



Multi-Unit Dwelling Waste Audit Report

Prepared for Auckland Council

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1. INTRODUCTION

In August 2022, Molly Coombes, Waste Planning Advisor, Waste Solutions, Auckland Council, requested a proposal to undertake an audit of waste and recycling from a selection of multi-unit dwelling (MUDs) in central Auckland.

Waste and recycling collections from MUDs vary, with many MUDs contracting private waste companies to collect their waste, and others using Council’s domestic kerbside collections. While reasons for choosing one service over the other vary, it is often related to the size of the complexes and accessibility of bins. Council’s kerbside rubbish and recycling collections in central Auckland collects materials set out in 120- and 240-litre wheelie bins on the kerbside. For many MUDs it is not feasible to use 120- and 240-litre wheelie bins and set them out once a week. Larger bins and more frequent collections are required.

Council has an obligation under the Waste Minimisation Act 2008 to plan for the collection of domestic waste from all residences, regardless of the ultimate service provider. Council commissioned this audit to attempt to better understand waste generation in MUDs.

1.1. Sites selected

Prior to the audit, Council, with assistance from local waste contractor, Rubbish Direct, selected four MUDs to be included in this study. These sites were chosen to represent a selection of different types of MUDs, both in the inner city business district (ICDB) and in the inner city suburbs. The selected MUDs are shown in Table 1.1.

Table 1.1 – MUDs selected for waste audits

Site name	MUD A	MUD B	MUD C	MUD D
Tenant type	Majority tenant-occupied	Majority owner-occupied	Majority owner-occupied	Majority tenant-occupied
# of residential units	110	27	25	174
# of residents	345	42	45	550

The selected MUDs include one large and one smaller MUD in the ICBD, and one large and one smaller MUD in the central suburbs. Both of the larger MUDs are majority tenant-occupied and the smaller MUDs are majority owner-occupied.

1.2. Waste and recycling services

The selected MUDs receive waste and recycling services from Rubbish Direct. Rubbish Direct provide waste, commingled recycling and cardboard recycling receptacles to each of these MUDs. These receptacles are located in communal areas and residents place their waste materials directly into these bins.

Table 1.2 provides an overview of the bin numbers, types and sizes at each MUD, and their collection frequency.

Table 1.2 – Number of waste and recycling bins held by each MUD

Site name	MUD A	MUD B	MUD C	MUD D
Waste to landfill	2 x 1100-litre bins, emptied 5 x weekly	1 x 1100-litre bins, emptied 3 x weekly	2 x 240-litre bins, emptied 5 x weekly	2 x 1100-litre bins, emptied 6 x weekly
Commingled recycling	3 x 660-litre bins, emptied 4 x weekly	3 x 240-litre bins, emptied 3 x weekly	2 x 240-litre bins, emptied 5 x weekly	4 x 240-litre bins, emptied 7 x weekly
Cardboard recycling	1 x 1100-litre bins, emptied 3 x weekly	1 x 1100-litre bins and 1 x 600-litre sack, emptied 3 x weekly	1 x 600-litre sack, emptied 5 x weekly	2 x 600-litre sacks, emptied 7 x weekly

2. WASTE AUDIT METHODOLOGY

2.1. Delivery of rubbish and recycling bins

The rubbish and recycling bins from each MUD were tagged with the name of the MUD and delivered directly to Waitakere Transfer Station by Rubbish Direct on the morning of the audit.



Rubbish and recycling bins delivered on Tuesday 6 and Thursday 8 December

2.2. Auditing

Auditing was undertaken at Waitakere Transfer Station over two days (Tuesday 6 and Thursday 8 November 2022). The sorting was supervised by a SYCL staff member and three casual staff were engaged to assist.

Each MUD's waste and recycling was sorted separately. All waste materials were removed from a MUDs waste bin and weighed. They were then placed onto a sorting table. The audit team sorted the materials in the waste into the 23 categories outlined in Appendix 1. Labelled crates set out around the sorting table were used to store the materials.

Once all of the waste from that MUD had been sorted into the 23 categories, the materials were weighed, and the weights recorded. The waste was then placed back into the rubbish bin it had been removed from.



Waste audit set up

Once all of the waste had been sorted and disposed of, the materials in the recycling bins were sorted in a similar way. Recycling was sorted into the same 23 categories as the waste. Cardboard was also sorted in the same way.

3. AUDIT RESULTS

The following sections provide the results of the audit of waste and recycling from the four MUDs.

3.1. Waste to landfill

One or two days' worth of rubbish were delivered to the transfer station for the audit. Rubbish Direct provided SYCL with a list of how many days' worth of material were contained in each bin. This information has been used to calculate average waste per week for each MUD. It should be noted that waste quantities are likely to vary from day to day, so extrapolating from one or two days is not the most reliable manner to estimate weekly waste generation. However, in the absence of better data, the waste audit data has been extrapolated to weekly for the purposes of this report.

Table 3.1 provides the total weight of waste to landfill per MUD per week, based on the audit results. The average weight of waste to landfill per residential unit within each MUD is also provided, as well as the average weight of waste to landfill per resident within each MUD. These have been calculated using the number of residential units and residents provided by the MUD facility managers.

The overall composition of the waste to landfill from each MUD per week is provided in Appendix 1. Appendix 2 provides the composition of waste to landfill per residential unit per week at each MUD, and Appendix 3 provides the composition of waste to landfill per resident per week at each MUD.

