



**Maura Walker & Associates**  
ENVIRONMENTAL CONSULTANTS

# **Solid Waste Composition Study Report (2012)**

Prepared for

**Regional District of Nanaimo**

By

Maura Walker and Associates

and

MJ Waste Solutions

January 29, 2013



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ENVIRONMENTAL CONSULTANTS

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Sharon Horsburgh, Senior Zero Waste Coordinator  
Regional District of Nanaimo  
6300 Hammond Bay Road  
Nanaimo, BC V9T 6N2

Dear Ms. Horsburgh,

**Re: Solid Waste Composition Study (2012)**

We are pleased to submit the Regional District of Nanaimo (RDN) solid waste composition study report. This report provides a description of the methodology employed to conduct the waste composition study and presents findings from the study conducted at the Regional Landfill and the Church Road Transfer Station in October 2012. Additionally, the results of this study are compared to the results of the 2004 waste composition study.

We appreciate this opportunity to be of service.

Yours very truly,

Maura Walker

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- B. Detailed Data by Waste Sector
- C. Photo Gallery
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# 1 Introduction

In preparation for updating their Solid Waste Management Plan, the Regional District of Nanaimo (RDN) identified the need for a solid waste composition study. This study is a follow-up to the baseline waste composition study conducted in 2004. Findings from the 2012 study will help the RDN understand the nature of the present day solid waste stream and provide information to inform Stage 1 of the RDN's process to update the Solid Waste Management Plan. Maura Walker and Associates and MJ Waste Solutions were retained to conduct the sampling exercise and data analysis.

The primary objectives of the study were to:

- Determine the composition of solid waste being disposed by waste material type;
- Complete a detailed characterization of the various waste streams delivered to the RDN's solid waste facilities for disposal, specifically: curbside residential, industrial, commercial and institutional (ICI) and self-haul;
- Provide a sub-set of data to provide insight into the waste generated by multi-family buildings;
- Compare the current (2012) waste stream composition with the results from the 2004 study;
- Provide data that will be consistent with BC's *draft* waste composition study guidelines, to allow for greater comparability with studies completed in other BC jurisdictions.

The waste characterization study was conducted over five days in October 2012, at the Regional Landfill and the Church Road Transfer Station. The Regional Landfill and Church Road Transfer Station are owned and operated by the Regional District of Nanaimo. The RDN waste management system serves an estimated population of 152,138<sup>1</sup>. The RDN disposed of 53,319<sup>2</sup> tonnes of municipal solid waste from November 1, 2011 to October 31, 2012. The annual rate of disposal in 2012 can be extrapolated to approximately **350 kilograms per capita**.

The waste composition study is a one-time sampling of the RDN solid waste stream. As this study represents a "snap-shot" of the solid waste stream, the resultant data may not reflect seasonal variations. However, based on discussions with RDN staff, it is understood that the composition of the waste stream does not vary substantially throughout the year with the exception of roofing materials and yard waste. The relative percentage of these roofing and yard waste tends to be minimal in the winter months. Given this information, the study data is believed to provide a reasonable representation of the RDN solid waste stream.

This report provides a description of the methodology employed to conduct the waste composition study and presents the findings from the study. The material categories utilized in the waste sort are presented in Appendix A. A detailed table of findings from each waste sector is presented in Appendix B. Photographs of the sampling exercise are provided in Appendix C. The statistical analysis is in Appendix D.

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<sup>1</sup> BC Stats (2011 Census data) – plus 1% growth factor applied for 2012

<sup>2</sup> RDN scale house data (2012)

## 2 Solid Waste Composition Study

This section describes the methodology used to determine the composition of RDN's residual solid waste disposed.

The main objective of this study was to determine the composition of solid waste by material type, based on weight, utilizing detailed sorting and sampling that is consistent with the approach employed during the RDN's 2004 waste composition study, and to provide data that is consistent with the waste composition study guidelines currently being prepared by the Province of BC. Table 2 presents a glossary of the material categories as they are presented in the report.

Composition analysis was conducted for the following solid waste streams: curbside residential; institutional, commercial & industrial (ICI); and self-haul. It should be noted that while the Construction/Demolition (CD) waste stream entering the Regional Landfill was examined during the 2004 waste composition study; it was not part of the 2012 study because the RDN has banned disposal of CD waste and the majority of CD waste is now managed at private facilities. Multi-family waste, which is a sub-set of the ICI waste stream, was examined to provide deeper insight into this waste stream. Each waste sample was characterized into 90 material categories as presented in Appendix A.

The following tasks outline the work performed during the waste composition study:

### 1. Prepare for Waste Composition Study

- Establish sampling methodology based on recent waste data; see Table 1 for the sampling strategy;
- Finalize waste sort categories to meet the needs to the RDN<sup>3</sup>; see Table 2 for the modified list of material categories as they are presented in this report;
- Establish method to access multi-family waste samples;
- Confirm dates and locations for sampling; and
- Assemble safety and sampling equipment.

### 2. Conduct Waste Composition Study

Three waste streams (curbside residential, ICI and self-haul) entering the RDN Regional Landfill and the Church Road Transfer Station were analyzed separately to determine their composition. The number and type of waste samples was based on the sampling strategy shown in Table 1. As shown in the table, the proportion of samples from each sector was based on the relative proportion that waste each sector contributes to the waste disposed (as determined using recent scale data). Sampling and sorting of a dedicated multi-family load was also conducted to gain insight into this waste stream.

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<sup>3</sup> Materials categories used for the sorting exercise were based on the draft *BC waste characterization* tool and material categories.

**Table 1 Waste Composition Sampling Strategy**

Service Type	metric tonnes disposed (2012)			waste stream percentage			number of samples		
	Regional Landfill	CRTS	Total MT	Waste Stream Percentage (RL)	Waste Stream Percentage (CRTS)	Totals	# of Samples (RL)	# of Samples (CRTS)	Total # of samples
Commercial	26,082	7,157	33,239	49%	13%	62%	14	5	19
Municipal Curbside	471	3,466	3,937	1%	7%	7%	1	2	3
Municipal Billable	4,021	1,125	5,146	8%	2%	10%	2	2	4
Self-Haul	6,320	4,678	10,998	12%	9%	21%	2	2	4
<b>Totals</b>	<b>36,894</b>	<b>16,425</b>	<b>53,319</b>	<b>69%</b>	<b>31%</b>	<b>100%</b>	<b>20</b>	<b>10</b>	<b>30</b>

### 3. Sampling Methodology

On each sort-day, the scale house was provided with a list of the desired loads for the day to assist with identifying and routing target loads. To obtain a representative sample from each selected load of waste, a stratified random sampling approach was used. The sampling procedure was a judgmental sampling approach as recommended by Klee and Carruth (1970) and supported by Pavoni, Hagerty and Heer (1971). A sample volume was chosen to give a weight of between 100-135 kilograms (kg) as recommended by the CCME and BC waste composition study guidelines. After sorting each sample into 90 material categories, each category of waste was individually weighed and recorded. Details regarding the source of the waste (residential, commercial, self-haul), net weights and the hauler were also recorded for each sample. Images of the sorting and sampling exercise can be found in Appendix C.

Table 2 presents a list of the material categories that are utilized in this report.

RDN Solid Waste Composition Study Report (2012)

Table 2 RDN Material Categories

1. PAPER PRODUCTS		4. BEVERAGE CONTAINERS		9. ELECTRONIC WASTE	
1	Newsprint	30	Aseptic Containers (deposit)	62	Computers and Peripherals
2	Cardboard (recyclable)	31	Aseptic Containers (food or dairy)	63	Televisions & Audio Visual Equipment
3	Cardboard (waxed)	32	Gable Top Cartons (deposit)	64	Telephones & Telecommunications Equipment
4	Cardboard (non-recyclable)	33	Gable Top Cartons (food or dairy)	65	Small Kitchen Appliances & Floor Care
5	Boxboard / Paper Roll Cores	34	Beverage pouches (deposit)	66	Electronic Toys
6	Office Paper (fine papers)	35	Plastic Rigid Beverage (dairy or dairy substitute)	67	Smoke and CO Detectors
7	Magazines & Catalogues	36	Plastic Rigid Beverage (deposit)	68	Other Electronics
8	Molded Paper Containers (eggs, berries)	37	Plastic Rigid Beverage (takeout cups)	<b>10. HOUSEHOLD HAZARDOUS</b>	
9	Hardcover Books	38	Metal Beverage (deposit)	69	Batteries
10	Takeout Cups	39	Metal Beverage (non-deposit)	70	Medical/Biological
11	Composite Can (e.g. Pringles, spiral wound juice)	40	Glass Beverage (deposit)	71	Stains/preservatives
12	Other Paper (e.g. laminates, photos)	41	Glass Beverage (non-deposit)	72	Latex paint
<b>2. PLASTICS</b>		<b>5. TEXTILES</b>		73	Oil-based paint
13	Bags - Retail (grocery & carry-out)	42	Clothing (e.g. polyester)	74	Aerosols
14	Film Packaging (bags & overwrap that contained product)	43	Other Textiles (synthetic)	75	Solvents
15	Bags - Non Packaging (garbage and food storage bags)	44	Textiles (cotton, linen)	76	Pesticides/Herbicides/Fungicides
16	Other plastic film (pallet wrap)	45	Leather	77	Motor Oil
17	PETE #1	46	Composite Organic Materials (e.g. shoes)	78	Oil Filters
18	HDPE #2	<b>6. METALS</b>		79	Anti-Freeze
19	PVC #3	47	Metal Packaging (food)	80	Pharmaceuticals
20	LDPE #4	48	Aluminum Foil & Foil Trays (packaging)	81	Other Petroleum based Products
21	PP #5	49	Aluminum Foil & Foil Trays (non-packaging)	82	Mercury Containing items
22	PS #6	50	Non-consumables mixed metals <0.5kg	83	Other HHW
23	#7 - Mixed Resin	51	Non-consumables mixed metals >0.5kg	<b>11. HOUSEHOLD HYGIENE</b>	
24	Other unmarked un-coded plastics (e.g. stir-sticks, straws)	<b>7. GLASS</b>		84	Diapers and Sanitary Products
25	Durable Plastic (non-packaging, e.g. toys & lawn furniture)	52	Packaging (food)	85	Pet Waste
<b>3. COMPOSTABLE ORGANICS</b>		53	Other Glass and Ceramics	<b>12. OTHER</b>	
26	Food Waste	<b>8. BUILDING MATERIALS</b>		86	Cosmetics / Soaps
27	Yard and Garden	54	Clean wood (dimensional lumber)	87	Fines (items smaller than 1cm <sup>3</sup> )
28	Compostable Paper (tissue / toweling, food wrappers)	55	Treated or painted wood	88	Furniture
29	Tree based wood (branches/stumps)	56	Gypsum/drywall/plaster	89	Rubber (tires, other)
		57	Masonry/bricks	90	White Goods (refrigerators, stoves, washing machines, dryers)
		58	Asphalt products		
		59	Carpet and underlay		
		60	Flooring (non-wood)		
		61	Other (e.g. fiberglass / cellulose insulation)		

### 3 RDN Solid Waste Composition

The composition of the municipal solid waste stream in the Regional District of Nanaimo was determined by combining the waste composition data from each of the disposal facilities for each of the waste generation sectors (curbside residential, ICI and self-haul). The data indicate that approximately 80% of the waste disposed in the RDN can be characterized by five primary material categories: compostable organics (35%), plastic (14%), paper products (13%), building materials (11%), and household hygiene (7%).

