the final waste have contributed and will contribute to increasing the quantity of residual materials valorized. The quantity of residual materials to be landfilled or incinerated has remained relatively constant for several years.

For the coming years, scenarios were outlined based on the demographic outlook and the various levels of effort deployed to reduce the disposal rate, in connection with the implementation of the Québec Residual Materials Management Policy, the action plans and strategies that result from it, as well as the management plans for residual materials produced in each territory. It appears from this exercise that disposal needs for Québec will likely be between 6.1 and 9.4 million metric tons in 2041, compared to 8.8 million metric tons in 2019.

APPENDICES

Table 1.5.1-A - Overview of Residual Capacity of Engineered Landfill Sites as of December 31, 2019

	Regional county municipality	Owner Operator	Residual capacity * [1] volume (m^3)	 ton (t) (a)	Quantity received in 2019 * [2] volume (m^3) (b)	 ton (t) (c)	Authorized capacity volume (m^3)
Administrative Region: Bas-Saint-Laurent (01)							
1	Matane (080)	City of Matane City of Matane	1,050,293	1,260,352	21,745	31,936	1,346,000
2	Rimouski-Neigette (100)	City of Rimouski City of Rimouski	3,056,592	3,667,910	33,687	38,684	3,713,750
3	Rivière-du-Loup (120)	City of Rivière-du-Loup (Cacouna) City of Rivière-du-Loup	483,356	580,027	79,486	64,310	2,340,000
4	Témiscouata (130)	Régie intermunicipale de déchets de Témiscouata (Dégelis) Régie intermunicipale de déchets de Témiscouata	374,886	449,863	11,195	13,573	532,956
Administrative Region: Saguenay–Lac-Saint-Jean (02)							
5	Lac-Saint-Jean-Est (930)	Régie de gestion des matières résiduelles du Lac-Saint-Jean (Hébertville-Station) Régie de gestion des matières résiduelles du Lac-Saint-Jean	1,988,389	2,386,067	141,099	160,111	2,500,000
Administrative Region: Capitale-Nationale (03)							
6	Charlevoix-Est (150)	Regional county municipality of Charlevoix-Est Regional county municipality of Charlevoix-Est	116,707	455,465	12,085	13,521	269,153
7	La Côte-de-Beaupré (210)	Quebec City Quebec City	5,613,407	6,736,088	57,033	53,624	6,669,065
8	Portneuf (340)	Régie régionale des matières résiduelles de Portneuf (Neuville) Régie régionale des matières résiduelles de Portneuf	2,260,140	27 12,168	80,522	84,230	2,940,000

	Regional county municipality	Owner Operator	Residual capacity * [1] volume (m^3)	 ton (t) (a)	Quantity received in 2019 * [2] volume (m^3) (b)	 ton (t) (c)	Authorized capacity volume (m^3)
Administrative Region: Mauricie (04)							
9	Les Chenaux (372)	Régie intermunicipale de gestion des matières résiduelles de la Mauricie (Champlain) GFL Environnement	617,320	740,784	173,940	158,294	1,490,000
10	Maskinongé (510)	Régie intermunicipale de gestion des matières résiduelles de la Mauricie (Saint-Étienne-des-Grès) Régie intermunicipale de gestion des matières résiduelles de la Mauricie	2,488,000	2,985,600	234,300	237,364	10,400,000
Administrative Region: Estrie (05)							
11	Coaticook (440)	Régie intermunicipale de gestion des déchets solides de la région de Coaticook (R.I.G.D.S.C.) Régie intermunicipale de gestion des déchets solides de la région de Coaticook (R.I.G.D.S.C.)	198,070	237,684	20,865	20,476	900,000
12	Le Haut-Saint-François (410)	Le Haut-Saint-François RCM (Bury) Le Haut - Saint-François RCM	79,180	95,016	52,450	64,309	755,000
Administrative Region: Montreal (06)							
13	City of Montreal (660) (Outside RCM)	City of Montreal City of Montreal	894,191	1,073,029	33,984	35,723	1,720,000
Administrative Region: Outaouais (07)							
---	**No site**	--- ---	---	---	---	---	---
Administrative Region: Abitibi-Témiscamingue (08)							
14	Abitibi (880)	City of Amos City of Amos	704,245	845,094	14,050	21,633	1,055,440
15	City of Rouyn-Noranda (860) (Outside RCM)	Multitech Environnement (3766063 Canada inc.) Multitech Environnement (3766063 Canada inc.)	859,910	1,031,892	51,990	52,483	1,400,000

	Regional county municipality	Owner Operator	Residual capacity * [1] volume (m^3)	 ton (t) (a)	Quantity received in 2019 * [2] volume (m^3) (b)	 ton (t) (c)	Authorized capacity volume (m^3)
16	Vallée-de-l'Or (890)	RCM Vallée de l'Or RCM Vallée de l'Or	695,940	835,128	39,900	43,279	1,219,000
Administrative Region: Côte-Nord (09)							
17	Manicouagan (960)	Régie intermunicipale d'enfouissement sanitaire de Manicouagan (RIESM) (Ragueneau) Régie intermunicipale d'enfouissement sanitaire de Manicouagan	1,004,861	1,205,833	21,605	24,251	1,449,800
18	Sept-Rivières (971)	City of Sept-Îles City of Sept-Îles	547,170	656,604	52,830	66,894	1,253,500
Administrative Region: Nord-du-Québec (10)							
19	Jamésie (991)	Town of Chibougamau Town of Chibougamau	174,087	208,904	10,487	12,140	300,000
Administrative Region: Gaspésie–Îles-de-la-Madeleine (11)							
20	La Côte-de-Gaspé (030)	City of Gaspé (Wakeham) City of Gaspé	547,548	657,058	23,874	26,632	920,000
21	Bonaventure	Municipality of Saint-Alphonse Municipality of Saint-Alphonse	1,187,464	1,424,957	17,763	19,655	1,420,544
Administrative Region: Chaudière-Appalaches (12)							
22	Beauce-Sartigan (290)	Régie intermunicipale du comté de Beauce-Sud (Saint-Côme) Régie intermunicipale du comté de Beauce-Sud	2,304,527	2,765,432	17,158	31,518	2,779,000
23	Bellechasse (190)	Bellechasse RCM (Armagh) Bellechasse RCM	ND	ND	ND	32,543	1,113,000
24	Lotbinière (330)	Lotbinière RCM (Saint-Flavien) Lotbinière RCM	288,154	345,785	26,663	34,209	785,000
25	La Nouvelle-Beauce (260)	La Nouvelle- Beauce RCM (Frampton) La Nouvelle- Beauce RCM	418,903	502,684	41,497	27,665	1,161,388
26	La Nouvelle-Beauce (260)	Régie intermunicipale de gestion des déchets des Chutes-de-la-Chaudière (Saint-Lambert) Régie intermunicipale de gestion des déchets des Chutes-de-la-Chaudière	1 317269	1,580,723	72,275	84,062	2,778,000

