



**Waitakere City Council**  
*Te Taiao o Waitakere*

## Analysis of Earthsong Eco-Neighbourhood Refuse

Prepared for Robin Allison

**April 2010**

### **Introduction**

As part of Waitakere City Council “Zeroing in on Waste”, the council’s guiding document for waste management, the council regularly audits the city’s domestic waste stream. Domestic refuse was collected from Earthsong on April 1 2010 and audited as part of a wider study comparing Earthsong’s per capita use rates and resource habits with traditional urban residential living. The data collected was compared with a previous audit of Earthsong refuse which took place in April 2003, and also with refuse quantities for Waitakere residents generally from a Waste Analysis Plan (WAP) completed by WasteNot Consulting in February 2009.

Earthsong has had an increase in the number of residents. In 2003 there were 17 occupied households and this year, 2010, there are 32 occupied households. 52 adults and 12 children live in households varying in size from one bedroom to four bedrooms.

### **Methodology**

For the audit, all the refuse bags, recycling bins and paper were collected on April 1 2010, and analysed at the Refuse and Recycling Transfer Station. Refuse bags were sorted into refuse, recyclable paper, organic waste and recyclable items that could have been placed into the recycling bins. Recycling bin contents were sorted into glass, aluminium, steel cans, #1 plastics through to #7 plastics and non-conforming items. Paper recycling was sorted into paper recycling and non-conforming items.

Earthsong’s total rubbish, paper and recycling volumes were also recorded every week for 2 months, to give an average quantity per household.



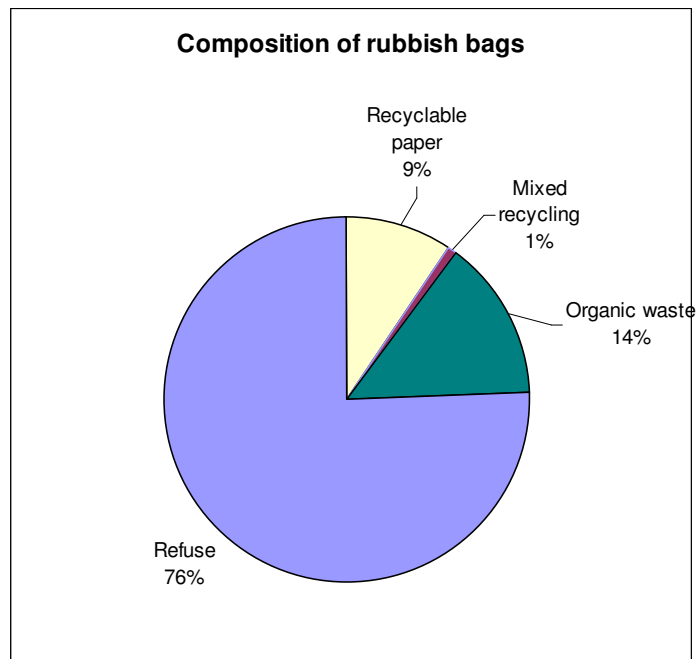
**Picture 1. Waste collected at Earthsong**

On the morning of collection there were five recycling bins, 20 boxes of paper recycling and 21 bags of rubbish.