The compostable component consisted of food waste (25%), yard waste (5%) and compostable paper (5%). The largest components of the plastics category were plastic film (3%), which consisted of over-wrap from retail packaging and carry-out bags, rigid containers (3%) and durable plastics (3%), which can be characterized as “non-packaging” and includes materials such as plastic toys, lawn furniture and laundry baskets. Paper products consisted of office paper (4%), cardboard (3%), and boxboard (2%). Overall, very little cardboard was found during the study, with the exception of a few ICI samples, which contained disproportionate amounts of cardboard. Building materials consisted of carpet and underlay (3%), clean and treated wood (4%) and other materials (2%) such as insulation. The household hygiene category contained diapers (5%) and pet waste (2%).

Figure 1 illustrates the estimated composition of the municipal solid waste stream in the Regional District of Nanaimo.

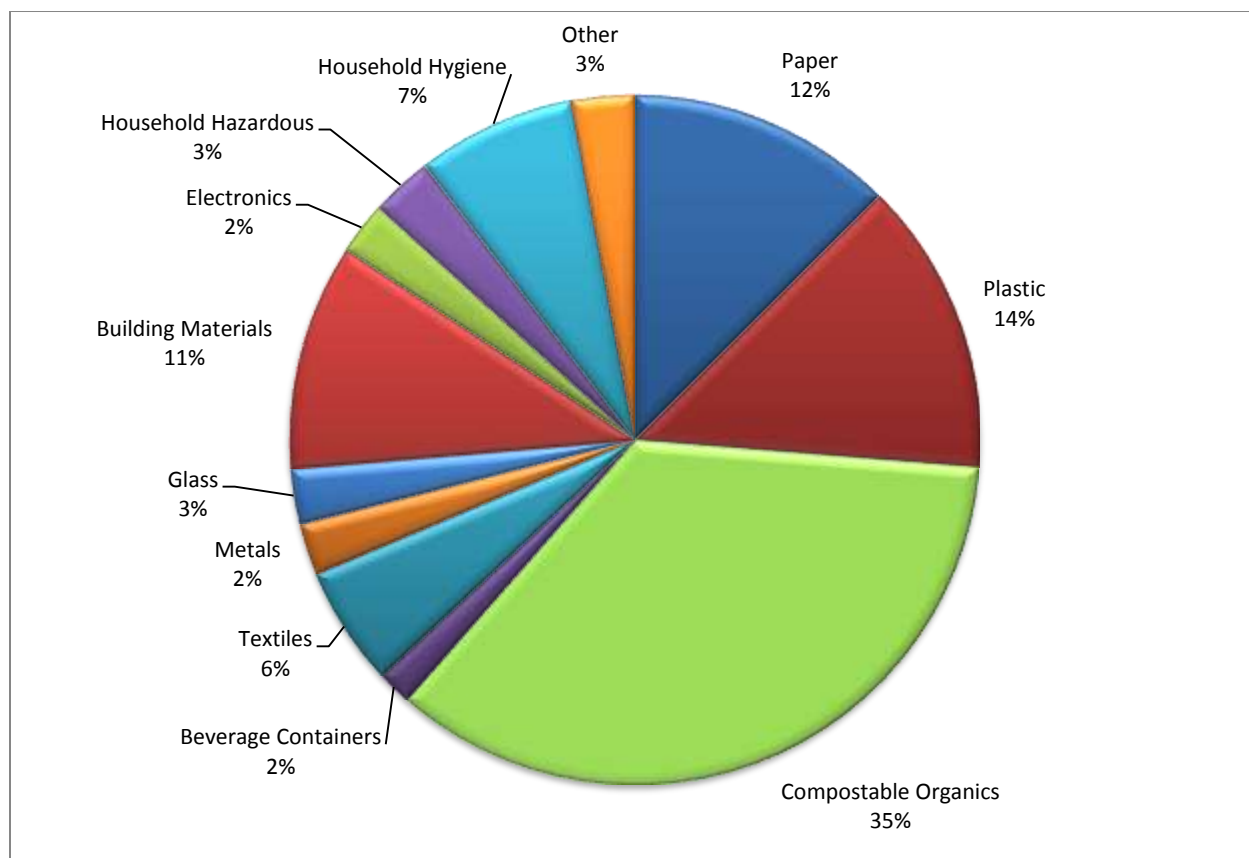


Figure 1 RDN Waste Composition Summary (2012)



*RDN Solid Waste Composition Study Report (2012)*

Table 3 presents a sector by sector comparison of the present day composition of the solid waste stream in the Regional District of Nanaimo. The relative contribution of each sector to the disposed waste stream is presented as well as the overall waste composition of the RDN. The estimated weight disposed is extrapolated from the November 1, 2011 to October 31, 2012 disposal records. Detailed tables showing additional detail for each material category can be found in Appendix B.

**Table 3 RDN Waste Composition Summary (2012)**

Material Category	Residential		ICI		Self-Haul		Totals	
	Waste Stream Percentage	Estimated Disposed (MT)	Waste Stream Percentage	Estimated Disposed (MT)	Waste Stream Percentage	Estimated Disposed (MT)	Waste Stream Percentage	Estimated Disposed (MT)
Paper	1.2%	637	9.5%	5,049	1.7%	969	<b>12.5%</b>	<b>6,656</b>
Plastic	2.5%	1,313	8.3%	4,421	3.0%	1,599	<b>13.8%</b>	<b>7,334</b>
Compostable Organics	6.4%	3,301	26.2%	13,879	2.6%	1,453	<b>35.2%</b>	<b>18,633</b>
Beverage Containers	0.2%	98	1.3%	681	0.2%	86	<b>1.6%</b>	<b>865</b>
Textiles	1.1%	576	2.0%	1,080	2.5%	1,380	<b>5.6%</b>	<b>3,037</b>
Metals	0.5%	260	1.2%	656	0.7%	375	<b>2.4%</b>	<b>1,291</b>
Glass	0.5%	275	1.2%	611	0.9%	500	<b>2.6%</b>	<b>1,386</b>
Building Materials	0.7%	347	4.6%	2,438	5.3%	2,963	<b>10.6%</b>	<b>5,748</b>
Electronics	0.3%	144	1.9%	997	0.3%	182	<b>2.5%</b>	<b>1,323</b>
Household Hazardous	0.3%	135	2.3%	1,220	0.3%	162	<b>2.9%</b>	<b>1,517</b>
Household Hygiene	3.5%	1,829	3.1%	1,633	0.8%	470	<b>7.4%</b>	<b>3,932</b>
Other	0.3%	168	1.1%	572	1.4%	859	<b>2.8%</b>	<b>1,599</b>
<b>Totals</b>	<b>17%</b>	<b>9,083</b>	<b>63%</b>	<b>33,239</b>	<b>20%</b>	<b>10,998</b>	<b>100%</b>	<b>53,319</b>

### 3.1 Curbside Residential Waste Composition

The composition of the curbside residential solid waste stream in the RDN was determined through the sampling of trucks serving the City of Nanaimo and Regional District of Nanaimo curbside collection routes. Seven samples were examined in total, three at the Regional Landfill and four at the Church Road Transfer Station.

Figure 2 illustrates the estimated composition of the curbside residential solid waste stream. As shown, approximately 83% of the residential waste stream can be characterized by five primary components: compostable organics (36%), household hygiene (20%), plastic (14%), paper (7%) and textiles (6%).

The compostable component was made up of food scraps (26%), compostable paper (8%) and yard waste (2%). Household hygiene consisted of diapers (15%) and pet waste (5%) and represents approximately 1,800 TPY of disposed waste. The plastics category consisted of film packaging (5%) such as candy and granola bar wrappers and bread bags, the next largest plastic categories were rigid containers (3%) and durable plastics such as beach toys and broken lawn chairs (2%).

