Regional Municipality of Niagara
Organic Co-Collection Pilot Program
Preliminary Final Report to the
Waste Diversion Organization

Part One - Background

In the Summer of 1996, the Region of Niagara initiated a residential Waste Composition Study which examined the waste generation and composition in three neighborhoods across Niagara. This study determined that organic material (food waste, leaf and yard waste and brush) comprised 35.5% of the total residential waste stream. Only a portion of the organic material in Niagara is currently diverted from landfill through municipal leaf and yard waste collection programs and backyard home composting.

In June 1999, Region of Niagara approved of the Task Three Report, Implementation of a Preferred Waste Management System which provides a blueprint for the implementation of the preferred system (System Three) selected in earlier Task reports. System Three focuses on maximizing diversion by improving existing programs and implementing a program for the collection and composting of organic materials. This system has the potential for the greatest waste diversion from disposal - 65%, if all system components are implemented. The Region has set a waste diversion objective of 65% by 2012.

The main purpose of the Organic Co-collection Pilot Program is to investigate methods for source separating, co-collecting and processing organic material to minimize costs and maximize diversion from landfill. This pilot also investigates the option of compacting recyclables collected at the curb to determine if a two-stream system with compaction would improve curbside collection efficiencies without significantly impacting processing costs.

The Organic Co-collection Pilot Program was set up as a nine-month study operating from July 2000 until the end of March 2001. The Preliminary Final Report to the Waste Diversion Organization (WDO) includes information up to and including the month of February 2001. The Regional Municipality of Niagara's Final Project Report, which will include detailed program analysis for the full pilot program, will be available for the WDO by June 30, 2001.

Part Two - Project Design and Components

2.1 – Organic Co-Collection

2.1.1 Collection of Materials

The pilot was divided into two study areas. In Study Area One, in the south end of St. Catharines, source-separated organic material, in the resident's choice of container (clear plastic bags, dedicated container, etc.) was co-collected on a weekly basis with blue box recyclable materials in a two compartment collection vehicle. Study Area One was known as the Bag Based Study Area. Recyclable paper fibres and co-mingled containers were collected on alternate weeks in Study Area One. In Study Area Two, in central Port Colborne, source-separated organic material, in 360 Litre Schaefer Compostainer carts (supplied by the Region) was co-collected on a weekly basis in the same two-compartment collection vehicle, along with residential waste. Study Area Two was known as the Cart Based Area.

2.1.2 The Collection Vehicle

Co-collection of these materials was undertaken using a two-compartment Labrie Expert 2000 (35 cubic yard capacity) collection vehicle equipped with a vertical 70/30 proportion split. Both compartments were equipped with compaction. The pilot's organic waste component was collected in the 30% compartment (10.5 cubic yards) while the residential waste and recyclable materials were collected in the 70% compartment (24.5 cubic yards) in the respective pilot areas. Canadian Waste Services Inc. provided collection services in the Port Colborne Cart Based Area while Modern Landfill Corporation provided collection service in the St. Catharines Bag Based Area.

2.1.3 Program Promotion

The Organic Co-collection Pilot Program was advertised extensively in advance of the launch, the week of July 3, 2000. Hand-delivered invitations advertised Pre-pilot Open Houses in Port Colborne on May 9, 2000 and in St. Catharines on May 11, 2000. Once residents had been introduced to the respective programs through the open house invitations and the open houses themselves, door front surveys were conducted in each pilot area in late May/early June 2000 to gain a better insight into resident's waste management habits. If residents were not home at the time of the visit, surveys accompanied with self-addressed, stamped envelopes were left in their mailbox for residents to complete and return. Starting in mid March 2001, a second door front survey was initiated in each of the pilot areas to collect data specifically related to the resident's experiences during the pilot.

Program literature and related pilot project equipment was distributed to each study area household a minimum of 9 days before the first collection. In St. Catharines, the

information package included an introductory letter, one 8.5 litre plastic pail for indoor collection of organics, a collection schedule, Frequently Asked Questions (FAQ) Fact Sheet, a sample set of see-through bags for collection of household organics, one bright yellow sticker with "ORGANICS" printed on it for residents to affix to their own dedicated hard wall container for use during the program, a program brochure and a form outlining the acceptable program materials. The Port Colborne area residents received an introductory letter, one Schaefer cart and kitchen container, program brochure, acceptable materials form and a FAQ Fact Sheet.

In October 2000 and in January 2001, newsletters were distributed to all pilot area households to update residents on the progress of the pilot and to encourage continued participation. A third newsletter, outlining the results of the pilot, will be distributed in April/May 2001to all pilot area homes.

2.1.4 Time and Motion Studies

Time and Motion Studies were conducted on each collection day during the pilot project. An Earth Tech staff person followed the collection truck on each of the 78 collection days to monitor particulars such as total time spent on and off the route, distances traveled during the collection day, weights of materials collected, and time spent carrying out various on-route activities.

2.1.5 Other Pilot Area Information

Both of the proposed study areas are classified as Urban Low Density Residential, however, the St. Catharines study area is based in a large urban centre with an overall diversion rate in 1999 of 30%, while the Port Colborne study area is based in a much smaller urban centre with an overall diversion rate of approximately 40% in 1999. Based on the 1996 Waste Composition Study, 40% of the total 770.4 kg/hhld/year of the household waste stream for this sector is organic material in the form of food waste, leaf and yard waste and brush.

