

Haldimand County Waste Composition Audit

Curbside Garbage (Black Bag) Residential Waste Audit

4 – Year Summary Report

Prepared for
Haldimand County

Prepared by
AET Group Inc.

531 Wellington St. North
Kitchener ON N2H 5L6
T (519) 573-9723
F (519) 570-9589
www.aet98.com



TABLE OF CONTENTS

1.0 INTRODUCTION 3

1.1 Background..... 3

1.2 Objectives..... 3

2.0 APPROACH AND METHODOLOGY 3

2.1 Sample Size..... 3

2.2 Sample Collection Procedure 3

2.3 Sample Sorting Procedure..... 3

3.0 SUMMARY OF SINGLE-FAMILY RESIDENTIAL CURBSIDE GARBAGE RESULTS 4

3.1 Collection Results 4

3.2 Garbage Stream Composition..... 4

LIST OF TABLES

Table 3.1 Curbside Collection Summary..... 4

Table 3.2 Comparison of Garbage Stream over 4 Years 5

Table 3.3 Garbage Stream Composition - 4 Year Average 5

Table 3.4 Top 10 Garbage Items in the Garbage Stream..... 6

Table 3.5 Top 9 Recyclable Fibres Items in the Garbage 7

Table 3.6 Top 10 Recyclable Containers Items in the Garbage 7

LIST OF FIGURES

Figure 3.1 Garbage Stream Composition..... 5

Figure 3.2 Garbage Stream Composition by %..... 6

APPENDICES

APPENDIX A: Waste Audit Results

Subject: Haldimand County Curbside Garbage (Black bag) Waste Audit

AET Group has successfully completed Haldimand County's Single-Family Curbside Garbage Waste Audit (2021-2024). The auditors did not experience anything out of the ordinary that would pose any anomalies in the data set. This was considered when calculating the participation rates for this stream.

The following report provides a brief summary of the findings from (2021- 2024) curbside garbage waste audits.

1.0 INTRODUCTION

1.1 Background

Haldimand County contracted AET Group Inc. (AET) to conduct single-family curbside garbage (black bag) waste composition audits from 2021 - 2024. This report summarizes the data collected and analyzed for the following 4 years:

- 2021 (October & December)
- 2022 (July & October)
- 2023 (March & June)
- 2024 (July & October)

1.2 Objectives

The waste composition audit is intended to accomplish the following objectives:

- Collect, categorize, and assess the waste material composition by stream (garbage) from the curbside of select Haldimand County single family households.
- Collect and record data with respect to the material streams set out at the curbside of each individually selected household such as number of items set out, and fullness equivalents.
- Develop various participation and set out rates, estimate the amount of material generated in the garbage stream and individual material type.
- Provide a summary analysis of the composition audit results.

2.0 APPROACH AND METHODOLOGY

2.1 Sample Size

Over the 5-day audit period, 100 single family households were sampled from. All material set out at the curbside was eligible for collection and auditing if it met the County's curbside requirements in accordance with By-Law 1736-16, COLLECTION OF WASTE, RECYCLABLES, AND OTHER MATERIALS WITHIN THE COUNTY.

2.2 Sample Collection Procedure

AET collected garbage and made notes on the recyclable fibre and container materials from each of the preselected households on their regularly scheduled collection day. Collected material was brought back to the centralized location (Canborough Waste Management Facility) where garbage (black bag) was sorted and weighed separately.

Collection logs were maintained during the curbside collection of each of the 100 single family households. Specific data including the number of items set out, and fullness equivalents was recorded at the curbside.

2.3 Sample Sorting Procedure

All the material collected during the sampling period was sorted and weighed by AET at the Canborough Waste Management Facility, located at 499 James Road, in Dunnville Ontario.

Samples were sorted into 7 major waste groups, consisting of 64 individual sub-categories. The full list of sort categories and detailed results can be found in Appendix A.

