

knowwaste

Waste and Sustainability Consultancy

Our aim is to deliver sustainable solutions to our clients by providing them with the skills and knowledge to meet their project objectives

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Report

Kerbside waste, and organics audits 2022

Produced for: Queanbeyan–Palerang Regional Council



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This document has been researched and developed by Knowwaste Pty Ltd

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1. Executive summary

The following tables provide a summary of the 2022 results compared to 2018 results.

Table 1 – Presentation rate

	Presentation rate			
	Queanbeyan Googong		Braidwood, Bungendore Captains Flat	
	2018	2022	2018	2022
Waste bins	82.8%	70.6%	80.2%	68.2%
Organic bins	70.0%	28.2%	72.5%	27.3%

The presentation rate difference between 2018 and 2022 is likely due to the seasonal difference the audits were carried out. 2018 audits were completed in Spring/Summer and the 2022 audits were completed in Winter.

Table 2 – Bin percent full

	Bin percent full			
	Queanbeyan Googong		Braidwood, Bungendore Captains Flat	
	2018	2022	2018	2022
Waste bins	68.4%	65.2%	60.3%	49.9%
Organic bins	69.3%	73.3%	68.7%	80.8%

Table 3 – Average weekly generation rate

	Average weekly generation rates Kg / households / week			
	Queanbeyan Googong		Braidwood, Bungendore Captains Flat	
	2018	2022	2018	2022
Waste bins	8.07 Kg	9.28Kg	7.31Kg	8.00Kg
Organic bins	4.45Kg	7.24Kg	6.69Kg	6.93Kg

Table 4 – Contamination/leakage rate

	Contamination / leakage of recoverable rates			
	Queanbeyan Googong		Braidwood, Bungendore Captains Flat	
	2018	2022	2018	2022
	Waste bins – MGB recycling	15.0%	10.0%	15.9%
Waste bins – MGB organics	51.8%	38.5%	46.1%	30.0%
Organic bins	3.9%	0.1%	2.8%	0.5%

2. Introduction

QPRC has a population of approximately 62,239. There are approximately 19,959 residential dwellings, of which approximately 87% are estimated to be single residential dwellings and 12% are estimated to be multi-unit dwellings (dwelling numbers from census quick stats 2016). The dwelling structure and number of each occupied dwelling type is shown in the following table.

Table 5 - Council dwelling structure

Dwelling structure	Number of households	Percentage in LGA	National percentage
<i>Occupied</i>			
Separate house	14,664	73%	73%
Semi-detached, row or terrace house etc	2,819	14%	13%
Flat, unit or apartment	2,376	12%	13%
Other dwelling	100	1%	1%
Total	19,959	100%	100%

Data adapted from <http://www.censusdata.abs.gov.au/> - 2016 data

Note: there is an estimated 2,447 (10.9% of total private dwellings) unoccupied private dwellings in the LGA

Current bin systems

The waste audit occurred within a specified area of the LGA and did not cover all properties nor all service types. The audited areas comprised:

- properties receiving a three-bin domestic waste service (comprising residual waste, commingled recycling and garden organics) within the urban areas of Queanbeyan, Googong and Jerrabomberra.
- properties receiving a three-bin domestic waste service (comprising residual waste, commingled recycling and food organics & garden organics) within the urban areas of Bungendore, Braidwood and Captains Flat.

The following table shows the three bin systems across the project areas.

Table 6 – Residential services provided.

	General/residual waste red-lid bin	Commingled recycling yellow-lid bin	Organics * green-lid bin
Standard service	Weekly	Fortnightly alternating with organics	Fortnightly alternating with recycling

- Queanbeyan and Googong have a garden organic service.
- Braidwood, Bungendore and Captains Flat have a Food Organics and Garden Organics service.

Project main objectives

All project objectives were successfully met. The audit was undertaken in accordance with the NSW EPA's "*Guidelines for conducting Household Kerbside and Residual Waste, Recycling and Garden Organics Audit in NSW Local Government Areas 2008 – Addendum 2010*", "Per household method".

