



ACT Landfill Audits

Combined Final Audit Report

FOR

ACT NOWaste

July 2010

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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
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01	A. Quinn	D. Gamble	<i>David Gambel</i>	D. Gamble	<i>David Gambel</i>	7/7/09
02	A Quinn	D. Gamble	<i>David Gambel</i>	D. Gamble	<i>David Gambel</i>	3/2/10
03	A Quinn	D. Gamble	<i>David Gambel</i>	D. Gamble	<i>David Gambel</i>	27/7/10

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1. Introduction

1.1 The Audit Project

GHD, as a sub-consultant to APC, was commissioned to conduct landfill audits in the ACT as part of a larger project being undertaken for ACT NOWaste by APC. These audits were visual assessments of the quantities and composition of loads deposited at Mitchell Transfer Station, Mugga Lane Transfer Station and Mugga Lane Landfill between May 4 and May 12, 2009.

The results of these audits are described in the first part of this report. In this section the headings are prefaced 'Original Results'. The results showed that a significant proportion of the landfilled stream was comprised of waste in plastic bags, the contents of which could not be determined by visual assessment. As a result ACT NOWaste commissioned APC to perform audits on samples of plastic bags collected from loads delivered to Mugga Lane Landfill between Tuesday September 1 and Thursday September 3 in order to determine the composition of this part of the waste stream. The results for the audit of plastic bags are also provided in this report.

In the second part of this report provides the combined results of the original landfill audit and the results of the second plastic bag audit. In this section the headings are prefaced 'Combined Results'.

1.2 Operation of Facilities

Mitchell Transfer Station, Mugga Lane Landfill and Mugga Lane Transfer Station were the three sites at which the audits took place. These sites cover all the waste delivered to landfill. All three sites are open to the public from 7.30 am to 5 pm seven days per week. The landfill is open for commercial customers from 6.15 am.

The Mitchell Transfer Station and the landfill at Mugga Lane are operated by Thiess Services. The transfer station at Mugga Lane is operated by Samarkos Earthmoving/ACT Recyclers. All three sites have separate weighbridges.

Table 1 below shows information provided by ACT NOWaste on the disposal areas at each site and the number of vehicles using them.

Table 1 Disposal Site Information

Site	Tipping Area	Average Number of Vehicles per Day			Total
		Commercial and Industrial	Private and Domestic Self Haul	Household Kerbside	
Mitchell Resource Management Centre	One transfer station	23	158		181
Mugga Lane Resource Management Centre	One transfer station		235		235
Mugga Lane Landfill	Two adjacent at landfill	138 ¹		31	169
Total		161	393	31	585

1.3 Results to be Delivered

Section 4.1 of the project brief specified that the report must:

- ▶ Determine the quantity, source and composition of commercial and industrial waste, construction and demolition waste and special waste disposed of to landfill;
- ▶ Determine the composition of waste delivered to transfer stations for disposal to landfill;
- ▶ Analyse and report on the volumes and composition of waste streams in a format consistent with other waste studies; and
- ▶ Identify potential opportunities to divert waste from landfill;

Section 5.5 Results and Reports of the project brief said that reports must include details of:

- ▶ Design of the audit;
- ▶ Implementation of the audit;
- ▶ Weight of the material in each category (in kilograms to the nearest half kilogram)
- ▶ Percentage of total weight of the material in each category groups;
- ▶ Analysis of the data collected; and
- ▶ Results and recommendations.

¹ Varies widely from 60 to 200. Also includes three transfers from Mitchell

2. Methodology

2.1 Audit Timeframe and Variations

ACT NOWaste indicated in its brief that '*Data must represent the total waste stream for the survey period*'. GHD devised the audit methodology using the advertised opening times. During the pre-audit site inspection it came to GHD's attention that the landfill was open from 6.15 am for commercial loads.

ACT NOWaste decided that these loads should be included in the audit and agreed to a variation that would allow a GHD staff member to be on site from 6.15 am to record these loads. The decision to allow the early start for the audit came after the audit had commenced so additional time was allowed the following week to audit those vehicles not captured.

Due to a scheduling conflict no audits were conducted on the morning of Tuesday May 5. Instead audits were conducted on the following Tuesday Morning May 12.

Table 2 below shows the audit program.

Table 2 **Audit Schedule**

Day	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station
Monday 4 May	7.30 am – 5 pm	7.30 am – 5 pm	7.30 am – 5 pm
Tuesday 5 May	12.30 pm – 5 pm	12.30 pm – 5 pm	12.30 pm – 5 pm
Wednesday 6 May	7.30 am – 5 pm	6.15 am – 5 pm	7.30 am – 5 pm
Thursday 7 May	7.30 am – 5 pm	6.15 am – 5 pm	7.30 am – 5 pm
Friday 8 May	7.30 am – 5 pm	6.15 am – 5 pm	7.30 am – 5 pm
Saturday 9 May	7.30 am – 5 pm	6.15 am – 5 pm	7.30 am – 5 pm
Sunday 10 May	7.30 am – 5 pm	6.15 am – 5 pm	7.30 am – 5 pm
Monday 11 May		6.15 am – 7.30 am	
Tuesday 12 May	7.30 am – 12.30 pm	6.15 am – 12.30 pm	7.30 am – 12.30 pm

2.2 Training, Induction and OH&S

On Friday 1 May, all audit staff underwent Thiess Services' and Samarkos' safety induction at the Mugga Lane site. Induction and training by GHD was also undertaken. Staff spent some time at both the landfill and the transfer station at Mugga Lane where they observed vehicles unloading. Arrangements were made with Thiess Services and Samarkos staff in regard to safe areas for staff to stand, move, observe loads and vehicles and record data. Those staff scheduled to be working at Mitchell Transfer Station also made a visit to that site for familiarisation.

During the course of the audit, all auditors had with them mobile phones and also used high-visibility safety vests, hats, masks, sunscreen and safety footwear. Staff at the transfer stations also had hard hats and eye protection.

2.3 Data Recording

Audit staff were positioned at, or as near as was safe and practical to, the tipping areas at each site. In this respect GHD was subject to instructions from the facilities operators, Thiess Services and Samarkos Earthmoving. As each vehicle arrived at the tipping area, the auditor recorded on the data-recording sheet, the following information:

- ▶ Date;
- ▶ Time;
- ▶ Vehicle registration number;
- ▶ Type of vehicle or container; and
- ▶ Apparent type of load (C&I, domestic or C&D).

The auditor observed the load being tipped, estimated the volume of the different components of the load and recorded the amounts in litres or cubic metres on the data-recording sheet.

The project brief required that only material going to landfill be audited, so material deposited in designated recycling areas was not included in the audit and not recorded. Staff from ACT Recyclers and Aussie Junk² (operators of recovery centres at Mitchell and Mugga Lane) scavenged items and materials considered recyclable or recoverable. These items and materials were also excluded from the audit data where its removal was observed.

ACT NOWaste specified that the data recorded must be similar to that recorded in other landfill audits to enable comparison. The list of components used for this audit is shown in Table 3 below. These categories were chosen because of their use in previous audits.

In addition, because of the variety of materials disposed of, especially in C&I loads, auditors were at liberty to categorise materials as they observed them. These additional categories are also shown. Where appropriate these classifications were aggregated later for comparison with other studies.

² Since the audit, the operations of the recovery centres have been taken over by a new contractor, 'Tiny's Green Shed'

Table 3 Audit Categories

Material Categories	Definitions
Office Paper	White or coloured paper, A4, A3 etc, envelopes, note paper etc
Paper - all other	Magazines, newspapers, brown craft paper, rolls of low-grade paper, hand towels
Dry cardboard	Dry cardboard boxes, cardboard rolls, clean dry cardboard
Wet cardboard	Wet cardboard, soiled cardboard
Food / Kitchen	Pre and post consumer fruit, vegetable, meat, fat, bone
Vegetation / garden	Plant material, leaves, grass, small branches
Wood - furniture, painted wood	Wardrobes, painted fence posts, varnished furniture, wooden chairs, doors, etc
Wood - chipboard, MDF	Any engineered timber products, old kitchen benches, chipboard
Wood - board/pole, untreated	Pieces of solid timber without any visible signs of treatment. May include timber off-cuts, pallets, posts
Wood - board/pole, treated	Pieces of solid timber with visible signs of chemical treatment. Timber treated with copper chrome arsenic has a green tinge, for example 'Koppers Logs'.
Textiles - carpet & underlay	Rolls of carpet ,carpet off-cuts, carpet tiles, felt underlay, synthetic underlay (but not rubber or plastic underlay)
Textiles - cloth	Clothes, rags, rolls of fabric, fabric off-cuts
Textiles - cloth- & leather-covered furniture	Leather- or cloth-covered chairs and couches.
Textiles /leather other	Leather off-cuts
Rubber - tyres, tubes	All tyres and inner-tubes
Rubber other	Rubber mats, rubber tubes, rubber washers, foam rubber
Glass - containers	Glass bottles and jars
Glass - plate	Window glass, non-recyclable glass such as wine glasses
Plastic - containers recyclable	Plastic bottles and jars - food/beverage containers (PET & HDPE)
Plastic - film	Film wrap, plastic bags (not filled)
Plastic - Polystyrene foam	Packaging foam
Plastic - other	All other plastics not elsewhere classified - include industrial plastic containers, plastic drums (not 1 or 2)
Metals - ferrous steel	Any items that are mainly steel or iron
Metals - non-ferrous	Aluminium Siding, aluminium foil, copper wire, any items

Material Categories	Definitions
	that are mainly metal but not steel/iron
Concrete / cement	Any concrete, bags of cement dust, etc
Bricks/Tiles	Full-bricks, broken bricks, Roof tiles, whole or broken
Plasterboard	Plasterboard, gypsum
Rock/dirt/soil	Stones, uncontaminated soil, Inert material not elsewhere classified
Tiles, ceramics	All ceramics and ceramic tiles
Asphalt	Asphalt, bitumen
Hazardous / special	Batteries, chemicals, clinical waste, contaminated material
Garbage bags of rubbish	Enclosed bags of garbage
Computers / office equipment	Computers, monitors, photocopiers, fax machines, printers
Toner cartridges	Toner cartridges from photocopiers, printers, etc
Other items	There is space on the form to record amounts of other items presenting in significant quantities.
Mattresses*	Includes bed bases and foam mattresses
Ducting and insulation*	Fibreglass insulation and insulated heating/air conditioning ducting
Electronics and electrical equipment*	Electrical equipment other than computer equipment, for example, televisions and household appliances
Luggage*	Bags
Fibro board*	Cement fibre board, 'fibro'
Hotwater system*	Whole or partial hotwater tank and fixtures
Dust*	Unidentified dust or powder
Dead animals*	Veterinary and agricultural mortalities, road kill
Household items*	Household items not other wise categorised, bric-a-brac, toys etc

* Additional items and materials

For the later audit of bags, ACT NOWaste proposed a modified list of audit categories that aggregated some categories used for the visual landfill audit and divided others. The data from the first landfill audit shown in this report complies with the list in Table 3 above while the later combined landfill data uses the modified list which is shown in Table 4 below. Lists of the different categories used in the different audits and the modified list can be found in Appendix A.

Table 4 Modified Audit Categories

Office paper
Newspapers & Magazines
Other Paper
Disposable contaminated paper
Corrugated cardboard
Food/Kitchen
Vegetation/Garden
Other organic wood timber
Textiles clothing carpet
Rubber Other
Glass containers
Glass Misc / Other
Plastic containers
Film / Plastic Bags
Polystyrene
Plastic other
Steel Cans / Packaging
Ferrous
Metals non-ferrous
Concrete / cement
Bricks /Tiles
Plasterboard
Soil
Asphalt
E-waste
Household appliances big and small
Nappies
Ceramics
Fibreglass / fibreglass batts
Residual / other miscellaneous

2.4 Data Recording Limitations

A number of conditions were present during the audit which provided limitations for the recording of data. These included:

- ▶ Low light early in the morning;
- ▶ Line of sight obstruction by plant, staff, customers, structures, topography and other vehicles;
- ▶ Dirty, damaged or obscured registration plates;
- ▶ The ambiguous nature of some vehicles and the contents of some loads; and
- ▶ The inability to safely approach some vehicles or loads to inspect them more closely.

As a result of this the following data inconsistencies occurred:

- ▶ Vehicle registration numbers;
 - Incompletely recorded;
 - Unrecorded; or
 - Incorrectly recorded.
- ▶ Type of loads (C&I, domestic or C&D);
 - Unrecorded; or
 - Incorrectly recorded.
- ▶ Type of vehicle;
 - Unrecorded; or
 - Incorrectly recorded.

Much of the data unrecorded as a result of these limitations was completed using data recorded for those vehicles at the weighbridge.

2.5 Weighbridge Data

2.5.1 Method

ACT NOWaste provided relevant weighbridge data collected at each site on the audit days, including data relating to small vehicles that were not weighed. GHD matched the audit data with the weighbridge data to provide a complete picture of the nature of waste disposed during the course of the audit.

The information recorded at the weighbridges of relevance to this project included:

- ▶ Date;
- ▶ Time – usually the exit time;
- ▶ Registration number;
- ▶ Product code – the classification of the load and/or the material for disposal³;

³ A full list of the classification codes can be found in Appendix C

- ▶ Customer or supplier – the name of the account holder if an account customer or whether a cash transaction;
- ▶ Docket number – the number of the record and receipt;
- ▶ The charge due for each load;
- ▶ The approximate size of the load for vehicles delivering to the transfer station; and
- ▶ The net weight of the load for vehicles delivering to the landfill.

2.5.2 Anomalies

A number of anomalies were noted when the weighbridge data was matched to the audit data. These anomalies took three main forms:

- ▶ Vehicles shown in the weighbridge records but not recorded as part of the audit;
- ▶ Vehicles recorded as part of the audit but not shown in the weighbridge records; and
- ▶ Missing, incorrect or incomplete weighbridge recording of;
 - registration numbers;
 - load weights; and
 - product codes.

The possible causes of these anomalies include:

- ▶ Inaccurate or incomplete entry of data at weighbridge or during audit; and
- ▶ Vehicles did not go to the tipping area but to the recycling area, tip shop or other part of the site.

The Mugga Lane weighbridge data does not record which loads deposit at the main landfill and which go to the transfer station. In addition, there is no record of which loads depositing at the transfer station are tipping material for recycling or for disposal to landfill.

Because the project brief required the audit be conducted of material going to landfill, those loads or parts of loads tipped as recycling were not recorded. This may account for some of those loads recorded at the weighbridge but not recorded as part of the audit.

2.5.3 Small Vehicle Classifications

The net weights of small vehicles entering either Mitchell Transfer Station or at Mugga Lane are not normally documented. They are usually recorded as follows:

- ▶ D1 – Small Domestic Vehicle – charged \$8 per load;
- ▶ D2 – Medium Domestic Vehicle – charged \$16 per load; and
- ▶ D3 – Large Domestic Vehicle – charged \$24 per load;

Some domestic loads, presumably those larger again, are classified 'D4 – Over 0.5t Domestic', weighed and charged \$62 per tonne. The weighbridge operator decides under which classification vehicles are charged.