Separated/sorted waste was placed in blue boxes and totes, based on the 64 categories, and weighed individually. A digital scale, with precision to 0.01 kg, was used to weigh the sorted waste material. Once all the waste material was classified and weighed, non-divertible material was placed in an area of the facility and disposed of by facility staff. Likewise, recyclable materials were placed in a separate pile and transferred back to the recycling tipping floor. Organic material was taken to the waste tipping floor by AET staff.

3.0 SUMMARY OF SINGLE-FAMILY RESIDENTIAL CURBSIDE GARBAGE RESULTS

The following section provides a summary of the audit results from the Single-Family residential curbside garbage audit. Results are presented in average kilograms per household per week (kg/hh/wk) as well as percentages, by weight.

3.1 Collection Results

Table 3.1 outlines the curbside collection results for the average of 4 years. It should be noted that the Curbside Collection Summary contains combined information from both rural and urban areas that represent the various areas across Haldimand County.

Overall, the garbage stream had an average participation rate of 78.89% over 4 years, the fibres recycling stream had a participation rate of 59.07% and the containers recycling stream had a participation rate of 61.13%.

Table 3.1 Curbside Collection Summary

	Fibres	Containers	Mixed	Garbage
Total number of households sampled ¹	96	96	99	100
Total number of household set-outs	57	59	1	79
Total number of items	68	68	1	125
Total number of full container equivalents	60.53	53.61	0.84	118.63
Average number of items/hh/wk ²	0.70	0.71	0.01	1.26
Average number of full container equivalents/hh/wk ²	0.63	0.56	0.01	1.19
Average number of full container equivalents/set out ³	1.01	0.86	0.71	1.39
Participation Rate	59.07%	61.13%	1.14%	78.89%

¹ Number of households sampled is adjusted to omit those households that were picked up by hauler prior to the audit team's arrival and houses that opted out of study.

² Averaged across all sampled households (including those with no setouts). This does not represent the average per household with a setout.

³ Averaged across just the subset of households that had something set out (i.e. avg. # of full container equivalents per household with something set out).

3.2 Garbage Stream Composition

An average of 9.22 kg/hh/wk of material was generated in the garbage stream during the last 4 years by single-family households in Haldimand County. Figure 3.1 illustrates the composition of the garbage stream. The garbage stream contained approximately 12.73% recyclable material (7.30% fibres and 5.43% containers). The remaining

Haldimand County

Curbside Garbage (Black Bag) Residential Waste Audit
July 2025

consisted of food waste (38.27%) and other materials not currently accepted in the County's curbside recycling program (49.00%).