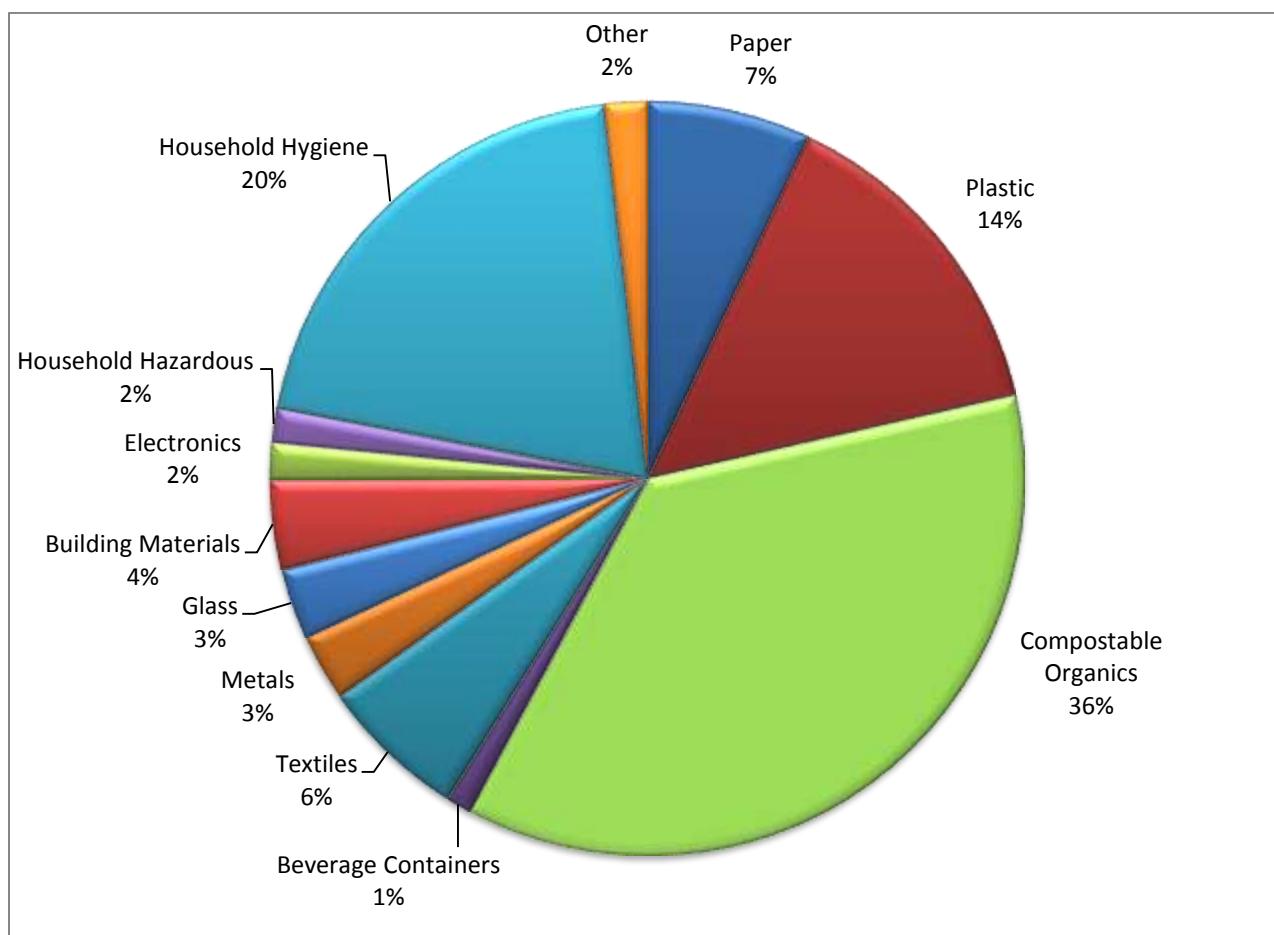


Figure 2 Curbside Residential Waste Composition (2012)

### 3.2 Industrial, Commercial, Institutional Waste Composition

The composition of the industrial, commercial, institutional (ICI) solid waste stream in the RDN was determined through sampling of commercial truck loads of ICI waste at the Regional Landfill and the Church Road Transfer Station; five samples were examined at the transfer station, while fourteen samples were examined at the landfill. Figure 3 illustrates the estimated composition of the ICI solid waste stream. As shown four material categories characterize approximately 77% of the ICI waste stream: compostable organics (42%), paper (15%), plastic (13%) and building materials (7%).

The compostable organics category consisted of food scraps (28%), yard waste (7%) and compostable paper products (6%). The paper category contained mostly office paper (4%), cardboard (4%) and newspaper (2%). Cardboard, newsprint and office paper were found in higher than expected volumes in several of the ICI samples. The plastics category consisted of film packaging (4%), durable plastics (2%) and shrink wrap (2%). The building materials category contained clean (2%) and treated (2%) lumber as well as drywall/gyproc (1%) and insulation (1%).

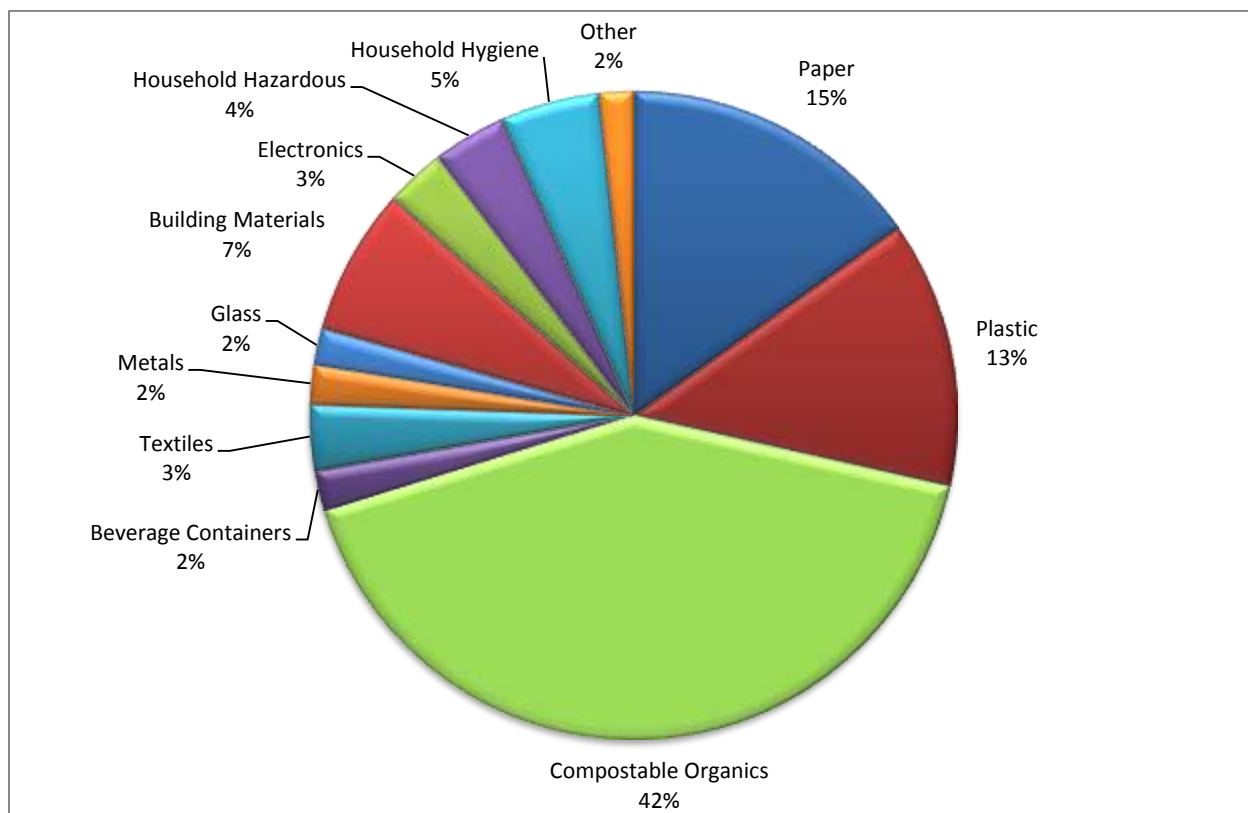


Figure 3 Industrial, Commercial, Institutional Waste Composition (2012)

### 3.2.1 Multi-Family Waste Composition

Multi-family waste is normally collected comingled with other types of Industrial, Commercial and Institutional (ICI) waste. In order to gain insight into the composition of this waste stream, a dedicated load of multi-family waste was collected and delivered to the Regional Landfill for sampling. Approximately 250 kilograms of material was examined (the equivalent of two samples). Figure 4 illustrates the estimated composition of the multi-family solid waste stream. As shown, the multi-family waste stream can be characterized by four primary waste streams: compostable organics (49%), paper products (23%), building materials (9%) and plastic (8%).

The compostable component consisted of food waste (25%), yard waste (20%) and compostable paper (4%). A large portion of the multi-family sample consisted of yard waste. Yard waste was also found in several of the ICI samples; this finding was corroborated by the landfill staff. The paper products category contained newspaper (11%), cardboard (6%) and boxboard (3%). Building materials consisted primarily of dimensional lumber (9%). Plastics contained rigid containers (4%), durable plastics (2%), and film packaging (1%).

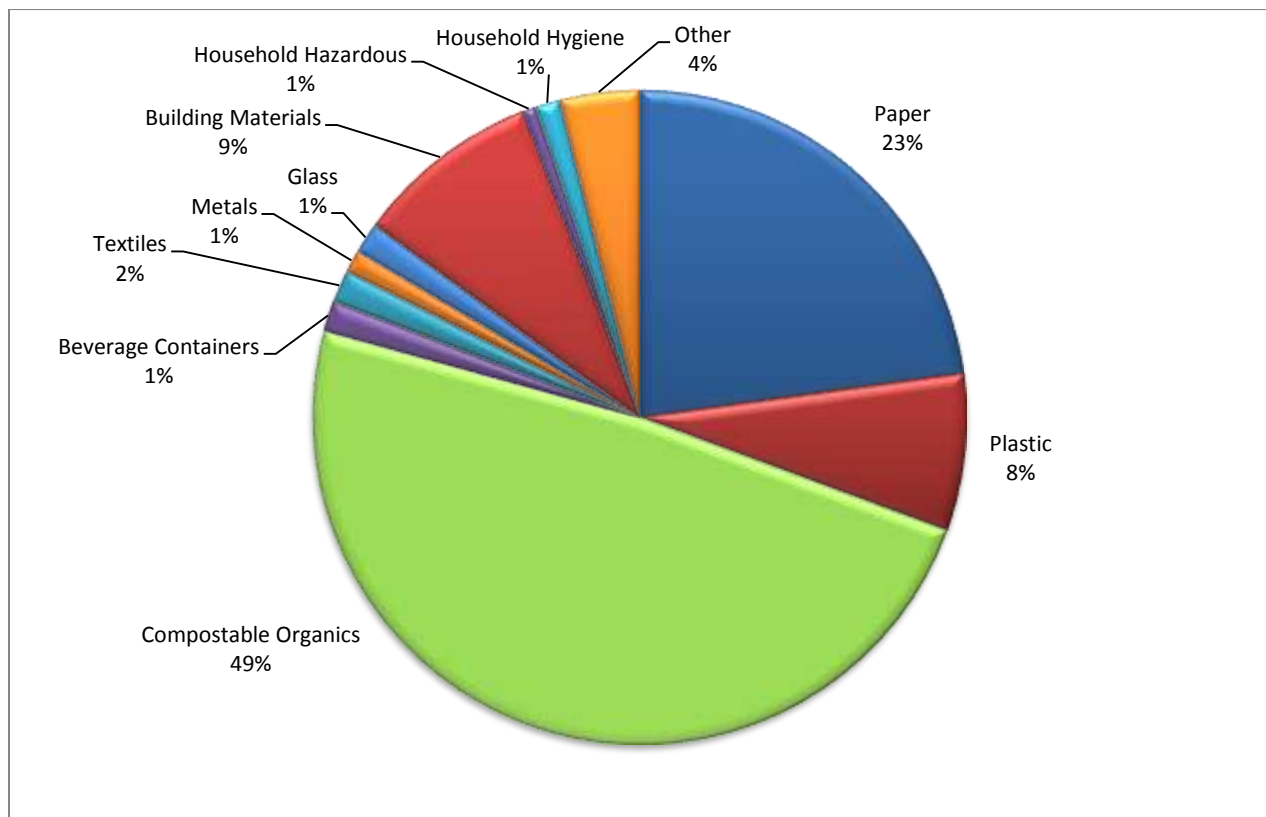


Figure 4 Multi-Family Waste Composition (2012)

### 3.3 Self-Haul Waste Composition

The composition of the self-haul solid waste stream in the RDN was determined through sampling of loads of self-haul waste at the Regional Landfill and the Church Road Transfer Station. Two samples were examined at each location. Figure 5 illustrates the estimated composition of the self-haul solid waste stream. As shown, five primary materials characterize approximately 77% of the self-haul disposal stream: building materials (27%), plastic (15%), compostable organics (13%), textiles (13%), and paper products (9%).