The project objectives were to provide Council with the following data:

- a) allow future evaluation of the FOGO program and waste diversion impacts
 - Generation rates, based on weight and volume (bin percentage full)
 - Presentation rates
 - Unrecovered resources in the residual waste bins
 - Contamination rates in the organics bins
 - Resource recovery rates
 - Diversion rates
 - CDS eligible containers in all bin streams
- b) compare the summary results of the 2022 audit with the results of the 2018 audits.

3. Results

This section is split into two reporting sections to allow for the different organic services across the LGA.

1. Queanbeyan and Googong have a garden organic service.
2. Braidwood, Bungendore and Captains Flat have a Food Organics and Garden Organics (FOGO) service.

Queanbeyan and Googong – Waste results

Waste bins had a presentation rate of 70.6% with the average bin at 65.2% full. The average household had 9.28 Kg of material in their waste bin per week.

Of the weekly waste bin generation 10.0% was compliant kerbside recycling.

Of the weekly waste bin generation 42.5% content was Food Organic and Garden Organic (FOGO) material. Food contributed the majority at 38.5% and garden organic compliant material at 4.1%. A further 5.2% of material was containerised food and 1.4% non-compliant garden organics (oversized).

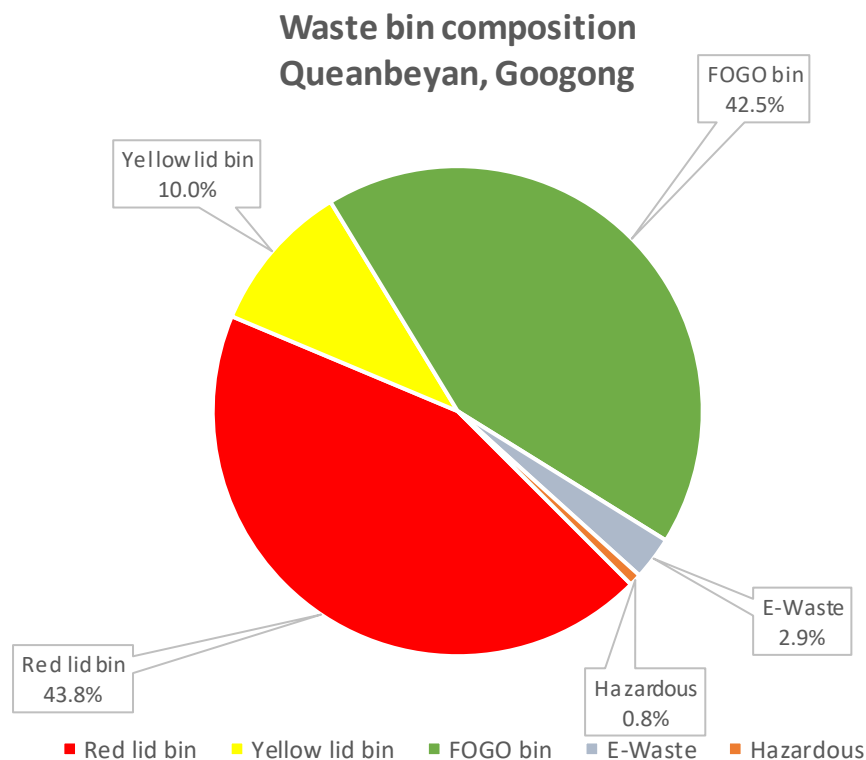
There was minimal eligible container deposit scheme (CDS) items in the waste bins.