Table 3.1 – Weekly waste to landfill from each MUD

Waste to landfill per week	MUD A	MUD B	MUD C	MUD D	Average
Kg waste per week	1,118 kg	197 kg	232 kg	947 kg	-
Kg waste per residential unit	10.2 kg	7.3 kg	9.3 kg	5.4 kg	7.4 kg
Kg waste per resident	3.2 kg	4.7 kg	5.1 kg	1.7 kg	2.5 kg

Waste to landfill per residential unit per week varies from 5.4 kg at MUD D to 10.2 kg at MUD A. The average weight of waste to landfill per residential unit, across the four MUDs, is 7.4 kg. Waste to landfill per resident per week varied from 1.7 kg at MUD D to 5.1 kg at MUD C. The average weight of waste to landfill per resident, across the four MUDs, was 2.5 kg.

While recycling bins are available at each of the four MUDs, recyclable materials were still found in the waste to landfill. Table 3.2 presents the quantity of recyclable materials in each MUDs waste to landfill. Compostable materials are also presented in this table, as these could be diverted to composting if organics collection bins were available.

Table 3.2 – Proportion of weekly waste that could be diverted to recycling or composting

Proportion of weekly waste that could potentially be diverted to recycling or composting	MUD A	MUD B	MUD C	MUD D
Recyclable paper	5.4%	4.1%	23.2%	6.2%
Plastic containers #1, 2 & 5	3.2%	3.0%	3.5%	4.8%
Steel cans	0.5%	0.4%	0.8%	0.5%
Aluminium cans	0.3%	0.2%	0.3%	0.5%
Glass bottles/jars	2.1%	2.7%	12.6%	5.6%
ALL RECYCLABLE MATERIALS	11.5%	10.4%	40.4%	17.6%
Food waste	52.2%	47.3%	34.7%	44.9%
Greenwaste	0.1%	1.6%	0.0%	0.4%
ALL COMPOSTABLE MATERIALS	52.3%	48.9%	34.7%	45.3%
ALL DIVERTABLE MATERIALS	63.8%	59.2%	75.1%	62.9%
ALL DIVERTABLE MATERIALS - KG	713.2 kg/ week	116.6 kg/ week	174.0 kg/ week	85.1 kg/ week

The waste audit found that between 59% and 75% of waste to landfill from each MUD could potentially be diverted to recycling or composting.

The proportion of recyclable materials in the waste stream varied considerably between the four MUDs, from 10.4% of waste to landfill at MUD B to 40.1% at MUD C. Organic waste was comprised almost entirely of food waste at each MUD, and varied from 34.7% of waste to landfill at MUD C to 52.3% at MUD A.

3.1. Recycling

Each of the four MUDs have commingled recycling bins and cardboard bins or sacks available for use. These recycling bins/sacks were audited, and Table 3.3 provides an overview of the proportion of contamination in each building's commingled recycling and cardboard recycling, as well as the weekly quantity of these materials collected from each building (extrapolated from the audit results).

There was no cardboard recycling available from MUD C.

The full composition of the audit of recyclable materials is available in Appendices 4 and 5.

Table 3.3 – Commingled and cardboard recycling per MUD

Contamination in commingled and cardboard recycling	MUD A	MUD B	MUD C	MUD D
Commingled recycling				
Total commingled recycling per week per MUD (kg)	148 kg	120 kg	42 kg	217 kg
Commingled recycling per residential unit per week (kg)	1.3 kg	4.5 kg	1.7 kg	1.2 kg
Recyclable materials in commingled recycling	76%	89%	99%	80%
Contamination in commingled recycling	24%	11%	1%	20%
Cardboard recycling				
Cardboard recycling per week per MUD (kg)	103 kg	21 kg	-	36 kg
Cardboard recycling per residential unit per week (kg)	0.9 kg	0.8 kg	-	0.2 kg
Recyclable cardboard	99%	100%	-	100%
Contamination	1%	0%	-	0%

There was almost no contamination in the commingled recycling from MUD C. Contamination in commingled recycling from the other three MUDs varied from 11% to 24%, by weight.

There was very little contamination in cardboard recycling at any of the MUDs.

4. DISCUSSION

The MUDs included in this research include two MUDs in the ICBD, and two in the suburbs, two majority tenant-occupied and two majority owner-occupied. The sample also includes two larger MUDs and two smaller MUDs.

Trying to discern whether any of these factors affects waste generation is challenging. These factors are outlined in Table 4.1, along with weekly waste per residential unit and per resident, based on the waste audit results.

Table 4.1 – Comparison of MUD waste generation with possible affecting factors

Site name	MUD A	MUD B	MUD C	MUD D
Address	Suburb	Suburb	ICBD	ICBD
Tenant type	Majority tenant-occupied	Majority owner-occupied	Majority owner-occupied	Majority tenant-occupied
Waste to landfill bin types	2 x 1100-litre bins	1 x 1100-litre bins	2 x 240-litre bins	2 x 1100-litre bins
Commingled recycling	3 x 660-litre bins	3 x 240-litre bins	2 x 240-litre bins	4 x 240-litre bins
# of residential units	110	27	25	174
Average # of residents per unit	3.14	1.56	1.80	3.16
Average waste per unit per week	10.2 kg	7.3 kg	9.3 kg	5.4 kg
Average waste per resident per week	3.2 kg	4.7 kg	5.1 kg	1.7 kg

An audit of domestic kerbside rubbish collected from the Auckland Isthmus in 2016¹ found that the average household kerbside rubbish bin held 9.99 kg of waste. This is not the same as weekly waste generation, rather it is the amount of rubbish set out by a household when they set out rubbish, which may be weekly, fortnightly or less often.

In the current audit, weekly waste generation at three of the MUDs is within a similar range as the Auckland isthmus kerbside rubbish bin set out weight.

The outlier in terms of waste generation is MUD D, with 5.4 kg per residential unit per week. With the available information it is not possible to determine whether this is because there was lower than usual waste disposal on the day before the audit (affecting the size of the audit sample), or whether waste generation at MUD D is usually lower than at the other three MUDs.

