

# University of Canterbury waste audit 2014

## Introduction

The University of Canterbury has a comprehensive recycling system. The waste disposal system is clearly labelled and colour coded all across the university campus to facilitate the correct recycling of waste in origin and then maintain the different types of waste all across the process, from collection to final disposal.

According to UC Sustainability Office reports, there is an annual increase in landfill and recycling waste in May, so it has been determined that this would be a good time to conduct an audit to understand what is happening in the waste stream in this time of the year. The selected places for the audit are:

- James Hight Undercroft; with special attention in what is happening with coffee waste
- History building ; to understand how occupants of newly remediated spaces are using the system
- Central lecture theatres: to understand how a space is used by people just passing through it.

The goals of the audit are:

1. determine whether there are any significant changes in the content of the waste stream from these spaces since the last audit in 2010/11;
2. assess the contamination levels of both recycling and landfill; and
3. assess staff usage of the “ice cream containers” and feedback associated with the new labels.

## Waste audit

The audit was conducted between 19 May and 10 June following the same procedure as the previous audit in 2011. Bags from landfill (LF), general recycling (GR), and paper containers were assessed in detail, whereas organic waste and cardboard were only visually checked to identify contaminants.

The landfill, general recycling and paper bags from the chosen areas for that week’s audit were set aside daily in an undercover area of the waste depot where I had access to the various bins for disposal once the audit had been carried out. As each bag was opened, I would remove any recyclables and contaminants, log them by type, quantity, and then weight the whole lot (per type), before placing them in the correct bin. The contents of some bags were photographed to demonstrate common trends or unusual occurrences.

The data was collected numerically by item type and by weight. Whether occurring in the GR or LF bags, all recyclables were logged according to their type in the following categories: plastic bottle, glass bottle, can/tin, coffee cups, coffee cup lids, plastic supermarket bags, food containers, yoghurt containers, UCSA sandwich packs, sushi containers, other clean containers, Tetrapaks, and reusable items. Even though weight is considered the most important indicator of quantity, by recording the numbers of items it is possible to compare the results of this audit with the preceding one. Coffee

cups were counted and finally disposed in a separate bin until a number of approximately 1000 units were reached.<sup>1</sup>

In addition, non-recyclable contaminants in the GR bags were also logged by type so as to give an indication of where any confusion may be arising as to which bins should be used.

### Waste origin and dates audited

From each of the audited areas the total waste of a period of a week was evaluated.

19 – 23 May: Central lecture theatres

27 May – 03 Jun: Undercroft

30 May – 03 Jun UCSA production kitchen

4 –10 Jun: History building

## Results

### General figures

The results are presented by weight and in cases also by the number of items, since the weight better represents volume and allow for a better comparison. Figure 1 shows the overall figures of the auditing; over this period, a total of 566Kg of waste were classified. According to bag/container category, the majority (416kg) was from landfill bags, whilst the origins with higher amount were split between UCSA pk and Undercroft, 242kg and 236kg respectively. Special attention was given to the waste collected in landfill red bags form CLTh because the majority of its contents were paper,