	Regional county municipality	Owner Operator	Residual capacity * [1] volume (m^3)	 ton (t) (a)	Quantity received in 2019 * [2] volume (m^3) (b)	 ton (t) (c)	Authorized capacity volume (m^3)
Administrative Region: Laval (13)							
---	**No site**	--- ---	---	---	---	---	---
Administrative Region: Lanaudière (14)							
27	Les Moulins (640)	Complexe Enviro Connexions ltée (Lachenaie) Complexe Enviro Connexions ltée	857,656	1,029,187	1,584,033	2,038,367	23,892,000
28	D'Autray (520)	Dépôt Rive-Nord inc. (Saint-Thomas) Dépôt Rive-Nord inc.	10,147,076	12,176,491	655,400	905,996	21,000,000
Administrative Region: Laurentides (15)							
29	Antoine-Labelle (790)	Régie intermunicipale de déchets de la Lièvre (Mont-Laurier) Régie intermunicipale de déchets de la Lièvre	90,895	109,074	19,221	14,584	330,000
30	Antoine-Labelle (790)	Régie intermunicipale de déchets de la Rouge (Marchand) Régie intermunicipale de déchets de la Rouge	719,241	863,089	32,870	40,873	1,200,000
31	Argenteuil (760)	Régie intermunicipale Argenteuil/Deux-Montagnes (Lachute) WM Québec inc.	6,004,622	7,205,546	508,815	559,443	12,400,000
32	La Rivière-du-Nord (750)	WM Québec inc. (Sainte-Sophie) WM Québec inc.	3,803,874	4,564,649	1,132,788	1,650,805	17,400,000
Administrative Region: Montérégie (16)							
33	Brome-Missisquoi (460)	Régie intermunicipale d'élimination des déchets solides de Brome-Missisquoi (Cowansville) Régie intermunicipale d'élimination des déchets solides de Brome-Missisquoi	2,187,711	2,625,253	90,510	87,482	3,787,000
34	La Haute-Yamaska (470)	GFL Environmental inc. (Sainte-Cécile-de-Milton) GFL Environmental inc.	5,011,970	6,014,364	211,890	201,295	6,840,000

	Regional county municipality	Owner Operator	Residual capacity * [1] volume (m^3)	 ton (t) (a)	Quantity received in 2019 * [2] volume (m^3) (b)	 ton (t) (c)	Authorized capacity volume (m^3)
Administrative Region: Centre-du-Québec (17)							
35	Drummond (490)	WM Québec inc./Drummondville WM Québec inc.	346,867	416,240	371,959	537,353	8,300,000
36	Bécancour (380)	Olin Canada ULC Olin Canada ULC	227,330	272,796	1,887	2,005	252,000
37	Arthabaska (390)	Société de développement durable d'Arthabaska Société de développement durable d'Arthabaska	4,731,345	5,677,614	118,133	187,896	5,945,075
38	Bécancour (380)	Gestion 3 LB Gestion 3 LB	1,040,542	1,248,650	18,960	30,430	1,114,202

EXPLANATORY NOTES:

*1 The residual capacity of the premises is calculated in volume (m^3), using survey readings and volumetric analyses.

*2 The annual quantity in tons is obtained by weighing the daily residual materials and cover materials at the entrance to the disposal sites.

(a) The residual capacity in tons (t) is an estimate obtained by multiplying the residual volume (m^3) by 1.2 (t/m^3), which is the average density of compacted waste at the site, including daily cover material.

(b) The annual quantity in volume (m^3) is an estimate that is calculated from survey readings and volumetric analyses.

(c) This data includes the tonnage of residual materials eliminated and the daily recovery materials used.

February 16, 2021

Table 1.5.1-B - Authorized Construction or Demolition Waste Landfills (CDWLs) in Operation and Residual Capacity as of December 31, 2019

N° region	Administrative Region	RCM of the site	Municipality of location	Name of the holder of authorization	Address of the holder of authorization	Authorized capacity volume (m^3)	Quantity of materials received in 2019 *	Residual capacity volume (m^3)
2	Saguenay-Lac-Saint-Jean	Maria-Chapdelaine	Dolbeau-Mistassini	Excavation Dolbeau inc.	223 rue Bordeleau Dolbeau-Mistassini (Québec), G8L2Z3	220,000	16,206 tons 17,390 m^3	43,602
2	Saguenay-Lac-Saint-Jean	Le Domaine-du-Roy	Saint-Félicien	Entreprises Jean Tremblay & Fils inc.	1227, rang Simple Saint-Félicien (Québec), G8K 2N8	ND	20,306 tonnes 24,217 m^3	36,350
4	Mauricie	Trois-Rivières	Trois-Rivières	Sables des Forges inc.	8750, boulevard Industriel Trois-Rivières (Québec), G9A 5E1	4,000,000	88,491 tons 126,934 m^3	2,130,752
7	Outaouais	Les Collines-de-l'Outaouais	Val-des-Monts	Thibault Démolition ltée	135 chemin Saint-Antoine, Val-des-Monts (Québec), J8N7G9	973,175	2,505 tons 8,491 m^3	170,213
14	Lanaudière	Matawinie	Saint-Félix-de-Valois	Gestion intégrée de Matériaux secs Lanaudière inc.	621, route Louis-Cyr, St-Jean-de-Matha (Québec), J0K2S0	1,069,850	27,881 tons 29,110 m^3	419,100
14	Lanaudière	Montcalm	Sainte-Julienne	2845-5103 Québec inc.	2601, rue Jarry Est, Montréal, (Québec), H1Z2C2	1,000,000	14,782 tons 8,662 m^3	444,868
17	Centre-du-Québec	Bécancour	Bécancour	Lemay-Bec inc.	18055, rue Gauthier, Bécancour, (Québec), G9H1C1	1,132,061	54,744 tons 45,496 m^3	323,674

