

City of Sault Ste. Marie

**CURRENT WASTE MANAGEMENT SYSTEM
SUMMARY**

September, 2000

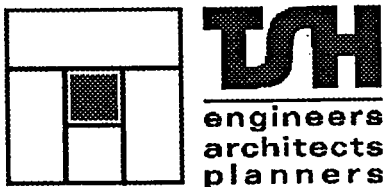


*In association with
Russell Environmental Services ("RES")*

City of Sault Ste. Marie

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CITY OF SAULT STE. MARIE

CURRENT WASTE MANAGEMENT SYSTEM SUMMARY

TSH Project No. 38-60219



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September 28, 2000
File Ref: 60219.10

Mr. Jim Elliott, P.Eng.
Environmental/Construction Engineer
City of Sault Ste. Marie
P.O. Box 580
99 Foster Drive
Sault Ste. Marie, Ontario
P6A 5N1

Dear Mr. Elliott:

Re: City of Sault Ste. Marie
Current Waste Management System Summary
TSH Project No. 38-60219

We are pleased to submit the draft Waste Management System Summary Report for the City's review. The report summarizes the City's current waste management system and compares some of the system components and performance with other similar jurisdictions.

Once the report has been reviewed, we would be happy to meet and discuss the contents with you.

You will note from your review of the figures obtained from comparable municipalities that there is a significant disparity for some costs, compared to those of our City. We recognize that the individual components making up the reported gross costs of the comparison municipalities may not mirror those of Sault Ste. Marie. We are therefore proposing to develop a standard waste management costing form in which individual components will be listed. That form will be forwarded to you and Pat, with a request that it be reviewed for completeness. Once reviewed, we will prepare a covering letter, on behalf of the City, and forward the forms to the comparison municipality to complete on behalf of the City. On receipt of this information, we will assess the data and issue an addendum, if required. This will ensure our cost comparison is equitable (ie. that the cost base is developed using the same parameters by all.)

We hope you will find this approach acceptable. Should you have any questions in the interim, please do not hesitate to call.

Yours very truly,

M. Cant, B.A. (Hons.)
Manager, Solid Waste
MC/wb

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Encl.

CITY OF SAULT STE. MARIE CURRENT WASTE MANAGEMENT SYSTEM SUMMARY

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1 General	1
1.2 Description of Current Waste Management Systems of Sault Ste. Marie and Comparable Municipalities	1
2. WASTE COLLECTION AND DISPOSAL	4
2.1 Waste Collection	4
2.2 Waste Disposal	8
2.3 Landfill Performance	15
2.4 Summary	16
3. WASTE DIVERSION	18
3.1 Blue Box Recycling	18
3.2 Corrugated Cardboard Recycling	23
3.3 Miscellaneous Landfill Diversion	24
3.4 Composting	25
3.5 IC&I Waste Diversion	27
3.6 Household Hazardous Waste	28
3.7 Residential Waste Diversion Rate	29
3.8 Total System Diversion Rate	29
3.9 Summary	30
4. CONCLUSIONS	32

LIST OF TABLES

Table 1.1 - Summary of Waste Systems for Comparable Municipalities
Table 2.1 - City of Sault Ste. Marie Municipal Waste Collection (1999)
Table 2.2 - Breakdown of Cost of Waste Collection (1999)
Table 2.3 - Sault Ste. Marie Landfill Tonnages (1996-1999)
Table 2.4 - Breakdown of Tipping Fee Revenue at Sault Ste. Marie Landfill - 1999
Table 2.5 - Tipping Fees at Municipal Landfills
Table 2.6 - Sault Ste. Marie Landfill Operating Costs (1997 - 1999)
Table 2.7 - Waste Collection and Disposal Costs - 1999
Table 3.1 - Recycling Collection Streams
Table 3.2 - Residential Recyclables Processed in 1999 at Sault Ste. Marie Recycling Centre
Table 3.3 - Miscellaneous Landfill Diversion - 1999
Table 3.4 - Estimated Quantity of Materials Processed at Lemieux Composting (tonnes)

LIST OF FIGURES

- Figure 1 - City and Private Sector Waste and Recycling Collection Routes
- Figure 2 - Residential Waste Generation Rate for Sault Ste. Marie and Comparable Municipalities - 1999
- Figure 3 - Cost of Waste Collection for Sault Ste. Marie and Comparable Municipalities - 1999
- Figure 4 - Incoming Waste at the Sault Ste. Marie Landfill - 1999
- Figure 5 - Incoming Waste at the North Bay Landfill - 1999
- Figure 6 - Landfill Operating Costs Per Tonne - 1999
- Figure 7 - Recycling Facility Schematic
- Figure 8 - Residential Recyclables Collected for Sault Ste. Marie and Comparable Municipalities - 1999
- Figure 9 - Cost of Residential Recycling for Sault Ste. Marie and Comparable Municipalities - 1999
- Figure 10 - Yard Waste Collected for Sault Ste. Marie and Comparable Municipalities - 1999
- Figure 11 - Cost of HHW Programs for Comparable Municipalities - 1999
- Figure 12 - Residential Waste Stream for the City of Sault Ste. Marie - 1999
- Figure 13 - Total Waste Stream for the City of Sault Ste. Marie - 1999

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LIST OF ABBREVIATIONS

ASI	Algoma Steel Incorporated
cm	centimetre(s)
CSR	Corporation Supporting Recycling
c/w	complete with
ft ³	cubic feet
ft.	foot(feet)
GP	Georgia Pacific
HDPE	High Density Polyethylene
hh	household
HHW	Household Hazardous Waste
IC&I	Industrial Commercial and Institutional
kg	kilogram(s)
km	kilometre(s)
OCC	Old Corrugated Cardboard
PET	Polyethylene Terephthalate
RES	Russell Environmental Services
TSH	Totten Sims Hubicki Associates
WRO	Waste Reduction Office

CITY OF SAULT STE. MARIE WASTE MANAGEMENT SYSTEM SUMMARY

1. INTRODUCTION

1.1 General

The City of Sault Ste. Marie retained Totten Sims Hubicki Associates (TSH), in association with Russell Environmental Services (RES) and Hydroterra Limited, to provide the City with direction on all aspects of its solid waste management for the next 25 to 40 years. A four-phased study is being undertaken over the next 18 months with the goal to develop a practical, economically feasible, environmentally acceptable and technically competent long-term waste management system for the City.

The four phases of the study include:

- Phase 1: Identification of a Preferred Waste Diversion System
- Phase 2: Identification of a Preferred Waste Disposal System
- Phase 3: Development of an Implementation and Business Plan
- Phase 4: Development of an Environmental Assessment Terms of Reference

This report provides a summary description of the current waste management programs being offered in the City of Sault Ste. Marie and compares the programs and costs with other Ontario municipalities. Five Ontario cities which are similar to Sault Ste. Marie in location and size were used as comparison municipalities. The municipalities compared included the Cities of Thunder Bay, Timmins, Sudbury, North Bay and Barrie. A brief description of each municipality's waste management system is provided in Section 1.2 and summarized in Table 1.1.

1.2 Description of Current Waste Management Systems of Sault Ste. Marie and Comparable Municipalities

The City of Sault Ste. Marie has a population of 80,054¹. City forces collect waste weekly in the downtown sector, while a private contractor collects waste weekly in the rural areas. The waste is deposited in the City owned and operated landfill. The City has a six-bag limit for wastes generated by each residential and commercial establishment.

Blue box recycling collection and processing is undertaken by a private contractor. The materials are collected weekly and include: cans, glass bottles and jars, newsprint, magazines, PET plastic and aluminum. The City has banned commercial cardboard from the landfill and set up 13 depots throughout the City for cardboard collection. At the landfill, wet cell batteries, large appliances, scrap metal, used tires, propane cylinders, leaves, wood waste and Christmas trees are also diverted from disposal. The City also operates a leaf and yard waste collection program in the Fall. It is

¹Source: Enumeration, 1997

estimated that the City has a waste diversion rate of 8%. The City is currently in the process of establishing a Household Hazardous Waste (HHW) facility.

The City of Thunder Bay is located 700 km northwest of Sault Ste. Marie and has a population of 116,965¹. Municipal forces collect garbage weekly. The waste is disposed in a City owned and operated landfill. The City has a three-bag limit on residential garbage collection. Recycling collection is undertaken by a private contractor bi-weekly (every other week). Prior to March 2000, fibres (newspapers, magazines and other papers) were collected at the curbside in see-through blue bags. It was felt that the bags offered better protection from the elements than a blue box. Containers (cans, glass bottles and jars, PET plastic, and HDPE plastic) were dropped off at centrally located depots. It was found that this dual system increased the cost of the recycling program, therefore the two systems were combined into one curbside collection contract. As of March 2000, residents place containers in one blue bag, while fibres are placed in a second blue bag. Both bags are collected from the curbside on a bi-weekly basis. Corrugated cardboard is bundled and left beside the blue bags for collection. Scrap metal is segregated for recycling at the landfill. The City had one collection of yard waste from the curbside in 1999, and residents can take yard waste to a depot at the landfill at any time. A municipal HHW depot collects and processes hazardous waste self hauled by the residents.

The City of Timmins, located 320 km northeast of Sault Ste. Marie, has a population of 45,845¹. Municipal forces collect garbage weekly in the spring and summer months, and bi-weekly in the fall and winter months. There is no limit on the number of bags collected per household. The City owns and operates one main landfill, 4 smaller landfill sites, and one transfer station. A private contractor collects recyclables under contract to the City, in a "green box" on a bi-weekly basis. Depots for the collection of recyclables, steel and rubber are also available at the landfill sites and transfer stations. The City does not have programs for centralized composting or the handling of HHW.

The City of Sudbury is located 300 km east of Sault Ste. Marie. The City has a population of 91,056¹ and uses both public and private sector forces for waste collection. There is no limit on the number of bags collected per household. Waste is collected in the southern, rural portion of the City and the downtown commercial area by a private contractor, while municipal forces collect waste from the remainder of the City. The landfill sites and recycling program are administered at the Regional level (population 164,000) which includes a number of rural communities. The Region of Sudbury is responsible for the operation of 5 landfill sites. Waste diversion activities implemented at the Regional landfill sites include diversion of tires, white goods, scrap metals, wood wastes and wet cell batteries. Leaves, grass clippings, garden waste, brush, tree trunks and trimmings, other plant material and clean wood waste can be delivered to a designated area of the Regional landfill sites for on-site composting. The contract for the weekly collection and processing of blue box recyclables provides a 50/50 split of the material revenue between the Region and the contractor. The Region operates a permanent HHW depot that is open 26 Saturdays per year and also a "toxic taxi" service that collects hazardous waste by appointment from residents throughout the Region. Overall, the Region of Sudbury is diverting 28% of the residential waste stream.