Overview of 2022 waste bin audit results:

- Presentation rates – **70.6%**
- Average bin percent full – **65.2%**
- Average overall weekly generation rate – **9.28 kg** per household per week (kg/hh/wk)
- Average leakage rate (loss or MGB recyclable in the waste stream) – **10.0%**
- CDS items in the waste stream – average of **1.1** items per household per week

The following figure shows the summary composition of the waste bins

Figure 1 – Summary Waste bin composition (garden organic service area)



As shown in the figure, if a FOGO service was available in the area and residents disposed of the organic material in the FOGO bin, 42.5% of the bin contents could be diverted from landfill (38.5% loose food and 4.1% garden organics). A further 10% of complaint MGB recyclables are being lost to landfill that could go in the existing yellow-lid council recycling bin. Paper and cardboard was the highest proportion (3.4%), plastics (2.8%), glass (2.3%) and metal (1.4%).

2.93% of the waste bin contents were electrical items that could have been dropped at the local Council Recycling Centre (CRC) and 0.8% items were deemed hazardous and should not have been placed in the bin. These included general household chemical and paints. No asbestos was discovered during the audit.

The remaining 43.8% of material was deemed acceptable items, highest proportions included non-recyclable plastics (9.0%), nappies (8.1%) and non-recyclable paper (6.0%).

The following table provides the summary results of the waste audit for Queanbeyan and Googong.

Table 7 – Waste bin audit results Queanbeyan and Googong

Sorting categories from waste bin audit		Percent by weight
Paper	Recyclable	3.2%
	Liquid Paper board	0.2%
	Nappies	8.1%
	Non Recyclable	6.0%
Plastics	Recyclable	2.8%
	Non recyclable	9.0%
Metals	Recyclable metal packaging	1.4%
	Non-recyclable metals	0.6%
Glass	Recyclable glass	2.3%
	Non-recyclable glass	0.0%
Organic	Loose food	38.5%
	Containerised food	5.2%
	Compliant garden organics	4.1%
	Other organic not compliant	1.4%
e-Waste	TV, computer, laptops etc	2.9%
Hazardous	Chemicals, paints and other	0.8%
Animal faeces	Cat litter, bagged and loose	5.3%
Textiles	Clothing and bedding	4.1%
Inert	Ceramics, dust, dirt	4.0%
Total		100.0%

Queanbeyan and Googong - **Garden organic results**

The garden organic bins had a presentation rate of 28.2% with the average bin at 73.3% full. The average bin collected had 14.48Kg of material in their garden organic bin per fortnight.

Of the garden organic bin generation less than 1% was contamination.

The garden organics is a fortnightly service, so the average weekly generation is 7.24 Kg.

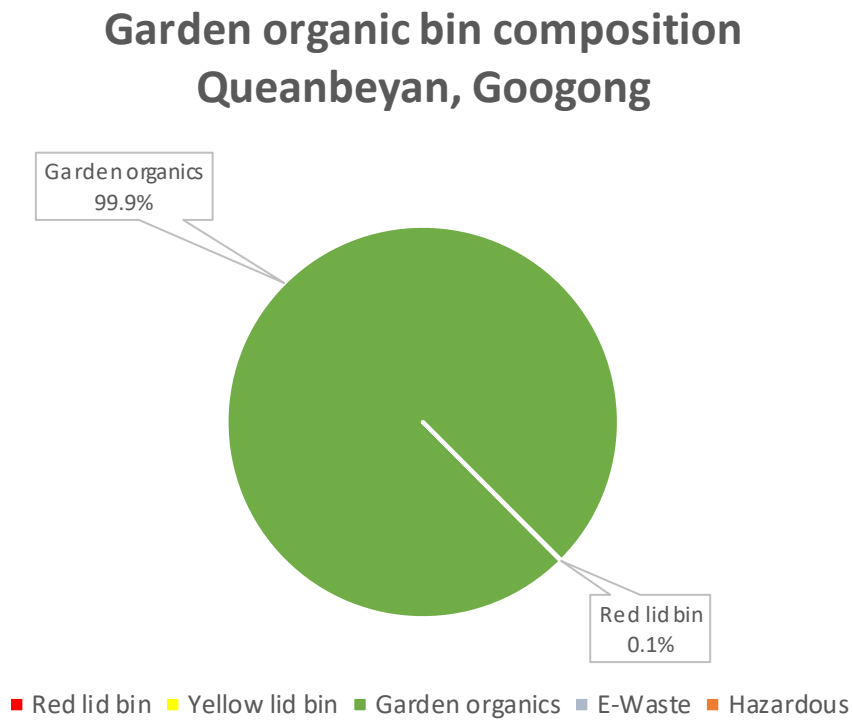
No CDS observed in the garden organic bins.