The building materials category contained carpet and underlay (9%), gyproc (6%) and dimensional lumber (4%). The plastics category consisted of durable plastics such as picnic tables, chairs and water toys (8%), un-coded plastics such as plant pots made up 3% of the self-haul disposal stream. The compostable category contained food scraps (12%) and compostable paper (1%), no yard waste was found in the self-haul samples. A range of textiles from shoes to jackets was found in the self-haul waste stream. Paper products consisted of office paper (3%), cardboard and newsprint (1% each).

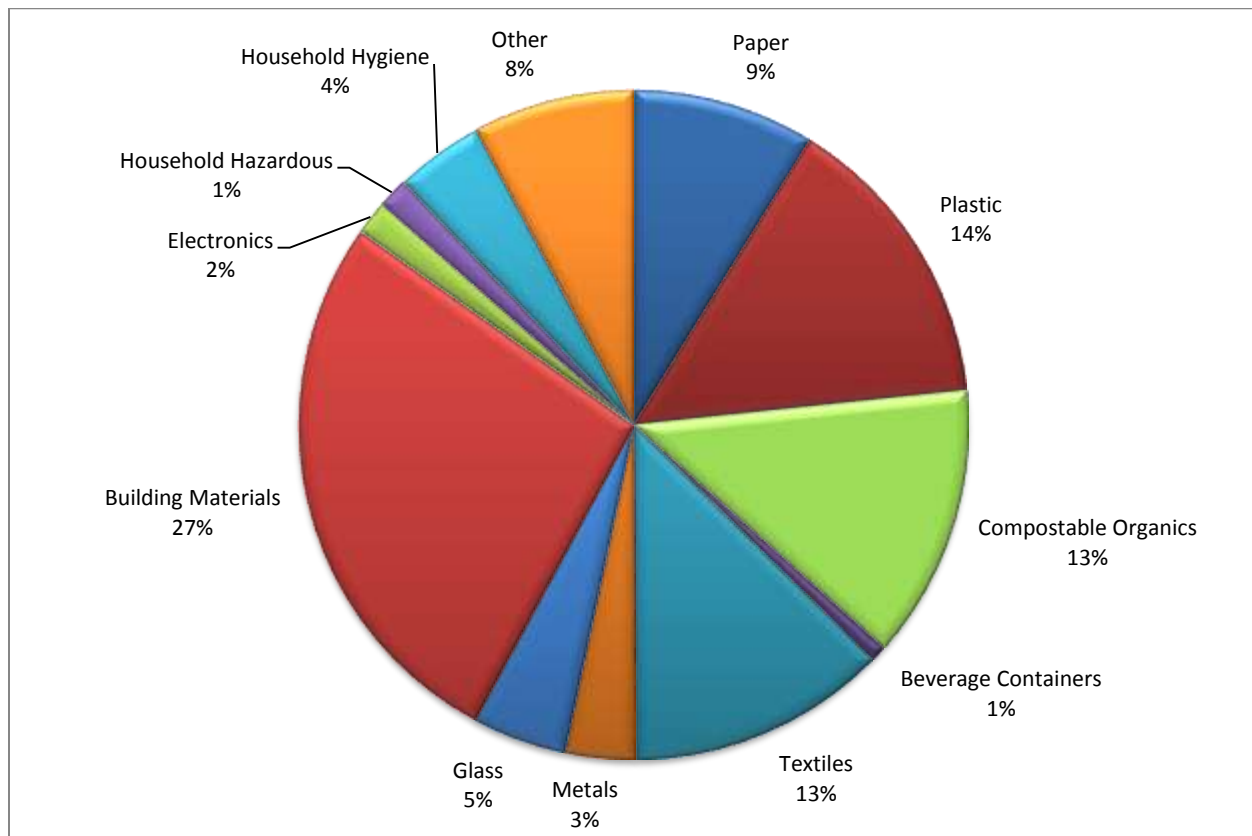


Figure 5 Self-Haul Waste Composition (2012)

### 3.4 Regional Landfill Waste Composition

The composition of the waste delivered directly to the Regional Landfill (excluding waste from the transfer station) was determined through sampling of incoming loads from each of the target sectors (curbside residential, ICI and self-haul). Figure 6 illustrates the estimated composition of the waste delivered directly to the regional landfill. As shown, five primary components characterize approximately 85% of the waste delivered directly to the regional landfill. The primary material categories were: compostable organics (38%), paper products (13%), plastic (13%), building materials (11%) and household hygiene (10%).

The compostable component consisted of food waste (26%), yard waste (7%) and compostable paper (5%). The paper products category was characterized by cardboard (4%), office paper (3%) and boxboard (2%). An interesting note: fully 1% of the regional landfill waste samples consisted of takeout coffee cups (~350 metric tonnes per year).

Plastics consisted of retail packaging (3%), durable plastics (2%) and rigid containers (2%). Building materials were characterized by wood, gyproc and insulation. Household hygiene (10%) consisted of diapers (7%) and pet waste (3%).

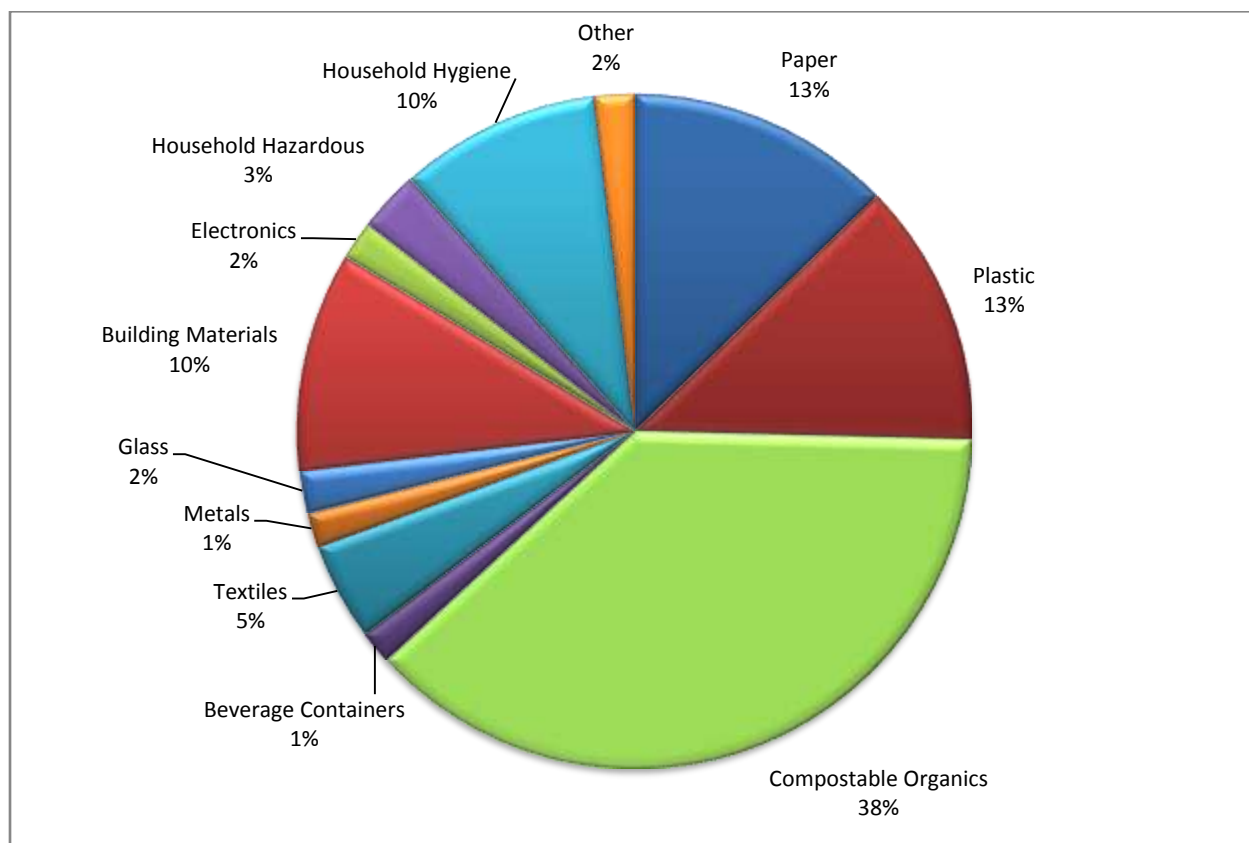


Figure 6 Regional Landfill Waste Composition (2012)

### 3.5 Church Road Transfer Station Waste Composition

The composition of the Church Road Transfer Station (CRTS) solid waste stream was determined through sampling of incoming loads of ICI, curbside residential and self-haul waste. Figure 7 illustrates the estimated composition of the CRTS solid waste stream. As shown the primary components are compostable organics (34%), plastic (16%), paper (12%), building materials (7%) and household hygiene (7%).

The compostable component contained food waste (25%), compostable paper (6%), and yard waste (3%). The plastics category consisted of durable plastics (4%) and retail packaging (4%). The paper products category can be characterized by office paper (4%), boxboard (2%), newsprint (92%) and cardboard (1%). Building materials consisted of a mixture of insulation (3%), wood products (2%) and carpet (2%). The household hygiene category contained diapers (5%) and pet waste (2%).

