

Integrated Waste Management Plan

June 2010



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Executive Summary

Background

The Integrated Waste Management Plan process was a holistic approach to assess and decide on the appropriate waste management options for the future for the municipalities represented by the Centre and South Hastings Waste Services Board, a municipal service board operating as Quinte Waste Solutions. It was created by evaluating the environmental, social, and economic factors of waste management and integrating them with municipal planning.

“The urgency to act on these recommendations is paramount and action to implement this plan must begin this calendar year.”-Centre & South Hastings Waste Services Board

In order to identify an appropriate course of action, we needed to review waste categories for trends and the most effective and efficient means of managing them. From there we developed options, determined the best fit and provided solutions that addressed the needs of each of the nine member municipalities. The scope of this Integrated Waste Management Plan focuses on residential Municipal Solid Waste and biosolids.

Where We Are Now

A KPMG report on *Best Practices (2007)* cited Quinte Waste Solutions as an ‘example community’ within its Rural Regional municipal grouping. The *Waste Diversion Ontario DataCall (2008)* substantiated that claim by identifying the 2008 average provincial diversion rate of 42%, and the Rural Regional diversion rate of 36%, whereas this region achieved a higher diversion rate of 43%.

Further, the Provincial average capture rate of all available Blue Box materials was 66% in 2008. Our most recent curbside waste audit in 2007 showed that our single-family residents put 83% of available Blue Box materials in the Blue Box.

Since the start of our diversion program almost 20 years ago, over 31,000 backyard composters have been distributed through municipal sources, further contributing to our already higher than average diversion rate.

Working with our municipal partners, we developed and implemented programs to manage household hazardous waste and waste electronics in the area. In 2009, the equivalent of twenty-four 53’ tractor-trailer loads of waste electronics and another 167 tonnes of household hazardous waste was diverted from landfill. In short, we have maintained an excellent waste diversion program in the area.

Where We Want To Go - Generally

A 2009 report by the Minister of the Environment proposed that our approach to waste diversion should be 'guided by a long-term vision of zero waste'. To support the Minister's vision, while working to achieve our own municipal goals, we should continuously strive to improve our waste diversion program.

Where We Want To Go - Specifically

To this end, the Integrated Waste Management Plan Steering Committee set these targets:

- Increased Diversion based on Waste Diversion Ontario's (WDO) calculations:

Year	% WDO Diversion
2008	43%
2015	50%
2020	57%
2030	60%

- Reduced overall waste produced (waste diverted and waste landfilled) per person per year:

Year	Per Capita Waste Generation (kg/cap)
2008	333
2015	323
2020	317
2030	300

- Much less waste going to landfill in the future if an Energy from Waste solution is implemented such as a facility to convert residual Municipal Solid Waste to fuel:

Year	Landfill Diversion	Waste to Landfill per person (kg/cap/yr)	Waste to Landfill per Household (kg/hhld/yr)
2008	43%	190	388
2015	50%	162	331
2020	85%	48	97
2030	90%	30	61

Defining 'Implementation'

Before discussing recommendations, it is very important to note that although all nine municipalities were committed to the creation of this plan, this does not obligate any of the municipalities to implement any or all of the recommendations. The extent of implementation is at the total and unfettered discretion of each individual municipal Council. Plan implementation does not affect a municipality's relationship to the Centre and South Hastings Waste Services Board, nor does it affect their rights and responsibilities within the Board Agreement.

The term 'implementation' as used in this document implies many important activities will take place, many before a shovel even gets close to breaking ground, including but not limited to:

- Technological and economic due diligence as per Section 6.9
- Retaining a qualified consultant for the preparation of appropriate terms of reference and conducting necessary studies
- Joint municipal Request for Proposal (RFP) by participating municipalities
- Other actions recommended by municipal Councils and staff

How We Could Get Where We Want To Go (Recommendations)

Many possible strategies and technologies listed in Section 6.11, were reviewed and analyzed by the Integrated Waste Management Plan Committees, focus groups and citizens involved in the Integrated Waste Management Planning process. Based on a detailed financial analysis as outlined in Section 8 and Appendix 7, the Integrated Waste Management Plan Steering Committee recommends the following options be moved forward to the implementation stage to achieve our region's waste diversion and reduction targets:

1. Continue with the pre-existing Material Recovery Facility upgrade project involving minor upgrades to improve the facility for the remainder of its existing contract.
2. Apply for a Green Infrastructure Fund grant, which could provide up to two thirds (2/3) of eligible infrastructure costs.
3. Implement curbside collection of Source Separated Organics (Green Bin Program) for single-family homes in Belleville, Prince Edward County and Quinte West. Consider central rotary composting of the collected organic material, and consider co-composting municipal biosolids.
4. Consider, through further study (which may include a joint Request for Proposal by participating municipalities), local Energy from Waste facility options to manage the residual waste that remains after all diversion strategies have been implemented.
5. If required, consider further study (which may include a joint Request for Proposal by participating municipalities), as to whether a publicly owned, enhanced waste transfer station would provide competitive waste solutions, and if it would encourage some diversion of other waste categories not managed in our current programs.



Why We Want To Go There

As detailed in later sections of this document, there is a high probability that implementing these recommendations will help us realize our diversion targets and reduce our waste management costs, simultaneously addressing the three pillars of sustainability:

- Socially acceptable local solution
- Environmentally responsible solution to our waste management needs
- Economically viable as initial financial analysis of possible strategies and technologies suggests cost savings from the current waste management system if the above recommendations are implemented, based on the parameters as outlined in Appendix 7.



Glossary of Acronyms and Terms

Acronym or Term	Definition
Biosolids	Sludge from municipal sewage treatment plants and lagoons
Blue Box Program	Program to recycle packaging and paper (fibre) products
C&D	Construction and Demolition
EPR	Extended Producer Responsibility
hhld	Household
IC&I	Industrial, Commercial and Institutional
IWMP	Integrated Waste Management Plan
kg	kilogram
MOE	Ministry of the Environment
MRF	Material Recovery Facility
MSW	Municipal Solid Waste = Residential waste
MT	Metric tonne = 1000 kilograms = 2204.6 pounds
Per Capita	Per Person
SO	Stewardship Ontario - funding organization for Blue Box Program
Source Separated Organics	Curbside Collected Food Waste
SSO	Source Separated Organics
Ton	2000 pounds
Tonne	MT or metric tonne = 1000 kilograms = 2204.6 pounds
WDO	Waste Diversion Ontario

1 Introduction and Problem Statement

1.1 What Is An Integrated Waste Management Plan?

An Integrated Waste Management Plan (IWMP) is a holistic approach to assess and decide on appropriate waste management options for the future for the municipalities represented by the Centre and South Hastings Waste Services Board. This plan will be achieved by evaluating the environmental, social, and economic factors and integrating them with municipal planning.

This was accomplished by assessing waste categories and trends, developing options, determining the best fit, and providing solutions for the future.

1.2 What Was Followed?

The structure of this Integrated Waste Management Plan document was based on the *Policy Statement on Waste Management Planning: Best Practices for Waste Managers*. See Appendix 1. This policy was published by the Ministry of the Environment (MOE) on June 12, 2007. It was distributed to municipal representatives at a 2007 focus group session. It is not posted on the Ministry of the Environment website, and it is not publicly available.

1.3 Planning Period

The planning period for this Integrated Waste Management Plan is a twenty year period from 2010 to 2030. The baseline data was derived from 2007 to 2009 information.

1.4 Who Was Involved?

- Councils and key staff of each of the nine member municipalities.
- Centre and South Hastings Waste Services Board, comprised of representatives from the nine member municipalities: City of Belleville, Centre Hastings, Madoc, Marmora and Lake, Prince Edward County, City of Quinte West, Stirling-Rawdon, Tweed, and Tyendinaga. The Board administers Quinte Waste Solutions, which on behalf of these municipalities, operates the Blue Box recycling program, Hazardous Waste program, Waste Electric and Electronic Equipment program. It also administers programs and promotion to divert organic materials including food scraps and leaves and brush from landfill. Quinte Waste Solutions also provides recycling services to other Quinte area municipalities including Limerick and Wollaston.
- Quinte Waste Solutions staff including the Integrated Waste Management Plan Coordinator, Donald Scharfe.
- Steering Committee comprised of five representatives from the Centre and South Hastings Waste Services Board and 3 staff from Quinte Waste Solutions.
- Working Committee - Technical and citizen representatives invited from each member municipality plus 2 staff from Quinte Waste Solutions.
- The public was engaged through citizen representatives on the Working Committee, surveys completed at five Public Information Meetings, radio and newspaper advertisements and reports, press releases, and emails from citizens.

1.5 Acknowledgement - Waste Diversion Ontario Continuous Improvement Fund

This Integrated Waste Management Plan was made possible in part by a generous grant from Waste Diversion Ontario and Stewardship Ontario's Continuous Improvement Fund (CIF).

1.6 Disclaimer

This document is the result of a collaborative effort by members of the groups listed in section 1.4.

Drafts were reviewed by these groups to ensure this document broadly represents the majority view of all parties involved.

It does not mean, however, that every member agrees with every word.

Note that although all nine municipalities were committed to the creation of this plan, this does not obligate any of the municipalities to implement any or all of the recommendations. The extent of implementation is at the total discretion of each individual municipal Council. Plan implementation does not affect a municipality's relationship to the Centre and South Hastings Waste Services Board, nor does it affect their rights and responsibilities within the Board Agreement.

1.7 The Development Process

The Integrated Waste Management Plan was developed as follows:

- Introductory presentation to each of the nine member municipalities
- Steering Committee meetings
- Working Committee meetings
- Monthly updates to the Board
- Research of issues and options
- Board and Quinte Waste Solutions staff facilitated focus group meeting
- Municipal facilitated focus group meeting for municipal Councillors, municipal staff, and Working Committee
- Facilitated focus group meeting for Board, Quinte Waste Solutions staff, and Working Committee
- Five Public Information meetings
- Council Briefing Notes in newsletter format
- Occasional press releases
- Board review of Integrated Waste Management Plan outline and draft documents
- Board review and approval of final Integrated Waste Management Plan document
- Council approval and adoption of final Integrated Waste Management Plan document
- Post Integrated Waste Management Plan document on website for public access

1.8 Regulatory Framework

1.8.1 Recycling

General Recycling



Ontario Regulation 101/94 (Recycling and Composting of Municipal Waste) under the Environmental Protection Act states in section 7. (1) that “A local municipality that has a population of at least 5,000 shall establish, operate and maintain a blue box waste management system if the municipality is served by a waste management system owned by or operated by or for the municipality that collects municipal waste or accepts such waste from the public at a waste disposal site.”

Based on population, municipalities in this region that must recycle by law are City of Belleville, Prince Edward County, City of Quinte West, and Tweed. They must recycle all basic blue box materials in Schedule 1 Part I, and at least two supplementary blue box materials in Schedule 1 Part II. Quinte Waste Solutions collects all materials on both lists except textiles in Schedule 1 Part II.

Section 2 (f) of O. Reg. 101/94 states that ‘The blue box waste management system must include reasonable efforts to ensure that the waste collected or accepted is processed and used.’

Section 23.9 of the same regulation states: ‘Waste or materials that result from the processing of waste may not be removed from the site except for direct shipment to a user of the waste or materials, a distributor who distributes such waste or materials to users, another municipal waste recycling site, or a waste disposal site.’

The last statement requires clarification in case it leaves the impression that this region could plan to send recyclables to landfill or an Energy from Waste facility with the blessing of the Ministry of the Environment. This clarification is available in A Guide to Approvals for Recycling Sites, Leaf and Yard Waste Composting Sites and Compost Use, PIBS 2477.

Section 3.3.9 of that guide states that it is expected that materials produced by the Municipal Waste Recycling Site are shipped to where the material will be used such as a manufacturer or broker. Recyclable materials can be shipped to another Municipal Waste Recycling Site for further processing. The materials are allowed to be shipped to an approved waste disposal site because some of these sites are able to process waste for recycling.

The Guide also states that the material can be sent to a landfill or incinerator for disposal ‘only under very exceptional circumstances.’ The Guide lists some examples of when this might happen, but further states: ‘Before the site directs the waste to a landfill all attempts should be made to locate alternative users or recycling sites.’

Multi-residential Recycling

Ontario Regulation 103/94 (Industrial, Commercial and Institutional Source Separation Programs), Section 10 regulates recycling in multi-residential buildings. Section 10 states that the owner of a building that contains six or more dwelling units shall implement a source separation program for the waste generated, if the building is located in a municipality with a population of at least 5,000 residents.



1.8.2 Waste Diversion Act, 2002

Recycling is also regulated under The Waste Diversion Act, 2002.

Section 1 of the Waste Diversion Act, 2002 states the purpose of the Act is 'to promote the reduction, reuse and recycling of waste and to provide for the development, implementation and operation of waste diversion programs.' Section 23.(1) states that 'the Minister may require Waste Diversion Ontario to develop a waste diversion program for a designated waste.'

Section 25.(5) states that municipalities are to be reimbursed 50% of the net costs incurred by the municipalities as a result of the blue box program. Ontario Regulation 273/02 Blue Box Waste under the Waste Diversion Act states in Section 1 that Glass, Metal, Paper, Plastic, and Textiles are prescribed as blue box materials. Section 2 of O. Reg. 273/02 designates Stewardship Ontario as the industry funding organization for the blue box waste diversion program. Each year a record of weights and costs of recycling and residual waste is submitted to Stewardship Ontario in the Generally Accepted Practices (GAP) DataCall submission in order to maximize recycling program payments.

The Act includes the designation of Stewards that pay fees to fund diversion programs including Blue Box materials, Household Hazardous and Special Waste, Waste Electrical and Electronic Equipment, and Used Tires. This is referred to as extended producer responsibility (EPR).

The Ministry of the Environment is planning to revise the Waste Diversion Act. The most significant proposed change is 100% Extended Producer Responsibility (EPR) for Blue Box materials. The projection is that eventually the Stewards will take over the operation of the Blue Box system and phase in regional collection and large regional Material Recovery Facilities. Our strategy is to keep our MRF operating as efficiently as possible until this happens. See Appendix 3 for the Minister's Message and Executive Summary from the *Minister's Report on the Waste Diversion Act 2002 Review, October 2009*.

1.8.3 Biosolids Management

The term 'biosolids' refers to sewage biosolids from municipal sewage treatment plants and sewage biosolids from municipal sewage lagoons.

Land Spreading Biosolids

The Ministry of the Environment website refers to sewage biosolids that are spread on agricultural land as non-agricultural source materials (NASM). The website goes on to state that NASM land application standards and requirements are

enforceable under the Nutrient Management Act and if an adverse effect occurs or may occur, the Environmental Protection Act or the Ontario Water Resources Act may also apply.

The regulation of biosolids was updated September 18, 2009. Generators of NASM are regulated under the Environmental Protection Act and Regulation 347 until the material arrives at the farmer's gate where it becomes subject to the Nutrient Management Act, 2002 and Regulation 267/03.

Since the land spreading of sewage biosolids is controlled provincially, it is possible for biosolids from one municipality to be spread on approved land in another municipality.

Composting Biosolids

Requirements for composting are listed in the Ministry of the Environment's Interim Guidelines for the Production and use of Aerobic Compost in Ontario, PIBS 1749-01 dated 1991. Under these guidelines, the inclusion of biosolids was nearly impossible for municipalities due to very restrictive metal levels for the compost feedstock. Any resulting compost including biosolids would be controlled just as strictly as the original biosolids.

The Ministry of the Environment issued a proposed Guideline for Composting Facilities and Compost Use in Ontario dated November 2009 for consultation until January 2010. It introduces higher allowable feedstock metal levels and three categories of finished compost (Categories AA, A, and B). If the Guideline is finalized without changes, there is a much higher probability of co-composting biosolids if desired. Thorough testing for metals would be required to determine the acceptable level of dilution with low-metal feedstocks. At best, compost produced with biosolids has the potential of meeting the requirements of the middle category of compost, Category A, involving some labeling and usage restrictions. If the compost falls into Category B, its use would be controlled just as strictly as the original biosolids.

1.8.4 Leaf & Yard Waste Management

Section 11.(1) of Ontario Regulation 101/94 (Recycling and Composting of Municipal Waste) under the Environmental Protection Act states 'a local municipality that has a population of at least 5,000 shall establish, operate and maintain a leaf and yard waste system.' This system includes 'the provision of home composters to residents by the municipality at cost or less, the provision of information to residents, publicizing the availability of home composters, explaining the proper installation and use of home composters and the use of compost, and encouraging home composting.'

Section 1. (1) of Ontario Regulation 101/94 states that 'leaf and yard waste includes waste consisting of natural Christmas trees and other plant materials but not tree limbs or other woody materials in excess of 7 centimetres in diameter.' Pumpkins are not specifically mentioned in this regulation.

Assuming a 2% per year population growth rate, Belleville and Quinte West could reach populations of at least 50,000 during the planning period to 2030. In that case, they will come under the requirements of Section 12 of Ontario Regulation 101/94 that 'the leaf and yard waste system must include the collection or acceptance of

leaf and yard waste in a manner that is reasonably convenient to the generators of leaf and yard waste in the municipality.'

Section 13 of Ontario Regulation 101/94 states that if a municipality has a population above 50,000 or already collects or accepts source separated leaf and yard waste beyond Christmas trees, the waste must be either applied directly to land, transported to be applied directly to land, composted, or transported to be composted.

Burning of clean wood and brush is allowed at some member municipality landfills under conditions specified in their Certificates of Approval (C of A) in accordance with Ministry of the Environment Guideline C-7 (Burning at Landfill Sites - April 1994). In the event of any future expansion of landfills, Section 22.(2) of Ontario Regulation 232/98, which applies to new or expanding sites larger than 40,000 cubic metres, allows the burning of clean wood and brush during daylight hours under controlled and supervised conditions in a segregated portion of the site.

1.8.5 Food Waste Composting

At this time, there is no Ontario provincial legislation banning food waste from landfill, or making composting of food waste mandatory.

If a municipality chooses to implement curbside collection of Source Separated Organics (SSO), the central composting facility and testing of feedstock and resulting compost are currently regulated by the Ministry of the Environment's Interim Guidelines for the Production and use of Aerobic Compost in Ontario, PIBS 1749-01 updated November 2004.



The Ministry of the Environment recently issued a proposed Guideline for Composting Facilities and Compost Use in Ontario dated November 2009 for consultation until January 2010. It introduces higher allowable feedstock metal levels and three categories of compost (Categories AA, A, and B). As mentioned in the Biosolids Management section, this proposed guideline creates an opportunity to co-compost food waste with biosolids if desired, to produce a Category A compost as long as metal levels and mixing ratios are carefully controlled.

1.8.6 Waste Management Facility Approvals

This Integrated Waste Management Plan could involve the construction of new waste management facilities like a transfer station, composting facility, or Energy from Waste facility. These may require approval under the Environmental Assessment Act (EAA) and Section 27 of the Environmental Protection Act (EPA), as well as approval under Section 9 of the EPA (air & noise) and/or Section 53 of the OWRA (sewage works). Approval may also be required from other Ontario ministries, federal and municipal governments.

The main provincial legislation that applies to new waste management facilities:

- The Environmental Assessment Act, (EAA)
- Ontario Regulation 101/07 under EAA - Waste Management Projects
- The Environmental Protection Act, (EPA)
- The Ontario Water Resources Act, (OWRA)
- The Consolidated Hearings Act, 1990

Other legislation that may be involved are the Environmental Bill of Rights, Ontario Municipal Board Act, the Planning Act, the Expropriations Act, the Conservation Authorities Act, and the federal Fertilizers Act.

The 'Publications' section of the Ministry of the Environment's website at www.ene.gov.on.ca has several guidelines and application forms to obtain the appropriate approvals, including but not limited to:

- Guide for Applying for Approval of Waste Disposal Sites, June 2009, PIBS 4183e
- Guide to Environmental Assessment Requirements for Waste Management Projects, PIBS 6168e
- Preparing and Reviewing Environmental Assessments in Ontario, October 2009, PIBS 7258e
- Guide for Applying For Approval of Waste Management Systems, November 1999, PIBS 4185e
- Interim Guidelines for the Production and Use of Aerobic Compost in Ontario, Nov 2004, PIBS 1749e01
- A Guide to Approvals for Recycling Sites, Leaf and Yard Waste Composting Sites and Compost Use, PIBS 2477e
- Guide to Applying for Approval (Air & Noise) s.9 EPA, November 2005, PIBS 4174e
- The Requirements of the Environmental Bill of Rights for Prescribed Instruments, November 1994, PIBS 3323e

1.8.7 Industrial, Commercial, & Institutional (IC&I)

The management of Industrial, Commercial & Institutional (IC&I) and Construction & Demolition (C&D) waste is not within the scope of this Integrated Waste Management Plan. However, in an October 2009 report, the Minister of the Environment states that waste from the Industrial, Commercial and Institutional sector accounts for 60% of Ontario's waste. In other words, the Industrial, Commercial and Institutional sector generates at least one and a half times as much waste as the residential sector (A weight ratio of 1.5 to 1).

The waste reduction and diversion regulations that apply to the Industrial, Commercial and Institutional sector are:

- Ontario Regulation 102/94: Waste Audits and Waste Reduction Workplans
- Ontario Regulation 103/94: Industrial, Commercial and Institutional Source Separation Programs
- Ontario Regulation 104/94: Packaging Audits and Packaging Reduction Workplans

The Ministry of the Environment created guides to assist the Industrial, Commercial and Institutional sector meet the requirements of these regulations to reduce waste going to landfill:

- A Guide to Waste Audits and Reduction Workplans for Industrial, Commercial and Institutional Sectors as Required under Ontario Regulation 102/94, PIBS 2480e01

- A Guide to Source Separation of Recyclable Materials for Industrial, Commercial and Institutional Sectors and Multi-Unit Residential Buildings as Required under Ontario Regulation 103/94, PIBS 2478e01
- A Guide to Waste Audits and Waste Reduction Work Plans For Construction & Demolition Projects as Required under Ontario Regulation 102/94, PIBS 2481e01
- A Guide to Packaging Audits and Reduction Workplans, PIBS 2482e
- In a report released October 2009 titled *The Role of Waste Diversion in the Green Economy, Minister's Report on the Waste Diversion Act 2002 Review*, the Industrial, Commercial and Institutional sector may be included in future extended producer responsibility (EPR) waste diversion initiatives. It should be noted that if that portion of Industrial, Commercial and Institutional waste that is divertible was, it would strain existing systems.

1.9 The Common Problems

All nine member municipalities have common waste management problems, some more pressing than others:

- Landfill Capacity and Lifespan - Limited or None
- Improving Blue Box material capture rate
- Sewage biosolids from municipal sewage treatment plants or municipal sewage lagoons
- Rural septage
- Food waste
- Large and Bulky goods like mattresses and sofas have a low packing density in landfills and should be diverted
- Construction and Demolition (C&D) waste projected to increase due to aging buildings and vinyl siding reaching end of life and could be diverted
- Industrial, Commercial, & Institutional (IC&I) waste could be diverted
- Leaf, yard, and wood waste
- Household Hazardous Waste
- Waste Electrical and Electronic Equipment including televisions
- White Goods
- Tires
- Tight waste management budgets
- Growing population puts more pressure on existing waste management systems

According to waste audits performed in 2007, 42% of residential single family curbside waste in this region was recycled through the Blue Box program. Waste Diversion Ontario (WDO) figures for 2008 indicate the overall waste diversion from landfill for this region was 43%.

These regional recycling figures compare well to the 2008 Waste Diversion Ontario DataCall 'Rural Regional' municipal grouping average of 35.57% and the 2008 Waste Diversion Ontario DataCall provincial average of 42%. See Appendix 2. These figures also compare well to the 2007 provincial average residential diversion rate of 39% reported in the 2007 Waste Diversion Ontario DataCall and the October 2009 Minister's Report on the Waste Diversion Act 2002 Review titled "From Waste to Worth: The Role of Waste Diversion in the Green Economy." See Appendix 3.

In that same report, the Minister of the Environment proposes that 'we must continue to build on our commitment to the environment and our past successes in waste diversion to do even better.' The Minister goes on to propose that 'our long-term goal is a zero waste society' and our approach to waste diversion should be 'guided by a long-term vision of zero waste.' Therefore, to be consistent with the Minister's proposals, this region should strive for continuous improvement of its waste diversion systems.

1.10 Municipality-Specific Problems



1.10.1 City of Belleville

- The City of Belleville, the largest of the nine member municipalities, lacks a landfill with sufficient capacity to handle their residential garbage. Their garbage from the urban area currently goes to a privately owned transfer station in Quinte West and is shipped out of the region for disposal at a substantial cost, including contributing to greenhouse gas production due to long trucking distances. Increasing waste diversion will reduce disposal costs, and greenhouse gas production.
- The Thurlow ward landfill, for rural area garbage is filling up rapidly. It has an estimated lifespan of eight (8) years. Extending the landfill lifespan through 'mining' is being considered. The social, economic and environmental factors of landfill mining will require scrutiny. No commitment has been made to this, but there are cost favorable options available to extend the life of the Thurlow landfill.
- Approximately 40% of garbage may be food waste according to 2007 waste audits
- The City of Belleville has one sewage treatment plant that generates biosolids. Their liquid biosolids are land spread, often on land of farmers in other municipalities in accordance with all legislation
- Rural septage.
- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items.
- Blue Box material capture rate
- No scale at Thurlow ward landfill



1.10.2 Municipality of Centre Hastings

- Centre Hastings shares the landfill it owns with the Township of Madoc. The landfill has an estimated lifespan of over 50 years.
- Approximately 40% of garbage may be food waste according to 2007 waste audits
- Rural septage. Private contractors have their own disposal sites. In winter they are allowed to dump into the municipal lagoon on a limited basis.
- Municipal lagoon biosolids management. The lagoon has not been dredged, and is not expected to be for the next 5 years. Dredging may be necessary at some point before 2030.
- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items
- Blue Box material capture rate
- No scale at landfill



1.10.3 Township of Madoc

- The Township of Madoc shares a landfill that is owned by Centre Hastings. The landfill has an estimated lifespan of over 50 years.
- Approximately 40% of garbage may be food waste according to 2007 waste audits
- Rural septage
- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items
- Blue Box material capture rate
- No scale at landfill



1.10.4 Municipality of Marmora and Lake

- Marmora and Lake's landfill has an estimated lifespan of 12-15 years. It is possible this will be extended to 20-25 years depending on the result of discussions with the Ministry of the Environment.
- Approximately 40% of garbage may be food waste according to 2007 waste audits
- Rural septage
- Sewage treatment plant biosolids management. The biosolids have elevated copper levels, but are currently approved for land spreading on provincially approved land in accordance with all legislation.

- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items
- Blue Box material capture rate
- No scale at landfill

1.10.5 Prince Edward County



- Prince Edward County is the third largest of the nine member municipalities and has the most diverse system for handling their residential garbage. The waste generated in Prince Edward County goes to four landfills and three transfer stations. The waste collected at the transfer stations accounts for over half of the waste generated in Prince Edward County. The waste from the transfer stations is consolidated at a privately owned transfer station in Quinte West and shipped out of the region for disposal at a substantial cost, including contributing to greenhouse gas production due to long trucking distances. Increasing waste diversion will reduce disposal costs, and greenhouse gas production.
- Estimated landfill lifespans are 40 years for Ameliasburgh, 11 years for Wellington, 40 years for Hillier, and 10 years for South Marysburgh
- Approximately 40% of garbage may be food waste according to 2007 waste audits
- Prince Edward County has two sewage treatment plants that generate biosolids. Although approved and tightly controlled by the Ministry of the Environment, the practice of land spreading of sewage biosolids is becoming out-of-favour in many jurisdictions around the world. In fact, the Prince Edward County Council banned the land spreading of Prince Edward County biosolids. In 2009, approximately 1,276 tonnes of biosolids at 20-25% solids, were shipped out of the region to landfill at a substantial cost. Therefore, alternatives to Biosolids land spreading and landfilling are desired by Prince Edward County.
- Rural septage
- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items
- Blue Box material capture rate
- No scales at landfills

1.10.6 City of Quinte West



- The City of Quinte West, the second largest of the nine member municipalities, lacks a landfill with sufficient capacity to handle their residential garbage. Their garbage currently goes to a privately owned transfer station and is shipped out of the region for disposal at a substantial cost, including contributing to greenhouse gas production due to long trucking distances. Increasing waste diversion will reduce disposal costs, and greenhouse gas production.
- Approximately 40% of garbage may be food waste according to 2007 waste audits

- The City of Quinte West has three sewage treatment plants that generate biosolids. Their liquid biosolids are land spread, often on land of farmers in other municipalities in accordance with all legislation. They are moving towards dewatering the biosolids before spreading.
- Rural septage
- The Frankford landfill has an estimated lifespan of fifteen (15) years
- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items
- Blue Box material capture rate
- No scale at rural ward landfill



1.10.7 Township of Stirling-Rawdon

- The Springbrook landfill's lifespan has been extended to an estimated twenty (20) years due to recent landfill 'mining'
- The Stirling landfill has an estimated lifespan of six (6) to seven (7) years. Stirling-Rawdon is considering extended the landfill lifespan through 'mining'. The social, economic, and environmental factors of landfill mining will require scrutiny.
- Approximately 40% of garbage may be food waste according to 2007 waste audits
- Rural septage. Rural Septage is picked up by local haulers and taken to where their certificates of approval allow them to discharge
- Municipal lagoon biosolids management. Stirling has two lagoon cells and a wetland system. The wetland system is a pilot project with the Ministry. At the time of writing this report, they are removing sludge from the North lagoon cell. This sludge is being land spread on provincially approved land in accordance with all legislation. The South lagoon cell has not been emptied for many years.
- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items
- Blue Box material capture rate
- No scales at landfills



1.10.8 Municipality of Tweed

- Tweed's landfill has an estimated lifespan of sixteen (16) to eighteen (18) years
- Approximately 40% of garbage may be food waste according to 2007 waste audits

- Rural septage
- Municipal lagoon biosolids management
- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items
- Blue Box material capture rate
- No scale at landfill

1.10.9 Township of Tyendinaga



- The landfill site in the Township of Tyendinaga has been converted to a transfer station, and therefore does not dispose of waste on site. The waste generated in the Township of Tyendinaga goes to their transfer station and is shipped out of the region.
- Approximately 40% of garbage may be food waste according to 2007 waste audits
- Rural septage
- Industrial, Commercial and Institutional and Construction & Demolition waste
- Large and Bulky items
- Blue Box material capture rate

1.11 Scope of Integrated Waste Management Plan

Although other wastes are mentioned such as Industrial, Commercial & Institutional and Construction & Demolition, the scope of this Integrated Waste Management Plan is Municipal Solid Waste (MSW) and biosolids that are not currently covered by a Nutrient Management Strategy. In other words, as recommended in the guiding *Policy Statement on Waste Management Planning (2007)*, although all biosolids were considered, the main biosolids scope is the biosolids that are landfilled.

2 **Goals and Objectives**

2.1 **Background**

Ministry of the Environment Goals

In 1991, the Ontario Ministry of the Environment (MOE) set a goal of 50% reduction of waste to landfill by the year 2000 compared to 1987 levels.

In 2004, the Ministry of the Environment set a provincial goal of 60% diversion from landfill by 2008.

In a 2009 report, the Minister of the Environment proposed that 'our long-term goal is a zero waste society' and our approach to waste diversion should be 'guided by a long-term vision of zero waste.' Therefore, to be consistent with the Minister's proposals, we should strive for continuous improvement of our waste diversion systems.

Waste Diversion Ontario (WDO) Diversion Rates

Our Stewardship Ontario 2007 waste audits based on curbside collection indicated an average diversion rate of 42% for Single Family dwellings, and 24% for Multi-Family dwellings. The 2007 Waste Diversion Ontario DataCall indicated a diversion rate of 35.55%. The discrepancy between the 42% waste audit figure and the 35.55% Waste Diversion Ontario figure is a function of the Waste Diversion Ontario's GAP (Generally Accepted Practices) definitions, measurements, estimates, and assumptions. It is also affected by no scales at many of the landfills in the region, requiring estimated residual waste disposal weights for the Waste Diversion Ontario DataCall.

The 2008 Waste Diversion Ontario DataCall (Appendix 2) indicated a diversion rate of 43.09%. This is comparable to the 42% from the 2007 waste audit. There are no 2008 waste audits to compare this to.

In our 2008 Waste Diversion Ontario DataCall 'Rural Regional' municipal grouping, Quinte Waste Solutions is second only to the Restructured County of Oxford which achieved 43.46% total residential diversion rate. At 43.09%, Quinte Waste Solutions is above the 2008 Waste Diversion Ontario DataCall provincial average of 42%.

Note that the Ministry of the Environment and Waste Diversion Ontario do not count waste that is sent to an Energy from Waste facility as diversion in the Waste Diversion Ontario DataCall. The Ministry of the Environment is developing its definition of 'material recovered and preserved' as it relates to thermal processes. In the future, it's possible that the ash or slag from an Energy from Waste facility, if it is used in a beneficial way, might be counted as diversion by Waste Diversion Ontario.

The *Blue Box Program Enhancement and Best Practices Assessment Project by KPMG Final Report Volume II, July 6, 2007* selected Quinte Waste Solutions as the Analog Community for the 'Rural Regional' municipal grouping. The excerpt of this report in Appendix 4 confirmed this region uses many Best Practices to achieve low cost and high Blue Box material recovery levels.

As other communities improve their diversion programs, this region will need to continuously improve its programs as well.

When developing Waste Diversion Ontario Diversion targets, it was noted that on average, municipalities that had curbside Source Separated Organics programs reported a 2008 DataCall 'Residential Organics Diverted Percent' that was approximately 14 percentage points higher than reported by this region. Adding the extra 14 percentage points to the current 43% results in approximately 57% overall diversion rate if an organics program is implemented. When setting the targets, the program was given time to mature to reach this level of diversion. It was then assumed that further diversion efforts would be successful to achieve 60% by 2030.

Per Capita Total Waste Generation

The Minister of the Environment promoted the adoption of the Zero Waste philosophy in "Toward a Zero Waste Future: Review of Ontario's Waste Diversion Act, 2002" dated October 2008. The Minister stated that resources should be looked at cradle-to-cradle rather than cradle-to-grave. The belief that waste is inevitable should be challenged by focusing on Reduction through "Design for Environment", Extended Producer Responsibility, and changing consumer buying habits through education.

The 2007 Waste Diversion Ontario DataCall indicated that the per capita (per person) total residential waste generated (waste diverted + waste disposed) was 383.30 kg/cap for this region. Comparing this figure from year to year can be used as an indicator to gauge effectiveness of Reduction and Reuse initiatives, which can be difficult to measure directly. The 2008 Waste Diversion Ontario DataCall indicated the per capita total residential waste generated was 333.19 kg/cap for this region, a 13% reduction compared to 2007.

Over the next 20 years, residents will likely be exposed to more and more 'Zero Waste' and 'Waste Reduction' messages. The Stewards are likely to introduce changes to packaging that will reduce waste production per capita. Performing some calculations of the Waste Diversion Ontario DataCall shows that the provincial average 'Total Waste Generated Per Capita' in 2006 was 397 kg/cap and in 2008 it was 387 kg/cap, which is a slightly downward trend.

Further Landfilled Waste Diversion Due to Energy from Waste

After maximizing diversion, Recovery of Energy or thermal treatment options like an Energy from Waste facility may be implemented to further divert residual waste from landfill. Most Energy from Waste facilities will create a residual ash or slag that may require disposal. This residue can be 10% to 30% of the weight of the incoming waste, which means that the weight of residual waste to landfill could be reduced by 70% to 90% in addition to reductions from other diversion efforts.



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It's worth repeating in this section that the Ministry of the Environment and Waste Diversion Ontario do not count waste that is sent for 'thermal treatment' as diversion in the Waste Diversion Ontario DataCall. The Ministry of the Environment is developing its definition of 'material recovered and preserved' as it relates to thermal processes. In the future, it's possible that the ash or slag, if it is used in a beneficial way, might be counted as diversion by Waste Diversion Ontario. Finding a beneficial use for the ash or slag will have the advantage of further reducing landfilled waste even if it doesn't count as diversion by the Waste Diversion Ontario.





2.2 Waste Diversion Ontario Diversion Rate Targets

Goal: Increase our Waste Diversion Ontario Diversion Rates above 2008 levels.

Table 1: Target Waste Diversion Ontario DataCall diversion rates

Year	% WDO Diversion
2008	43%
2015	50%
2020	57%
2030	60%

2.3 Per Capita Total Waste Generation Reduction Targets

Goal: Reduce per capita waste generation from 333.19 kg/cap reported in 2008.

Definitions: Waste Generation = Waste Diverted + Waste Disposed.
Per Capita = Per person = Per resident

Table 2: Target per capita overall waste generation

Year	Per Capita Waste Generation (kg/cap)
2008	333
2015	323
2020	317
2030	300



2.4 Waste to Landfill Diversion Targets with Recovery of Energy

Goal: Further reduce waste to landfill by processing residual waste in an Energy from Waste facility or Waste Derived Fuel facility.

Table 3: Target waste to landfill diversion, assuming Recovery of Energy

Year	Landfill Diversion	Waste to Landfill per person (kg/cap/yr)	Waste to Landfill per Household (kg/hhld/yr)
2008	43%	190	388
2015	50%	162	331
2020	85%	48	97
2030	90%	30	61

Calculation Clarification

Waste to landfill per capita = waste generation per capita x % Disposed

Where % Disposed = $(100 - \% \text{Diversion}) / 100$

Examples:

For 2008, Waste to landfill per capita

$$= 333 \text{ kg/cap} \times (100 - 43.09) / 100$$

$$= 333 \text{ kg/cap} \times 0.5691$$

$$= 189.51 \text{ kg/cap/yr to landfill}$$

$$= 190 \text{ kg/cap/yr to landfill}$$

For 2030, Waste to landfill per capita

$$= 300 \text{ kg/cap} \times (100 - 90) / 100$$

$$= 30 \text{ kg/cap/yr to landfill}$$

Waste to landfill per household = waste to landfill per capita x people per household

Example:

For 2008, Waste to landfill per household

$$= 189.51 \text{ kg/cap} \times 2.0474 \text{ people/hhld}$$

$$= 388 \text{ kg/hhld/yr to landfill}$$

3 **Geographical Area**

The geographical area for the Integrated Waste Management Plan includes the nine member municipalities of the Centre and South Hastings Waste Services Board: Belleville, Centre Hastings, Madoc, Marmora and Lake, Prince Edward County, Quinte West, Stirling-Rawdon, Tweed, and Tyendinaga. See Figure 1.

Municipalities in this area have agreed to a cooperative approach and are committed to the creation of this plan. To foster this cooperation, the municipalities were asked for input at all stages of the process. They were updated through regular Briefing Notes, and copies of Steering Committee, Working Committee and focus group meeting notes. They reviewed the Integrated Waste Management Plan at several stages of development.

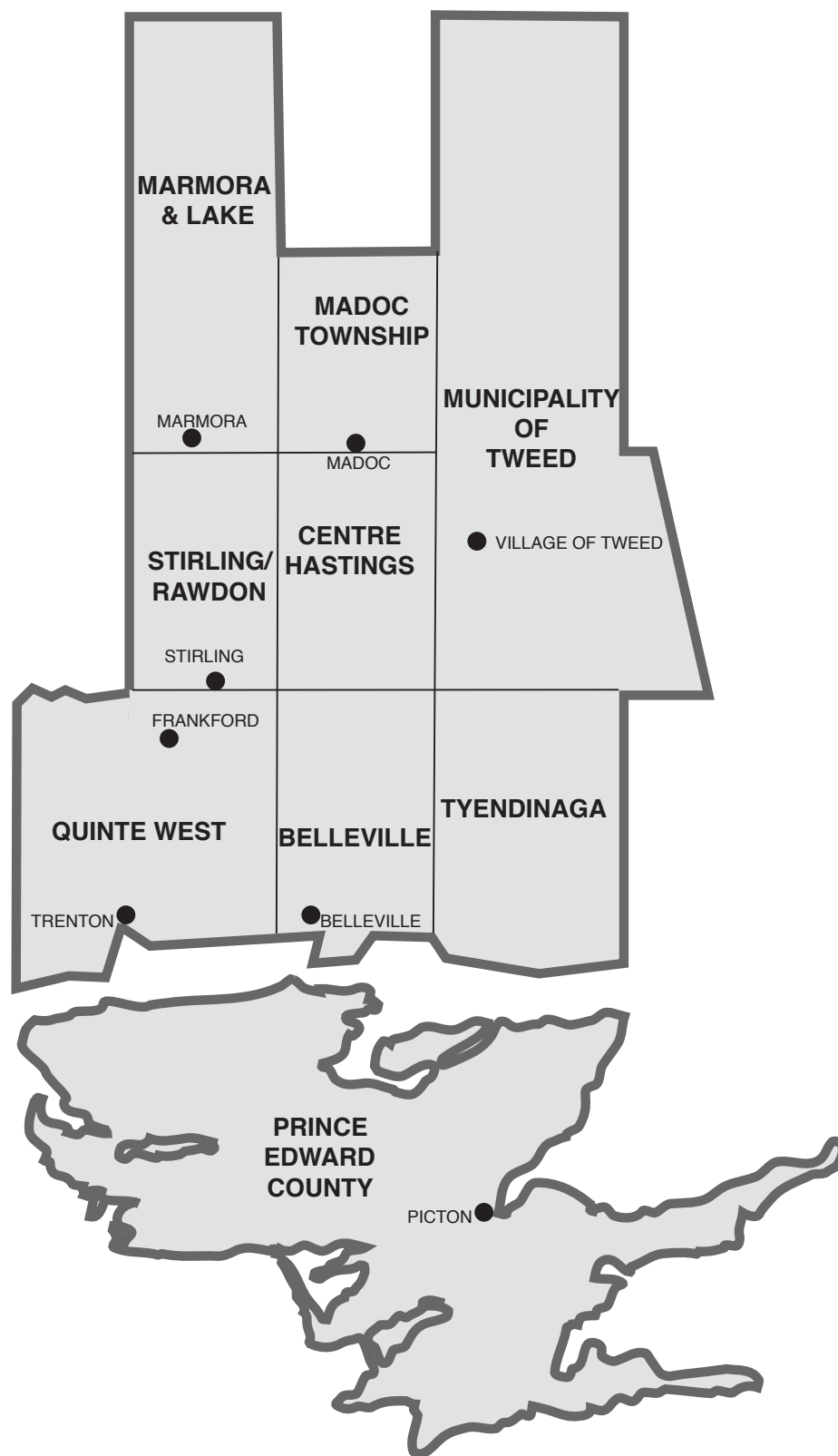
As mentioned in section 1.6, although all nine municipalities were committed to the creation of this plan, this does not obligate any of the municipalities to implement any or all of the recommendations. The extent of implementation is at the total discretion of each individual municipal Council. Plan implementation does not affect a municipality's relationship to the Centre and South Hastings Waste Services Board, nor does it affect their rights and responsibilities within the Board Agreement.

To address the specific needs of all member municipalities, this Integrated Waste Management Plan is structured as an integrated document, and has a section for issues or exceptions that are specific to each municipality.

A larger geographical area is being considered for some possible processes like a Regional Compost Facility, Recovery of Energy (e.g. energy from waste, waste derived fuel), Regional Steward-Run MRF, etc. Cooperation could extend to neighbouring municipalities such as Napanee, Kingston, Northumberland, County of Peterborough, City of Peterborough, Kawartha Lakes and Perth. Cooperation among neighbouring municipalities is discussed in Regional Waste Manager Meetings attended by the General Manager of Quinte Waste Solutions.

To keep a possible Recovery of Energy facility running at full capacity, it could be considered as a possibility to extend the geographical area for sources of residual waste to Industrial, Commercial and Institutional sources in Toronto.

Figure 1: Geographical Area



4 Current Waste Generation Trends, Waste Management Practices & Systems

4.1 Waste Generation Trends

Table 4 is a summary of current waste generation.

Table 4 also includes projections for number of households and waste generation up to 2030, which will be discussed in more detail in section 5.

Total residential waste disposed in 2008 was 24,665 tonnes based on the estimates that were submitted to the Waste Diversion Ontario DataCall. Note that due to Waste Diversion Ontario assumptions and calculations, in the published 2008 Waste Diversion Ontario DataCall report, the waste disposed was shown as 25,047 tonnes.

There were approximately 10,000 tonnes of biosolids generated from sewage treatment plants in 2008 according to minutes from a presentation by the Quinte Waste Solutions' Composting Coordinator at an August 11, 2008 Quinte Organics Diversion Committee meeting. This weight is based on the biosolids being dewatered to 25% solids. As mentioned in Section 1.10, Belleville, Marmora and Lake, Prince Edward County, and Quinte West generate biosolids from sewage treatment plants. Occasionally, biosolids are generated from municipal sewage lagoons in Centre Hastings, Stirling-Rawdon, and Tweed.

The least expensive method of dealing with biosolids is land spreading on provincially approved land under a Nutrient Management Strategy. Most municipalities, except one, land spread their biosolids. Prince Edward County decided to stop land spreading its biosolids. Therefore, in 2009, Prince Edward County sent 1,276 tonnes of dewatered biosolids to a landfill outside the region. In a September 28, 2009 Integrated Waste Management Plan focus group meeting, the consensus on biosolids management was that the municipalities allow provincial legislation to set the operating standard. At this time, all municipalities except Prince Edward County planned to continue the most cost effective Ministry of the Environment approved practice of land spreading on provincially approved land until provincial legislation changes dictate a procedural review. The municipalities also plan to watch for emerging technology for biosolids management.

The 2008 Waste Diversion Ontario DataCall reported that this region diverted 43.09% of its waste from landfill. The DataCall reported 13,040 tonnes of Blue Box material diverted from landfill in 2008 based on quantity marketed. Quinte Waste Solutions' records indicate 13,591 tonnes of Blue Box material were collected in the region in 2008.

Table 5 summarizes the 2008 DataCall figures for percentage and tonnes of waste diverted and disposed for this region. Note that it does not include the weight of Waste Electrical and Electronic Equipment that was diverted from landfill.

Table 6 shows that 9,347 tonnes, or 38%, of waste is disposed in local landfills. The other 15,318 tonnes, or 62%, of waste is processed through transfer stations for disposal outside the region.

Table 7 is a summary of the 2007 single family and 2006 multi-family curbside waste audits for this region. The summary was provided by John Dixie of Stewardship Ontario. It shows that the capture rate of available Blue Box material and Blue Box diversion rate is higher for single family households than multi-family households consisting of 6 units or more. The Minister of the Environment and Waste Diversion Ontario set a goal of achieving a 70% Blue Box capture rate by December 31, 2011. This region is above this target with a weighted average Blue Box capture rate of 82%.

Table 8 is a summary from 2004 to 2009 of the member municipality Blue Box material tonnages.

Figure 2 is a detailed residual waste composition chart prepared by Bob Argue from 2001 waste audit data. Compostable food waste organic material makes up at least 40% of the residual waste sent for disposal. The 2007 curbside waste audits confirm that compostable organic material is still as large a proportion of the residual waste. Table 9 provides the weights of each waste category from the 2001 waste audit. It also shows the weight of each category that can be composted in a central facility, including fibre (paper) material. Anything that is backyard compostable can be composted in a central composting facility. Central composting can handle additional material that can't be put in a backyard composter like milk, fat, bones, meat and fish.

Table 4: Waste Summary by Municipality for 2008 to 2030

Municipality	Households	Waste MT/yr	Food Waste Portion (MT/yr)	Waste Minus Food Waste (MT/yr)	Waste (MT/day)	Waste Minus All Food Waste (MT/day)	Food Waste (MT/day)	Leaf & Yard (MT/Yr)	Biosolids (25%) (MT/yr)	Biosolids (MT/day)
Belleville (incl Thurlow)	20,998	7,605	3,042	4,563	21	13	8	~3562	4,800*	13
Quinte West (incl Frankford)	17,402	5,730	2,292	3,438	16	9	6	Burned/landfill	3,724*	10
Prince Edward County	12,250	6,594	2,637	3,956	18	11	7	Burned/landfilled	1,276	4
Tvendingaga	1,480	255	102	153	1	0	0	Not Accepted	0	0
Stirling-Rawdon	2,005	791	317	475	2	1	1	Landfilled	Lagoon	0
Marmora	2,559	1,032	413	619	3	2	1	Burned/Landfilled	200*	<1
Tweed	2,932	1,157	463	694	3	2	1	Landfilled	Lagoon	0
Centre Hastings	1,902	1,019	408	611	3	2	1	Burned	Lagoon	0
Madoc	898	481	192	289	1	1	1	Burned	0	0
2008 Totals	62,426	24,665	9,866	14,799	68	41	27	3,562	10,000	27
2030 Projections (2% pa)	93,129	36,795	14,718	22,077	101	60	40	5,314	14,918	41

Most figures are from the 2008 WDO DataCall Submission

Thurlow's waste estimated from Belleville's MT/hhld figure

PEC from 2008 WDO DataCall including 2630 MT from unscaled landfills per DataCall comments

J. Lackie April 2009 Transfer Station Report, page 6 estimated 4533 tonnes waste from 11486 households in the smaller municipalities = 0.395 tonnes/hhld

Stirling-Rawdon Figure estimated using MT/hhld estimate from John Lackie April 2009 Transfer Station Report - page 6 (2005 hhlds x 0.395 tonnes/hhld)

Centre Hastings and Madoc share a landfill. Their 2008 Landfill Report estimated 1500 MT to landfill. Applied weighted average for each municipality

Tweed's WDO DataCall estimate of 151 MT seemed too low. Estimated in similar manner to Stirling-Rawdon. (2932 hhlds x 0.395 tonnes/hhld)

For Organics, assume Source Separated Organics is 40% of waste going to landfill based 2001 and 2007 waste audits.

For Leaf and Yard Waste used 2009 Belleville information.

For Biosolids Total used estimate from May 2008 Organics Committee minutes.

Biosolids weights for Belleville, Marmora & Lake and Quinte West are estimated.

Formula for exponential population growth = $N = N_0 e^{rt}$ (Used this formula to project 2030 population and waste)

N = Future Population r = growth rate (Assume 2% increase per year)

No = Starting population t = number of years. $e = 2.71828$

Table 5: Solid Waste Diverted and Disposed from 2008 WDO DataCall

	Disposal (MT)	Diversion (MT)	Total (MT)	Percent of Total Waste Disposed	Percent of Total Waste Diverted	Comments	
Residual Waste	24,915		24,915	56.6%	0.0%		
Blue Box Material		13,040	13,040	0%	29.6%		
MHSW	132	31	163	0.3%	0.1%		
WEEE			N/A	N/A	0.0%	Not Reported in DataCall	
Backyard Composting		3,118	3,118	0%	7.1%		
Leaf&Yard, Grasscycling		2,042	2,042	0	4.6%		
Glass Deposit/Return		726	726	0	1.6%		
Reuse		4.4	4	0%	0.0%		
Totals	25,047	18,961	44,008	56.9%	43.09%		
2008 Diversion %		43.09%					

Table 6: Waste to Landfills and Transfer Stations in 2008

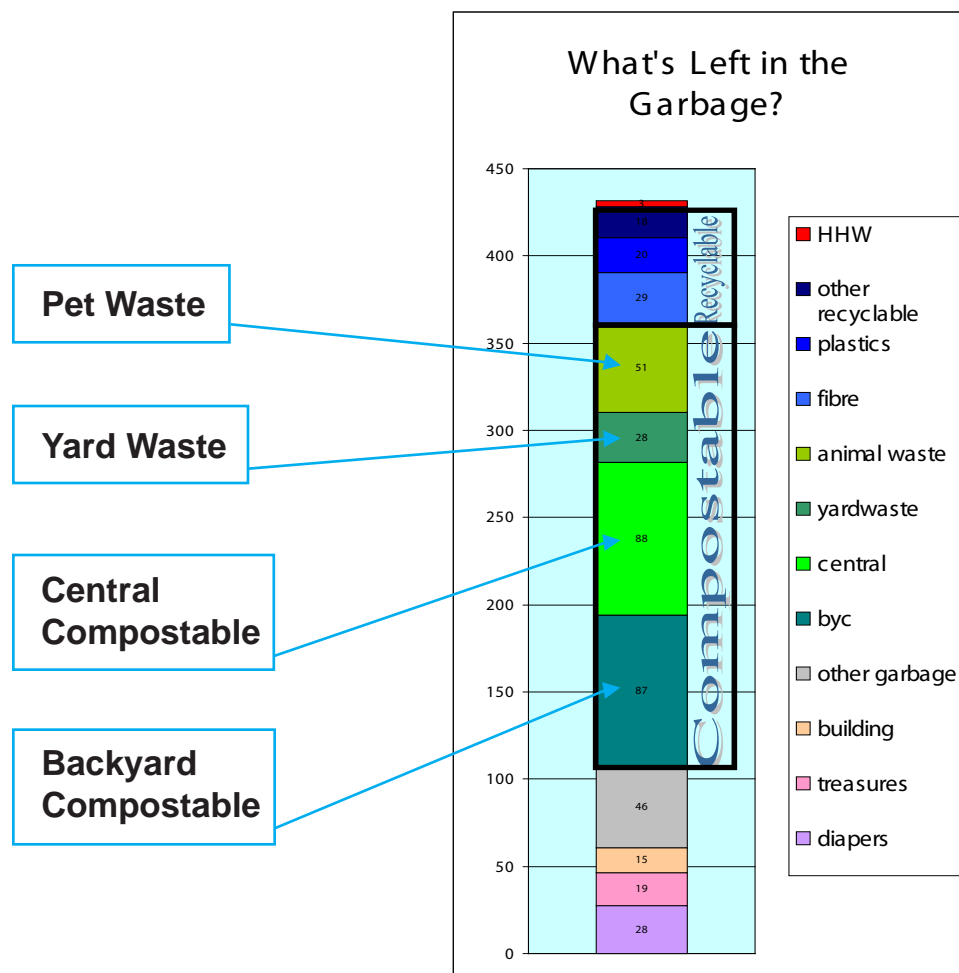
Municipality	Tonnes to Landfills	Tonnes to Transfer Stations	Total Tonnes
Belleville	1,689	5,916	7,605
Centre Hastings	1,019		1,019
Madoc	481		481
Marmora & Lake	1,033		1,033
Prince Edward	2,630	3,964	6,594
Quinte West	547	5,183	5,730
Stirling-Rawdon	791		791
Tweed	1,157		1,157
Tyendinaga		255	255
Subtotals	9,347	15,318	24,665
Percentages	38%	62%	100%

Table 7: Summary of 2006/2007 Waste Audits

Category	Single Family 2007 Average of Four seasonal audits	Multi-Family 2006 Average of Four seasonal audits	Weighted Average by Household Type
Capture rate for accepted Blue Box materials	83%	63%	82%
Diversion rate with contamination in Blue Box	42%	24%	41%
Diversion rate without contamination in Blue Box	39%	23%	38%

Table 8: Member Municipality Recycling Tonnages 2004-2009

Municipality	2009	2008	2007	2006	2005	2004
Belleville	4,678	4,852	4,900	4,940	4,620	4,497
Quinte West	3,818	4,031	3,953	4,106	3,918	3,860
Centre Hastings	426	440	416	408	355	334
Twp of Madoc	154	155	141	143	129	61
Marmara and Lake	340	347	335	368	341	323
Prince Edward County	2,567	2,715	2,658	2,768	2,603	2,427
Stirling-Rawdon	406	426	400	389	363	264
Tweed	344	338	346	356	327	307
Twp of Tyendinaga	275	287	285	279	259	240
TOTAL	13,008	13,591	13,427	13,757	12,915	12,313

Figure 2: 2001 Residual Waste Composition**Table 9: 2001 Curbside Residual Waste Composition Table**

Category	kg/hhld/yr	Percent	Compostable in Central Facility (kg/hhld/yr)	Percent Central Compostable
HHW	3	1%		
Other recyclable	18	4%		
Plastics	20	5%		
Fibre	29	7%	29	7%
animal waste	51	12%	Avoid	0%
Yard waste	28	6%	28	6%
Central Compostable	88	20%	88	20%
Backyard Compostable	87	20%	87	20%
other garbage	46	11%		
building	15	3%		
treasures	19	4%		
diapers	28	6%		
total	432	100%	232	54%

4.2 Existing Blue Box Material Diversion Program

- Blue Box Materials are collected in a blue box multi-stream system with pre-sorting by homeowner. The sort card for the resident is based on one blue box with containers inside and fibres outside. In practice, many residents use one blue box for containers and a second blue box for fibres. The collection truck drivers sort into four streams into a truck with two side loaded compacted compartments for fibres and containers and two glass storage compartments with bottle breakers for the clear and coloured glass.
- From the start, this region has been an advocate of the expanded Blue Box program. Therefore, we collect a full range of packaging and paper.
- The material is delivered to the Quinte Waste Solutions two-stream Material Recovery Facility at 270 West Street, Trenton. The Blue Box material is sorted and baled into fourteen (14) marketed material types.
- The Material Recovery Facility was originally designed to process 8,000 tonnes per year in 1990. Between 1990 and 2000, the fibre line sorting cages were replaced with bunkers to reduce downtime. In 2002 the tipping floor was expanded and the baler was replaced. The facility currently processes 14,000 to 16,000 tonnes per year which is 75% to 100% more material than it was originally designed for.
- The residential Blue Box program services single family households, multi-residential households, small Industrial, Commercial and Institutional in the downtown cores, and schools
- The 'Recycle Away' program captures recyclable Blue Box material from special events and parks
- Some Industrial, Commercial and Institutional recyclable Blue Box material is captured in the 'Big Bin' program, involving a driver and truck dedicated to servicing small to medium Industrial, Commercial and Institutional generators. The Industrial, Commercial and Institutional sector also utilizes private contractors to manage their recyclable Blue Box material, some of which is delivered to the Material Recovery Facility for processing.
- A tip and rebate system is in place for Blue Box material generators that deliver to the Material Recovery Facility
- Details of the recycling program, including Promotion and Education (P&E) material, can be found on the Quinte Waste Solutions website at www.quinterecycling.org, then click 'Recycling'.