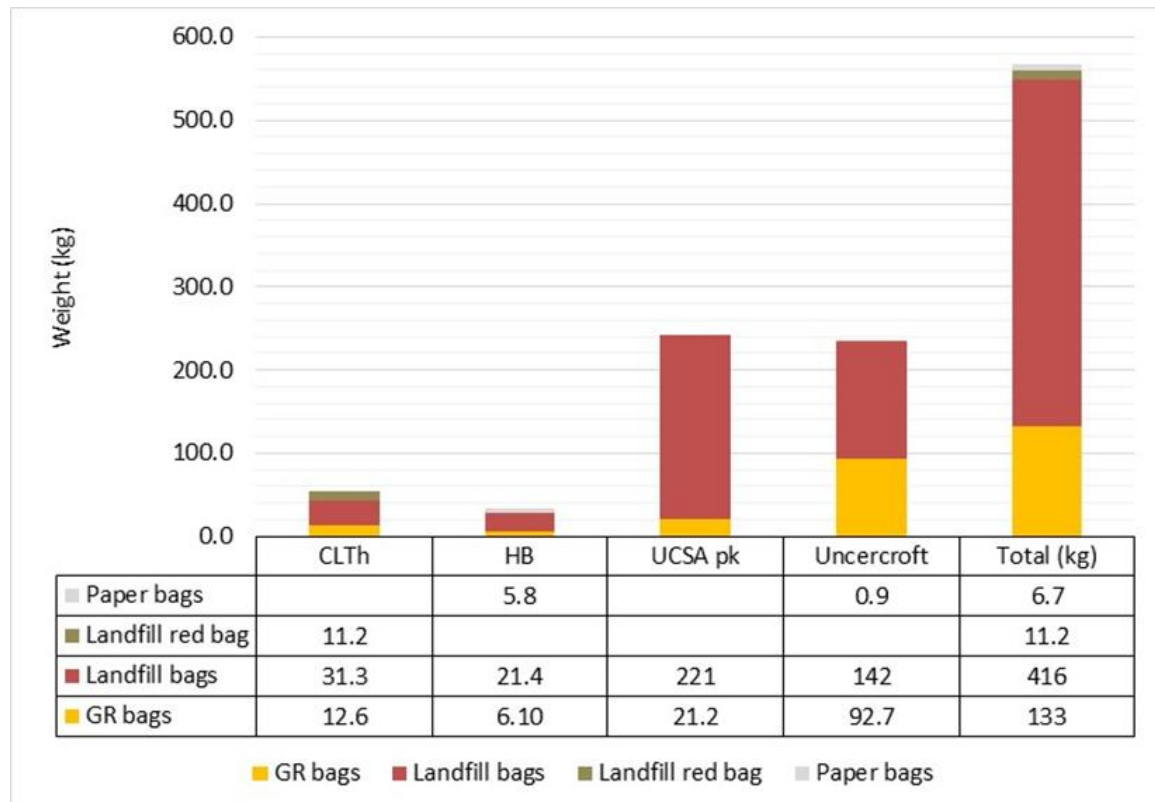


Figure 1: Total quantity of waste audited according to origin and container/bag used.

<sup>1</sup> The cups were collected for a composting trial at Selwyn District Council.

suggesting that paper is being put in those red bags instead of being taken as paper (clear bags).

However, as shown in Table 1, after counting and classifying the waste, the final figures were very different from the classification in origin. For example, roughly twice as much material was put in the landfill bins as should have been (there was a large component of recyclable and organic material put in landfill bins). Paper also is being mistakenly disposed of or collected, since, after classification the quantity is about six times higher than the original amount. General recycling on the other hand, registered a relatively low difference between both points of recording.

Table 1: Total weight of waste per type classified in origin and after counting.

Waste type	Weight (kg)	
	Container/bag used	After classification
GR	133	103
Landfill	427	219
Organic		201
Paper	6.7	43
<b>Total</b>	566	566

General observation would suggest that organic waste bags and cardboard are being used correctly. Rarely I found contaminants (napkins, food wraps) in organic bags. However there is a significant amount of organic residues that are not being put in the corresponding containers.