The following types of loads are also charged by item and no weight is recorded;

- I1 – Computer terminals - \$15 per item;
- I2 – Computer monitors - \$22 per item;
- I3 – Tyres-Small vehicles - \$3 per item;
- I4 – Mattress - \$5 per item;
- I5 – Carcass small/medium - \$10.5 per item; and
- I6 – Carcass large - \$121 per item;

2.5.4 Average Weights of Small Vehicle Loads

Mitchell Transfer Station

The average weight of each small vehicle load delivering materials for landfilling recorded during the audit week at Mitchell Transfer Station was calculated by subtracting the total amount of weight from all landfill loads recorded as entering the site from the total amount of weight of all landfill loads leaving the site and then averaging and apportioning the balance over the number of loads recorded for the three small vehicle sizes.

The amount of material leaving the site was calculated by adding the weight recorded for the following classifications:

- ▶ T21 Mitchell Waste Outbound (238.12 t) ; and
- ▶ T24 T/S [transfer station] to Aussie Junk (7.56 t).

Aussie Junk operates the reuse shops located at both the Mitchell and Mugga Lane sites. This was a total of 245.68 t.

The amount of material entering the site was calculated by adding the weight recorded for the following classifications:

- ▶ D4 - Over 0.5t Domestic (17.38 t);
- ▶ D5 - Domestic Asbestos Under 0.25t (0.86 t);
- ▶ C1 - C&I Waste (92.92 t);
- ▶ C2 - Garden Waste – Charged (30.98 t);
- ▶ I4 – Mattress (2.1 t⁴); and
- ▶ T-25 Aussie Junk Waste to T/S (2.96 t).

This was a total of 147.2 t, leaving a balance of 98.48 t presumed to be delivered by small vehicles. In order to apportion this weight among small vehicles of different sizes as accurately as possible, the different sized small vehicle loads were given 'shares' in this amount according to the fee they paid. D1 loads were given one share each, D2 were given two shares, as they paid twice the fee of D1 loads, and D3 loads were given three shares, as they paid three times the fee. The 13 loads delivering computers and tyres were counted as D1 loads for this purpose.

This meant that there were 417 D1 loads with 417 shares, 574 D2 loads with 1148 shares and 74 D3 loads with 222 shares. This was a total of 1787 shares. The 98.48 t

⁴ The weight of mattresses was calculated by multiplying the total number of mattresses recorded – 60 – by the known average weight of a mattress – 35 kg.

was then divided into these 1787 shares to arrive at a value of 0.0551 t per share, or 55 kg. Each D1 load then was an average of 55 kg, each D2 load 110 kg (twice 55 kg) and each D3 load an average of 165 kg (three times 55 kg).

Mugga Lane Transfer Station

Essentially the same calculation was used at Mugga Lane. The amount of material leaving the transfer station was calculated by adding the weight recorded for the following classifications:

- ▶ T01 - T/S to RRA (109.0 t);
- ▶ T02 - T/S to Aussie Junk (0.3 t);
- ▶ T03 – T/S Waste to landfill (191.9 t);
- ▶ T04 - T/S to Metal Outbound (24.8 t);
- ▶ T06 - T/S to Paint Outbound (2.2 t);
- ▶ T19 - Mugga T/S to Tyres (0.5 t); and
- ▶ T24 - T/S to Aussie Junk (0.9 t).

This was a total of 329.6 t and presumed to be the total amount of waste delivered to the transfer station by small vehicles. A small amount of waste (3.2 t), recorded as T-25 Aussie Junk Waste to T/S, was known to be deposited at the transfer station but as this was not delivered by small vehicles it was not included.

The different sized small vehicle loads were again given 'shares' in this amount according to the fee they paid. The 31 loads delivering computers and tyres were counted as D1 loads for this purpose.

This meant that there were 458 D1 loads with 458 shares, 595 D2 loads with 1190 shares and 202 D3 loads with 606 shares. This was a total of 2254 shares. The 329.6 t was then divided into these 2254 shares to arrive at a value of 0.146 t per share, or 146 kg. Each D1 load then was an average of 146 kg, each D2 load 292 kg (twice 146 kg) and each D3 load an average of 439 kg (three times 146 kg).

Mugga Lane Landfill

Only a small number of small vehicles were recorded tipping at the landfill. During the audit 22 cars, station wagons, utes and vans, with and without trailers, were recorded at the landfill. At the weighbridge nine vehicles were classified as D1, D2 or D3 small vehicles, while 14 loads were classified as mattresses, 16 loads classified as D4 (over 5 t domestic) and nine loads as small or large carcasses. Any 13 of them could have been the balance of small vehicles recorded during the audit.

It was not possible to calculate the average weight of small vehicles tipping at the landfill, so the average weights calculated for Mugga Lane Transfer Station were used instead.

2.5.5 Converting Volume to Weight

GHD has used a set of volume to weight conversion factors developed by the former Resource NSW (now the NSW Department of Environment and Climate Change) after

major audits of landfills and transfer stations carried out in 2003⁵. That project involved both visual audits, like those conducted for this project, as well as physical audits of selected loads of waste. The categories and conversion factors are shown in Table 5.

Table 5 Density of Categories in Mixed Loads (tonnes/cubic metre)

Category	Low compaction/ Uncompacted	Medium	Compacted
Office Paper	0.37	0.38	0.38
Paper Other	0.1	0.25	0.47
Dry Cardboard	0.05	0.1	0.17
Wet Cardboard	0.5	0.5	0.5
Food/kitchen	0.33	0.33	0.33
Vegetation/Garden	0.15	0.23	0.22
Wood-Furniture	0.17	0.16	0.4
Wood-MDF	0.25	0.2	0.3
Wood Solid Untreated	0.12	0.16	0.36
Wood Solid Treated	0.18	0.22	0.26
Textiles-Carpet	0.15	0.1	0.35
Textiles-Cloth	0.13	0.12	0.49
Textiles-Cloth Furniture	0.09	0.1	0.45
Textiles/Leather Other	0.07	0.07	0.24
Rubber-Tyres	0.2	0.2	0.2
Rubber Other	0.26	0.26	0.26
Glass Containers	0.28	0.28	0.28
Glass Plate	0.36	0.36	0.36
Plastic Containers	0.08	0.16	0.18
Plastic Film	0.07	0.12	0.2
Polystyrene Foam	0.03	0.03	0.06
Plastic Other	0.17	0.17	0.36
Ferrous	0.28	0.28	0.29
Metals Non-ferrous	0.25	0.45	0.44
Concrete/Cement	0.74	0.76	0.76
Bricks/Tiles	0.53	0.32	0.48
Plasterboard	0.32	0.21	0.2
Soil	0.93	0.9	0.8

⁵ Department of Environment and Conservation (NSW) (2003) Disposal-based Commercial and Industrial Waste Characterisation Survey Sydney Metropolitan Area - May - July 2003

Category	Low compaction/ Uncompacted	Medium	Compacted
Asphalt	0.68	0.68	0.68
Garbage bags of rubbish	0.23	0.29	0.3
Computers	0.15	0.05	0.05

Those factors listed under the 'Compacted' column were used for the ACT audit to convert volumes recorded as coming from rear lift, front lift and side lift compactor vehicles, the loads carried by which are normally compacted, while those factors listed under the 'Low compaction/Uncompacted' column were applied to all other loads.

2.6 Bag Audit Method

To establish the composition of the bags found in the C&I loads delivered for landfilling at the two transfer stations and the landfill, the following audit method was devised between ACT NOWaste and APC. It involved collecting bags from loads deposited at the landfill and physically sorting and weighing the contents.

Each vehicle depositing at the Mugga Lane Landfill was observed as it ejected its load. The following information about each vehicle was recorded:

- ▶ Tipping time;
- ▶ Registration number;
- ▶ Trading name of company tipping, if known;
- ▶ Type of vehicle;
- ▶ The number of bags collected for sorting;
- ▶ The approximate volume of the bags selected for sorting (in litres);
- ▶ The proportion of the load that appeared to be C&I waste;
- ▶ The proportion of the load that appeared to be domestic waste; and
- ▶ The proportion the sample of bags appeared to be of all the bags observed in the load.

A code was also assigned to each load on the data recording sheet.

A sample of approximately 200 litres of bags was collected from each load in which bags were present. These bags were labelled with the code for that load and put aside for sorting.

A team of sorters operating nearby sorted as many of the sampled bags as possible each day of the audit period, a total of three days.

Bags that were collected from the vehicles delivering from the transfer stations were kept separate and given priority. The bags from each transfer station and those deposited directly at the landfill were sorted separately so that three sets of data; one for each transfer station and one for the landfill were produced.

2.7 Combining Landfill and Bag Audit Data

The quantities found in bags sampled from each load were weighted to reflect the proportion the sample was of all the bags seen in that load. For example, a sample of bags that appeared to be about 50% of the number of bags in the load was multiplied by the inverse of 50%, that is 2. A sample of bags that appeared to be about 10% of the number of bags in the load was multiplied by the inverse of 10%, that is 10, and so on. In this way, the contents of sampled bags that made up a larger proportion of the bags in that load did not bias the ultimate composition.

In the case of the C&I bag audit, the composition of the bags disposed of at Mitchell Transfer Station, Mugga Lane Transfer Station and Mugga Lane Landfill were each able to be calculated separately. These, along with the composition of the kerbside garbage stream are shown in Table 6 below using the modified category list previously shown in Table 4.

Table 6 Proportions Applied to Garbage Bags

Materials	Commercial and Industrial			Domestic
	Mitchell Transfer Station	Mugga Lane Transfer Station	Mugga Lane Landfill	Kerbside Garbage
Office paper	0.1%	0.8%	3.9%	*0%
Newspapers & Magazines	4.1%	2.1%	2.0%	1.7%
Other Paper	0.4%	1.2%	3.3%	3.2%
Disposable contaminated paper	7.9%	2.3%	14.7%	6.0%
Corrugated cardboard	0.0%	0.2%	2.2%	0.4%
Food/Kitchen	16.8%	8.3%	16.1%	38.9%
Vegetation/Garden	10.7%	10.4%	2.2%	5.3%
Other organic wood timber	0.3%	0.9%	0.7%	0.9%
Textiles clothing carpet	9.1%	31.9%	21.9%	4.7%
Rubber Other	12.9%	0.0%	0.5%	*0%
Glass containers	3.9%	3.4%	4.7%	3.3%
Glass Misc / Other	0.0%	0.0%	0.2%	0.7%
Plastic containers	1.2%	3.3%	3.6%	1.9%
Film / Plastic Bags	9.4%	4.9%	8.5%	5.9%
Polystyrene	4.2%	0.7%	0.7%	0.6%
Plastic other	5.9%	1.5%	4.9%	1.9%
Steel Cans / Packaging	0.1%	0.6%	0.9%	1.2%
Ferrous	1.3%	0.0%	0.2%	0.5%

Materials	Commercial and Industrial			Domestic
	Mitchell Transfer Station	Mugga Lane Transfer Station	Mugga Lane Landfill	Kerbside Garbage
Metals non-ferrous	0.2%	0.9%	1.1%	0.7%
Concrete / cement	0.0%	0.0%	0.0%	0.2%
Bricks / Tiles	0.0%	0.0%	0.0%	*0%
Plasterboard	0.0%	3.2%	0.5%	0.6%
Soil	0.0%	8.7%	0.0%	3.1%
Asphalt	0.0%	0.0%	0.0%	0.0%
E-waste	0.2%	0.0%	0.0%	*0%
Household appliances big and small	0.0%	0.0%	0.0%	*0%
Nappies	0.2%	8.2%	2.3%	*0%
Ceramics	0.4%	1.2%	0.2%	1.0%
Fibreglass / fibreglass batts	0.0%	0.5%	0.0%	0.0%
Residual / other miscellaneous	10.8%	4.8%	4.8%	17.4%
Total	100.0%	100.0%	100.0%	100.0%

* These materials were not specifically sorted in the kerbside audit

The composition of the contents of the bags in the C&I stream was applied to the quantities found in the C&I stream during the landfill audit. The composition of the kerbside garbage stream found during the domestic audits was applied to the bags disposed of by domestic vehicles during the landfill audit.

During the original landfill audit the volumes of garbage bags were recorded by auditors. These volumes were converted to weight (see Section 2.5.5). The bag audit was conducted by weight only.

The converted weight of bags recorded during the landfill audit as originating from C&I loads⁶ was divided by the proportions of materials in the bag stream as calculated from the bag audit. The quantity of each material was then added back to the weight (converted from volume) of that material recorded during the landfill audit.

The converted weight of bags recorded during the landfill as originating from domestic loads was divided by the proportions of materials in the bag stream as calculated from the kerbside audit. The quantity of each material was then added back to the weight (converted from volume) of that material recorded during the landfill audit.

To include the bag results in the volume data, the weight of the contents of the bags was converted to volume first before the same procedure described above was carried out.

⁶ C&D loads and loads for which the origin was 'Not known' were included as C&I for this purpose

The volume of bags recorded during the landfill audit as originating from C&I loads⁷ was divided by the proportions of materials in the bag stream as calculated from the bag audit. The quantity of each material was then added back to the volume of that material recorded during the landfill audit.

The volume of bags recorded during the landfill audit as originating from domestic loads was divided by the proportions of materials in the bag stream as calculated from the kerbside audit. The quantity of each material was then added back to the volume of that material recorded during the landfill audit.

In this way compositions by weight and volume of the landfilled streams delivered to both transfer stations and the landfill, were calculated without garbage bags as a component.

The tables and charts showing 'volume' figures include both original visual audit data recorded by volume and physical audit data recorded by weight and converted to volume. The tables and charts showing 'weight' figures include both original visual audit data recorded by volume and converted to weight and physical audit data recorded by weight.

⁷ C&D loads and loads for which the origin was 'Not known' were included as C&I for this purpose

3. Results

3.1 Introduction

Data was transcribed from data recording sheets into Microsoft Excel spreadsheets. Table 7 below shows the average numbers of vehicles delivering per day provided by ACT NOWaste before the audit and the numbers recorded during the audit.

Table 7 Average Number of Vehicles per Day

Site	Commercial and Industrial		Private and Domestic Self Haul		Household Kerbside		Not known ⁸	Total	
	Provided	Recorded	Provided	Recorded	Provided	Recorded	Recorded	Provided	Recorded
Mitchell Resource Management Centre ⁹	23	34	158	126	-	-	1	181	162
Mugga Lane Resource Management Centre ¹⁰	-	26	235	130	-	-	1	235	157
Mugga Lane Landfill	138	85	-	-	31	38	1	169	124
Total	161	145	393	256	31	38	3	585	443

An average of 443 vehicles per day were recorded at all sites during the audit, compared to the estimated average provided of 585. This was 142 vehicles per day fewer than expected. The Sunday of the audit was Mothers Day and site operators reported that use of sites was significantly down compared to a normal Sunday. This may go some way in accounting for the lower average.