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- The Canadian Forces Base – Trenton, is a federal agency, but is part of the local community and does participate in local waste management programs to an extent. Private Married Quarters are served by local municipally managed waste diversion and collection programs. The Federal Government lets tenders for privately operated garbage, other waste and recycling services on the Base and much of this material flows to the QWS Material Recovery Facility or local private transfer stations. The Base operates a Wright in-vessel composting system for Base generated (cafeteria) food and leaf and yard waste and has its own electronics/chemical/hazardous waste handling procedures, its own sewage treatment facility, and through Public Works and Government Services Canada an asset disposal program that encourages reuse.



4.3 Other Existing Diversion Programs

- Details of existing diversion programs can be found on the Quinte Waste Solutions website at www.quinterecycling.org
- Programs operated by organizations outside of Quinte Waste Solutions are subject to change without our knowledge
- The Household Hazardous Waste (HHW) program is officially called Municipal Hazardous and Special Waste (MHSW) by the provincial government. There is a reuse program for household paint at the Belleville Depot. Each year, a Household Hazardous Waste Collections Events Brochure is created that contains the list of accepted materials and a schedule of Belleville Depot hours and mobile events. The brochure also provides details on the Paint Giveaway Days where residents can pick up paint for reuse. In 2009, the total weight of HHW diverted from landfill was 167.38 tonnes. Fifteen (15) tonnes were reused, mostly due to the Paint Giveaway Days.
- Alkaline and rechargeable batteries are accepted at the HHW events and at any Home Hardware, Home Depot, Foxboro Co-op, and "The Source"
- Waste Electrical and Electronic Equipment (WEEE). In this region, the equivalent of more than twenty-four 53' tractor trailers of electrical and electronic equipment were diverted from landfill in 2009. Including special 'TV Days' mentioned below, the total weight of WEEE material diverted from landfill in 2009 was 162.16 metric tonnes.
- Televisions, although officially an accepted item in the provincial WEEE program, are currently not accepted at the Belleville depot due to space, logistic, ergonomic, and Health & Safety issues. Some of this region's landfills are adding collection for televisions and possibly other electronics. Currently, televisions are collected for proper recycling under the WEEE program through special events called 'TV Days'.
- Backyard Composting is promoted through the YIMBY (Yes In My Back Yard) program. To date, 31,179 backyard composters have been given away or sold at cost. Waste Diversion Ontario assumes each composter diverts 100 kg/hhld/yr from disposal.
- Leaf and Yard Waste is handled at the discretion of each municipality. Details can be found on the Quinte Waste Solutions website at www.quinterecycling.org and clicking on 'Collection Schedule'. Then select the desired municipality.
- Residents are encouraged to leave grass clippings on their lawn
- Tire collection is handled at the discretion of each municipality based on instructions from Ontario Tire Stewardship. Residents can bring their tires, at no charge, subject to certain conditions, to any Registered Collector under the Ontario Tire Stewardship Program.
- White goods are set aside at each landfill for proper freon removal, then sent for metal recycling

- Scrap metals, including Black goods, are set aside at each landfill and sent for metal recycling. There are several scrap metal yards in the area, such as Crawford Metal in Belleville that accept metal directly from residents. Some accept white goods and metal appliances like microwaves.
- Most Construction and Demolition (C&D) waste is landfilled. Some Construction & Demolition waste, including scrap wood, is processed by local Construction & Demolition recyclers and diverted from landfill. One large Construction & Demolition recycler in the Belleville area was recently closed by the Ministry of the Environment. This had a negative impact on the management of Construction & Demolition waste in this region.
- Privately run Reuse Centres divert waste from landfill. A list of local Reuse Centres is maintained at Quinte Waste Solutions, and is subject to change without our knowledge. Some examples are The Salvation Army, Hospital Auxiliaries, St Vincent de Paul, and private yard sales. The Salvation Army sends non-reusable textiles for appropriate recycling.
- There is a small Reuse Centre at the shared landfill of the Municipality of Centre Hastings and the Township of Madoc
- Internet websites like Freecycle and Kijiji help to divert waste from landfill by promoting reuse.
- Biosolids generated in the City of Belleville and the City of Quinte West are diverted from landfill through land application. Sewage Biosolids generated in Prince Edward County are dewatered and sent to a landfill outside the region.
- A Deposit/Return program on LCBO bottles and the long-standing Deposit/Return program on Beer Store bottles reduced the amount of glass that must be handled by municipal systems
- Quinte Waste Solutions maintains a list of Return To Vendor retailer programs for a variety of materials on the Quinte Waste Solutions website at www.quinterecycling.org. Click 'Return To Vendor'. Keep in mind that these programs are subject to change without our knowledge.
- Used motor oil is not included in the MHSW program. However, Canadian Tire will accept used motor oil for a fee. Shaw Auto Sales & Service in Belleville will accept used Motor Oil for no charge. For places that accept oil filters and empty oil containers that are included in the MHSW program, see www.dowhatyoucan.ca.
- The Waste Diversion Act (WDA) drives the WEEE program funded by Stewards with many options for receivers such as Staples, Best Buy, and municipalities. See www.dowhatyoucan.ca for details
- Under a program driven by the WDA, Stewards and pharmacies across Ontario have agreed to take back pharmaceuticals and syringes

4.4 Inventory of Residual Materials

- Residue from Material Recovery Facility:
 - 4.61 % in 2007
 - 7.42 % in 2008
 - 8.77 % in 2009
- Table 9 details the composition of residual waste from curbside waste audits conducted in 2001. Note that this does not include bulky materials and the total quantity of Construction & Demolition waste generated. Some highlights of Table 9 are:
 - Food Waste = 40 %
 - Pet Waste = 12 %
 - Diapers and Hygiene products = 6%
 - Recyclable material that was not separated at source = 11% to 16%
 - Non-recyclable packaging and other garbage = 11%
 - Construction & Demolition (C&D) waste = Not fully measured
 - Mattresses and Bulky Materials = Not measured

Table 9 indicates that all waste categories that can be composted in a central composting facility total 54% of the residual waste sent for disposal. It's important to realize that even a well run composting program will not capture all of this. The assumption made is that 70% of the available compostable material could be diverted from landfill.

4.5 Disposal of Residual Waste

Here is a summary of how regular residential curbside residual waste (i.e. garbage) is managed in each municipality.

It is acknowledged that there are private companies that offer waste disposal services or residential waste and Industrial, Institutional & Commercial waste including multi-residential sources.

4.5.1 City of Belleville

Belleville residual waste is handled by weekly curbside pickup and is managed at Waste Management Inc.'s transfer station on Chester Road in Trenton. The waste is shipped to Michigan for final disposal. Since the WMI transfer station is privately owned we have no information on its expected lifespan. Residents of Belleville can bring residual waste directly to this transfer station for a tipping fee.

Residual waste collected in the Thurlow ward is brought to the Thurlow landfill on Mudcat Road. Residents of Thurlow ward can bring their residual waste directly to the Thurlow landfill.

4.5.2 Municipality of Centre Hastings

Curbside collection of residual waste is done weekly for the whole municipality. The residual waste is brought to the landfill on Highway 7 east of Madoc Village. The landfill is shared with the Township of Madoc. Residents of Centre Hastings can also bring their residual waste directly to the Madoc landfill.

4.5.3 Township of Madoc

Residual waste is collected curbside every other week and brought to the Madoc landfill on Highway 7 east of Madoc Village. The landfill is shared with Centre Hastings. Residents of the Township of Madoc can also bring their residual waste directly to the landfill.

4.5.4 Municipality of Marmora and Lake

Curbside collection of residual waste is done weekly for the entire municipality. The residual waste is brought to the landfill on 613 Station Rd, northeast of the town of Marmora. Residents of the Municipality of Marmora and Lake can also bring their residual waste directly to the landfill.

4.5.5 Prince Edward County

Weekly curbside collection of residual waste throughout Prince Edward County is contracted to Waste Management Inc. Residents of Prince Edward County can also bring their residual waste to four landfills and three transfer stations. The four landfills are at 245 Valley Road, Ameliasburgh; 275 Consecon Street, Wellington; 450 Bakker Road, Hillier; and 1132 Old Milford Road, South Marysburgh. The three transfer stations are at 37 Church Street, Picton; 1080 Shannon Road, Hallowell; and 35 County Road 14, Sophiasburgh. The waste collected curbside and at the transfer stations accounts for over half of the waste generated in Prince Edward County. The waste from the curbside collection and transfer stations is consolidated at a privately owned transfer station in Quinte West and shipped out of the region.

4.5.6 City of Quinte West

Quinte West residual waste is handled by weekly curbside pickup and is managed at the Waste Management transfer station on Chester Road in Trenton. The waste is shipped to Michigan for final disposal. Since the WMI transfer station is privately owned we have no information on its expected lifespan. Residents of Quinte West can bring residual waste directly to this transfer station for a tipping fee.

Residual waste collected in the Frankford area is brought to the Frankford landfill on Fish and Game Club Road. Residents of Frankford can bring their residual waste directly to the Frankford landfill.

Quinte West has a depot at Aikins Road where residents can bring White Goods and Bulky items on specific dates.

4.5.7 Township of Stirling-Rawdon

Curbside collection of residual waste is done weekly each Monday in Stirling Village with additional pickup for the commercial core every Thursday. Areas outside Stirling Village have curbside collection of residual waste every other Monday. The Township has two landfills. Residents from Concession 1 through 5 can bring their residual waste to the Stirling Waste Disposal Site at 141 Fairground Road. Residents from Concession 6 through 14 can bring their residual waste to the Springbrook Waste Disposal Site at 3091 Springbrook Road.

4.5.8 Municipality of Tweed

Curbside collection of residual waste is done weekly for the Village of Tweed. The residual waste is brought to the landfill at 831 Marlbank Road, Stoco. Residents outside the Village of Tweed do not have curbside collection, and bring their residual waste to the landfill. Any resident of the Municipality of Tweed, including the Village of Tweed, can also bring their residual waste directly to the landfill.

4.5.9 Township of Tyendinaga

Residents bring residual waste directly to the Tyendinaga Township Waste Transfer Site at 6663 Old Highway 2. Residents can also contract with a private hauler to collect residual waste at the curbside and deliver it to the transfer site. The waste is shipped from there to a Waste Management Inc. transfer station for consolidation and then to a landfill for disposal.

4.6 Landfill Facility Information

Table 10 summarizes landfill facility information and their remaining estimated lifespans.

Table 10: Landfill Facility Information

Municipality	Address	Estimated Lifespan (yrs)
<i>Belleville(Thurlow Ward)</i>	Mudcat Road	8
Centre Hastings (Shared with Twp of Madoc)	106968 Highway 7 (Shared by Centre Hastings & Twp of Madoc)	50+
Twp of Madoc (Shared with Centre Hastings)	106968 Highway 7 (Shared by Centre Hastings & Twp of Madoc)	50+
Marmora and Lake	613 Station Rd	12 to 15
Prince Edward County	245 Valley Road, Ameliasburgh	40
Prince Edward County	275 Consecon Street, Wellington	11
Prince Edward County	450 Bakker Road, Hillier	40
Prince Edward County	1132 Old Milford Road, South Marysburgh	10
Quinte West (Frankford Ward)	Fish and Game Club Road	15
Stirling-Rawdon	141 Fairground Road	6 to 7
Stirling-Rawdon	3091 Springbrook Road	20
Tweed	831 Marlbank Road, Stoco	16 to 18
Twp of Tyendinaga	Former landfill now transfer site	Not applicable

5 Projected Waste Management Needs

The projections in Table 4 are based on a 2% growth rate per annum and, for simplicity, assume the worst case of no change in waste generation rates. The projections show how much waste this region could be generating by 2030 if no diversion improvements occur.

By 2030, waste disposed for all nine municipalities could reach 36,795 tonnes per year if no improvements in diversion or changes to consumer buying habits occur.

Approximately 10,000 tonnes of sewage treatment plant biosolids, at 25% solids, were generated in 2008. By 2030, this is projected to be 14,918 tonnes of biosolids per year at 25% solids.

When this region is successful at meeting per capita waste generation reduction targets, actual total waste generation should be lower than projected in Table 4.

Blue Box material collected in 2008 was 13,591 tonnes. At a 2% growth rate per annum, by 2030 this could reach 20,275 tonnes.

The 2% population and waste growth rates were chosen as a worst case scenario of waste generation. This was the growth rate used for projections in John Lackie's *Quinte Waste Solutions Transfer Station Report*, published in April 2009.

Actual population and waste growth rates will likely be much lower than 2%. According to Belleville's Economic Development staff, Belleville's official plan indicates a growth of 0.7% to 1.4% per year. Other municipalities in this area are predicting growth rates in that range or lower.

Belleville's Environmental/Sustainability Action and Implementation Plan (Green Plan), Quinte West's Corporate Strategic Plan, Tweed's Integrated Community Sustainability Plan (ICSP), and the Official Plans of the nine municipalities could have an impact on population growth, waste generation and waste diversion.

6 **Diversion Strategy - Recommended Strategy and Options Considered**

6.1 **Diversion Strategy Decision-Making Criteria**

Decisions were based on the principles of Sustainable Development by considering the 'triple bottom line' of Environmental, Social, and Economic benefits and costs. Figure 3 illustrates that the Integrated Waste Management Plan options that are implemented should result in all three principles being optimized.

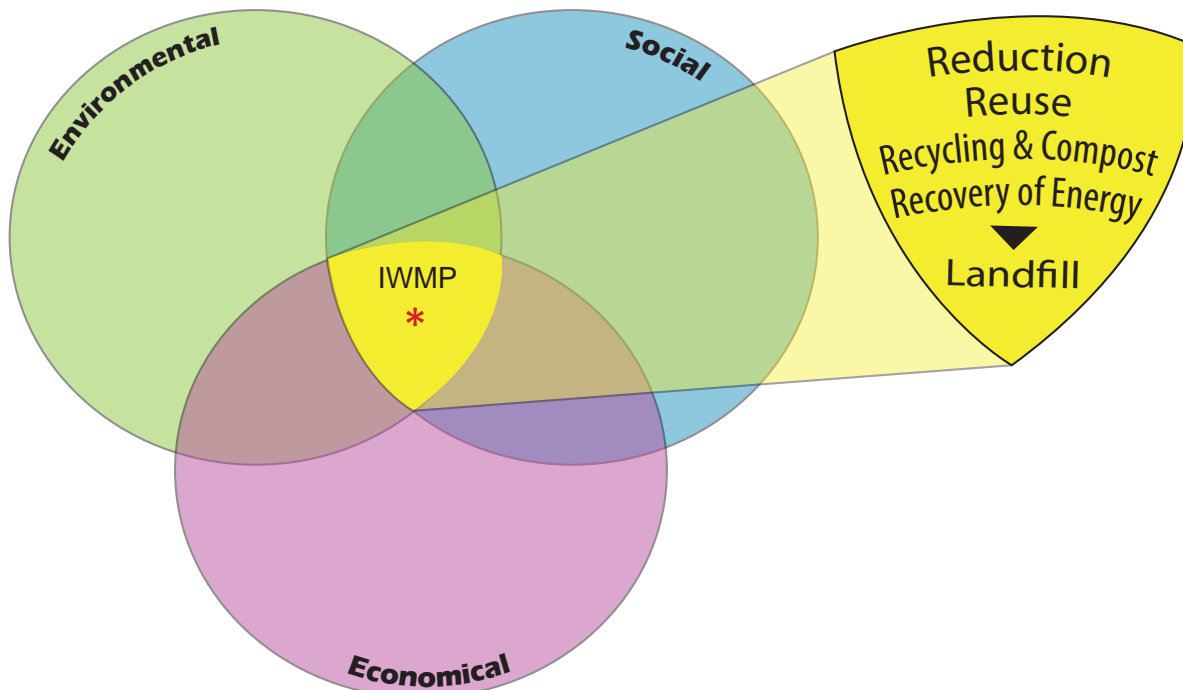
Total system costs were evaluated and compared. The goal was to identify a system that maximized Waste Diversion Ontario approved diversion, maximized reduction of waste to landfill, and maximized waste management cost savings by minimizing waste management cost per tonne.

Options were evaluated by the Steering Committee, Working Committee, Centre and South Hastings Waste Services Board, and the Council of each member municipality.

There are other indicators available that could have been used to compare systems, but were not used in depth when developing this plan. It is recommended that one or more of these indicators be used more in depth in future revisions of this plan. Examples are:

- MEBCalc by Jeffrey Morris that monetizes the environmental benefits of diverting waste from landfill. See www.zerowaste.com for more information.
- Greenhouse gas calculators such as the US EPA's W.A.R.M. model. See www.epa.gov/WARM for more information.
- Genuine Progress Indicator or Index (GPI). See www.gpiatlantic.org for more information on Nova Scotia's Genuine Progress Index. See www.greeneconomics.ca/gpi for information on Alberta's Genuine Progress Indicator.

Figure 3: Decision Framework - Circles of Sustainability

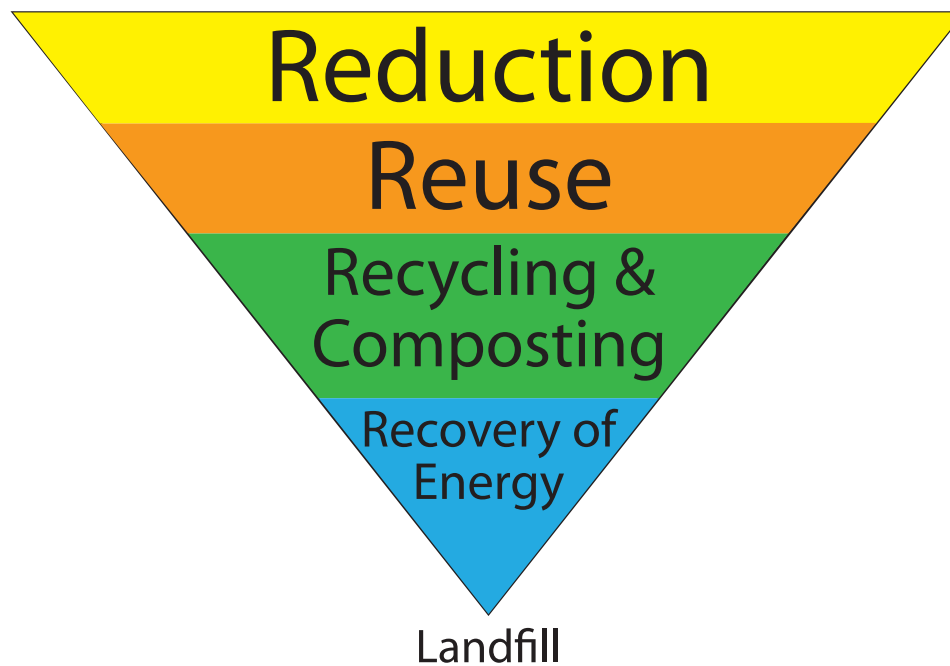


6.2 Integrated Waste Management Plan Diversion Strategy Focus

The Integrated Waste Management Plan diversion strategy focus was based on the Ministry of the Environment's concept of the Waste Value Chain. The Ministry of the Environment presented a detailed Waste Value Chain in their June 12, 2007 Policy Statement on Waste Management Planning (Appendix 1).

A simplified 'Waste Value Chain' is shown in Figure 4. The point of the waste value chain is to get the most value from waste. Therefore, Reduction is the most important component of waste management. Reuse is the next important. Recycling and Composting are next followed by Recovery of Energy. The least valuable way to handle waste is Landfill with no energy recovery. Notice that 'Landfill' is shown very small to remind us that the ultimate goal is to reduce waste going to landfill to as close to zero as possible.

Figure 4: Integrated Waste Management Plan Focus - Waste Value Chain



6.3 Pre-existing Diversion Strategy

Upgrade the Material Recovery Facility to increase efficiency and reduce residue. This will enhance the Recycling section of the Waste Value Chain.

Prior to the start of the Integrated Waste Management Plan process, planning was already underway to upgrade the Material Recovery Facility to increase efficiency and reduce residue. The goal is to improve the Blue Box program in a cost effective way. The strategy is to keep the Material Recovery Facility running as efficiently and economically as possible until such time as the Stewards take over the Blue Box program under the proposed 100% Extended Producer Responsibility (EPR).

6.4 Priority Diversion Strategy Recommended To Move Forward

After careful consideration and analysis of possible diversion and waste management strategies, the Integrated Waste Management Plan Steering Committee determined that there was enough evidence to move forward on the implementation of this priority diversion strategy:

Central Rotary Composting of curbside collected Source Separated Organics (SSO) and Prince Edward County biosolids. This diversion strategy could include every other week collection of residual waste beginning one year after SSO composting launch. This will enhance the Composting section of the Waste Value Chain.

6.5 Priority Waste Management Strategy Recommended For Further Study

After careful consideration and analysis of possible diversion and waste management strategies, the Integrated Waste Management Plan Steering Committee determined that there was enough evidence to justify further study of the possible implementation of this priority waste management strategy:

An Energy from Waste facility that converts residual waste to fuel. This facility could also remove ferrous and non-ferrous metals from the residual waste that could be added to other scrap metals for smelting. This facility could create fuel for use locally or elsewhere, or use the fuel to generate electricity for sale into the Provincial grid. This will slightly enhance the Recycling section and significantly enhance the Recovery of Energy section of the Waste Value Chain.

6.6 Secondary Waste Management Strategies Recommended for Further Study

After careful consideration and analysis of possible diversion strategies, the Integrated Waste Management Plan Steering Committee recommended further study of the possible implementation of these secondary waste management strategies depending on the results of the implementation steps of the priority diversion strategy in Section 6.4 and priority waste management strategy in Section 6.5:

- a) Publicly owned waste transfer station with some 'enhanced' features to improve diversion. This would slightly enhance the Recycling section of the Waste Value Chain. It may reduce overall garbage handling costs, and aid in diverting many other waste categories.
- b) An Energy from Waste facility such as incineration or gasification of residual waste, to achieve Recovery of Energy for residual waste after maximum possible diversion. This would significantly enhance the Recovery of Energy section of the Waste Value Chain.
- c) Future review of management of Construction & Demolition wastes, Industrial, Commercial and Institutional wastes, and waste Large & Bulky items

6.7 Supporting Waste Management Strategies Recommended for Further Study

In addition to the priority and secondary diversion strategies recommended for implementation or further study in sections 6.4, 6.5 and 6.6, it is recommended by the Integrated Waste Management Plan Steering Committee that the following supporting diversion strategies be studied for possible implementation.

6.7.1 Reduction Supporting Strategies

- a) Zero Waste Philosophy promoted to residents to reduce per capita waste generation.
- b) Support and promote Extended Producer Responsibility
- c) Green Procurement Policies

6.7.2 Reuse Supporting Strategies

- a) Support, promote, and create reuse centres throughout the area, including municipally contracted reuse centres at each landfill or transfer site

6.7.3 Recycling and Composting Supporting Strategies

- a) Requiring use of clear bags for residual garbage
- b) Enforceable waste management bylaws
- c) Waste disposal bans
- d) Reduced bag limits
- e) Bag tag price increase where appropriate
- f) Continued landfill operator training and upgrading
- g) Ongoing improvements to multi-residential and special events recycling
- h) WEEE depot at each municipal landfill or transfer site
- i) Depot collection of empty plastic oil bottles for dedicated recycling
- j) Improve rural recycling pickup in the Municipality of Tweed as per section 8.6.2 (b) of Tweed's ICSP, possibly with every other week, one side of the road, curbside Blue Box collection.
- k) Depot collection of SSO in rural areas to increase organics diversion, to support central rotary composting if implemented
- l) Educate Industrial, Commercial and Institutional sector to set up waste disposal contracts so they benefit from cost savings when waste is recycled and diverted from disposal
- m) Travelling or stationary shredder for regional mattress and bulky goods shredding and recycling of metal and wood, or regional collection and shipping to a specialized mattress and bulky goods recycler
- n) Travelling shared Tub Grinder to grind wood waste at each landfill. The ground wood waste could be used as an amendment at the rotary composting facility. A related option is to have collection bins at each landfill for wood waste and leaf & yard waste, bring the material to the rotary composting facility and grind it there for use as an amendment.