¹ Waste Not Consulting, 2016, *Composition of Auckland Domestic Kerbside Waste*, Auckland Council

As it is unlikely that residents dispose of their waste to the communal bins on a daily basis, it is feasible that there are higher or lower quantities of waste in the communal bins on some days of the week than on others.

Ideally a waste audit would include a week’s worth of waste and recycling from each MUD, however the logistics of collecting a week’s worth of waste (involving up to seven collections per MUD) is likely to prove too onerous.

One possible trend seen in the data outlined in Table 4.1, is that units with higher numbers of residents generate less waste per resident than units with lower numbers of residents. This has been seen in other research and points to waste generation being more closely linked to the running of a household than to the number of people living within the household. For example, the amount of waste generated in cooking a meal for three is not exponentially larger than when cooking a meal for two.

In Table 4.2, the results of the waste audit and the audit of recycling have been combined, to show the overall waste generation from each MUD (waste and recycling combined). The full composition of the overall waste is presented in Appendix 6.

Table 4.2 – Overall waste generation – waste and recycling

Overall waste generation – waste and recycling	MUD A	MUD B	MUD C	MUD D
Overall waste generation	12.45 kg	12.52 kg	10.93 kg	6.91 kg

Table 4.2 shows that when all waste materials are combined, there is very little difference in waste generation between three of the MUDs (between 12.52 kg and 10.93 kg per week). Waste generation at MUD D is considerably lower, at 6.91 kg per week.

In Figure 4.1, the materials disposed of to the waste to landfill bins and the materials disposed of to recycling bins have been combined to show the primary composition of overall waste generation per MUD.

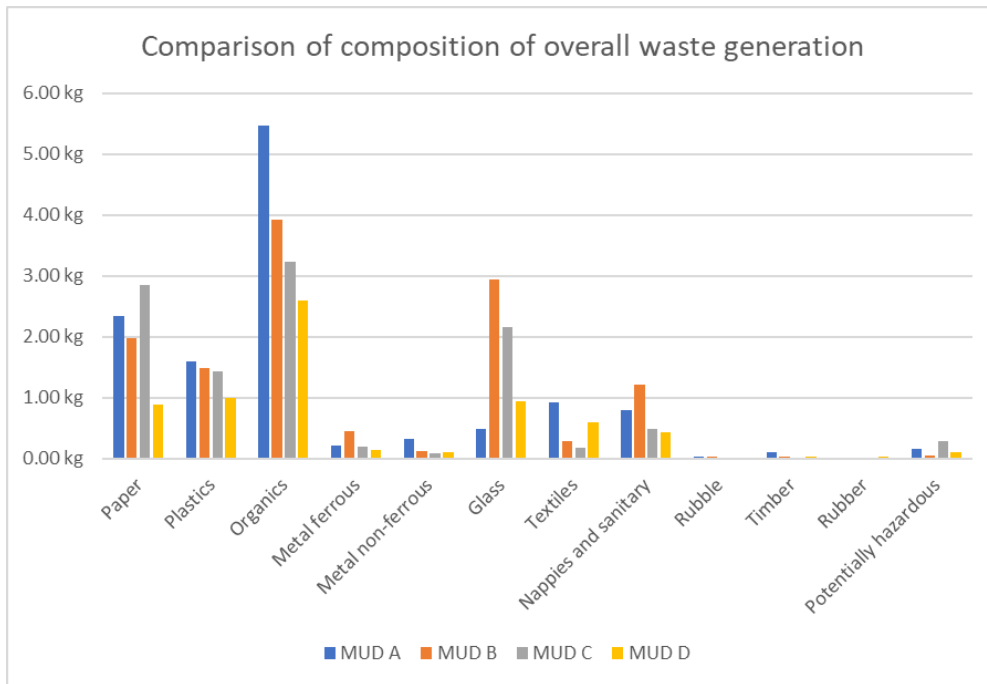


Figure 4.1 - Comparison of the composition of overall waste generation

This figure shows that MUD D has lower quantities of almost all materials than the other MUDs. MUD A generates higher quantities of Organics than the other MUDs, and MUD B generates higher quantities of Glass and Nappies and sanitary. MUD C has slightly higher quantities of Paper.

Table 4.3 provides a comparison of the composition of the primary categories of waste in the four MUDs with the composition of domestic kerbside rubbish on the Auckland Isthmus in 2016. The composition of all secondary categories is presented in Appendix 7.

Table 4.3 – Comparison of composition of primary categories of waste, MUDs (2022) and Auckland Isthmus (2016)

Primary Categories	MUD A	MUD B	MUD C	MUD D	Auckland Isthmus 2016
Paper	8.3%	7.1%	25.9%	8.8%	7.9%
Plastics	12.1%	10.1%	13.8%	15.0%	11.3%
Organics	53.0%	51.2%	34.8%	46.5%	56.9%
Metal ferrous	1.6%	4.4%	1.8%	1.2%	1.4%
Metal non-ferrous	2.6%	0.5%	0.7%	1.6%	1.1%
Glass	2.5%	4.7%	12.6%	6.0%	2.5%
Textiles	9.2%	3.9%	1.9%	10.5%	3.4%
Nappies and sanitary	7.8%	16.6%	5.3%	7.8%	10.4%
Rubble	0.3%	0.5%	0.0%	0.0%	2.2%
Timber	1.1%	0.5%	0.2%	0.1%	1.0%
Rubber	0.1%	0.0%	0.0%	0.6%	0.5%
Potentially hazardous	1.5%	0.4%	3.1%	1.9%	1.4%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

While there are differences in composition between the different MUDs and the average Auckland isthmus weekly household set out, the compositions are generally similar. The largest differences are at MUD C, which has higher proportions of Paper and Glass.

Contamination in recycling bins varied across the four MUDs. It is not possible to draw any conclusions about contamination levels based on different sized recycling bins, as in the two MUDs with the worst contamination levels (MUD A 24% and MUD D 20%), one uses 660-litre bins while the other uses 240-litre bins.