3.2 Original Results - Mitchell Transfer Station – Without Garbage Bag Details

3.2.1 Volume Results

Table 8 below shows the composition in litres of the waste deposited at Mitchell Transfer Station during the audit period. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

⁸ Vehicles of unknown origin

⁹ Transfer station

¹⁰ Transfer station

Table 8 Composition of Landfilled Waste at Mitchell Transfer Station by Audit Day – Litres – Without Garbage Bag Details

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total	Percent
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Office Paper	1,350	100	-	100	-	-	150	1,700	0.1%
Paper - all other	2,000	2,700	3,100	1,900	4,700	4,050	5,050	23,500	1.1%
Dry cardboard	23,150	8,100	18,450	15,000	28,500	23,800	49,700	166,700	7.9%
Wet cardboard	300	-	300	400	200	100	400	1,700	0.1%
Food / Kitchen	100	-	600	-	50	3,100	-	3,850	0.2%
Vegetation / garden	80,100	32,050	83,510	74,850	32,550	42,250	49,450	394,760	18.7%
Wood - furniture, painted wood	16,700	10,200	20,550	28,100	13,550	27,100	28,750	144,950	6.9%
Wood - chipboard, MDF	18,900	2,100	14,800	15,050	17,100	13,400	15,050	96,400	4.6%
Wood - board/pole, untreated	16,100	3,400	12,700	14,600	10,800	8,400	4,100	70,100	3.3%
Wood - board/pole, treated	17,400	8,150	6,550	5,000	6,000	11,650	40,150	94,900	4.5%
Textiles - carpet & underlay	7,000	8,700	11,500	2,600	12,450	16,550	16,550	75,350	3.6%
Textiles - cloth	16,350	3,300	22,300	9,600	24,400	10,750	9,950	96,650	4.6%
Textiles - cloth & leather- covered furniture	10,150	7,700	22,300	10,850	8,500	15,000	23,700	98,200	4.7%
Textiles /leather other	5,200	1,700	2,200	1,350	2,450	5,950	6,250	25,100	1.2%
Rubber - tyres, tubes	400	100	600	50	100	750	-	2,000	0.1%
Rubber other	300	-	-	1,600	250	3,600	550	6,300	0.3%
Glass - containers	400	800	500	600	750	300	2,300	5,650	0.3%
Glass - plate	1,500	1,250	1,700	1,600	1,000	1,350	250	8,650	0.4%
Plastic - containers recyclable	900	50	1,950	4,700	6,600	300	50	14,550	0.7%
Plastic - film	5,650	2,100	2,750	2,800	11,200	11,300	13,650	49,450	2.3%
Plastic - Polystyrene foam	10,400	2,350	7,050	7,300	13,950	5,750	4,810	51,610	2.4%
Plastic - other	26,450	8,600	33,250	20,350	29,800	15,450	30,350	164,250	7.8%
Metals - ferrous steel	4,200	2,500	200	250	3,600	2,370	23,450	36,570	1.7%
Metals - non-ferrous	8,000	950	2,450	2,700	5,450	4,000	2,150	25,700	1.2%

Concrete / cement	31,600	2,300	2,850	1,950	2,750	3,800	3,500	48,750	2.3%
Bricks/Tiles	4,400	850	4,700	3,900	2,800	5,250	1,500	23,400	1.1%
Plasterboard	3,100	4,250	1,300	6,300	5,000	10,450	8,200	38,600	1.8%
Rock/dirt/soil	4,200	2,550	2,050	4,300	1,300	3,500	600	18,500	0.9%
Tiles, ceramics	3,400	1,100	900	2,500	1,850	4,750	3,800	18,300	0.9%
Asphalt	-	-	-	-	-	-	-	-	0.0%
Hazardous / special	510	-	50	100	-	500	50	1,210	0.1%
Garbage bags of rubbish	33,450	14,150	45,650	21,500	28,050	35,150	43,050	221,000	10.5%
Computers / office equipment/Toner cartridges	4,500	100	300	200	200	2,070	1,900	9,270	0.4%
Car parts	-	2,000	-	-	-	-	-	2,000	0.1%
Dead animals	-	-	-	-	-	-	-	-	0.0%
Ducting and insulation	2,000	5,450	50	3,000	1,500	50	500	12,350	0.6%
Dust	-	-	-	-	-	-	-	-	0.0%
Electrical equipment	4,800	1,020	3,250	3,740	5,080	1,480	800	20,020	0.9%
Fibro board	-	-	-	-	-	-	-	-	0.0%
Hotwater system	-	-	-	-	-	500	-	500	0.0%
Luggage	200	-	-	-	-	-	-	200	0.0%
Mattresses	3,700	3,000	10,650	7,550	7,480	2,300	2,800	37,480	1.8%
Total (litres)	368,860	143,670	341,060	276,390	289,960	297,070	393,510	2,110,170	100.0%

Table 8 shows that about 2.1 million litres, or about 2,100 cubic metres, of waste were recorded as landfilled during the audit period. The largest amounts were delivered on Monday and Sunday.

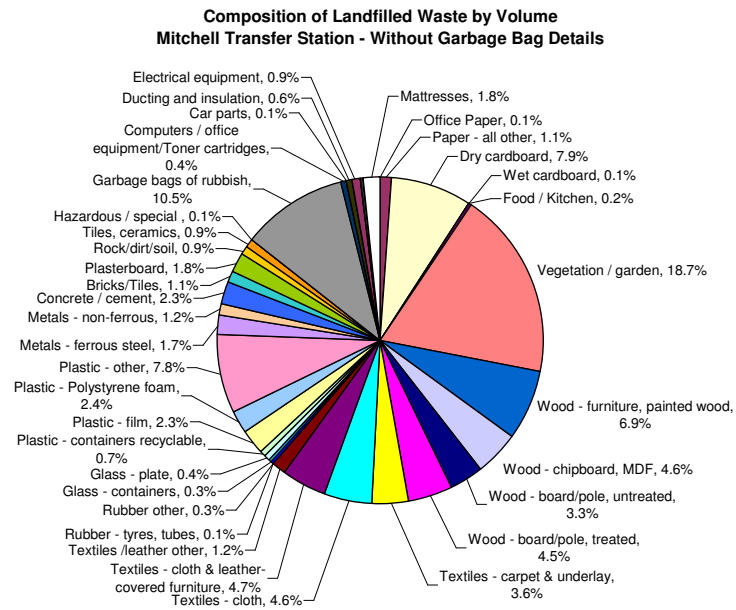


Figure 1 - Composition of Landfilled Waste by Volume at Mitchell Transfer Station – Without Garbage Bag Details

That a large range of materials was deposited is shown in Figure 1. The largest proportion was vegetation and garden waste at 18.7%, with garbage bags of rubbish (10.5%), plastic other (7.8%) and painted wood and furniture (6.9%) the next largest proportions.

Table 9 below shows the aggregated composition in cubic metres of the waste deposited at the landfill at Mitchell Transfer Station during the audit period. The figures for Monday and Tuesday include those quantities also recorded on the following Monday May 11 and Tuesday May 12.

Table 9 Aggregated Total Composition of Mitchell Transfer Station Stream – Cubic Metres – Without Garbage Bag Details

	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Category	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	26.8	10.9	21.9	17.4	33.4	28.0	55.3	193.6	9.2%
Organics	80.2	32.1	84.1	74.9	32.6	45.4	49.5	398.6	18.9%
Wood and timber products	69.1	23.9	54.6	62.8	47.5	60.6	88.1	406.4	19.3%
Textiles and rubber	39.4	21.5	58.9	26.1	48.2	52.6	57.0	303.6	14.4%
Glass	1.9	2.1	2.2	2.2	1.8	1.7	2.6	14.3	0.7%
Plastics	43.4	13.1	45.0	35.2	61.6	32.8	48.9	279.9	13.3%
Metals	12.2	5.5	2.7	3.0	9.1	6.4	25.6	64.3	3.0%
Building material	48.7	16.5	11.9	22.0	15.2	27.8	18.1	159.9	7.6%
Hazardous	0.5	-	0.1	0.1	-	0.5	0.1	1.2	0.1%
Bags and loose garbage	33.5	14.2	45.7	21.5	28.1	35.2	43.1	221.0	10.5%
E-waste and office equipment	9.3	1.1	3.6	3.9	5.3	3.6	2.7	29.3	1.4%
Other	3.9	3.0	10.7	7.6	7.5	2.8	2.8	38.2	1.8%
Total (cubic metres)	368.9	143.7	341.1	276.4	290.0	297.1	393.5	2,110.2	100.0%

This data is shown as percentages in Figure 2 below.

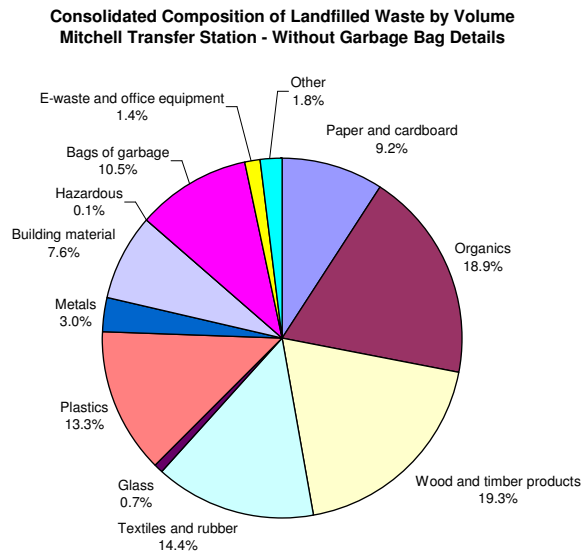


Figure 2 – Consolidated Composition of Landfilled Waste by Volume at Mitchell Transfer Station – Without Garbage Bag Details

Figure 2 shows that organic material, both paper and cardboard, wood and timber or organics (vegetation and kitchen waste), were the largest proportions of this stream. They totalled 47.4%. A further 36.5% was plastics and other potentially recoverable materials.

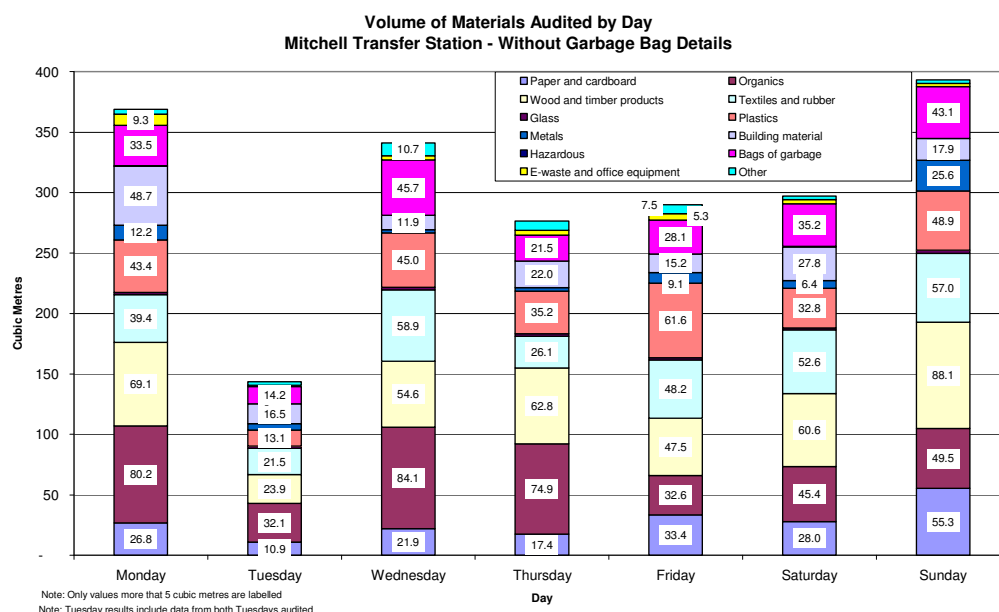


Figure 3 – Volume of Materials Audited by Day at Mitchell Transfer Station – Without Garbage Bag Details

The volume in cubic metres of the aggregated categories deposited at Mitchell Transfer Station each day of the audit is shown in Figure 3. Apart from Tuesday, the volumes of waste deposited each day are reasonably consistent, between about 300 and 400 cubic metres.

Greater quantities of organics are deposited on Monday, Wednesdays and Thursday, but otherwise the amounts of most materials are relatively consistent across all weekdays, with the exception of Tuesday. It is not immediately obvious why there are such smaller quantities on Tuesday. Later charts show that the number of vehicles delivering on Tuesday is consistent with other others days. An examination of the average load size however, shows that on Tuesday this was 1.2 m³ compared to over 2 m³ on other weekdays (up to 3 m³ on Wednesday).

Table 10 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mitchell Transfer Station each day.

Table 10 Quantities Landfilled by Stream by Volume

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	200,260	50,420	137,250	114,670	128,900	247,420	380,060	1,258,980	59.7%
C&I	160,400	77,850	183,060	146,370	127,060	13,600	10,350	718,690	34.1%
C&D	-	12,850	13,650	14,550	34,000	36,050	750	111,850	5.3%
No Known	8,200	2,550	7,100	800	-	-	2,000	20,650	1.0%
Total (litres)	368,860	143,670	341,060	276,390	289,960	297,070	393,160	2,110,170	100%

This data is shown in the two figures below.

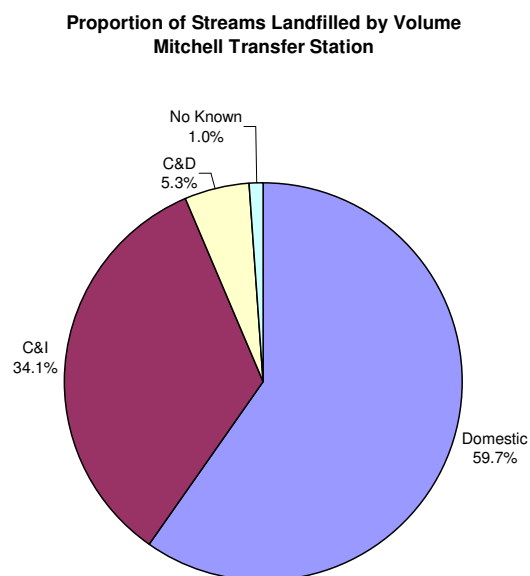


Figure 4 – Proportion of Stream Landfill by Volume at Mitchell Transfer Station

Figure 4 shows the proportion by volume of the different streams landfilled. Domestic waste comprises the largest proportion by far with C&I the next most significant.

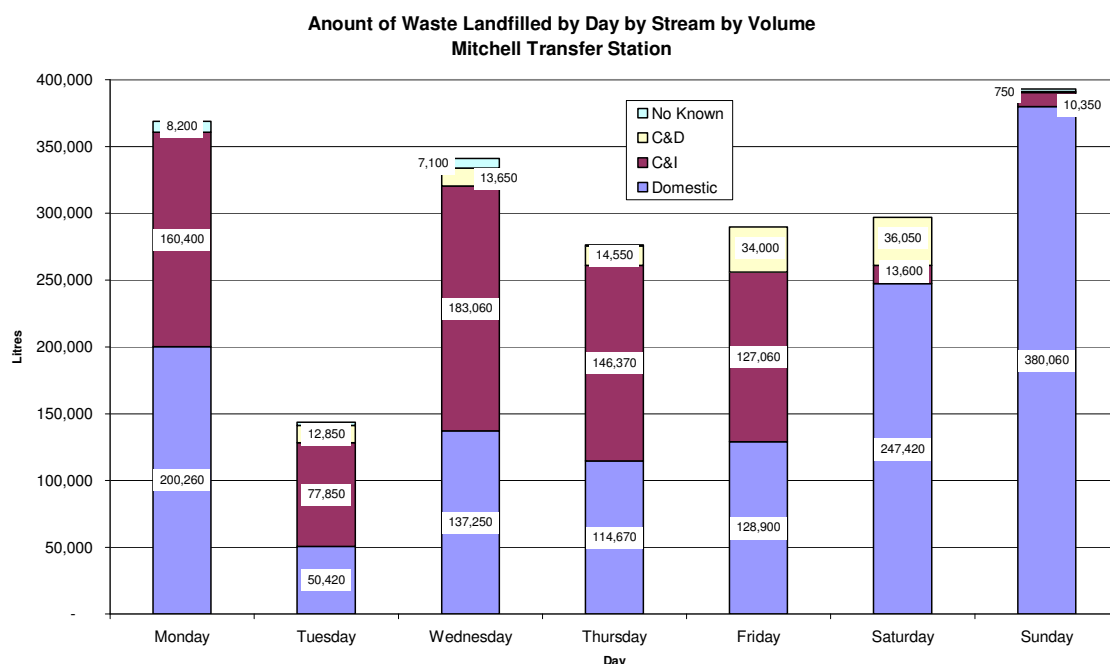


Figure 5 – Amount of Waste Landfilled by Day by Stream and by Volume at Mitchell Transfer Station

Figure 5 shows the composition and volume in litres of waste landfilled each day at for the domestic, C&I and C&D streams. The most waste deposited in a single day was on Sunday with almost 400,000 litres (400 cubic metres). Almost all of this was domestic waste. During the week the proportion of domestic and C&I was closer to half each.