6.8 Emerging Technologies

It is recommended that the following emerging technologies be watched and implemented if and only when they are technologically proven and economically, socially, and environmentally advantageous to this region.

- a) Vermistabilization of the output from the central composting facility. Vermistabilization is the production of worm castings from the compost. When the technology and market are proven on a large scale, worm castings have the potential of being 10 to 20 times more valuable than regular compost. This could reduce waste management costs. Worm castings may provide quality improvements such as increasing plant growth and reducing the bioavailability of heavy metals from biosolids.
- b) Thermal treatment of biosolids, food waste, and/or leaf & yard waste to create fuel or fertilizer. One example technology was developed in Quebec and uses a small rotary kiln equipped with an electric plasma torch to oxidize the organic material and destroy all volatile solids and pathogens.
- c) Capture waste heat from waste management facilities to heat a greenhouse to grow vegetables or fruit for sale. This could provide another source of revenue that further reduces waste management costs. For example, a landfill in the state of New York grows hydroponic tomatoes using heat produced from their landfill gas fueled electrical generating engines.
- d) Capture carbon dioxide emissions from waste management facilities to grow algae. This is a longer term emerging technology that could produce biofuel from the algae that could be used by the waste collection vehicles offsetting some fuel costs and further reducing waste management costs. For example, the National Research Council Institute for Marine Biosciences (NRC-IMB) is investing \$5 million to construct a 50,000-litre algae cultivation plant at their Ketch Harbour facility in Nova Scotia.
- e) Capture landfill gas to generate heat and/or electricity.

6.9 Technological and Economic Due Diligence

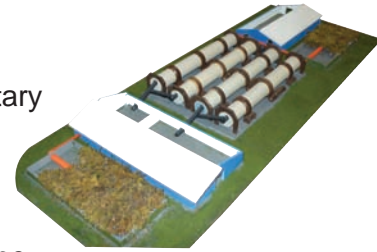
It is understood that due diligence will be exercised before actual construction begins on any of these components. This would be completed during the initial approvals and studies phase of each component. If a particular component fails the due diligence step, it will be eliminated from the overall plan.

Some examples of due diligence steps include but are not limited to:

- Retaining a qualified consultant for the preparation of appropriate terms of reference and conducting necessary studies
- Joint municipal Request for Proposal (RFP) by participating municipalities
- Visiting example facilities
- Consulting with the Ministry of the Environment
- Other actions recommended by municipal Councils and staff

6.9.1 Rotary Composting Due Diligence

The main due diligence for the technology of rotary composting is verifying that it will properly compost Source Separated Organics and biosolids and will be approved by the Ministry of the Environment. Some examples of where the technology is used and some studies being planned are discussed here to begin the due diligence process. Rotary composting technology is used to compost dead livestock at several locations. It has been used for the process of composting mixed municipal solid waste (MSW) in several facilities in Canada and the US. Examples are a large facility in Edmonton, Alberta, and a waste stabilization facility in Otter Lake, Nova Scotia.



A local supplier of rotary composting technology recently supplied a system to Auburn, NY. The same company supplied a system to Anchorage, Alaska that successfully processes SSO and horse manure. They are planning to supply a SSO/biosolids composting system to Sudbury, Ontario once Sudbury's application for Certificate of Approval is approved by the Ministry of the Environment.

Prince Edward County is planning to fund a study at Laurentian University to supply the technical data to expedite Ministry of the Environment approvals when that stage is reached. The Ministry of the Environment has issued new proposed composting guidelines that they plan to finalize around the middle of 2010. If finalized largely unchanged, these guidelines could make the co-composting of biosolids permissible to create a middle category of compost with some labeling and usage restrictions.

Budgetary quotes from two potential suppliers suggest that a facility to handle our expected volume of SSO and Prince Edward County biosolids would cost around \$2,500,000, which is very competitive when compared to other central composting facilities investigated to date. Relatively low operating costs are also projected. Firm quotes for equipment and buildings would be required to verify the economics before moving on to the approvals and building stage. Another factor to consider is a market for the finished compost, such as selling it, or each municipality using it instead of buying outside compost or fertilizer.

Some rotary composting equipment suppliers are listed in Appendix 6.

6.9.2 Energy from Waste Due Diligence

Energy from Waste, whether it is a facility to convert waste to fuel, an incinerator, or gasification, will require the most due diligence to verify it's suitability for this area before money is invested in approvals and construction. Economics will be affected by factors such as funding, electricity selling price, securing outside waste contracts, facility size, the ability to offer a competitive tipping fee, and stable market for the output of the facility. There are several suppliers listed in Appendix 6 who are working to prove Energy from Waste technology in Ontario.

6.9.3 Transfer Station Due Diligence

The transfer station is a known, proven technology. The economics appear to be neutral to slightly more costly than the status quo. Firm, current quotes for haulage and tipping fees, construction and operating costs, and curbside collection costs would be required before proceeding with building a municipally owned transfer station. Another important consideration is making sure the transfer station does not become a stranded asset if it is no longer needed in the event of implementation of an Energy from Waste facility. In some cases, the transfer station could be incorporated into an Energy from Waste facility. In other cases, this may not be practical.



6.10 Blue Box Plan

Blue Box Future Strategy

The recommended Blue Box strategy for maximum diversion of municipal waste is to upgrade the existing Material Recovery Facility (MRF) to increase efficiency and capacity, and reduce residue. It will remain a two stream MRF.

The current Blue Box collection system will remain unchanged.

Blue Box Supporting Strategies

To drive diversion to the Blue Box the following supporting strategies will be considered for implementation:

- Every other week garbage collection
- Clear garbage bags

Background

The Ministry of the Environment is planning to revise the Waste Diversion Act. See Appendix 3 for the Minister's Report on the Waste Diversion Act 2002 Review, October 2009. The most significant proposed change is 100% Extended Producer Responsibility (Full EPR) for Blue Box materials. The projection is that eventually the Stewards will take over the operation of the Blue Box system and phase in regional collection and large regional Material Recovery Facilities. This region's strategy is to keep the MRF operating as efficiently as possible until full EPR comes into force.

The Minister is proposing that 100% Extended Producer Responsibility apply to the Industrial, Commercial and Institutional sector to increase diversion. It should be noted that if this extra diversion from the Industrial, Commercial and Institutional sector is routed through the municipal MRF, it would strain the existing system.

The 2008 Waste Diversion Ontario DataCall indicated a total residential diversion rate of 43.09%. In our 'Rural Regional' municipal grouping, Quinte Waste Solutions is second only to the Restructured County of Oxford which achieved 43.46% total residential diversion rate. This region is above the 2007 Waste Diversion Ontario DataCall provincial residential diversion average of 39% and the 2008 Waste Diversion Ontario DataCall provincial residential diversion average of 42%.

The Blue Box Program Enhancement and Best Practices Assessment Project by KPMG Final Report Volume II, July 6, 2007 selected Quinte Waste Solutions as the Analog Community for the Rural Regional municipal group. This is an indication that this region uses many Best Practices to achieve low cost and high blue box recovery levels. As other communities improve their diversion systems, this region will need to continually improve to keep pace.

Specifically related to the Blue Box program, curbside waste audits sponsored by Stewardship Ontario indicated that this region's capture rate of available Blue Box material was 83% for single family households in 2007 and 63% for multi-family households in 2006. A weighted average based on household type resulted in an overall available Blue Box material capture rate of 82%. At an average Blue Box capture rate of 82%, this region is well above the provincial average Blue Box capture rate of 63% in 2008, 66% in 2009 and the 2011 target of 70%.

The provincial Blue Box capture rate target is being raised to 70% by December 31, 2011 according to the Draft Preliminary Revised Blue Box Program Plan that was released on February 12, 2010. This is in response to an August 2009 letter from the Minister of the Environment to Waste Diversion Ontario that directed that the Blue Box program plan be amended to achieve a diversion target of 70% for Blue Box wastes by the end of 2011.

Although this region's Blue Box capture rate is well above the 2011 provincial target, in the spirit of continuous improvement, methods to improve the Blue Box program were reviewed. Much of this review was completed before the Integrated Waste Management Plan process began. Specifically, plans to upgrade the Material Recovery Facility were developed independently of the Integrated Waste Management Plan process, but are recorded here for completeness.

Options considered for improving the Blue Box Plan for this region are recorded in Section 6.11.3.

Several studies published in the Solid Waste and Recycling Magazine state that two stream recycling systems have a lower net operating cost per tonne compared to single stream recycling systems. One study is Single Stream vs. Two Stream: Round 3, published December 2009/January 2010. Another study is Understanding economic and environmental impacts of single stream collection systems, published December 2009. One of the reasons cited for the lower cost is less contamination of the outgoing products from a two stream MRF, which improves the ability to market the material and command a higher selling price. These studies support this region's decision to stay with a two stream MRF at this time.

More support for the decision to maintain a two stream MRF is found in the KPMG Best Practices Report, 2007 that states that due to economies of scale, a single stream MRF is more appropriate for processing at least 40,000 tonnes/year. This region processes less than half that amount.

6.11 Diversion Options Considered

In determining the recommended diversion strategy, the following options were considered.

6.11.1 Waste Reduction

- a) Adopt the Zero Waste Philosophy. Begin by making all municipal buildings Zero Waste. Durham Region is moving in this direction.
- b) Establish Green Procurement Policies in each municipality to lead by example. Buy products that have been "Designed For the Environment".
- c) Establish Special Event Policies that stipulate that events be Zero Waste Events, paying particular attention to food vendor packaging. The Toronto Metro Convention Centre prides itself in hosting Zero Waste Events and could be used as one example to learn from.
- d) Promote and support the concept of Extended Producer Responsibility.
- e) Promote backyard composting.
- f) Enhance public education on changing buying habits to reduce waste at the source.

6.11.2 Reuse Centres

- a) Reuse Centres at each landfill and transfer station before vehicles go to tipping area - monitored and verifiable information for Waste Diversion Ontario purposes.
- b) Updated list of region's Reuse Centres available at each landfill, on the website, and on the calendar if one is produced.
- c) Request Reuse Centres report diverted weight to Quinte Waste Solutions. However, if the Reuse Centre is not owned by a municipality, the diverted weight does not count towards the Waste Diversion Ontario diversion rate.

6.11.3 Recycling (Blue Box) Options Considered

- a) No changes to current one box (inside/outside - presorted by resident) multi-stream collection system
- b) No changes to current two-stream MRF
- c) Upgrade existing MRF to increase efficiency and capacity, and reduce residue:
 - Replace Fibre line uptake conveyor
 - Rebuild Container Line:
 - New, relocated uptake container conveyor
 - Extend sort line length, Add pre-sort stations
 - Add 'Eddy Current' to increase capture of aluminum
 - Raise height of line to add bunkers and eliminate cages

- d) Recycling depots at every municipal landfill and transfer station before vehicles go to tipping area
- e) Single stream system where all recyclables are placed in one bag or blue box with no presorting. According to best practices, a single stream system is better suited when processing over 40,000 tonnes per year.
- f) Two Box system (Brown Box (fibre) / Blue Box) with alternating pickup.
- g) Improve rural recycling pickup in the Municipality of Tweed as per section 8.6.2 (b) of Tweed's Integrated Community Sustainability Plan (ICSP), possibly with every other week, one side of the road, curbside Blue Box collection.
- h) Dirty MRF or Mechanical Biological Treatment (MBT) to separate Blue Box material from residual waste.
- i) Dirty MRF or MBT to separate Blue Box material from all waste with no source separation by residents.
- j) Super Regional MRF operated by Stewards

6.11.4 Organics (Food Waste)

- a) Enhanced Backyard composting
- b) Curbside Source Separated Organics (SSO) pickup
- c) Depot collection of SSO
- d) Centralized local Composting Facility:
- e) Centralized regional Composting Facility operated with neighbouring municipality or municipalities.
- f) Ship organics to be composted at an existing central composting facility outside the local area
- g) Compost, dry or pelletize Organics and use as fuel (e.g. cement kilns, Energy from Waste facilities)
- h) Dry or pelletize Organics with general waste for fuel (e.g. cement kilns, Energy from Waste facilities)
- i) Compost alone or with Biosolids, Leaf and Yard Waste, Wood Waste
- j) Anaerobic Digestion
- k) Continue to landfill with general waste
- l) Organics with general waste directly to Energy from Waste facility.
- m) Mechanical Biological Treatment (MBT) of mixed municipal solid waste (MSW) to compost organics and divert recyclable materials.
- n) Plasma-assisted sludge oxidation to create fuel of fertilizer

6.11.5 Leaf and Yard Waste

- a) Promote mulching mower, backyard composting
- b) Bylaws prohibiting disposal of grass clippings and leaf & yard waste
- c) Curbside pickup Spring and Fall
- d) Depot for drop off
- e) Centralized local Composting Facility
- f) Regional Composting Facility
- g) Compost with SSO and/or Biosolids
- h) Recovery of Energy facility
- i) Burn at landfills where permitted
- j) Plasma-assisted sludge oxidation to create fuel of fertilizer

6.11.6 Wood Waste

- a) Promote delivery to a wood recycling facility when applicable
- b) Travelling shared Tub Grinder to grind Wood Waste at each landfill
- c) Deliver wood waste to Tub Grinder located at centralized location like a local composting facility.
- d) Compost at each landfill
- e) Compost at local centralized composting facility
- f) Compost at regional composting facility
- g) Recovery of Energy facility

6.11.7 Biosolids

- a) Dewater using centrifuge, belt press, or the like
- b) Alkaline stabilization, then land application
- c) Land application as done now by Belleville and Quinte West
- d) Compost alone or with Organics, Leaf and Yard Waste, Wood Waste
- e) Pelletize Biosolids and use as fuel (e.g. cement kilns)
- f) Direct feed to Recovery of Energy facility
- g) Plasma-assisted sludge oxidation to create fuel of fertilizer
- h) Landfill as done now by Prince Edward County

6.11.8 Recovery of Energy

- a) Convert Municipal Solid Waste (MSW) to fuel
- b) Publicly owned Plasma Gasification to produce electricity
- c) Publicly owned low temperature gasification to produce electricity
- d) Publicly owned incinerator to produce electricity
- e) Privately owned incinerator or gasification facility in this area and pay tipping fee. Note that minimum waste quantities usually must be supplied to such a facility in a 'Put or Pay' contract.
- f) Ship residual waste to a Recovery of Energy (Energy from Waste) facility outside this region and pay a tipping fee
- g) Convert food waste to fuel
- h) Convert biosolids to fuel
- i) Sell waste derived fuel to Cement Kilns as partial replacement for coal

- j) Sell waste derived fuel to wider market
- k) Ship residual waste to a waste derived fuel making facility outside this region and pay a tipping fee

6.11.9 Large and Bulky Goods

- a) Travelling or stationary shared shredder to separate recyclable metal and wood from the other materials
- b) Collect and ship to a mattress and bulky goods recycler

6.11.10 Construction and Demolition (C&D) Waste

- a) Existing private companies for handling Construction & Demolition waste
- b) Build a publicly owned Construction & Demolition waste recycling facility
- c) Attract Construction & Demolition residual waste to a publicly owned transfer station or Energy from Waste facility

6.11.11 Industrial, Commercial, and Institutional (IC&I) Waste

- a) Existing private companies for handling Industrial, Commercial and Institutional waste
- b) Expand existing 'Big Bin' program to recycle more Industrial, Commercial and Institutional waste
- c) Educate Industrial, Commercial and Institutional sector on how to set up waste management contracts without flat fees for garbage disposal, so they can see cost savings when waste is recycled and diverted from disposal.
- d) Attract Industrial, Commercial and Institutional residual waste to a publicly owned transfer station or Energy from Waste facility

6.11.12 Landfill

- a) Landfill 'mining' to extend landfill lifespans
- b) Continued landfill operator training and upgrading to extend landfill lifespans
- c) Add scales to unscaled landfills
- d) Rent scales at unscaled landfills for a sufficient period to obtain average weights per load or bag.
- e) Direct all waste to composting and Energy from Waste facilities when they become operational, and close landfills.

6.12 **Biosolids Management Strategies**

- a) Co-compost Prince Edward County biosolids with Source Separated Organics in a central rotary composting facility.
- b) All other municipalities that generate biosolids will continue the most cost effective Ministry of the Environment approved practice of land spreading on provincially approved land until provincial legislation changes dictate a procedural review.
- c) Watch emerging legislative trends and technology for biosolids management

As stated in Section 4.1, the least expensive method of dealing with biosolids is land spreading on provincially approved land under a Nutrient Management Strategy. Most municipalities, except one, land spread their biosolids. Prince Edward County decided to stop land spreading its biosolids and in 2009, sent 1,276 tonnes of dewatered biosolids to a landfill outside the region. In a September 28, 2009 Integrated Waste Management Plan focus group meeting, the consensus on biosolids management was that the municipalities allow provincial legislation to set the operating standard. At this time, all municipalities except Prince Edward County plan to continue the most cost effective Ministry of the Environment approved practice of land spreading on provincially approved land until provincial legislation changes dictate a procedural review. The municipalities also plan to watch emerging legislative trends and technology for biosolids management.

6.13 **Municipality-Specific Diversion Strategy Considerations**

No municipality-specific diversion strategy considerations were raised.

7 Description of Planned Waste Management System Infrastructure

As stated in Section 1.6, although all nine municipalities were committed to the creation of this plan, this does not obligate any of the municipalities to implement any or all of the recommendations. The extent of implementation is at the total discretion of each individual municipal Council. Plan implementation does not affect a municipality's relationship to the Centre and South Hastings Waste Services Board, nor does it affect their rights and responsibilities within the Board Agreement.

7.1 Pre-Existing Plans for Infrastructure Upgrades

Upgrade existing Material Recovery Facility to increase efficiency and reduce residue in Blue Box recycling. Planning for this upgrade began before the Integrated Waste Management Plan process. The Minister of the Environment's planned changes to the Waste Diversion Act call for 100% EPR (extended producer responsibility). The projection is that the MRF upgrades will keep the MRF operating as efficiently as possible until full EPR is in place and the Blue Box program is managed by the Stewards in a regional system.

7.2 Recommended Diversion System Infrastructure

After careful consideration and analysis of possible diversion strategies, technology, and infrastructure as listed in Section 6.11, the Integrated Waste Management Plan Steering Committee determined that there was enough evidence to move forward on the implementation of the following diversion system infrastructure:

Central Rotary Composting facility for co-composting of curbside collected SSO and Prince Edward County biosolids.

7.3 Waste Management System Infrastructure Recommended for Study

After careful consideration and analysis of possible diversion strategies, technology, and infrastructure as listed in Section 6.11, the Integrated Waste Management Plan Steering Committee determined that there was enough evidence to justify further study of the possible implementation of the following waste management system infrastructure:

Energy from Waste facility to convert residual Municipal Solid Waste to a fuel. The recommended facility size for study would be 28,000 tonnes per year, possibly expandable to 42,000 tonnes per year.

7.4 Backup Waste Management System Infrastructure Studies

After careful consideration and analysis of possible diversion and waste management infrastructure, the Integrated Waste Management Plan Steering Committee recommended further study of the possible implementation of these backup waste management infrastructure options, depending on the results of the implementation steps of the recommended diversion infrastructure in Section 7.2 and the recommended waste management infrastructure in Section 7.3:

- a. If the Energy from Waste facility mentioned in Section 7.3 is not implemented, the building of the following could be considered as another type of Energy from Waste infrastructure: An Energy from Waste facility such as incineration or gasification of residual waste to produce electricity, to achieve Recovery of Energy for residual waste after maximum possible diversion. The recommended facility size for possible implementation would be 30,000 to 60,000 tonnes per year.

- b. If Energy from Waste infrastructure in any form is not implemented, the region could consider implementing the following infrastructure: Publicly owned waste transfer station with some 'enhanced' features to improve diversion of many other waste categories. This facility would provide more control over disposition of residual waste and could lower overall waste management costs through competitive bidding on collection, operation, hauling and disposal.

7.5 List of Existing Waste Management System Facilities

- a) Material Recovery Facility
- b) Permanent Hazardous Waste Depot in Belleville
- c) Mobile HHW events scheduled
- d) Municipal landfills and transfer stations/sites
- e) Waste Management Inc. transfer station on Chester Road, Trenton
- f) Reuse Centre at Centre Hastings landfill

7.6 List of Possible Future Waste Management System Facilities-Study Stage

- a) Central rotary composting facility in study stage
- b) Energy from Waste facility to convert MSW to fuel in study stage

Facilities in study stage would go through a due diligence step. A facility that fails this step will be eliminated from the plan. Facilities that pass the due diligence step and are selected for implementation would go through site selection concurrent with public consultations. When a site is selected, applications for approval would be prepared and submitted to the appropriate authorities.

7.7 Municipality-Specific Waste Management Infrastructure Considerations

It's very important in this section of the plan to remember the disclaimer in Section 1.6 that although all nine municipalities were committed to the creation of this plan, this does not obligate any of the municipalities to implement any or all of the recommendations. The extent of implementation is at the total discretion of each individual municipal Council. Plan implementation does not affect a municipality's relationship to the Centre and South Hastings Waste Services Board, nor does it affect their rights and responsibilities within the Board Agreement.

Some municipalities may choose to partner in the infrastructure implementation. Other municipalities may choose to be customers of the infrastructure partnership. These decisions can be made by each Council as the infrastructure implementation strategy moves forward.

8 Cost and Financing Strategy

8.1 Estimated Capital Costs, Operating Costs, and Cost Savings

Appendix 7 contains financial analysis spreadsheets of the possible infrastructure changes including a detailed breakdown of capital and operating costs, potential revenues/cost savings and potential overall Net cost savings. These spreadsheets were created with the valuable assistance of the Financial Directors/Treasurers of Quinte West, Belleville and Prince Edward County. Included are realistic interest charges, cost of living increases, and a replacement fund for rolling stock and infrastructure created by setting aside two thirds (2/3) of annual cost savings.

For demonstration purposes, the financial analysis was based on a partnership among Belleville, Prince Edward County, and Quinte West.

The main points of the financial analysis are summarized in Table 11 for the case of no outside funding.

The column 'Net Avg Annual Cost Savings (Launch to 2030)' is the net average annual cost savings from the year a facility begins operation up to 2030, before any deductions are made for the replacement fund.

The column 'Replacement Fund Value by 2030' is the value of the replacement fund at 2030, not the expected cost to replace infrastructure at that time.

Table 11: Financial Analysis Summary - No Outside Funding

Infrastructure	Capital Cost (Approvals, Land, Bldg, Equipment)	Initial Annual Operating Cost	Net Avg Annual Cost Savings before rep. fund (Launch to 2030)	Replacement Fund Value by 2030 (2/3 of Savings minus replacements)
Rotary Composting and Waste to Fuel	16,754,000	2,349,000	476,000	4,763,000
Rotary Composting Only	4,420,000	277,000	338,000	3,141,000
Waste to Fuel Only	12,504,000	2,072,000	369,000	3,927,000
Transfer Station Only	5,141,000	461,000	700	- 336,000
Gasification Only	71,400,000	6,000,000	275,000	2,074,000

Table 12 is the summary of the financial analysis assuming funding from the Green Infrastructure Fund. This federal/provincial fund can cover up to two thirds (2/3) of eligible infrastructure costs. To be conservative, the analysis was completed assuming 50% funding.

For demonstration purposes, the financial analysis was based on a partnership among Belleville, Prince Edward County, and Quinte West.

The column 'Net Avg Annual Cost Savings (Launch to 2030)' is the net average annual cost savings from the year a facility begins operation up to 2030, before any deductions are made for the replacement fund.

The column 'Replacement Fund Value by 2030' is the value of the replacement fund at 2030, not the expected cost to replace infrastructure at that time.

Table 12: Financial Analysis Summary - With Green Infrastructure Fund at 50%*

(*Note: Green Infrastructure Fund could fund up to 2/3 of infrastructure)

Infrastructure	Municipal Capital Cost After Funding	Initial Annual Operating Cost	Net Avg Annual Cost Savings before rep. fund (Launch to 2030)	Replacement Fund Value by 2030 (2/3 of Savings minus replacements)
Rotary Composting and Waste to Fuel	8,677,000	2,349,000	1,071,000	11,852,000
Rotary Composting Only	2,335,000	277,000	487,000	4,844,000
Waste to Fuel Only	6,427,000	2,072,000	816,000	9,290,000
Transfer Station Only	5,015,000	461,000	10,000	- 257,000
Gasification Only	36,400,000	6,000,000	2,930,000	30,248,000

8.2 Financing Strategies

It is recommended that the proposed waste management system infrastructure costs be submitted to possible funding sources by December 2010. The highest priority is the Green Infrastructure Fund since it could fund up to 2/3 of the infrastructure costs. The financial analysis was based on a conservative estimate of the Green Infrastructure Fund funding 50% of infrastructure. If it funds 2/3 that improves the financial outlook.

The submissions should be accompanied by letters of support from the Councils of each of the nine member municipalities of the Centre & South Hastings Waste Services Board, local Members of Parliament and local Members of Provincial Parliament.

Loans from Green Municipal Fund, Infrastructure Ontario, financial institutions (e.g. banks), or private funding should be investigated.

If desired, bag tag prices could be raised to further encourage diversion and offset a portion of waste management infrastructure and operating costs.

8.3 Possible Funding Sources

a) Green Infrastructure Fund (GIF) - Federal and Provincial Governments

Infrastructure Canada, 605-90 Sparks, Ottawa, Ontario K1P 5B4
 Telephone: 613-948-1148 Fax: 613-948-9138 www.infc.gc.ca
www.buildingcanada-chantierscanada.gc.ca/creating-creation/gif-fiv-eng.html

Federal Contact: Tom Horan 613-954-8073 (Fax: 613-948-6062)
 Email: tom.horan@infc.gc.ca
 Provincial Contact: Scott Pegg, Infrastructure Policy and Planning Division
 Ministry of Energy and Infrastructure, 416-212-1874
 Email: scott.pegg@ontario.ca

- b) Continuous Improvement Fund (CIF) - Waste Diversion Ontario (WDO)
- c) Green Municipal Fund - Federation of Canadian Municipalities
- d) Infrastructure Ontario Loan
- e) Sustainable Development Fund - Sustainable Development Technology Canada
- f) Gas Tax Fund (GTF)
- g) Public-Private Partnerships Canada (<http://www.p3canada.ca/home.php>)
- h) Banks
- i) Private Funding
- j) Other Funding Sources

9 Implementation Timeline For Recommended Infrastructure Changes

This is a proposed implementation timeline for consideration by the member municipalities.

August-December 2010 - Upgrade existing Material Recovery Facility

July-September 2010 - Letters of support from each of the nine municipal Councils

July-September 2010 - Letters of support from local Members of Parliament (MP and MPP)

July-September 2010 - Partnership agreement - Belleville, Prince Edward County, Quinte West

September-December 2010 - Submissions to Green Infrastructure Fund and other funding

January-December 2011 - Site Selection and preliminary approvals

January-December 2011 - Composting-specific planning, studies, approvals

January-December 2011 - Municipal Solid Waste to fuel specific initial planning, studies, approvals

January-December 2011 - Purchase 7 acres land for MSW to fuel facility

January-December 2011 - Purchase 5 acres land for Rotary Composting facility

January-December 2012 - Construct MSW to fuel facility

January-December 2012 - Construct Rotary Composting facility

October-December 2012 - Green Bin roll-out and P&E

January 2013 - Launch SSO collection and central rotary composting

February 2013 - Launch Municipal Solid Waste to fuel facility operation

November 2013 - Launch co-composting of Prince Edward County biosolids

January 2014 - Launch every other week garbage collection



10 Contingencies

New waste management technologies and strategies may be developed in the future. It is recommended that they be reviewed within the context of this Integrated Waste Management Plan. If they are found to be better than systems already considered, the plan should be modified to incorporate them.