* This data includes monthly covering materials.

Table 1.5.1-C - Decrees Issued for the Establishment and Expansion of Operating ELs

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Real Lifetime
Expansion of a site Sanitary landfill (SL) at Saint-Joachim Quebec City	Authorized Decree 1530-93 from Nov. 3 1993 (before subject projects of SL at the procedure evaluation)		Decree 1017-2002 of Sep. 4 2002 Decree 940-2006 from Oct. 18 2006	5,696,000 m^3		
Extension of the SL (career Demix, cell n° 2) for the exclusive use of the wastewater treatment plant CUM Urban community of Montréal	Authorized Decree 1351-95 from Oct. 11 1995	Hearings		860,000 m^3 (for the cell n° 2)	Provided for in the impact study: 62,000 mt The cell will remain in exclusive use of the wastewater treatment plant of the CUM.**	
Extension of the SL Lachenaie BFI Sorting Plant Lachenaie inc.	Authorized Decree 1549-95 from Nov. 29 1995	Mediation and hearings	Decree 1425-98 from Nov. 19 1998 Decree 1554-2001 of 19 Dec. 2001	4,000,000 mt	970,000 mt The operator can bury only the residual materials from certain territories of the Montreal region, unless the annual tonnage allowed is not reached during a year.	
Vertical expansion of the eastern sector of the SL Lachenaie BFI Sorting Plant Lachenaie ltée	Moratorium lifting accepted Emergency decree 413-2003 of 21 March 2003			1,357,000 m^3	1,085,000 mt	1 year

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Lifetime real
Expansion of the SL Lachenaie (northern sector) on the territory of the City of Terrebonne BFI Sorting Plant Lachenaie	Authorized Decree 89-2004 from 4 Feb. 2004	Hearings		6,500,000 m^3	1,300,000 mt	
Expansion for a capacity of 1.3 million mt, of the north-eastern part of the sector north of EL of Lachenaie BFI Sorting Plant Lachenaie	Authorized Emergency decree 375-2008 of April 16, 2008			1,300,000 mt	1,300,000 mt	1 year
Expansion of the sector north of EL of Lachenaie on the territory of the City of Terrebonne BFI Sorting Plant Lachenaie	Authorized Decree 827-2009 of June 23, 2009	Hearings	Decree 976-2014 from Nov. 12 2014 Decree 674-2019 of June 26, 2019	7,500,000 m^3 for the 1st 5-year phase 7,100,000 m^3 for the 2nd 5-year phase Extension of 2 years	1,300,000 mt for the 1st phase 5 years 1,290,000, 1,285,000, 1,280,000, 1,275,000 and 1,270,000 for the 1st phase of 5 years 1,265,000 and 1,260,000 mt for these 2 years	5 years 5 years 2 years
Expansion of the SL Champlain Municipality of Champlain	Authorized Decree 316-96 of March 13/16, 1996	Mediation Request frivolous	Decree 929-2013 of Sep. 11 2013 Decree 980-2013 of Sep. 25 2013 Decree 596-2016 of 2016-06-29 Decree 792-2019	1,490,000 m^3 (about 890,000 mt)	150,000 mt	

			of July 8, 2019			

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Lifetime real
Establishment of an SL on the territory of the Municipality of St-Édouard-de- Frampton La Nouvelle- Beauce RCM	Authorized Decree 707-97 of 1997-05-28	Hearings	Decree 139-2000 from 2 Feb. 2000 Decree 331-2012 of April 4, 2012	1,161,388 mt	Limitation: 14,000 mt The operator can bury only the residual materials from La Nouvelle- Beauce RCM Decree 139-2000 of February 16 2000 amends Decree 707-97 and stipulates that waste should not come from outside the RCMs of La Nouvelle-Beauce and of Robert-Cliche	
Expansion of an LES at Cowansville Régie intermunicipale d'élimination des déchets solides de Brome-Missisquoi	Authorized Decree 673-98 of 1998-05-20	Mediation and hearings	Decree 60-2004 from Jan. 29 2004 Decree 1082-2010 of 8 Dec. 2010	3,787,000 m^3	75,000 mt	
Extension of the SL Saint-Lambert-de-Lauzon Régie intermunicipale de gestion des déchets des Chutes-de-la-Chaudière	Authorized Decree 701-98 of 1998-05-27		Decree 1083-2007 of 5 Dec. 2007 Decree 123-2011 Of February 22 2011	2,778,000 m^3		
Expansion of an LES at Saint-Flavien Lotbinière RCM	Authorized Decree 861-98 of 1998-06-22		Decree 83-2009 from 11 Feb. 2009	785,000 m^3	32,000 m^3	
Expansion of an SL on the territory of Municipality of Saint-Rosaire	Authorized Decree 150-99 of Feb 24 1999	Mediation Request frivolous	Decree 1088-2006 of Nov. 29 2006		150,000 t/year	