3.2.2 Weight Results

Table 11 below shows the composition in kilograms (to the nearest half kilogram) of the waste deposited at Mitchell Transfer Station during the audit period. These figures were calculated by converting the volume of each material recorded during the audit to weigh using the Resource NSW conversion factors. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 11 Composition of Landfilled Waste at Mitchell Transfer Station by Audit Day – Kilograms – Without Garbage Bag Details

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total	Percent
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Office Paper	499.5	37.0	-	37.0	-	-	55.5	629.0	0.2%
Paper - all other	200.0	270.0	310.0	190.0	470.0	405.0	505.0	2,350.0	0.6%
Dry cardboard	1,157.5	405.0	922.5	750.0	1,425.0	1,190.0	2,485.0	8,335.0	2.1%
Wet cardboard	150.0	-	150.0	200.0	100.0	50.0	200.0	850.0	0.2%

Food / Kitchen	33.0	-	198.0	-	16.5	1,023.0	-	1,270.5	0.3%
Vegetation / garden	12,015.0	4,807.5	12,526.5	11,227.5	4,882.5	6,337.5	7,417.5	59,214.0	15.3%
Wood - furniture, painted wood	2,839.0	1,734.0	3,493.5	4,777.0	2,303.5	4,607.0	4,887.5	24,641.5	6.4%
Wood - chipboard, MDF	4,725.0	525.0	3,700.0	3,762.5	4,275.0	3,350.0	3,762.5	24,100.0	6.2%
Wood - board/pole, untreated	1,932.0	408.0	1,524.0	1,752.0	1,296.0	1,008.0	492.0	8,412.0	2.2%
Wood - board/pole, treated	3,132.0	1,467.0	1,179.0	900.0	1,080.0	2,097.0	7,227.0	17,082.0	4.4%
Textiles - carpet & underlay	1,050.0	1,305.0	1,725.0	390.0	1,867.5	2,482.5	2,482.5	11,302.5	2.9%
Textiles - cloth	2,125.5	429.0	2,899.0	1,248.0	3,172.0	1,397.5	1,293.5	12,564.5	3.2%
Textiles - cloth & leather- covered furniture	913.5	693.0	2,007.0	976.5	765.0	1,350.0	2,133.0	8,838.0	2.3%
Textiles /leather other	364.0	119.0	154.0	94.5	171.5	416.5	437.5	1,757.0	0.5%
Rubber - tyres, tubes	80.0	20.0	120.0	10.0	20.0	150.0	-	400.0	0.1%
Rubber other	78.0	-	-	416.0	65.0	936.0	143.0	1,638.0	0.4%
Glass - containers	112.0	224.0	140.0	168.0	210.0	84.0	644.0	1,582.0	0.4%
Glass - plate	540.0	450.0	612.0	576.0	360.0	486.0	90.0	3,114.0	0.8%
Plastic - containers recyclable	72.0	4.0	156.0	376.0	528.0	24.0	4.0	1,164.0	0.3%
Plastic - film	395.5	147.0	192.5	196.0	784.0	791.0	955.5	3,461.5	0.9%
Plastic - Polystyrene foam	312.0	70.5	211.5	219.0	418.5	172.5	144.3	1,548.3	0.4%
Plastic - other	4,496.5	1,462.0	5,652.5	3,459.5	5,066.0	2,626.5	5,159.5	27,922.5	7.2%
Metals - ferrous steel	1,176.0	700.0	56.0	70.0	1,008.0	663.6	6,566.0	10,239.6	2.6%
Metals - non-ferrous	2,000.0	237.5	612.5	675.0	1,362.5	1,000.0	537.5	6,425.0	1.7%
Concrete / cement	23,384.0	1,702.0	2,109.0	1,443.0	2,035.0	2,812.0	2,590.0	36,075.0	9.3%
Bricks/Tiles	2,332.0	450.5	2,491.0	2,067.0	1,484.0	2,782.5	795.0	12,402.0	3.2%
Plasterboard	992.0	1,360.0	416.0	2,016.0	1,600.0	3,344.0	2,624.0	12,352.0	3.2%
Rock/dirt/soil	3,906.0	2,371.5	1,906.5	3,999.0	1,209.0	3,255.0	558.0	17,205.0	4.4%
Tiles, ceramics	1,802.0	583.0	477.0	1,325.0	980.5	2,517.5	2,014.0	9,699.0	2.5%
Garbage bags of rubbish	7,693.5	3,254.5	10,499.5	4,945.0	6,451.5	8,084.5	9,901.5	50,830.0	13.1%
Computers / office equipment/Toner	675.0	15.0	45.0	30.0	30.0	310.5	285.0	1,390.5	0.4%

cartridges									
Car parts	-	560.0	-	-	-	-	-	560.0	0.1%
Ducting and insulation	340.0	926.5	8.5	510.0	255.0	8.5	51.0	2,099.5	0.5%
Electrical equipment	720.0	153.0	487.5	561.0	762.0	222.0	97.5	3,003.0	0.8%
Hotwater system	-	-	-	-	-	140.0	-	140.0	0.0%
Luggage	18.0	-	-	-	-	-	234.0	252.0	0.1%
Mattresses	333.0	270.0	958.5	679.5	673.2	207.0	18.0	3,139.2	0.8%
Total Audit (kg)	82,593.5	27,160.5	57,940.0	50,046.0	47,126.7	56,331.1	66,790.3	387,988.1	100.0%

The composition of the waste landfilled at Mitchell Transfer Station by weight, converted from volume, is shown in Figure 6.

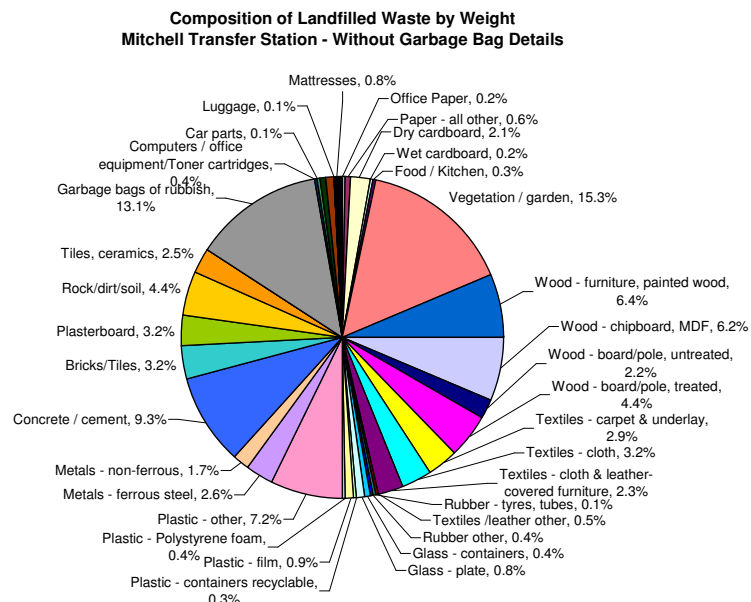


Figure 6 - Composition of Landfilled Waste by Weight at Mitchell Transfer Station

Figure 6 shows that the largest proportion of material by weight was vegetation and garden waste at 15.3%, with garbage bags of rubbish (13.1%) and concrete and cement (9.3%) the next largest proportions.

Table 12 below shows the aggregated composition in kilograms, converted from litres, of the waste deposited at the landfill at Mitchell Transfer Station during the audit period. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12.

Table 12 Aggregated Total Composition of Mitchell Transfer Station Stream – Kilograms – Without Garbage Bag Details

	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Category	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent

Category	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Paper and cardboard	2,007.0	712.0	1,382.5	1,177.0	1,995.0	1,645.0	3,245.5	12,164.0	3.1%
Organics	12,048.0	4,807.5	12,724.5	11,227.5	4,899.0	7,360.5	7,417.5	60,484.5	15.6%
Wood and timber products	12,628.0	4,134.0	9,896.5	11,191.5	8,954.5	11,062.0	16,369.0	74,235.5	19.1%
Textiles and rubber	4,944.0	2,836.0	7,863.5	3,814.5	6,734.2	6,939.5	6,507.5	39,639.2	10.2%
Glass	652.0	674.0	752.0	744.0	570.0	570.0	734.0	4,696.0	1.2%
Plastics	5,276.0	1,683.5	6,212.5	4,250.5	6,796.5	3,614.0	6,263.3	34,096.3	8.8%
Metals	3,176.0	1,497.5	668.5	745.0	2,370.5	1,663.6	7,103.5	17,224.6	4.4%
Building material	32,756.0	7,393.5	7,408.0	11,360.0	7,563.5	14,719.5	8,632.0	89,832.5	23.2%
Hazardous ¹¹	-	-	-	-	-	-	-	-	0.0%
Bags and loose garbage	7,693.5	3,254.5	10,499.5	4,945.0	6,451.5	8,084.5	9,901.5	50,830.0	13.1%
E-waste and office equipment	1,395.0	168.0	532.5	591.0	792.0	532.5	382.5	4,393.5	1.1%
Other	18.0	-	-	-	-	140.0	234.0	392.0	0.1%
Total (kg)	82,593.5	27,160.5	57,940.0	50,046.0	47,126.7	56,331.1	66,790.3	387,988.1	100.0%

This data is shown as percentages in Figure 7 below.

¹¹ No suitable conversion factor was available for hazardous waste and as this represented only a small proportion it was omitted.

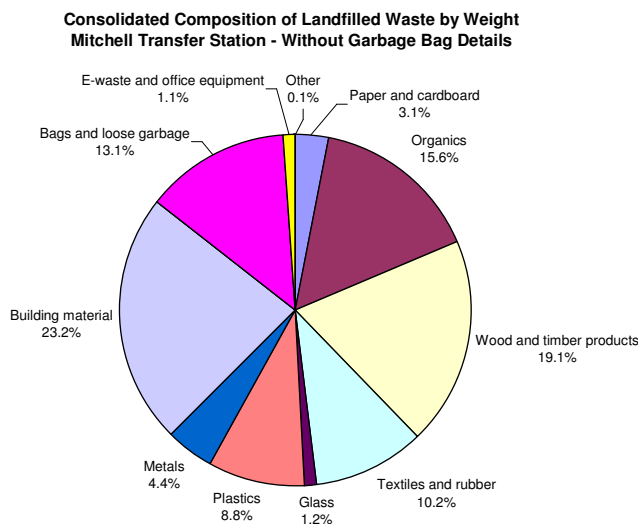


Figure 7 – Consolidated Composition of Landfilled Waste by Weight at Mitchell Transfer Station – Without Garbage Bag Details

The chart in Figure 7 above shows that organic material, both paper and cardboard, wood and timber or vegetation and kitchen waste, were the largest proportions of this stream. They totalled 37.8%. A further 38.7% was plastics and other potentially recoverable materials.

Table 13 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mitchell Transfer Station each day.

Table 13 Quantities Landfilled by Stream by Weight

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	55,603	10,429	23,361	23,723	20,838	44,945	64,920	243,818	62.8%
C&I	25,541	13,979	27,866	21,731	19,208	1,834	1,512	111,670	28.8%
C&D	-	2,437	5,790	4,457	7,081	9,552	178	29,495	7.6%
No Known	1,450	316	923	136	-	-	180	3,005	0.8%
Total (kg)	82,594	27,161	57,940	50,046	47,127	56,331	66,790	387,988	100%

This data is shown in the two figures below.

**Proportion of Streams Landfilled by Weight
Mitchell Transfer Station**

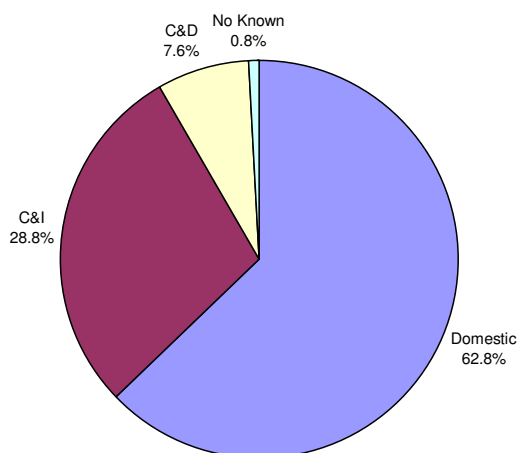


Figure 8 – Proportion of Stream Landfill by Weight at Mitchell Transfer Station

Figure 8 shows the proportion by weight of the different streams landfilled. Domestic waste comprises the largest proportion by far with C&I the next most significant.

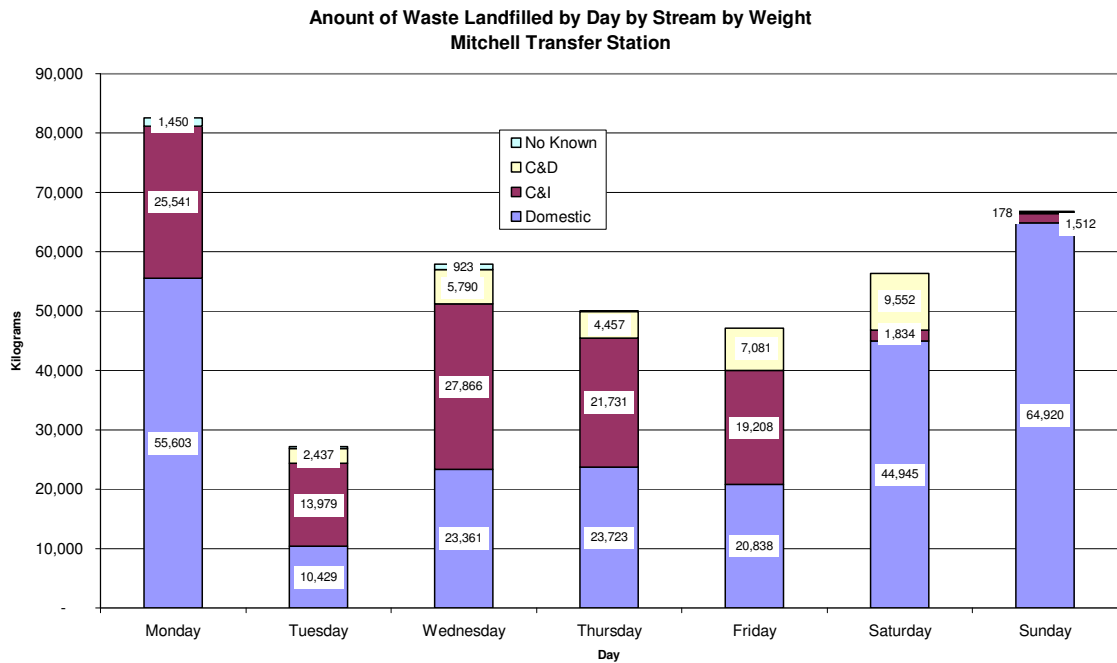


Figure 9 – Amount of Waste Landfilled by Day by Stream and by Weight at Mitchell Transfer Station

Figure 9 shows the composition and weight in kilograms of waste landfilled each day at for the domestic, C&I and C&D streams. The most waste deposited in a single day was on Monday with more than 80,000 kg (80 tonnes). The composition of the waste deposited on Saturday, Sunday and Monday was most similar, with higher proportions of domestic waste. On the other week days the proportion of domestic and C&I was closer to half each.