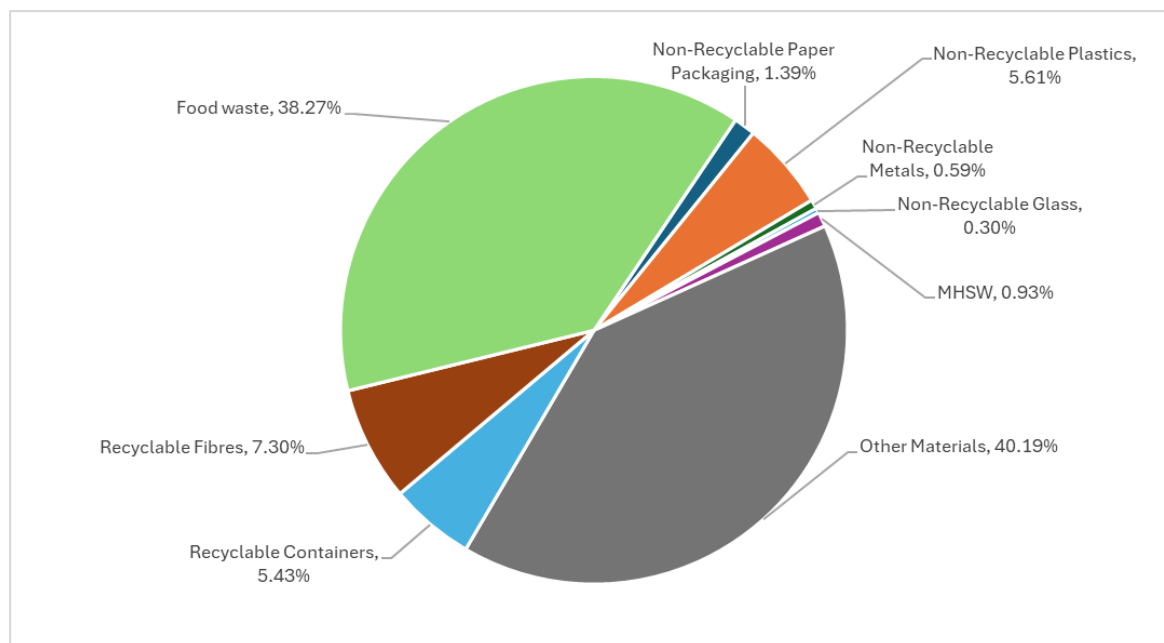


Figure 3.1 Garbage Stream Composition

Table 3.2 summarizes the generation and composition values for the garbage stream. A total of 10.82 kg/hh/wk of garbage was generated in July 2024, and 7.84 kg/hh/wk of garbage was generated in October 2024. This equals an average of 9.33 kg/hh/wk of garbage generated by single-family households in Haldimand County across 2-seasons

Table 3.2 Comparison of Garbage Stream over 4 Years

Contributing Material	2021			2022			2023			2024		
	kg/hh/wk	kg/hh/yr	%	kg/hh/wk	kg/hh/yr	%	kg/hh/wk	kg/hh/yr	%	kg/hh/wk	kg/hh/yr	%
Garbage	4.77	248.51	48.07%	4.30	224.04	47.50%	4.06	211.91	47.30%	4.95	257.85	53.02%
Food Waste	3.70	192.68	37.27%	3.70	193.19	40.96%	3.35	174.51	38.95%	3.37	175.56	36.10%
Fibres	0.81	42.13	8.15%	0.63	33.01	7.00%	0.69	36.15	8.07%	0.56	29.01	5.97%
Containers	0.65	33.70	6.52%	0.41	21.43	4.54%	0.49	25.43	5.68%	0.46	23.88	4.91%
Total	9.92	517.02	100.00%	9.05	471.67	100.00%	8.59	447.99	100.00%	9.33	486.31	100.00%

Table 3.3 Garbage Stream Composition - 4 Year Average

Contributing Material	4 Year Average		
	kg/hh/wk	kg/hh/yr	%
Garbage	4.52	235.58	49.00%
Food Waste	3.53	183.99	38.27%
Fibres	0.67	35.08	7.30%
Containers	0.50	26.11	5.43%
Total	9.22	480.75	100.00%