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Lifetime real
Services Sanitaires Gaudreau inc.			Decree 92-2012 Of February 16 2012 Decree 758-2012 of July 4, 2012 Decree 1427-2019 of 12 december 2019			
Expansion of the SL Saint-Côme - Linen Régie intermunicipale de Beauce-Sud county	moratorium lifting accepted Decree 1002-96 of 14 August 1996 Authorized Decree 694-2000 of 2000-06-07	Mediation	Decree 525-2010 of 2010-06-23	Limitation: 2,779,000 m^3	27,000 mt Residual materials buried cannot come from that of the RCM de Beauce- Sartignan or municipalities members of the Régie.	
Establishment Expansion of the SL Matane City of Matane	moratorium lifting accepted Decree 424-2001 of April 11, 2001 Authorized Emergency decree 1112-2004 of Dec 2 2004	Hearings for the prior project expansion proposed by a Regie	Decree 527-2015 of 2015-06-17	1,346,000 m^3		
Establishment of an SL on the territory of the City of Amos City of Amos	Authorized Decree 487-2001 of 2001-05-02	Hearings	Decree 306-2009 of 2009-03-25	1,055,440 m^3	28,500 tm si 0% of recovery 21,405 tm si 25 % of 14,270 tm si 50 % of	
Establishment or expansion of the SL of Rimouski	moratorium lifting accepted Decree 710-2001 of 2001-06-13	Hearings	Decree 1346-2009 of 21 Dec. 2009	3,713,750 m^3	42,650 mt	

City of Rimouski						

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Lifetime real
	Authorized Decree 483-2004 of 2004-05-19					
Vertical expansion on zone 1 of the SL of Ste- Sophie Intersan inc.	moratorium lifting accepted Emergency decree 919-2003 of Sep. 3 2003			1,030,000 m^3	1,030,000 mt	1 year
Establishment Expansion of the SL Sainte- Sophie Intersan inc.	moratorium lifting accepted Decree 1390-2001 of Nov. 21 2001 Authorized Decree 1068-2004 of Nov. 16 2004	Hearings	Decree 406-2008 of April 23, 2008 Decree 800-2018 of 2018-06-20	5,400,000 m^3	1,000,000 mt	
Expansion of the EL Sainte- Sophie Intersan inc.	Authorized Decree 829-2009 of 2009-06-23	Hearings		6,000,000 m^3 for the 1st 5-year phase 6,000,000 m^3 for the 2nd 5-year phase	1,000,000 mt Year 1: 993,000 mt Year 2: 989,000 mt Year 3: 985,000 mt Year 4: 981,000 mt Year 5: 977,000 mt	10 years
Expansion of the EL of Sainte-Sophie WM Québec Inc.	Authorized Decree 1227-2020 of Nov. 18 2020	Hearings		18,600,000 m^3	1,000,000 mt	
Establishment of an SL on the territory of the Municipality of the parish of Ragueneau	Authorized Decree 89-2002 from 6 Feb. 2002		Decree 424-2009 of April 8, 2009 Decree 478-2019 of 2019-05-08	1,499,800 mt	30,000 mt	

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Lifetime real
Régie intermunicipale Sanitary landfill Manicouagan						
Establishment Expansion of the SL of Val-d'Or La Vallée-de-l'Or RCM	moratorium lifting accepted Decree 598-2002 of 2002-05-22 Authorized Decree 18-2005 from Jan. 19 2005	Mediation	Decree 623-2015 of July 7, 2015	1,473,000 m^3	42,000 mt	25 years
Expansion of a site sanitary landfill on the territory of the Municipality o Armag f h Bellechasse RCM	moratorium lifting accepted Decree 604-99 of 1999-06-02 Authorized Decree 803-2002 of 2002-06-26		Decree 1000- 2009 of Sep. 16 2009	1,113,000 m^3	28,500 mt	
Establishment of an SL on the territory of the City of Rouyn-Noranda Consortium Multitech (3766063 Canada inc.)	Authorized Decree 875-2002 of 2002-08-08	Hearings		1,400,000 m^3	Year 1: 22,000 mt Year 2: 20,950 mt Year 3: 19,900 mt Year 4: 18,850 mt Subsequent years: 16,750 mt	24 years
Establishment of an SL on the territory of the City of Gasp é City of Gaspé	Authorized Decree 905-2002 of 2002-08-21	Mediation	Decree 824-2009 of 2009-06-23 Decree 278-2013 of 2013-03-27	920,000 m^3	34,500 mt	
Establishment Extension of the SL Saint-Thomas	moratorium lifting accepted		Decree 505-2008 of 2008-05-21	1,200,000 m^3	700,000 mt	1 year

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Lifetime real
Dépôt Rive-Nord inc.	Decree 1051-2002 of Sep. 11 2002 Authorized Emergency decree 338-2005 of 13 April 2005					
Expansion of the SL St-Thomas on the territory of Municipality of Saint-Thomas Dépôt Rive-Nord inc.	Authorized Decree 645-2006 of 2006-06-28	Hearings		21,200,000 m^3	About 650,000 mt	
Expansion of the SL the territory of the City of Sept-Iles City of Sept-Îles	Authorized Decree 1173- 2002 of Oct. 2 2002			1,253,500 m^3 (or until Sep. 1, 2027)	33,000 mt	25 years
Expansion of the SL of Argenteuil-Deux-Montagnes on the territory of the City of Lachute Régie intermunicipale Argenteuil-Deux-Montagnes	Authorized Decree 918-2003 of Sep. 3 2003	Hearings	Decree 801-2018 of 2018-06-20	12,400,000 m^3	500,000 mt	
Establishment or expansion of an SL on the territory of the Canton of Ste-Cécile-de-Milton Roland Thibault inc.	moratorium lifting accepted Decree 1065-2003 of Oct. 8 2003 Authorized			6,840,000 m^3	About 150,000 mt	