## Results of the audit

### Rubbish Bags

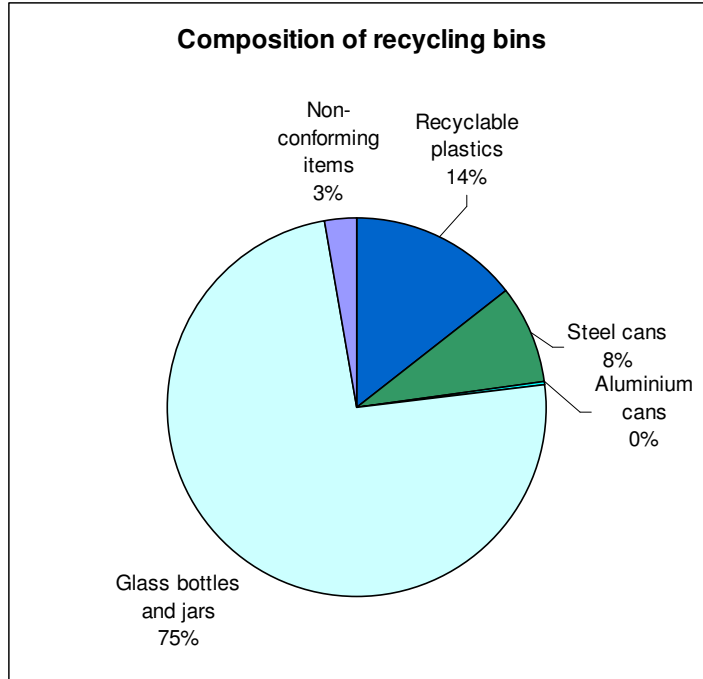
Total number of bags collected was 21 bags with a combined weight of 116.7kg. When the bags were sorted, the results were refuse 75.6%, organic waste 14.3%, recyclable paper 9.3% and mixed recycling 0.9%.



**Graph 1.** Composition of Earthsong rubbish bags.

### Recycling Bins

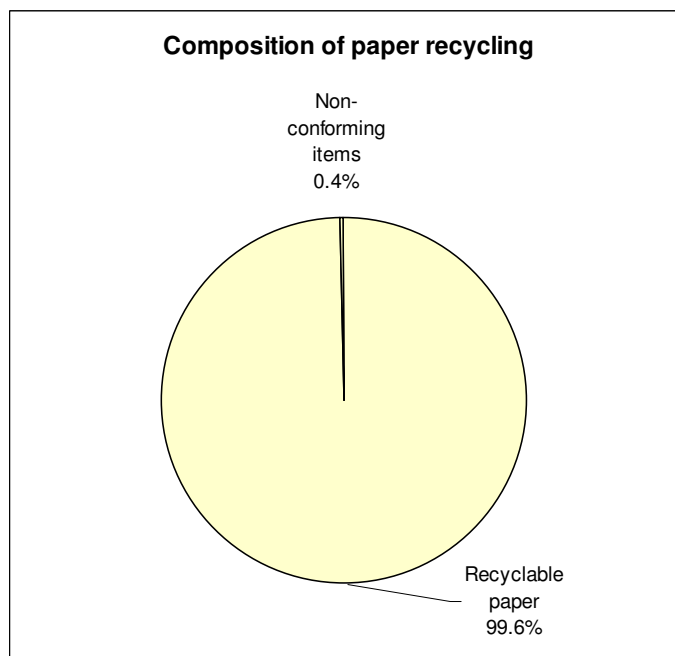
Total number of recycling bins had a combined weight of 77.52 kg. When the contents were sorted out the results were glass bottles and jars 74%, recyclable plastics 14.5%, steel cans 8.2%, non-conforming items 2.8% and aluminium cans 0.4%.



**Graph 2.** Composition of recycling bins.

### Paper

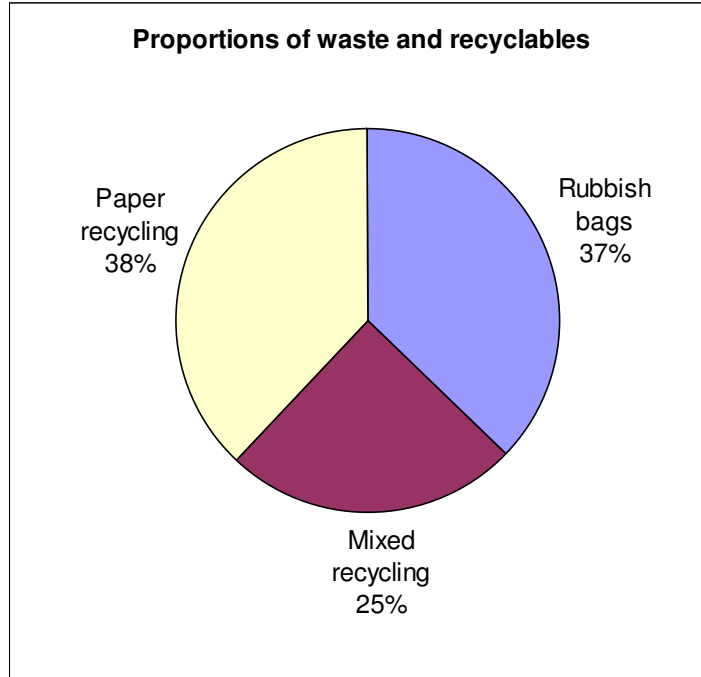
The total amount of paper that was collected had the combined weight of 118.84kg. When the contents were sorted out the results were recyclable paper 99.6% and non-conforming paper 0.4%.