2.1.6 Acceptable Program Materials

The following organic materials were acceptable for the Co-collection Pilot Program:

Kitchen Waste

Bread, muffins, cake, cookies, pies and dough, coffee grinds, paper filters, tea bags, solid dairy products, eggs and egg shells, plate scrapings, meat or meat by-products, gravy, pasta, sauces, vegetables, fruit and peelings, nut shells

Leaf and Yard Waste

Grass clippings, plants, leaves and flowers, vegetable garden waste (no brush)

Other Organic Waste

Soiled newsprint, brown paper bags and waxed and soiled cardboard

Note: Brush was not included in the co-collection pilot program, but was collected separately as it requires pre-processing (chipping) prior to composting.

2.2 Organic Processing

The organic material collected from both study areas was delivered to the Earth~Works Composting Facility for inspection, pre-processing and composting. The Earth~Works facility is an outdoor windrow composting facility located at the Elm Street Landfill site in Port Colborne. This facility has a proven history of successfully composting a wide range organic materials including municipal leaf and yard waste, material from the Port Colborne IC&I cart based organic collection program, and solid and liquid organic material received from industrial sources such as local flour mills and food processing operations.

The addition of household organic material in bags and in loose form (from the organic carts) provided an additional processing and composting challenge. The Region tested the performance of a new bag-breaker to determine its effectiveness in removing plastic bags prior to the composting of the material. The results of the pilot will demonstrate whether it is feasible to pursue this cost effective, composting approach for source separated materials generated across the entire Region.

2.3 Recyclables Processing

The Region of Niagara completed a study in 1998/1999 called the “Thorold Curbside Combo Demonstration", which examined the impact of allowing residents to use either blue boxes or see-through bags to set out recyclable materials and which reduced the number of curbside sorts for recycling to 2-streams, co-mingled containers, and co-mingled fibres. The recyclables set-out in Study Area One for this pilot is not significantly different from the set-out in the previous study, with the exception that in the previous study, both streams of recyclables were collected at the same time, on a bi-weekly basis, and in this pilot both streams were collected separately, on alternate weeks.

The primary difference between this pilot and the previous study is that the recyclable materials are **compacted.** The Region investigated if the compaction of the recyclable materials offered greater efficiency in the collection of these materials as compared to the current collection approach.

2.4 Waste Composition Studies

Three waste composition studies were conducted in order to gather detailed waste stream information. The studies included the collection of waste, recyclables, and organic materials from a sample set of 50 homes in each pilot area, over a four-week

period. The first study was conducted prior to the pilot in May-June 2000 in order to gain base line information on residents waste management habits. A second set of waste composition studies was conducted in October/November 2000 to evaluate each pilot area's performance during peak leaf and yard material season when volumes were greatest. A third waste composition study was performed in February 2001 in order to study the willingness of pilot area residents to divert food materials during the winter months.

2.5 Project Consultants

The Regional Municipality of Niagara retained the consulting services of Earth Tech Canada Inc. (Earth Tech) to perform a variety of program activities, including:

- Distribution of program literature and related equipment (carts etc.);
- Weekly co-collection time and motion studies;
- Spring, Fall and Winter waste composition studies;
- Pre-study and post-study door-front surveys, and;
- Collection of carts for return to the manufacturer upon completion of the study

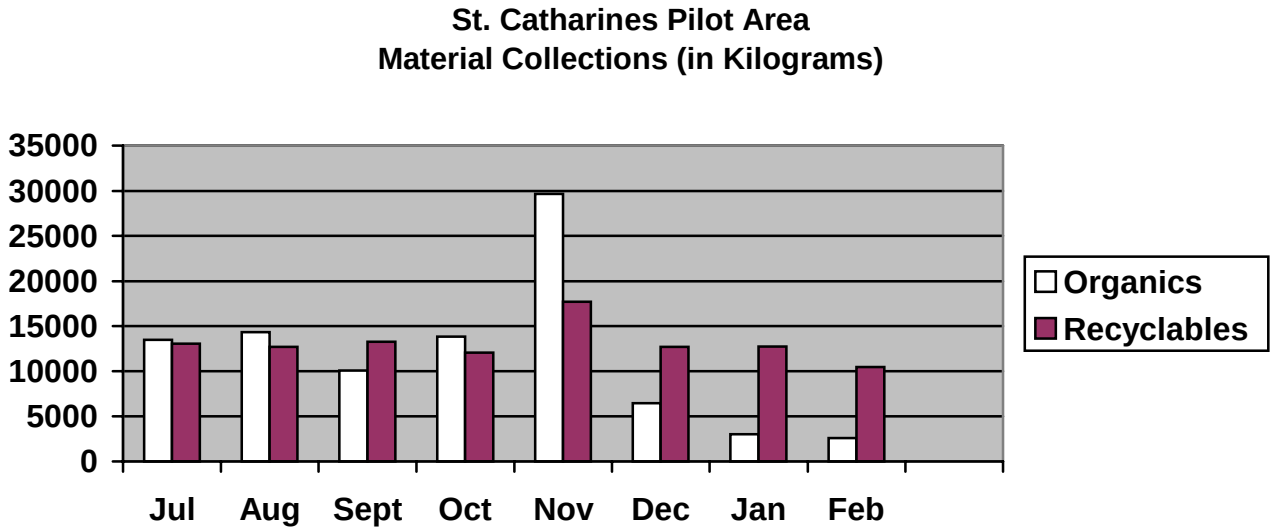
Part Three - Summary of Results (July 2000-February 2001)