Overview of 2022 waste bin audit results:

- Presentation rates – **28.2%**
- Average bin percent full – **73.3%**
- Average overall weekly generation rate – **7.24 kg** per household per week (kg/hh/wk)
- Average contamination – **0.01%**
- No CDS items were found in the garden organic bins

The following figure shows the summary composition of the garden organic (GO) bins.

Figure 2 – Summary Garden organic bin composition



As shown in the figure, there was almost no contamination in the garden organic bins. The only contamination observed was bagged dog faeces. There were a couple of instances of charcoal placed in the garden organic bins, however this was at such a low and inconsistent level it was not deemed noteworthy.

The following table provides the summary results of the garden organic audit for Queanbeyan and Googong.

Table 8 – Garden Organic bin audit results Queanbeyan and Googong

Sorting categories from garden organic bin audit		Percent by weight
Paper	Recyclable	0.0%
	Liquid Paper board	0.0%
	Nappies	0.0%
	Non Recyclable	0.0%
Plastics	Recyclable	0.0%
	Non recyclable	0.0%
Metals	Recyclable metal packaging	0.0%
	Non-recyclable metals	0.0%
Glass	Recyclable glass	0.0%
	Non-recyclable glass	0.0%
Organic	Loose food	0.0%
	Containerised food	0.0%
	Compliant garden organics	99.9%
	Other organic not compliant	0.0%
e-Waste	TV, computer, laptops etc	0.0%
Hazardous	Chemicals, paints and other	0.0%
Animal faeces	Cat litter, bagged and loose	0.1%
Textiles	Clothing and bedding	0.0%
Inert	Ceramics, dust, dirt	0.0%
Total		100.0%

Braidwood, Bungendore & Captains Flat – Waste results

Waste bins had a presentation rate of 68.2% with the average bin at 49.9% full. The average household had 8.00Kg of material in their waste bin per week.

Of the weekly waste bin generation 7.04% was compliant kerbside recycling.

Of the weekly waste bin generation 30.0% content was potential Food Organic and Garden Organic (FOGO) material. Food contributed the majority at 28.3% and garden organic compliant material at 1.7%. A further 3.9% of material was containerised food.