APPENDIX 1 – WASTE TO LANDFILL PER WEEK

Kg of waste to landfill per week		MUD A	MUD B	MUD C	MUD D
Paper	Recyclable paper	60.8 kg	8.1 kg	53.8 kg	58.5 kg
	Non-recyclable paper	32.5 kg	5.9 kg	6.2 kg	24.8 kg
	Subtotal	93.2 kg	13.9 kg	59.9 kg	83.3 kg
Plastics	# 1, 2 and 5 containers	35.6 kg	6.0 kg	8.1 kg	45.5 kg
	#3, 4, 6, & 7 containers	1.7 kg	0.4 kg	0.4 kg	1.8 kg
	Plastic bags and film	68.5 kg	10.9 kg	18.5 kg	15.0 kg
	Non-recyclable plastics	29.3 kg	2.6 kg	5.0 kg	80.1 kg
	Subtotal	135.0 kg	19.9 kg	32.1 kg	142.4 kg
Organics	Food waste	583.2 kg	93.0 kg	80.5 kg	425.3 kg
	Greenwaste	1.3 kg	3.2 kg	0.0 kg	3.9 kg
	Organic other	7.8 kg	4.7 kg	0.1 kg	11.5 kg
	Subtotal	592.3 kg	100.9 kg	80.6 kg	440.7 kg
Ferrous metals	Steel cans	5.7 kg	0.8 kg	1.8 kg	4.3 kg
	Ferrous other	12.5 kg	7.8 kg	2.2 kg	7.3 kg
	Subtotal	18.2 kg	8.7 kg	4.1 kg	11.6 kg
Non-ferrous metals	Aluminium cans	3.6 kg	0.4 kg	0.7 kg	4.5 kg
	Non-ferrous other	25.9 kg	0.6 kg	1.0 kg	10.4 kg
	Subtotal	29.5 kg	0.9 kg	1.7 kg	14.8 kg
Glass	Bottles/jars	23.0 kg	5.3 kg	29.1 kg	53.5 kg
	Glass other	4.5 kg	4.0 kg	0.0 kg	2.9 kg
	Subtotal	27.4 kg	9.2 kg	29.1 kg	56.4 kg
Textiles	Clothing & rags	9.7 kg	4.8 kg	3.5 kg	69.7 kg
	Textile other	92.7 kg	2.9 kg	1.0 kg	29.7 kg
	Subtotal	102.3 kg	7.8 kg	4.5 kg	99.4 kg
Nappies and sanitary		87.2 kg	32.7 kg	12.2 kg	73.6 kg
Rubble		2.8 kg	1.1 kg	0.0 kg	0.0 kg
Timber		12.5 kg	0.9 kg	0.4 kg	1.0 kg
Rubber		1.1 kg	0.1 kg	0.0 kg	5.6 kg
Potentially hazardous	Household	16.2 kg	0.8 kg	5.9 kg	18.3 kg
	Other	0.0 kg	0.0 kg	1.3 kg	0.0 kg
	Subtotal	16.2 kg	0.8 kg	7.1 kg	18.3 kg
TOTAL		1,117.9 kg	196.8 kg	231.7 kg	947.2 kg

Composition of waste to landfill – kg per week		MUD A	MUD B	MUD C	MUD D
Paper	Recyclable paper	5.4%	4.1%	23.2%	6.2%
	Non-recyclable paper	2.9%	3.0%	2.7%	2.6%
	Subtotal	8.3%	7.1%	25.9%	8.8%
Plastics	# 1, 2 and 5 containers	3.2%	3.0%	3.5%	4.8%
	#3, 4, 6, & 7 containers	0.2%	0.2%	0.2%	0.2%
	Plastic bags and film	6.1%	5.5%	8.0%	1.6%
	Non-recyclable plastics	2.6%	1.3%	2.2%	8.5%
	Subtotal	12.1%	10.1%	13.8%	15.0%
Organics	Food waste	52.2%	47.3%	34.7%	44.9%
	Greenwaste	0.1%	1.6%	0.0%	0.4%
	Organic other	0.7%	2.4%	0.1%	1.2%
	Subtotal	53.0%	51.2%	34.8%	46.5%
Ferrous metals	Steel cans	0.5%	0.4%	0.8%	0.5%
	Ferrous other	1.1%	4.0%	1.0%	0.8%
	Subtotal	1.6%	4.4%	1.8%	1.2%
Non-ferrous metals	Aluminium cans	0.3%	0.2%	0.3%	0.5%
	Non-ferrous other	2.3%	0.3%	0.4%	1.1%
	Subtotal	2.6%	0.5%	0.7%	1.6%
Glass	Bottles/jars	2.1%	2.7%	12.6%	5.6%
	Glass other	0.4%	2.0%	0.0%	0.3%
	Subtotal	2.5%	4.7%	12.6%	6.0%
Textiles	Clothing & rags	0.9%	2.5%	1.5%	7.4%
	Textile other	8.3%	1.5%	0.4%	3.1%
	Subtotal	9.2%	3.9%	1.9%	10.5%
Nappies and sanitary		7.8%	16.6%	5.3%	7.8%
Rubble		0.3%	0.5%	0.0%	0.0%
Timber		1.1%	0.5%	0.2%	0.1%
Rubber		0.1%	0.0%	0.0%	0.6%
Potentially hazardous	Household	1.5%	0.4%	2.5%	1.9%
	Other	0.0%	0.0%	0.5%	0.0%
	Subtotal	1.5%	0.4%	3.1%	1.9%
TOTAL		100.0%	100.0%	100.0%	100.0%