It's possible that during the due diligence phase of implementation, that some planned technology or technologies could be deemed to be not feasible. In that case the plan should be modified accordingly.

For example, if it is found through studies that rotary composting will not provide the desired result, other composting methodologies could be investigated to replace it.

As another example, if it is found that a facility to convert Municipal Solid Waste to fuel is not feasible due to, for instance, no market for the fuel, another type of Energy from Waste facility could be evaluated for implementation.

A third example, if an Energy from Waste facility is not feasible, and the region desires to have a more competitive waste collection bidding process, and more control over waste disposition and costs, a publicly owned transfer station could be considered for implementation.





11 Monitoring and Reporting System

A monthly Integrated Waste Management Plan progress update to the Centre & South Hastings Waste Services Board will be implemented.

Preliminary results on performance versus targets can be calculated each year from the data gathered for the Waste Diversion Ontario DataCall submission.

Final results can be calculated each year when Waste Diversion Ontario publishes the DataCall report.

A summary of performance measurements can be reported to the Centre and South Hastings Waste Services Board once per year at a Board meeting.

Once reviewed by the Board, the performance summary can be distributed to each member municipal Council.

The performance summary can then be posted on the Quinte Waste Solutions website if desired.



June 28, 2010

Centre & South Hastings Waste Services Board

12 Plan Review

It is recommended that the Integrated Waste Management Plan (IWMP) be reviewed when there is a significant waste management technological development. Other reasons for review could be major legislative changes, demographic changes, and Board agreement or membership changes. Review can occur as other unforeseen circumstances dictate.

In the absence of the above factors, the Integrated Waste Management Plan should be reviewed at least every 5 years:

- 2015
- 2020
- 2025
- 2030





13 Public Education Strategy

- a) Communications Coordinator
- b) Promotion & Education (P&E) material for the Source Separated Organics (food waste) rotary composting program distributed to each household with curbside bin and kitchen bin
- c) Zero Waste Philosophy messages promoted to residents to reduce per capita waste generation
- d) Blue Box/Garbage Collection Schedules
- e) Household Hazardous Waste Collection Events brochure
- f) The Compost Book (for backyard composting)
- g) Radio advertisements
- h) Newspaper advertisements
- i) Public meetings
- j) Press Releases
- k) Website
- l) Social Media
- m) Waste Reduction Calendar (if approved for production)



14 Public Consultation Record

Five public information meetings were held in October and November 2009:

- Oct 19 Prince Edward Community Centre, 375 Main St, Picton
- Oct 21 St. Paul's Anglican Parish Hall, 82 Boundary Rd, Roslin
- Nov 3 Belleville Recreation Centre, 116 Pinnacle St., Belleville
- Nov 5 Quinte West Council Chamber, 7 Creswell Dr, Trenton
- Nov 18 Madoc Kiwanis Hall - 139 St. Lawrence St E, Madoc

A survey was available for attendees to fill out.

Supporting information was in posters on the wall.

There was a short presentation explaining the Integrated Waste Management Plan process and options being considered.

A detailed report on the public consultation process is included in Appendix 5.

This Integrated Waste Management Plan document will be available to the public on our website (www.quinterecycling.org).

It will be requested to be posted on the Waste Diversion Ontario's Continuous Improvement Fund (CIF) website.

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Township of Madoc - www.madoc.ca

Marmora and Lake - www.marmoraandlake.ca

Prince Edward County - www.pecounty.on.ca

City of Quinte West - www.city.quintewest.on.ca

Stirling-Rawdon - www.stirling-rawdon.com

Tweed - www.twp.tweed.on.ca

Township of Tyendinaga - www.tyendinagatownship.com

Waste Diversion Ontario - www.wdo.ca

Compost Council of Canada - www.compost.org

US EPA's W.A.R.M. model Greenhouse gas calculator - www.epa.gov/WARM

Genuine Progress Index (GPI) Nova Scotia - www.gpiatlantic.org

Genuine Progress Indicator (GPI) Alberta - www.greeneconomics.ca/gpi

Waste Electrical and Electronic Equipment (WEEE) - www.dowhatyoucan.ca

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www.alternrg.com

www.sunbayenergy.com

www.plascoenergygroup.com

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Appendices

Appendix 1: Policy Statement on Waste management Planning: Best Practices for Waste Managers, June 12, 2007, Ministry of the Environment

Appendix 2: Excerpt of 2008 Waste Diversion Ontario DataCall by Municipal Grouping

Appendix 3: From Waste to Worth: The Role of Waste Diversion in the Green Economy. Minister's Report on the Waste Diversion Act 2002 Review, October 2009, Ministry of the Environment

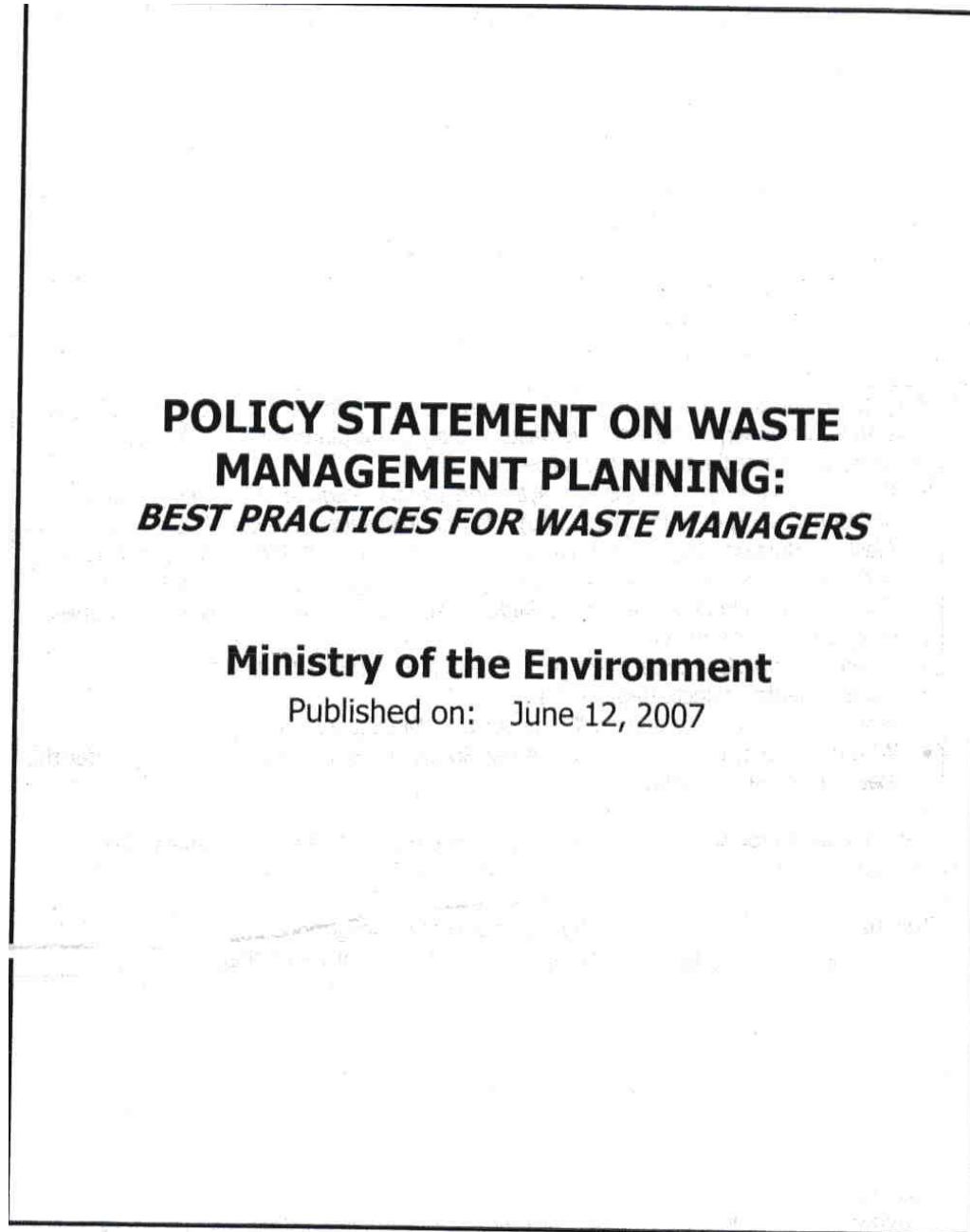
Appendix 4: Excerpt of The Blue Box Program Enhancement and Best Practices Assessment Project by KPMG Final Report Volume II, July 6, 2007

Appendix 5: Survey Results from October to November 2009 IWMP Public Information Meetings

Appendix 6: Examples of Technology Suppliers

Appendix 7: Financial Analysis of Possible Diversion Infrastructure Changes

**Appendix 1: Policy Statement on Waste management Planning: Best Practices
for Waste Managers, June 12, 2007, Ministry of the Environment**



This statement does not exempt waste managers from adhering to relevant provincial laws and policies when undertaking waste management planning decisions. This includes, but is not limited to, the following:

- Part V, *Environmental Protection Act*,¹ and *Ontario Regulation 101/94* (Recycling and Composting of Municipal Waste), *Ontario Regulation 102/94* (Waste Audits and Waste Reduction Work Plans), *Ontario Regulation 103/94* (Industrial, Commercial and Institutional Source Separation Program), *Ontario Regulation 104/94* (Packaging Audits and Packaging Reduction), and *Ontario Regulation 347* (General — Waste Management);
- *Environmental Assessment Act*; and *Ontario Regulation 101/07*, EAA (Waste Managements Projects Regulation)
- Provincial Policy Statement, 2005, under the *Planning Act*; and
- Where relevant, the Growth Plan for the Greater Golden Horseshoe, 2006, under the *Places to Grow Act*, 2005.

See appendices for some relevant sections of the Provincial Policy Statement, 2005 and the Growth Plan for the Greater Golden Horseshoe, 2006.

This statement does not replace the requirements or obligations imposed on municipalities through other provincial policies, statutes or regulations.

¹ Italicized terms (unless they are the name of an Act) have been further defined in the Definitions section of this statement.

POLICY STATEMENT ON WASTE MANAGEMENT PLANNING

Ministry of the Environment

Published on: June 12, 2007

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Part I: Introduction



POLICY STATEMENT ON WASTE MANAGEMENT PLANNING

Ministry of the Environment

Published on: June 12, 2007

Part I: Introduction

Purpose

The Government of Ontario is committed to protecting the environment and human health, and conserving the province's natural resources. For waste management, the Ministry of the Environment (MOE) develops, implements and maintains a regulatory framework for the management of hazardous and non-hazardous waste; issues approvals to waste disposal sites and waste haulers to ensure appropriate management; and undertakes inspections and enforcement activities. This includes requirements to minimise waste by reducing, reusing, recycling, composting and recovering resources.

Ontario has a long history of waste diversion based on the promotion of the 3Rs (reduce, reuse, recycle). Recycling initiatives gained momentum throughout the 1980s and 1990s as industry and municipalities embraced the 3Rs, and expanded significantly in 1994 with the introduction of the 3Rs regulations (Ontario Regulations 101/94, 102/94, 103/94 and 104/94, made under the *Environmental Protection Act*). For a number of years thereafter, few new policy or program initiatives were introduced at the provincial level. In 2002, the province passed the *Waste Diversion Act*, which established Waste Diversion Ontario as a non-government corporation to oversee extended producer responsibility-based diversion programs involving industry.

In recent years, Ontario has taken a number of important steps to strengthen and broaden the province's waste management approach and drive diversion, including:

- Making it easier to increase waste diversion, use specific waste as alternative fuel, and test new energy from waste technologies;
- Introducing a deposit return system for wine and spirit containers;
- Launching an extensive compliance effort to ensure that the IC&I sectors are meeting their obligations under Ontario Regulations 101-104;
- Requesting the development of a program plan for municipal hazardous or special wastes from Waste Diversion Ontario (completed June 2007), and Waste Electrical and Electronic Equipment (winter 2008);
- Forming a partnership with Ontario industry and environmental organizations that will ensure 50 per cent reduction in the use of plastic bags by 2012 through expansion of reusable bag programs and consumer education;

- Committing to work with industry at the provincial and federal level to reduce the net environmental impacts of packaging; and,
- Supporting innovation and research to increase diversion.

As part of its commitment to give waste managers the tools they need to develop sustainable waste management solutions, Ontario is also introducing this Policy Statement on Waste Management Planning. The Policy Statement articulates the province's expectations for waste management in Ontario, outlines a framework and principles for decision-making by all waste managers and provides specific direction to guide the development of long-term municipal waste management plans. It is intended to achieve more consistent and timely waste management planning across the province and to make the decision-making process more transparent.

This Policy Statement sets out best management practices for the management of waste and creation of waste management plans, and the Province encourages all waste managers to face the challenge of waste management and follow this policy.

In particular, the industrial, commercial and institutional sectors (IC&I) generate significant quantities of waste that requires appropriate management. The Province challenges these sectors to consider the principles established here in minimizing the amount of waste produced, and therefore minimizing waste management requirements for both the business sectors and municipalities.

Context

An expanding economy and a growing population are placing heavy demands on Ontario's natural resources and straining our ability to effectively manage the environmental impacts of growth. For example, the population of Ontario's fastest growing region, the Greater Golden Horseshoe (GGH), is expected to increase by an additional 3.7 million people by 2031. Managing the increasing volume of waste is one resulting challenge.

Provincial planning documents recognize the importance of creating well-planned policies to manage the waste created by our growing population. In the Provincial Policy Statement, 2005, the province expressed the need to integrate land-use planning (including waste management planning) and planning for growth in order to maintain strong communities, a clean and healthy environment and a strong economy.

In the Growth Plan for the Greater Golden Horseshoe, 2006, the province provides policy direction to guide decisions on a wide range of growth-related issues, including urban form, infrastructure planning and resource protection. The Growth Plan aims to guide infrastructure investment decisions to address current shortfalls and provide for future needs. It also discusses the importance of coordinating land-use planning with infrastructure planning.

The province's history of promoting, encouraging and providing guidance to municipalities in waste management planning dates back to the early 1980s. Provincial guidance has emphasized the need for long-term, forward-thinking area waste management planning coordinated with land-use planning. However, Ontario communities do not always assess what their waste management needs will be over a 20 to 25 year period, or take steps to ensure that they can meet those needs. This gap in planning is evident across the province, but it is of particular concern in rapidly developing urban areas, where residential and commercial growth is competing with other land uses.

A failure to adequately plan for effective waste management infrastructure has led to many undesirable circumstances. The following are key examples:

- Ontario cannot sufficiently manage all waste generated.
- Progress on waste diversion is slow.
- Existing public and private waste management infrastructure are under great pressure to handle increasing quantities of waste.
- Waste is being exported out of Ontario for management.

Exporting waste is not a sustainable long-term solution because it creates broader problems. It generates greenhouse gases from long-distance truck transport, causes social discord (as many communities oppose siting of landfills for other communities in their municipality) and could potentially create economic challenges for Ontario businesses and municipalities required to search for alternative solutions.



Part II: Framework for Waste Management Decisions

This section provides direction to all waste managers.



Part II: Framework for Waste Management Decisions

The Way Forward — Expectations for Waste Management in Ontario

To address Ontario's waste management challenges, progressive and cooperative approaches are needed to ensure that sustainable systems and services are available over the long-term.

Planning for appropriate waste management infrastructure is vital to building strong, healthy and prosperous communities. As we move forward and our communities continue to grow, we must anticipate future waste management needs. Greater consideration needs to be given to developing local solutions.

A holistic approach should be taken when assessing different waste management options in order to minimize our environmental footprint (e.g., minimized need for new resources, conserving land, and fewer pollutants generated, including the greenhouse gases responsible for climate change). Source reduction should always be considered as a first step. Where reduction is not possible, we must embrace programs and technologies that increase diversion and recognize the value in waste. By simply disposing of waste (in a landfill, for instance), we lose potentially valuable resources.

We all have a role to play in addressing our waste management challenges and contributing to the provincial goal of 60% diversion from disposal — and the private sector in particular can play a vital part. Through better waste management planning (including waste diversion), the IC&I sectors can demonstrate leadership in responding to our waste management challenges and make a valuable contribution towards protecting the environment and conserving our natural resources.

The province also encourages the producers and stewards of those products that end up in Ontario's waste stream to take greater responsibility for the well-being of our natural environment, and ensure that the environmental impacts of the products produced and/or consumed in the province are appropriately managed throughout their life cycle.

A. Waste management principles

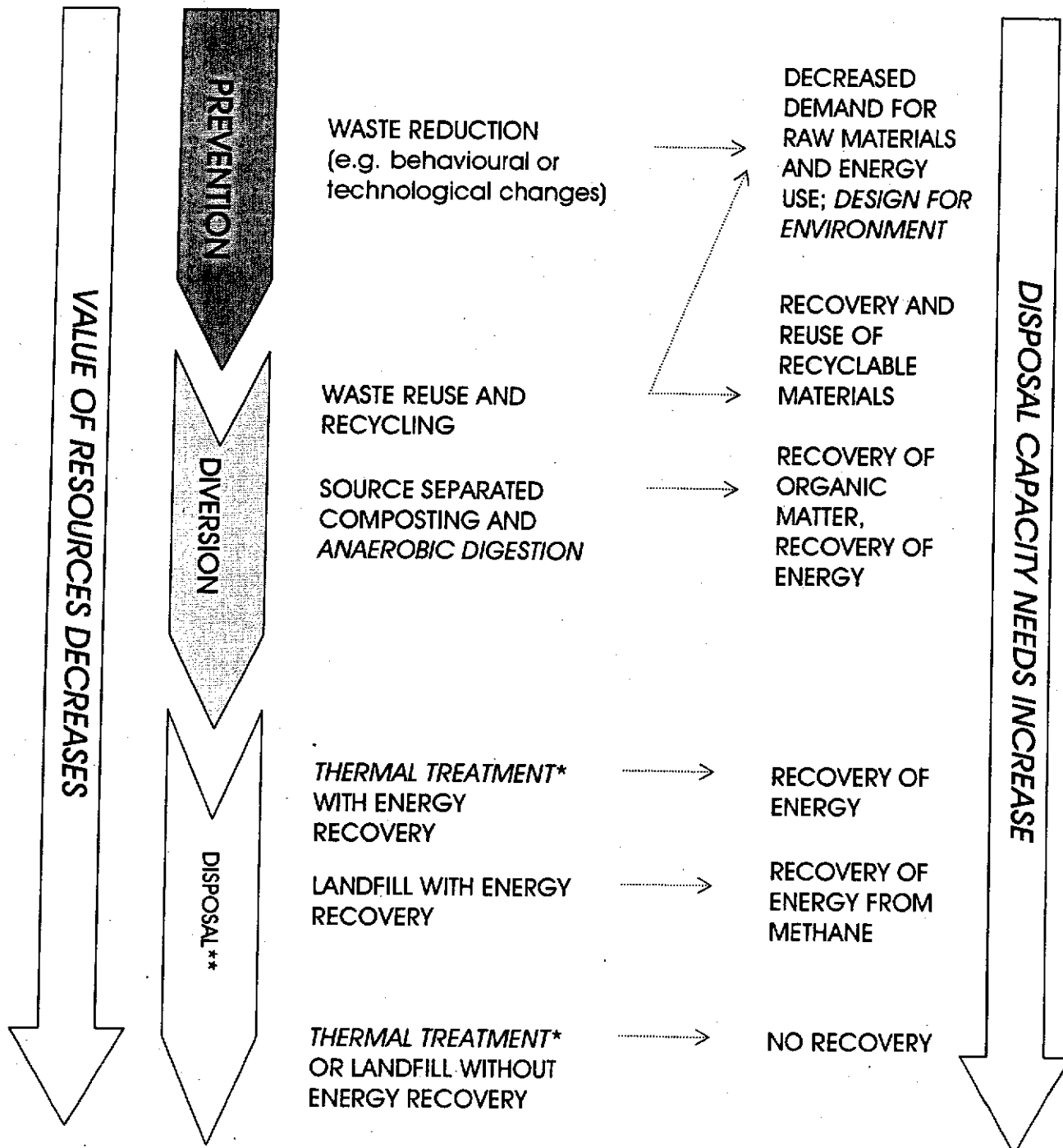
Ontario's framework for waste management decisions protects the environment and public health, is committed to resource conservation, encourages innovation and promotes sustainable systems.

To achieve these goals all waste management decisions, including those made by municipalities and the private sector, should consider the following principles:

- a. Environmental protection is a shared responsibility.
- b. Integrated waste management systems that reflect local circumstances are in place.
- c. Diversion of materials from final disposal is maximized in consideration of the provincial 60% diversion target, including the creation of incentives where appropriate.
- d. Public and private sectors cooperate, where possible, to realize cost savings and maximize efficiencies.
- e. Waste management choices consider economic, social *and* environmental costs.
- f. Investment in infrastructure is made to accommodate growth.
- g. Waste is managed as close to the source of generation as possible.
- h. Producer responsibility is incorporated into waste reduction and management.
- i. Decision-making is open and transparent.
- j. Informed citizens support waste management choices and participate in waste management programs.
- k. Maximum value from waste is recovered from the waste stream (see Figure 1: The Waste Value Chain).
- l. Innovative waste management technologies and approaches are incorporated as appropriate to local circumstances to achieve sustainable solutions.

B. The waste value chain

The waste value chain emphasizes waste reduction, reuse, recycling and composting and all forms of resource recovery before considering final disposal. As illustrated in Figure 1, as the value inherent in waste diminishes, disposal needs increase.

Figure 1: The Waste Value Chain

* With potential use of ash or recovery of metals.

** Waste managers should consider waste reduction as a first priority, followed by diversion. All disposal options have unique environmental concerns and should only be considered as a last option. Where disposal is necessary, waste managers should carefully reflect on these environmental concerns in light of their local circumstances. Recovering energy from landfill or thermal treatment should be considered prior to thermal treatment or landfill without energy recovery.

C. Roles and responsibilities

All parties involved in waste management — the province, municipalities, private sector waste management industry, IC&I sectors, the public and environmental groups — have a role to play in achieving sustainable waste management and a responsibility towards the environment.

ROLES AND RESPONSIBILITIES

The Province

- Set and enforce environmental standards and requirements for waste diversion and disposal.
- Support municipalities and the private sector by providing the necessary tools for waste diversion and the disposal of residual waste.
- Issue approvals to waste disposal sites and waste haulers to ensure appropriate management.

Municipalities

- Plan for and provide direct waste management services to their residents, and in some cases, local businesses, including programs for waste diversion and disposal of residual waste.
- Plan for, site and invest in necessary waste management infrastructure.
- Comply with provincial waste management standards and requirements.
- Fund and implement diversion programs under the *Waste Diversion Act*.

Private Sector Waste Management Industry

- Provide waste services to clients of the IC&I sectors, and in some cases, through contract to municipalities, waste services to residents.
- Comply with provincial waste management standards and requirements.

The IC&I Sectors

- Plan for, and help reduce, the amount of waste generated by their operations.
- Comply with provincial waste management standards and requirements.

Producers and Stewards

- Minimize the life-cycle impacts (i.e. environmental footprint) of products and their packaging through *Design for the Environment*.
- Fund and implement diversion programs under the *Waste Diversion Act*.

The Public

- Help reduce the amount of waste generated through their activities and choices.
- Engage in waste management decisions and participate in waste prevention and diversion programs.



June 28, 2010

Centre & South Hastings Waste Services Board

Environmental Groups

- Promote the need to reduce waste and conserve our natural resources.
- Raise public awareness of waste management issues.





Part III: Guidelines for Developing a Municipal Waste Management Plan

This section provides direction to municipal waste managers.



Part III: Guidelines for Developing a Municipal Waste Management Plan

The following guidelines describe the Ministry of the Environment's expectations of an effective waste management plan.

These guidelines are relevant to all municipalities.

Context

Long-term waste management plans are essential to ensure that integrated and sustainable waste management systems are provided that:

- address our waste management objectives, including a commitment to meet the provincial target of 60% diversion from waste disposal;
- avoid waste disposal capacity issues by ensuring the necessary resources are committed to meet the needs of Ontario's communities, now and in the future (e.g. investing in infrastructure, services and systems);
- ensure waste is managed as close to the source of generation as possible;
- meet the requirements set out in provincial planning documents, such as the Provincial Policy Statement and Growth Plan, to address the long-term growth and development of communities (see the Appendix);
- are supported by Ontario's communities, through citizen engagement and transparent decision-making; and
- improve access to consistent and comparable municipal data.

Plans developed in accordance with these guidelines could also facilitate the approvals process for waste management facilities, as a municipality may have the opportunity to provide the Minister with information from another planning process, which he/she will be able to use for decision-making purposes (see Section 4.0 for more information on integration with approvals processes).

Where a municipality has already developed, or is in the process of developing a waste management plan, the Ministry encourages that adjustments be made, where necessary, to ensure the plan (or planning process) reflects the principles and expectations established through the Policy Statement.

It is not the Ministry's expectation that municipalities will be bound by their plans for the entire 20 to 25-year planning horizon; but rather, plans should be updated to reflect changing local circumstances (see section 3.14).

To support municipalities in developing effective waste management plans, the Ministry of the Environment will develop guidance material to support this statement.

1.0 Strategic Directions

When developing municipal waste management plans, the province's expectation is that the framework for waste management decisions (as outlined in Part II of this Policy Statement) will be applied to decision-making. The following section provides additional direction to municipalities on the framework.

1.1 Integrated waste management

A municipal waste management plan should employ an integrated waste management system that combines waste diversion and disposal options in a way that is appropriate for local circumstances. When developing an integrated waste management system, municipalities should consider the waste management principles that this Statement articulates in Part II and Figure 1: The Waste Value Chain (which is further described in Section 1.6, below).

When examining waste management options to decide on an appropriate system, municipalities should consider all the potential economic, social and environmental elements of each option.

1.2 Proximity

Waste should be managed as close as possible to the source of generation.

1.3 Strategic planning

Waste management planning is most effective when integrated, on an ongoing basis, with other municipal planning decisions, including but not limited to, development, infrastructure and financial planning. Waste management plans should be integrated with, or become an element of, other broad municipal planning activities, such as economic development, growth, environmental or sustainability plans.

1.4 Cooperation among municipalities

The province encourages cooperation among municipalities to seek efficiencies and to find mutually acceptable solutions to waste management. This partnership approach could expand the waste management options available to the municipalities involved.

Also, such an approach can have financial benefits (for instance, from the economies of scale that can be realized by regional facilities) and at the same time allow municipalities to make waste management decisions relevant to local circumstances. Smaller municipalities may also benefit from sharing the cost of plan development, by partnering with other municipalities or regions.

1.5 Public engagement

Public consultation should be integrated with the waste management planning and decision-making process, from beginning to end and should be aligned with other long-range planning consultations.

The methods used to evaluate all elements of the plan, including all options being considered, should be made clear during consultation.

1.6 Waste value chain

The Ministry of the Environment expects that municipalities will consider waste management options according to the 3Rs — reduce, reuse and recycle — and that, where feasible, all methods of resource recovery will be considered prior to final disposal of waste (see Figure 1).