3.1 Organic Co-collection

3.1.1 Bag Based Study Area (St. Catharines)

3.1.1.A St. Catharines Materials Collected

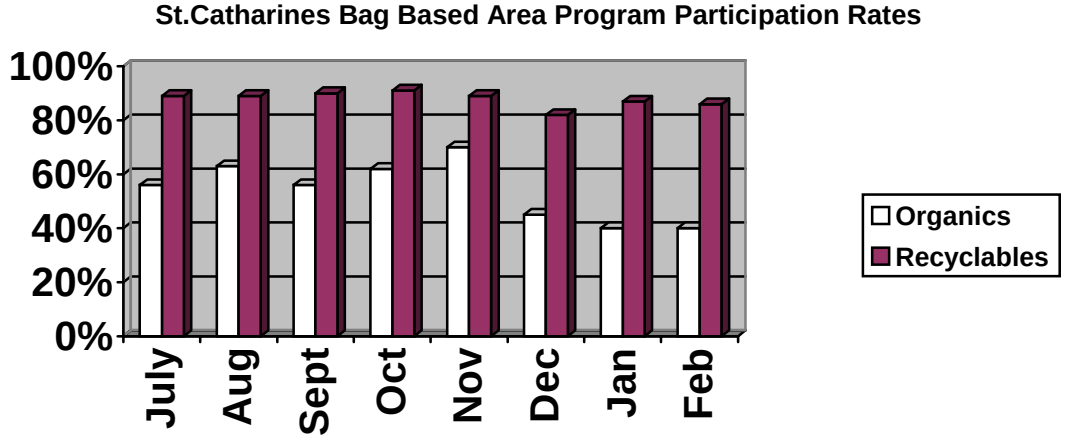
In the St. Catharines study area, a total of 93,580 kg of organic material and 104,626 kg of recyclable materials were co-collected from July 2000 to February 2001. The weekly average collection weights ranged from a high of 9,474 kg in November 2000 to a low of 3,258 kg in February 2001. The November tonnage is attributable to strong participation during peak leaf and yard waste collection season. The February 2001 figure can be is attributable to the lack of available leaf and yard materials and a reduction in the number of households participating in the food material portion of the program. As of February 2001, the average St. Catharines area pilot household was setting out 17.80 kg of organic material and 19.90 kg of recyclable material each month.



3.1.1.B St. Catharines - Participation Rates

The participation rate was measured as the percentage of households that placed a specific stream of material curbside for collection at least once per month. During the study roll-out in late June 2000, there were no households in the 657 home area that refused to participate in the pilot. Participation in the organic collection portion of the program ranged from a high of 70% in November 2000 to a low of 40% in both January and February of 2001. The November participation rate is attributed to the strong contribution of leaf and yard material. The 40% participation rate in both January and February 2001 is a reflection of the number of households that chose to set out food materials for collection in the Winter.

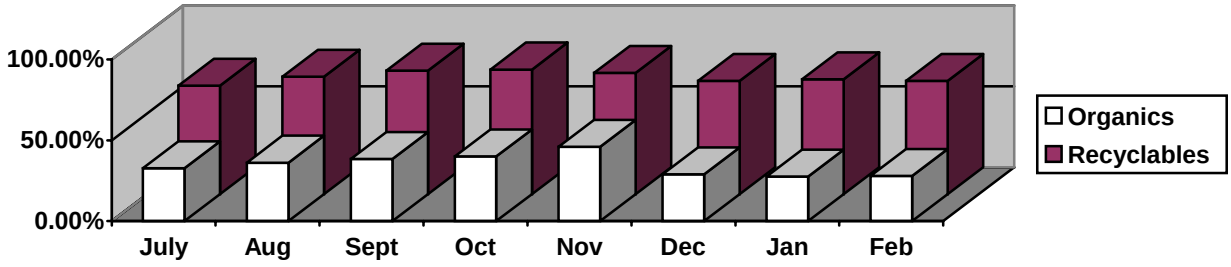
Participation in the recycling portion of the co-collection program ranged from 82 to 91% per month during the first eight months. Participation rates for both organic and recyclable collection for the St. Catharines Bag Based Pilot area are noted below.



3.1.1.C St. Catharines Set Out Rates

Set out rates, for the purpose of this study, include the number of households each week that set out a specific material type at the curbside for collection. The weekly set out rate for the organic material steadily increased over the first five months from an average of 32.7% in July 2000 to 46.0% in November 2000. The set out rates for organic material from December 2000 through February 2000 were much lower, ranging from 27.5% to 29.0%. Recyclable material weekly set out rates ranged from an average of 67.1% in July 2000 to 77.1% in October 2000.