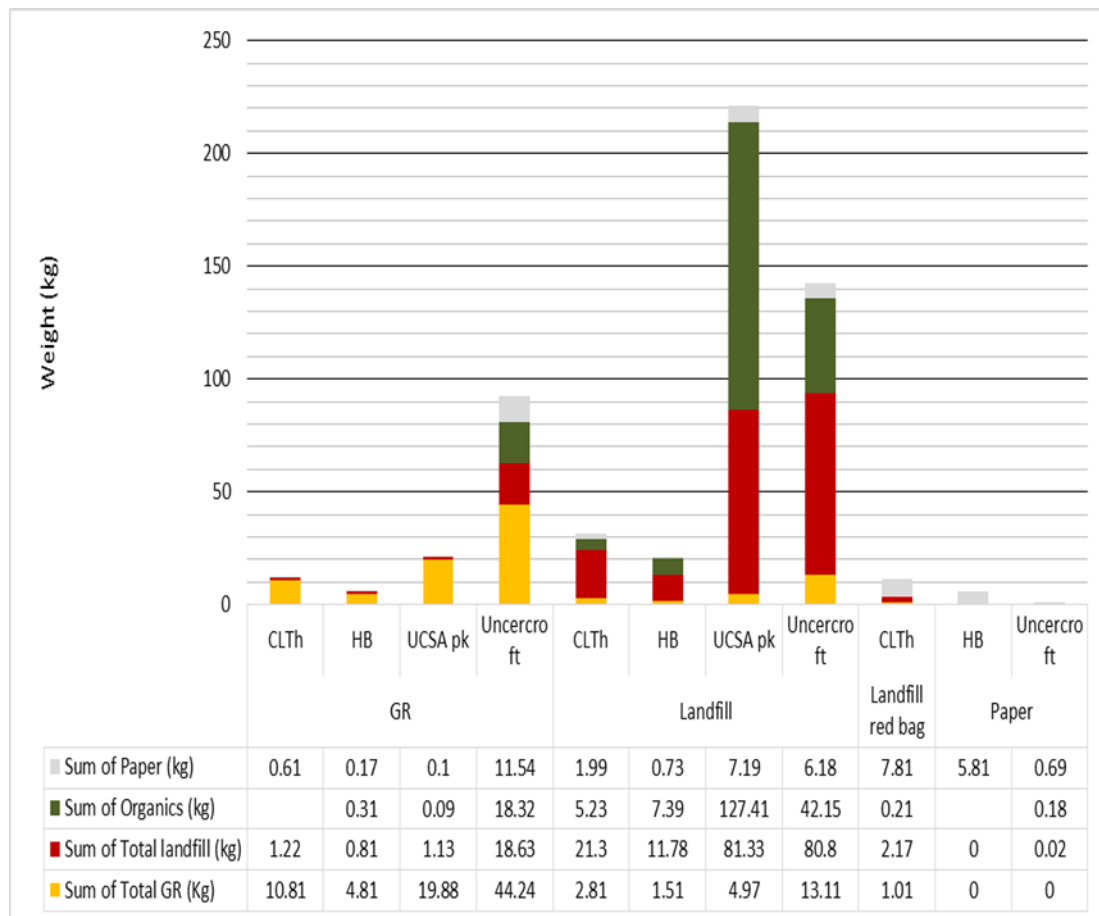


Figure 2: Quantities, in kg, of waste deposited in each type of container/bag according to their origin.

After organizing the information from waste classification in origin, it is possible to establish what areas and/or waste category present problems. Figures 2 and 3 show the quantity and percentage respectively of each type or waste after being audited from each category of container/bag used and place of origin.

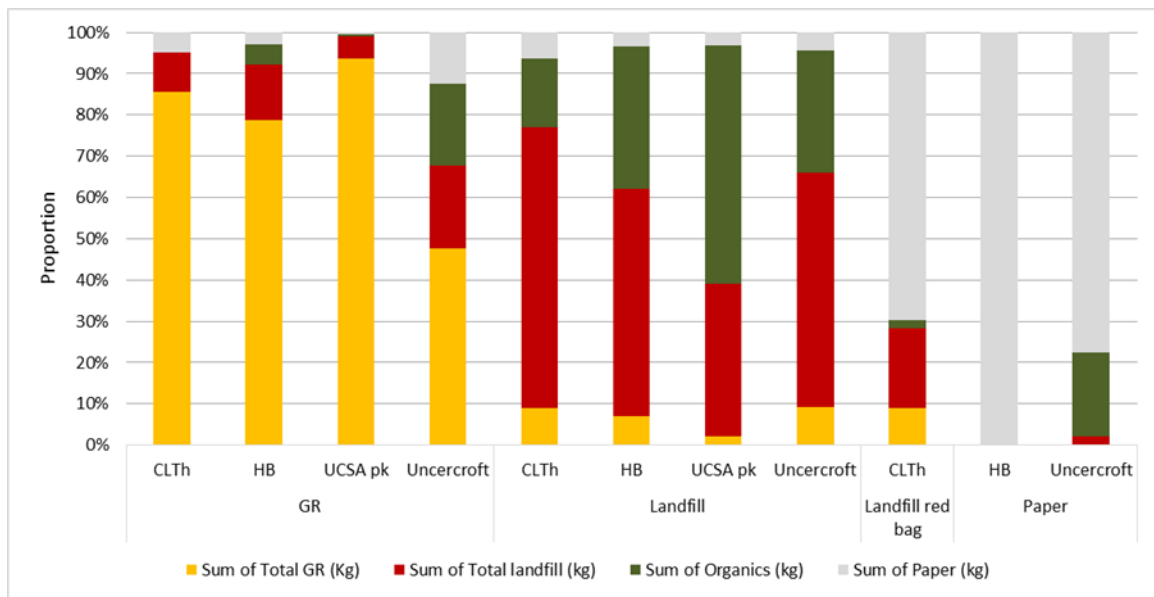


Figure 3: Percentage, of waste deposited in each type of container/bag according to their origin.