Haldimand County

Curbside Garbage (Black Bag) Residential Waste Audit
July 2025

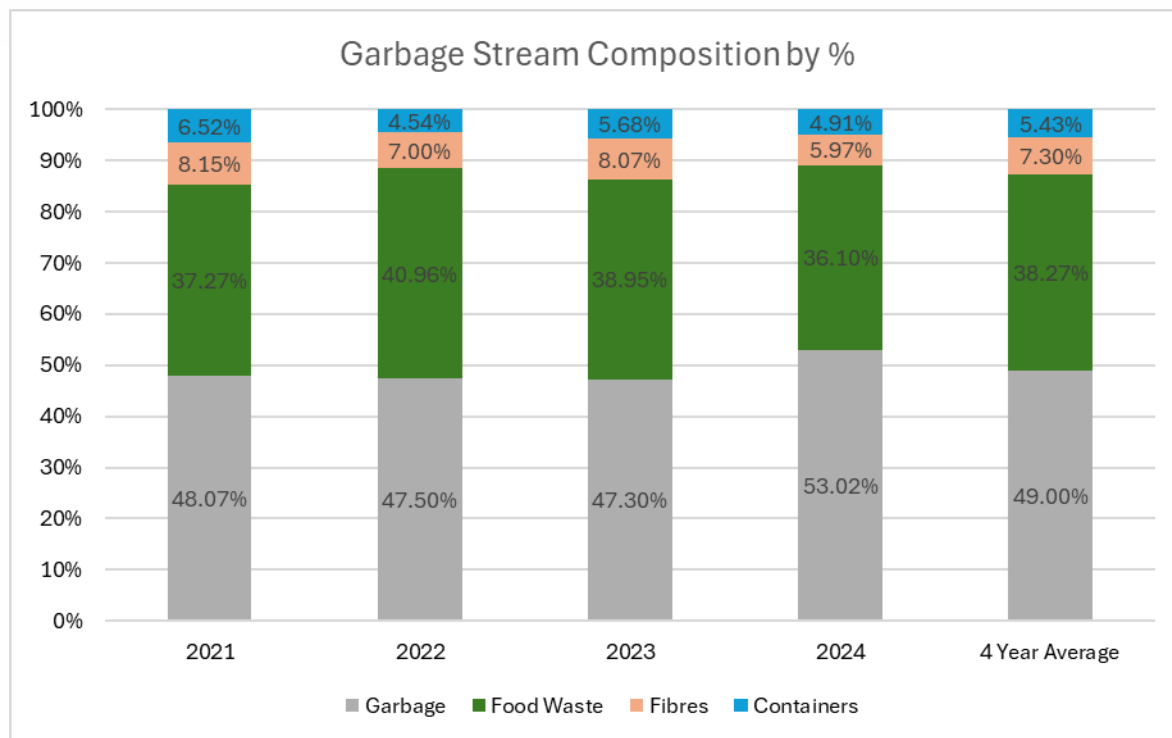


Figure 3.2 Garbage Stream Composition by %

Table 3.3 below provides an overview of the top 10 non-recyclable items placed in the garbage stream. These are items that have been properly placed in the garbage stream based on Haldimand County's curbside recycling program in place. It should be noted that some items may have other non-curbside disposal options, such as hazardous waste and electronics.

Table 3.4 Top 10 Garbage Items in the Garbage Stream

	Top 10 Garbage Items in the Garbage Stream	kg/hh/wk	% of Stream
1	Food Waste	3.53	38.27%
2	Other Waste	2.60	28.25%
3	Tissue/Towelling	0.49	5.32%
4	Leaf & Yard	0.46	4.94%
5	Plastic Laminates and Other Film Packaging	0.18	1.92%
6	LDPE/HDPE Film - Products (non-packaging)	0.16	1.77%
7	C&D Materials	0.15	1.67%
8	Other Plastics - (non-packaging/durable)	0.11	1.23%
9	Paper Laminate Packaging	0.07	0.73%
10	Electronics (WEEE)	0.06	0.70%
	Total	7.82	84.81%

Table 3.4 provides an overview of the top 9 recyclable fibre items placed in the garbage stream. These items could have been diverted through the curbside recycling program in place if they were disposed of into the correct stream.

Table 3.5 Top 9 Recyclable Fibres Items in the Garbage

	Top 9 Recyclable Fibre Items in the Garbage	kg/hh/wk	% of Stream
1	Boxboard/Cores/Molded Pulp	0.21	2.29%
2	Flexible Film Plastic – LDPE & HDPE	0.14	1.54%
3	Corrugated Cardboard	0.11	1.19%
4	Other Printed Paper (Obligated)	0.07	0.73%
5	Other Printed Paper (Non-Obligated)	0.06	0.59%
6	Other Newspapers/Newsprint - Other	0.03	0.29%
7	Magazines and Catalogues	0.02	0.23%
8	Newspapers - Daily and weekly	0.02	0.18%
9	Other Paper Packaging (Non-Obligated)	0.02	0.17%
	Total	0.67	7.24%

Table 3.5 provides an overview of the top 10 recyclable containers items placed in the garbage stream. These items could have been diverted through the curbside recycling program in place if they were disposed of into the correct stream.