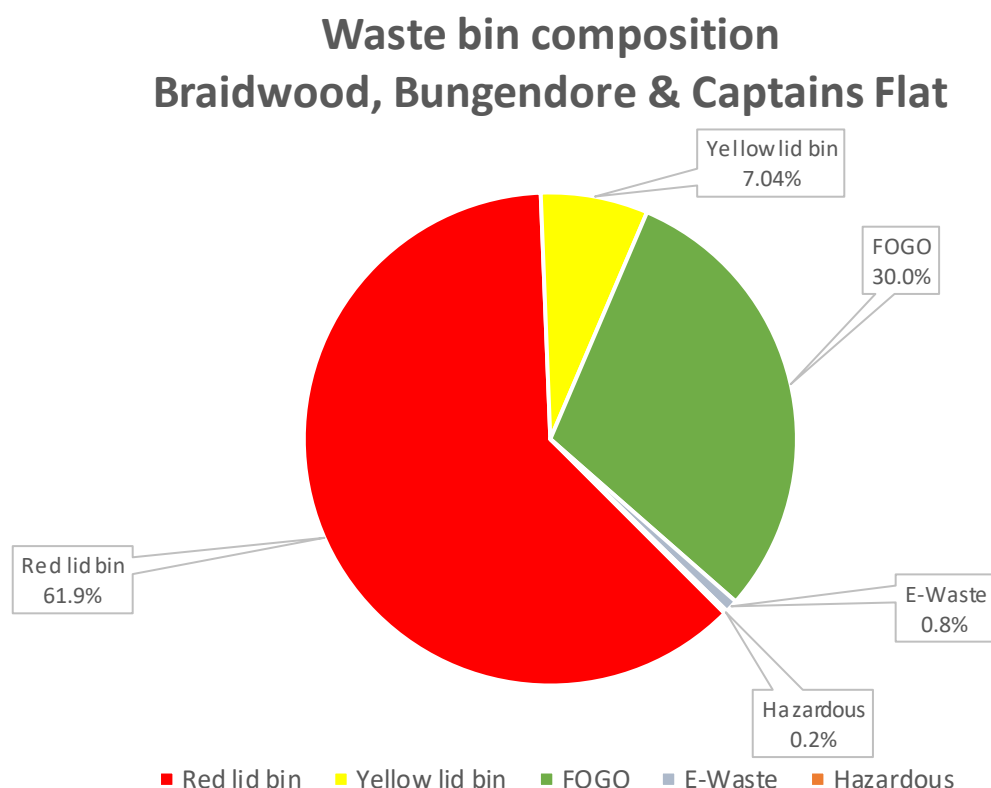
There was minimal eligible container deposit scheme (CDS) items in the waste bins.

Overview of 2022 waste bin audit results:

- Presentation rates – **68.2%**
- Average bin percent full – **49.9%**
- Average overall weekly generation rate – **8.00 kg** per household per week (kg/hh/wk)
- Average leakage rate (loss or MGB recyclable in the waste stream) – **7.04%**
- CDS items in the waste stream – average of **1** item per households per week

The following figure shows the summary composition of the waste bins

Figure 3 – Summary Waste bin composition (FOGO service area)



As shown in the figure, if residents place all the available food and garden organics in the existing FOGO bins, 30.0% of the bin contents could be diverted from landfill (28.3% loose food and 1.7% garden organics). A further 7.04% of complaint MGB recyclables are currently being lost to landfill that could go in the existing yellow-lid council recycling bin. Paper and cardboard was the highest proportion (3%), plastics (1.9%), metal (1.7%) and glass (0.5%).

0.8% of the waste bin contents were electrical items that could have been dropped at the local CRC and 0.2% of items were deemed hazardous and should not have been placed in the bin. These included general household chemical and paints. No asbestos was discovered during the audit. A significant 12.2% of waste bin contents were animal faeces.

The remaining 61.9% of material was deemed acceptable items, highest proportions included nappies (10.4%), non-recyclable plastics (8.5%), Textiles (8.5%) and non-recyclable paper (6.1%).

The following table provides the summary results of the waste audit for Braidwood, Bungendore and Captains Flat.

Table 9 – Waste bin audit results Braidwood, Bungendore & Captains Flat

Sorting categories from waste bin audit		Percent by weight
Paper	Recyclable	2.7%
	Liquid Paper board	0.3%
	Nappies	10.4%
	Non Recyclable	6.1%
Plastics	Recyclable	1.9%
	Non recyclable	8.5%
Metals	Recyclable metal packaging	1.7%
	Non-recyclable metals	0.9%
Glass	Recyclable glass	0.5%
	Non-recyclable glass	0.1%
Organic	Loose food	28.3%
	Containerised food	3.9%
	Compliant garden organics	1.7%
	Other organic not compliant	3.1%
e-Waste	TV, computer, laptops etc	0.8%
Hazardous	Chemicals, paints and other	0.2%
Animal faeces	Cat litter, bagged and loose	12.2%
Textiles	Clothing and bedding	8.5%
Inert	Ceramics, dust, dirt	8.2%
Total		100.0%

Braidwood, Bungendore & Captains Flat - FOGO results

The FOGO bins had a presentation rate of 27.3% with the average bin at 80.08% full. The average bin collected had 13.85Kg of material in their garden organic bin per fortnight.