### General recycling

Considering the weight of the waste, this is the type of container that has been best used across all sites evaluated. Approximately 80% or more of the content in GR containers is correctly placed in CLTh, HB and UCSA pk; landfill items are the most common contaminants. Bags from Undercroft; however, show a high level of contamination. Whilst less than 50% of the total weight were correctly put in GR containers, the remaining half corresponds to: organics, landfill (about 20% each), and paper (less than 15%). Other non-recyclable items such as dirty nylon, napkins, and paper food

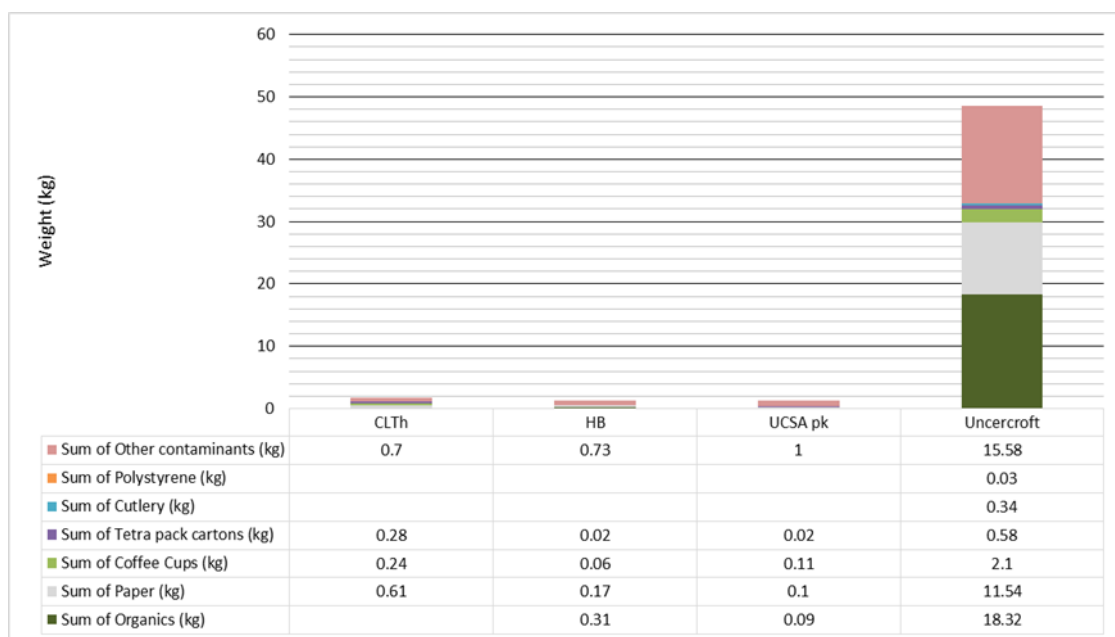


Figure 4: Types of contaminants found in GR bags for the 4 audited locations.

containers make the majority of landfill contaminants.

There are GR items found in other containers/bags. Figure 10 show that about one fifth (23.4kg out of 103kg) of the total GR items weight was placed or collected in landfill bags. This figure however, seems to be a significant amount when the number of items is compared. As shown in Figure 9, the number of GR items in GR and Landfill bags are similar 1589 and 1362 respectively. Coffee cups lids are the most common misplaced item (approximately 500 out of 800); 'other containers clean' and 'food containers' are also items highly misplaced. This trend is similar for the four audited locations.

## Landfill



Figure 5: Landfill bags from UCSA pk content; detail of organic contaminants.

There are no clear trends in the use of landfill containers/bags. While there are variable level of contamination for all places, the proportion varies widely. Bags from UCSA pk and Undercroft are not only the origins with highest volume of landfill waste but also have the highest level of contamination in their bags. See Figures 2 and 3.



Figure 6: Landfill bags from UCSA pk content; detail of coffee grounds with landfill waste and paper

The UCSA pk is the origin with the highest level of contamination. From over 220kg of waste put in landfill bags, about a third (81kg) corresponds to landfill waste while over half of the total (127kg) is organic waste. Food waste (fruit skin, leftovers, fruit pieces, food that went off, eggshells and milk) put together with rubbish (Figure 5), coffee grounds with rubbish and paper from the cash register (Figure 6), and food containers with leftovers (Figure 7).