Table 3.6 Top 10 Recyclable Containers Items in the Garbage

	Top 10 Recyclable Container Items in the Garbage	kg/hh/wk	% of Stream
1	#1 PET Bottles and Jars (excluding alcoholic beverages)	0.06	0.69%
2	Clear Glass - food and beverage (excluding alcohol containers)	0.06	0.63%
3	#5 Other PP Containers	0.05	0.58%
4	Steel Food and Beverage Cans	0.05	0.53%
5	Aluminum Foil & Foil Trays	0.04	0.40%
6	#1 PET Thermoform - Clear	0.04	0.39%
7	#2 HDPE Bottles and Jugs (Coloured)(excluding alcoholic beverages)	0.02	0.26%
8	#6 PS - Non-expanded Polystyrene	0.02	0.22%
9	#6 PS - Expanded Polystyrene	0.02	0.21%
10	Aluminum- food and beverage Containers (excluding alcoholic beverage containers)	0.02	0.20%
	Total	0.38	4.11%

Haldimand County

Curbside Garbage (Black Bag) Residential Waste Audit
July 2025

Report Prepared By:



Naushef Kotadia

EMA Cert., Waste Resource Manag. Cert., B. Hons

Waste Sector Team Lead

Report Reviewed By:



William Baird, BSc., Dip. EC, EP(Waste)

Waste Audit Manager

Disclaimer

AET Group Inc. makes no warranty and assumes no liability for the information contained in this report outlining the waste audit results. Waste generation measurements should be considered snapshots in time and may not reflect conditions across Haldimand County over time.