APPENDIX 2 – WASTE TO LANDFILL PER RESIDENTIAL UNIT

Composition of waste to landfill per residential unit – kg per week		MUD A	MUD B	MUD C	MUD D
Paper	Recyclable paper	0.6 kg	0.3 kg	2.2 kg	0.3 kg
	Non-recyclable paper	0.3 kg	0.2 kg	0.2 kg	0.1 kg
	Subtotal	0.8 kg	0.5 kg	2.4 kg	0.5 kg
Plastics	# 1, 2 and 5 containers	0.3 kg	0.2 kg	0.3 kg	0.3 kg
	#3, 4, 6, & 7 containers	0.0 kg	0.0 kg	0.0 kg	0.0 kg
	Plastic bags and film	0.6 kg	0.4 kg	0.7 kg	0.1 kg
	Non-recyclable plastics	0.3 kg	0.1 kg	0.2 kg	0.5 kg
	Subtotal	1.2 kg	0.7 kg	1.3 kg	0.8 kg
Organics	Food waste	5.3 kg	3.4 kg	3.2 kg	2.4 kg
	Greenwaste	0.0 kg	0.1 kg	0.0 kg	0.0 kg
	Organic other	0.1 kg	0.2 kg	0.0 kg	0.1 kg
	Subtotal	5.4 kg	3.7 kg	3.2 kg	2.5 kg
Ferrous metals	Steel cans	0.1 kg	0.0 kg	0.1 kg	0.0 kg
	Ferrous other	0.1 kg	0.3 kg	0.1 kg	0.0 kg
	Subtotal	0.2 kg	0.3 kg	0.2 kg	0.1 kg
Non-ferrous metals	Aluminium cans	0.0 kg	0.0 kg	0.0 kg	0.0 kg
	Non-ferrous other	0.2 kg	0.0 kg	0.0 kg	0.1 kg
	Subtotal	0.3 kg	0.0 kg	0.1 kg	0.1 kg
Glass	Bottles/jars	0.2 kg	0.2 kg	1.2 kg	0.3 kg
	Glass other	0.0 kg	0.1 kg	0.0 kg	0.0 kg
	Subtotal	0.2 kg	0.3 kg	1.2 kg	0.3 kg
Textiles	Clothing & rags	0.1 kg	0.2 kg	0.1 kg	0.4 kg
	Textile other	0.8 kg	0.1 kg	0.0 kg	0.2 kg
	Subtotal	0.9 kg	0.3 kg	0.2 kg	0.6 kg
Nappies and sanitary		0.8 kg	1.2 kg	0.5 kg	0.4 kg
Rubble		0.0 kg	0.0 kg	0.0 kg	0.0 kg
Timber		0.1 kg	0.0 kg	0.0 kg	0.0 kg
Rubber		0.0 kg	0.0 kg	0.0 kg	0.0 kg
Potentially hazardous	Household	0.1 kg	0.0 kg	0.2 kg	0.1 kg
	Other	0.0 kg	0.0 kg	0.1 kg	0.0 kg
	Subtotal	0.1 kg	0.0 kg	0.3 kg	0.1 kg
TOTAL		10.2 kg	7.3 kg	9.3 kg	5.4 kg

APPENDIX 3 – WASTE TO LANDFILL PER RESIDENT

Composition of waste to landfill per resident – kg per week		MUD A	MUD B	MUD C	MUD D
Paper	Recyclable paper	0.2 kg	0.2 kg	1.2 kg	0.1 kg
	Non-recyclable paper	0.1 kg	0.1 kg	0.1 kg	0.0 kg
	Subtotal	0.3 kg	0.3 kg	1.3 kg	0.2 kg
Plastics	# 1, 2 and 5 containers	0.1 kg	0.1 kg	0.2 kg	0.1 kg
	#3, 4, 6, & 7 containers	0.0 kg	0.0 kg	0.0 kg	0.0 kg
	Plastic bags and film	0.2 kg	0.3 kg	0.4 kg	0.0 kg
	Non-recyclable plastics	0.1 kg	0.1 kg	0.1 kg	0.1 kg
	Subtotal	0.4 kg	0.5 kg	0.7 kg	0.3 kg
Organics	Food waste	1.7 kg	2.2 kg	1.8 kg	0.8 kg
	Greenwaste	0.0 kg	0.1 kg	0.0 kg	0.0 kg
	Organic other	0.0 kg	0.1 kg	0.0 kg	0.0 kg
	Subtotal	1.7 kg	2.4 kg	1.8 kg	0.8 kg
Ferrous metals	Steel cans	0.0 kg	0.0 kg	0.0 kg	0.0 kg
	Ferrous other	0.0 kg	0.2 kg	0.0 kg	0.0 kg
	Subtotal	0.1 kg	0.2 kg	0.1 kg	0.0 kg
Non-ferrous metals	Aluminium cans	0.0 kg	0.0 kg	0.0 kg	0.0 kg
	Non-ferrous other	0.1 kg	0.0 kg	0.0 kg	0.0 kg
	Subtotal	0.1 kg	0.0 kg	0.0 kg	0.0 kg
Glass	Bottles/jars	0.1 kg	0.1 kg	0.6 kg	0.1 kg
	Glass other	0.0 kg	0.1 kg	0.0 kg	0.0 kg
	Subtotal	0.1 kg	0.2 kg	0.6 kg	0.1 kg
Textiles	Clothing & rags	0.0 kg	0.1 kg	0.1 kg	0.1 kg
	Textile other	0.3 kg	0.1 kg	0.0 kg	0.1 kg
	Subtotal	0.3 kg	0.2 kg	0.1 kg	0.2 kg
Nappies and sanitary		0.3 kg	0.8 kg	0.3 kg	0.1 kg
Rubble		0.0 kg	0.0 kg	0.0 kg	0.0 kg
Timber		0.0 kg	0.0 kg	0.0 kg	0.0 kg
Rubber		0.0 kg	0.0 kg	0.0 kg	0.0 kg
Potentially hazardous	Household	0.0 kg	0.0 kg	0.1 kg	0.0 kg
	Other	0.0 kg	0.0 kg	0.0 kg	0.0 kg
	Subtotal	0.0 kg	0.0 kg	0.2 kg	0.0 kg
TOTAL		3.2 kg	4.7 kg	5.1 kg	1.7 kg