The City of North Bay is east of Sudbury, and has a population of 56,411¹. A private sector contractor picks up waste on a weekly basis. There is a four-bag limit for residential waste and a 16 bag limit for the Industrial, Commercial and Institutional (“IC&I”) sector. The City operates one landfill site. Special materials, such as tires, wood waste, and concrete are diverted at the landfill. The City purchased recycling equipment and leases the recycling building. Collection and processing of recyclables is contracted, with the City receiving 80% of the revenue from the sale of materials. Collection of recyclables is done on a bi-weekly basis. The City operates a HHW depot. North Bay ran a leaf and yard waste collection program for 3 weeks in the Fall of 1999.

The City of Barrie is located in southern Ontario, approximately 100 kilometres north of Toronto and has a population of 78,965¹. Waste collection is contracted to the private sector. Residents are allowed to put out two bags of garbage each week for free, after which they pay \$1.00 per bag. The City has a well-developed waste diversion program that includes an expanded blue box program with extensive public education. The weekly collection and processing of recyclables is contracted to the private sector. Recyclables collected include newspaper, boxboard, cardboard, telephone books, magazines, textiles, steel and aluminum cans, clear and coloured glass, PET and HDPE plastic jugs and bottles. Leaf and yard waste collection is provided throughout the year on a bi-weekly basis. The City has a permanent HHW depot that is open 2 days a week. Barrie is achieving a 50% waste diversion rate.

The following sections provide detailed descriptions of each component of the City of Sault Ste. Marie’s waste management system. The different waste management component costs are compared to the five other municipalities referenced in this section.

**TABLE 1.1
WASTE MANAGEMENT SYSTEMS IN SAULT STE. MARIE AND COMPARABLE MUNICIPALITIES**

	Sault Ste. Marie	Thunder Bay	Timmins	Sudbury	North Bay	Barrie
Distance from Sault Ste. Marie (kms)	0	700	320	300	450	600
Population	80,054	116,965	45,845	91,056	56,411	78,965
Waste Collection Frequency	weekly	weekly	- weekly in spring and summer - biweekly in fall and winter	weekly	weekly	weekly
Waste Collection Forces	public/private	public	public	public/private	private	private
Bag Limit	6	3	none	none	4	2 free bags, \$1.00 per bag beyond limit
Recycling Collection Frequency	weekly	bi-weekly	bi-weekly	weekly	bi-weekly	weekly
Centralized Composting Available	yes (private)	yes (public)	no	yes (public)	yes (public)	yes (public)
Yard Waste Collections per year	4	1	none	none	3	26
HHW depot	planned	yes	no	yes	yes	yes
Residential Waste Diversion Rate (%)	8			28		50

Source: TSH, August 2000

2. WASTE COLLECTION AND DISPOSAL

2.1 Waste Collection

Municipal By-Laws

The City of Sault Ste. Marie's Municipal By-Law 94-101 governs the requirements for municipal waste collection. According to the by-law, waste must be placed in one of the following containers for collection:

- metal or plastic container, not to exceed 97 cm in height, 51 cm in diameter, and 110 litres in volume;
- plastic bags, not less than 46 cm or more than 97 cm in height; or
- bundles, not to exceed 61 cm x 61 cm x 91 cm and securely tied with heavy cord or twine.

The individual weight for any of the above units is not to exceed 25 kilograms. The by-law lists a number of items not collected in the municipal waste collection system, including: animal waste, electrical appliances, furniture, mattresses, building materials, and other bulky items. A public drop-off area at the landfill site is available to accept these items at a nominal fee of \$2.00.

Effective January 1, 2000, the City of Sault Ste. Marie implemented a 6 bag (or can) per week limit for all residential and commercial establishments, with the exception of apartment buildings, which are allowed the following set-out rates:

- buildings containing one or two apartments or businesses are entitled to a total of six bags (or cans) per week;
- buildings containing three or four apartments or businesses are entitled to a total of ten bags (or cans) per week; and
- buildings containing five to twenty apartments or businesses are entitled to a total of twenty bags (or cans) per week.

For apartment buildings that use containers for the collection of waste from the residents, the following limits apply:

- buildings containing between five and twenty apartments are entitled to the collection of a total of 2.25 cubic metres once per week;
- buildings containing between twenty and fifty apartments are entitled to the collection of a total of 4.5 cubic metres once per week; and
- buildings containing fifty one or more apartments are entitled to the collection of a total of 4.5 cubic metres of garbage twice per week.

The City contracts separately for the collection of waste from approximately 80 apartment buildings that use containerized garbage collection.

Any individual business that generates more than 6 bags (or cans) of garbage per week is required to contract with a private hauler for the collection of their waste stream.

Collection Responsibility

The City of Sault Ste. Marie utilizes both private and public sector forces for waste collection. The collection throughout the City is done five days per week.

Waste is collected in the central urban area of the City using municipally operated and maintained equipment. Three (two-person) rear-loading packer vehicles are utilized on a regular basis, with two vehicles available for backup. The following vehicles are currently in use for this service:

Central Area

- ▶ 1994 Ford model CRT 8000 c/w Heil model 5000, 25 cubic yard packer
- ▶ 1995 Ford model CRT 8000 c/w Heil model 5000, 25 cubic yard packer
- ▶ 1996 Freightliner model FL 80 c/w Heil model 5000, 25 cubic yard packer
- ▶ 2000 Mack model MR 688S c/w Heil model 5000, 25 cubic yard packer
- ▶ 2000 Mack model MR 688S c/w Heil model 5000, 25 cubic yard packer

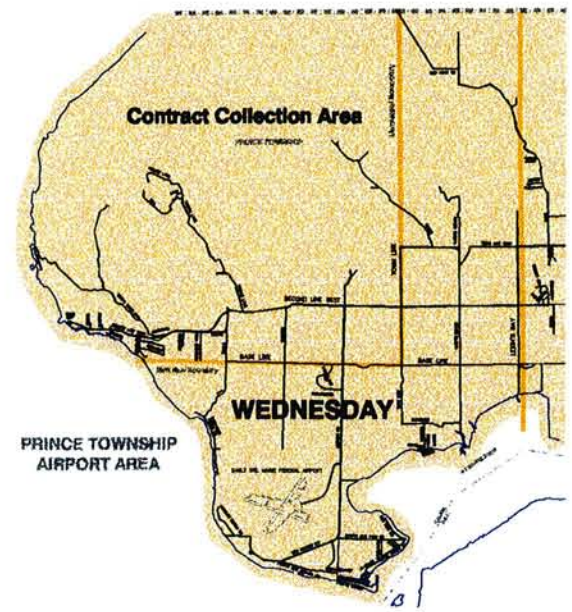
Waste in the central area is collected five days per week, as indicated in the schedule shown in Figure 1.

Outlying Area

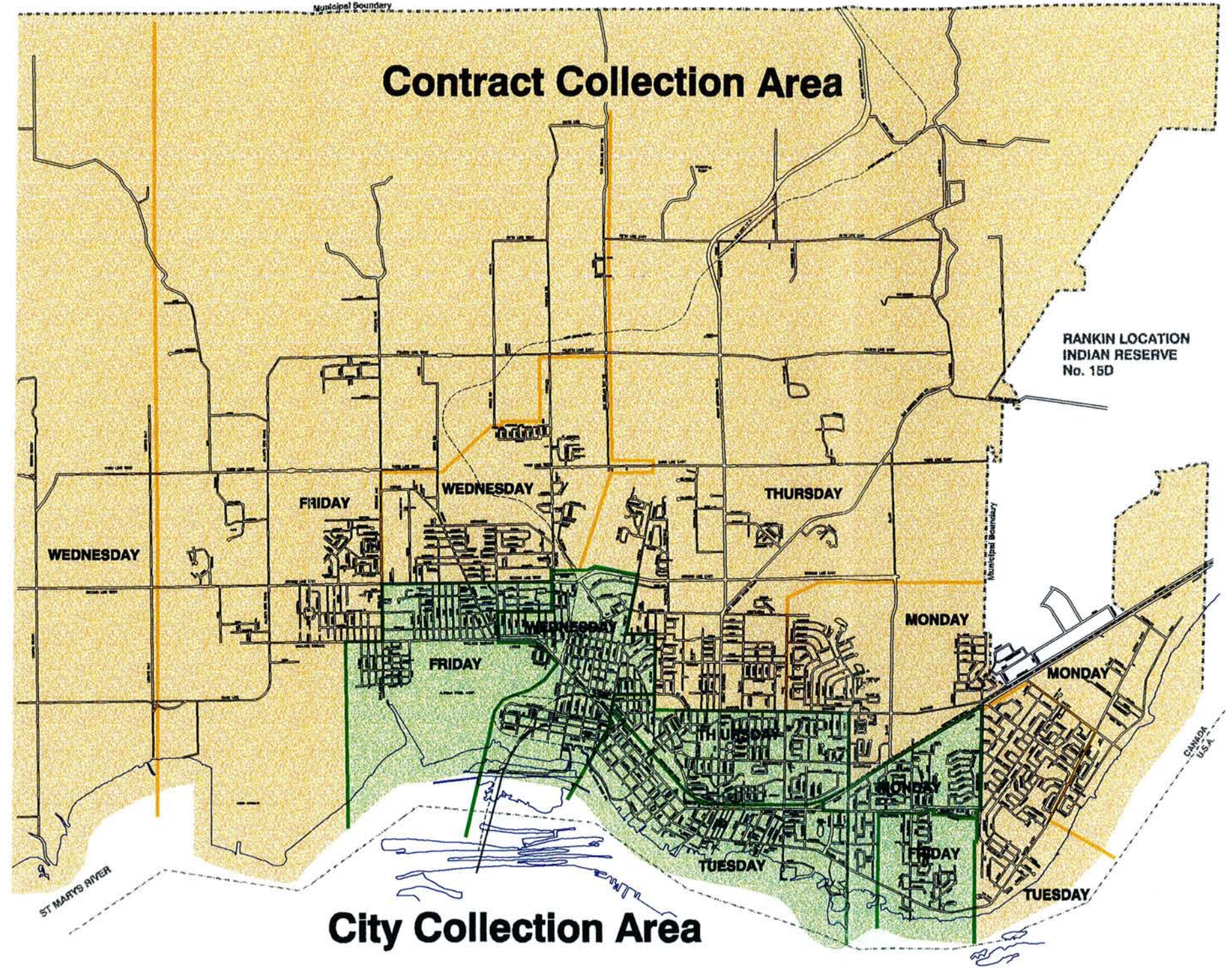
Collection of waste in the outlying, more rural areas is contracted to the private sector. In December 1999, a private contractor (Canadian Waste) was awarded the contract to provide all labour and equipment necessary to complete the service for a 5-year period. The collection of waste from the 80 high-density residential (apartment) units is also part of this waste collection contract.

The contractor utilizes three (one-person) 1995 Labrie Expert 2000 side-loading collection vehicles (25 cubic metre) for the regular municipal collection, and front-loaders for waste collection from the apartments.

Waste from the outlying areas is collected five days per week, based on the schedule shown in Figure 1.



REFUSE COLLECTION SERVICE AREA
Contract Waste/Recycling Collection Area
City Waste Collection/Contract Recycling Collection Area



**City of Sault Ste. Marie
Waste Management Plan**

City and Private Sector Waste and Recycling Collection Routes

FIGURE NO.