St. Catharines Bag Based Area Program Set Out rates



3.1.1.D St. Catharines Time and Motion Studies

The "on-route" collection time is difficult to compare to the pre-study period because the three-stream-sort recycling collection vehicle in service before July 2000 required assistance from two additional collection vehicles near the end of the day to complete the route. It is estimated by Modern Landfill Corp. that the primary recycling collection vehicle in the pre-study pilot area completed approximately 80% of the 657 home collection route by 3:00pm while the other two trucks completed the remaining 20%. The co-collection on-route collection times ranged from a peak average of 5.31 hours (319 minutes) in July 2000 to a low of 3.76 hours (226 minutes) in February 2001. In November, there were occasions when the organics compartment filled to capacity early on in the route. When this occurred, the collector elected to finish the route collecting recyclables only. Once the recyclables were unloaded at the MRF, the collection vehicle would then return to the collection route to complete the organics collection, storing the remainder of the organics in the 70% compartment normally reserved for recyclables. Even with the partial "double passes" through the study area in November, the collection time for the month averaged 4.71 hours (289 minutes), which, coincidentally was the same average on-route collection time for the first five months of the pilot.

3.1.1.E St. Catharines Public Inquiries

By the end of February 2001, Regional staff received 71 telephone calls from pilot area residents. The majority of the calls, 38 in total were regarding missed collections of recyclables or organics including 26 calls from residents who had placed both recycling streams out for collection on the first collection day. A rough survey of the pilot area on the first collection day indicated that approximately 1/3 of the homes had set out all available recyclable material instead of the container stream only. It was common for residents to approach the co-collection driver regarding collection issues. This significantly reduced the number telephone inquires to the Region.

3.1.2. Cart Based Study Area (Port Colborne)

3.1.2. A Port Colborne Material Collections

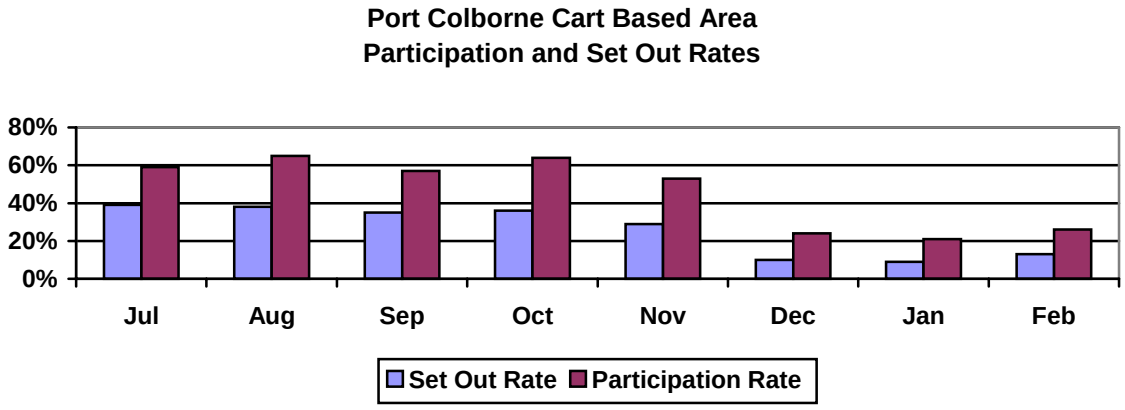
In the Port Colborne Cart Based study area, 77,260 kg of organic material and 290,020 kg of waste was collected from July 2000 to February 2001. An additional 17,010 kg of bagged leaf and yard waste was collected by a separate collection vehicle in November 2000. The combined total for organic material collections was 94,270 kg. The diversion rate (excluding recyclables) for the organic stream was 24.5% during the first eight months of the study.

3.1.2.B Port Colborne Project Participation

In the Port Colborne study area, there were 606 carts in use in the 700 home pilot collection area. Approximately 70 residents (mostly seniors) did not wish to participate in the program for a variety of health related reasons or because they felt they would not be able to produce enough organic material to substantially contribute to the program. Some residents preferred to continue backyard composting exclusively. Another 24 residents did not provide reasons for not wishing to participate. Participation in the cart based program ranged from a high of 65% in August to a low of 21% in January 2001. The November cart based participation rate was 52% but did not include leaf and yard waste collected in bags by the separate collection vehicle. See Section 3.1.2.C for monthly participation rates.