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Lifetime real
	Decree 920-2007 from Oct. 24 2007					
Expansion of the SL Of Marchand on the territory of the city of Rivière-Rouge Régie intermunicipale des déchets de La Rouge	Authorized Decree 470-2005 of 2005-05-18	Hearings	Decree 483-2014 of 2014-06-03	1,200,000 m^3	About 33,000 mt	
Establishment of an EL on the territory of the Municipality of Saint-Alphonse Municipality of Saint-Alphonse	Authorized Decree 471-2008 of 2008-05-14			1,420,544 m^3	24,000 to 40,000 mt	
Expansion of the SL Chibougamau Town of Chibougamau	Authorized CA of Sep. 5 2008			300,000 m^3	7,763 mt	
Expansion of the SL on the territory of the Municipality of Neuville Régie régionale de gestion des matières résiduelles de Portneuf	Authorized Emergency decree 443-2010 of 26 May 2010			75,000 mt	75,000 mt	1 year
Expansion of the SL on the territory of the Municipality of Neuville Régie régionale de gestion des matières résiduelles de Portneuf	Authorized Decree 688-2011 of 2011-06-22			2,940,000 m^3	75,000 mt	

Project title Operator	Decision	Hearings or mediation	Modification	Total capacity	Annual tonnage	Lifetime real
Expansion of the EL St-Nicéphore, on the territory of the city of Drummondville WM Québec inc.	Authorized Decree 551-2013 of 2013-06-05	Hearings	Decree 791-2019 of July 8, 2019 Decree 993-2020 of Sep. 23 2020	2,300,000 t	Year 1: 500,000 t Year 2: 480,000 t Year 3: 460,000 t Year 4: 430,000 t Year 5: 430,000 t Years 6, 7 and 8: 430,000 t	5 to 8 years 10 years
Establishment of an EL on the territory of the Municipality of Hébertville-Station Régie de gestion des matières résiduelles du Lac-Saint-Jean	Authorized Decree 1306-2013 of 11 Dec. 2013	Hearings	Decree 230-2018 of 2018-03-14	2,500,000 m^3	203,500 mt	

Updated 2021-02-18

Table 1.5.1-D - Limitations of Operating ELs

	Site (municipality)	Owner / operator	Authorization deadline	Annual limitation (tons) anniversary	RMMP (right of inspection) (tonnes)	Remarks
01	Cacouna	City of Rivière-du-Loup	transformation SL in EL	None	75,000 see remarks	The right of inspection only appears in the RMMP (no RCM regulation)
01	Dégelis	Régie Témiscouata	transformation SL in EL	None	Forbidden see remarks	The right of inspection only appears in the RMMP (no RCM regulation)
01	Matane	City of Matane	decree / 2015	25,000 see remarks January	25,000 see remarks	The site receives only the residual materials generated on the territory of the RCMs Matanie and Haute-Gaspésie Regulation of the RCM (2017) for the right of inspection (applicable in 2015?)
01	Rimouski	City of Rimouski	decree / 2004	None	none	42,650 t / year (estimated in the impact study)
02	Hebertville	Régie Lac-Saint-Jean	decree / 2018	203,500 January	none	
03	Clermont	Charlevoix- Est RCM	transformation SL in EL	None	none	
03	Neuville	Régie Portneuf	decree / 2011	75,000 January	35,000 see remarks	Regulation of the RCM (2011) for the right of inspection
03	St-Joachim	Quebec City	decree / 1993	None	none	180,000 t / year (estimated in the impact study)
04	Champlain	Régie Mauricie / Matrec	decree / 2019	150,000 January	none	
04	St-Étienne-des-Grès	Régie Mauricie	transformation SL in EL	None	none	

	Site (municipality)	Owner / operator	Authorization deadline	Annual limitation (tons) anniversary	RMMP (right of inspection) (tons)	Remarks
05	Bury	Régie Haut-St-François and Sherbrooke (Valoris)	transformation SL in EL	None	none	
05	Coaticook	Régie Coaticook	transformation SL in EL	None	none	
08	Amos	City of Amos	decree / 2001	None	none	
08	Rouyn-Noranda	Multitech Environnement	decree / 2002	None see remarks	none	16,750 t / year (estimated in the impact study) Serves only the City of Rouyn-Noranda at the impact study
08	Val-d'Or	RCM Vallée - de - l'Or	decree / 2005	None see remarks	Forbidden see remarks	The site receives only materials generated on the territory of the Vallée-de-L'Or The right of inspection only appears in the RMMP (no RCM regulation) 42,000 t / year (estimated and planned in the EIA
09	Ragueneau	Régie Manicouagan	decree / 2002	None	none	30,000 t / year (estimated in the impact study)
09	Sept-Iles	City of Sept-Îles	decree / 2002	None	none	33,000 t / year (estimated in the impact study)
10	Chibougamau	Town of Chibougamau	Authorization / 2008	None	none	
11	Gaspé	Régie Gaspésie	decree / 2009	34,500 January	none	The site receives only materials generated on the territory of the city of Gaspé and the Côte-de-Gaspé and Rocher-Percé RCMs
11	St-Alphonse	Municipality of Saint-Alphonse	decree / 2008	None	none	40,000 t / year maximum estimated in the impact study
12	Armagh	Bellechasse RCM	decree / 2002	None	none	28,500 t / year (estimated in the impact study)
12	Frampton	Nouvelle-Beauce RCM	decree / 2000	None see remarks	none	The site receives only materials generated on the territory of the RCMs of Beauce and Robert-Cliche
12	St-Côme-Linière	Régie Beauce-Sud	decree / 2000	None see remarks	none	The site receives only materials generated on the territory of the RCM of Sartigan and municipalities that are members of the régie.