1

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Waste Quantities Per Household

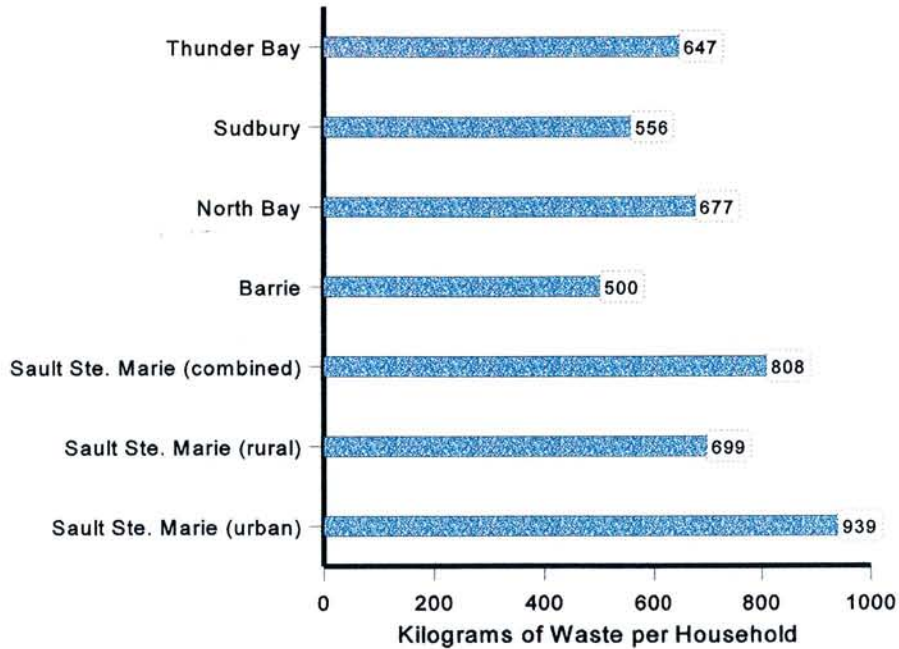
The quantity of waste collected at curbside by both the private and public sectors in 1999 is summarized in Table 2.1. As indicated, the quantity of waste per household collected in the rural areas is less than what is collected in the central area of the City. This is fairly typical, since residents in rural areas have larger properties and are generally more inclined to compost or burn waste on-site.

TABLE 2.1 CITY OF SAULT STE. MARIE MUNICIPAL WASTE COLLECTION (1999)			
	Urban	Rural	Total
Service Provider	Public	Private	
Households	11002	13410	24412
No. of Collection Vehicles	3	3	6
Waste Collected (tonnes)	10,336	9,380	19,716
Waste/Household (kg/hh)	939	699	808

Source: Mr. P. McAuley, City of Sault Ste. Marie

The quantity of waste collected in the City's municipal system averaged 808 kilograms per household during 1999. As shown in Figure 2, this is a high waste generation rate when compared to the other municipalities. The City of Timmins does not weigh the waste collected in the municipal system and is therefore not included in this analysis.

Figure 2 - Residential Waste Generation Rate for Sault Ste. Marie and Comparable Municipalities - 1999
 Source: TSH, August 2000



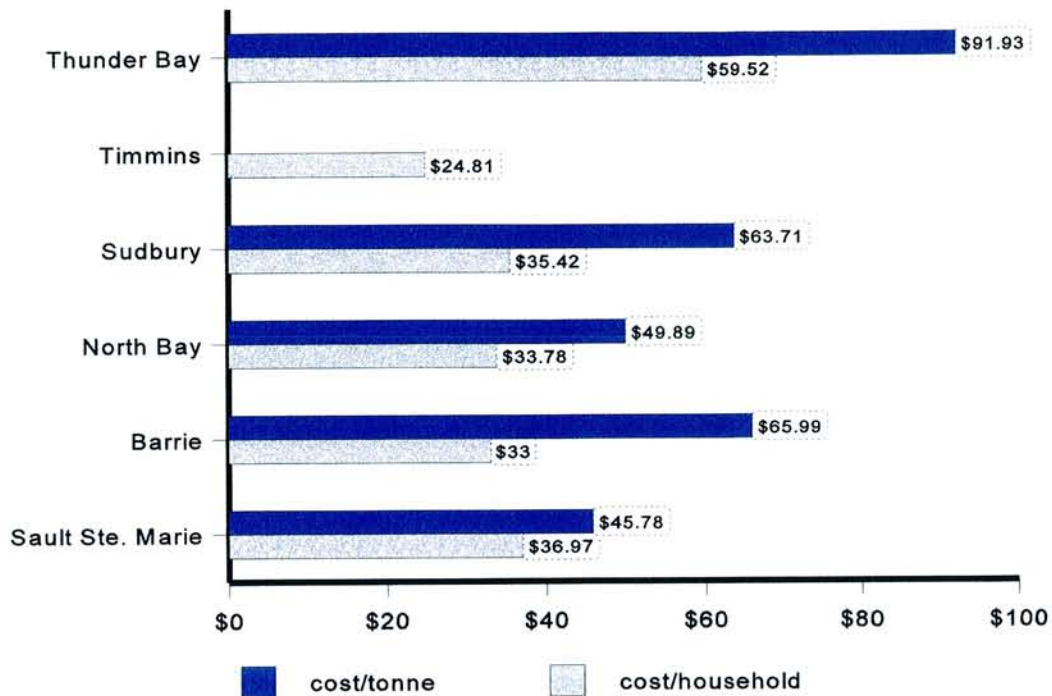
Collection Costs

The total cost of providing the municipal waste collection services in the City for the year 1999 was \$902,518 per year (excluding apartments and special collections), as shown in Table 2.2 . This equates to a cost of \$36.97 per household, or \$45.78 per tonne, which is reasonable in comparison with other similar municipalities as shown in Figure 3.

TABLE 2.2 - BREAKDOWN OF COST OF WASTE COLLECTION	
Canadian Waste Management Contract	\$415,174
Direct Supervision	\$21,424
City Labour	\$247,520
Vehicle depreciation, fuel, maintenance	\$218,400
TOTAL	\$902,518

Source: Sault Ste. Marie Budget and discussions with Pat McAuley,

Figure 3 - Cost of Waste Collection for Sault Ste. Marie and Comparable Municipalities - 1999
Source: TSH, August 2000



2.2 Waste Disposal

Landfill Tonnages

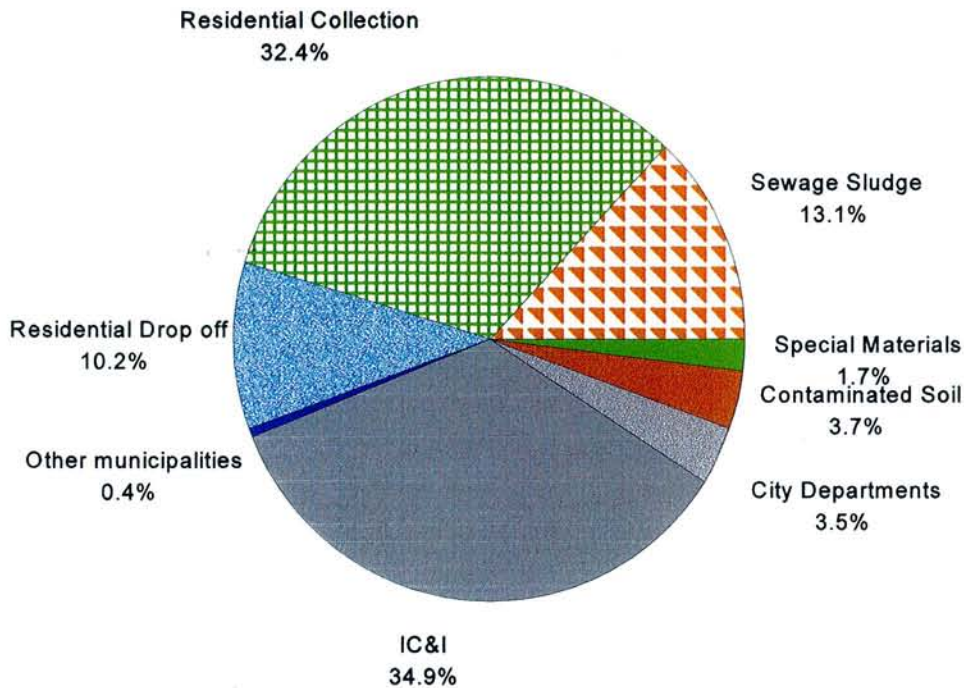
The landfill site servicing the City of Sault Ste. Marie was developed, owned and operated by Cherokee Construction in the early 1960's. The site was acquired by the City in 1989 and is currently operated by City staff under Provisional Certificate of Approval No. 560102, dated March 29, 1989. The landfill site is open to the public 5½ days a week during the summer months (April 1 - October 31) and 5 days a week from November 1 to March 31.

A total of 73,952 tonnes of waste was accepted at the landfill in 1999. This is more than double the amount of waste that was projected (with recycling) in the Design and Operations Report for the Cherokee Landfill Site (*Dillon, December 1990*) for that year. Using the current 1999 figures, it is estimated that the site has capacity for approximately 11 years of waste or until 2011 (*Dillon, February 2000*).

A general breakdown of the incoming tonnages for 1999 is shown in Figure 4, while Table 2.3 details the incoming waste tonnages for the years 1996 through 1999.