APPENDIX A

WASTE AUDIT RESULTS



Haldimand County, Ontario Audited Waste Results- Curbside-Garbage Single Family			Average-2024		2023		2022		2021		Average of 4 years	
Sample Area:			Disposed Per Household Per Week (kg/hh/wk)	Disposed Per Household Per Year (kg/hh/yr)	Disposed Per Household Per Week (kg/hh/wk)	Disposed Per Household Per Year (kg/hh/yr)	Disposed Per Household Per Week (kg/hh/wk)	Disposed Per Household Per Year (kg/hh/yr)	Disposed Per Household Per Week (kg/hh/wk)	Disposed Per Household Per Year (kg/hh/yr)	Disposed Per Household Per Week (kg/hh/wk)	Disposed Per Household Per Year (kg/hh/yr)
Waste Stream:			Garbage	Garbage	Garbage	Garbage	Garbage	Garbage	Garbage	Garbage	Garbage	Garbage
Material Category		Recyclable=R, Non-Recyclable=W, Other Divertible=D	Net Weight (kg)	Net Weight (kg)	Net Weight (kg)	Net Weight (kg)	Net Weight (kg)	Net Weight (kg)	Net Weight (kg)	Net Weight (kg)	Net Weight (kg)	Net Weight (kg)
PAPER												
1	Newspapers - Daily and weekly	R	0.01	0.47	0.03	1.43	0.01	0.66	0.02	1.04	0.02	0.90
2	Other Newspapers/Newsprint - Other	R	0.02	0.81	0.02	1.24	0.04	1.92	0.03	1.61	0.03	1.40
3	Magazines and Catalogues	R	0.02	0.92	0.04	2.02	0.02	0.84	0.01	0.64	0.02	1.11
4	Directories / Telephone books	R	0.00	0.00	0.01	0.37	0.00	0.00	0.00	0.06	0.00	0.11
5	Other Printed Paper (Obligated)	R	0.07	3.63	0.05	2.46	0.07	3.71	0.09	4.49	0.07	3.57
6	Other Printed Paper (Non-Obligated)	R	0.03	1.31	0.08	4.26	0.04	2.33	0.07	3.64	0.06	2.89
Total Recyclable Paper		TR	0.14	7.15	0.23	11.78	0.18	9.47	0.22	11.48	0.19	9.97
Total Non Recyclable Paper		TND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Acceptable Compostable Paper		TAO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Paper			0.14	7.15	0.23	11.78	0.18	9.47	0.22	11.48	0.19	9.97
PAPER PACKAGING												
1	Gable Top Containers	R	0.01	0.44	0.02	0.91	0.01	0.43	0.02	0.78	0.01	0.64
2	Aseptic Containers (excluding alcoholic beverages)	R	0.01	0.42	0.01	0.75	0.01	0.60	0.02	0.84	0.01	0.65
3	Aseptic Containers - alcoholic beverages	R	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
4	Polycoat Beverage Cups	W	0.04	2.08	0.06	2.92	0.05	2.54	0.07	3.68	0.05	2.81
5	Spiral Wound Containers	R	0.01	0.38	0.01	0.30	0.01	0.38	0.01	0.36	0.01	0.35
6	Ice Cream Containers and Other Bleached Long Polycoat Fibre	W	0.01	0.39	0.00	0.25	0.01	0.35	0.01	0.42	0.01	0.35
7	Paper Laminate Packaging	W	0.05	2.42	0.08	4.23	0.05	2.63	0.09	4.73	0.07	3.50
8	Corrugated Cardboard	R	0.09	4.93	0.09	4.91	0.10	5.32	0.15	7.92	0.11	5.77
9	Boxboard/Cores/Molded Pulp	R	0.19	9.68	0.23	12.13	0.19	9.92	0.23	12.23	0.21	10.99
10	Other Paper Packaging (Non-Obligated)	R	0.01	0.64	0.02	0.97	0.02	1.12	0.01	0.64	0.02	0.84
Total Recyclable Paper Packaging		TR	0.32	16.52	0.38	19.98	0.34	17.77	0.44	22.77	0.37	19.26
Total Non Recyclable Paper Packaging		TND	0.09	4.88	0.14	7.40	0.11	5.52	0.17	8.83	0.13	6.66
Total Paper Packaging			0.41	21.40	0.53	27.39	0.45	23.29	0.61	31.60	0.50	25.92
PLASTICS												
1	#1 PET Bottles and Jars (excluding alcoholic beverages)	R	0.06	3.05	0.06	3.33	0.06	3.08	0.07	3.78	0.06	3.31
2	#1 PET Bottles and Jars -Coloured(excluding alcoholic beverages)	R	0.00	0.23	0.00	0.08	0.00	0.13	0.00	0.22	0.00	0.16
3	#1 PET Bottles and Jars ≥ 5 L(excluding alcoholic beverages)	R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	#1 PET Bottles (alcoholic beverages)	R	0.00	0.10	0.00	0.06	0.00	0.08	0.00	0.14	0.00	0.10
5	#1 PET Thermoform - Clear	R	0.04	2.30	0.03	1.62	0.03	1.51	0.04	2.24	0.04	1.92
6	#1 PET Thermoform - Coloured	R	0.00	0.21	0.01	0.33	0.00	0.19	0.01	0.29	0.00	0.25