APPENDIX 4 – COMMINGLED RECYCLING

Composition of commingled recycling – kg per week		MUD A	MUD B	MUD C	MUD D
Paper	Recyclable paper	58.7 kg	16.7 kg	11.2 kg	30.5 kg
	Non-recyclable paper	3.1 kg	1.9 kg	0.3 kg	4.2 kg
	Subtotal	61.7 kg	18.6 kg	11.5 kg	34.7 kg
Plastics	# 1, 2 and 5 containers	19.7 kg	16.1 kg	3.7 kg	24.5 kg
	#3, 4, 6, & 7 containers	0.6 kg	0.0 kg	0.0 kg	0.8 kg
	Plastic bags and film	3.1 kg	0.6 kg	0.2 kg	3.8 kg
	Non-recyclable plastics	16.9 kg	3.4 kg	0.0 kg	1.7 kg
	Subtotal	40.3 kg	20.2 kg	3.9 kg	30.8 kg
Organics	Food waste	8.4 kg	4.9 kg	0.0 kg	9.8 kg
	Greenwaste	0.0 kg	0.0 kg	0.0 kg	0.0 kg
	Organic other	0.1 kg	0.0 kg	0.0 kg	0.4 kg
	Subtotal	8.5 kg	4.9 kg	0.0 kg	10.2 kg
Ferrous metals	Steel cans	4.8 kg	3.3 kg	0.7 kg	7.3 kg
	Ferrous other	0.0 kg	0.0 kg	0.0 kg	7.4 kg
	Subtotal	4.8 kg	3.3 kg	0.7 kg	14.7 kg
Non-ferrous metals	Aluminium cans	4.2 kg	2.6 kg	0.7 kg	3.1 kg
	Non-ferrous other	0.4 kg	0.0 kg	0.0 kg	0.1 kg
	Subtotal	4.6 kg	2.6 kg	0.7 kg	3.2 kg
Glass	Bottles/jars	25.9 kg	68.3 kg	24.8 kg	107.1 kg
	Glass other	0.0 kg	1.7 kg	0.0 kg	0.0 kg
	Subtotal	25.9 kg	69.9 kg	24.8 kg	107.1 kg
Textiles	Clothing & rags	0.0 kg	0.0 kg	0.0 kg	2.7 kg
	Textile other	0.1 kg	0.0 kg	0.0 kg	2.0 kg
	Subtotal	0.1 kg	0.0 kg	0.0 kg	4.6 kg
Nappies and sanitary		1.4 kg	0.1 kg	0.0 kg	2.5 kg
Rubble		0.0 kg	0.0 kg	0.0 kg	3.1 kg
Timber		0.0 kg	0.1 kg	0.0 kg	4.9 kg
Rubber		0.0 kg	0.0 kg	0.0 kg	0.0 kg
Potentially hazardous	Household	1.0 kg	0.6 kg	0.0 kg	0.7 kg
	Other	0.0 kg	0.0 kg	0.0 kg	0.0 kg
	Subtotal	1.0 kg	0.6 kg	0.0 kg	0.7 kg
TOTAL		148.4 kg	120.3 kg	41.6 kg	216.6 kg

Composition of commingled recycling - %		MUD A	MUD B	MUD C	MUD D
Paper	Recyclable paper	39.5%	13.9%	26.9%	14.1%
	Non-recyclable paper	2.1%	1.6%	0.7%	1.9%
	Subtotal	41.6%	15.4%	27.6%	16.0%
Plastics	# 1, 2 and 5 containers	13.3%	13.4%	8.9%	11.3%
	#3, 4, 6, & 7 containers	0.4%	0.0%	0.0%	0.4%
	Plastic bags and film	2.1%	0.5%	0.5%	1.7%
	Non-recyclable plastics	11.4%	2.9%	0.0%	0.8%
	Subtotal	27.2%	16.8%	9.4%	14.2%
Organics	Food waste	5.7%	4.1%	0.0%	4.5%
	Greenwaste	0.0%	0.0%	0.0%	0.0%
	Organic other	0.1%	0.0%	0.0%	0.2%
	Subtotal	5.8%	4.1%	0.0%	4.7%
Ferrous metals	Steel cans	3.2%	2.7%	1.7%	3.4%
	Ferrous other	0.0%	0.0%	0.0%	3.4%
	Subtotal	3.2%	2.7%	1.7%	6.8%
Non-ferrous metals	Aluminium cans	2.8%	2.2%	1.7%	1.4%
	Non-ferrous other	0.3%	0.0%	0.0%	0.1%
	Subtotal	3.1%	2.2%	1.7%	1.5%
Glass	Bottles/jars	17.5%	56.8%	59.6%	49.5%
	Glass other	0.0%	1.4%	0.0%	0.0%
	Subtotal	17.5%	58.1%	59.6%	49.5%
Textiles	Clothing & rags	0.0%	0.0%	0.0%	1.2%
	Textile other	0.1%	0.0%	0.0%	0.9%
	Subtotal	0.1%	0.0%	0.0%	2.1%
Nappies and sanitary		0.9%	0.1%	0.0%	1.2%
Rubble		0.0%	0.0%	0.0%	1.4%
Timber		0.0%	0.1%	0.0%	2.3%
Rubber		0.0%	0.0%	0.0%	0.0%
Potentially hazardous	Household	0.7%	0.5%	0.0%	0.3%
	Other	0.0%	0.0%	0.0%	0.0%
	Subtotal	0.7%	0.5%	0.0%	0.3%
TOTAL		100.0%	100.0%	100.0%	100.0%