TABLE 2.3 SAULT STE. MARIE LANDFILL TONNAGES (1996-1999)				
	1996	1997	1998	1999
Residential (Rural)	9,543.4	9,588.0	9,551.4	9,379.5
Residential (Urban)	11,006.8	11,161.9	10,823.2	10,335.9
Sewage Sludge	8,997.8	9,640.1	9,646.2	9,660.5
Canadian Waste IC&I	12,637.7	13,122.6	11,672.0	12,186.9
Canadian Waste (Apartment Credit)	3,371.2	4,007.7	4,341.8	4,258.2
Sault Disposal IC&I	6,160.3	5,849.0	7,279.6	9,103.3
Meyers - General Accounts	130.7	100.4	110.3	131.8
- Rankin Reserve	62.4	66.5	70.9	80.1
Prince Township	217.4	215.2	222.8	228.4
Community Services Department (CSD)	113.3	370.0	105.1	1,054.2
Public Works and Transportation	1,831.1	1,563.5	1,386.3	1,252.3
Road Sweepings/City Other	5,120.9	1,082.6	2,455.9	
Humane Society	41.3	32.0	13.3	8.3
Public Drop-Off	7,205.7	7,655.0	7,397.1	7,558.5
Inert Material			281.1	7.1
Shingles			1,241.0	1,033.0
Metal	285.3		542.2	
CSD Brush	563.0	712.9	441.7	312.9
Other Brush	2,731.9		102.9	17.1
Christmas Trees	15.8	17.0	12.0	15.0
Asbestos		17.4	1.3	172.9
St. Mary's Paper	9,198.6	674.2	9.5	
G.P. Flakeboard	14,456.6	6,047.1	1,528.2	
Contaminated Soil	12,207.9	4,010.0	6,953.7	2,752.5
Miscellaneous Cash	514.5	685.0	650.5	859.9
Miscellaneous Charge	3,908.8	553.9	2,708.5	3,544.8
Total Incoming Material	110,481.3	82,226.6	79,548.5	73,952.1
Total Diverted Material	1,718.4	585.9	1,098.8	1,381.0
Total Landfilled Material	108,762.9	81,640.71	78,449.7	72,571.1

Figure 4 - Incoming Waste at the Sault Ste. Marie Landfill - 1999
Source: TSH, August 2000



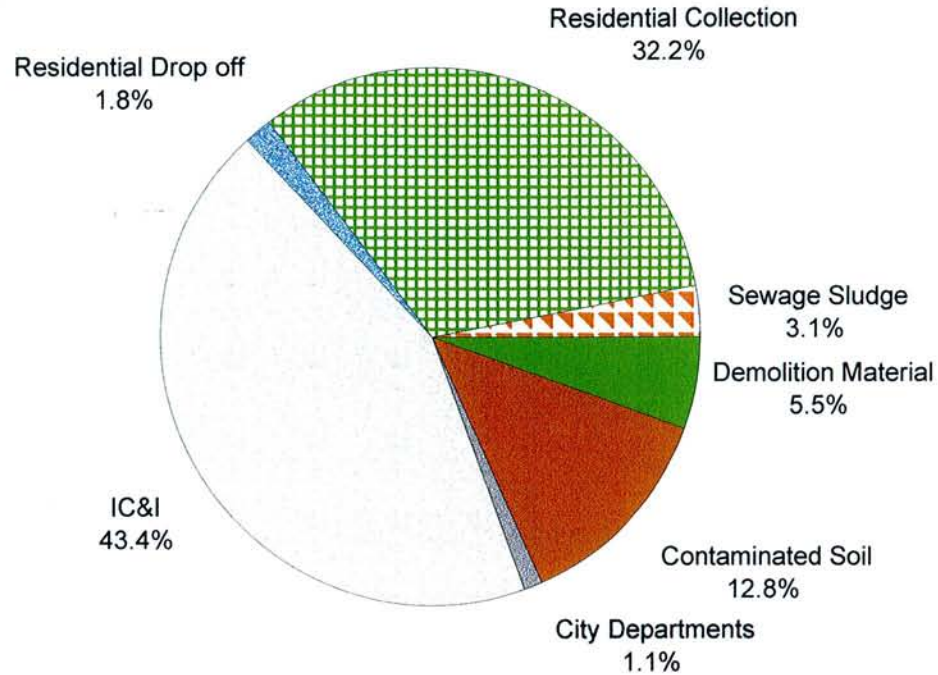
In Figure 4, “Residential Collection” includes single family residential and high-density residential waste picked up by both the public and private sectors. The “City Departments” category includes waste brought in by the Community Services and Public Works and Transportation Departments (e.g. brush from tree trimmings, waste from road construction, etc.). “Special Materials” includes brush, shingles, asbestos, and inert materials.

The single largest contributor of waste being disposed at the Sault Ste. Marie landfill is the residential sector, which generates a total of 42.6% of the total waste landfilled through the municipal collection system (of which 10.2% is delivered by residents to the public drop-off area at the landfill). The second largest contributor is the IC&I sector at 34.9%, followed by sewage sludge from the City’s sewage treatment plants at 13.1%.

In comparison, we have presented as Figure 5, the breakdown of the incoming waste at the North Bay landfill as it is recorded in similar categories as at the Sault Ste. Marie landfill. It is noted that the waste accepted at the North Bay landfill site consists of 34.1% residential waste, 43.4% IC&I waste, and 22.5% other wastes.

Figure 5 - Incoming Waste at the North Bay Landfill - 1999

Source: TSH, August 2000



Tipping Fees

The current tipping fee at the Sault Ste. Marie landfill is \$27.50 per tonne for IC&I wastes. Waste is also delivered to the site from Prince Township and the Rankin Reserve for a tipping fee of \$43.00 per tonne. Local residents with less than 500 kilograms of waste can drop it off for a \$2.00 per visit fee. The fee for dropping off passenger tires is \$1.80 per tire or \$200 per tonne for larger tires. Based on these tipping fees, the City generated \$984,310 in revenue from the site in 1999, which included \$111,954 in drop-off fees from individual vehicles. Table 2.4 indicates the breakdown of the tipping fee revenue for 1999.

TABLE 2.4 BREAKDOWN OF TIPPING FEE REVENUE AT SAULT STE. MARIE LANDFILL - 1999	
	Revenue
C.W.S. Private Refuse	332,612.10
SSM Disposals	248,453.00
Meyers Cartage	3,595.79
Rankin First Nation	3,416.19
Prince Township	9,746.69
Charge Accounts	96,745.87
Shingles	28,192.97
Asbestos - bulk	34,309.24
Asbestos - bags	793.97
Contaminated Soil	75,122.79
Tires	7,181.62
Cash for Disposals	31,158.60
Batteries	1,027.19
Sub-total	872,356.02
Gate Fee	111,954.00
Total	984,310.02

Source: Written correspondence from P. McAuley, dated Sept. 12, 2000

The \$27.50 per tonne tipping fee being charged at the Sault Ste. Marie landfill is low in comparison to other landfill sites, particularly in southern Ontario where tipping fees are typically in the range of \$65 to \$100 per tonne.

Table 2.5 below indicates tipping fees that are currently being charged at the five comparison municipalities.

Municipality	Tipping Fee (\$/tonne)
Sault Ste. Marie	\$27.50
North Bay	\$37.00
Region of Sudbury	\$72.00
Timmins	No Weigh Scale - \$40 for 32 ft ³
Thunder Bay	\$27.50
Barrie	\$74.00

Source: TSH, August 2000

Landfill Operating Costs

In 1999 it cost the City approximately \$1,058,054 to operate the landfill site, as indicated in Table 2.6. Based on accepting 73,952 tonnes of waste at the site, this represents an operating cost of \$14.31 per tonne.

TABLE 2.6 - SAULT STE. MARIE LANDFILL OPERATING COSTS (1997 - 1999)			
	1997	1998	1999
Direct Supervision	\$11,884	\$14,337	\$9,582
Salaried Employees & Benefits	\$74,958	\$52,812	\$55,233
Site Labour & Benefits	\$696,064	\$795,467	\$685,380
Leachate Pump Station (Mtce. & Repairs)	\$51,671	\$13,332	\$5,686
Landfill Monitoring	\$103,125	\$100,722	\$153,688
Grant In-lieu of Taxes	\$21,737	\$58,216	\$59,270
City Owned Equipment	\$8,820	\$9,867	\$9,710
Special Projects	\$20,550	\$21,234	\$15,577
Supplies	\$5,579	\$9,281	\$3,072
Utilities (gas, electric)	\$18,606	\$16,086	\$18,704
Janitorial Service	\$4,934	\$4,444	\$5,996
Miscellaneous Equipment	\$5,138	\$1,958	\$1,571
Road Maintenance	\$11,459	\$20,697	\$17,559
Building and Grounds Maintenance	\$20,955	\$20,015	\$17,026
TOTAL	\$1,055,480	\$1,138,468	\$1,058,054

Source: City of Sault Ste. Marie Budget

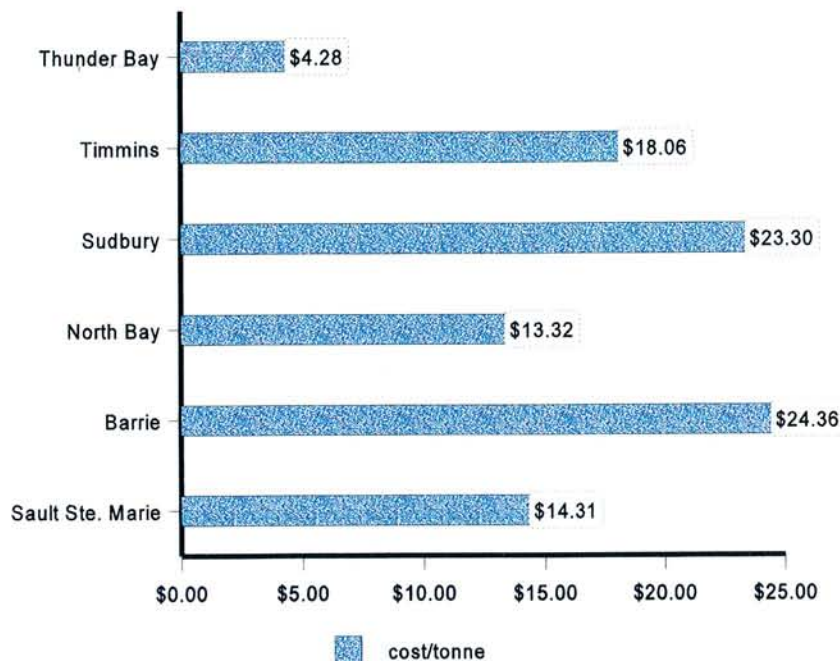
Based on the information presented in this section, the net cost to the City for waste collection and disposal after tipping fees is \$1,028,935 based on the following information:

TABLE 2.7 WASTE COLLECTION AND DISPOSAL COSTS -1999	
Waste Collection - single family dwellings	\$902,518
Waste Collection - multi-family and special collections	\$59,304
Landfill Operating Costs	\$1,058,054
Tipping Fees (Revenue)	(\$984,310)
TOTAL	\$1,035,566

Figure 6 provides the per tonne landfill operating costs for all six municipalities. Thunder Bay has very low cost per tonne due to a large quantity of industrial waste that is brought in from one local industry which is used for landfill cover. The landfill operating cost for the remaining comparison municipalities range between \$13 and \$24 per tonne.

Figure 6 - Landfill Operating Costs Per Tonne - 1999

Source: TSH, August 2000



2.3 Landfill Performance

As a condition of the Provisional Certificate of Approval annual reporting has been completed and submitted to the MOE since 1989 with the most recent submission being the following:

- Site Development and Operations Report - 1998-1999
Sault Ste. Marie Municipal Landfill dated February 10, 2000 by Dillon Consulting; and
- Monitoring Report - 1999
Sault Ste. Marie Municipal Landfill dated February 18, 2000 by Dillon Consulting.

The overall plan for the landfill development is described in the Design and Operation Report (Cherokee Landfill Site, M.M. Dillon Limited, finalized in December, 1990.) Any deviations from this plan are outlined within each of the annual reporting documents.

In general, the waste, once accepted at the landfill site, is either disposed of within the landfilling area(s) or segregated to be transported and recycled off-site. At the 1999 rate of volume consumption there is approximately 11 years of disposal remaining at the site.

A leachate collection system has been operating since November, 1992. Until March, 1998 the collected leachate was re-circulated, however, since that time leachate discharge has been redirected via a leachate transmission sewer to the City's sanitary sewer system.