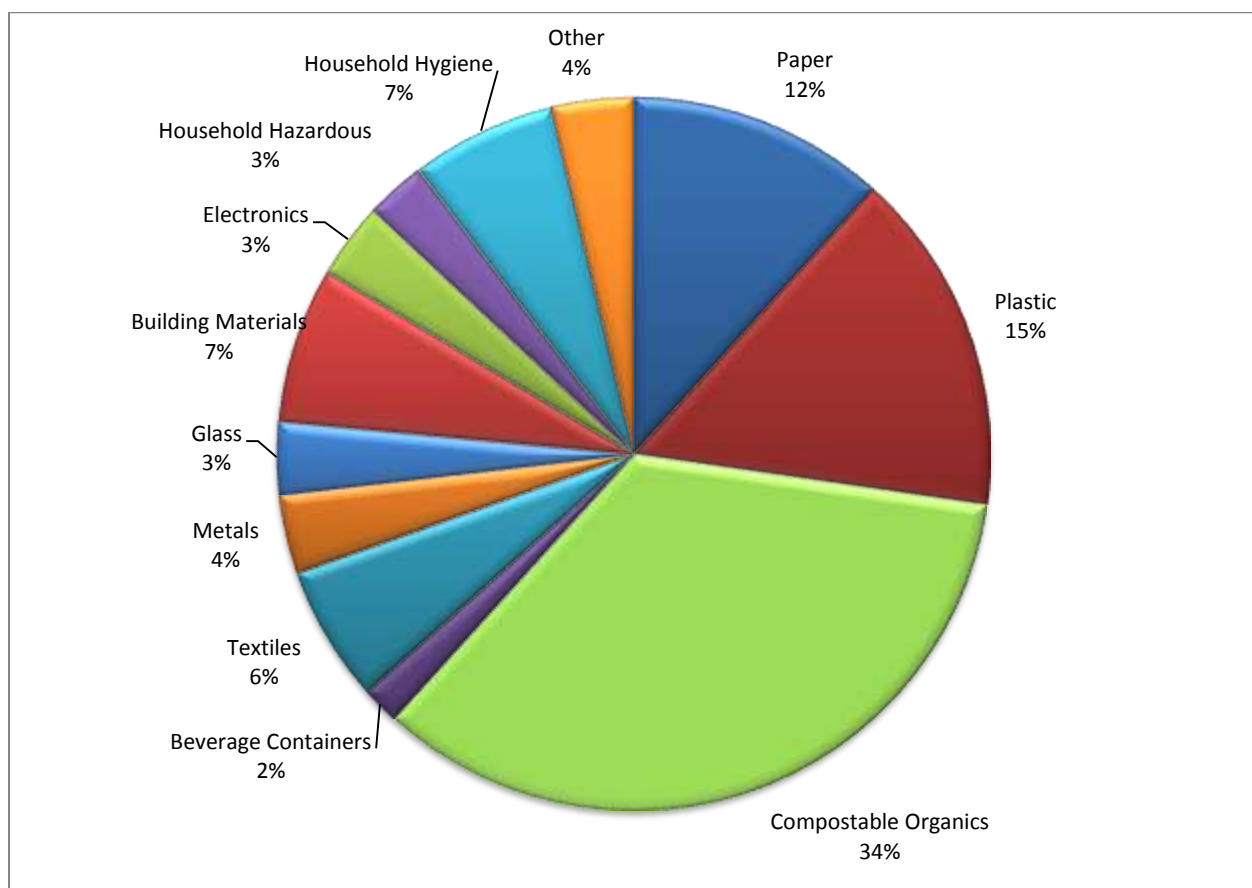
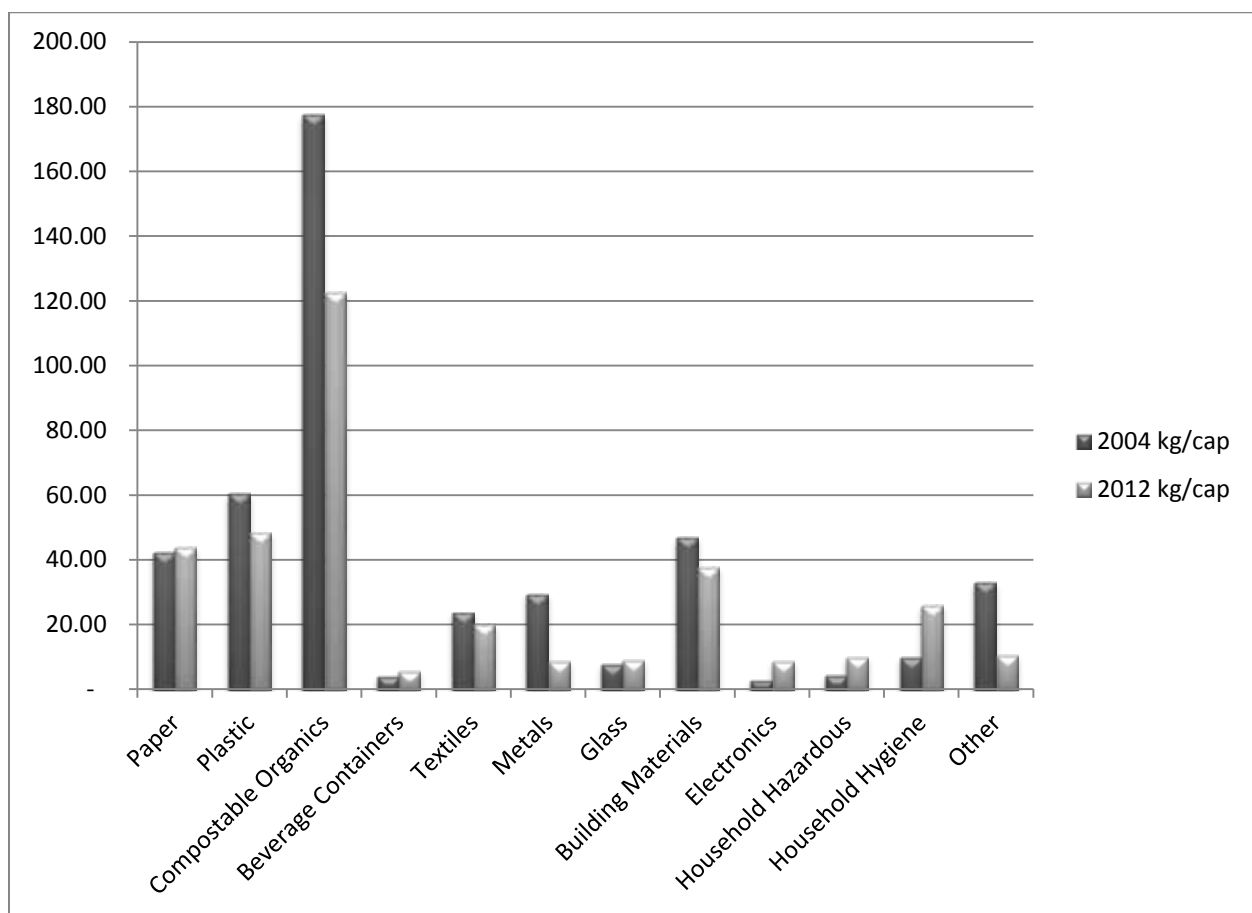


Figure 7 Church Road Transfer Station Waste Composition (2012)

### 3.6 Comparison of the 2004 and 2012 Waste Composition Data

Findings from the 2004 and 2012 waste composition studies, along with scale house data, were used to estimate and compare how the waste disposed in the RDN has changed between 2004 and 2012.

Figure 8 illustrates the change in per capita waste disposed for each of the primary material categories. The most notable change is in compostable organics, which decreased 31% from approximately 178 kg/capita in 2004 to 122 kg/capita in 2012. Metals disposed decreased 71% from 29 kg/capita to 8.5 kg/capita in 2012. Disposal of building materials also decreased from 47 kg/capita to 38 kg/capita. In contrast, household hygiene (diapers, sanitary products and pet waste) is estimated to have increased from approximately 10 kg/capita in 2004 to 26 kg/capita in 2012. Electronics disposed increased from ~3kg/capita to almost 9kg/capita in 2012.



**Figure 8 Comparison of 2004 to 2012 Waste Composition (Kilograms per Capita)**



*RDN Solid Waste Composition Study Report (2012)*

Table 4 presents a detailed comparison between the findings from the 2004 and the 2012 waste composition studies. The table indicates the change in the relative proportion of each primary material and shows the quantity disposed, in metric tonnes, by waste sector. Overall, tonnes disposed decreased from approximately 60,000 metric tonnes in 2004 to about 53,000 metric tonnes in 2012.

**Table 4 RDN Waste Composition Comparison (2004 to 2012)**

Material Category	Residential				ICI				Self-Haul				Waste Stream Summary			
	2004 Waste Stream %	2004 Waste Disposed (MT)	2012 Waste Stream %	2012 Waste Disposed (MT)	2004 Waste Stream %	2004 Waste Disposed (MT)	2012 Waste Stream %	2012 Waste Disposed (MT)	2004 Waste Stream %	2004 Waste Disposed (MT)	2012 Waste Stream %	2012 Waste Disposed (MT)	2004 Waste Stream %	2004 Waste Disposed (MT)	2012 Waste Stream %	2012 Waste Disposed (MT)
Paper	1.6%	931	1.2%	637	6.4%	3,793	9.5%	5,049	1.6%	970	1.7%	969	9.5%	5,694	12.5%	6,656
Plastic	2.7%	1,598	2.5%	1,313	9.2%	5,496	8.4%	4,432	1.8%	1,069	2.9%	1,599	13.7%	8,163	13.8%	7,344
Compostable Organics	16.5%	9,834	6.4%	3,301	21.6%	12,898	26.2%	13,879	2.1%	1,264	2.6%	1,453	40.2%	23,996	35.2%	18,633
Beverage Containers	0.3%	152	0.2%	98	0.3%	205	1.3%	670	0.3%	203	0.2%	86	0.9%	560	1.6%	855
Textiles	1.2%	689	1.1%	576	2.5%	1,476	2.0%	1,080	1.7%	1,029	2.5%	1,380	5.3%	3,194	5.6%	3,037
Metals	0.9%	544	0.5%	260	4.8%	2,864	1.2%	656	0.9%	564	0.7%	375	6.7%	3,972	2.4%	1,291
Glass	0.3%	203	0.5%	275	1.0%	621	1.2%	611	0.4%	224	0.9%	500	1.8%	1,048	2.6%	1,386
Building Materials	0.9%	525	0.7%	347	5.4%	3,207	4.6%	2,438	4.3%	2,596	5.3%	2,963	10.6%	6,328	10.6%	5,748
Electronics	0.0%	14	0.3%	144	0.6%	333	1.9%	997	0.1%	36	0.3%	182	0.6%	383	2.5%	1,323
Household Hazardous	0.1%	83	0.3%	135	0.3%	168	2.3%	1,220	0.6%	334	0.3%	162	1.0%	585	2.9%	1,517
Household Hygiene	1.6%	961	3.5%	1,829	0.6%	351	3.1%	1,633	0.1%	35	0.8%	470	2.3%	1,347	7.4%	3,932
Other	0.3%	133	0.3%	168	3.8%	2,241	1.1%	572	2.7%	2,080	1.4%	859	6.8%	4,454	2.8%	1,599
<b>Totals</b>	<b>26%</b>	<b>15,666</b>	<b>17%</b>	<b>9,083</b>	<b>56%</b>	<b>33,653</b>	<b>63%</b>	<b>33,239</b>	<b>17%</b>	<b>10,405</b>	<b>20%</b>	<b>10,998</b>	<b>100%</b>	<b>59,724</b>	<b>100%</b>	<b>53,319</b>