**Graph 3.** Composition of paper recycling.

**Overall composition of waste and recyclables:**

The overall proportions of waste and recycling collected were recyclable paper 38%, rubbish 37% and mixed recycling 25%.



**Graph 4.** Proportions of waste and recyclables.

The recording of waste volumes at Earthsong over the 2-month period gave an average quantity per household of:

Rubbish	Recycling	Paper
2.80kg	2.89kg	3.25kg

**Analysis**

**Quantity of waste per household:**

As in 2003, the audit in 2010 indicates that Earthsong residents are still sorting their waste into paper, recycling and waste streams. Compared to the results from the previous audit in 2003, this audit indicates that the amount of waste per household has increased from 2.24kg in 2003 to 3.65kg in 2010.

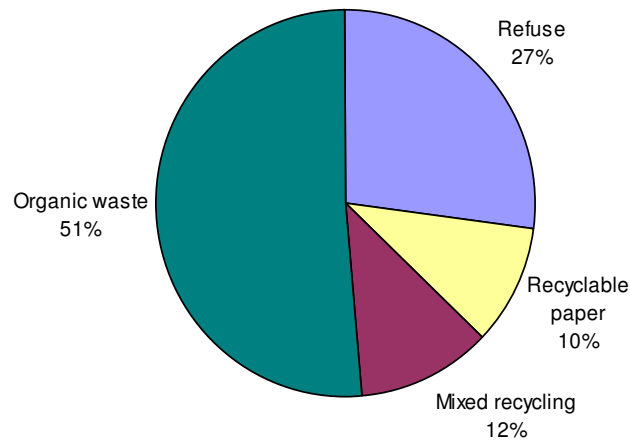
From the two month observation the average rubbish bag weight per household was considerably lower than that of the day of the waste audit. The average weight per household over two months was 2.80kg. For recycling the average weight per household was 2.42kg for the waste audit, yet 2.89kg for the two month observation and for paper the average weight per household during the audit was 3.71kg while over the two month period was 3.25kg per household.

The audit results are still considerably less than the 9.61kg mean bag weight per Waitakere household obtained in the Waste Analysis Plan (WAP) completed by WasteNot Consulting in February 2009. This waste analysis covered 500 Council rubbish bags from over 300 households.

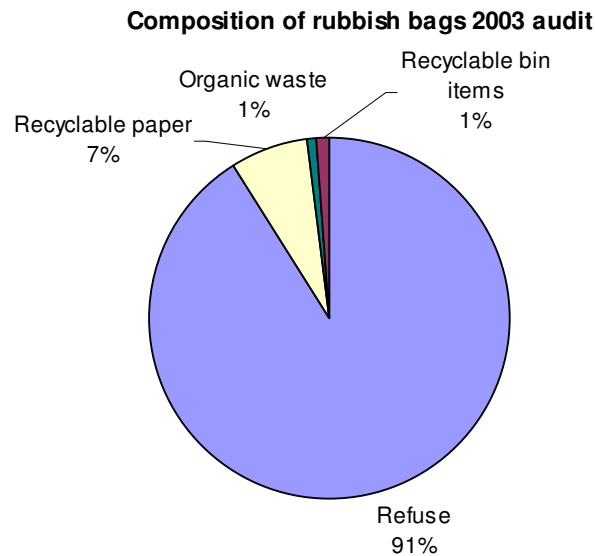
Composition of Waste:

Using the same categories as the audit conducted for Earthsong applied to the waste audit completed by WasteNot Consulting in 2009 for Waitakere residents, we can compare the results with those from the Earthsong audit. Of the contents from the rubbish bags collected for the Waitakere residential audit, 73% of the waste could have been diverted from landfill (Graph 5, 51% organic waste, 10% recyclable paper and 12% mixed recycling). Compared with the results from the audit for Earthsong in 2010, 24.4% could have been diverted (Graph 1, 9.3% recyclable paper, 0.9% mixed recycling and 14.3% organic waste).