Three purge wells were installed in 1996 along the west perimeter of the landfill. The purpose of the purge wells is to intercept groundwater flow between the landfill area and the west property limit. They have been operational since April, 1997, however, operational difficulties have been encountered due to biofouling, etc. A detailed preventative maintenance program has been recommended and the installation of backup wells a possibility.

A groundwater and surface water monitoring program has been established for the landfill site. The groundwater monitoring program for 1999 included the sampling of 28 monitoring wells at 24 sampling locations for up to three occasions during the year. Chemical analysis were conducted and the results presented in the Monitoring Report - 1999. The surface water monitoring program for 1999 included five events of the collection of water samples and benthic invertebrates at five sampling locations along Canon Creek and Root River. Leachate samples from the pump station were also collected twice for fish toxicity testing. Methane gas measurements were taken on two occasions at the three gas monitors.

In summary, the Monitoring Report - 1999 by Dillon Consulting concludes "that the monitoring program is indicative that the natural attenuation processes and dilution by infiltrating precipitation are either reducing or keeping the plume stationary along the eastern and southern property boundaries." The results of the chemical analysis both upgradient and downgradient of the collection system directly reflect its installation. The Dillon Report also concluded that the surface water quality for 1999 is consistent with results for previous years.

2.4 Summary

The following conclusions are provided on the waste collection and disposal components of the City of Sault Ste. Marie waste management system:

- There is a high quantity of waste being generated per household;
- The cost of waste collection on a per household basis is low in comparison to the other municipalities;
- The largest generators of waste going to the landfill are the residential sector (42.6%), the IC&I sector (34.9%), and sewage sludge (13.1%);
- The landfill site has approximately 11 years of capacity remaining, based on 1999 generation rates with the Dillon February, 2000 report.
- The annual landfill operating costs are relatively low when compared to the other municipalities;
- The tipping fee charged at the landfill is low in comparison to the other municipalities;
- The net cost to the City for waste collection and disposal (after tipping fee revenue) is \$1,035,566.

- The leachate collection system requires remediation;
- The leachate monitoring program appears to be acceptable;
- The leachate collection system, together with natural attenuation processes, appear to be controlling groundwater migration of landfill leachate; and
- The surface water in Canon Creek adjacent to the landfill (Monitoring Station B-3) indicates the presence of iron precipitates and iron bacteria.



Photo No. 1 - Northeast Corner of Storage Building

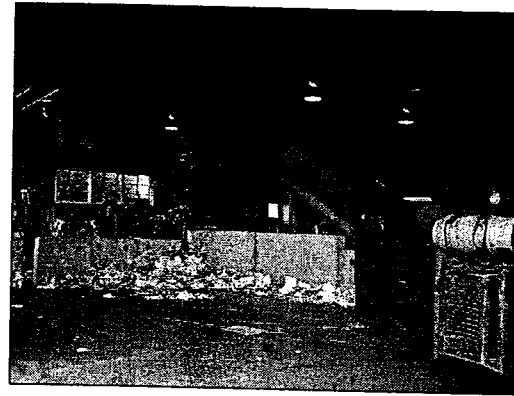


Photo No. 4 - Conveyor with Baler at rear

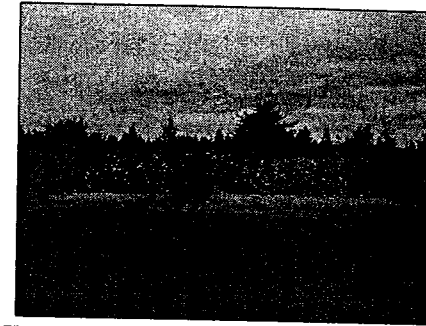


Photo No. 7 - Storage Bays at North Side of Building (ie. Glass - Coloured and Clear Storage)

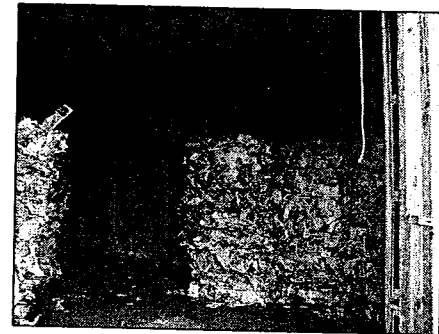


Photo No. 2 - Looking Inside Storage Building (ie. Newspaper Storage)

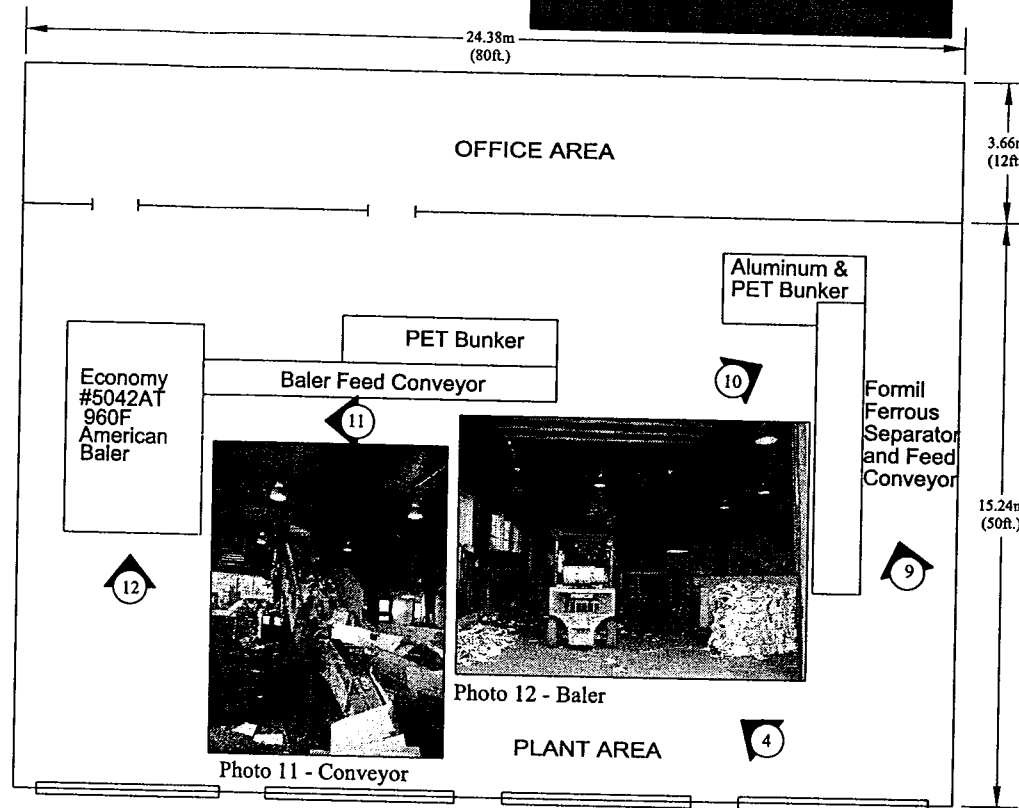
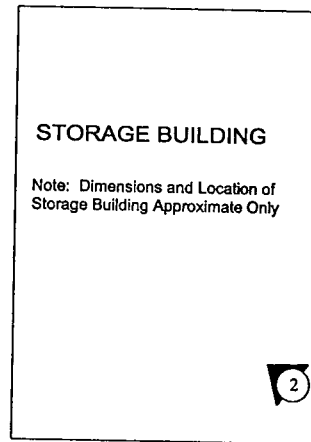


Photo No. 9 - Feed Area for Steel and Aluminum Material

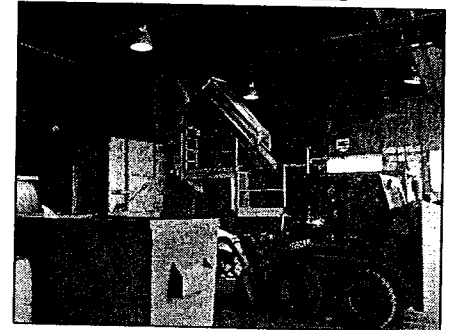
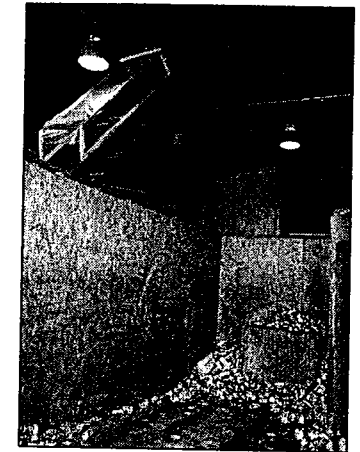


Photo No. 10 - Formil Ferrous Separator and Feed Conveyor



Photo No. 3 - South Side of Storage Building

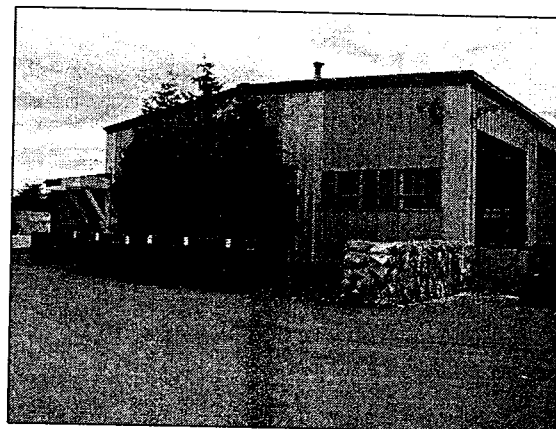


Photo No. 5 - Exterior West Wall of Recycling Facility

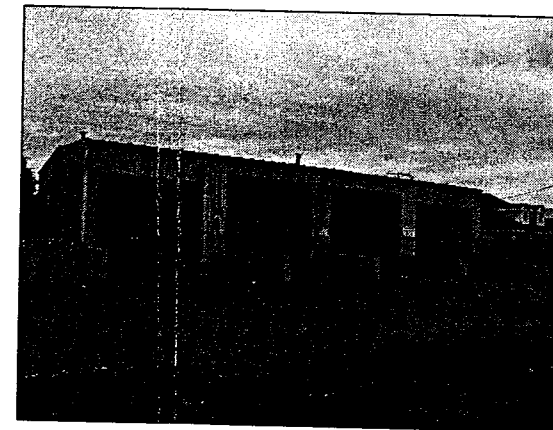


Photo No. 6 - South Side of Recycling Facility

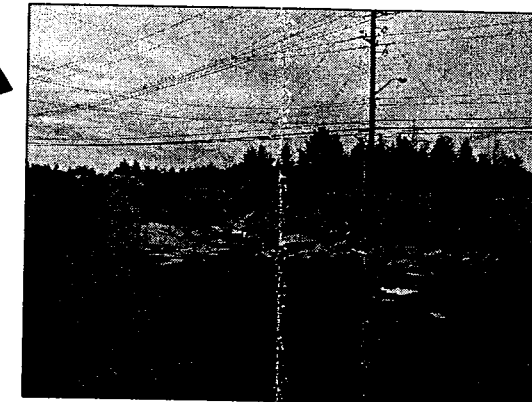
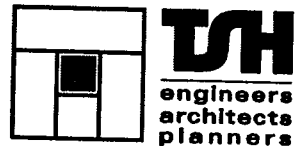


Photo No. 8 - Cardboard Storage Bay at South Side of Recycling Facility

Legend
1 Location and Direction of Photograph Number

Note: Building Dimensions to Scale
Equipment Only General Proportions



City of Sault Ste. Marie
Waste Management Plan
Recycling Facility Schematic

FIGURE NO.