Figure 7: Undercroft landfill bags, detail of food containers with leftovers

Bags from Undercroft were also highly contaminated, mostly with organic waste (30%). *Also full organic bags put in rubbish bags (Figure 8) were found several times, which can be a collection issue rather than misuse of the containers.*

Even though there are lower volumes of waste from HB and CLTh, the landfill bags were also contaminated. For the former the proportion are pretty similar to Undercroft's. Whereas, from CLTh almost 70% are correctly placed.

Red bags had a mix of all types of waste (recyclable, landfill, paper); they are treated as landfill. The red bags from CLTh caught my attention due to the amount of paper they contained, about 70% of the total weight. In addition, there were no paper bags collected from CLTh, so I went to check if



Figure 8: Landfill bags with organic bags inside

there were paper containers in the area, and there were. Thus, they are not been collected properly. For this reason the Landfill red bags from CLTh were assessed separately.

Although the weight of GR items in landfill bags is not significant, the number of them is. GR items were found in landfill bags for all places audited (see Figures 9 and 10).

About a thousand coffee cups were sorted in a separate container for further tests/research. The vast majority (almost 90%) of them were retrieved from landfill bags. This also explains the high proportion of coffee cup lids in landfill bags, because frequently the cups were with the lid on.

## Paper

Paper bags were collected only from HB and Undercroft. As already mentioned, no paper bags were collected from CLTh, or from the UCSA pk. From HB 100% of the waste put in paper bags was indeed paper, while just under 80% were the figures for Undercroft.

From the 43kg of paper finally classified (Fig. 1 and Table 1), only 6.7kg were placed or collected in paper bags, the rest was placed in the wrong container.