	Site (municipality)	Owner / operator	Authorization deadline	Annual limitation (tons) anniversary	RMMP (right of inspection) (tons)	Remarks
12	St-Flavien	Lotbinière RCM	decree / 1998	32 000 (m^3) January	none	The annual limitation is in cubic metres The RMMP indicates the client municipalities outside the RCM
12	St-Lambert	Régie Chutes-de-la-Chaudière	decree / 1998	None	none	
14	St-Thomas	Dépôt Rive-Nord (EBI)	decree / 2006	None	none	650,000 t / year (estimated in the impact study)
14	Lachenaie	Complexe EnviroConnexion	decree / 2019	1,265,000 / August 2020 1,260,000 / August 2021	none	
15	Lachute	Régie Argenteuil-Deux-Montagnes Operated by Waste Management	decree / 2018	500,000 see remarks January	470,000 see remarks	The site cannot receive materials from outside the territory of service specified in the impact study. The right of inspection only appears in the RMMP (no RCM regulation)
15	Mont-Laurier	Town of Mont-Laurier	transformation SL in EL	None	33,000 see remarks	The right of inspection only appears in the RMMP (no RCM regulation)
15	Rivière-Rouge	Régie de la Rouge	decree / 2005	None	33,000 see remarks	The right of inspection only appears in the RMMP (no RCM regulation) 33,000 t / year (estimated in the impact study)
15	Ste-Sophie	Waste Management	decree / 2016	985,000 / November 2020 981,000 / November 2021	1,000,000 see remarks	Regulation of the RCM (2016) for the right of inspection (applicable in 2009?)
16	Ste-Cécile-de-Milton	Roland Thibault inc. (Matrec)	decree / 2007	None	150,000 see remarks	Regulation of the RCM (2009) for the right of inspection (applicable in 2007?) 150,000 t / year (estimated in the impact study)
16	Cowansville	Régie Brome-Missisquoi	decree / 2010	75,000 / January	none	
17	St-Nicéphore	Waste Management	decree / 2019	None total volume of zone 3A 2,760,000 m^3 filled at the latest in September 2021 see remarks	370,000 see remarks	The 2019 decree extended the operation of the EL until September 2021 and until the total volume of 2.76 Mm^3 is reached. 100,000 t / year (estimated in the update of the impact study) Regulation of the RCM (modification 2016) for the right of inspection Inspection rights were 540,000 t / year at the time of authorization in 2013.

	Site (municipality)	Owner / operator	Authorization deadline	Annual limitation (tons) anniversary	RMMP (right of inspection) (tons)	Remarks
17	St-Rosaire	Gesterra (mixed company)	decree / 2019	150,000	none	

Table 2.1.1-A - List of ELs in operation - Treatment / Rejection

D.R.	EL	Treatment at the municipal factory	In situ treatment	
			Rejection during water	Rejection infiltrated in ground
01	**Rivière-du-Loup**		X	
	Dégelis	X		
	Matane*	X		
	Rimouski*	X		
02	**Hébertville-Station***		X	
03	**Clermont**			X
	Neuville*		X	
	St-Joachim*		X	
04	**Champlain***		X	
	St-Étienne-des-Grès		X	
05	**Bury**		X	
	Coaticook		X	
06	**City of Montreal**	X		
08	**Amos***	X		
	Rouyn-Noranda*	X		
	Val-d'Or*		X	
09	**Ragueneau***		X	
	Sept-Îles*	X		
10	**Chibougamau***			X
11	**Gaspé***		X	
	St-Alphonse*		X	
12	**Armagh***		X	
	Frampton*		X	
	St-Côme*		X	
	St-Flavien*		X	
	St-Lambert*		X	
14	**St-Thomas***		X	
	Lachenaie*	X		
15	**Lachute***	X		
	Mont-Laurier		X	
	Rivière-Rouge*		X	
	Ste-Sophie*		X	
16	**Ste-Cécile-de-Milton***		X	
	Cowansville*		X	
17	**Olin**	Reuse of leachate at the company's plant for salt dissolving		
	Gestion 3LB		X	
	St-Nicéphore*	X		
	St-Rosaire*		X	

* Place

decreed

2021-02-11

Table 2.1.1-B - Engineered Landfills (ELs) Authorized for Operation and Biogas Capture

N° region	Administrative Region	RCM of the site	Municipality of the site	Owner's name	Owner's address	Type of biogas capture
01	Bas-Saint-Laurent	Matane	Matane	City of Matane	230, avenue Saint-Jérôme, Matane (Québec), G4W3A2	passive system
01	Bas-Saint-Laurent	Rimouski-Neigette	Rimouski	City of Rimouski	205, avenue de la Cathédrale, Rimouski (Québec), G5L5J1	active system
01	Bas-Saint-Laurent	Rivière-du-Loup	Cacouna	City of Rivière-du-Loup	65, rue de l'Hôtel-de-Ville, Rivière-du-Loup (Québec), G5R1L4	active system
01	Bas-Saint-Laurent	Témiscouata	Dégelis	Régie intermunicipale des déchets de Témiscouata	369, avenue Principale Dégelis (Québec), G5T2G3	passive system
02	Saguenay--Lac-Saint-Jean	Lac-Saint-Jean-Est	Hébertville-Station	Régie de gestion des matières résiduelles du Lac-Saint-Jean	625, rue Bergeron Ouest, Alma (Québec), G8B1V3	active system
03	Capitale-Nationale	Charlevoix-Est	Clermont	Regional county municipality of Charlevoix-Est	172, boulevard Notre-Dame, Clermont (Québec), G4A1G1	passive system
03	Capitale-Nationale	La Côte-de-Beaupré	Saint-Joachim	Quebec City	2000, boulevard Lebourgneuf, 2e étage, Québec (Québec), G2K0B8	passive system
03	Capitale-Nationale	Portneuf	Neuville	Régie régionale de gestion des matières résiduelles de Portneuf	1300, chemin du Site, Neuville (Québec), G0A2R0	active system
04	Mauricie	Les Chenaux	Champlain	Régie de gestion des matières résiduelles de la Mauricie	400, chemin de La Gabelle, Saint-Étienne-des-Grès (Québec), G0X2P0	active system
04	Mauricie	Maskinongé	Saint-Étienne-des-Grès	Régie de gestion des matières résiduelles de la Mauricie	400, chemin de La Gabelle, Saint-Étienne-des-Grès (Québec), G0X2P0	active system
05	Estrie	Coaticook	Coaticook	Régie intermunicipale de gestion des déchets solides de la région de Coaticook	1095, chemin Bilodeau, Coaticook (Québec), J1A2S4	passive system
05	Estrie	Le Haut-Saint-Francois	Bury	Régie intermunicipale du Centre de valorisation des matières résiduelles du Haut-Saint-François and Sherbrooke	107, chemin du Maine Central, Bury (Québec), J0B1J0	active system
06	Montréal	CMM	Montréal-Est	City of Montreal *	275, rue Notre-Dame Est Montréal (Québec), H2Y1C6	passive system
08	Abitibi-Témiscamingue	Abitibi	Amos	City of Amos	182, 1re Rue Est, Amos (Québec), J9T2G1	passive system
08	Abitibi-Témiscamingue	Vallée-de-l'Or	Val-d'Or	Regional county municipality of Vallée-de-l'Or	42, place Hammond Val-d'Or (Québec), J9P3A9	active system (registry of offset credit projects) *3
08	Abitibi-Témiscamingue	City of Rouyn-Noranda	Rouyn-Noranda	3766063 Canada Inc.	700, avenue Dallaire, bureau 250, Rouyn-Noranda (Québec), J9X4V9	passive system