7	#2 HDPE Bottles and Jugs (Natural)(excluding alcoholic beverages)	R	0.01	0.32	0.00	0.11	0.00	0.13	0.01	0.36	0.00	0.23
8	#2 HDPE Bottles and Jugs (Coloured)(excluding alcoholic beverages)	R	0.02	0.93	0.02	0.83	0.02	1.10	0.04	2.14	0.02	1.25
9	#2 HDPE Bottles and Jugs ≥ 5 L(excluding alcoholic beverage)	R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	#2 HDPE Bottles (alcoholic beverage containers)	R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	#2 Other HDPE Containers	R	0.00	0.00	0.00	0.08	0.00	0.05	0.02	1.00	0.01	0.28
12	Flexible Film Plastic – LDPE & HDPE	R	0.13	6.62	0.12	6.36	0.14	7.18	0.19	9.86	0.14	7.50
13	LDPE/HDPE Film - Products (non-packaging)	W	0.16	8.52	0.13	6.95	0.18	9.48	0.17	9.01	0.16	8.49
14	#5 PP Bottles	R	0.00	0.04	0.00	0.09	0.00	0.14	0.01	0.32	0.00	0.15
15	#5 Other PP Containers	R	0.07	3.49	0.06	3.08	0.05	2.38	0.05	2.38	0.05	2.83
16	#5 Other PP Containers (Black)	R	0.01	0.27	0.01	0.31	0.01	0.69	0.01	0.65	0.01	0.48
17	#6 PS - Expanded Polystyrene	R	0.01	0.48	0.01	0.70	0.02	1.27	0.03	1.56	0.02	1.00
18	#6 PS - Expanded Polystyrene (Black)	R	0.00	0.04	0.00	0.06	0.00	0.04	0.00	0.12	0.00	0.06
19	#6 PS - Non-expanded Polystyrene	R	0.02	0.87	0.02	1.11	0.02	0.94	0.03	1.36	0.02	1.07
20	#6 PS - Non-expanded Polystyrene (Black)	R	0.00	0.00	0.00	0.01	0.00	0.03	0.01	0.49	0.00	0.13
21	Plastic Laminates and Other Film Packaging	W	0.18	9.25	0.17	9.06	0.16	8.28	0.20	10.31	0.18	9.22
22	Other Rigid Plastic Packaging	W	0.08	4.16	0.06	2.87	0.04	2.24	0.06	2.96	0.06	3.06
23	Other Rigid Plastic Packaging (Black)	W	0.01	0.60	0.01	0.27	0.00	0.19	0.00	0.05	0.01	0.28
24	Large HDPE & PP Pails & Lids	R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	Other Plastics - (non-packaging/durable)	W	0.14	7.44	0.07	3.48	0.10	5.45	0.14	7.33	0.11	5.92
Total Recyclable Plastics		TR	0.36	18.97	0.35	18.15	0.36	18.91	0.52	26.90	0.40	20.73
Total Non Recyclable Plastics		TND	0.57	29.97	0.43	22.62	0.49	25.63	0.57	29.65	0.52	26.97
Total Plastics			0.94	48.94	0.78	40.77	0.85	44.54	1.08	56.55	0.91	47.70
METALS												
1	Aluminum- food and beverage Containers (excluding alcoholic beverage containers)	R	0.02	1.13	0.02	0.99	0.01	0.78	0.02	1.01	0.02	0.98
2	Aluminum (alcoholic beverage containers)	R	0.01	0.77	0.02	1.18	0.01	0.45	0.01	0.42	0.01	0.71
3	Aluminum Foil & Foil Trays	R	0.03	1.71	0.04	1.92	0.03	1.74	0.05	2.35	0.04	1.93
4	Aluminum Aerosols	R	0.01	0.26	0.01	0.30	0.00	0.11	0.00	0.12	0.00	0.20
5	Other Aluminum (non-packaging)	W	0.00	0.11	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.04
6	Steel Food and Beverage Cans	R	0.03	1.33	0.04	2.03	0.04	2.10	0.09	4.85	0.05	2.58
7	Steel Paint Cans	R	0.00	0.00	0.01	0.64	0.00	0.13	0.00	0.13	0.00	0.23
8	Steel Aerosol Container	R	0.01	0.47	0.01	0.72	0.01	0.54	0.01	0.73	0.01	0.62
9	Other steel (non-packaging)	D	0.04	2.15	0.03	1.33	0.08	4.19	0.07	3.44	0.05	2.78
Total Recyclable Metals		TR	0.11	5.67	0.15	7.79	0.11	5.85	0.18	9.61	0.14	7.23
Total Non Recyclable Metals		TND	0.00	0.11	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.04
Total Other Divertible Metals		TOD	0.04	2.15	0.03	1.33	0.08	4.19	0.07	3.44	0.05	2.78
Total Metals			0.15	7.94	0.17	9.11	0.19	10.06	0.25	13.07	0.19	10.05
GLASS												
1	Clear Glass - food and beverage (excluding alcohol containers)	R	0.07	3.74	0.05	2.70	0.04	1.90	0.08	3.93	0.06	3.07
2	Clear Glass - alcoholic beverage containers	R	0.00	0.22	0.02	0.80	0.01	0.29	0.01	0.70	0.01	0.50
3	Coloured Glass - food and beverage (excluding alcoholic beverage containers)	R	0.0.									