**Composition of Waitakere residential rubbish bags**



**Graph 5.** Composition of Waitakere residential rubbish bags from waste audit conducted in 2009



**Graph 6.** Composition of Earthsong rubbish bags from waste audit conducted in 2003.

Composition of organic waste:

The main differences in the waste audit in 2003 to this year, is that there has been an increase in organic waste from 1% in 2003 to 14.3% in 2010. The majority of this organic waste was found in a single rubbish bag, indicating that the waste from one household has significantly affected the average. The amount of recyclable paper that was found in the rubbish bags has increased from 7% to 9.3%. The amount of mixed recycling is very similar. In 2003 paper comprised 1% of the material found in the rubbish bags, and 0.9% in 2010.



**Picture 2. Organic waste**

A total of 14.3% of organic waste was removed from the rubbish bags. The organic waste was a combination of garden waste and food.



**Picture 3. Recyclable Paper in the rubbish bags**

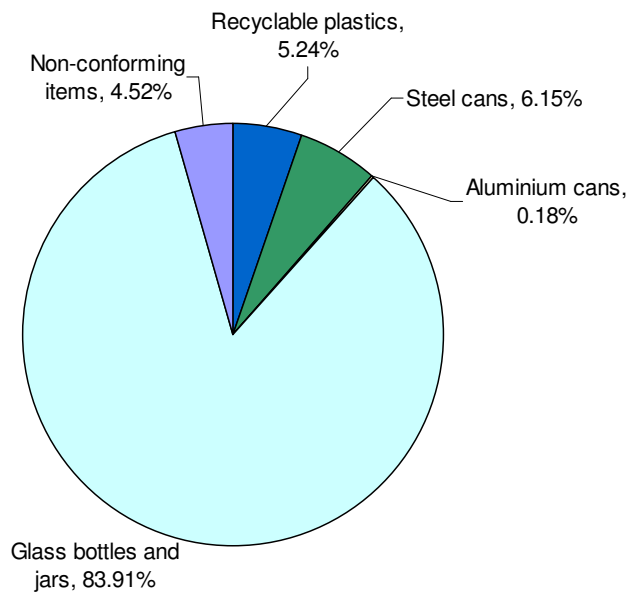
Paper that could be recycled found in the rubbish bags comprised 9.3%. This included a mix of packaging and new paper.

Composition of recycling:

A small amount of non-conforming items were found in the recycling and with the paper recycling. Items found that were not recyclable are oil containers, paper coated with plastic film and plastics that are not labelled 1 through to 7 (picture 2).

Recyclable collection in Waitakere now covers all plastics labelled one through to seven. In 2003 the plastic collected only included labels one to two. The proportion of recyclable plastics has increased from 6% in 2003 to 14.5% in 2010. Steel cans have also increased from 6% in 2003 to 8.2% in 2010. Glass bottles and jars (83% in 2003, 74% in 2010) and non-conforming items (4.5% in 2003 and 2.8% in 2010) found in the recycling bins have reduced. Aluminium cans have reduced slightly from 0.5% in 2003 to 0.4% in 2010.

**Composition of recycling bin 2003 audit**



**Graph 7.** Composition of recycling bins in the 2003 Earthsong audit



**Picture 4.** Contamination in Recycling and paper recycling

Very little non-conforming paper was found in this audit (0.4%) with the paper recycling which is similar to the audit in 2003 (1%).

## **Conclusion**

The overall results of the snapshot analysis are very good. Earthsong residents are doing a great job at diverting waste to landfill by composting on site and sorting their recyclables. There is a good amount of recycling through both the recycling bins and paper collection taking place.