N° region	Administrative Region	RCM of the site	Municipality of the site	Owner's name	Owner's address	Type of biogas capture
09	Côte-Nord	Manicouagan	Ragueneau	Régie de gestion des matières résiduelles de Manicouagan	800 rue Léonard-E Schlemm, Baie-Comeau (Québec), G4Z3B7	active system (registry of offset credit projects) *3
09	Côte-Nord	Sept-Rivières	Sept-Iles	City of Sept-Îles	546, avenue De Quen, Sept-Îles (Québec), G4R2R4	passive system
10	Nord-du-Québec	Jamésie (terr. contracted)	Chibougamau	Town of Chibougamau	650, 3e rue, Chibougamau (Québec), G8P1P1	passive system
11	Gaspésie--Îles-de-la-Madeleine	Bonaventure	Saint-Alphonse	Municipality of Saint-Alphonse	127, rue Principale Est, Saint-Alphonse (Québec), G0C2V0	passive system
11	Gaspésie--Îles-de-la-Madeleine	La Côte-de-Gaspé	Gaspé	Régie intermunicipale de traitement des matières résiduelles de la Gaspésie	498, Grande Allée Ouest, Grande-Rivière (Québec), G0C1W0	passive system
12	Chaudière-Appalaches	Beauce-Sartigan	Saint-Côme-Linière	Régie intermunicipale du comté de Beauce-Sud	695, rang Saint-Joseph, Saint-Côme-Linière (Québec), G0M1J0	active system
12	Chaudière-Appalaches	Bellechasse	Armagh	Regional county municipality of Bellechasse	100, rue Mgr-Bilodeau, Saint-Lazare-de-Bellechasse (Québec), B0R3J0	passive system except for cells 6, 7 and 9, where there is a system passive burning (flares installed at vents)
12	Chaudière-Appalaches	La Nouvelle-Beauce	Frampton	Municipalité régionale de comté de La Nouvelle-Beauce	268, rue d'Assise, bureau 103, Vallée-Jonction (Québec), G0S3J0	active system (registry of offset credit projects) *3
12	Chaudière-Appalaches	La Nouvelle-Beauce	Saint-Lambert-de-Lauzon	Régie intermunicipale de gestion des déchets des Chutes-de-la-Chaudière	1114, rue du Pont, Saint-Lambert-de-Lauzon (Québec), G0S2W0	active system
12	Chaudière-Appalaches	Lotbinière	Saint-Flavien	Regional county municipality of Lotbinière	6375, rue Garneau, Sainte-Croix (Québec), B0S2H0	active system (registry of offset credit projects) *3
14	Lanaudière	Joliette	Saint-Thomas	Dépôt Rive-Nord inc.	670, rue Montcalm, Berthierville (Québec), J0K1A0	active system
14	Lanaudière	Les Moulins	Terrebonne	Complexe Enviro Connections Ltée	135, Queens Plate boulevard, suite 300 Toronto (Ontario), M9W6V1	active system
15	Laurentides	Antoine-Labelle	Mont-Laurier	Régie intermunicipale des déchets de la Lièvre	1064, rue Industrielle, Mont-Laurier (Québec), J9L3V6	passive system
15	Laurentides	Antoine-Labelle	Rivière-Rouge	Régie intermunicipale des déchets de la Rouge	688, ch. du Parc Industriel, C.P. 4669 (BDP Rivière-Rouge), Ville de Rivière-Rouge (Québec), J0T1T0	active system (registry of offset credit projects) *3
15	Laurentides	Argenteuil	Lachute	Régie Intermunicipale Argenteuil Deux-Montagnes	380, rue Principale, Lachute (Québec), J8H1Y2	active system

N° region	Administrative Region	RCM of the site	Municipality of the site	Owner's name	Owner's address	Type of biogas capture
15	Laurentides	La Rivière-du-Nord	Sainte-Sophie	WM Québec inc.	117, Court Wenwort, Brampton (Ontario) L6T 5L4	active system
16	Montérégie	Brome-Missisquoi	Cowansville	Régie intermunicipale d'élimination de déchets solides de Brome-Missisquoi	2500, rang Saint-Joseph, Cowansville (Québec), J2K3G6	active system
16	Montérégie	La Haute-Yamaska	Sainte-Cécile-de-Milton	GFL Environmental inc.	500, 100 NewPark Place, Vaughan (Ontario) L4K0H9	active system
17	Centre-du-Québec	Bécancour	Bécancour	Gestion 3LB *¹	18055, rue Gauthier, Bécancour (Québec), G9H1C1	passive system
17	Centre-du-Québec	Bécancour	Bécancour	Olin Canada ULC *²	675, boul. Alphonse-Deshaies (Québec), G9H2Y8	passive system
17	Centre-du-Québec	Arthabaska	Saint-Rosaire	Société de développement durable d'Arthabaska inc.	330, rue J.-Aurèle-Roux, Victoriaville (Québec), G6T0N5	active system
17	Centre-du-Québec	Drummond	Drummondville	WM Québec inc.	117, Court Wenwort, Brampton (Ontario) L6T 5L4	/ active system