A. Waste prevention

While recognizing that industry producers and stewards have a significant contribution to make within this area, municipalities should also be focusing on waste prevention as a first step. This could include creating programs to encourage reducing waste at the source, such as consumer education programs (e.g., helping consumers to identify packaging that is recyclable through the municipality's recycling program) or financial incentives (e.g., user-pay systems that charge waste management fees based on the amount of non-recyclable waste that is disposed). Municipalities can also make purchasing decisions that focus on buying products or services for municipal operations that minimize waste management costs.

B. Waste diversion

Reuse activities should be fostered throughout municipal operations by providing space for and information about reuse centres for residential waste. This ensures that the useful life of products is exhausted prior to recycling.

Recycling products and materials that cannot be used, and diverting organics through composting and anaerobic digestion, are integral options for maximizing the rate of diversion from disposal.

C. Waste disposal

Recovering energy from *thermal treatment* or landfill (e.g. methane capture) should be considered prior to *thermal treatment* or landfill without energy recovery.

2.0 Scope of Municipal Waste Management Plans

2.1. Types of waste the plan will cover

Municipal waste

To be effective, waste management plans should cover all residential waste (single and multi-family) generated within the *study area* and all other waste managed by the municipality, including:

- Residential waste collected on behalf of a municipality (e.g., by a private contractor);
- Any waste collected through a curb side collection program, such as leaf and yard waste, blue box and green bin programs for organic food waste;
- Waste generated by municipal operations;
- IC&I and Construction and Demolition (C&D) waste collected by the municipality; and
- All wastes received, or to be disposed at, municipal transfer stations, landfills, composting facilities and material recovery facilities.

Biosolids

A number of municipalities are already managing *sewage biosolids* through the preparation of Nutrient Management Strategies in accordance with the requirements of the *Nutrient Management Act*, 2002, and Ontario Regulation 267/03.

The ministry does not intend that municipalities duplicate efforts. Rather, waste management plans should reference waste being managed through land application and plan for anticipated changes over time (i.e., covered by Nutrient Management Strategies).

Biosolids that are not covered by a Nutrient Management Strategy (for example, biosolids that are put in landfills or incinerated) should be integrated into municipalities' waste management plans.

2.2 Timing

All municipalities, regardless of size and location, should have a waste management plan in place, or be covered by a plan developed by another municipality (e.g., a regional municipal waste management plan).

It would be appropriate for large municipalities (with populations of 100,000 or greater) to have completed and begun implementation of a waste management plan that conforms to the guidance provided in this statement, by [*insert date* – 2 years after statement is finalized].

It would be appropriate for small municipalities (with populations under 100,000) to have completed and begun implementation of a waste management plan that conforms to the guidance provided in this statement, by [*insert date* – 2.5 years after statement is finalized].

Planning period

At minimum, municipal waste management plans should cover a 20 to 25-year planning period.

2.3 Appropriate level of government

The *Municipal Act*, 2001, provides broad authority to lower-tier municipalities to develop bylaws and provide services for waste management (unless specifically assigned to an upper-tier municipality), and to undertake long-term waste management planning (including planning for waste management facilities). For each municipality, this means considering whether the plan should cover a local service area, or if the municipality should partner with neighbouring municipalities to develop a plan that covers a larger service area, e.g., one defined by political or regional boundaries.

3.0 Minimum Recommended Plan Content

This section outlines what a municipal waste management plan should contain, at a minimum. A municipality should add to the plan as is deemed suitable.

At minimum, municipal waste management plans should include the following elements:

1. Stated problem

2. Goals and objectives
3. Area that the plan will cover
4. Present waste generation trends and waste management practices and systems
5. Projected waste management needs over the planning period
6. Diversion strategy
7. Description of the planned waste management system
8. Cost and financing strategy
9. Implementation timelines
10. Contingencies
11. Monitoring and reporting system
12. Plan Review
13. Public education strategy
14. Public consultation record

Each of these elements is described further below.

3.1 Stated problem

Include a discussion of factors driving the need to review current waste management programs (i.e., economic/population growth, landfill capacity constraints, etc.).

Based on the current waste management situation, state the problem or situation that the plan must address (e.g., a municipality with a growing population and less than 10 years' waste disposal capacity, at current growth rates, may choose to develop a plan to maximize potential diversion activities, to extend the lifespan of existing disposal capacity).

3.2 Goals and objectives

Set broad goals and objectives for the plan (e.g., enhanced diversion) along with associated targets (e.g., set a percentage increase in waste generated to be diverted from disposal over the planning period).

When setting targets, municipalities should consider the provincial goal of 60% diversion from disposal and describe how and by what date this goal will be attained. If this diversion target is not feasible over the timeframe for the plan, identify the reasons why.

3.3 Area that the plan will cover

Define the *study area* with consideration of Section 1.2 of this Statement. The waste management plan must account for all waste (identified in Section 2.1 of this Statement) that is generated within this *study area*.

All municipalities within the delineated *study area* should have agreed to a cooperative approach and be committed to the terms of that plan.

3.4 Present waste generation trends and waste management practices and systems

Describe the current solid waste management system:

- the percentage and tonnes of waste diverted (provide details);
- the percentage and tonnes of waste going to various disposal (provide details);
- a summary of existing diversion programs;
- an inventory of residual materials generated; and
- information about the facilities that deal with treated, processed, recovered or disposed waste, including the remaining lifetime of those facilities.

Current residential diversion and disposal data should match information submitted for the Waste Diversion Ontario (WDO) and the Municipal Performance Measurement Program (MPMP) in the year the plan is completed.

3.5 Projected waste management needs over the planning period

Estimate future processing/disposal capacity needs for municipal waste that will be generated during the planning period. Describe the variables affecting this estimate and the extent to which they can reasonably be expected to change.

Supporting information from previously developed reports/studies could contribute to estimating the amount and type of waste expected to be generated over the planning period (e.g., waste audits, demographics studies and economic projections). The plan should reference these documents.

As these documents may be lengthy and/or technical, it may be helpful to summarize the key outcomes or findings of supporting reports within the waste management plan. Also, if these reports are not attached to the municipal waste management plan as a technical appendix, they should be made available to the public in the same manner as the plan (e.g., accessible on the same web page).

Links to strategic planning documents, such as growth plans, Official Plans, or sustainability plans should also be indicated.

3.6 Diversion strategy

Provide a detailed analysis of municipal solid waste management options and a recommended strategy for maximum diversion of municipal waste. Include options considered (e.g., functionally different activities or solutions to deal with waste), criteria used to evaluate options and determine strategy, and an explanation of how selected approach will meet established targets.

Describe diversion programs that will be implemented and show the individual contribution of waste reduction, reuse, recycling and recovery as components of the diversion plan.

3.7 Description of the planned waste management system

Provide a description of the future solid waste management system envisioned to ensure adequate waste management capacity over the remainder of the planning period, including facilities to be used for either diversion or disposal. Specific facilities should be identified if they are already approved and/or operational. If facilities have not yet been approved, briefly describe their current status and/or plans to move forward for their approval.

3.8 Cost and financing strategy

Include a cost analysis for all proposed components of the plan, including the capital and operating costs to implement the plan.

The plan should address financing strategies for the cost of all sites, facilities and programs in the plan, including cost-recovery mechanisms.

Strategic financing decisions should be clearly articulated (e.g., if a user-pay system is going to be introduced).

A detailed 10-year financial plan should be sufficient, but must be revisited periodically to ensure that it remains relevant throughout the entire planning period (20 to 25 years).

3.9 Implementation timelines

Include an implementation plan, with timelines for each component of the plan.

3.10 Contingencies

Indicate any implementation risks that could interfere with the achievement of critical objectives and include contingency actions.

3.11 Monitoring and reporting system

Describe how the municipality will monitor the plan's implementation.

Prepare an annual update report that includes, at minimum, data and information on the following elements:

- waste generated (by type and by weight)
- diversion rates achieved (by type and by weight and by what means)
- diversion rates achieved (expressed as a percentage and measured against set diversion targets)
- waste disposed (by type and by weight and by what means)
- remaining waste disposal capacity
- any planning activities (e.g., introduction of new programs, studies, or consultations).

Diversion and disposal data should match information submitted for the Waste Diversion Ontario (WDO) Datacall (and include a reiteration of the previous year's figure as verified by WDO).

3.12 Plan Review

Describe how and when the municipality will review the plan to ensure that it remains relevant.

At minimum, plans should be reviewed and revised when a municipality has less than 10 years' waste disposal capacity remaining.

Municipalities may wish to coordinate the review of the waste management plan with the five-year review of the municipality's Official Plan, as required by the *Planning Act*. This will help to integrate waste management planning with municipal land-use planning and planning for growth.

3.13 Public education strategy

Include an *ongoing* public awareness and education strategy for waste programs included in the plan.

3.14 Public consultation record

Describe the public consultation undertaken to develop the plan and how the plan addresses the public's issues and concerns. If the plan does not address some of the public's issues and concerns, the municipality's reasons for not addressing these should be explained.

At a minimum, the municipality should consult on the waste management plan with its residents and all communities potentially affected by the elements of the plan, including First Nations. These communities may include host communities for waste processing or disposal facilities, communities adjacent to host communities, or communities through which waste may have to be transported to reach the host community.

The municipality should ensure that it considers and integrates the concerns of affected communities into its decision-making process prior to using and/or establishing a new facility, and throughout its lifetime.

The plan should be accessible to the public through a convenient means (e.g., website posting in areas where broadband access is widespread).

4.0 Integration with Approvals Processes

4.1 Approval of plans by municipal council

Municipal council should approve all waste management plans.

4.2 Environmental assessment processes for waste management undertakings

When developing waste management plans, and the implementation schedule for the plans, municipalities should consider the time required to complete the Environmental Assessment process for waste management projects that are included in the plan. Ontario Regulation 101/07 (waste management projects) under the *Environmental Assessment Act* (EAA) prescribes how certain waste management projects will be assessed under the EAA. The regulation classifies waste management projects based on the type of waste to be used, the size and, in some cases, the ability of the planned facility to recover energy from the waste in relation to EA requirements.

A comprehensive guide has been developed to help proponents of waste management projects, consultants, the public and other interested persons understand the EA requirements for waste management projects which are set out in the regulation.

EA is not intended to re-examine questions/issues that have previously been answered through other planning mechanisms/approvals. Rather the EAA provides an opportunity for proponents to provide the Minister with information from other planning process which he/she will rely upon for decision making purposes. This could include information developed as part of the waste management planning process. Proponents are responsible for providing the necessary material/information demonstrating how these issues have been resolved during previous planning processes to justify the limited scope.

Note:

In January 2007, the Ministry of the Environment concluded consultations through the Environmental Registry on the document *Code of Practice: Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario* (the Ministry is now finalizing this document, taking into account stakeholder feedback). The Code of Practice provides guidance on how to integrate previous planning work, such as municipal waste management plans, into the environmental assessment process, and includes the following elements:

- Examination of alternative responses to problems, challenges, or opportunities;
- Regard for the environment and environmental effects;
- Public consultation with interested persons (public, municipalities);
- Ability for the public to inspect the planning document in its entirety; and
- Approval by a recognized decision-making body in a transparent manner (municipal council resolution).

Proponents should refer to the Code of Practice for further information.

Definitions

Anaerobic digestion: Anaerobic digestion is the biological decomposition of organic matter, by bacteria, in the absence of oxygen in an enclosed vessel. Anaerobic digestion produces a biogas, a partially stabilized soil-like material, and a liquid effluent. The biogas consists mainly of methane and carbon dioxide and can be burned to produce energy.

Design for the Environment:

The examination of a product's entire lifecycle, and incorporation of changes to product design, in order to minimize its environmental footprint.

Municipal waste:

This term includes

- (a) any waste, whether or not it is owned, controlled or managed by a municipality, except
 - (i) hazardous waste,
 - (ii) liquid industrial waste, or
 - (iii) gaseous waste; and
 - (b) solid fuel, whether or not it is waste, that is derived in whole or in part from the waste included in clause (a)
- (R.R.O. 1990, REGULATION 347, EPA).

Sewage biosolids:

The residue from a sewage treatment works following treatment of sewage and removal of effluent (O. Reg. 267/03, NMA).

Study area:

The area covered by the waste management plan. It is up to municipal waste management decision makers to define the study area. Its definition may be decided based on one or more municipal boundaries or waste facility service areas. Defining the study area can be a strategic decision, within or among municipalities, to enable the coordination of actions for development of waste management solutions that will result in the most benefit.

Thermal treatment: This type of treatment includes incineration, gasification, pyrolysis or plasma arc treatment (O. Reg. 101/07, EAA).

APPENDIX

Excerpt from the Provincial Policy Statement, 2005

Section 1.6.8 of the Provincial Policy Statement on land-use planning, issued under the authority of Section 3 of the *Planning Act*, states that:

Waste management systems need to be provided that are of an appropriate size and type to accommodate present and future requirements, and facilitate, encourage and promote reduction, reuse and recycling objectives.

Waste management systems shall be located and designed in accordance with provincial legislation and standards.

Excerpt from the Growth Plan for the Greater Golden Horseshoe, 2006

The *Places to Grow Act*, 2005, requires all municipal planning decisions made under the *Planning Act* and the *Condominium Act*, 1998, to comply with the policies of growth plans developed under the Act. The Growth Plan for the Greater Golden Horseshoe was released in 2006. The Growth Plan outlines strategies for where and how the Greater Golden Horseshoe region should grow over the next 25 years.

The Growth Plan states that municipalities in the Greater Golden Horseshoe will develop and implement official plan policies and other strategies in support of conservation objectives including the following objectives on integrated waste management (See the Growth Plan, Section 4.2.4 A Culture of Conservation, Clause 1(d)):

- i. Enhanced waste reduction, composting, and recycling initiatives and the identification of new opportunities for source reduction, reuse, and diversion where appropriate
- ii. A comprehensive plan with integrated approaches to waste management, including reduction, reuse, recycling, composting, diversion and the disposal of residual waste
- iii. Promotion of reuse and recycling of construction materials
- iv. Consideration of waste management initiatives within the context of long-term regional planning, and in collaboration with neighbouring municipalities

Appendix 2: Excerpt of 2008 Waste Diversion Ontario DataCall by Municipal Grouping

Municipality	Total Reported Multi-Family Households Including Seasonal Households	Reported Seasonal Households	Reported Population	Reported + Calculated Population	Total Residential Waste Generated		Total Residential Waste Diverted		Total Residential Waste Disposed		Residential Waste Diverted						Residential Waste Disposed					
					Tonnes	Kg/Cap	Tonnes	Kg/Cap	Tonnes	Kg/Cap	Residential Return Program	Residential Reuse	Residential On Property	Residential Recyclables	Residential Organics Diverted	Residential MMSW Treatment / Reuse / Recycle	Total Residential Diversion Rate	Residential EFW	Residential Hazardous Waste Disposal	Residential Landfill	Total Residential Disposal Rate	
					%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Large Urban																						
YORK REGIONAL MUNICIPALITY OF	232,549	70,484	0	1,011,360	1,011,360	344,682.80	340.81	192,546.58	180.50	162,135.84	160.31	1.82%	0.00%	2.93%	24.50%	23.46%	0.46%	52.98%	3.36%	0.02%	43.66%	47.04%
HALTON REGIONAL MUNICIPALITY OF	139,150	27,671	0	462,238	462,238	201,102.70	439.58	102,822.07	222.20	98,280.63	212.37	1.27%	0.00%	2.56%	23.93%	23.93%	0.00%	51.13%	0.00%	0.48%	48.39%	48.87%
PEEL REGIONAL MUNICIPALITY OF	297,030	89,000	0	1,199,000	1,199,000	503,126.44	419.62	244,414.12	203.85	258,712.32	215.77	1.31%	0.00%	3.02%	26.67%	17.37%	0.21%	48.69%	20.16%	0.14%	31.11%	51.42%
HAMILTON CITY OF	155,030	48,857	0	519,109	519,109	227,209.70	437.69	100,687.29	193.86	126,522.41	243.73	1.26%	0.00%	3.94%	19.66%	19.66%	0.41%	44.31%	0.00%	0.15%	55.53%	55.65%
TORONTO CITY OF	442,548	554,347	0	2,511,995	2,511,995	921,604.51	366.88	405,068.52	161.25	516,535.98	205.63	1.50%	0.00%	3.81%	18.69%	19.84%	0.11%	43.95%	0.00%	0.10%	55.95%	56.05%
LONDON CITY OF	112,912	47,350	0	379,200	379,200	153,308.70	420.12	65,655.41	173.14	93,653.28	246.98	1.31%	0.00%	5.84%	22.36%	11.60%	0.10%	41.21%	0.00%	0.05%	58.74%	58.79%
Urban Regional																						
DURHAM REGIONAL MUNICIPALITY OF	182,748	22,405	0	605,735	605,735	237,322.97	397.78	117,328.61	183.70	119,994.36	198.10	1.41%	0.00%	4.27%	23.13%	20.28%	0.35%	49.44%	0.00%	0.06%	50.50%	50.56%
WATERLOO REGIONAL MUNICIPALITY OF	143,530	46,300	0	533,700	533,700	192,707.78	361.03	90,784.47	170.12	101,913.37	190.96	1.53%	0.00%	5.73%	21.00%	18.59%	0.35%	47.12%	0.00%	0.09%	52.81%	52.89%
SIMCOE COUNTY OF	117,912	7,628	10,519	319,801	324,284	113,970.89	368.96	56,289.47	173.58	63,681.42	196.38	1.47%	0.00%	3.58%	32.54%	9.17%	0.16%	46.92%	0.00%	0.08%	53.02%	53.08%
Niagara Regional Municipality of	158,079	29,427	0	449,685	449,685	210,975.48	468.65	91,150.63	202.57	119,724.85	266.08	1.18%	0.00%	4.07%	20.01%	17.67%	0.31%	43.22%	0.00%	0.08%	56.70%	56.78%
OTTAWA CITY OF	250,064	115,708	0	889,150	889,150	341,629.21	380.37	112,812.13	126.00	228,817.08	254.78	1.45%	0.00%	2.17%	19.43%	19.43%	0.07%	33.02%	0.93%	0.20%	66.88%	66.98%
ESSEX-WINDSOR SOLID WASTE AUTHORITY	130,226	22,887	0	393,115	393,115	154,710.29	392.43	49,251.26	126.28	105,019.03	267.15	1.40%	0.00%	3.17%	17.69%	9.40%	0.00%	31.93%	0.00%	0.31%	67.60%	68.07%
Medium Urban																						
PETERBOROUGH CITY OF	25,243	8,459	0	76,936	76,936	38,037.76	497.90	19,367.17	253.51	18,670.28	244.38	1.11%	0.00%	5.34%	30.93%	13.16%	0.31%	50.92%	0.00%	0.14%	48.94%	49.08%
BARRIE CITY OF	40,768	8,659	0	133,800	133,800	60,405.47	451.48	26,815.16	200.41	35,950.31	251.05	1.22%	0.00%	5.16%	24.15%	13.54%	0.32%	44.39%	0.00%	0.05%	55.56%	55.61%
GUELPH CITY OF	38,168	10,765	0	124,443	124,443	46,160.01	370.93	19,585.64	149.35	27,574.17	221.58	1.49%	0.00%	5.00%	18.62%	14.62%	0.26%	40.28%	0.00%	0.26%	37.33%	37.24%
SARNIA CITY OF	29,742	10,723	0	74,533	74,533	26,941.24	348.35	9,323.66	125.10	16,717.58	224.38	1.58%	0.00%	3.71%	25.69%	19.16%	0.26%	35.80%	0.00%	0.12%	64.20%	64.24%
SALT STE. MARIE CITY OF	23,741	9,667	0	75,200	75,200	32,600.34	433.52	11,007.45	146.38	21,592.85	287.14	1.27%	0.00%	3.71%	25.69%	2.88%	0.32%	29.25%	0.00%	0.12%	66.24%	66.28%
BRANTFORD CITY OF	28,688	9,508	0	82,319	82,319	43,292.32	489.94	12,662.55	137.16	30,629.76	351.78	1.17%	0.00%	3.62%	16.18%	8.14%	0.11%	20.46%	0.00%	0.08%	70.67%	70.73%
THUNDER BAY CITY OF	38,285	10,744	0	109,016	109,016	46,919.85	430.38	9,559.60	88.06	37,360.25	342.34	1.28%	0.00%	3.62%	13.87%	1.85%	0.11%	20.46%	0.00%	0.32%	78.54%	78.54%
Rural Regional																						
OXFORD, RESTRUCTURED COUNTY OF	40,625	2,465	0	102,756	102,756	29,972.55	297.69	13,026.91	126.78	16,945.64	164.91	1.89%	0.00%	5.03%	20.64%	15.77%	0.13%	43.46%	0.00%	0.26%	56.28%	56.54%
QUINTE WASTE SOLUTIONS	62,055	2,465	0	132,081	132,081	44,008.01	333.19	18,961.09	143.56	25,046.93	189.63	1.65%	0.01%	7.08%	29.63%	4.64%	0.07%	43.09%	0.00%	0.30%	56.62%	56.91%
KINGSTON CITY OF	37,910	11,906	0	118,453	118,453	46,567.67	393.13	19,902.41	168.02	26,665.26	225.11	1.40%	0.00%	6.27%	19.83%	15.24%	0.00%	42.74%	0.00%	0.57%	57.26%	57.26%
KAWARTHA LAKES CITY OF	34,951	2,860	6,766	64,573	67,404	23,901.80	354.60	9,799.08	145.38	14,102.72	209.23	1.49%	0.00%	5.84%	32.37%	1.13%	0.17%	41.00%	0.00%	0.69%	58.31%	58.00%
WELLINGTON COUNTY OF	31,049	13,781	0	87,934	87,934	22,419.41	254.96	9,009.95	102.46	13,409.46	152.48	2.16%	0.00%	6.48%	29.85%	1.20%	0.50%	40.19%	0.00%	0.07%	59.75%	59.81%
GREATER SUBURBY CITY OF	48,161	13,781	0	157,857	157,857	80,431.14	508.53	31,824.34	201.60	48,606.80	307.92	1.08%	0.00%	2.42%	27.34%	8.68%	0.94%	39.97%	0.00%	0.36%	60.07%	60.43%
NORTHAMBERLAND COUNTY OF	39,018	0	0	182,422	182,422	28,656.43	344.63	10,975.05	133.15	17,680.43	214.59	1.58%	0.00%	3.88%	24.83%	7.15%	0.85%	38.30%	0.00%	0.13%	61.57%	61.70%
CHATHAM-KENT MUNICIPALITY OF	47,315	0	0	108,167	108,167	55,666.79	515.58	19,481.49	180.16	36,075.31	333.44	1.07%	0.00%	6.47%	9.66%	17.65%	0.35%	35.08%	0.00%	0.00%	64.92%	64.92%
PETERBOROUGH COUNTY OF	34,268	10	12,079	59,182	59,182	22,127.55	390.04	7,649.57	121.01	14,477.98	229.03	1.45%	0.00%	7.24%	20.93%	0.46%	0.13%	34.57%	0.00%	0.31%	65.12%	65.43%
NORTH BAY CITY OF	18,841	5,000	0	53,986	53,986	20,953.05	371.55	6,213.55	115.14	13,839.50	256.45	1.48%	0.00%	4.31%	28.92%	4.10%	0.17%	30.99%	0.00%	0.37%	68.65%	69.01%
BLUEWATER RECYCLING ASSOCIATION	69,689	0	3,995	150,149	151,815	49,306.85	324.78	14,716.56	96.94	34,590.29	227.84	1.68%	0.00%	3.77%	24.11%	0.29%	0.00%	29.85%	0.00%	0.00%	70.15%	70.15%
MUSKOGA DISTRICT MUNICIPALITY OF	47,081	804	21,270	135,606	144,469	49,036.15	338.42	14,136.63	97.85	34,899.52	241.57	1.52%	0.01%	1.59%	15.59%	9.99%	0.12%	28.83%	0.00%	0.38%	70.79%	71.17%
NORFOLK COUNTY OF	23,500	4,168	1,967	62,653	63,383	25,407.60	400.77	6,783.05	107.18	18,624.55	293.58	1.36%	0.00%	5.00%	16.24%	3.84%	0.00%	26.74%	0.00%	0.13%	73.25%	73.25%
BRIDGE AREA SOLID WASTE RECYCLING	32,914	0	6,022	60,794	63,304	18,735.71	296.97	4,410.68	69.68	14,325.02	226.28	1.79%	0.00%	0.00%	17.28%	0.00%	0.02%	23.54%	0.00%	0.13%	76.46%	76.46%
Averages																				35.57%		
Residential Return Program																				43.64%	57.04%	

Appendix 3: From Waste to Worth: The Role of Waste Diversion in the Green Economy. Minister's Report on the Waste Diversion Act 2002 Review, October 2009, Ministry of the Environment

**From Waste to Worth: The Role of Waste
Diversion in the Green Economy**

Minister's Report on the Waste Diversion Act 2002 Review

October 2009

Ontario Ministry of the Environment

Minister's Message

Every day in this province, we generate more than 34,000 tonnes of waste. Every day, most of us throw something into the garbage that could have been recycled. For individuals, businesses, and industries, waste is a part of daily life and often we think about it as little as possible. But now, that is changing.

Ontario's natural environment is one of our greatest assets. We take pride in our abundant natural resources, and we have a well-established commitment to protecting our environment. We are coming to understand that we can, and must, do better for this and future generations than digging holes in the ground and burying our waste.

There is a growing commitment to waste diversion in this province. Ontarians have made progress in integrating waste diversion into their lives. But we know that we can do more. We know that ways can be found to reduce the amount of waste being generated, from better manufacturing processes to improved methods for reuse and recycling.

There are real economic opportunities in waste diversion, from reclaiming valuable materials that would otherwise have been buried forever, to innovative, economy-driving new recycling technologies. Above all, we know that waste diversion is a critical foundation for the kind of green economy we want in this province, one that protects and conserves natural resources while generating wealth and prosperity for Ontarians. If we are to continue to be one of the best places in the world to live, work, and raise our children, we must establish a culture of waste diversion.

This report reflects what we heard through consultations on the review of the Waste Diversion Act and contains our proposal for improving the way we manage waste here in Ontario. It is guided by a long-term vision of "zero waste" and it is about shifting our thinking from waste to worth.

I am certain that together we can make Ontario a global leader in waste diversion and help build a green and sustainable economy for the benefit of all Ontarians, now and for the future.

John Gerretsen
Minister of the Environment

Executive Summary

From Waste to Worth: The Role of Waste Diversion in the Green Economy is part of the Government of Ontario's dialogue with Ontarians about how we can continue to improve waste diversion in Ontario. This report contains the findings of the government's review of the Waste Diversion Act, 2002 (WDA) and presents proposals for changes to our waste diversion framework that are intended to foster a green and sustainable economy for the benefit of all Ontarians.

Ontario's waste diversion framework was constructed over the last 20 years and reflects our shared values that we should create less waste, and reuse and recycle the waste that we do create. Waste diversion in Ontario is increasing bit by bit. Overall, we divert 22 per cent of our waste from disposal. We are better at home, diverting about 39 per cent of our waste, while at work and play we only divert about 12 per cent.

Over the past couple of years alone, programs have been put in place in Ontario for household hazardous waste, electronic waste, and used tires that will help us achieve even more diversion. Together, these new programs are keeping tens of thousands of tonnes of the most environmentally problematic materials out of our landfills and from being poured down our drains.

Ontarians recognize that we can and we should be doing more to reduce waste and lower the impacts that products and packaging have on the environment. Waste should be managed appropriately and reused and recycled to the greatest extent possible.