*RDN Solid Waste Composition Study Report (2012)*

Table 5 presents a comparison of the 2004 and 2012 waste disposed on a per capita basis. In 2004, the estimated the disposal rate was 442 kilograms per capita. In 2012, the per capita disposal rate was approximately 350 kilograms.<sup>4</sup>

**Table 5 RDN Waste Composition – Kilograms per Capita Comparison (2004 to 2012)**

Material Category	Residential				ICI				Self-Haul				Waste Stream Summary			
	2004 Waste Stream %	2004 KG/Cap	2012 Waste Stream %	2012 KG/Cap	2004 Waste Stream %	2004 KG/Cap	2012 Waste Stream %	2012 KG/Cap	2004 Waste Stream %	2004 KG/Cap	2012 Waste Stream %	2012 KG/Cap	2004 Waste Stream %	2004 KG/Cap	2012 Waste Stream %	2012 KG/Cap
<b>Paper</b>	1.6%	6.9	1.2%	4.2	6.4%	28.1	9.5%	33.2	1.6%	7.2	1.7%	6.4	9.5%	42.1	12.5%	43.7
<b>Plastic</b>	2.7%	11.8	2.5%	8.6	9.2%	40.7	8.4%	29.1	1.8%	7.9	2.9%	10.5	13.7%	60.4	13.8%	48.2
<b>Compostable Organics</b>	16.5%	72.8	6.4%	21.7	21.6%	95.5	26.2%	91.2	2.1%	9.4	2.6%	9.6	40.2%	177.6	35.2%	122.5
<b>Beverage Containers</b>	0.3%	1.1	0.2%	0.6	0.3%	1.5	1.3%	4.5	0.3%	1.5	0.2%	0.6	0.9%	4.1	1.6%	5.7
<b>Textiles</b>	1.2%	5.1	1.1%	3.8	2.5%	10.9	2.0%	7.1	1.7%	7.6	2.5%	9.1	5.3%	23.6	5.6%	20.0
<b>Metals</b>	0.9%	4.0	0.5%	1.7	4.8%	21.2	1.2%	4.3	0.9%	4.2	0.7%	2.5	6.7%	29.4	2.4%	8.5
<b>Glass</b>	0.3%	1.5	0.5%	1.8	1.0%	4.6	1.2%	4.0	0.4%	1.7	0.9%	3.3	1.8%	7.8	2.6%	9.1
<b>Building Materials</b>	0.9%	3.9	0.7%	2.3	5.4%	23.7	4.6%	16.0	4.3%	19.2	5.3%	19.5	10.6%	46.8	10.6%	37.8
<b>Electronics</b>	0.0%	0.1	0.3%	0.9	0.6%	2.5	1.9%	6.6	0.1%	0.3	0.3%	1.2	0.6%	2.8	2.5%	8.7
<b>Household Hazardous</b>	0.1%	0.6	0.3%	0.9	0.3%	1.2	2.3%	8.0	0.6%	2.5	0.3%	1.1	1.0%	4.3	2.9%	10.0
<b>Household Hygiene</b>	1.6%	7.1	3.5%	12.0	0.6%	2.6	3.1%	10.7	0.1%	0.3	0.8%	3.1	2.3%	10.0	7.4%	25.8
<b>Other</b>	0.3%	1.0	0.3%	1.1	3.8%	16.6	1.1%	3.8	2.7%	15.4	1.4%	5.6	6.8%	33.0	2.8%	10.5
<b>Totals</b>	<b>26%</b>	<b>116.0</b>	<b>17%</b>	<b>59.7</b>	<b>56%</b>	<b>249.1</b>	<b>63%</b>	<b>218.5</b>	<b>17%</b>	<b>77.0</b>	<b>20%</b>	<b>72.3</b>	<b>100%</b>	<b>442.1</b>	<b>100%</b>	<b>350.5</b>

<sup>4</sup> The estimated population in 2004 was 135,099. The estimated population in 2012 was 152,138 (based on the 2011 population estimate plus a 1% growth factor). Population estimates are based on BC Statistics data.

# **Appendix A**

## **Material Categories – as per BC draft guidelines**

## Appendix A – Material Categories as Per BC Draft Guidelines

1. PAPER PRODUCTS		3. COMPOSTABLE ORGANICS		9. HOUSEHOLD HAZARDOUS	
1	Newsprint	37	Yard and Garden	70	Batteries
2	Cardboard (recyclable)	38	Tree based wood (branches/stumps)	71	Medical/Biological
3	Cardboard (waxed)	39	Food Waste	72	Stains/preservatives
4	Cardboard (non-recyclable)	<b>4. NON-COMPOSTABLE ORGANICS</b>		73	Latex paint
5	Boxboard / Paper Roll Cores	40	Clean wood (dimensional lumber, pallets)	74	Oil-based paint
6	Office Paper (fine papers)	41	Treated or painted wood	75	Aerosols
7	Magazines & Catalogues	42	Textiles (cotton, linen)	76	Solvents
8	Molded Paper Containers (eggs, berries)	43	Rubber (tires, other)	77	Pesticides/Herbicides/Fungicides
9	Compostable Paper (tissue/towelling, food wrappers)	44	Leather	78	Motor Oil
10	Hardcover Books	45	Composite Organic Materials (e.g. shoes)	79	Oil Filters
11	Aseptic Containers (deposit)	<b>5. METALS</b>		80	Anti-Freeze
12	Aseptic Containers (food or dairy)	46	Metal Beverage (deposit)	81	Pharmaceuticals
13	Gable Top Cartons (deposit)	47	Metal Beverage (non-deposit)	82	Other Petroleum based Products
14	Gable Top Cartons (food or dairy)	48	Metal Packaging (food)	83	Mercury Containing items
15	Takeout Cups	49	Aluminum Foil & Foil Trays (packaging)	84	Other HHW
16	Composite Can (e.g. Pringles, spiral wound juice)	50	Aluminum Foil & Foil Trays (non-packaging)	<b>10. HOUSEHOLD HYGIENE</b>	
17	Other Paper (e.g. laminates, photos)	51	Non-consumables mixed metals <0.5kg	85	Diapers and Sanitary Products
<b>2. PLASTICS</b>		52	Non-consumables mixed metals >0.5kg	86	Pet Waste
18	Bags - Retail (grocery & carry-out)	<b>6. GLASS</b>		<b>11. BULKY OBJECTS</b>	
19	Film Packaging (bags & overwrap that contained product)	53	Beverage containers (deposit)	87	White Goods (refrigerators, stoves, washing machines, dryers)
20	Bags - Non Packaging (garbage and freezer bags)	54	Beverage containers (non-deposit)	88	Furniture
21	Beverage pouches (deposit)	55	Packaging (food)	<b>12. COSMETICS</b>	
22	Other plastic film (pallet wrap)	56	Other Glass and Ceramics	89	Cosmetics
23	Clothing (e.g. polyester)	<b>7. BUILDING MATERIALS</b>		<b>13. FINES</b>	
24	Other Textiles (synthetic)	57	Gypsum/drywall/plaster	90	Fines (items smaller than 1cm <sup>3</sup> ), also includes dust and ashes.
25	Rigid Beverage (dairy or dairy substitute)	58	Masonry/bricks		
26	Rigid Beverage (deposit)	59	Asphalt products		
27	Rigid Beverage (takeout cups)	60	Carpet and underlay		
28	PETE #1	61	Flooring (non-wood)		
29	HDPE #2	62	Other (e.g. fiberglass / cellulose insulation)		
30	PVC #3	<b>8. ELECTRONIC WASTE</b>			
31	LDPE #4	63	Computers and Peripherals		
32	PP #5	64	Televisions & Audio Visual Equipment		
33	PS #6	65	Telephones & Telecommunications Equipment		
34	#7 - Mixed Resin	66	Small Kitchen Appliances & Floor Care		
35	Other unmarked un-coded plastics (stir-sticks, straws, single serve condiments)	67	Electronic Toys		
36	Durable Plastic Products (non-packaging, includes toys and lawn furniture)	68	Smoke and CO Detectors		
		69	Other Electronics		

# **Appendix B**

## **Detailed Data by Waste Sector**

## Appendix B – Detailed Data by Waste Sector

Material Category	Residential		Commercial		Self-Haul		Totals	
	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)
<b>Paper</b>	<b>1.2%</b>	<b>637</b>	<b>9.5%</b>	<b>5,049</b>	<b>1.8%</b>	<b>969</b>	<b>12.5%</b>	<b>6,655</b>
Newsprint	0.1%	76	1.3%	690	0.3%	134	1.7%	900
Cardboard (recyclable)	0.2%	105	2.4%	1,271	0.3%	143	2.8%	1,519
Cardboard (waxed)	0.0%	0	0.0%	1	0.0%	0	0.0%	1
Cardboard (non-recyclable)	0.0%	0	0.2%	108	0.0%	0	0.2%	108
Boxboard / Cores	0.4%	191	1.3%	709	0.2%	128	1.9%	1,028
Office Paper	0.4%	198	2.5%	1,324	0.7%	368	3.5%	1,889
Magazines and Catalogues	0.0%	1	0.2%	106	0.1%	59	0.3%	166
Molded Paper Containers	0.0%	20	0.4%	237	0.0%	25	0.5%	282
Hardcover Books	0.0%	7	0.2%	91	0.2%	87	0.3%	186
Takeout Cups	0.1%	30	0.7%	360	0.0%	23	0.8%	413
Composite Can	0.0%	8	0.0%	21	0.0%	2	0.1%	31
Other Paper	0.0%	1	0.2%	130	0.0%	0	0.2%	131
<b>Plastic</b>	<b>2.5%</b>	<b>1,313</b>	<b>8.3%</b>	<b>4,421</b>	<b>3.0%</b>	<b>1,599</b>	<b>13.8%</b>	<b>7,333</b>
Bags - Retail (carry-out and grocery)	0.2%	124	0.2%	115	0.1%	44	0.5%	284
Bags - Packaging (film and overwrap)	0.9%	468	2.2%	1,173	0.2%	127	3.3%	1,768
Bags - Non Packaging (e.g. Ziploc bags)	0.2%	113	0.7%	379	0.1%	46	1.0%	538
Other Plastic Film (pallet wrap)	0.1%	27	0.9%	473	0.0%	0	0.9%	500
PETE #1	0.1%	71	0.2%	99	0.1%	33	0.4%	202
HDPE #2	0.1%	65	0.4%	235	0.1%	58	0.7%	357
PVC #3	0.0%	0	0.0%	7	0.0%	1	0.0%	8
LDPE #4	0.0%	0	0.0%	6	0.0%	0	0.0%	6
PP #5	0.1%	37	0.2%	131	0.1%	29	0.4%	198
PS #6	0.2%	98	0.8%	450	0.1%	45	1.1%	593
Mixed Resin #7	0.0%	25	0.4%	210	0.0%	25	0.5%	260
Other uncoded plastics	0.2%	104	0.7%	391	0.5%	291	1.5%	786
Durable plastic (non-packaging)	0.3%	180	1.4%	753	1.7%	901	3.4%	1,833
<b>Compostable Organics</b>	<b>6.2%</b>	<b>3,301</b>	<b>26.0%</b>	<b>13,879</b>	<b>2.7%</b>	<b>1,453</b>	<b>34.9%</b>	<b>18,632</b>
Food Waste	4.5%	2,381	17.6%	9,386	2.4%	1,297	24.5%	13,065
Yard and Garden	0.4%	223	4.7%	2,490	0.0%	12	5.1%	2,725
Compostable Paper	1.3%	696	3.7%	1,987	0.3%	141	5.3%	2,824
Tree Based Wood	0.0%	0	0.0%	16	0.0%	3	0.0%	19