3.2.3 Other Results

A number of other sets of data were extracted relating to vehicle types using the transfer station and these are shown in the following section.

**Types of Vehicles by Proportion
Mitchell Transfer Station**

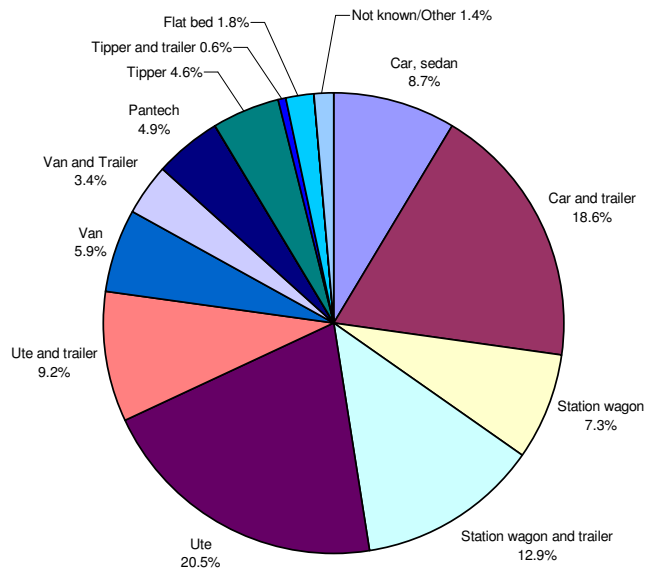


Figure 10 – Types of Vehicles by Proportion at Mitchell Transfer Station

Figure 10 shows the proportions of different vehicle types delivering to Mitchell Transfer Station. For consistent data recording, auditors were provided with a vehicle identification sheet, a copy of which can be found in Appendix A. The descriptions and classifications of vehicles shown in that document are those used in the charts.

Transfer stations are designed to aggregate smaller quantities of waste for bulk transport to final disposal. It is not surprising therefore to see that the types of vehicles delivering to the transfer station tend to be smaller. No front lift or rear lift commercial vehicles and no domestic side lift vehicles were recorded at Mitchell Transfer Station. A variety of small cars, utes, vans and station wagons, with and without trailers, were recorded (a total of 86.5%). Vehicles towing trailers made up 44.1% of those delivering.

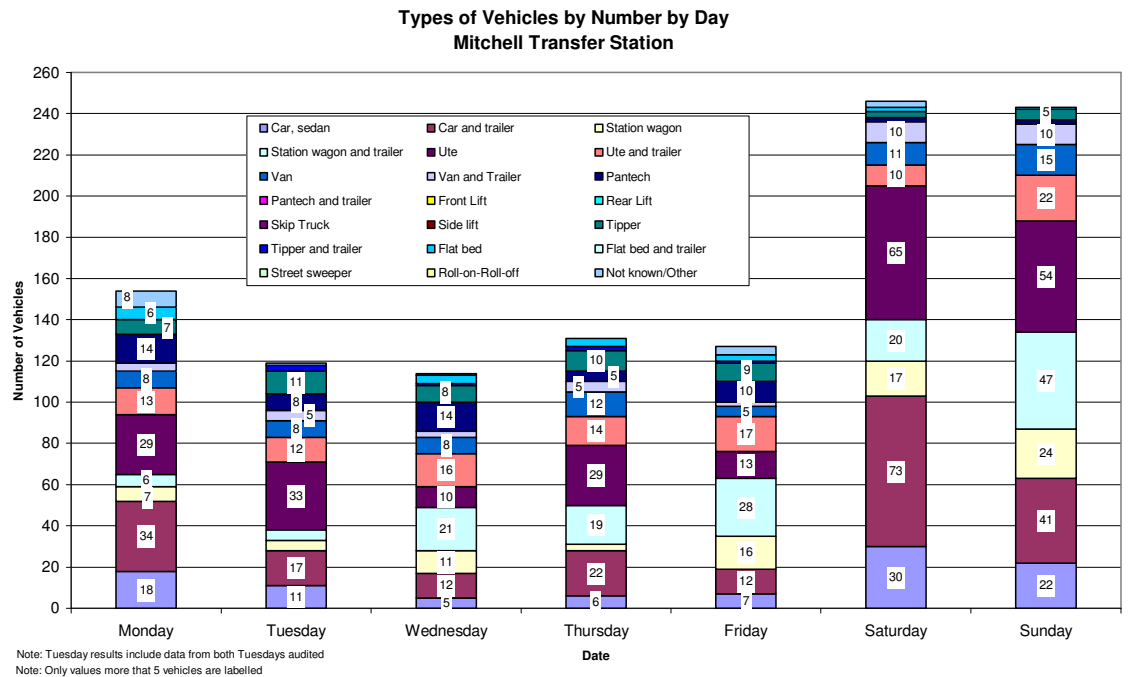


Figure 11 – Types of Vehicles by Number by Day at Mitchell Transfer Station

Figure 11 shows the number of different types of vehicles delivering to the transfer station each day. In contrast to the landfill, at the transfer station, most vehicles deliver on the weekends and there is little significant difference in the numbers each weekend day.

During the week there are about half as many vehicles delivering each day except Monday. There are also some interesting differences in the composition of vehicles each day. For example there are more utes on Monday, Tuesday and Thursday, but more station wagons and trailers on Wednesday, Thursday and Friday and more cars and trailers on Monday.

**Types of Waste by Proportion
Mitchell Transfer Station**

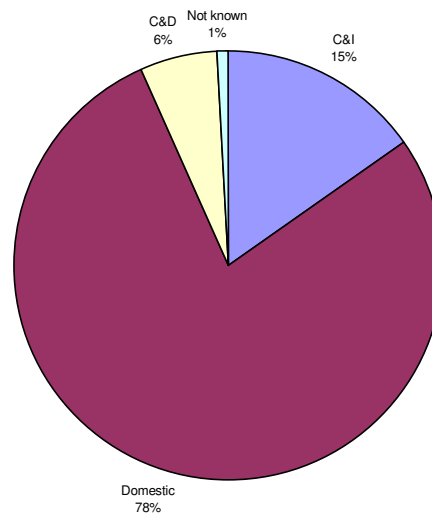


Figure 12 – Types of Waste by Proportion at Mitchell Transfer Station

Figure 12 shows the proportion of loads of different types deposited at the transfer station. Auditors recorded whether a load was domestic, commercial and industrial (C&I) or construction and demolition (C&D) in origin as best they could from their observations of the type of vehicle and type of waste.

The classification for each load was revised when compared to weighbridge classifications and adjusted accordingly, except for C&D loads which remained as recorded in the audit. Unsurprisingly most loads delivered were domestic.

Load Types by Waste Stream From Weighbridge Report
Mitchell Transfer Station

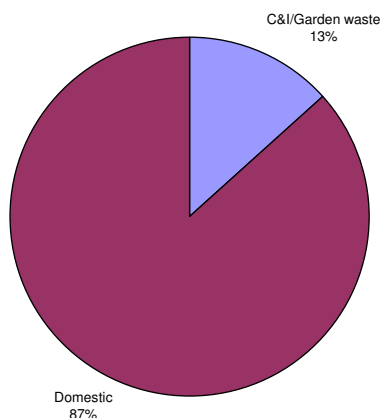


Figure 13 - Load Types by Waste Stream from Weighbridge Report

Information provided by ACT NOWaste generated from weighbridge data collected during the audit period is shown in Figure 13 above. ACT NOWaste has indicated that it is aware that weighbridge operators incorrectly classify C&D data as C&I and it is also apparent that about 8-9% of loads are classified as domestic when they are commercial or a combination of C&D/commercial/industrial, for example, home renovations.

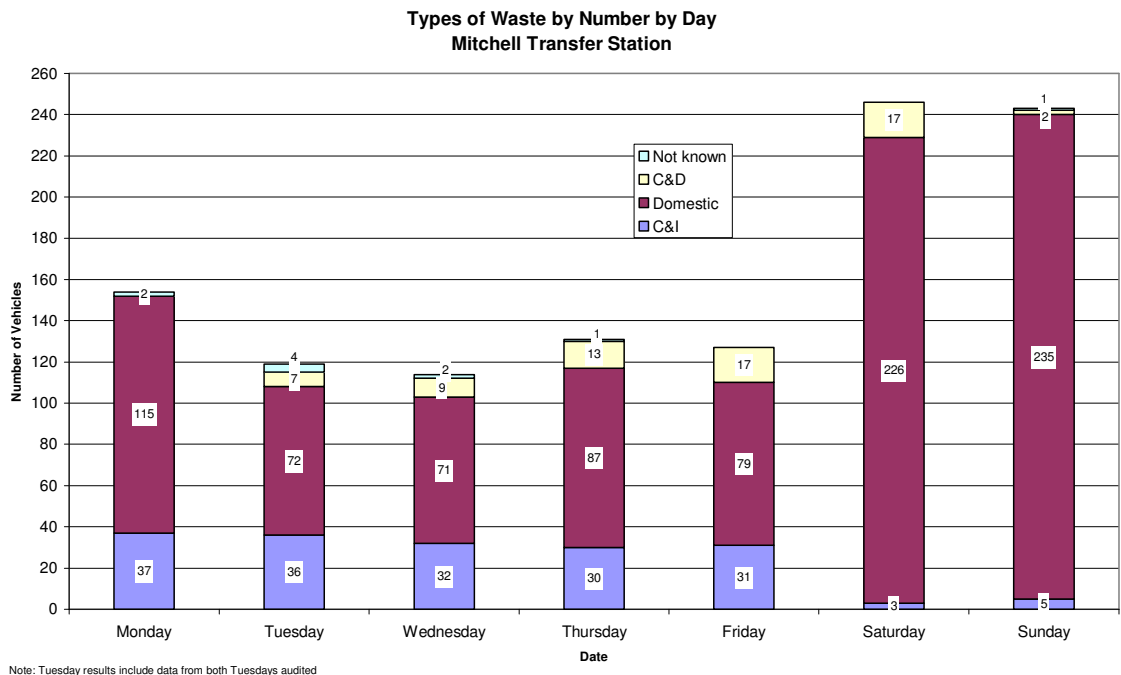


Figure 14 – Types of Waste by Number by Day at Mitchell Transfer Station

Figure 14 shows the number of loads of different types deposited at the landfill during the audit period. On weekdays, the number of C&I and domestic loads delivered was greater than on the weekends, but domestic loads were the largest proportion every day. Approximately twice as many loads were delivered each weekend day compared to weekdays.

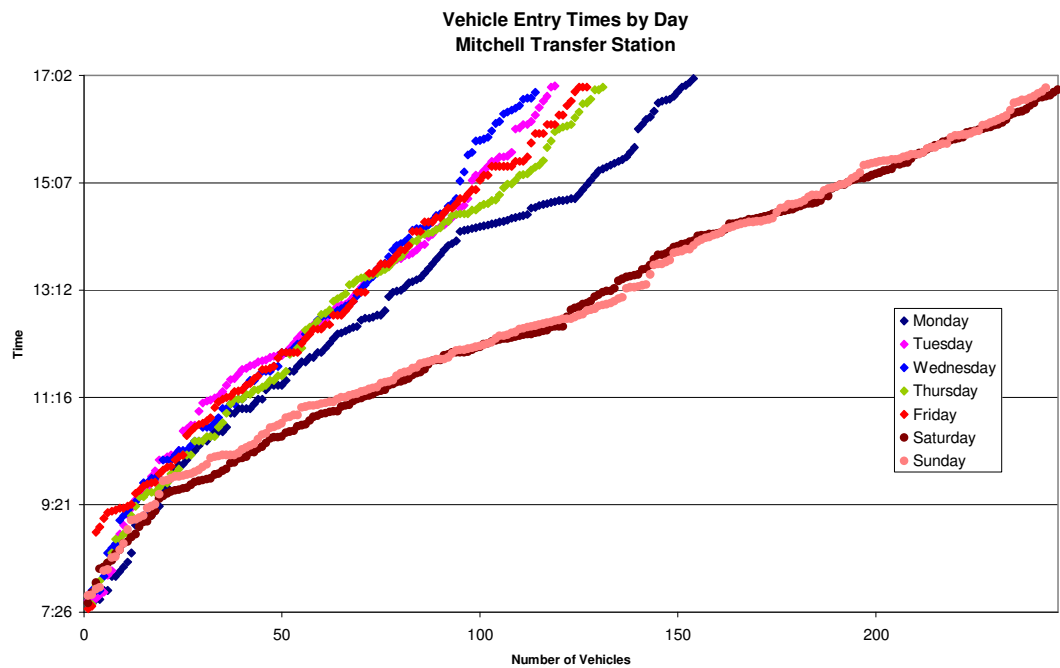


Figure 15 – Vehicle Entry Times by Day at Mitchell Transfer Station

Figure 15 shows the times that vehicles of all types were recorded tipping each day at the transfer station. The slope of the lines shows the frequency of visits. The steeper the slope, the fewer the visits. The closer together the points are the more frequent the visits. The chart shows, for example, that there were many more loads delivered in Saturday and Sunday compared to week days. The points for Saturday and Sunday also become slightly steeper between about 1.00 pm and 2.00 pm (lunch time) when fewer vehicles delivered.

All vehicles tended to arrive for tipping on week days at similar regular intervals (the slope of all lines tends to be the same angle) from opening time to about mid afternoon, when from about 2.00 pm on Mondays the number and frequency of loads increased significantly for about an hour before returning to a steeper slope. The slope of the Wednesday curve became steeper about 3.00 pm indicating a sudden drop in the frequency of loads. Tuesday, Thursday and Friday have the most similar curves event to the point of having small flatter sections just before 5.00 pm as there is a rush of deliveries before the facility closes.