Worldwide, jurisdictions are grappling with how best to promote waste diversion and are adopting frameworks based on the principles of extended producer responsibility (EPR). EPR is premised on making those who put products and packaging into the marketplace responsible for managing the waste associated with them. EPR shifts the responsibility for waste diversion to those that are best able to influence and control decisions throughout the lifecycle of a product or package.

Today, we face new challenges and opportunities, such as sustainable production and consumption, efficient use of resources, and addressing climate change. Perhaps most importantly, we live in a world where Ontario is competing for investments and businesses that are new, green, and innovative. Designing our waste diversion framework to address the challenges that we face today and to encourage and harness new opportunities is essential.

WASTE DIVERSION ACT REVIEW

In October 2008, the Ministry of the Environment began the review of Ontario's Waste Diversion Act and launched a public dialogue on how to achieve greater waste diversion and to explore using EPR as the foundation for Ontario's waste diversion framework. Over 200 Ontarians participated in the review including producers, retailers, municipalities, environmental non-governmental organizations, waste management companies and concerned members of the public.

This Minister's Report has been prepared to fulfill the requirement to report publicly on the results of the review and forms the basis for further public dialogue on Ontario's proposal for changes to our waste diversion framework. The report reflects many of the key issues that were raised during the review and recommends a path forward for Ontario that would make us a true leader in waste diversion, and support a greener and more prosperous Ontario.

PROPOSAL

This report lays out proposed changes to Ontario's waste diversion framework:

Outcomes-Based Individual Producer Responsibility

- Making individual producers fully responsible for meeting waste diversion requirements for waste discarded in both the residential and IC&I sectors
- Allowing those individual producers to meet their waste diversion requirements either by joining a materials management scheme or by developing their own individual waste diversion plan
- Requiring individual producers to annually report information on sales into the Ontario marketplace of designated products and packaging
- Requiring that any waste diversion plan must meet outcome-based requirements
- Requiring producers who fail to meet outcome-based requirements to meet prescriptive requirements ("default" option) or face penalties for non-compliance

Clarify the Concept of Diversion

- Clarifying the concept of diversion to allow a wider range of processes and technologies to be used to meet diversion requirements and encourage innovation:
 - Diversion continues to be reduce, reuse, recycle (which includes material recovery)
 - The material value recovered and preserved from all processes and technologies will be counted as diversion

- Burning waste, without recovering material for reuse, would not be counted as diversion

A Long-Term Schedule for Diversion

- Developing a long-term waste diversion schedule for the province that would:
 - Designate materials for diversion including materials discarded in both the residential and IC&I sectors
 - Set consistent timelines and milestones for producer registration, development and implementation of waste diversion plans, and data submission for each designated material
 - Set five-year material-specific collection and diversion targets
 - Trigger a review of targets five years after coming into force
- Including the following materials in the five-year schedule: IC&I generated paper and packaging, additional electronics, construction and demolition materials, bulky items, vehicles, branded organics, and small household items.

Effective Oversight

- Improving oversight by clearly articulating the roles of the Ministry of the Environment and Waste Diversion Ontario:
 - Ministry of the Environment: set the policy framework, including designating materials, setting targets and establishing timelines, setting penalties for non-compliance, and setting environmental standards as appropriate. Maintain enforcement role in those instances where prosecution for offences under the WDA is required.
 - Waste Diversion Ontario: carry out guidance, oversight and compliance, including setting up systems for and conducting compliance checks on registration, waste diversion plans, and annual data submissions; levying administrative penalties for non-compliance, and setting administrative standards as appropriate.

Supporting Producer Responsibility

- Ban designated materials from disposal
- Implementing a disposal levy to narrow the gap between the cost of diversion and disposal, and shift behaviour toward greater diversion
- Using disposal levy revenues to support the waste diversion efforts of businesses, consumers, and municipalities such as measures aimed at design for the environment and consumer education

Transitioning Existing Programs

- Setting phased end dates for each existing program with corresponding

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From Waste to Worth: The Role of Waste Diversion in the Green Economy
Minister's Report on the Review of Ontario's Waste Diversion Act 2002



- milestones to move existing programs to the proposed new framework
- Developing transition plans, in consultation with stakeholders, for each program
- Keeping the current framework in place for existing programs until transition is complete

Please take the time to review the report and provide us with your comments through the Environmental Registry (www.ebr.gov.on.ca registry number 010-8164). We look forward to your feedback.

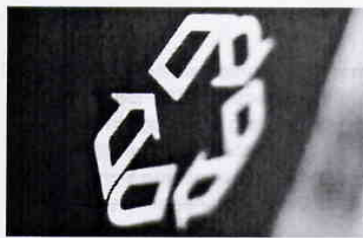


Appendix 4: Excerpt of The Blue Box Program Enhancement and Best Practices Assessment Project by KPMG Final Report Volume II, July 6, 2007



Cost Model Construction

The Team employed the selected cost modeling methodology to estimate 2006 Net System Cost under Best Practices.



Selection of Analog Communities

To streamline the cost modeling process, several project members with cross functional skills were organized into a Cost Model Team. This Team carried out all of the above activities, providing input and leveraging expertise on an as needed basis.

In the early phases of the project several communities were selected on the basis of low cost and high recovery levels as “learning municipalities”. This was done by leveraging WDO Datacall information, such as processing and collection costs and recovery rates, as well as by using the experience of our team of secondees and experienced recycling professionals in Ontario. At least one such municipality was chosen for every WDO municipal group, in order to provide a high degree of representation and similarity to other group members. The team anticipated observing and documenting Best Practices employed by these programs.

Upon visiting these communities and identifying Best Practices in Blue Box recycling in Ontario, the team members were able to verify that, in most cases, “learning municipalities” indeed do exhibit the use of many Best Practices. As a result, all but one of our “learning municipalities” were deemed to be appropriate for use as “Analog Communities” in the cost model. (One of the “learning municipalities” could not be verified as a community employing Best Practices; therefore, another community, recognized in another E&E funded project to be a better performer within its municipal group, was selected as the analog.) Thus, these analogs represent the effect of Best Practices employment across their respective municipal group. The list of analog communities is presented below (descriptions of each of the analog communities visited by the team are included in Appendix A):

Analog Community	Municipal Group
City of Hamilton	Large Urban
Regional Municipality of Durham	Urban Regional
City of Peterborough	Medium Urban
Quinte Waste Solutions	Rural Regional
City of Orillia	Small Urban
City of Timmins	Rural Collection - North
Township of Russell	Rural Collection - South
Township of Amaranth	Rural Depot - South
Township of Casey	Rural Depot - North

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Program Title:

Quinte Waste Solutions

Program Type:

Rural Regional

Site Visit Date:

November 22, 2006

Brief Description of Program:

Quinte Waste Solutions is a Municipal Management Board providing services to nine member municipalities and the PMC area of CFB Trenton along with several municipal contracts, ICI services, and special events collection. The Board consists of one Municipal Councillor from each Member Municipality where the decisions regarding the program are made. Workshops are held on a periodic basis for new Board members to ensure there is a consistency within the Board. The Board owns the Material Recovery Facility and two vehicles and it tenders the collection and processing services to the private industry at regular intervals. The last tender was in 2002 and it was awarded to Waste Management for a six year term.

Quinte uses a low technology driven program with multi-stream collection supported with a heavy promotion program to reach high diversion levels. Quinte has a user pay program for household waste in all but one of their municipalities which has enhanced their ability to recover more recyclables. They also have a strong emphasis on recovering ICI tonnage available albeit outside the scope of this review.

In 2002, Quinte moved away from its multi-stream top-loaded collection program in favour of a modified four-stream collection using side loaded compaction trucks with two compacted compartments (fibres and containers) and two special glass storage compartments (clear and coloured) with bottle breakers. Little or no changes were made to the processing facility other than upgrading the baler.

The contractor currently uses the municipally owned facility for processing. The current Material Recovery Facility and vehicles are fully depreciated. The Board is currently planning and looking at options to building a new Material Recovery Facility in the Fall of 2008 coinciding with the end of the contract agreement. There has been discussion on setting the location around the north end of Belleville instead of Trenton, which is believed to be a more central location for their activities.

Quinte has devoted one full time staff to commodities marketing and has resulted in higher than average revenues per tonne when compared to similar communities. Quinte's MRF is also situated close to a paper mill therefore decreasing the freight costs and ability to maximize the revenue from the materials.

Fundamental Best Practices Employed:

Best Practice	Employed (Y/N)	Description of Best Practice Use
Program Planning	Y	Quinte has a Long Term Waste Management Plan specifying diversion targets which was reviewed by the Board in the past 3 years. There are visioning meetings held with the Board and staff on a regular basis to ensure a consistent vision, message and approach is in agreement by all parties.

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Performance Mgmt and Continuous Improvement	Y	<p>Quinte employees perform waste composition audits to monitor the performance of their promotion and education program and to analyze the materials that need to be targeted for their promotion campaign. Quinte also tracks notices that have been given out to residents for non-compliance to detect problem areas.</p> <p>Quinte also monitors the complaints by residents to assess the performance and quality of the contractor. Quinte keeps abreast of the contractor's financial performance on a monthly basis and reports all findings to the Board. The contract is drafted in such a way that if changes need to be made to better improve the service, it is allowed.</p>
Multi-Municipal Cooperation	Y	<p>Quinte Waste Solutions is a municipal management board that manages waste diversion for the nine member municipalities. This municipal cooperative approach to recycling is beneficial to all who participate by combining increased tonnage to efficient levels for processing and attractive to potential buyers. Fleets of vehicles are shared to provide levels of service otherwise unachievable by small communities on their own. Additionally multi-municipal co-operation means the municipalities benefit from the consistent messaging, increased awareness and participation rates from the well funded regional P&E program.</p> <p>The Board consists of one municipal Councillor from each Member Municipality to ensure equal representation and a fair decision making process. The Board also works closely with the staff of QWS to ensure the interests of both sides are aligned.</p>
Operations Optimization	Y	<p>In 2002, Quinte moved from its multi-stream top loaded collection program in favour of a modified four stream collection using side-loaded compaction trucks with two compacted compartments and two glass storage compartments with glass breakers. This led to an increased load carried per vehicle from 3 tonnes to 7 tonnes resulting in collection cost reductions. The cost reduction is maximized further when long distances must be travelled to reach the material or MRF as the traditional vehicles were not able to get the load in one trip. Quinte also uses PET perforator technology in the MRF which maximizes the payload density and cohesiveness of plastic loads resulting in higher revenue. This minor investment has resulted in an increase of 1¢ per pound of revenue for PET sold from Quinte in freight savings resulting in a one year pay back of the perforator.</p>
Effective Procurement	Y	<p>Quinte uses a tendering process to contract out their collection and processing of the blue box program. In 2002, a contract was tendered out and the Board received several bids in the process. This has allowed Quinte to obtain the lowest price for the services required while keeping in mind their community specific needs. The contract was awarded out to Waste Management for a six year term. The six year term has allowed Quinte to work with a fixed cost and thus allow them to better plan and budget their resources in the forthcoming years.</p> <p>The contractor is paid on a per tonne basis for both collection and processing. Tonnage is measured on an outbound basis for processing. The contractor pays for disposal costs on residual materials thus there is an incentive to keep residuals as low as possible at each process.</p>
Promotion and Education	Y	<p>Quinte's P&E program is well funded and exemplary. It consists of the use of standardized graphics while delivering a simple yet effective consistent message. It accommodates visual learners ensuring that most of the population will receive the message.</p>

44 Blue Box Program Enhancement and Best Practices Assessment Project
Final Report

Policies and Incentives	Y	The implementation of a user pay waste program in all of their communities except one provides an economic incentive for residents to recycle as evidenced by the 82% recovery rate achieved as compared to non-user pay communities which typically achieve 60% recovery rate at best.
Training of program staff	N	Current staff are trained and have attended some workshops. Quinte staff recognize a need to commence a program of upgrading to meet the future.

Appendix 5: Survey Results from October to November 2009 IWMP Public Information Meetings

Subject: Integrated Waste Management Plan Public Information Meetings
Survey Results

Summary By: Donald Scharfe, P.Eng., Quinte Waste Solutions

Locations and Dates:

Oct 19	Prince Edward Community Centre, 375 Main St, Picton
Oct 21	St. Paul's Anglican Parish Hall, 82 Boundary Rd, Roslin
Nov 3	Belleville Recreation Centre, 116 Pinnacle St., Belleville
Nov 5	Quinte West Council Chamber, 7 Creswell Dr, Trenton
Nov 18	Madoc Kiwanis Hall - 139 St. Lawrence St E, Madoc
Meeting Times:	7-9 p.m. with a 10-15 minute presentation at 8 p.m.
Meeting Format:	Eleven-question survey with details on a series of posters
Report Date:	December 15, 2009

Statistical Disclaimer:

Please keep in mind these results are not statistically significant due to the very small sample size of 24 responses out of approximately 62,000 households. Although this is a summary of the opinions of the meeting attendees, use caution if attempting to extrapolate these opinions to the whole population.

Overall Summary of the five public meetings:

Five Public Information meetings were held between October 19 and November 18, 2009.

Including an email response to the radio advertisements, 24 responses were received. The email response specifically gave their opinion on Household Food Waste Choice and no other questions. Therefore, for all other questions the maximum expected total number of votes is 23.

Responses were received from eight of the nine member municipalities. No responses were received from Marmora & Lake.

Everybody didn't make a selection on some questions, resulting in less than 23 total votes. On three questions, some people selected more than one answer, resulting in 24 or more total votes.

Generally, the results of the surveys were similar to the direction from the September 10 and 28 focus group meetings on questions covered at those meetings.

There was a wide range of comfort with the location of the publicly owned waste transfer station with 15 choosing less than 20 km, and 7 choosing greater than 20 km.

There was majority support for staying with our current multi-stream recycling system. The current system received 19 votes, and the single stream system received 2 votes

The vote was split on whether people would bring polystyrene and plastic bags to a depot if they were no longer allowed in the blue box.

The majority voted for the backyard composting solution to household food waste with 16 votes out of 26.

Sixteen out of 22 said 'yes' they would use a backyard composter if they were given one. Two voted 'no' because they already have their own and actively compost. Twelve out of thirteen said they would use a backyard composter all year.

Thirteen out of 22 votes support garbage collection every other week to get weekly curbside collection of food waste (SSO).

Fifteen out of 22 voted 'yes' or 'maybe' to support clear bags to increase diversion.

Biosolids management choice votes were split. Nine out of 24 voted for the status quo of land-spreading and landfilling. Nine out of 24 voted for Fuel/Fertilizer pellets or Incineration/EFW. Five out of 24 voted for Compost to produce a land amendment.

The question on Recovery of Energy Choices Comfort level received a total of 31 votes as many attendees selected more than one option. Nineteen out of 31 votes were for a local Energy from Waste (EFW) facility. A closer look at the individual surveys, ignoring multiple selections, showed that 16 out of 23 meeting attendees supported a local EFW facility. Eight of the 31 votes were for local use of fuel pellets. A minority (2) votes were for 'None of the above'.



Detailed Tally of Survey Answers and Comments:

1. Location Information

	Single Family	Multi- residential	Rural Single Family		Totals
Belleville	2	0	0		2
Centre Hastings	3	1	0		4
Madoc	2	0	0		2
Marmora & Lake	0	0	0		0
Prince Edward	3	0	1		4
Quinte West	3	0	3		6
Stirling-Rawdon	0	2	0		2
Tweed	1	0	0		1
Tyendinaga	3	0	0		3
Totals	17	3	4		24





2. Public Owned Waste Transfer Station

How close to your residence could we build a modern, good-looking, odour-controlled well-managed publicly owned waste transfer station to reduce our waste management costs and provide more control over our waste management options?

	0 - 0.25 km	> 0.25 km	> 0.5 km	>1 km	> 2 km	> 3 km	> 5 km	> 10 km	> 20 km	Totals
Belleville			1					1	1	2
Centre Hastings	1							1	1	3
Madoc							1		1	2
Marmora & Lake										0
Prince Edward					2				1	3
Quinte West	3	1		1	1					6
Stirling-Rawdon						2				2
Tweed								1		1
Tyendinaga									3	3
Totals	4	1	1	1	3	2	1	2	7	22

Location Suggestions:

Putman Road; Belleville; Industrial Park (PEC); Industrial Park (PEC); Industrial Park in Belleville; Hwy 7 by Madoc Dump; Stirling-Rawdon would be a central location, as would Ivanhoe

Comments:

Belleville: "I'm a resident in the East Hill. If I were living on the 'outskirts', I would support a closer location."
Quinte West: "As long as controlled properly, no objection", "Close as you want if price is right", "I would like to see the options available"

3. Blue Box Recycling System Option Choice:

	Current Two Stream		Single Stream		Other		Totals
Belleville	1		1				2
Centre Hastings	3				1		4
Madoc	2						2
Marmora & Lake							0
Prince Edward	3						3
Quinte West	5						5
Stirling-Rawdon	2						2
Tweed			1				1
Tyendinaga	3						3
Totals	19		2		1		22

'Other' was Incinerator

Comments: Madoc: "Easy to sort at home"
Quinte West: "Current system works well"
Centre Hastings: The 'Other' choice was 'Incinerator'



4. Would you bring Polystyrene (Styrofoam) or plastic bags to a depot if they were no longer allowed in the Blue Box?

	Yes	No	Maybe	Totals
Belleville		1		1
Centre Hastings	2	1		3
Madoc		1	1	2
Marmora & Lake				0
Prince Edward	1	1	1	3
Quinte West	3		1	4
Stirling-Rawdon	1	1		2
Tweed		1		1
Tyendinaga	1	2		3
Totals	8	8	3	19

Comments:

Belleville: "If they are not allowed in a blue box, I assume they're not being recycled, whether we bring them to a depot or not"

Centre Hastings: "Burn it"

Madoc: "Maybe, if at local landfill site"

Quinte West: "Polystyrene only if convenient. Make use of garbage bags"

5. Household Food Waste Choice:

	Backyard Composting	Source Separated Organics Curbside	Other	Totals
Belleville	1	2		3
Centre Hastings	4		1	5
Madoc	2			2
Marmora & Lake				0
Prince Edward	2	3		5
Quinte West	3	1	2	6
Stirling-Rawdon	2			2
Tweed		1		1
Tyendinaga	2			2
Totals	16	7	3	26

Food Waste
Other (specify):

Comments:

Centre Hastings: "Raise pigs. You can feed them then now you have food."
Quinte West: "Currently compost at Frankford or Belleville yard waste"
Quinte West: "Feed to chickens and compost"
Belleville: "Both are good options. A curbside program should have means for residents to obtain compost afterwards"
Stirling-Rawdon: "When I have the space to do so that would be my choice", "I would give anything to have a
composter at my apartment"
Quinte West: "Very few people will do backyard composting"



6. If you were given a free backyard composter and were shown how it could keep up to half your food waste out of the garbage, would you use it?

	Yes	No	Maybe	Totals
Belleville	2			2
Centre Hastings	3		1	4
Madoc	2			2
Marmora & Lake				0
Prince Edward	2	2		4
Quinte West	3	1		4
Stirling-Rawdon	2			2
Tweed			1	1
Tyendinaga	2	1		3
Totals	16	4	2	22

If yes, when?			
All Year	Summer Only	Winter Only	Totals
2			2
3			3
1			1
			0
1	1		2
1			1
2			2
			0
2			2
12	1	0	13

If no, why not?:
Comments:

Prince Edward: The two "No's" wrote "We already compost" (They don't need a new composter)
Belleville: "We currently use ours all year"
Centre Hastings: "All the time", "In use now"
Stirling-Rawdon: "Yes!!"
Quinte West: "Presently have one in use", "Food waste is mixed with cattle manure and used as fertilizer"
Quinte West: "Currently own one but not practicing now as no real time for gardening", "Have one"

7. To get weekly curbside pick up of food waste, which of the following do you support? (Check all that you support)

	Garbage Pick up Every Other Week	Higher Bag Tag Price for Remaining Garbage	Higher Taxes	Other	Totals
Belleville	1	1	1		3
Centre Hastings	3				3
Madoc	1		1		2
Marmora & Lake					0
Prince Edward	3				3
Quinte West	3			2	5
Stirling-Rawdon	1			1	2
Tweed	1				1
Tyendinaga				3	3
Totals	13	1	2	6	22

Other (specify):

- Stirling-Rawdon: "Backyard only"
- Quinte West: "Fee for Green Bins", "None"
- Tyendinaga: "None", "None", "None"
- Centre Hastings: "Burn the stuff",
- Stirling-Rawdon: "It's really not that hard to take it out-plus people might put it in plastic bags which is defeating the defeating the purpose (for pick up)"
- Tyendinaga: "Do not agree", "Do not agree"

Comments:



8. Do you support using clear garbage bags to increase diversion and reduce garbage, if you knew their contents would be subject to enforcement?

	Yes	No	Maybe	Totals
Belleville	2			2
Centre Hastings	3	1		4
Madoc	2			2
Marmora & Lake				0
Prince Edward		3		3
Quinte West	4		1	5
Stirling-Rawdon	1		1	2
Tweed	1			1
Tyendinaga		3		3
Totals	13	7	2	22

Comments:

Belleville: "Has this been successful in Peterborough?"

Prince Edward: "Too many problems and cost"

Quinte West: "Make the bag the tag (all in one)"

Tyendinaga: "Stores would charge more if made mandatory"

9. Biosolids Management Choices

	Land-spread Liquid	Land-spread dewatered	Landfill dewatered	Fuel or Fertilizer Pellets	Incineration or EFW	Compost to produce land amendment	Other	Totals
Belleville								0
Centre Hastings						2		2
Madoc	1							1
Marmora & Lake								0
Prince Edward					2		1	3
Quinte West	3	3	1	2	1	3		13
Stirling-Rawdon	1			1				2
Tweed								0
Tyendinaga				3				3
Totals	5	3	1	6	3	5	1	24

Biosolids

Other (specify):

Comments:

Prince Edward: "Vermicast Stabilization"

Belleville: "With more research and implementation of treatment to address metals...as well as greater enforcement of sewer-use bylaw"

Centre Hastings: "?", "Leave it alone"

Quinte West: "Spreading dewatered reduces risk of water contamination. Compost seems cheap-practical", "Good fertilizer"

Tweed: "?"

10. Recovery of Energy Choices Comfort Level

	Medium to Large Local EFw facility	Small Local EFw facility	Local use of fuel pellets	Send to EFw facility in another region	Export Pellets to another region or USA	None of the Above	Other	Totals
Belleville		1				1		2
Centre Hastings	3		2			1		6
Madoc		1		1				2
Marmora & Lake								0
Prince Edward	2	1						3
Quinte West	5	4	3					12
Stirling-Rawdon	1							1
Tweed	1							1
Tyendinaga			3	1				4
Totals	12	7	8	2	0	2	0	31

Other (specify):

Comments:

Belleville: "As I understand it, we currently do not have enough waste to run a plasma etc. We should focus on waste reduction"

Centre Hastings: "Burn" (Clarification to choosing None of the Above)

Madoc: "Depends on costs and any cost recovery"

Quinte West: "Great if it could be done at reasonable cost", "This is a great idea to make something positive out of a negative"

11. Do you have any other questions, comments, or suggestions?

Belleville: "Wet composting to include diapers etc.? Or separate recycling box for diapers?"

Centre Hastings: "Just make on large incinerator"

Quinte West: "We must work to get control of our own waste. Handle our own waste properly. Transfer Station a must"

Quinte West: "DO IT NOW"

Quinte West: "Whatever is decided, we need to get started now! If changes come later it will have to be adapted into our system"

Quinte West: "Let's keep trying to do better - all of us -"

Tyendinaga: "If it came to my home area I would probably sell out and move"

Appendix 6: Examples of Technology Suppliers

Rotary Composting Equipment Suppliers

- X-Act Systems Composting is a local (Trenton) supplier of rotary composting technology. X-Act has a working system for SSO and horse manure in Alaska, recently supplied a system to Auburn, NY, Alaska, their technology is being installed in a Desviar Inc. organics facility in Alberta and is planning a facility in Sudbury. X-Act Systems provided a budgetary quote.

X-Act Systems Composting, 340 Sidney Street, Trenton, Ontario K8V 5R6
Glenn McConkey, President
Phone: 613-394-1922 x 306 Cell: 613-391-1445 Fax: 613-394-4311
Email: glenn@xactsystemscomposting.com
Web: www.xactsystemscomposting.com

- Ballagh in Wingham, Ontario provided a budgetary quote for a rotary composting system.

Ballagh Liquid Technologies Inc., Wingham, Ontario
Byron Ballagh
Phone: 519-357-4600 Fax: 519-357-4630
Email: byron@bliquidtech.com Website: www.bliquidtech.com

- Transform Compost Systems supplied rotary composting systems to the Alberta Research Council that are being used for research at the Waste Management Centre in Edmonton.

Transform Compost Systems, 211, 33119 South Fraser Way, Abbotsford, BC,
Canada V2S 2B1
Phone: 604-504-5660 Fax: 604-504-5666
Email: info@transformcompost.com
Web: <http://transformcompostsystems.com/RotaryDrum.htm>

- Nioex Systems BIOvator rotary composter for dead stock (mortalities) may work for SSO and biosolids.

Nioex Systems Inc., Brandon, Manitoba
Shawn Compton
1-701-370-0782
Email: scompton@nioex.com Web: www.nioex.com

Energy from Waste (Waste to Fuel) Facility Suppliers

- WastAway technology creates Fluff from MSW in their proven, operating plants in Tennessee and Aruba. The Fluff from the Tennessee facility is used to create composite lumber and is used as a horticultural growing medium. In Aruba, it is used as landfill cover and in the future may be used to make electricity. Before implementing a WastAway facility in this area, the main due diligence would be establishing a stable market for the Fluff. For example, the Fluff could be used to partially replace coal as a fuel at Essroc Cement, if Essroc can obtain the necessary Ministry of the Environment approval and public acceptance. The facility could and probably would be municipally owned and the equipment purchased from WastAway.

WastAway Services Canada Inc., 145 Lilac Lane, Sherwood Park, AB T8H 1W1
 Patricia McConkey
 Phone: 780-417-9278 Cell: 780-298-9278
 Email: patricia@wastaway.ca Web: www.wastaway.com

- Dongara produces fuel pellets from Vaughan's MSW.

Dongara, 7251 HWY 27, Woodbridge, Ontario L4L 0C2
 Betty Disero
 Email: bdisero@rogers.com or info@dongara.ca Web: www.dongara.ca

Energy from Waste (Waste to Electricity) Facility Suppliers

- AlterNRG with their Westinghouse Plasma technology signed a Memorandum of Understanding with the County of Dufferin, Ontario. Pending approvals, construction is expected to begin late 2010. The Westinghouse Plasma technology is used to process MSW at two commercial scale plasma gasification plants in operation for at least 7 years in Utashinai and Mihama-Mikata, Japan. These plants can be toured. They also have a commercial demonstration facility in Madison, Pennsylvania. Alter NRG stated they could build a range of facility sizes from 30,000 to 120,000 tonnes per year. They could build, own and operate the facility or the facility could be municipally owned.