## Appendix B – Detailed Data by Waste Sector

Material Category	Residential		Commercial		Self-Haul		Totals	
	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)
<b>Beverage Containers</b>	<b>0.2%</b>	<b>98</b>	<b>1.3%</b>	<b>681</b>	<b>0.2%</b>	<b>86</b>	<b>1.6%</b>	<b>866</b>
Aseptic Containers (deposit)	0.0%	8	0.0%	19	0.0%	1	0.1%	29
Aseptic Containers (non-deposit)	0.0%	4	0.0%	9	0.0%	0	0.0%	14
Gable Top Containers (deposit)	0.0%	0	0.0%	8	0.0%	1	0.0%	9
Gable Top Containers (non-deposit)	0.0%	22	0.1%	59	0.0%	15	0.2%	96
Beverage Pouches (deposit)	0.0%	0	0.0%	11	0.0%	0	0.0%	11
Plastic Beverage Containers (deposit)	0.0%	6	0.2%	110	0.0%	18	0.3%	133
Plastic Beverage Containers (non-deposit)	0.0%	25	0.0%	25	0.0%	17	0.1%	67
Plastic Beverage (takeout cups)	0.0%	8	0.1%	72	0.0%	2	0.2%	82
Metal Beverage (deposit)	0.0%	9	0.1%	65	0.0%	4	0.1%	78
Metal Beverage (non-deposit)	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Glass Beverage Containers (deposit)	0.0%	16	0.6%	303	0.1%	28	0.7%	347
Glass Beverage Containers (non-deposit)	0.0%	0	0.0%	0	0.0%	0	0.0%	0
<b>Textiles</b>	<b>1.1%</b>	<b>576</b>	<b>2.0%</b>	<b>1,080</b>	<b>2.6%</b>	<b>1,380</b>	<b>5.7%</b>	<b>3,037</b>
Clothing	0.1%	45	0.0%	16	0.1%	64	0.2%	126
Composite Textiles	0.1%	74	0.1%	37	0.3%	167	0.5%	278
Leather	0.0%	5	0.0%	12	0.1%	49	0.1%	66
Natural Fibre Textiles	0.7%	380	1.4%	727	1.3%	690	3.4%	1,798
Synthetic Textiles	0.1%	72	0.5%	288	0.8%	410	1.4%	770
<b>Metals</b>	<b>0.5%</b>	<b>260</b>	<b>1.2%</b>	<b>656</b>	<b>0.7%</b>	<b>375</b>	<b>2.4%</b>	<b>1,291</b>
Metal Packaging (food)	0.2%	120	0.4%	213	0.0%	25	0.7%	358
Aluminum Foil and Trays (packaging)	0.0%	10	0.0%	4	0.0%	0	0.0%	14
Aluminum Foil and Trays (non-packaging)	0.1%	79	0.2%	89	0.0%	12	0.3%	180
Non-consumables mixed metals (<0.5kg)	0.1%	51	0.3%	169	0.0%	25	0.5%	245
Non-consumables mixed metals (>0.5kg)	0.0%	0	0.3%	181	0.6%	313	0.9%	494
<b>Glass</b>	<b>0.5%</b>	<b>275</b>	<b>1.1%</b>	<b>611</b>	<b>0.9%</b>	<b>500</b>	<b>2.6%</b>	<b>1,386</b>
Glass Packaging (food)	0.4%	188	0.6%	299	0.3%	182	1.3%	669
Other Glass and Ceramics	0.2%	86	0.6%	313	0.6%	318	1.3%	717
<b>Building Materials</b>	<b>0.7%</b>	<b>347</b>	<b>4.6%</b>	<b>2,438</b>	<b>5.6%</b>	<b>2,963</b>	<b>10.8%</b>	<b>5,748</b>
Clean Wood	0.3%	145	1.0%	509	0.8%	403	2.0%	1,057
Treated or Painted Wood	0.2%	88	1.4%	759	0.0%	6	1.6%	853
Gypsum/drywall/plaster	0.0%	0	0.3%	186	1.2%	652	1.6%	838
Masonry/bricks	0.0%	0	0.2%	91	0.5%	241	0.6%	332
Asphalt products	0.0%	0	0.1%	52	0.0%	0	0.1%	52
Carpet & Underlay	0.0%	0	0.8%	437	1.9%	1,004	2.7%	1,441
Flooring (non-wood)	0.0%	0	0.0%	0	0.1%	54	0.1%	54
Other (fiberglass insulation)	0.2%	114	0.8%	404	1.1%	604	2.1%	1,122

## Appendix B – Detailed Data by Waste Sector

Material Category	Residential		Commercial		Self-Haul		Totals	
	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)	Waste Stream Percentage	Estimated Disposed (2012)
<b>Electronics</b>	<b>0.3%</b>	<b>144</b>	<b>1.9%</b>	<b>997</b>	<b>0.3%</b>	<b>182</b>	<b>2.5%</b>	<b>1,323</b>
Computers and Peripherals	0.0%	0	0.5%	274	0.0%	2	0.5%	276
Televisions and Audio Visual Equipment	0.1%	36	0.5%	257	0.1%	40	0.6%	333
Telephones and Telecommunications Equipment	0.0%	0	0.3%	137	0.0%	9	0.3%	146
Small Kitchen Appliances and Floor Care	0.1%	36	0.5%	243	0.2%	123	0.8%	402
Electronic Toys	0.0%	3	0.0%	3	0.0%	0	0.0%	6
Smoke and CO Detectors	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Other Electronics	0.1%	69	0.2%	83	0.0%	7	0.3%	160
<b>Household Hazardous</b>	<b>0.3%</b>	<b>135</b>	<b>2.3%</b>	<b>1,220</b>	<b>0.3%</b>	<b>162</b>	<b>2.8%</b>	<b>1,516</b>
Batteries	0.0%	13	0.1%	31	0.0%	1	0.1%	46
Medical/Biological	0.1%	42	0.7%	383	0.0%	0	0.8%	425
Stains/Preservatives	0.0%	0	0.0%	0	0.0%	10	0.0%	10
Latex Paint	0.0%	12	0.3%	163	0.2%	103	0.5%	278
Oil Based Paint	0.0%	0	0.1%	31	0.0%	0	0.1%	31
Aerosols	0.0%	24	0.1%	38	0.1%	35	0.2%	97
Solvents	0.0%	0	0.1%	34	0.0%	0	0.1%	34
Pesticides/Herbicides/Fungicides	0.0%	0	0.0%	3	0.0%	0	0.0%	3
Motor Oil	0.0%	3	0.0%	17	0.0%	0	0.0%	20
Oil Filters	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Anti-Freeze	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Pharmaceuticals	0.0%	1	0.0%	10	0.0%	13	0.0%	23
Other Petroleum Based Products	0.0%	0	0.0%	16	0.0%	0	0.0%	16
Mercury Containing Items	0.0%	0	0.0%	5	0.0%	0	0.0%	5
Other HHW	0.1%	39	0.9%	488	0.0%	0	1.0%	527
<b>Household Hygiene</b>	<b>3.4%</b>	<b>1,829</b>	<b>3.1%</b>	<b>1,633</b>	<b>0.9%</b>	<b>470</b>	<b>7.4%</b>	<b>3,932</b>
Diapers / Personal Hygiene	2.6%	1,394	2.2%	1,187	0.4%	205	5.2%	2,786
Pet Waste	0.8%	435	0.8%	446	0.5%	266	2.1%	1,146
<b>Other</b>	<b>0.3%</b>	<b>169</b>	<b>1.1%</b>	<b>572</b>	<b>1.6%</b>	<b>859</b>	<b>3.0%</b>	<b>1,599</b>
Cosmetics / Soaps	0.1%	61	0.1%	75	0.0%	26	0.3%	162
Fines	0.2%	102	0.5%	261	0.0%	7	0.7%	370
Furniture	0.0%	0	0.4%	196	1.5%	825	1.9%	1,021
Rubber/Tires	0.0%	6	0.1%	40	0.0%	0	0.1%	46
White Goods	0.0%	0	0.0%	0	0.0%	0	0.0%	0
<b>Totals</b>	<b>17%</b>	<b>9,083</b>	<b>62%</b>	<b>33,239</b>	<b>21%</b>	<b>10,998</b>	<b>100%</b>	<b>53,319</b>



# **Appendix C**

## **Photo Gallery**

## Appendix C – Photo Gallery



Waste sorters at the Regional Landfill (Oct 2012)



Waste sorters find many items. Including the bathroom sink!



Yard Waste – the majority was found in commercial loads.



Load of commercial waste pre-sort. Note: cardboard, paint and yard waste.



Commercial waste – some organics continue to be landfilled.

## Appendix C – Photo Gallery



Two examples of the large variety of durable, non-recyclable plastics.



Gyproc in the Self-Haul waste stream. This finding was quite typical.