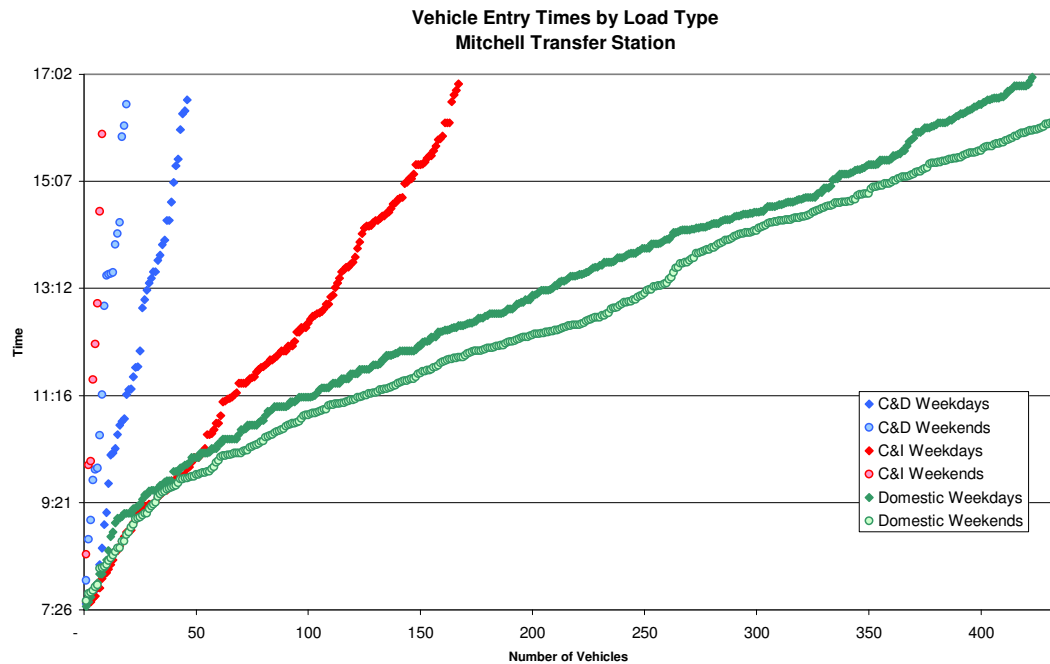


Figure 16 – Vehicle Entry Times by Load Type at Mitchell Transfer Station

Figure 16 shows the times that loads of different types were recorded tipping on both weekdays and weekends. The slope of the lines shows the frequency of visits. The steeper the slope, the fewer the visits. The closer together the points are the more frequent the visits. The chart shows, for example, that fewer C&D loads were delivered at any time, especially on weekends, and most of these arrived after midday.

There is a marked difference in the slope of the C&I curves with very few loads being delivered on the weekend. The weekday curve becomes progressively flatter indicating that the frequency of load delivery increases through the day especially after about 11.00 am.

The weekday slopes for both C&I and domestic are similar while the weekend slope for domestic is quite different. This shows that not only are there many loads delivering at very frequent intervals all day, but also that the frequency of delivery does not really increase until about 9.30 am. The slope flattens out in the late morning indicating an increase in frequency after which there is a break in deliveries around 12.30 pm (lunch time). Deliveries resume at slightly less frequent intervals after that until closing time..

3.3 Original Results - Mugga Lane Landfill – Without Garbage Bag Details

3.3.1 Volume Results

Table 14 below shows the composition in litres of the waste deposited at the landfill at Mugga Lane during the audit period. The figures for Monday and Tuesday include those quantities also recorded on the following Monday May 11 and Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 14 Composition of Landfilled Waste at Mugga Lane Landfill by Audit Day – Litres – Without Garbage Bag Details

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Office Paper	3,000	2,000	5,000	7,500	750	2,000	-	20,250	0.2%
Paper - all other	36,500	1,000	48,250	80,600	8,000	1,000	3,000	178,350	1.8%
Dry cardboard	107,000	95,500	244,450	227,900	146,950	44,000	15,500	881,300	8.7%
Wet cardboard	4,000	-	-	600	3,500	1,000	2,500	11,600	0.1%
Food / Kitchen	29,000	14,000	4,600	7,500	6,000	8,000	7,500	76,600	0.8%
Vegetation / garden	149,000	201,000	136,600	213,250	124,000	12,000	-	835,850	8.2%
Wood - furniture, painted wood	23,000	17,250	14,500	21,750	25,500	-	-	102,000	1.0%
Wood - chipboard, MDF	3,000	25,000	23,500	8,500	9,500	2,500	-	72,000	0.7%
Wood - board/pole, untreated	41,000	60,500	29,000	17,500	54,500	5,500	2,000	210,000	2.1%
Wood - board/pole, treated	18,000	36,500	55,000	34,000	12,000	11,000	-	166,500	1.6%
Textiles - carpet & underlay	34,300	45,000	8,000	37,500	73,000	3,000	-	200,800	2.0%
Textiles - cloth	11,000	19,500	5,500	22,050	6,500	-	-	64,550	0.6%
Textiles - cloth & leather- covered furniture	39,000	26,000	9,500	17,600	14,500	1,500	-	108,100	1.1%
Textiles /leather other	12,000	-	3,000	-	-	-	-	15,000	0.1%
Rubber - tyres, tubes	500	3,000	1,000	-	100	-	-	4,600	0.0%
Rubber other	1,000	-	-	4,700	2,000	-	-	7,700	0.1%
Glass - containers	3,000	-	10,000	12,000	1,500	2,000	4,000	32,500	0.3%
Glass - plate	1,000	1,000	-	4,000	-	-	-	6,000	0.1%
Plastic - containers recyclable	2,000	4,000	4,600	12,000	8,250	-	-	30,850	0.3%
Plastic - film	50,000	61,000	32,000	51,100	33,000	18,250	500	245,850	2.4%
Plastic - Polystyrene foam	16,000	25,500	6,800	27,800	13,250	8,500	-	97,850	1.0%
Plastic - other	31,000	43,000	59,000	42,350	37,250	2,500	1,000	216,100	2.1%
Metals - ferrous steel	11,000	13,000	3,000	19,600	4,000	1,000	-	51,600	0.5%
Metals - non-ferrous	500	5,000	11,500	15,500	27,750	-	500	60,750	0.6%
Concrete / cement	-	-	-	2,000	4,000	250	-	6,250	0.1%
Bricks/Tiles	14,000	2,000	3,000	3,500	-	-	-	22,500	0.2%
Plasterboard	9,000	16,000	6,500	7,500	25,750	2,000	-	66,750	0.7%
Rock/dirt/soil	50,500	15,000	32,000	21,600	60,000	17,500	-	196,600	1.9%

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Tiles, ceramics	-	-	1,000	2,600	2,000	-	-	5,600	0.1%
Asphalt	-	-	-	-	-	-	-	-	0.0%
Hazardous / special	-	-	-	-	-	-	-	-	0.0%
Garbage bags of rubbish	1,305,250	1,410,500	967,800	1,046,850	1,080,000	201,000	74,250	6,085,650	59.9%
Computers / office equipment/Toner cartridges	500	2,500	2,000	9,600	6,000	-	-	20,600	0.2%
Dead animals	-		750				-	750	0.0%
Dust	-	750	3,000				-	3,750	0.0%
Household items		2,000						2,000	0.0%
Mattresses	31,900	1,500	8,200	4,200	9,500	1,500	-	56,800	0.6%
Total (litres)	2,036,950	2,149,000	1,739,050	1,983,150	1,799,050	346,000	110,750	10,163,950	100.0%

The table shows that about 10.1 million litres, or about 10,100 cubic metres, of waste were recorded as landfilled during the audit period. The largest amounts were delivered on Monday and Tuesday. This composition is shown in Figure 17 below.

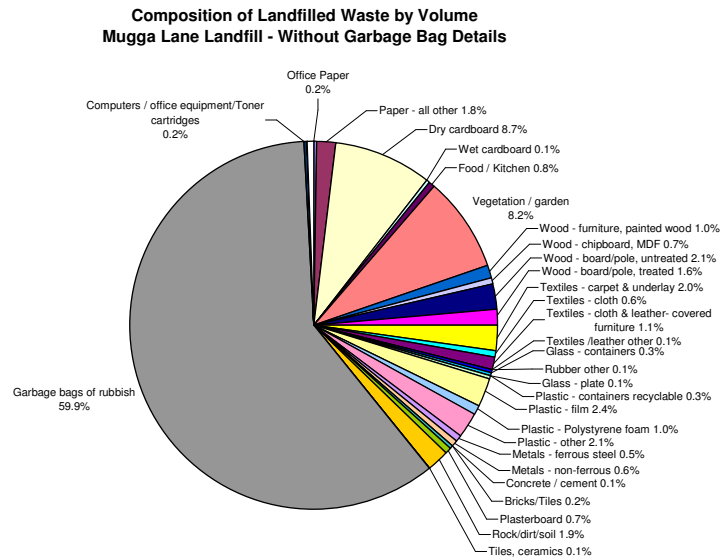


Figure 17 –Composition of Landfilled Waste by Volume at Mugga Lane Landfill – Without Garbage Bag Details

Figure 17 shows that the largest proportion of waste being landfilled was garbage bags of rubbish. This material mostly came from domestic waste vehicles as well as commercial waste delivered in compactor vehicles or in roll-on-roll-off compactors. The composition of the contents of the bags is not known.

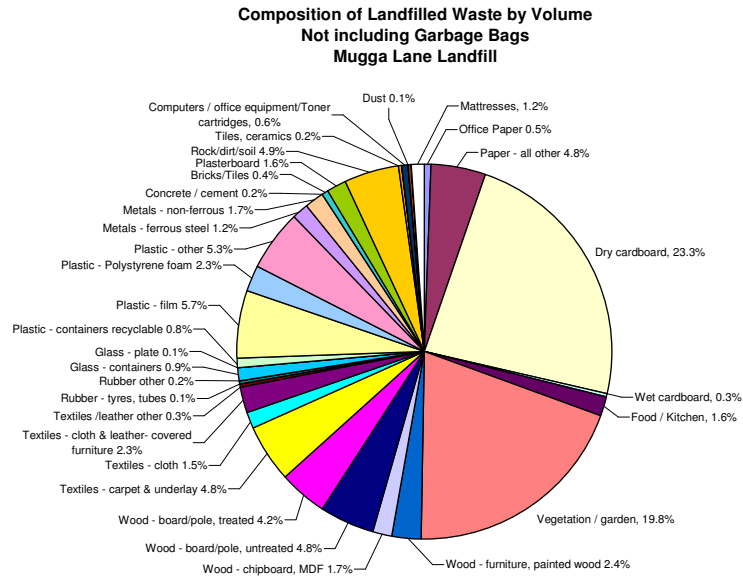


Figure 18 – Consolidate Composition of Landfilled Waste by Volume at Mugga Lane Landfill – Not Including Garbage Bags

With the garbage bags removed Figure 18 above shows the composition of the landfilled stream is mostly dry cardboard and vegetation. In fact almost 63% of this stream is organic - vegetation, kitchen waste, timber and paper.

Table 15 below shows the aggregated composition in cubic metres of the waste deposited at the landfill at Mugga Lane during the audit period. The figures for Monday and Tuesday include those quantities also recorded on the following Monday May 11 and Tuesday May 12.

Table 15 Aggregated Total Composition of Mugga Lane Landfill Stream – Cubic Metres – Without Garbage Bag Details

	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Category	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	150.5	98.5	297.7	316.6	159.2	48.0	21.0	1,091.5	10.7%
Organics	178.0	215.0	142.0	220.8	130.0	20.0	7.5	913.2	9.0%
Wood and timber products	85.0	139.3	122.0	81.8	101.5	19.0	2.0	550.5	5.4%
Textiles and rubber	97.8	93.5	27.0	81.9	96.1	4.5	-	400.8	3.9%
Glass	4.0	1.0	10.0	16.0	1.5	2.0	4.0	38.5	0.4%
Plastics	99.0	133.5	102.4	133.3	91.8	29.3	1.5	590.7	5.8%
Metals	11.5	18.0	14.5	35.1	31.8	1.0	0.5	112.4	1.1%
Building material	73.5	33.8	45.5	37.2	91.8	19.8	-	301.5	3.0%
Hazardous	-	-	-	-	-	-	-	-	0.0%
Bags and loose garbage	1,305.3	1,410.5	967.8	1,046.9	1,080.0	201.0	74.3	6,085.7	59.9%
E-waste and office equipment	0.5	2.5	2.0	9.6	6.0	-	-	20.6	0.2%
Other	31.9	3.5	8.2	4.2	9.5	1.5	-	58.8	0.6%
Total (cubic metres)	2,037.0	2,149.0	1,739.1	1,983.2	1,799.1	346.0	110.8	10,164.0	100.0%

This data is shown as percentages in Figure 19 below.

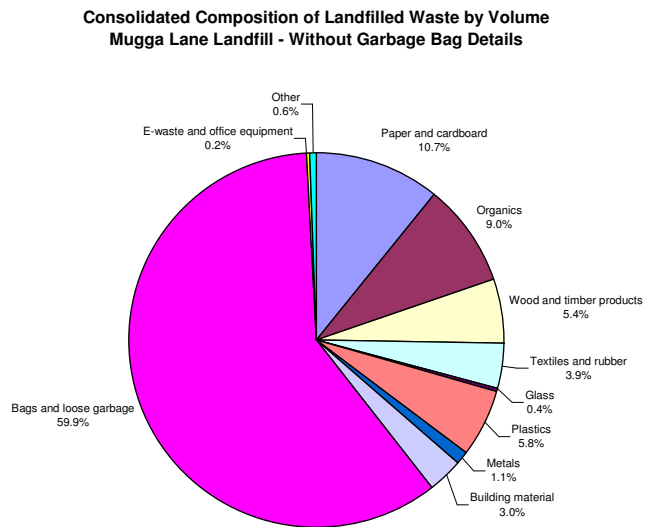


Figure 19 –Composition of Landfilled Waste by Volume at Mugga Lane Landfill – Without Garbage Bag Details

Figure 19 shows that garbage bags and some loose garbage form the largest proportion. Figure 20 below shows the aggregated composition of this stream without the garbage bags.

**Consolidated Composition of Landfilled Waste by Volume
Not including garbage bags
Mugga Lane Landfill**

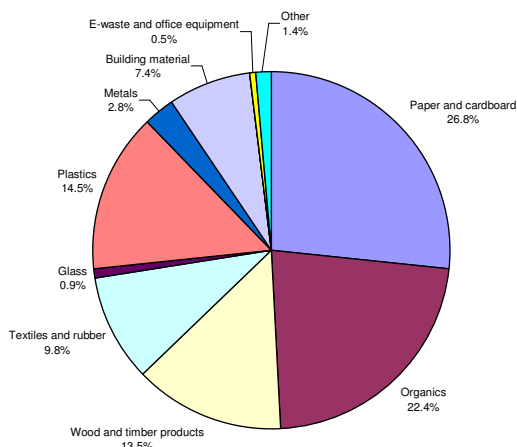


Figure 20 – Consolidated Composition of Landfilled Waste at Mugga Lane Landfill – Not including Garbage Bags

Paper and cardboard and organics make up almost half the landfilled stream with organics in total comprising 62.7%. A further 26.1% is plastics and other potentially recoverable materials.

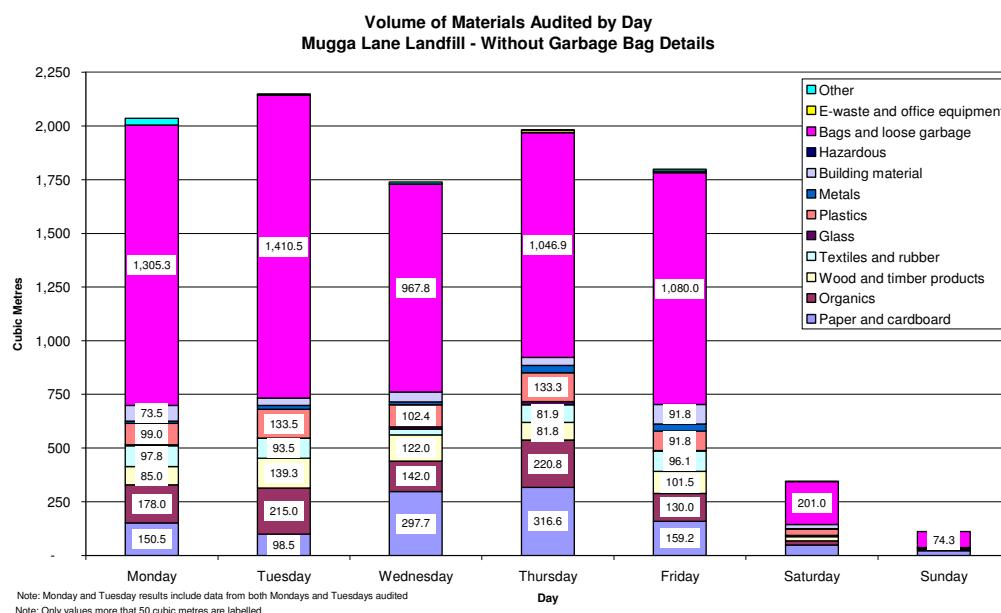


Figure 21 – Volume of Materials Audited by Day at Mugga Lane Landfill – Without Garbage Bag Details

The volume in cubic metres of the aggregated categories deposited at the landfill each day of the audit is shown in Figure 21. Clearly most waste is deposited on weekdays

and most of this is garbage bags, mainly from domestic collections and large-scale commercial collections.