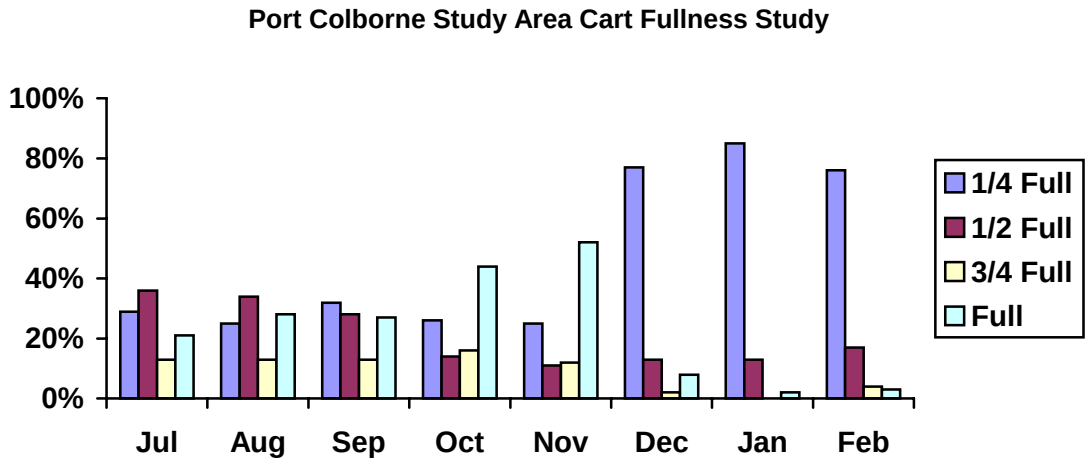
3.1.2.C Port Colborne Cart Set Out Rate

The weekly cart set outs ranged from a monthly average of 38.9% of all households in July 2000 to an average monthly low of 8.5% in January 2001. The November statistics also do not include the bags of leaf and yard waste set out for a separate collection in November. If the bagged leaf and yard waste was included in the set out totals, the November set out rates and participation rates would most likely exceed the July 2000 totals.



3.1.2. D Port Colborne Cart Fullness Study

Based on a random sample of 50 carts on each collection day, the cart fullness was monitored and averaged by month. In July 2000, 34% of the carts placed at the curbside for collection were 3/4 full or more. Cart fullness statistics continued to improve up to November 2000 when 64% of the cart set-outs were 3/4 full or greater. From December to February, approximately 90% of carts set out were 1/2 full or less.



3.1.2. E Port Colborne Time and Motion Studies

The actual time on route collecting waste and organics in carts ranged from an average of 6.76 hours (406 minutes) in July 2000 to 3.76 hours (226 minutes) in February 2001. The July on-route time statistic can be attributed to the two primary drivers learning to efficiently use the cart tipper and because of the heavy volume of

material. The February 2001 on-route time is due to the decrease in organic material collection participation and set out rate as well as seasonally predictable lower waste tonnages.

According to Canadian Waste Services Inc., the waste/organics co-collection adds an approximately 1.5 to 2.5 additional hours to the collection day during peak collection times, particularly in the Spring, compared to the single stream waste collection service in the same area prior to July 2000.

3.1.2 F Public Inquiries

The Region received 62 telephone calls from the cart based area to the end of February 2000. The majority of the calls (36) were from residents who did not wish to participate in the pilot (at the beginning of the program). Other contacts included missed collections, inquiries about acceptable program materials and requests for additional program literature. There were only two calls related to insects in the food material.

3.2 Recyclables Processing

3.2.1 St.Catharines Recyclables Processing

Currently in the Niagara Region, recyclable materials are collected curbside in three streams including co-mingled containers, paper fibres (including ONP, household papers and OMG), and rigid paper fibres (including OCC and OBB). For the purpose of the co-collection study, the paper streams were combined into one stream while the co-mingled container stream remained unchanged. The two recyclable material streams were collected on alternating weeks while the organic material was collected weekly in the two-compartment collection vehicle in St. Catharines.

3.2.2 Co-mingled Container Processing

The Region's recyclable materials processing contractor, Niagara Recycling, has indicated that there have been no problems processing the compacted co-mingled containers. The biweekly collection of co-mingled containers averaged 1,683 kg per bi-weekly collection day (July 2000 to February 2001) or 2.56 kg per household per biweekly collection. The binding and fusing together of various co-mingled containers was considered a potential concern before the pilot began, however, to date there has been no additional time required to process the compacted co-mingled containers. Vehicle compartment fullness estimates (visual) range from 70%-100% and overall averaged 80% compartment fullness for co-mingled materials over the eight months of collections from July 2000 to February 2001.

3.2.3 Co-mingled Paper Fibres Processing

The biweekly delivered co-mingled fibre stream from the St. Catharines study area averaged 4,471 kg per collection (July 2000 to February 2001) or 6.80 kg per

household per bi-weekly collection. Compartment fullness estimates range from 50%-100% and averaged approximately 69% from July 2000 to February 2001. There have been no problems specifically related to the compaction of the paper fibre stream as the compacted materials tend to loosen and unbind during off-loading.

At the MRF, the co-mingled fibres (including OBB and OCC) are loaded onto the conveyor line that transports the materials to an adjoining sorting conveyor. Some of the larger items from the co-mingled fibre stream, such as OBB and OCC, can obstruct the conveyor line. When this occurs, the sorting line must be stopped, cleared and restarted. There is considerable time and labour associated with processing a single fibre stream at Niagara Recycling. Overall, it is recognized that the current MRF design/configuration not compatible with the delivery of the co-mingled paper fibres.

3.3 Organics Processing

3.3.1 Bag Based Study Area (St. Catharines)

The incoming organic material from St. Catharines was weighed, tipped, and pre-processed through a hand-fed Bag Breaking Unit (BBU) at the Earth~Works Facility. Pre-processing these materials through the BBU involved 2-3 staff to effectively operate the loader, hand feed the unit and to sort the non-compostable material. An average of 44 person hours per month was required to operate the BBU. The de-bagged product was immediately incorporated into the "St. Catharines" windrow and bulked with wood chips, leaves or paper sludge.