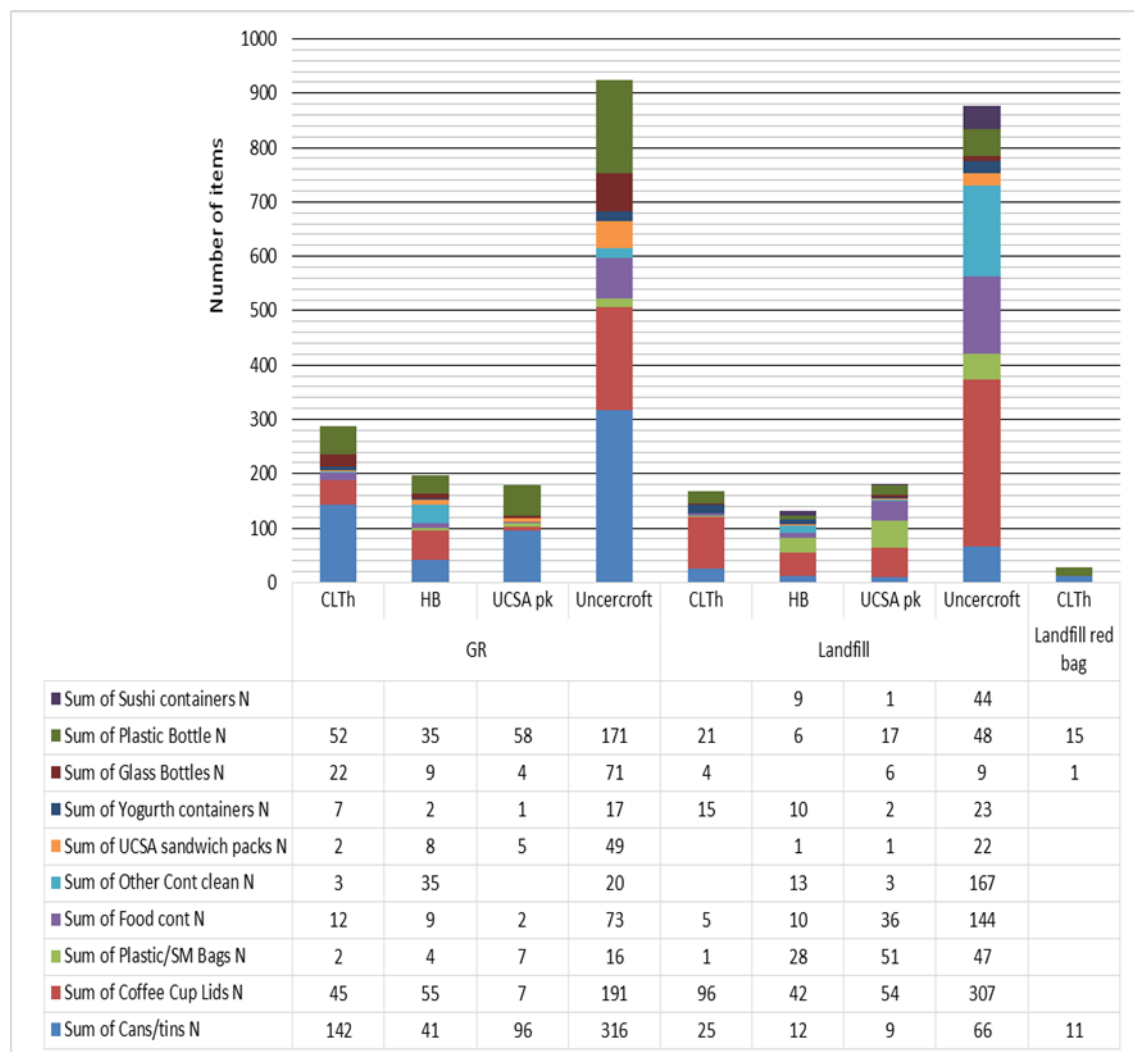


Figure 9 Number of recycling items disposed according to container/bag used and origin

## Brief comparison with 2011 results

Overall, it appears as though the recycling system at UC is operating with increased success since the introduction of UC Waste Watchers in 2012. *General Recycling contamination appears to have dropped from 35% in 2011 to less than 20% in 2014.* In the Undercroft the contamination rate is higher than this, which is concerning because there is a very high volume of waste from this area. Paper recycling continues to be highly successful in the office environment but is still contaminated in the more public spaces. Recyclable materials that are commonly landfilled include, in order of importance, food containers (especially the takeaway containers from The Wokl), glass bottles, plastic bottles and cans. There is still a considerable amount of waste that could be diverted from the landfill bins. About 20% of GR currently goes into LF, and 12-30% of LF contents are organic.

## Waste containers in the History Building

Part of the audit was focussed on the History Building as a building that has been recently remediated and where staff have received a lot of information about the green credentials of the new space. A new sticker was trialled in History prior to the audit which itemised which items should be placed in the 2 litre desk top waste container that all staff should have. The stickers also included specific instructions about who should be emptying the containers (office staff, *not* cleaners).

There was a mixed reaction to the new stickers but overall staff were happy to accommodate the change. However, the results of the audit indicate that the containers are not being emptied correctly as the landfill component from the building is highly contaminated. *Around 35% of the landfilled material was actually organics.* This suggests that staff use their desk top containers to collect waste such as apple cores, tea bags, banana peels and other organic waste and then either tip it all into the larger landfill bins themselves without sorting, or else that cleaning staff are doing this.

A short survey about the bins was circulated to staff in the building, but the response rate was too low to draw meaningful conclusions from alone. However, combined with anecdotal feedback gathered when the bins were distributed, the following points may be noted:

- many staff do not put their desk top containers on their desks, as they consider them to be unsightly
- some staff do not think their bins are big enough, and some have even purchased their own larger rubbish bins
- staff like the idea that the University recycles what it can, but aren't especially engaged with the idea that they need to take responsibility for their own rubbish. They are neutral to satisfied with the university's waste system.

## Conclusions and comments

Collection problems:

- Paper bags are not collected from CLTh, UCSA pk and from the Undercroft were collected only one out of five days. From CLTh paper is in red bags (this is a deduction), while from the UCSA pk all the paper has been disposed in landfill bags
- Organic bags (with organic waste) inside rubbish bags, looks like is also a collection problem, because the waste was correctly disposed at some point in origin (inside the organic bags)



The GR bins are not particularly contaminated. There is however a significant number of GR items in landfill bags, which suggests the message of recycling is not getting across the university community.

Landfill bags are highly contaminated with organics, the biggest issue is in UCSA pk and Undercroft for both, the percentage of contamination and for the relatively high volume of waste.

Organic waste bags and cardboard are not contaminated. However, there is a high quantity of organic waste put in landfill bags.

Office staff need more reminders to sort out the contents of their desk top waste containers as the contamination rate is very high.