Ken Willis Vice President, Project Development
 Alter NRG Corp. 700, 910-7 Avenue SW, Calgary, AB T2P 3N8
 (O): (403) 806-3901 (C): (403) 975-4349 (F): (403) 806-3721
 email: kwillis@alternrg.ca web: www.alternrg.ca

- Sunbay has partnered with CHO-Power, a subsidiary of France's Europlasma SA, which is a plasma gasification company with 32 plasma torches in operation worldwide, some for over 16 years. Sunbay's two proposed Ontario projects in Port Hope and Chappleau appear to have stalled at this time. Sunbay has approached Miramichi, New Brunswick to build a facility there, but extent of implementation is unknown. CHO-Power is constructing and expecting to start up a plant processing 55,000 tonnes/year of Industrial, Commercial and Institutional waste at the end of this year in Morcenx, France and ones processing MSW in Portugal and United Kingdom in 2011. Sunbay stated they could build a range of facility sizes from 30,000 to 120,000 tonnes per year. They could build, own and operate the facility or the facility could be municipally owned.

Sunbay Energy Corporation, 330 University Avenue, Suite 504
 Toronto, Ontario M5G 1R7
 Jordan Oxley, President
 Email: jordan.oxley@sunbayenergy.com
 Web: www.sunbayenergy.com

- Plasco currently has a 100 tonne/day test facility in Ottawa. According to a January 14, 2010 Ottawa Citizen Article, the City of Ottawa is about to finalize a deal with Plasco to build a plant to handle 140,000 tonnes/year of Ottawa MSW. Red Deer, Alberta has signed a contract for a 200 tonnes/day facility. In an email, Plasco stated they might be willing to build a 200 tonne/day (60,000 tonnes/year) facility in our region. They would maintain ownership and charge a negotiated tipping fee. Our region would be responsible to locate waste sources in a 'Put or Pay' contract.

Plasco Energy Group Inc., 1000 Innovation Drive, Suite 400, Ottawa, ON K2K 3E7
 Siobhan Baker, Account Director
 613-591-9438 ext 1237 613-591-9439 (fax)
 Email: SBaker@plascoenergygroup.com Website: www.plascoenergygroup.com

- Renewable Energy Management (REM) began the Environmental Assessment for a low temperature gasification Advanced Conversion Technology plant on Wesleyville Road, Port Hope. It is based on the ENTECH-WtGas-RES System that is used in 160 facilities worldwide, some processing MSW. Since our region is a neighbouring municipality, REM may offer this region a reasonable tipping fee to accept our residual waste at their facility.

Renewable Energy Management Inc., 270-1101 Kingston Rd, Pickering, ON L1V 1B5
 Doug Starr, Executive Vice President
 Phone: 905-839-4766 Cell: 905-903-5630 E-Fax: 412-202-7965
 Email: doug-starr@rem-energysolutions.com
 Web: www.rem-energysolutions.com

- Covanta was awarded the contract to build and operate the Durham/York Incinerator. Perhaps they could accept our residual waste for a tipping fee if they have extra capacity.
<http://www.durhamyorkwaste.ca>

Alternative Central Composting Equipment Suppliers

- Rotary Composting (Xact, Ballagh, Transform) as detailed above.
- HotRot System www.hotrotsystems.com/USCanada/contactusa/
- Gore system (e.g. Norterra, Kingston or Walker, Thorold)
www.norterraorganics.com/contact-us.html
www.walkerind.com/contact.html
- Wright Tech Bio-Dryer www.wrighttech.ca/Biodryer.htm
- Agitated Tunnel (Lafleche, Transform)
www.laflecheenvironmental.com/contact.htm
transformcompostsystems.com/in-vessel.html
- Open windrow composting in Perth www.perthcanada.com

- Anaerobic Digestion
Donnandale Farms for information
www.harvesthastings.ca/harvesthastings/producerprofile/donnandale-farms

Mattress and Bulky Item Recycling

MattCanada Environmental in Montreal recycles mattresses and may help set up our own local system if desired.

MattCanada - 10,701B rue Sécant
Montréal, Québec H1E 5Y7 - CANADA
Telephone: (514) 648-7575 - Fax: (514) 648-7525
Email: mattcanada@bellnet.ca Web: www.mattcanada.com

Emerging Technology - Vermistabilization (Worm Castings)

Vermistabilization is the production of worm castings from the output of a composting facility. When the technology and market are proven on a large scale, worm castings have the potential of being 10 to 20 times more valuable than regular compost. This could reduce waste management costs. Some companies involved with this technology are:

- CSRplus Vermicast Industries www.csrplus.com/contact.htm
- X-Act Systems Composting (Associated with CSRplus) www.xactsystemscomposting.com
- Forterra www.forterra.ca/contact/contact_index.html
- Sansai Environmental Technologies in Cleveland, Ohio <http://www.sansaitech.com/>

Emerging Technology - Biosolids and Organics Thermal Treatment

- Wright Tech Bio-Dryer www.wrighttech.ca/Biodryer.htm
- Plasma-assisted sludge oxidation (PASO) by Fabgroups Technologies of Montreal is an emerging technology to create fuel or fertilizer from biosolids, food waste, and/or leaf & yard waste. It is a relatively small rotary kiln equipped with an electric plasma torch that consumes less than 100 kWh of electricity per wet ton of sludge (20% solids) to oxidize the organic material and destroy all volatile solids and pathogens.
www.fabgroups.com/en/paso.html

Emerging Technology - Waste Heat to Greenhouse

The Modern Corporation landfill in Model City, New York grows hydroponic tomatoes in a 12-acre greenhouse using heat produced from their landfill gas fuelled electrical generating engines.
www.moderncorporation.com and www.h2gro.net

Emerging Technology - Carbon Dioxide Capture to Algae to Biofuel

A longer term emerging technology is the capture of carbon dioxide emissions from waste management facilities to grow algae. Biofuel could be produced from the algae that could be used to fuel the waste collection vehicles offsetting some fuel costs and further reducing waste management costs. For example, the National Research Council Institute for Marine Biosciences (NRC-IMB) is investing \$5 million to construct a 50,000-litre algae cultivation plant at their Ketch Harbour facility in Nova Scotia.

www.nrc-cnrc.gc.ca/eng/programs/imb/national-bioproducts-program.html

Biosolids Dewatering

There are many types and suppliers of biosolids dewatering equipment. Most of these are already known to the Public Works Directors/Commissioners. A few suppliers that may not be as well known are listed here as alternatives.

- Centrifuge: X-Act Systems Composting (Centrisys Centrifuge)
- Electro-dewatering of biosolids cake (~50% solids): Eimco Water Technologies (Cinetik A-Series Linear Electro-Dewatering Solutions)

Eimco Water Technologies, a Division of GL&V Canada Inc.
1380-114 Newton St , Boucherville, Quebec, Canada J4B 5H2
Phone: 450-641-3611 Fax: 450-641-8507
Email: info@ewt-cinetik.com Web: www.ewt-cinetik.com

Appendix 7: Financial Analysis of Possible Diversion Infrastructure Changes

<u>Appendix 7-1:</u>	Definitions For Financial Analysis
<u>Appendix 7-2:</u>	Assumptions For Financial Analysis
<u>Appendix 7-3:</u>	Rotary Composting and Waste to Fuel Facility - No GIF
<u>Appendix 7-4:</u>	Rotary Composting Only- No GIF
<u>Appendix 7-5:</u>	Waste to Fuel Facility Only - No GIF
<u>Appendix 7-6:</u>	Transfer Station Only - No GIF
<u>Appendix 7-7:</u>	Energy from Waste Facility Only - No GIF
<u>Appendix 7-8:</u>	Rotary Composting and Waste to Fuel Facility - With GIF
<u>Appendix 7-9:</u>	Rotary Composting Only- With GIF
<u>Appendix 7-10:</u>	Waste to Fuel Facility Only - With GIF
<u>Appendix 7-11:</u>	Transfer Station Only - With GIF
<u>Appendix 7-12:</u>	Energy from Waste Facility Only - With GIF

Appendix 7.1**Definitions For Financial Analysis Sheets**

<u>Description</u>	<u>Details</u>
<u>Capital Costs</u>	
Site Selection & Approvals	Includes \$50,000 salary
WastAway-specific planning, studies, permitting	Estimated cost for studies and permitting for WastAway facility
WastAway Land Purchase 7 acres @ 50K	Assumed 7 acres for Waste for Fuel facility
WastAway Building	Estimated cost for building
WastAway Equipment	Budgetary WastAway Quote
WastAway Freight, Installation, Spare Parts	Budgetary WastAway Quote
Compost Land Purchase 5 acres@ \$50K	Assumed 5 additional acres for compost facility
Composting-specific planning, studies, permitting	Estimated Composting planning and permitting including salary
Build SSO Composting Facility	From Xact and Ballagh Liquid Budgetary Quotes - Assumed 3 rotary composters
Green Bin Roll-out and P&E	From Halton Region Roll-out Costs
Additional Cost for Composting PEC Biosolids	Assumed \$0 since 3 rotary composters should handle SSO and PEC biosolids
Site Selection & Transfer Station Approvals	Cost from John Lackie Transfer Station Report
Land Purchase 5 acres@ \$50K	Assumed 5 acres required for transfer station
Build 'Enhanced' Transfer Station (incl rolling stock)	Cost from John Lackie Transfer Station Report
EFW-specific planning, studies, permitting	From Sunbay emailed budgetary quote
Land Purchase 20 acres and Build EFW facility	From Sunbay emailed Budgetary Quote, assumed 20 acres needed for EFW facility
<u>Annual Operating Costs</u>	
WastAway Operating Costs	Budgetary WastAway Quote
Central Composting Operating Costs	Xact and Ballagh estimates
Belleville L&Y Bin Collection Additional Cost	Assumed \$120 per bin instead of \$102.50 to deliver to our composting facility
Belleville L&Y Curbside Collection Added Cost	Assumed \$100/MT versus current \$25/MT to deliver to our composting facility
QW / PEC L&Y Bin Collection Additional Cost	Set up bins at \$120 each to collect L&Y from QW/PEC and deliver to our facility
Wood Chip Cost for Biofilter (5 loads/yr)	Estimate 5 loads per year (130 cu yds each) of wood chips for biofilter
Transfer Station Operating Costs	John Lackie Transfer Station Report-Salary portion adjusted for local salaries
EFW Operating Costs	From Sunbay emailed Budgetary Quote
<u>Annual Other Costs</u>	
Extra Organics Co-Collection Costs	From 2005 Waste Collection Bid (Garbage/SSO collection - garbage collection)
Additional Blue Box Costs	Includes Collection, Processing, & Admin Minus sales and WDO Grant = \$88.77/MT
Transfer Station MSW Hauling/Disposal Costs	Transfer station municipal waste hauling/Disposal cost/MT. Only until EFW running.
Trans Stat IC&I Waste Hauling/Disposal Fee	Cost to haul and tip outside waste to US landfill. Only until EFW running.
<u>Gross Annual Revenue</u>	
WastAway Outside Waste Tipping Fee	Tipping fee for outside waste. Assumed \$70/tonne for this analysis
WastAway Fluff Sales to Essroc	Sale price for Fluff to Essroc Cement plant. Assumed \$40/tonne for this analysis
Compost Sales or Value (\$/yr)	Assumed Selling price at \$5/MT or use by Parks & Recreation Departments
Trans Station IC&I Waste Tip Fee	Tipping fee for outside waste like IC&I and residential drop-off.
EFW Outside Waste Tipping Fee	Tipping fee for outside waste direct to Energy from Waste facility.
EFW Electricity Sales	Based on \$0.105/kWh and 1292 kWh/tonne as per Sunbay estimates/projections.
<u>Gross Annual Savings</u>	
Leaf & Yard waste disposal savings (\$/yr)	Savings on 3,562 MT at \$25/MT for disposal
PEC Biosolids Disposal Cost Savings (\$/yr)	Save current shipping/tipping cost on 1276 tonnes/year
Every Other Week Garbage Collection Savings	Assumed 10% collection savings on curbside garbage collection
WM MSW Tipping Fee Cost Avoidance	Cost avoidance on all waste except waste going to Frankford or PEC landfills
Garbage Collection Cost Savings (Due to new recycling)	Save garbage collection on extra recyclables captured.
Net Annual Cash Flow Cost or (Savings)	A NEGATIVE result indicates a cost SAVINGS versus status quo. Prior to replacement fund.
Replacement Fund Deduction (2/3 of savings)	2/3 of savings were deducted for a replacement fund
Equipment/facility replacement cost	Some equipment is replaced as projected
Replacement Fund Running Total	The running total of the replacement fund
Cost or (Savings) after replacement fund	After replacement fund. A NEGATIVE result indicates a cost SAVINGS versus status quo
Amortization Rate (%) =	After replacement fund. A NEGATIVE result indicates a cost SAVINGS versus status quo
Yearly payment = $12 * (r / (1 - (1 + r)^{-N}))P_0$	6.5 Amortization Period (Years) = 30
Where N = Amortization Years * 12	Where r = Annual 'Amortize' Interest Rate/100/12
	Where P0 = Starting Principle

Annual Cost of Living Increase = 2.5% applied to most of the costs, revenues, and savings as applicable.

Annual MSW and IC&I waste increase = 1% applied to most of the weights, costs, revenues and savings as applicable.

To be conservative, assumed the Green Infrastructure Fund (GIF) would cover 50% of eligible costs, even though it can cover up to 2/3 of eligible infrastructure costs.

For the transfer station, assumed the only eligible costs under the GIF were the \$252,000 for the 'enhanced' portion since this would improve diversion.

Appendix 7-2
Assumptions for Financial Analysis
For Belleville, Prince Edward County, Quinte West

General

1. As per the suggestion of the Financial Directors/Treasurers, used 6.5% instead of the 5.09% from the Infrastructure Ontario website for the amortization interest rate. They expect interest rates may rise by the time they request a loan.
2. According to the Minister of the Environment, IC&I waste generated in an area is about 1.5 times the amount of residential waste for that area. Therefore, IC&I waste for the biggest three municipalities is $16,752 \times 1.5 = 25,128$ tonnes per year approximately.
3. If our tipping fees are competitive, closeness to the waste generator would be the deciding factor on whether our Waste to Fuel, Energy from Waste or transfer station facility or the existing privately owned transfer station in Trenton will be used by the waste generator. Assuming our facility is located in the Belleville area, we could attract the following IC&I waste to our facility: all of the IC&I waste from Belleville, half from Prince Edward County, and none from Quinte West. Use the percentage of households to determine the amount of IC&I waste from each area. IC&I waste from Belleville = $25,128 \times 41.457\% = 10,417$ tonnes per year. IC&I waste from Prince Edward County = $25,128 \times 24.186\% \times 0.5 = 3,039$ tonnes per year. Some will be under contract with the private transfer station, so multiply the resulting figure by 90%. Therefore total IC&I waste we could easily attract to our facility = $(10417+3039) \times 90\% = 12,110$ tonnes per year.
4. The Financial Directors/Treasurers recommended adding a line for replacement fund to be deducted from savings. Deducted 2/3 of annual savings.
5. The financial directors recommended adding an annual 2.5% cost of living increase to all costs, savings and revenue.
6. Increased Municipal Solid Waste and IC&I waste generation by 1% per year compounded.
7. Converted \$US at \$0.97 exchange rate.

Waste to Fuel Facility (e.g. WasteAway facility)

1. Assume 7 acres required for a Waste to Fuel facility
2. Assumed we could attract 12,000 tonnes/year of IC&I waste to the facility at \$70/tonne
3. Assumed if municipal waste was reduced due to composting, that we could attract up to 16,000 tonnes/year of IC&I waste to the facility to fill its capacity at \$70/tonne, which is a very competitive tipping fee for this area.
4. Assumed we could sell the resulting fuel at \$40 FOB Belleville
5. Assumed a local cement manufacturer would buy all the fuel produced

6. Increased operating cost by the recommended cost of living increase of 2.5%.

Composting Facility

1. Assume 5 acres required for the composting facility. Rotary composting can be compact as per picture of Sudbury's proposed system.
2. Assumed total rotary composting facility cost including studies and permits would be \$2,500,000 based on two budgetary quotes from X-Act Systems Composting and Ballagh Liquid. This would be for three rotating tunnels to compost SSO and PEC biosolids.
3. Assumed no extra cost for composting PEC biosolids. Three tunnels provide adequate capacity.
4. Belleville and Quinte West biosolids not composted at this time. Continue with land spreading for next 20 years. To include them and meet legislated metal levels for the middle category of compost would probably involve finding more food waste and adding more rotary composters.
5. Assumed kitchen bin, 12 gallon curbside bin and P&E rollout for 46,265 single family households in Belleville, Prince Edward County, and Quinte West would be \$1,500,000 based on Halton figures of about \$32/hhld = $((3000000+980000+260000+20000+220000+5000)/140000 \times 46265)$
6. Assume most of the composting facility would need to be replaced in 20 years at a cost of about \$2 million. Total replacement cost over 30 years = \$2,000,000.
7. Extra Organics co-collection costs based on figures from a 2005 tender. In the tender, we received a quote for 'curbside collect/haul garbage and organics (co-mingled) to disposal facility'. We also received a quote for 'curbside collect/haul garbage to disposal facility. Collect/haul organics to municipal processing facility'. Calculating the extra organics co-collection costs involved taking the difference between the two quotes. Since both quotes would be subject to the same cost of living increases, the difference should be independent of cost of living increases.
8. Assumed that rolling out the Organics program would also result in more capture of Blue Box material. To calculate extra Blue Box material, assumed Blue Box capture would go from 83% to 90%. This results in 4% of residual waste being diverted from garbage and requiring collection, processing, and marketing in our Blue Box program. Extra Blue Box material = $(42 \times 90 / 83 - 42) / 100 = 3.54\%$ of residual garbage = $3.54\% \times 19,929$ tonnes/yr = 706 tonnes/year $\times \$88.77/\text{tonne} = \$62,663/\text{yr}$. The \$88.77 per tonne of Blue Box material was calculated (with Rick Clow's help) on the 'Collection&Tipping Fees' worksheet.
9. Assumed that Leaf and Yard waste would be sent to our composting facility to use as a processing amendment (carbon source) with the SSO (nitrogen source). Currently, it costs \$25/tonne for a company to remove this material. We would see a cost savings by sending it to our composting facility in which the overall facility and operating costs have already been included in the spreadsheet.
10. Assumed 5000 tonnes/year SSO and 2000 tonnes/year biosolids for total of 7000

tonnes/year. Bulk density of SSO is about 865 kg/cubic metre. Therefore, 7000 tonnes = 8092 cubic metres. Assume 3 to 1 bulking agent (e.g. leaf and yard waste) requirement. Leaf and yard waste requirement is 24277 cubic metres. A document from West Virginia estimates leaf and yard waste averages 350 lb/cubic yard, which converts to 208 kg/cubic metre. Therefore, 24277 cubic metres of leaf and yard waste equals 5050 tonnes per year of leaf and yard waste required as a bulking agent in the composting process. In 2009, Belleville generated 3260 tonnes of leaf and yard waste per year. Therefore, an additional 1790 tonnes per year of leaf and yard waste is required. Assumed this would be available from Quinte West and possibly Prince Edward County. Bins could be set up at the Frankford landfill and PEC landfills/transfer stations and the leaf and yard waste dropped off at our composting facility instead of being burned. Belleville gets 5.8 tonnes per bin (3256.77 tonnes in 558 bins). Therefore, we would need an additional 309 bins of leaf and yard waste (1790 divided by 5.8).

11. Assumed the cost per bin would increase from \$102.50/bin to \$120/bin when the material is sent to our facility instead of being used by the landscaper.
12. Assumed the curbside collection per tonne would increase from \$25/tonne (\$7641.35 divided by 305.654 curbside tonnes) to \$100/tonne (Peel pays \$116.50, Caledon pays \$108.50, Ottawa pays \$126.71 for SSO/L&Y)
13. Assumed the purchase of wood chips for biofilter. Chisholm Lumber quoted \$2000/load for wood chips. Each load is 130 cubic yards (~100 cubic metres). Assumed we would need about 5 loads per year to recharge the biofilters for a total of \$10,000 per year.
14. PEC biosolids are currently hauled to landfill at ~ \$100/tonne. Cost savings to co-compost with SSO instead. Assumed the new proposed composting legislation is approved this year allowing co-composting with some metal concentration restrictions and end-use restrictions. Assumed compost containing biosolids would meet the metal concentration limits.
15. Assumed PEC biosolids quantity will increase by 1% per year. Assumed PEC biosolids disposal costs would rise with the cost of living (2.5%).
16. Calculation for Compost Sales was 5000 tonnes of SSO plus 2000 tonnes of biosolids plus 5050 tonnes of Leaf and Yard waste all times 40% conversion factor for raw material to compost times \$5 per tonne selling price or value. It was then increased each year by the cost of living and by the increase in MSW.

Transfer Station

1. Assumed we would need 5 acres for transfer station at \$50,000 per acre.
2. For Transfer Station Only, waste from the biggest three municipalities will be 16,752 tonnes per year. Waste going to PEC unscaled landfills is 2630 tonnes per year and much of it could be IC&I waste. Waste to Frankford landfill is about 547 tonnes per year. This waste will continue to go to those landfills for the next 20 years. Assumed any waste going to the Thurlow landfill will be redirected to the transfer station since the Thurlow landfill only has a few years left.
3. Assume land for transfer station and composting facility is purchased upfront from reserve funds. No financing required.

4. Assume transfer station will operate 12 hours per week day, and 8 hours on Saturday. That's 68 hours per week. A person can work 40 hours per week. If we need three staff at all times and need to cover vacation time that results in a need for 5.5 people. Assume 6 staff and one Manager. Staff earn $\$18/\text{hr} \times 40 \text{ hrs/wk} \times 52 \text{ wks/yr} = \$37,500$ per year per person. The Manager earns $\$50,000$ per year. Total salaries will be $\$37,500 \times 6 + \$50,000 = \$275,000$ per year. Adding in the factor for benefits = $\$275,000 \times 1.12 = \$308,000$ per year for salary and benefits. This is $\$76,000$ less than John Lackie's estimate and better represents local costs.
5. Assume the rest of John Lackie's operating costs are accurate. Therefore, overall operating costs = $\$537,000 - \$76,000 = \$461,000$ per year
6. For rolling stock, assume we don't need the $\frac{1}{2}$ ton truck or the tractor/loader/backhoe. Eliminating them reduces rolling stock cost by $\$110,000$. Therefore, rolling stock cost for the basic portion of the transfer station becomes $\$275,000$ instead of $\$385,000$.
7. The Financial Directors/Treasurers recommended adding a line for replacement fund to be deducted from savings. Assume the rolling stock (Wheel Loader) and roll-off truck would need to be replaced every 10 years. Current cost estimated at $\$275,000 + \$180,000 = \$455,000$. Assume in 10 years the cost could go from $\$455,000$ to $\$500,000$. By the 20th year it may be $\$550,000$. By the 20th year, most of the transfer station would require replacement at approximately $\$4,000,000$. Total replacement cost over 30 years = $\$5,050,000$. Divided by 30 years = $\$168,333$ per year.
8. Assumed we would want to add some roll-off bins for residential drop-off to slightly 'enhance' the transfer station to increase diversion. This includes an asphalt pad and roll-off truck for an additional approximate cost of $\$252,000$ over the cost of a basic transfer station.
9. Assume cost for enhanced features:

Ten Roll-off bins for 'Enhanced' Diversion Features	=	$\$50,000$
Roll-off truck for 'Enhanced Diversion Features	=	$\$180,000$
Concrete or asphalt Pad for "Enhanced Diversion Area	=	<u>$\\$22,000$</u>
Total for enhanced diversion features =		$\$252,000$
10. Assumed only the 'enhanced' portion of the transfer station would qualify for Green Infrastructure Fund.
11. The starting IC&I waste tip fee at the transfer station is $\$92/\text{tonne}$. Our estimated cost per tonne to build and operate the transfer station and haul and tip the waste is $\sim \$90/\text{tonne}$. It is hoped $\$92/\text{tonne}$ is competitive since Waste Management's posted rate is $\$99/\text{tonne}$, and their minimum fee for partial tonnes is more.
12. The Transfer Station IC&I waste tip fee was increased every 3 years to keep ahead of the IC&I waste hauling/disposal costs: 2015 increased by $\$2$ per tonne, 2018 increased another $\$3/\text{tonne}$, 2021 increased another $\$4/\text{tonne}$, 2024 increased another $\$5/\text{tonne}$, 2027 increased another $\$6/\text{tonne}$, and 2030 increased another $\$7/\text{tonne}$ resulting in a total increase of $\$27/\text{tonne}$ from the starting rate. Therefore, if the starting rate is $\$92/\text{tonne}$, by 2028 the rate would be $\$119/\text{tonne}$.
13. Increased IC&I waste by 1% per year which increases the Trans Station IC&I Waste Tip

Fee revenue and the Transfer Station IC&I Waste Hauling/Disposal Fee each year.

14. Waste Management's Tipping fee increases each year by 85% of the Cost of Living increase. Assuming Cost of Living increase is 2.5%, their tipping fee would increase 2.125% per year and so would our cost avoidance if we use our transfer station instead of their transfer station.
15. Increased MSW quantity by 1% per year which increases the Transfer Station MSW Hauling Disposal Costs each year.
16. Tipping fees and hauling quotes in \$US converted at \$0.97 exchange. A significant change in the exchange rate will affect hauling/tipping costs.
17. Hauling quotes based on \$0.90/Litre diesel cost. A higher diesel cost will result in a Fuel surcharge, which will increase waste hauling costs.
18. If a Waste to Fuel or Energy from Waste facility is built after a publicly owned transfer station, the transfer station could be incorporated into the new facility as the receiving area.

Energy from Waste Facility (e.g. Plasma Gasification)

1. Assumed we would need 20 acres for transfer station at \$50,000 per acre.
2. Assumed a 60,000 tonnes/year facility. It's possible to build a 30,000 tonnes/year facility, but the economics may only work for the smaller facility if it is funded by the Green Infrastructure Fund.
3. Facility capital costs estimated at \$70,000,000 and operating costs at \$6,000,000 per year based on budgetary quotes from Sunbay and Alter NRG.
4. If a publicly owned transfer station is built before an Energy from Waste facility, it could be incorporated into the new facility as the receiving area.
5. The \$70 million capital cost for the EFW facility contains a high contingency factor and will probably be lower.
6. Assumed starting EFW operating cost was \$6,000,000 minus transfer station operating cost. Assumed it would increase by 2.5% cost of living increase each year.
7. Assumed operating cost includes labour, maintenance, and replacement of plasma torches as needed.
8. Assumed we could attract over 40,000 tonnes/year of IC&I and outside waste to fill the facility capacity. Assumed a tipping fee for IC&I and outside waste at \$50/tonne.
9. Implementing rotary composting with Energy from Waste could reduce municipal waste and could increase revenue from IC&I and outside waste.

Green Infrastructure Fund (GIF)

1. The Green Infrastructure Fund (GIF) can cover up to 2/3 of infrastructure costs. It applies to approvals, buildings, bins, equipment and rolling stock. It does not apply to land purchase or operating costs
2. For this analysis, to be conservative, assumed the GIF would cover 50% of applicable infrastructure costs.
3. To be conservative, assumed Green Infrastructure Fund (GIF) would only apply to the 'Enhanced' features of the Transfer Station since these promote diversion. The enhanced features amount to ~\$252,000, so transfer station funding would be ~\$126,000.
4. Assumed GIF would cover at least 50% of rotary composting and EFW studies, permitting, green bin roll-out, equipment, and building costs.
5. Although not part of this Integrated Waste Management Plan, upgrades to municipal sewage treatment plants may also be eligible for Green Infrastructure Funding. Including these costs in any submissions should be investigated.



June 28, 2010

Centre & South Hastings Waste Services Board