Monthly incoming weights ranged from a low of 2,580 kg in February 2001 to a high of 29,670 kg in November 2000. Similarly, the number of pre-processing person hours ranged from a low of 7.0 hours in February 2001 to a high of 79.0 hours in November. The material delivered was very clean. Most of the 5,450 kg of non-compostable material were plastic bags mixed with residual organic material and moisture. By February 2001, 88,130 kg. of organic material (94% of incoming material) had been placed in windrows for composting.

St. Catharines Study Area - Organics Pre-Processing (in kilograms)				
Month	**Organics Delivered**	**Non-Compostables**	**Total Composted**	**Pre-Processing (Person Hours)**
Jul. 2000	13,480	630	12,850	69
Aug. 2000	14,320	1,180	13,140	61
Sept. 2000	10,060	490	9,570	43
Oct. 2000	13,940	630	13,310	63
Nov. 2000	29, 670	1,640	28,030	79
Dec. 2000	6,490	460	6030	24.5
Jan. 2000	3,040	240	2,800	9.0
Feb. 2000	2,580	180	2,400	7.0
Totals	**93,580**	**5,450**	**88,130**	**355.5**

3.3.2 Cart Based Study Area (Port Colborne)

During the first eight months of the study, 94,380 kg of organic material was delivered to Earth~Works from the cart based collection area in Port Colborne. The majority of the material was from curbside cart collections with the exception of 17,010 kg of leaves delivered in bags through the pre-scheduled fall leaf collection (November 2000 only). The material was relatively clean and therefore only a cursory inspection for contamination was required before incorporation into a dedicated windrow with paper sludge, leaves or wood chips. The bagged leaves from the November separate collection required 60 person hours of de-bagging before incorporation into the windrow.

In total, 93,560 kg of organic material was composted from the cart based area. Less than 1% of the incoming material was non-compostable material.

Port Colborne Study Area - Organics Pre-Processing (in kilograms)				
Month	**Organics Delivered**	**Non-Compostables**	**Total Composted**	**Pre-Processing (Person Hours)**
Jul. 2000	14,490	0	14,490	0.0
Aug. 2000	17,210	0	17,210	0.0
Sept. 2000	11,380	0	11,380	0.0
Oct. 2000	17,120	0	17,120	0.0
Nov. 2000	26,130	820	25,310	60.0
Dec. 2000	2,580	0	2,580	2.0
Jan. 2001	2,620	0	2,620	2.5
Feb. 2001	2,850	0	2,850	2.0
Totals	**94,380**	**820**	**93,560**	**66.5**

3.4 Waste Composition Studies

3.4.1 Bag Based Study Area (St. Catharines)

In the St. Catharines study area, the percentage of waste diverted for recycling or composting improved from the pre-pilot total of 41.0% in May/June 2000 to 64.2% during the peak leaf and yard waste collection season in October/November 2000. The largest single diversion improvement occurred in the leaf and yard waste category as the Spring study indicated that 57.6% of the leaf and yard waste was diverted from landfill compared to 96.8% in the Fall. Food waste diversion improved from less than 1% in the Spring 2000 to 28.7% in the Fall of 2000. The diversion of recyclables improved 7% between the first two waste composition studies.

The Winter 2001 waste composition study indicated continued improvement in the food material diversion stream in St. Catharines as approximately 35% of all available food material was captured for composting. Although the leaf and yard material diversion rate fell from 96.8% in the Fall of 2000 to 79.2% in Winter 2001, only a relatively small amount (88 kg) of leaf and yard material was captured in the Winter study. The reduction should not be considered a major reversal of the trends observed previously. The same could be said for brush as only 3.6 kg of brush was collected in the Winter 2001 study. The overall diversion of all material from the waste stream during the Winter 2001 study was 49.3%.

St. Catharines Pilot Area - Waste Composition Study Results Percentage of Waste Diversion By Material Type			
Category	**Spring 2000 Study**	**Fall 2000 Study**	**Winter 2001 Study**
Food material	0.6	28.7	34.9
Yard material	57.6	96.8	79.2
Brush	100.0	0.0	100.0
Paper products	73.1	73.1	74.4
Plastics	26.4	26.4	34.8
Ferrous Metals	36.1	65.2	71.9
Polycoat Containers	57.4	44.2	55.6
Aluminum	57.0	55.0	64.5
Glass	57.0	80.4	79.9
HSW	0.0	0.0	0.0
Other	2.2	3.6	1.6
Overall Diversion	**41.0%**	**64.2%**	**49.3%**

The overall summary of results from the three St. Catharines Study Area Waste Composition Studies is attached in Appendix 1.

3.4.2 Cart Based Study Area (Port Colborne)

Based on waste composition studies in the Port Colborne pilot area, the percentage of waste diverted for recycling or composting more than doubled from 22.1% in the Spring of 2000 to 48.9% in the Fall of 2000. Similar to St. Catharines pilot area, the largest single waste diversion improvement occurred in the leaf and yard waste category. The Spring study indicated that only 5.1% of the available material was set at the curbside for collection and composting whereas the Fall study indicated that 92.5 % of all leaf and yard waste was collected for composting. Food waste diversion improved from less than 1% to 15.3% from the Spring to Fall period.