Recyclable paper products and beverage containers. Found together as shown in photo.

# **Appendix D**

## **Statistical Analysis**

### Appendix D - Statistical Analysis

Waste Material	Mean Percentage	Standard Deviation	% Standard Deviation	Estimated Number of samples at 10% precision - 90% confidence	Estimated Number of samples at 20% precision - 90% confidence	% Confidence with which we can estimate the mean with 20% precision based on twenty-nine samples	% Precision with which we can estimate the mean with 90% confidence based on twenty-nine samples
<b>Paper</b>	<b>13%</b>	<b>0.0673</b>	<b>53%</b>	<b>82</b>	<b>20</b>	<b>97</b>	<b>17</b>
Newsprint	2%	0.0220	133%	508	127	79	42
Cardboard (recyclable)	3%	0.0372	131%	499	125	79	41
Cardboard (waxed)	0%	0.0001	539%	8372	2093	58	170
Cardboard (non-recyclable)	0%	0.0109	539%	8372	2093	58	170
Boxboard / Cores	2%	0.0092	46%	61	15	99	15
Office Paper	3%	0.0250	72%	151	38	93	23
Magazines and Catalogues	0%	0.0063	229%	1509	377	68	72
Molded Paper Containers	1%	0.0146	276%	2202	550	65	87
Hardcover Books	0%	0.0046	154%	686	172	75	49
Aseptic Containers (deposit)	0%	0.0009	156%	699	175	75	49
Aseptic Containers (non-deposit)	0%	0.0006	213%	1306	327	69	67
Gable Top Containers (deposit)	0%	0.0004	225%	1461	365	68	71
Gable Top Containers (non-deposit)	0%	0.0015	82%	195	49	90	26
Takeout Cups	1%	0.0148	190%	1040	260	71	60
Composite Can	0%	0.0008	133%	511	128	79	42
Other Paper	0%	0.0129	528%	8034	2009	58	166
<b>Plastic</b>	<b>16%</b>	<b>0.0775</b>	<b>49%</b>	<b>70</b>	<b>17</b>	<b>98</b>	<b>15</b>
Bags - Retail (carry-out and grocery)	1%	0.0067	112%	364	91	83	35
Bags - Packaging (film and overwrap)	4%	0.0323	90%	234	58	88	28
Bags - Non Packaging (ziploc)	1%	0.0071	67%	129	32	94	21
Beverage Pouches (deposit)	0%	0.0004	215%	1333	333	69	68
Other Plastic Film (pallet wrap)	1%	0.0190	199%	1144	286	70	63
Clothing	0%	0.0062	269%	2085	521	65	85
Other Textiles	1%	0.0214	173%	859	215	73	54
Rigid Beverage Containers (deposit)	0.2%	0.0039	159%	734	183	75	50
Rigid Beverage Containers (non-deposit)	0.1%	0.0030	219%	1383	346	69	69
Rigid Beverage (takeout cups)	0%	0.0036	230%	1531	383	68	73
PETE #1	0%	0.0030	72%	148	37	93	23
HDPE #2	1%	0.0050	73%	156	39	92	23
PVC #3	0%	0.0004	281%	2275	569	65	89
LDPE #4	0%	0.0003	302%	2630	657	64	95
PP #5	0%	0.0028	74%	156	39	92	23
PS #6	1%	0.0103	89%	229	57	88	28
Mixed Resin #7	0%	0.0086	176%	895	224	73	56
Other uncoded plastics	1%	0.0184	134%	519	130	79	42
Durable plastic (non-packaging)	3%	0.0439	146%	613	153	77	46

### Appendix D - Statistical Analysis

Waste Material	Mean Percentage	Standard Deviation	% Standard Deviation	Estimated Number of samples at 10% precision - 90% confidence	Estimated Number of samples at 20% precision - 90% confidence	% Confidence with which we can estimate the mean with 20% precision based on twenty-nine samples	% Precision with which we can estimate the mean with 90% confidence based on twenty-nine samples
<b>Compostable Organics</b>	<b>37%</b>	<b>0.1542</b>	<b>42%</b>	<b>52</b>	<b>13</b>	<b>99</b>	<b>13</b>
Food Waste	25%	0.1199	47%	64	16	99	15
Yard and Garden	5%	0.0731	139%	557	139	78	44
Compostable Paper	6%	0.0349	61%	107	27	96	19
Tree Based Wood	0%	0.0009	283%	2314	579	65	89
<b>Non-Compostable Organics</b>	<b>7%</b>	<b>0.0694</b>	<b>94%</b>	<b>254</b>	<b>64</b>	<b>87</b>	<b>30</b>
Clean Wood	2%	0.0265	144%	599	150	77	45
Treated or Painted Wood	2%	0.0592	357%	3679	920	62	113
Textiles	3%	0.0257	79%	182	46	91	25
Rubber/Tires	0%	0.0039	425%	5218	1305	60	134
Leather	0%	0.0035	362%	3787	947	62	114
Composite Organic Materials	0%	0.0106	224%	1452	363	68	71
<b>Metals</b>	<b>3%</b>	<b>0.0162</b>	<b>64%</b>	<b>117</b>	<b>29</b>	<b>95</b>	<b>20</b>
Metal Beverage (deposit)	0%	0.0013	89%	227	57	88	28
Metal Beverage (non-deposit)	0%	0.0000	0%	0	0	0	0
Metal Packaging (food)	1%	0.0069	92%	243	61	87	29
Aluminum Foil and Trays (packaging)	0%	0.0014	429%	5309	1327	60	135
Aluminum Foil and Trays (non-packaging)	0%	0.0045	116%	387	97	82	37
Non-consumables mixed metals (<0.5kg)	0%	0.0083	171%	846	211	73	54
Non-consumables mixed metals (>0.5kg)	1%	0.0169	231%	1546	386	68	73
<b>Glass</b>	<b>3%</b>	<b>0.0324</b>	<b>103%</b>	<b>307</b>	<b>77</b>	<b>85</b>	<b>33</b>
Beverage Containers (deposit)	1%	0.0106	164%	778	194	74	52
Beverage Containers (non-deposit)	0%	0.0000	0%	0	0	0	0
Glass Packaging (food)	1%	0.0133	104%	311	78	85	33
Other Glass and Ceramics	1%	0.0237	196%	1105	276	71	62
<b>Building Materials</b>	<b>6%</b>	<b>0.0788</b>	<b>138%</b>	<b>554</b>	<b>138</b>	<b>78</b>	<b>44</b>
Gypsum/drywall/plaster	1%	0.0341	293%	2470	618	64	92
Masonry/bricks	0%	0.0184	390%	4380	1095	61	123
Asphalt products	0%	0.0052	539%	8372	2093	58	170
Carpet & Underlay	2%	0.0492	237%	1624	406	67	75
Flooring (non-wood)	0%	0.0036	539%	8372	2093	58	170
Other (fiberglass insulation)	2%	0.0362	200%	1152	288	70	63

### Appendix D - Statistical Analysis

Waste Material	Mean Percentage	Standard Deviation	% Standard Deviation	Estimated Number of samples at 10% precision - 90% confidence	Estimated Number of samples at 20% precision - 90% confidence	% Confidence with which we can estimate the mean with 20% precision based on twenty-nine samples	% Precision with which we can estimate the mean with 90% confidence based on twenty-nine samples
<b>Electronics</b>	<b>2%</b>	<b>0.0413</b>	<b>167%</b>	<b>805</b>	<b>201</b>	<b>74</b>	<b>53</b>
Computers and Peripherals	1%	0.0276	536%	8286	2071	58	169
Televisions and Audio Visual Equipment	1%	0.0225	359%	3729	932	62	113
Telephones and Telecommunications Equipment	0%	0.0109	408%	4801	1200	60	129
Small Kitchen Appliances and Floor Care Equipment	0.7%	0.0145	206%	1221	305	70	65
Electronic Toys	0%	0.0005	388%	4354	1088	61	123
Smoke and CO Detectors	0%	0.0000	0%	0	0	0	0
Other Electronics	0%	0.0080	229%	1511	378	68	72
<b>Household Hazardous</b>	<b>3%</b>	<b>0.0579</b>	<b>204%</b>	<b>1199</b>	<b>300</b>	<b>70</b>	<b>64</b>
Batteries	0%	0.0014	149%	641	160	76	47
Medical/Biological	1%	0.0237	287%	2375	594	64	90
Stains/Preservatives	0%	0.0007	539%	8372	2093	58	170
Latex Paint	0%	0.0113	243%	1698	424	67	77
Oil Based Paint	0%	0.0031	539%	8372	2093	58	170
Aerosols	0%	0.0032	179%	925	231	72	56
Solvents	0%	0.0028	447%	5776	1444	59	141
Pesticides/Herbicides/Fungicides	0%	0.0003	539%	8372	2093	58	170
Motor Oil	0%	0.0014	340%	3334	834	62	107
Oil Filters	0%	0.0000	0%	0	0	0	0
Anti-Freeze	0%	0.0000	0%	0	0	0	0
Pharmaceuticals	0%	0.0009	251%	1815	454	66	79
Other Petroleum Based Products	0%	0.0017	539%	8372	2093	58	170
Mercury Containing Items	0%	0.0003	281%	2273	568	65	89
Other HHW	1%	0.0468	461%	6143	1536	59	146
<b>Household Hygiene</b>	<b>8%</b>	<b>0.0946</b>	<b>111%</b>	<b>358</b>	<b>89</b>	<b>83</b>	<b>35</b>
Diapers / Personal Hygiene	6%	0.0764	124%	442	110	80	39
Pet Waste	2%	0.0346	149%	644	161	76	47
<b>Bulky Objects</b>	<b>1%</b>	<b>0.0323</b>	<b>231%</b>	<b>1535</b>	<b>384</b>	<b>68</b>	<b>73</b>
White Goods	0%	0.0000	0%	0	0	0	0
Furniture	1%	0.0323	231%	1535	384	68	73
<b>Cosmetics</b>	<b>0%</b>	<b>0.0038</b>	<b>115%</b>	<b>381</b>	<b>95</b>	<b>82</b>	<b>36</b>
Cosmetics / Soaps	0%	0.0038	115%	381	95	82	36
<b>Fines</b>	<b>1%</b>	<b>0.0179</b>	<b>233%</b>	<b>1571</b>	<b>393</b>	<b>68</b>	<b>74</b>
Fines	1%	0.0179	233%	1571	393	68	74
<b>Totals</b>	<b>100%</b>	<b>0.0572</b>	<b>123%</b>	<b>560</b>	<b>140</b>	<b>83</b>	<b>39</b>