* The City of Montreal's EL is for the exclusive use of the City of Montreal's wastewater treatment plant incinerator ash landfill. *¹ Gestion 3LB's EL is authorized to receive only inorganic residues.

*² The LET of Olin Canada EL is for the exclusive use of the company.

*3 For information on the register of offset credit projects: http://www.environnement.gouv.qc.ca/changements/carbone/credits-compensatoires/registre_creditscompensatoires.htm

Table 8.1 - Total Charges Incurred by Disposal Facility for 2019

Name of the elimination site operator	Type of sites	Total charges paid
EL of the City of Matane	EL	447,300.31 $
EL of the City of Rimouski	EL	765,829.41 $
EL of the City of Rivière-du-Loup	EL	1,026,202.05 $
EL of Dégelis - Régie intermunicipale of Témiscouata waste	EL	242,521.99 $
EL Engineered Landfill of L'Ascension-de-Notre-Seigneur	EL	0.00 $
EL Hébertville-Station - Régie des matières résiduelles du Lac-Saint-Jean	EL	3,063,365.82 $
EL of Chicoutimi - Services Matrec inc. Division Centre technologique AES de Saguenay	EL	0.00 $
Charlevoix-Est RCM EL	EL	194,380.21 $
EL of the City of Québec	EL	384,589.13 $
EL of Neuville- Régie régionale de gestion des matières résiduelles de Portneuf	EL	1,224,610.65 $
EL Champlain - GFL Environmental (Matrec)	EL	3,116,810.29 $
EL of Saint-Étienne-des-Grès the RMM of the Mauricie	EL	3,809,933.47 $
EL of the Régie intermunicipale centre du valorisation des matières résiduelles du-Saint-François and Sherbrooke	EL	1,212,965.23 $
EL of RIGDS of Coaticook	EL	352,043.36 $
EL Rouyn-Noranda (Multitech Environment) 3766063 Canada Inc.)	EL	1,099,977.83 $
EL of the City of Amos	EL	406,224.80 $
EL of the RCM of Vallée-de-l'Or	EL	728,173.87 $
EL of Ragueneau of the Manicouagan RMM	EL	367,472.57 $
EL of the City of Sept-Iles	EL	790,139.89 $
EL of the City of Chibougamau	EL	143,340.62 $

Name of the elimination site operator	Type of sites	Total charges paid
EL of the City of Gaspé	EL	485,187.02 $
Armagh EL	EL	544,423.62 $
EL of Saint-Édouard-de-Frampton	EL	621,826.93 $
EL of the Régie intermunicipale centre du déchets des Chutes-de-la-Chaudière	EL	891,885.97 $
EL of the Régie intermunicipale du comté de Beauce-Sud	EL	559,728.49 $
Lotbinière RCM EL	EL	419,333.93 $
EL Dépôt Rive-Nord	EL	14,796,555.62 $
Enviro Connexions Complex EL	EL	30,678,834.13 $
EL of WM Québec inc. de Sainte-Sophie	EL	22,634,922.87 $
LET de Lachute de la RI Argenteuil / Deux-Montagnes	EL	10,184,835.63 $
EL of RID de la Lièvre	EL	301,533.18 $
EL of RID de la Rouge	EL	786,214.55 $
EL of the Régie intermunicipale centre du matières résiduelles de Brome-Missisquoi (R.I.G.M.R.B.M.)	EL	1,646,395.39 $
EL GFL Environmental (Matrec)	EL	3,465,228.43 $
EL of WM Quebec inc. de Saint-Nicéphore	EL	7,482,257.11 $
Industrial waste landfill site Bécancour - Gestion 3 L B inc.	EL	555,888.72 $
EL Société de développement durable d'Arthabaska (Gesterra)	EL	3,013,580.21 $
EL of the Municipality of Saint- Alphonse	EL	437,672.97 $
EL Olin Canada ULC	EL	46,255.35 $
CDWL Les Entreprises Jean Tremblay et Fils	CDWL	318,176.83 $

Name of the elimination site operator	Type of sites	Total charges paid
CDWL Excavation Dolbeau	CDWL	321,016.51 $
CDWL Léon Lavoie Entrepreneur général inc.	CDWL	0.00 $
CDWL Sable des Forges	CDWL	1,619,994.32 $
CDWL of Pierrefonds-GFL Environmental (Matrec)	CDWL	132,160.65 $
CDWL Thibault Demolition	CDWL	57,795.43 $
CDWL Gestion intégrée de matériaux secs Lanaudière	CDWL	533,197.99 $
CDWL of Sainte-Julienne (2845-5103 Quebec inc.)	CDWL	300,259.05 $
CDWL Recyclage Sainte-Adèle	CDWL	0.00 $
CDWL Sorel-Tracy - Danis Construction	CDWL	0.00 $
CDWL Enfoui-Bec	CDWL	883,429.52 $
Québec City Incinerator	Incinerator	5,835,181.38 $
Montreal Sewage Treatment Plant Incinerator	Incinerator	2,163,212.30 $
Lévis City Incinerator	Incinerator	375,840.06 $
Incinerator Aquacers, Société de gestion du CERS inc.	Incinerator	130,472.85 $
	Total:	**131,599,178.50 $**

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