The Winter 2001 waste composition study results are between the earlier two study results, indicating a diversion rate of 32.4%. The food waste diversion component

increased from 15.3% to 18.6% from Fall to Winter. Of the 32.4% of material diverted in the Winter 2001 study, recyclable material made up 23.7% of the diverted materials while organic materials made up the remaining 8.7% of the material diversion. Similar to the St. Catharines Bag Based Area, the leaf and yard material diversion rate fell from 92.5% in the Fall of 2000 to 74.1% in Winter 2001, but only a relatively small amount (84 kg) of leaf and yard material was captured in the Winter study. The reduction should not be considered a major reversal of the trends observed previously.

Port Colborne Pilot Area - Waste Composition Study Results

Percentage of Waste Diversion By Material Type

Category	Spring 2000	Fall 2000	Winter 2001
Food material	0.1	15.3	18.6
Yard material	5.1	92.5	74.1
Brush	0.0	100.0	93.8
Paper products	63.7	64.5	58.3
Plastics	22.8	27.4	28.6
Ferrous Metals	47.7	50.7	59.7
Polycoat Containers	32.9	47.1	46.9
Aluminum	43.5	54.4	51.5
Glass	52.9	67.9	58.5
HHW	5.3	0.0	0.0
Other	1.0	1.7	4.1
Overall Diversion	**22.1**	**48.9**	**32.7**

The overall summary of results from all three Port Colborne Area Waste Composition Studies is attached in Appendix 2.

3.4 Pre and Post Pilot Survey Results

3.4.1 Pre Pilot Survey

The pre-pilot surveys were conducted in May/early June 2000, to gain an insight into the resident's waste management habits. The return/response rate for the pre-pilot surveys exceeded expectations as approximately 60% of the St. Catharines Bag Based Area surveys were completed and returned while 32% of the Port Colborne Cart Based Area surveys were completed and returned.

The following is a sampling of the responses:

- one-half claim to produce no more than one bag of garbage per week;
- over one-half of respondents claim to backyard compost and the majority of those compost year round;
- one-half indicated that they use the Household Special Waste program once annually;
- over half indicated that a minimum of 60% waste diversion from landfill should occur and the majority expect the diversion goal to be reached by 2004;
- over 95% indicated that they use the Blue Box Program;
- if an organic material collection program was to commence, the organic material should be collected weekly;
- The Region should promote the current waste reduction programs more;
- The majority of respondents were willing to pay (through municipal taxes) up to $2.00 per week for all waste management services that include all waste diversion and disposal programs/facilities. Additionally, the remainder of respondents felt waste management services were worth more than $2.00 per week to them.

3.4.2 Post Pilot Surveys

The post pilot survey distributions were initiated in early March 2001, in the Port Colborne Cart Based Area, and later in March in the St. Catharines Bag Based Area. The purpose of the post pilot study was to collect data specifically related to the resident's experiences during the pilot. Approximately 150 surveys from the Port Colborne Cart Based Area were returned by the end of March 2001. Preliminary returns from the Port Colborne Cart Based Area indicate that the Schaefer Compostainer carts were relatively convenient for residents to use, especially for the yard waste component of collections. Residents overwhelming felt the program was worthwhile and were disappointed that the program was ending.

Part Four - Preliminary Conclusions

Preliminary results indicate that co-collection of recyclables and organics has been a relatively better collection match when compared to the co-collection of residential waste and organics. For the organic/recyclable component to be viable, there must be compaction of both material types. Based on estimates for weekly collection in Study Area One, a 35 cubic yard, co-collection vehicle may be able to collect up to 850 households per route (up from 657 homes) for most of the year (excluding the Fall leaf collection season). Based on Time and Motion studies to date, on average, route sizes for the waste/organics co-collection may not increase beyond 700 homes. The Final Report will provide more detail on the pros and cons of each co-collection option.

The type of collection container for organics will also be studied in detail in the Final Report. It is possible that any future organics collection system could be a "hybrid" system allowing residents to choose between an automated cart or any other type of designated collection container. The pros and cons of the two current collection arrangements and the potential use of automated cart collection will be reviewed.

The collection system chosen must be compatible with the compost facility pre-processing system. Mixed loads of loose, organic material and bagged organic material would require additional sorting to remove collection container related non-compostable materials (bags). It is clear to date that outdoor windrow composting is viable for composting a combination of food waste and yard waste in Niagara Region.

The Fall and Winter Waste Composition Studies illustrated that there was still a large component of the food waste stream that was not captured for composting during the pilot. Newsletters were distributed in each study area during the Fall and Winter Waste Composition Studies in an attempt to encourage additional food waste diversion.