Apart from greater quantities of cardboard deposited on Wednesdays and Thursday, the amounts of other materials are relatively consistent across all weekdays. The volumes of waste deposited each week day are reasonably consistent, between about 1750 and about 2200 cubic metres.

Table 16 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mugga Lane Landfill each day.

Table 16 Quantities Landfilled by Stream by Volume

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	689,050	783,000	605,750	673,500	703,000	11,000	-	3,465,300	34.1%
C&I	1,211,900	1,224,000	1,044,700	1,175,850	981,300	317,000	110,750	6,065,500	59.7%
C&D	110,000	125,500	88,600	133,800	107,750	18,000	-	583,650	5.7%
No Known	26,000	16,500	-	-	7,000	-	-	49,500	0.5%
Total (litres)	2,036,950	2,149,000	1,739,050	1,983,150	1,799,050	346,000	110,750	10,163,950	100%

This data is shown in the two figures below.

**Proportion of Streams Landfilled by Volume
Mugga Lane Landfill**

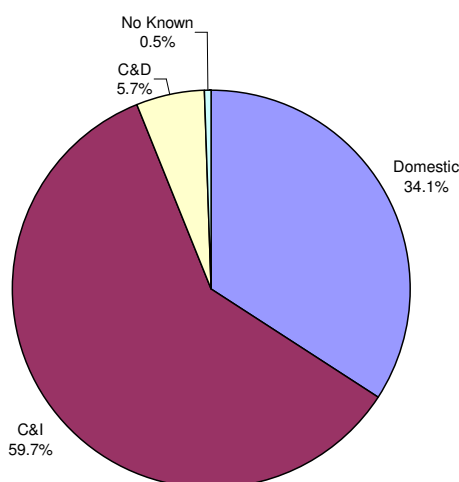


Figure 22 – Proportion of Stream Landfill by Volume at Mugga Lane Landfill

Figure 22 shows the proportion by volume of the different streams landfilled. C&I waste comprises the largest proportion by far with domestic the next most significant.

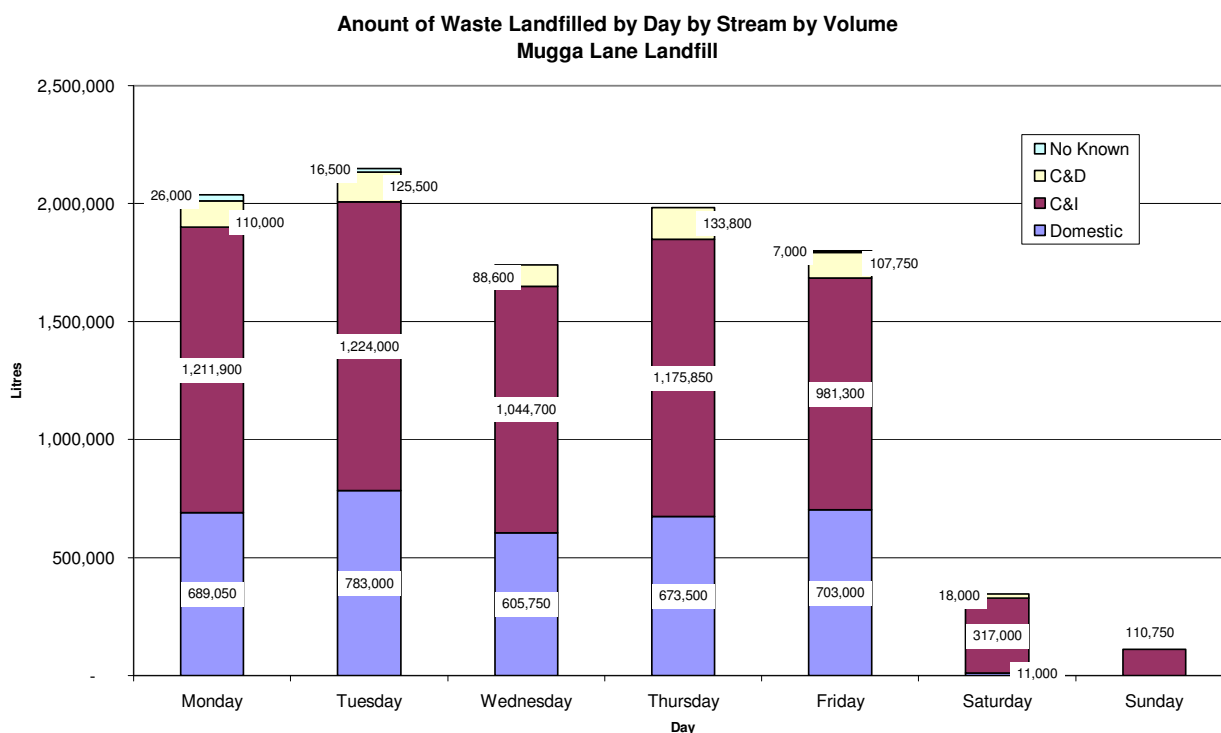


Figure 23 – Amount of Waste Landfilled by Day by Stream and by Volume at Mugga Lane Landfill

Figure 23 shows the composition and volume in litres of waste landfilled each day at for the domestic, C&I and C&D streams. The quantities and composition of waste were essentially similar on each week day with only very small quantities deposited on the weekend.

3.3.2 Weight Results

the composition in kilograms (to the nearest half kilogram) of the waste deposited at Mugga Lane Landfill during the audit period is shown in Table 17 below. These figures were calculated by converting the volume of each material recorded during the audit to weigh using the Resource NSW conversion factors. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 17 Composition of Landfilled Waste at Mugga Lane Landfill by Audit Day – Kilograms – Without Garbage Bag Details

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total	Percent
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Office Paper	1,140.0	760.0	1,880.0	2,830.0	282.5	760.0	-	7,652.5	0.3%
Paper - all other	9,200.0	470.0	17,775.0	30,260.0	2,095.0	470.0	1,040.0	61,310.0	2.3%
Dry cardboard	13,990.0	12,575.0	33,384.5	31,147.0	16,851.5	6,880.0	2,635.0	117,463.0	4.4%
Wet cardboard	2,000.0	-	-	300.0	1,750.0	500.0	1,250.0	5,800.0	0.2%
Food / Kitchen	9,570.0	4,620.0	1,518.0	2,475.0	1,980.0	2,640.0	2,475.0	25,278.0	0.9%
Vegetation / garden	24,765.0	34,175.0	22,667.0	37,871.0	21,977.5	1,870.0	-	143,325.5	5.3%
Wood - furniture, painted wood	4,370.0	3,392.5	2,695.0	4,617.5	4,335.0	-	-	19,410.0	0.7%
Wood - chipboard, MDF	750.0	6,650.0	6,325.0	2,200.0	2,450.0	625.0	-	19,000.0	0.7%
Wood - board/pole, untreated	7,560.0	9,540.0	5,040.0	4,260.0	10,740.0	900.0	720.0	38,760.0	1.4%
Wood - board/pole, treated	3,440.0	7,690.0	11,580.0	6,600.0	2,560.0	2,140.0	-	34,010.0	1.3%
Textiles - carpet & underlay	5,605.0	7,950.0	1,200.0	5,625.0	11,750.0	850.0	-	32,980.0	1.2%
Textiles - cloth	1,430.0	3,615.0	1,075.0	5,026.5	1,745.0	-	-	12,891.5	0.5%
Textiles - cloth & leather- covered furniture	11,430.0	3,420.0	855.0	1,944.0	1,305.0	135.0	-	19,089.0	0.7%
Textiles /leather other	840.0	-	210.0	-	-	-	-	1,050.0	0.0%
Rubber - tyres, tubes	100.0	600.0	200.0	-	20.0	-	-	920.0	0.0%
Rubber other	260.0	-	-	1,222.0	520.0	-	-	2,002.0	0.1%
Glass - containers	840.0	-	2,800.0	3,360.0	420.0	560.0	1,120.0	9,100.0	0.3%
Glass - plate	360.0	360.0	-	1,440.0	-	-	-	2,160.0	0.1%
Plastic - containers recyclable	160.0	320.0	668.0	1,410.0	1,460.0	-	-	4,018.0	0.1%
Plastic - film	6,815.0	9,795.0	3,735.0	6,807.5	4,845.0	3,292.5	100.0	35,390.0	1.3%
Plastic - Polystyrene foam	690.0	1,065.0	369.0	1,260.0	592.5	480.0	-	4,456.5	0.2%
Plastic - other	7,930.0	9,400.0	16,442.5	11,094.5	7,757.5	805.0	360.0	53,789.5	2.0%
Metals - ferrous steel	3,090.0	3,670.0	840.0	5,500.5	1,120.0	280.0	-	14,500.5	0.5%
Metals - non-ferrous	220.0	1,630.0	2,875.0	4,160.0	7,222.5	-	220.0	16,327.5	0.6%

Concrete / cement	-	-	-	1,480.0	2,960.0	185.0	-	4,625.0	0.2%
Bricks/Tiles	7,420.0	1,060.0	1,590.0	1,805.0	-	-	-	11,875.0	0.4%
Plasterboard	2,880.0	5,120.0	2,080.0	2,160.0	8,240.0	400.0	-	20,880.0	0.8%
Rock/dirt/soil	45,275.0	13,820.0	29,760.0	19,698.0	55,800.0	16,275.0	-	180,628.0	6.7%
Tiles, ceramics	-	-	530.0	1,378.0	1,060.0	-	-	2,968.0	0.1%
Asphalt	-	-	-	-	-	-	-	-	0.0%
Hazardous / special	-	-	-	-	-	-	-	-	0.0%
Garbage bags of rubbish	375,107.5	413,735.0	282,808.0	308,819.0	314,182.5	57,780.0	21,645.0	1,774,077.0	65.9%
Computers / office equipment/Toner cartridges	25.0	275.0	300.0	1,365.0	800.0	-	-	2,765.0	0.1%
Dead animals	-	-	247.5	-	-	-	-	247.5	0.0%
Household items	-	340.0	-	-	-	-	-	340.0	0.0%
Mattresses	8,559.0	315.0	738.0	774.0	1,035.0	135.0	-	11,556.0	0.4%
Total Audit (kg)	555,821.5	556,362.5	452,187.5	508,889.5	487,856.5	97,962.5	31,565.0	2,690,645.0	100.0%

The composition of the waste landfilled at Mugga Lane Landfill by weight, converted from volume, is shown in Figure 24.

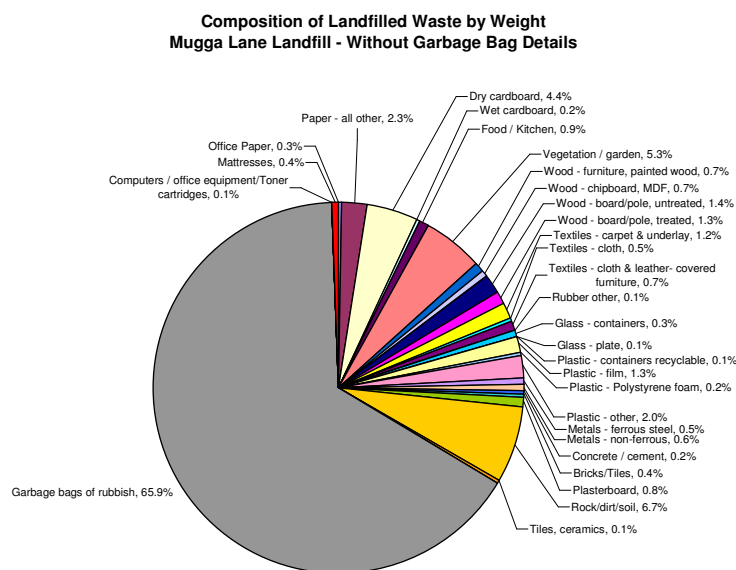
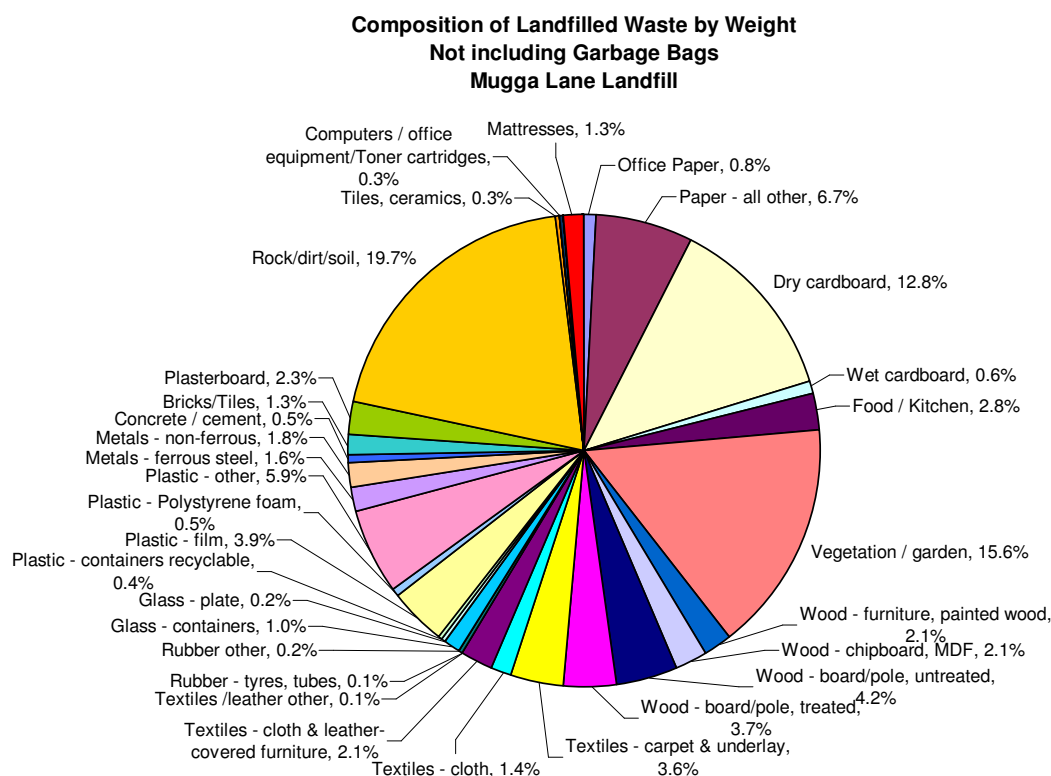


Figure 24 - Composition of Landfilled Waste by Weight at Mugga Lane Landfill – Without Garbage Bag Details

Figure 24 shows that the largest proportion of material by weight was garbage bags of rubbish at 65.9%, with rock/dirt/soil (6.7%) and vegetation/garden (5.3%) the next largest proportions.