APPENDIX 5 – CARDBOARD RECYCLING

Composition of cardboard recycling – kg per week		MUD A	MUD B	MUD D
Paper	Cardboard	102.2 kg	20.9 kg	36.0 kg
	Non-recyclable paper	0.0 kg	0.0 kg	0.0 kg
	Subtotal	102.2 kg	20.9 kg	36.0 kg
Plastics	# 1, 2 and 5 containers	0.0 kg	0.0 kg	0.6 kg
	#3, 4, 6, & 7 containers	0.0 kg	0.0 kg	0.0 kg
	Plastic bags and film	0.1 kg	0.0 kg	0.0 kg
	Non-recyclable plastics	0.0 kg	0.0 kg	1.3 kg
	Subtotal	0.1 kg	0.0 kg	1.8 kg
Organics	Food waste	0.0 kg	0.0 kg	0.0 kg
	Greenwaste	0.0 kg	0.0 kg	0.0 kg
	Organic other	0.0 kg	0.0 kg	0.0 kg
	Subtotal	0.0 kg	0.0 kg	0.0 kg
Ferrous metals	Steel cans	0.0 kg	0.0 kg	0.0 kg
	Ferrous other	0.0 kg	0.0 kg	0.0 kg
	Subtotal	0.0 kg	0.0 kg	0.0 kg
Non-ferrous metals	Aluminium cans	1.0 kg	0.0 kg	0.0 kg
	Non-ferrous other	0.0 kg	0.0 kg	0.0 kg
	Subtotal	1.0 kg	0.0 kg	0.0 kg
Glass	Bottles/jars	0.0 kg	0.0 kg	0.0 kg
	Glass other	0.0 kg	0.0 kg	0.0 kg
	Subtotal	0.0 kg	0.0 kg	0.0 kg
Textiles	Clothing & rags	0.0 kg	0.0 kg	0.0 kg
	Textile other	0.0 kg	0.0 kg	0.0 kg
	Subtotal	0.0 kg	0.0 kg	0.0 kg
Nappies and sanitary		0.0 kg	0.0 kg	0.0 kg
Rubble		0.0 kg	0.0 kg	0.0 kg
Timber		0.0 kg	0.0 kg	0.0 kg
Rubber		0.0 kg	0.0 kg	0.0 kg
Potentially hazardous	Household	0.0 kg	0.0 kg	0.0 kg
	Other	0.0 kg	0.0 kg	0.0 kg
	Subtotal	0.0 kg	0.0 kg	0.0 kg
TOTAL		103.3 kg	20.9 kg	37.8 kg

Composition of cardboard recycling – %		MUD A	MUD B	MUD D
Paper	Cardboard	98.9%	100.0%	95.2%
	Non-recyclable paper	0.0%	0.0%	0.0%
	Subtotal	98.9%	100.0%	95.2%
Plastics	# 1, 2 and 5 containers	0.0%	0.0%	1.5%
	#3, 4, 6, & 7 containers	0.0%	0.0%	0.0%
	Plastic bags and film	0.1%	0.0%	0.0%
	Non-recyclable plastics	0.0%	0.0%	3.3%
	Subtotal	0.1%	0.0%	4.8%
Organics	Food waste	0.0%	0.0%	0.0%
	Greenwaste	0.0%	0.0%	0.0%
	Organic other	0.0%	0.0%	0.0%
	Subtotal	0.0%	0.0%	0.0%
Ferrous metals	Steel cans	0.0%	0.0%	0.0%
	Ferrous other	0.0%	0.0%	0.0%
	Subtotal	0.0%	0.0%	0.0%
Non-ferrous metals	Aluminium cans	0.9%	0.0%	0.0%
	Non-ferrous other	0.0%	0.0%	0.0%
	Subtotal	0.9%	0.0%	0.0%
Glass	Bottles/jars	0.0%	0.0%	0.0%
	Glass other	0.0%	0.0%	0.0%
	Subtotal	0.0%	0.0%	0.0%
Textiles	Clothing & rags	0.0%	0.0%	0.0%
	Textile other	0.0%	0.0%	0.0%
	Subtotal	0.0%	0.0%	0.0%
Nappies and sanitary		0.0%	0.0%	0.0%
Rubble		0.0%	0.0%	0.0%
Timber		0.0%	0.0%	0.0%
Rubber		0.0%	0.0%	0.0%
Potentially hazardous	Household	0.0%	0.0%	0.0%
	Other	0.0%	0.0%	0.0%
	Subtotal	0.0%	0.0%	0.0%
TOTAL		100.0%	100.0%	100.0%