Of the garden organic bin generation less than 1% was contamination.

The food organics and garden organics is a fortnightly service so the average weekly generation was 6.93 Kg per week.

No CDS observed in the FOGO bins.

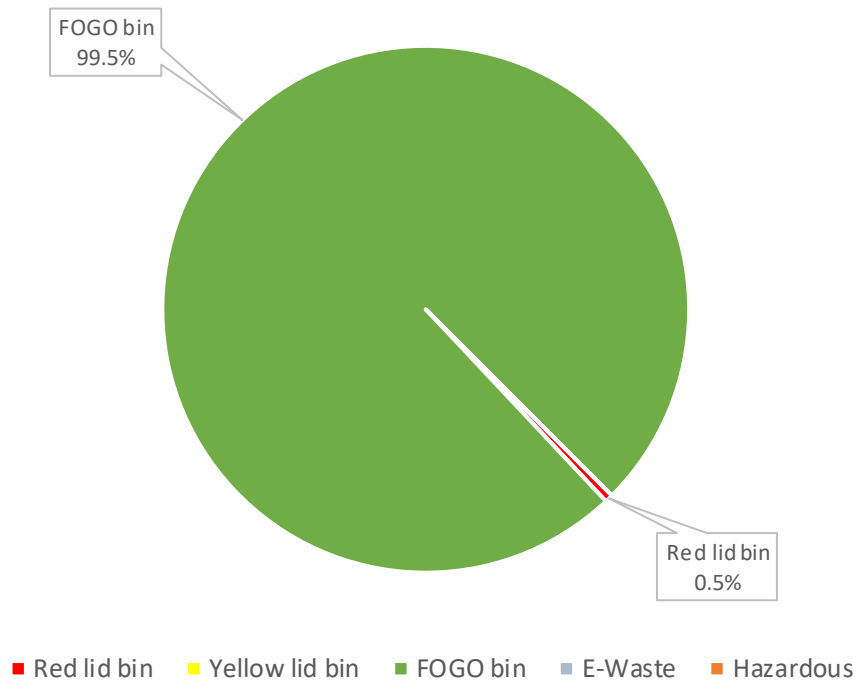
Overview of 2022 waste bin audit results:

- Presentation rates – **27.3%**
- Average bin percent full – **80.08%**
- Average overall weekly generation rate – **6.93 kg** per household per week (kg/hh/wk)
- Average contamination – **0.5%**
 - Contamination included; containerised food (0.4%) oversized organics (0.1%)
- No CDS items were found in the garden organic bins

The following figure shows the summary composition of the garden organic (GO) bins

Figure 4 – Summary FOGO bin composition

FOGO bin composition Braidwood, Bungendore & Captains Flat



As shown in the figure, there was almost no contamination in the FOGO bins. The only contamination observed was containerised food and a tree stump. There were a couple of instances of charcoal placed in the FOGO bins, however this was at such a low and inconsistent level it was not deemed noteworthy.

The following table provides the summary results of the waste audit for Queanbeyan and Googong.

Table 10 – FOGO bin audit results Braidwood, Bungendore and Captains Flat

Sorting categories from FOGO bin audit		Percent by weight
Paper	Recyclable	0.0%
	Liquid Paper board	0.0%
	Nappies	0.0%
	Non Recyclable	0.0%
Plastics	Recyclable	0.0%
	Non recyclable	0.0%
Metals	Recyclable metal packaging	0.0%
	Non-recyclable metals	0.0%
Glass	Recyclable glass	0.0%
	Non-recyclable glass	0.0%
Organic	Loose food	6.7%
	Containerised food	0.4%
	Compliant garden organics	92.8%
	Other organic not compliant	0.1%
e-Waste	TV, computer, laptops etc	0.0%
Hazardous	Chemicals, paints and other	0.0%
Animal faeces	Cat litter, bagged and loose	0.0%
Textiles	Clothing and bedding	0.0%
Inert	Ceramics, dust, dirt	0.0%
Total		100.0%