The majority of coffee cups are correctly placed in landfill bags with the lid on, which is an issue

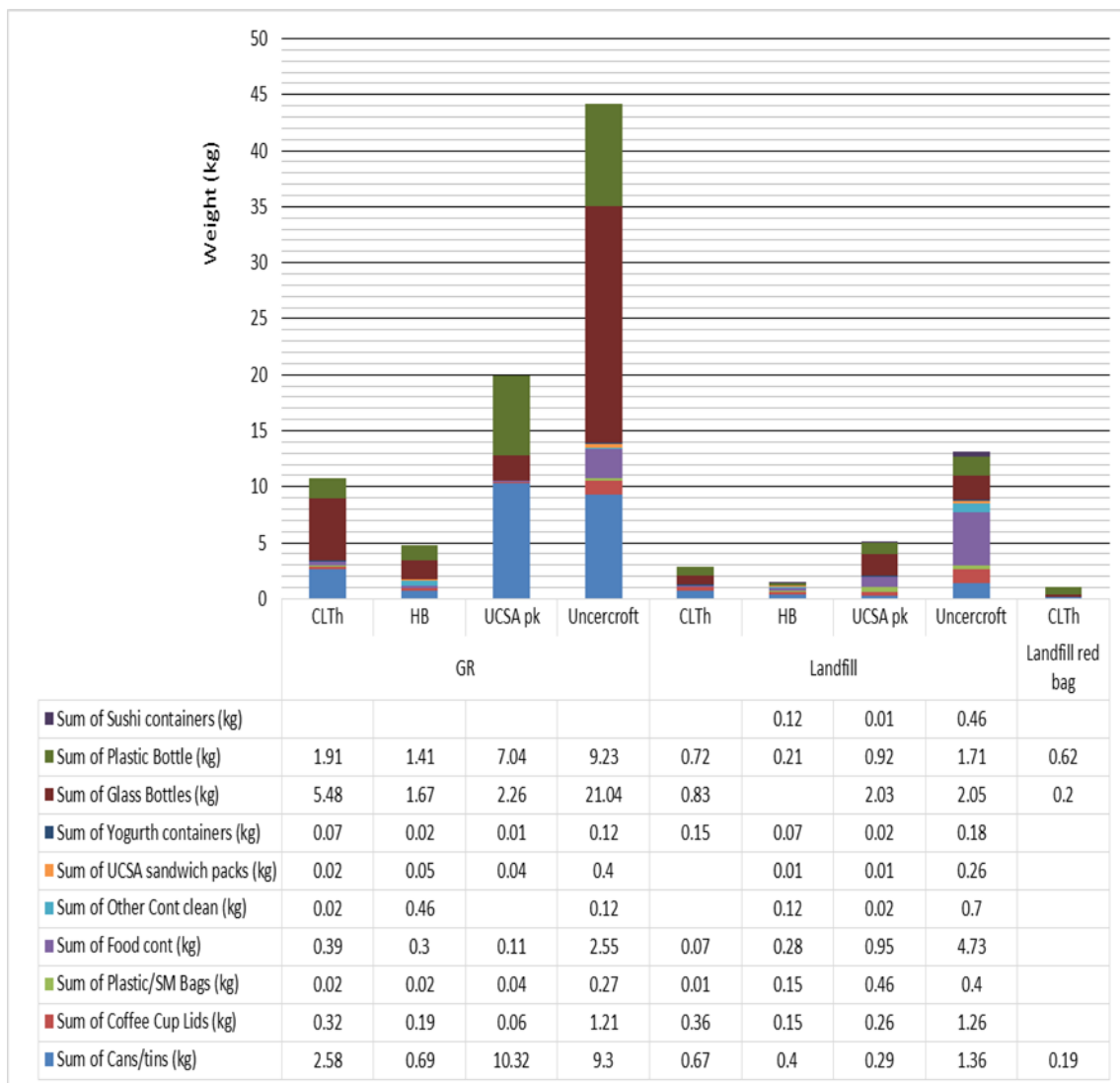


Figure 10 Quantity in kg of recycling items disposed according container/bag used and origin

consistently seen for all places audited.

## Recommendations

- Undercroft is a major problem area and therefore more work is required here. This may include having people standing by the bins instructing on what goes where
- More training to whoever is collecting the rubbish from problem areas
- Ensure that the UCSA staff separate organics from landfill in their kitchens
- Address the pricing model for charging the UCSA and other external organisations for waste collection
- Food containers and glass bottles are two important contaminants by weight – a campaign around these is suggested. Also, work with The Wok to find a way to reduce their impact on landfill volumes (can they take back used containers and wash them, for example, which would make it easier to recycle them)
- More education or reminders to office staff about correct use of their desk top waste containers
- Remind cleaners not to empty desk top waste containers
- Conduct another audit in 12 months.