7

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3. WASTE DIVERSION

3.1 Blue Box Recycling

Processing Plant

In 1990, the City converted its 4-bay former Tarentorus Works Garage into a municipal recycling centre. The plant area measures approximately 50ft. x 80ft. A 12ft. x 80ft. addition houses the office, locker room, rest room, storage area, lunch room and electrical room. The facility is located on a 3 acre parcel at 920 McNabb Street and is owned by the City.

A schematic of the recycling facility is included as Figure 7. The processing equipment at the facility includes:

- 1 Economy #5042ATX Conveyor/Baler System;
- 1 Formil Ferrous Separator/Conveyor System;
- 1 Sorting Conveyor;
- 5 Dump carts;
- 2 Thomas Model T-132 Skid Steer Loaders, propane powered; and
- 1 Cat #V40D Lift Truck.

Glass that is brought to the recycling plant is dumped in outside bunkers until there is sufficient material to send to market. Fibres are dumped onto the floor in the centre of the plant area and then loaded onto the baler feed conveyor, where any contaminants are pulled off manually by the operator(s) prior to the material being baled. Containers are dumped at the base of the ferrous separator feed conveyor. The conveyor has a magnetic head pulley, so that when the containers travel to the end of the conveyor the ferrous steel cans are magnetically held to the head pulley, while the PET plastic and aluminum containers drop off the end into a plywood storage bunker. The steel cans drop onto the floor where they are then loaded onto the baler feed conveyor to be baled. When the aluminum and PET bunker is full, the material is shovelled out onto the floor, and then loaded onto the sorting conveyor where the PET is manually sorted from the aluminum and thrown into the PET storage bunker. After the aluminum has been baled, the PET bunker is emptied onto the baler feed conveyor and the PET is processed (baled).

The processing equipment at the recycling plant has been in operation since the program's inception in 1990, and although the mobile equipment is in good condition, the baler is in need of a major overhaul including a new conveyor feed belt. The ferrous separator is not very effective at producing a clean sort of ferrous, and in general, there is considerable cross contamination in the bales of recovered materials. This contamination would reduce the amount of revenue obtained for the recyclables. In particular, a high percentage of aluminum is ending up in the ferrous metal stream. A good percentage of aluminum is then sold for the price of steel, which has a value of \$51 per tonne, in comparison to the much higher aluminum value of \$1909 per tonne⁽²⁾.

The processing plant is currently operated by a private sector contractor (Canadian Waste) under contract.

² Source: CSR Reported Spot Market Prices as of July 14, 2000

Collection

The City of Sault Ste. Marie operates a curbside blue box collection program for cans (ferrous aluminum), glass bottles and jars, newsprint, magazines and PET plastic. Recyclables are collected throughout the City on a weekly basis from a total of 23,412 properties, made up of:

- ▶ 21,725 single family and semi-detached properties³;
- ▶ 1,478 duplexes, rowhouses and apartments to five units; and,
- ▶ 209 apartments with six or more units.

Collection is conducted by Canadian Waste using three City-owned 1990 Walinga top-loading recycling vehicles. These collection vehicles have also been in operation for 10 years and are nearing the end of their practical service life. The 30 cubic yard vehicles have four compartments, allowing the recyclables to be divided into four separate material streams as outlined in Table 3.1.

Fibres	Newsprint, Office Paper, Glossy Paper (Magazines)
Containers	PET Bottles, Aluminum Cans, Ferrous Cans
Clear Glass	Clear Glass
Coloured Glass	Coloured Glass

The equipment, including plant and rolling stock, is maintained by the Contractor.

There are bins at the exterior of the recycling plant allowing residents and businesses to drop off recyclables at any time. It has been assumed that most of the recyclables dropped off are from residences, therefore volume figures for this material have been included with the residential recyclables total (see Table 3.2).

Tonnages Collected

The material collected in the blue box program is not weighed when it is brought to the recycling centre. Table 3.2 outlines the quantity of recyclables sold from the recycling operation in 1999.

³ Source: Corporation of the City of Sault Ste. Marie Request for Proposal : Recycling Program Contract No. 95EJ01

TABLE 3.2 RESIDENTIAL RECYCLABLES PROCESSED IN 1999 AT SAULT STE. MARIE RECYCLING CENTRE		
Material	Annual Quantity (tonnes)	Market Location
Newsprint	1261	Thunder Bay
Glass	479	Toronto
Aluminum Containers	77	Toronto
Ferrous Containers	211	Sault Ste. Marie
PET Plastic	39	Toronto
Total Recyclables	2067	
Recyclables/Household	88 kg/hh	

Source: Canadian Waste Management

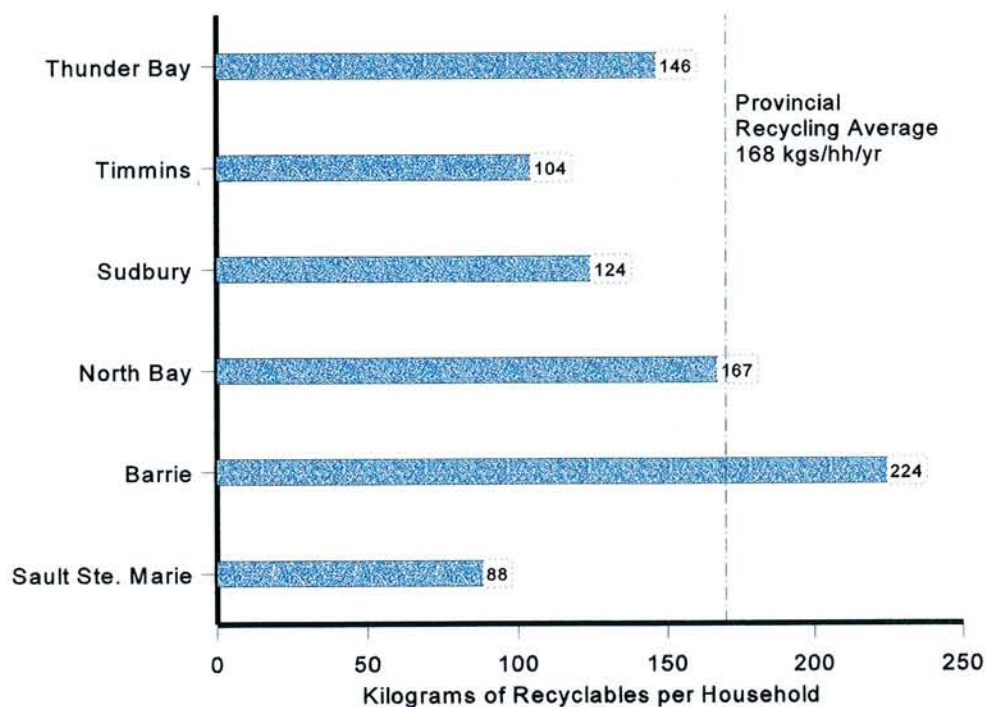
The Contractor also processes approximately 1,500 tonnes of corrugated cardboard and office paper per year collected from the IC&I sector at the McNabb Street facility. Since this material is generated by local industries and businesses, it is not included with the residential recycling tonnages.

The blue box program in the City captured approximately 88 kilograms of recyclables per household in 1999 as shown in Figure 8. This is considerably less than the quantity of recyclables recovered in other municipalities, and approximately half of the Provincial average of 168 kilograms of recyclables per household per year⁽⁴⁾. Public participation is the key to capturing and recovering the maximum amount of recyclables and public education is imperative to obtaining resident participation.

⁴ *Source: Municipal 3Rs in Ontario: 1998 Fact Sheet*

Figure 8 - Residential Recyclables Collected for Sault Ste. Marie and Comparable Municipalities - 1999

Source: TSH, August 2000



Recycling Program Costs

The costs for operating recycling programs vary in different municipalities due to a number of factors, including:

- the number and types of materials collected;
- the population served and population density;
- the collection and processing systems used;
- ownership of the collection and processing equipment and any funding received for purchase;
- the age of the equipment being used for collection and processing;
- operating efficiencies;
- contractual issues, such as material revenue share; and,
- the value of recovered materials.

For the sake of this analysis, the cost of recycling included rental of buildings and equipment. The cost of recycling collection vehicles has not typically been included since recycling vehicles were purchased by the municipalities, with funding from the province and OMMRI (Corporations in Support of Recycling).

In Sault Ste. Marie, the contractor leases the recycling facility and collection vehicles from the City. The contractor provides all labour and materials necessary to collect and process the recyclables, and to maintain the recycling vehicles and equipment. All revenue obtained from the sale of the recyclables remains with the contractor. The Contractor pays rent for the use of the recycling building and equipment and the City pays a monthly fee for the recycling contract. The net cost to the City for the blue box recycling program was \$119,000 in 1999. The contractor has advised the City that it has been losing money on the existing contract and is requesting an increase in the monthly payment for any extension to the contract. The existing contract expires in September 2000, and the City is currently negotiating a 2 year extension.

The current cost per household for recycling in Sault Ste. Marie is low in comparison to other municipalities as shown in Figure 9. An important factor to keep in mind when comparing recycling program costs is that the cost of recycling per household also reflects the quantities of recyclables that are collected from each household, so a low cost per household may indicate a cost-effective program or it may be indicative of a low capture rate of recyclables. In the case of Sault Ste. Marie, a low capture rate exists as shown in Figure 8.

Based on the quantity of recyclables processed in 1999, the cost for the blue box program on a per tonne basis was \$62.76. This cost is also relatively low in comparison with other municipalities.

According to the *Waste Diversion Organization Interim Report* (30 June 2000), the net blended "basket of goods" cost of collection, processing, and marketing recyclables in Ontario in 1999 was estimated to be \$99 per tonne. This figure includes operating costs and the amortized capital replacement cost of collection vehicles and recycling facilities and the blends of a range of costs observed in small and rural communities, mid-size towns and large urban centres. At the current time, the cost of recycling in the City is lower than the provincial average; however, it is expected that the recycling contract currently being negotiated will increase the costs to higher than the Provincial average.

Figure 9 indicates graphically how the costs for the current recycling program and the extended contract for recycling in the City of Sault Ste. Marie compare with the Ontario average and the recycling costs in other comparable municipalities. In all cases, costs include operating, collection, processing and capital costs net of revenue amounts.