APPENDIX 6 – COMPARISON OF OVERALL WASTE GENERATION

Composition of overall waste - waste to landfill and recycling combined – kg per unit per week		MUD A	MUD B	MUD C	MUD D
Paper	Recyclable paper	2.01 kg	1.69 kg	2.60 kg	0.72 kg
	Non-recyclable paper	0.32 kg	0.29 kg	0.26 kg	0.17 kg
	Subtotal	2.34 kg	1.98 kg	2.86 kg	0.89 kg
Plastics	# 1, 2 and 5 containers	0.50 kg	0.82 kg	0.47 kg	0.41 kg
	#3, 4, 6, & 7 containers	0.02 kg	0.02 kg	0.02 kg	0.02 kg
	Plastic bags and film	0.65 kg	0.43 kg	0.75 kg	0.11 kg
	Non-recyclable plastics	0.42 kg	0.22 kg	0.20 kg	0.48 kg
	Subtotal	1.59 kg	1.48 kg	1.44 kg	1.01 kg
Organics	Food waste	5.38 kg	3.63 kg	3.22 kg	2.50 kg
	Greenwaste	0.01 kg	0.12 kg	0.00 kg	0.02 kg
	Organic other	0.07 kg	0.17 kg	0.01 kg	0.07 kg
	Subtotal	5.46 kg	3.92 kg	3.23 kg	2.59 kg
Ferrous metals	Steel cans	0.10 kg	0.15 kg	0.10 kg	0.07 kg
	Ferrous other	0.11 kg	0.29 kg	0.09 kg	0.08 kg
	Subtotal	0.21 kg	0.44 kg	0.19 kg	0.15 kg
Non-ferrous metals	Aluminium cans	0.08 kg	0.11 kg	0.06 kg	0.04 kg
	Non-ferrous other	0.24 kg	0.02 kg	0.04 kg	0.06 kg
	Subtotal	0.32 kg	0.13 kg	0.10 kg	0.10 kg
Glass	Bottles/jars	0.44 kg	2.72 kg	2.16 kg	0.92 kg
	Glass other	0.04 kg	0.21 kg	0.00 kg	0.02 kg
	Subtotal	0.48 kg	2.93 kg	2.16 kg	0.94 kg
Textiles	Clothing & rags	0.09 kg	0.18 kg	0.14 kg	0.42 kg
	Textile other	0.84 kg	0.11 kg	0.04 kg	0.18 kg
	Subtotal	0.93 kg	0.29 kg	0.18 kg	0.60 kg
Nappies and sanitary		0.81 kg	1.22 kg	0.49 kg	0.44 kg
Rubble		0.03 kg	0.04 kg	0.00 kg	0.02 kg
Timber		0.11 kg	0.04 kg	0.02 kg	0.03 kg
Rubber		0.01 kg	0.00 kg	0.00 kg	0.03 kg
Potentially hazardous	Household	0.16 kg	0.05 kg	0.24 kg	0.11 kg
	Other	0.00 kg	0.00 kg	0.05 kg	0.00 kg
	Subtotal	0.16 kg	0.05 kg	0.29 kg	0.11 kg
TOTAL		12.45 kg	12.52 kg	10.93 kg	6.91 kg

APPENDIX 7 – COMPARISON OF MUDS AND DOMESTIC KERBSIDE RUBBISH

Kg of waste to landfill per week		MUD A	MUD B	MUD C	MUD D	Auckland Isthmus
Paper	Recyclable paper	0.55 kg	0.30 kg	2.15 kg	0.34 kg	0.68 kg
	Non-recyclable paper	0.30 kg	0.22 kg	0.25 kg	0.14 kg	0.11 kg
	Subtotal	0.85 kg	0.52 kg	2.40 kg	0.48 kg	0.79 kg
Plastics	# 1, 2 and 5 contain.	0.32 kg	0.22 kg	0.32 kg	0.26 kg	0.05 kg
	#3, 4, 6, & 7 contain.	0.02 kg	0.02 kg	0.02 kg	0.01 kg	0.12 kg
	Plastic bags and film	0.62 kg	0.40 kg	0.74 kg	0.09 kg	0.66 kg
	Non-recyclable plast.	0.27 kg	0.10 kg	0.20 kg	0.46 kg	0.30 kg
	Subtotal	1.23 kg	0.74 kg	1.28 kg	0.82 kg	1.13 kg
Organics	Food waste	5.30 kg	3.45 kg	3.22 kg	2.44 kg	4.33 kg
	Greenwaste	0.01 kg	0.12 kg	0.00 kg	0.02 kg	1.11 kg
	Organic other	0.07 kg	0.17 kg	0.01 kg	0.07 kg	0.26 kg
	Subtotal	5.38 kg	3.74 kg	3.23 kg	2.53 kg	5.69 kg
Ferrous metals	Steel cans	0.05 kg	0.03 kg	0.07 kg	0.02 kg	0.06 kg
	Ferrous other	0.11 kg	0.29 kg	0.09 kg	0.04 kg	0.08 kg
	Subtotal	0.17 kg	0.32 kg	0.16 kg	0.07 kg	0.14 kg
Non-ferrous metals	Aluminium cans	0.03 kg	0.01 kg	0.03 kg	0.03 kg	0.02 kg
	Non-ferrous other	0.24 kg	0.02 kg	0.04 kg	0.06 kg	0.09 kg
	Subtotal	0.27 kg	0.03 kg	0.07 kg	0.09 kg	0.11 kg
Glass	Bottles/jars	0.21 kg	0.19 kg	1.16 kg	0.31 kg	0.20 kg
	Glass other	0.04 kg	0.15 kg	0.00 kg	0.02 kg	0.05 kg
	Subtotal	0.25 kg	0.34 kg	1.16 kg	0.32 kg	0.25 kg
Textiles	Clothing & rags	0.09 kg	0.18 kg	0.14 kg	0.40 kg	0.19 kg
	Textile other	0.84 kg	0.11 kg	0.04 kg	0.17 kg	0.15 kg
	Subtotal	0.93 kg	0.29 kg	0.18 kg	0.57 kg	0.34 kg
Nappies and sanitary		0.79 kg	1.21 kg	0.49 kg	0.42 kg	1.04 kg
Rubble		0.03 kg	0.04 kg	0.00 kg	0.00 kg	0.22 kg
Timber		0.11 kg	0.03 kg	0.02 kg	0.01 kg	0.10 kg
Rubber		0.01 kg	0.00 kg	0.00 kg	0.03 kg	0.05 kg
Potentially hazardous	Household	0.15 kg	0.03 kg	0.24 kg	0.11 kg	0.08 kg
	Other	0.00 kg	0.00 kg	0.05 kg	0.00 kg	0.06 kg
	Subtotal	0.15 kg	0.03 kg	0.29 kg	0.11 kg	0.14 kg
TOTAL		10.16 kg	7.29 kg	9.27 kg	5.44 kg	9.99 kg