4. Photos

Figure 5 – Photos Recyclable material in the waste stream

1. Recyclable metal



2. Recyclable metal containers



3. Recyclable paper & cardboard



4. Recyclable plastic containers



5. Recyclable glass



6. 10c Container Deposit Scheme items (CDS)

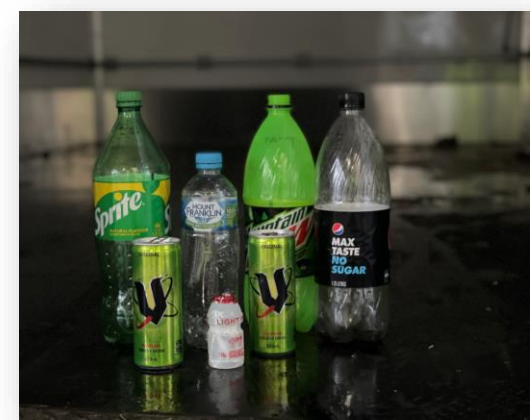


Figure 6 – Photos Food in the waste stream

1. Containerised food



2. Loose food



3. Loose food in bio-bags



4. Loose food in bio-bags



Figure 7 – Photos Hazardous and notes of interest in the waste stream

1. Tinned chemicals



2. Needles



3. Printer cartridge



4. Paving paint



5. Household chemicals



6. Shoe polish



Figure 8 – Photos Compliant Garden organics



Figure 9 – Photos Compliant food in FOGO stream



5. Appendix - Methods

This project used as a guide the NSW EPA Guidelines as a guide for auditing " *Guidelines for conducting household kerbside residential waste, recycling and garden organics audits in NSW Local Government Areas 2008 – Addendum 2010*". All samples were collected on the regular collection day prior to the regular kerbside collection truck servicing the bins. All project methods adhere to industry best practice WHS conformance and follow industry and company confidentiality and privacy procedures.

Waste audit background

A waste audit is the collection and analysis of garbage and resource recovery. The physical sorting of the waste stream provides a detailed view into the composition of the garbage and recycling generation by weight.

This waste audit has been designed to monitor the results and to identify the key composition categories.

Sampling method and techniques

Random households were selected in each collection zone to gain a representation of the areas on each day of auditing. These addresses were checked with Council and the waste contractor for corresponding collection days.

Due to the colder season the audit was conducted, presentation rates of organic bins was low. Therefore, samples were spread further across the LGA on more streets to capture the matched pair presentation of waste and organic bins.

Pre collection bin surveys

Prior to sample collection Knowwaste completed a visual survey of the waste and organic bins to capture presentation rates and bin percent full data for Council, the survey included:

1. Waste stream (waste and organics)
2. Percentage full (volume data generation) and Presentation rates

Collections and transport

Knowwaste completed sample collection using the 'bagging' technique.

- Run sheets and maps were produced for each collection day.
- Knowwaste staff identified the target household bins and place a heavy-duty woven polypropylene (WPP) bulk bag over the opened top of the targeted bin.
- Following manual handling training, Knowwaste staff emptied the contents of the bin into the WPP bags, then replaced the residents' bin back on the kerb.
- The bags were secured and labelled following the privacy procedure.
 - Following the NSW EPA guidelines, actual street addresses were never recorded in the field. During the collection process, each sample collected and bagged was labelled with a sample identifier. Sample identifiers record the:

Sample identifier (bagging labels)

<u>Date collected</u>	- dd/06/2022
<u>Waste stream collected</u>	- Waste Recycling Green
<u>SUD MUD</u>	SUD MUD
<u>Target street identifier number</u>	- A B C D E
<u>Target household identifier number</u>	- 1 2 3

Samples were placed into the rear of the collection vehicle for transportation to the designated sorting site at Bungendore CRC.