Figure 9 - Cost of Residential Recycling for Sault Ste. Marie and Comparable Municipalities - 1999
 Source: TSH, August 2000



3.2 Corrugated Cardboard Recycling

The City realized that a large portion of the waste going to landfill was old corrugated cardboard (OCC) being generated by businesses. Effective April 1, 1999, the City implemented a ban of commercially generated OCC at the landfill site. The City contracted with the private sector to set up depot containers at nine locations throughout the City for the collection of OCC. A one-year contract to supply the containers, collect the OCC from the containers as required, and process and market the OCC was awarded. The contractor is paid a lift fee for each container of OCC collected. The OCC depot collection program in Sault Ste. Marie resulted in the diversion of approximately 148 tonnes of waste from the landfill in 1999⁵.

⁵ Source: Written correspondence from Mr. P. McAuley, City of Sault Ste. Marie

The amount of OCC recovered has reportedly been increasing⁶ since the program start and the number of containers being utilized has increased from the nine original containers to thirteen. The containers are emptied twice a week and the OCC is brought to a processing facility where the material is baled with a manual vertical baler and sent to market when a full truckload volume has been accumulated. The amount of OCC currently being processed is approximately 22 tonnes per month⁷.

Although these containers have been put in place primarily for the commercial sector, they are also utilized by residents, since OCC is not collected as part of the blue box program. The depots are predominately utilized by the IC&I sector, therefore, this material is not included in the residential recycling tonnages. An assumption has been made that any residential OCC recovered in the depot OCC program and not included in the residential recycling tonnages will be offset by the commercial recyclables that are dropped off at the municipal recycling facility, which are included with the residential tonnages.

3.3 Miscellaneous Landfill Diversion

The waste diversion activities at the Sault Ste. Marie Landfill includes the diversion of the following materials:

- wet cell batteries;
- large appliances and scrap metal;
- used tires;
- propane cylinders;
- leaves and wood waste; and
- Christmas trees.

In 1999, a total of 1381 tonnes of material was diverted from disposal at the landfill site through these recovery programs. Table 3.3 outlines the processes used for diverting these materials and the 1999 quantities diverted.

⁶ Source: Verbal communications with Mr. Martella, Sault Ste. Marie Disposal Inc.

⁷ Source: Verbal communications with Mr. Martella, Sault Ste. Marie Disposal Inc.

TABLE 3.3 MISCELLANEOUS LANDFILL DIVERSION - 1999		
Material	Processor	Tonnes Processed
Scrap Metal	Scrap dealer removes and recycles scrap metal from the landfill and pays the City a revenue of \$7 per tonne.	511
Batteries	Batteries are recycled by Interstate Batteries who pay the City a revenue of \$1/battery (@ 18 kg/battery)	19
Wood	Superior 3-R processes and removes all wood waste from the landfill for a unit price of \$27.00 per tonne. Wood chips used as fuel by local industry or composted.	827
Scrap tires	Cockburn Island Tire Recycling removes and recycles scrap tires from the landfill for \$240 per tonne	24
Total		1381

Source: Weigh Scale Information from Sault Ste. Marie Landfill

3.4 Composting

The City of Sault Ste. Marie and *Clean North*, a non-profit group environmental group dedicated to promoting waste reduction in the Sault and Algoma District, have distributed subsidized and free backyard composters to City residents. Although these programs were discontinued when the Province discontinued the subsidies on composters in 1995, it is estimated that 11,000 backyard composters were distributed in the early 1990's⁸. Clean North estimates that 60% to 70% of these units are still be used. Assuming that several people purchase or build there own composting units, it is estimated that there are 8,000 backyard composting units currently being used in the City of Sault Ste. Marie. Based on an average organic waste diversion of 122 kgs/year for each composter, there may currently be an estimated 976 tonnes per year of waste diverted through backyard composting in Sault Ste. Marie.

The City has a once per year collection of Christmas trees which are chipped at the landfill site. In 1999 there were 15 tonnes of Christmas trees collected and diverted from disposal.

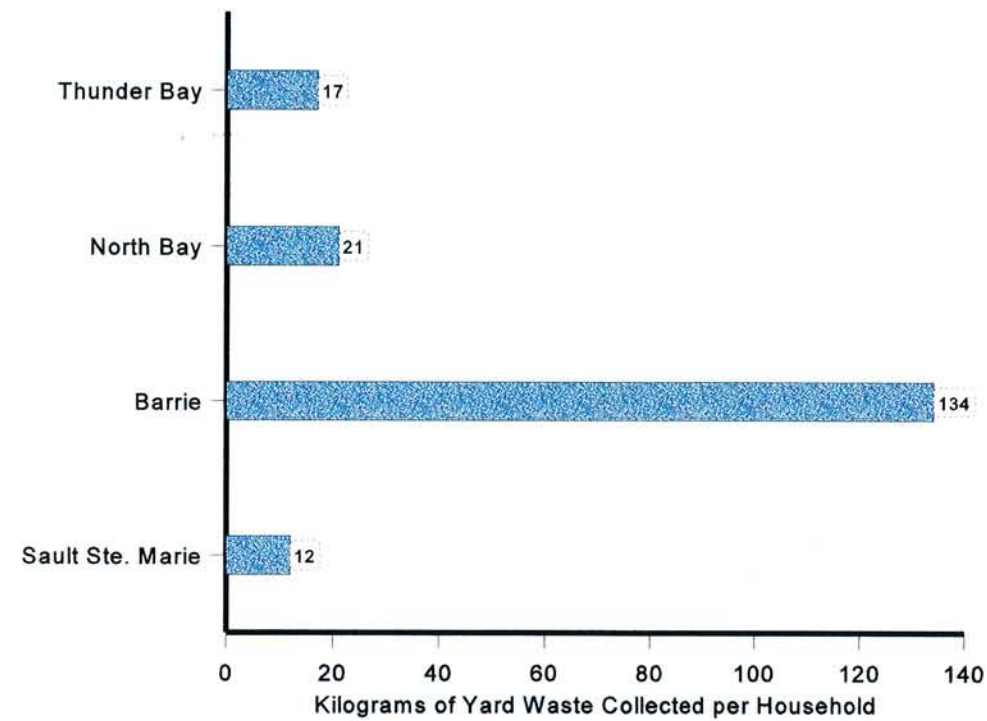
The City implemented a leaf and yard waste collection program in 1997. Periodically in the fall, City trucks are used to collect yard waste from residents in the central area of the City (see Figure 1) on the day after the regular waste collection day. This material is hauled to the landfill site where it is weighed, then taken to *Lemieux Composting & Haul-Away*, a privately owned and operated composting site located in the City. In 1999, the City collected 294 tonnes of leaves in 3 collection weeks. Four leaf and yard waste collection weeks are planned for the year 2000.

As shown in Figure 10, the amount of yard waste that is collected in the municipal yard waste collection program is low compared to other municipalities. The amount of yard waste collected is typically a function of the frequency of collection events. For example, the high quantity of yard

⁸Source: Written correspondence from Mr. P. McAuley, City of Sault Ste. Marie

waste collected in Barrie reflects the fact that the City provides bi-weekly yard waste collection throughout the year.

Figure 10 - Yard Waste Collected for Sault Ste. Marie and Comparable Municipalities - 1999
Source: TSH, August 2000



Lemieux Composting is located on Black Road in Sault Ste. Marie and has been operating an organic waste composting operation since 1990. They accept a variety of organic waste products including: leaves, lawn clippings, sod, uncooked vegetables, fruit, flowers and garden clippings. Residents and businesses can drop off suitable organic materials 7 days a week, provided that they do not leave any bagged materials. Lemieux Composting accepts the organic waste for free, including the material picked up by the City during its leaf and yard waste collection events. The waste is composted in open windrows and is then sold either as pure compost, or mixed with loam to produce a high-organic soil mix.

In 1999, a total of 1231 tonnes of organic material was accepted and processed at Lemieux Composting as detailed in Table 3.4.

Material	1998	1999
Leaves (City collection)	161	294
Leaves (public drop-off)	497	635
Grass	188	215
Wood waste	0	34
Sod	64	53
Total	910	1231

Source: Waste Volumes as provided by Lemieux Composting and converted based on densities from the WRO Waste and Secondary Density and Conversion Table

3.5 IC&I Waste Diversion

Waste diversion in the IC&I sector is difficult to quantify because the City does not have control over privately-generated waste or recyclables. In Sault Ste. Marie, businesses are provided with access to the drop-off depot at the recycling plant and the OCC recycling depots. There are also several diversion programs in place for specialized waste streams that are generated by particular industries.

Many of the local landscaping and yard maintenance companies utilize *Lemieux Composting* to drop off the yard waste generated in conducting their business.

GP Flakeboard uses waste wood purchased from other companies in its production of medium density fiber board and as a fuel source.

Algoma Steel Incorporated (ASI) has formed joint-ventures with several companies to utilize its slag as aggregate and in cement production. Among several other projects for by-products, ASI is using blast furnace and coke oven gases to supplement its own energy needs.

St. Mary's Paper uses pulp and paper sludges for the reclamation of closed landfills. It also sends sludge to be composted at a local site that specializes in processing paper sludge into a valuable soil amendment. St. Mary's uses wood chips from the landfill diversion program and other sources as a fuel source.

And-Son Contracting of Sault Ste. Marie chips waste wood which is sold for mulch and hog fuel. The company also owns screening equipment that has been used in a landfill mining project and other business applications and has done work with various communities in composting projects.

3.6 Household Hazardous Waste

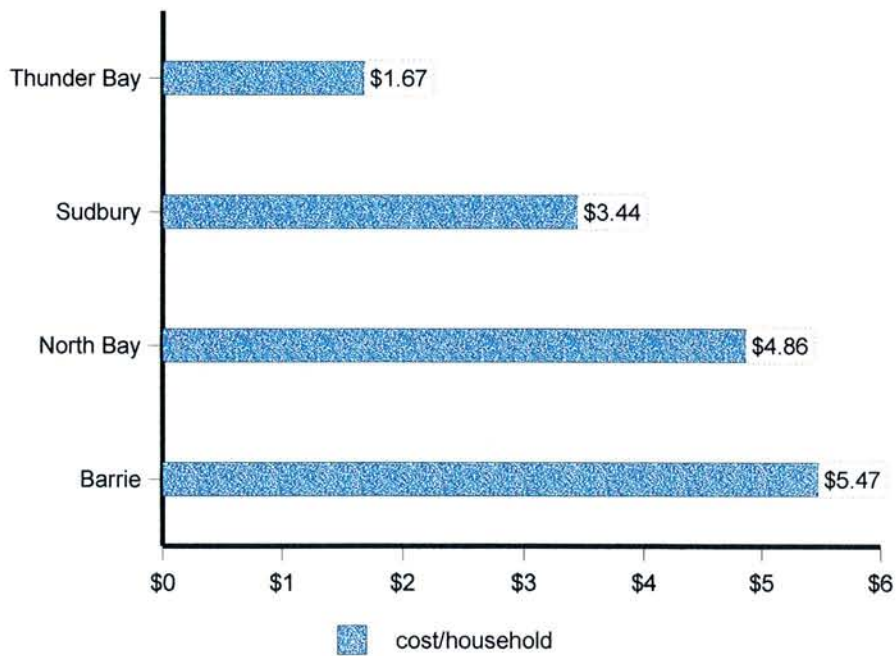
The City does not currently have a program in place for the collection and proper disposal of household hazardous waste (HHW).