Further education of the residents on what can be recycled through the kerbside collection program will help to reduce the amount of non conforming recycling found in the recycling bins and paper collection. Education may also help reduce the amount of recyclable paper and compostable material found in the refuse.

### **Prepared By**

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## APPENDIX 1. Results of the waste audit.

### Rubbish bags

	Tare weights	Gross weights	Net weights	Proportion
Recyclable paper	3.54	14.4	10.9	9.3%
Mixed recycling	3.24	4.2	1.0	0.9%
Organic waste	2.54	19.2	16.6	14.3%
Refuse	6.26	125.8	88.2	75.6%
<b>Total weight of rubbish bags:</b>			<b>116.7</b>	<b>100.0%</b>

### Recycling bins

	Tare weights	Gross weights	Net weights	Proportion
Recyclable plastics	3.26	27.5	11.22	14.5%
Steel cans	3.54	9.9	6.4	8.2%
Aluminium cans	3.26	3.6	0.3	0.4%
Glass bottles and jars	6.28	76.2	57.38	74.0%
Non-conforming items	2.56	4.8	2.2	2.8%
<b>Total weight of recyclables:</b>			<b>77.52</b>	<b>100.0%</b>

### Paper recycling

	Tare weights	Gross weights	Net weights	Proportion
Recyclable paper	0	118.36	118.36	99.6%
Non-conforming items	2.56	3.04	0.48	0.4%
<b>Total weight of paper:</b>			<b>118.84</b>	<b>100.0%</b>

### Composition of total waste generated at Earth Song - week to 1st April 2010

Refuse	116.7
Mixed recycling	77.52
Paper recycling	118.84

<b>Refuse bag weights</b>	3.2
	2.44
	2.82
	8.78
	12.96
	4.6
	3.22
	8.74
	3.14
	7.56
	4.62
	4.38
	3.08
	3.1
	2.18
	2.8
	11.66
	9.64
	4.14
	2.96
	10.86
<b>Average bag weight</b>	<b>5.57</b>
<b>Median bag weight</b>	<b>4.14</b>

## Appendix 2: Earthsong Eco-Neighbourhood Kerbside Solid Waste Record

Date	Grey Bags	Wheelie bins	Paper	Nos on site in week before
28.1.10	10			52 adults, 11 kids
4.2.10	20 (11 am)	4 ½ large, ¾ small = 1185 litres	18 boxes = 0.72 m <sup>2</sup>	53 adults, 11 kids
11.2.10	13 (8.45 am)			55 adults, 11 kids
18.2.10	7	3 large, 2 small = 1000 litres	12 boxes = 0.48 m <sup>2</sup>	53 adults, 11 kids
25.2.10	15 (9 am)			50 adults, 11 kids
4.3.10	13	3 ½ large, 1 x small = 980 litres	15 boxes = 0.6 m <sup>2</sup>	50 adults, 11 kids
11.3.10	13 (10.45 am)			54 adults, 13 kids
18.3.10	21 (9.30 am)	3 x large, 2 ¼ x small = 1035 litres	22 boxes = 0.88 m <sup>2</sup>	54 adults, 12 kids
25.3.10	15 (1.30pm)			52 adults, 12 kids
1.4.10	19 (9 am)	2 ½ large, 1 ¾ small = 845 litres	20 boxes = 0.8 m <sup>2</sup>	52 adults, 12 kids
<b>Average</b>	<b>14.6 bags</b>	<b>1009 litres</b>	<b>0.7 m<sup>2</sup></b>	<b>52 adults, 12 kids = 64/32 = 2 people per household.</b>

Grey bags are counted as full equivalents.

Wheelie bins full equivalents. Large bin = 240 litres, small bin = 140 litres.

Paper estimated on site as nos. of equivalent full banana boxes (500 x 400 x 200mm = 0.04 m<sup>2</sup>)

Numbers of people living on site averaged for Thursday - Wednesday before collection day.

Where possible rubbish was measured around 9 am on Thursday. (Some could have been added after this time).