Data collection

On each field day, the samples were delivered to the sorting site, the sorting stations were setup and sorting commenced. Each bin contents/sample were individually sorted and weighed. The sample was placed into the sorting tub [placed on the table] and sorted to the relevant material categories. The sorted material was placed into sampling bins for reconciling and weight recording.

The process was repeated until all samples for the day had been sorted into the relevant material categories. The following equipment was used for the project:

- tables
- sorting tubs
- sorting bins (labelled with categories)
- uniform, PPE, safety signage and first aid kits
- vehicles - Toyota Hilux
- scales (as below)
- all required PPE
 - gloves
 - masks
 - hi-vis
 - safety boots
 - waterproofs
 - UVA protection
 - eye protection

Scales

All auditing scales are purchased from Wedderburn and calibrated by Wedderburn for guaranteed accuracy. The scales are field-calibrated by Knowwaste field consultants on each day of auditing. Two different scale types are used for the weighing of sorted materials.

30kg scales

To weigh items less than 30kg to within 1g of accuracy



150kg scales

To weigh items greater than 30kg and less than 150kg to within 10g of accuracy



Sorting Categories – Materials

Knowwaste's Project manager confirmed with Councils representative on the parameters of compliant and contamination for each material category. This was completed to confirm:

- what materials are accepted and rejected at the MRF, and
- when compliant recyclable items are rejected due to contamination.

Table 11 – Sorting categories

Sorting categories	
Paper	Recyclable paper and cardboard
	Liquid Paper board
	Nappies
	Non-recyclable
Plastics	Recyclable
	Non-recyclable
Metals	Recyclable metal packaging
	Non-recyclable metals
Glass	Recyclable glass
	Non-recyclable glass
Organic	Loose food
	Containerised food
	Compliant garden organics
	Other organic not compliant
e-Waste	TV, computer, laptops etc
Hazardous	Chemicals, paints and other
Animal faeces	Cat litter, bagged and loose
Textiles	Clothing and bedding
Inert	Ceramics, dust, dirt
CDS Count	

Sorting site

Knowwaste used a designated sorting area at Council's Bungendore Recycling Centre. The site was selected because it provided a safe working environment and is a licensed facility to receive the sorted waste materials post auditing.

Figure 10 – Sorting area



Sorted material disposal

Knowwaste disposed of the sorted material in the small transfer station. Food organics were placed in 240L bins and garden organics were placed in the self-drop off area.

Workplace Health and Safety (WHS)

Knowwaste uses best industry practise for WHS, the WorkCover guide "*Collection of domestic waste, code of practice*" is referenced regarding WHS for the auditing of garbage. The code of practice sets clear procedures to reduce risk. The relevant sections include:

- Implementing WHS procedures and completing WHS forms
- Development of safe work method statements
- Manual handling and Hazardous substances
- Personal protective equipment (PPE) and First aid and Fatigue and fitness for work

Risk Management

Knowwaste implemented steps to identify any foreseeable hazards, assess their risks and take action to eliminate or control them. Prior to any works commencing on this project, at least the following WHS forms were completed:

- *Form_4 WHS HRAF (Hazard & Risk Assessment Form)*
- *Form_5 WHS Safe work method statement - manual collection (bagging)*
- *Form_7 WHS Safe work method statement – waste and recycling sorting*
- *Form_10 WHS Safe work method statement - visual bin surveys*
- *Form_13 WHS vehicle check list*
- *Form_17 WHS tool box and employee conformance*

These forms are completed in conjunction with the site-specific WHS plan.

Confidentiality

Only aggregated data is reported, no addresses are listed in any reporting.

All consultants and field workers complete a Police Record Check to conform to industry standards and Knowwaste's confidential policy. Knowwaste does not use labour hire or subcontractors for quality control and confidentiality purposes.