The City is currently in the process of examining the best available alternatives for the establishment of a permanent household hazardous waste depot. It is anticipated that a facility will be up and operating by the Summer of 2001.

Of the five comparison municipalities, four currently have programs in place for the collection of HHW. The Region of Sudbury operates both a regular HHW depot and a "toxic taxi" system that collects HHW from residents throughout the Region. The costs of the HHW programs range from \$1.67 per household to \$5.47 per household.

Figure 11 - Cost of HHW Programs for Comparable Municipalities - 1999

Source: TSH, August 2000

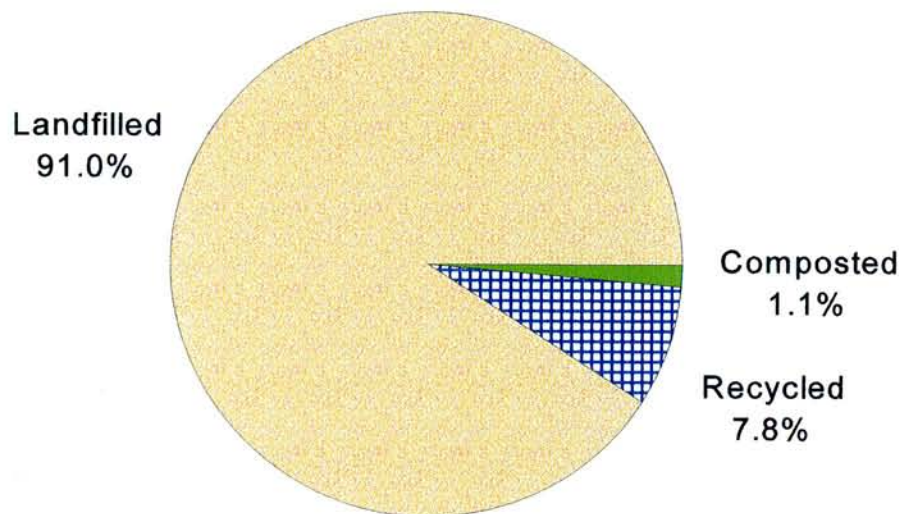


3.7 Residential Waste Diversion Rate

When considering the residential waste that is collected in the municipally operated system, the City is achieving a 9.0% diversion rate from landfilling. The breakdown is shown on Figure 12.

Figure 12 - Residential Waste Stream for the City of Sault Ste. Marie - 1999

Source: TSH, August 2000

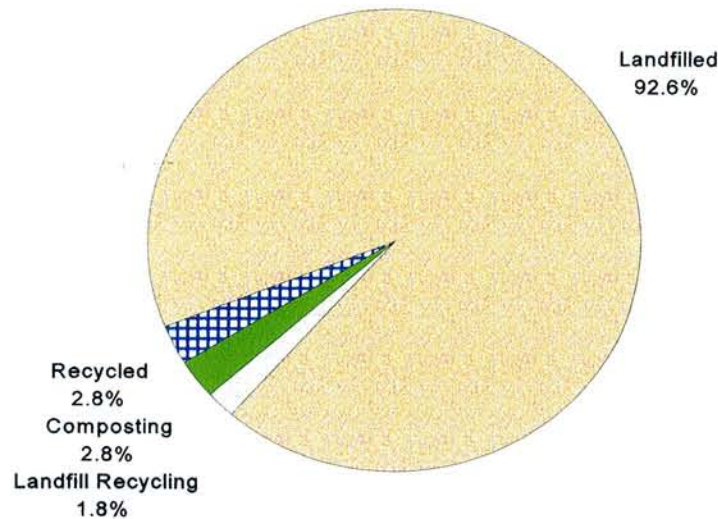


In 1999, a total of 26,445 tonnes of residential waste was collected by the City of Sault Ste. Marie. Of this amount 91.0% was landfilled and 8.9% was diverted from landfill through curbside blue box recycling (7.8%) and yard waste composting (1.1%) programs.

3.8 Total System Diversion Rate

If the entire waste stream is considered, the City is achieving a 7.4% waste diversion rate as shown on Figure 13.

Figure 13 - Total Waste Stream for the City of Sault Ste. Marie - 1999
Source: TSH, August 2000



In 1999, a total of 78,374 tonnes of waste was generated in the City of Sault Ste. Marie. Of this amount, 2.8% was recycled in the blue box or depot recycling programs, 2.8% was composted (in backyard composters or at Lemieux Composting), 1.8% was diverted through diversion programs at the landfill, and the remainder was landfilled.

3.9 Summary

The following conclusions are provided on the waste diversion components comprising the Sault Ste. Marie waste management system.

- There is very low recovery of recyclables in the blue box program (half of the provincial average) and less than any other of the comparable municipalities;
- The cost for recycling is currently low compared to the provincial average and other comparable municipalities;
- The cost per tonne for recycling after September 2000 is expected to be higher than the provincial average and that of all other comparable municipalities. This is directly related to the low rate of participation in the program by local residents;
- The quantity of yard waste collected per household is low compared to other municipalities;
- The City is achieving a 9.0% diversion from landfill based on the residential waste that is

collected in the municipally operated system; and

- The City is achieving a 7.4% diversion from landfill based on the total waste stream.

4. CONCLUSIONS

Based on the analysis presented in this report, the following conclusions will be taken into consideration during the conduct of the Waste Management Planning Study:

- The municipal waste collection and disposal system components are generally well operated and financially controlled. The recycling component lacks participation and is inefficient;
- The overall waste management system cost for 1999 is as follows:

System Component	Annual Cost (\$)
Waste Collection - single family dwellings	902,518
Waste Collection - multi-family and special collections	59,304
Landfill Operating Costs	1,058,054
Recycling Costs - Collection and Processing	134,944
Revenue (Tipping Fees)	(984,310)
Total System Cost	1,170,510

- The cost figures provided by the comparison municipalities were found not to be developed on the same basis (ie. all municipalities did not include the same costing categories when compiling their gross figures). The comparison figures presented may therefore not accurately reflect the true cost of certain system components.
- A high quantity of waste designated for disposal is being generated from the household sector in the City. This can be directly related to the low diversion rate;
- The cost per tonne for household waste collection is low, presumably because of the high quantities of wastes per household being directed to the landfill;
- The cost per household for household waste collection is comparable to the other municipalities;
- The largest generators of waste going to landfill are the residential sector, IC&I sector and the sewage treatment plants (sewage sludge). These generators should be targeted to increase their current diversion rates;
- The current tipping fee at the landfill is low compared to other northern municipalities;
- The landfill has approximately 11 years of capacity remaining, based on the 1999 disposal rate;

- The leachate collection system requires remediation;
- The leachate monitoring program appears to be acceptable;
- The leachate collection system, together with natural attenuation processes, appear to be controlling groundwater migration of landfill leachate;
- The surface water in Canon Creek adjacent to the landfill (Monitoring Station B-3) indicates the presence of iron precipitates and iron bacteria;
- The City-owned recycling collection and processing equipment is aging and will require replacement in the very near future;
- The recovery rate for recyclables is very low when compared to the Provincial average and other comparable municipalities. This area should be targeted to increase future diversion rates;
- The cost per tonne for recycling as a result of the extended contract is higher than the provincial average and that of all other comparable municipalities. This is directly related to the low rate of participation in the program by local residents;
- The cost per tonne for cardboard recycling is high; and
- The amount of yard waste collected is very low.

An overall summary of the comparable municipalities' waste programs is presented in Appendix A.

All of which is respectfully submitted.

Appendix A
Summary of Municipal Waste Programs

APPENDIX A: SUMMARY OF MUNICIPAL WASTE PROGRAMS

	City of North Bay	City of Sudbury	City of Timmins	City of Thunder Bay	City of Sault Ste. Marie	City of Barrie
Population (Enumeration, 1997)	56,411	164,000	45,845	116,965	80,054	78,965
Number of Households	18,500	41,500	18,190	42,000	24,412	34,593
Waste Collection Residential:						
Private/Public Collection	Private	Combination	Public	Public	Combination	Private
Waste Collected (tonnes)	12,528	23,075	—	27,194	19,716	17,300
Waste/Household (kilograms)	677	556	—	647	808	500
Annual Collection Costs - single family dwellings	\$625,000	\$1,470,000	\$451,273	\$2,500,000	\$902,518	\$1,141,569
Annual Collection Costs - multi-family and special collections					\$59,304	
Collection Costs/tonne	\$49.89	\$63.71	—	\$91.93	\$45.78	\$65.99
Collection Costs/Household	\$33.78	\$35.42	\$24.81	\$59.52	\$36.97	\$33.00
Landfill Operations:						
Number of Sites	1	5	5	1	1	1
Private/Public Operation	Combination		Public		Public	Public
Total Tonnes Disposed	48,406	100,000	26,400	186,771	72,571	31,444
Annual Landfill Operating Costs	\$645,000	\$2,330,000	\$476,773	\$800,000	\$1,058,054	\$765,959
Operating Cost/tonne	\$13.32	\$23.30	\$18.06	\$4.28	\$14.31	\$24.36
Operating Cost/household	\$34.86	\$56.14	\$26.21	\$19.05	\$43.34	\$22.14
Tipping Fee/tonne	\$37.00	\$72.00	—	\$27.50	\$27.50	\$74.00
Tipping Fee Revenue	\$1,016,000	—	—	—	\$984,310	—
Misc. Landfill Diversion (ie. scrap metal, tires, etc.) (tonnes)	710	5,200	—	—	1,381	—
Recycling Collection/Processing Residential:						
Private/Public Collection	Private	Private	Private	Private	Private	Private
Recyclables Collected (tonnes)	3,092	9,551	1,888	6,132	2,067	7,751
Recyclables/Household(kilograms)	167	124	104	146	88	224
Annual Collection/Processing Costs	\$188,657	\$1,292,216	\$224,647	\$557,000	\$119,000	\$852,610
Recycling Cost/tonne	\$61.01	\$135.30	\$118.99	\$90.83	\$57.57	\$110.00
Recycling Cost/Household	\$10.20	\$16.83	\$12.35	\$13.26	\$5.08	\$24.65
OCC Recycling Program					\$15,944	
Organics:						
Yard waste collected (tonnes)	384	N/A	N/A	700	294	4630
Yard waste/hh (kilograms)	21	0	0	17	12	134
HHW:						
Annual HHW Costs	\$90,000	\$263,746	N/A	\$70,000	—	\$189,253
HHW Cost/hh	\$4.86	\$3.44	—	\$1.67	—	\$5.47

Notes:

1. Residential Waste Collection excludes collection contracts for apartments or commercial sectors.
2. Landfill operations and the recycling program for the City of Sudbury are based on the programs operated by the Region of Sudbury.
3. No weights are available for waste collection in the City of Timmins.
4. The Region of Sudbury accepts yard waste for composting if it is dropped off at the Regional Landfill Sites, however the City does not conduct a yard waste collection program.