Appendix 1
St. Catharines Study Area
Pre-Program Waste Composition Study (May/June 2000)

Category	Recycled /Composted (Kg)	Garbage Collected (Kg)	Combined Total (Kg)	Percentage Captured For Recycling
Food Waste	3.6	612.3	615.9	0.6%
Yard Waste	340.3	250.2	590.5	57.6%
Brush	154.3	0.0	154.3	100.0%
Paper Products	582.8	214.6	797.4	73.1%
Plastics	58.3	162.2	220.5	26.4%
Ferrous Metal	35.6	63.1	98.7	36.1%
Polycoat Containers	8.8	6.6	15.4	57.4%
Aluminum	19.5	14.7	34.2	57.0%
Glass	126.1	60.6	186.7	67.6%
HSW	0.0	16.5	16.5	0.0
Other	12.9	553.7	566.6	2.2%
Total	**1,342.2**	**1,954.5**	**3,296.7**	**41.0%**

Program Waste Composition Study (October/November 2000)

Category	Recycled /Composted (Kg)	Garbage Collected (Kg)	Combined Total (Kg)	Percentage Captured For Recycling
Food Waste	171.7	425.8	597.5	28.7%
Yard Waste	1,412.0	46.3	1458.3	96.8%
Brush	0.0	7.5	7.5	0.0%
Paper Products	627.7	230.9	858.6	73.1%
Plastics	50.8	125.7	176.5	40.1%
Ferrous Metal	38.6	20.6	59.2	65.2%
Polycoat Containers	6.1	7.7	13.8	44.2%
Aluminum	17.5	14.3	31.8	55.0%
Glass	145.2	35.4	180.6	80.4%
HSW	0.0	0.9	0.9	0.0%
Other	17.4	471.6	489.0	3.6%
Total	**2,487.0**	**1,386.7**	**3,873.7**	**64.2%**

Winter Waste Composition Study (February 2001)

Category	Recycled /Composted (Kg)	Garbage Collected (Kg)	Combined Total (Kg)	Percentage Captured For Recycling
Food Waste	200.1	373.2	573.3	34.9%
Yard Waste	69.9	18.4	88.2	79.2%
Brush	3.6	0.0	3.6	100.0%
Paper Products	590.5	203.5	794.0	74.4%
Plastics	65.1	121.8	186.9	34.8%
Ferrous Metal	43.6	17.0	60.6	71.9%
Polycoat Containers	7.9	6.4	14.3	55.6%
Aluminum	17.7	9.8	27.5	64.5%
Glass	143.1	36.1	179.2	79.9%
HSW	0.0	8.2	8.2	0.0%
Other	6.4	382.2	388.6	1.6%
Total	**1,147.9**	**1,176.6**	**2,324.4**	**49.3%**

Appendix 2
Port Colborne Study Area
Pre-Program Waste Composition Study (May/June 2000)

Category	Recycled /Composted (Kg)	Garbage Stream (Kg)	Combined Total (Kg)	Percentage Captured For Recycling
Food Waste	0.5	728.2	728.7	0.1%
Yard Waste	22.7	424.0	446.7	5.1%
Brush	0.0	2.3	2.3	0.0%
Paper Products	481.6	274.0	755.6	63.7%
Plastics	45.1	153.1	198.2	22.8%
Ferrous Metal	39.7	43.6	83.3	47.7%
Polycoat Containers	5.2	10.7	15.9	32.9%
Aluminum	13.6	17.7	31.3	43.5%
Glass	62.2	55.4	117.6	52.9%
HSW	0.2	4.1	4.3	5.3%
Other	5.0	663.2	668.2	1.0%
Total	**675.7**	**2,376.3**	**3,052.0**	**22.1%**

Fall Waste Composition Study (October/November 2000)

Category	Recycled /Composted (Kg)	Garbage Stream (Kg)	Combined Total (Kg)	Percentage Captured For Recycling
Food Waste	93.2	518.1	611.4	15.3%
Yard Waste	683.8	55.4	739.1	92.5%
Brush	28.4	0.0	28.4	100.0%
Paper Products	444.2	244.3	688.5	64.5%
Plastics	45.4	120.2	165.6	27.4%
Ferrous Metal	31.5	30.6	62.1	50.7%
Polycoat Containers	5.7	6.4%	12.1	47.1%
Aluminum	16.8	14.1	30.9	54.4%
Glass	75.8	35.8	111.6	67.9%
HSW	0.0	0.2	0.2	0.0%
Other	8.2	466.7	474.9	1.7%
Total	**1,433.0**	**1,491.8**	**2,924.8**	**48.9%**

Winter Waste Composition Study (February/March 2001)

Category	Recycled /Composted (Kg)	Garbage Stream (Kg)	Combined Total (Kg)	Percentage Captured For Recycling
Food Waste	125.0	547.9	672.9	18.6%
Yard Waste	62.4	21.8	84.2	74.1%
Brush	6.8	0.5	7.3	93.8%
Paper Products	352.8	252.0	604.8	58.3%
Plastics	50.6	126.1	176.7	28.6%
Ferrous Metal	31.3	21.1	52.4	59.7%
Polycoat Containers	5.2	5.9	11.1	46.9%
Aluminum	15.0	14.1	29.1	51.6%
Glass	63.7	45.1	108.9	58.5%
HSW	0.0	8.5	8.5	0.0%
Other	7.9	469.2	477.1	4.1%
Total	**720.7**	**1,512.1**	**2,233.0**	**32.4%**