**Figure 25 - Composition of Landfilled Waste by Weight at Mugga Lane Landfill
Not Including Garbage Bags**

Figure 25 shows the composition of the landfilled waste at Mugga Lane Landfill by weight with the garbage bags removed. The largest proportion of material by weight was rock/dirt/soil at 19.7%, with vegetation/garden (15.6%) and dry cardboard (12.8%) the next largest proportions.

Table 18 below shows the aggregated composition in kilograms, converted from litres, of the waste deposited at the landfill at Mugga Lane Landfill during the audit period. The figures for Monday and Tuesday include those quantities also recorded on the following Monday May 11 and Tuesday May 12.

**Table 18 Aggregated Total Composition of Mugga Lane Landfill Stream –
Kilograms – Without Garbage Bag Details**

	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Category	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	26,330.0	13,805.0	53,039.5	64,537.0	20,979.0	8,610.0	4,925.0	192,225.5	7.1%
Organics	34,335.0	38,795.0	24,432.5	40,346.0	23,957.5	4,510.0	2,475.0	168,851.0	6.3%

Wood and timber products	16,120.0	27,272.5	25,640.0	17,677.5	20,085.0	3,665.0	720.0	111,180.0	4.1%
Textiles and rubber	28,224.0	15,900.0	4,278.0	14,591.5	16,375.0	1,120.0	-	80,488.5	3.0%
Glass	1,200.0	360.0	2,800.0	4,800.0	420.0	560.0	1,120.0	11,260.0	0.4%
Plastics	15,595.0	20,580.0	21,214.5	20,572.0	14,655.0	4,577.5	460.0	97,654.0	3.6%
Metals	3,310.0	5,300.0	3,715.0	9,660.5	8,342.5	280.0	220.0	30,828.0	1.1%
Building material	55,575.0	20,000.0	33,960.0	26,521.0	68,060.0	16,860.0	-	220,976.0	8.2%
Hazardous ¹²	-	-	-	-	-	-	-	-	0.0%
Bags and loose garbage	375,107.5	413,735.0	282,808.0	308,819.0	314,182.5	57,780.0	21,645.0	1,774,077.0	65.9%
E-waste and office equipment	25.0	275.0	300.0	1,365.0	800.0	-	-	2,765.0	0.1%
Other	-	340.0	-	-	-	-	-	340.0	0.0%
Total (kg)	555,821.5	556,362.5	452,187.5	508,889.5	487,856.5	97,962.5	31,565.0	2,690,645.0	100.0%

This data is shown as percentages in Figure 26 below.

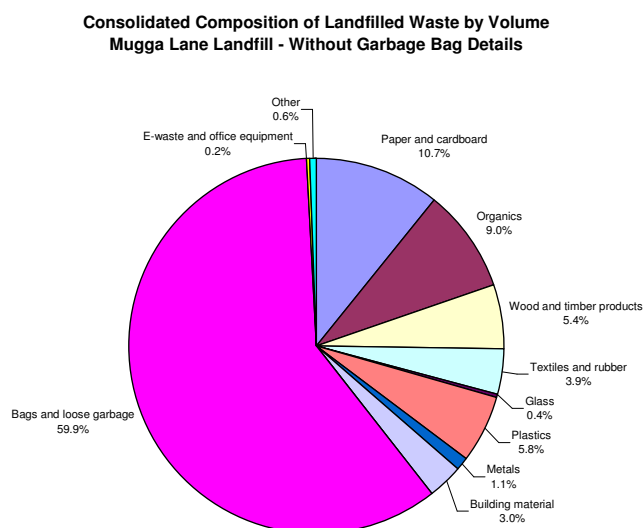


Figure 26 – Consolidated Composition of Landfilled Waste by Weight at Mugga Lane Landfill – Without Garbage Bag Details

Figure 26 shows that bags and loose garbage were the largest proportions of this stream at 65.9%.

¹² As no conversion factor is available for hazardous waste and it comprises a small proportion of this stream no weight figure has been calculated

**Consolidated Composition of Landfilled Waste by Weight
Not including garbage bags
Mugga Lane Landfill**

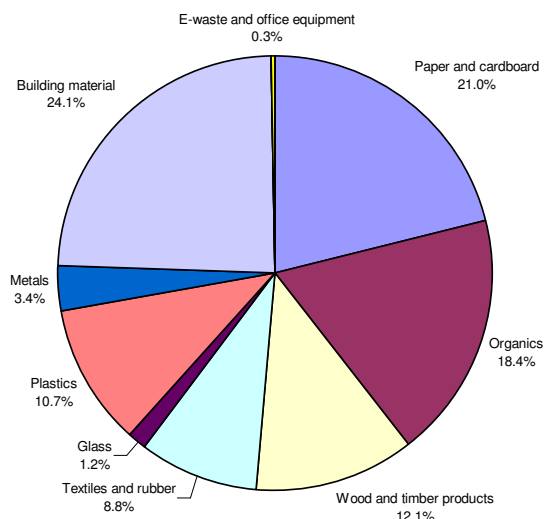


Figure 27 – Consolidated Composition of Landfilled Waste by Weight at Mugga Lane Landfill Not including Garbage Bags

Figure 27 shows with garbage bags excluded the largest proportions of this stream were building material at 24.1% followed by paper and cardboard (21.0%) and organics (18.4%).

Table 19 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mugga Lane Landfill each day.

Table 19 Quantities Landfilled by Stream by Weight

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	201,033	226,710	176,472	198,370	205,270	1,550	-	1,009,404	37.5%
C&I	322,129	302,693	242,427	282,849	233,617	79,935	31,565	1,495,214	55.6%
C&D	27,260	22,335	33,289	27,671	47,720	16,478	-	174,753	6.5%
No Known	5,400	4,625	-	-	1,250	-	-	11,275	0.4%
Total (kg)	555,822	556,363	452,188	508,890	487,857	97,963	31,565	2,690,645	100%

This data is shown in the two figures below.

**Proportion of Streams Landfilled by Weight
Mugga Lane Landfill**

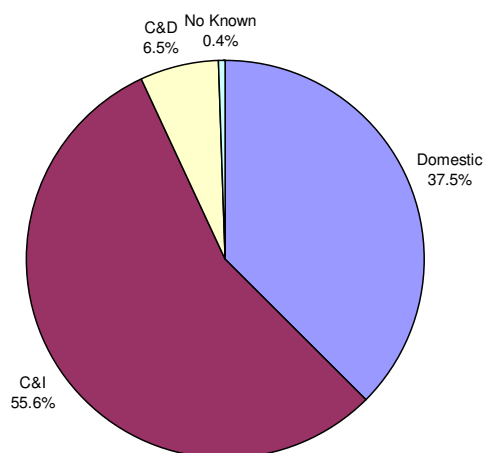


Figure 28 – Proportion of Stream Landfill by Weight at Mugga Lane Landfill

Figure 28 shows the proportion by weight of the different streams landfilled. C&I waste comprises the largest proportion by far with domestic the next most significant.

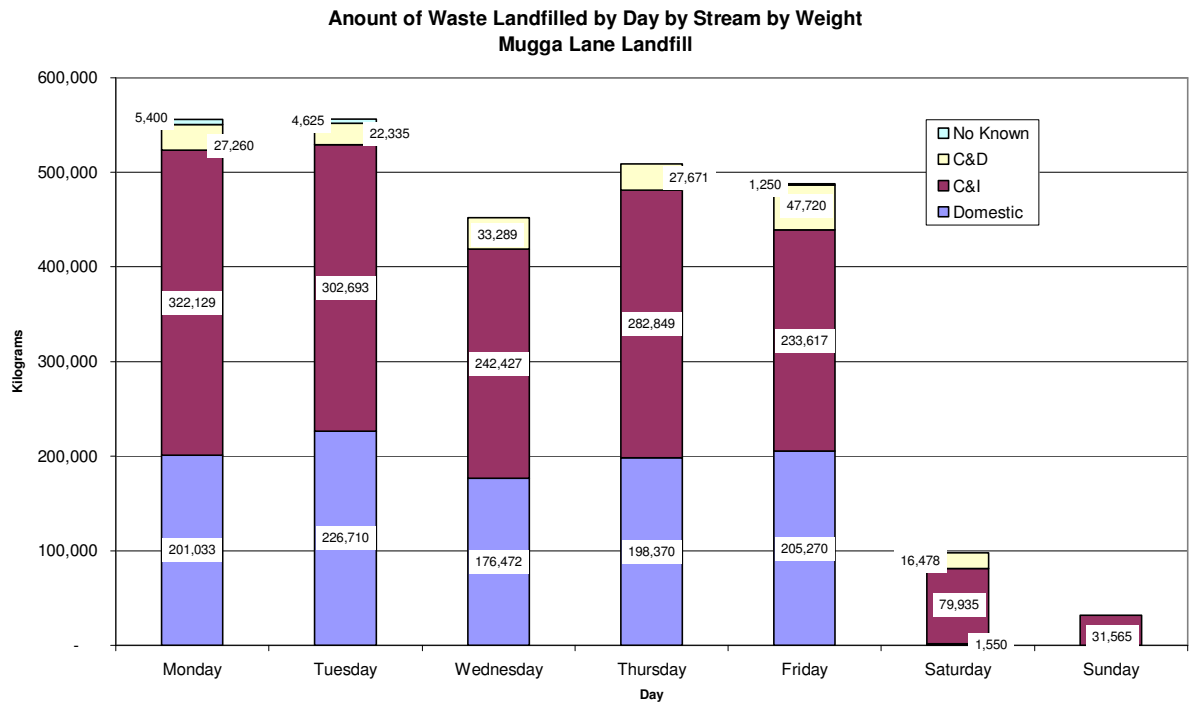


Figure 29 – Amount of Waste Landfilled by Day by Stream and by Weight at Mitchell Transfer Station

Figure 29 shows the composition and weight in kilograms of waste landfilled each day at for the domestic, C&I and C&D streams. Most waste is deposited on Monday and Tuesday with similar amounts through the week other than at weekends when only small amounts were deposited.

3.3.3 Other Results

A number of other sets of data were extracted relating to vehicle types using the transfer station and these are shown in the following section.

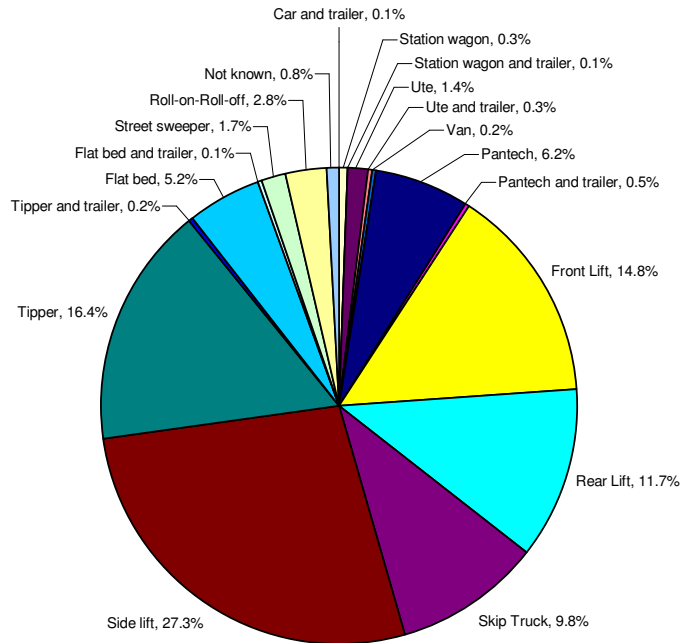


Figure 30 – Types of Vehicles by Proportion at Mugga Lane Landfill

Figure 30 shows the proportions of different vehicle types delivering to the landfill. For consistent data recording, auditors were provided with a vehicle identification sheet, a copy of which can be found in Appendix A. The descriptions and classifications of vehicles shown in that document are those used in the charts.

Except in particular circumstances, small vehicles are not allowed to tip at the main landfill. As a result most of the vehicles shown delivering to the landfill in the chart are large. Side lift vehicles form the largest proportion (27.3%) and most of these are collecting domestic waste, although there are a small number of side lift vehicles operating commercial services. Commercial front lift (14.8%) and rear lift vehicles (11.7%) also form significant proportions of the number of vehicles while skip trucks (9.8%) and tippers (16.4%), often collecting construction waste, also form significant percentages.

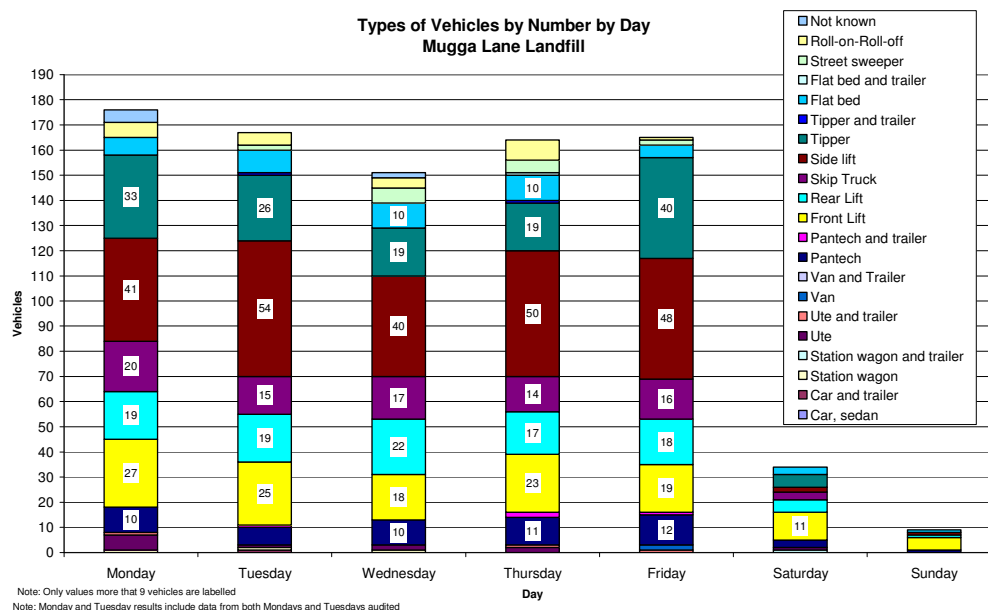


Figure 31 – Types of Vehicles by Number by Day at Mugga Lane Landfill

Figure 31 shows the number of different types vehicles delivering to the landfill each day. Most vehicles deliver on weekdays and there is little significant difference in the numbers each day. There are fewer vehicles in general on Wednesdays. This is due to the smaller number of tippers and domestic side lift vehicles.

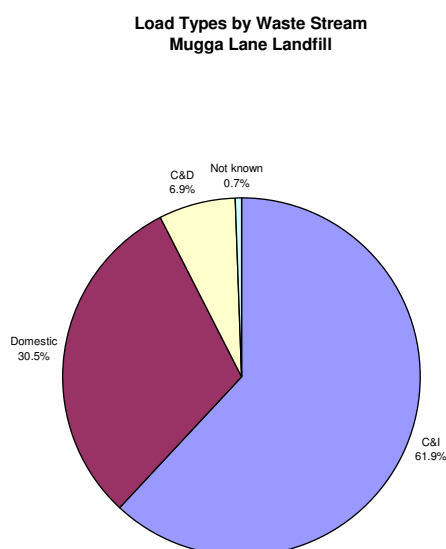


Figure 32 – Load Types by Waste Stream - Mugga Lane Landfill

Figure 32 shows the proportion of loads of different types deposited at the landfill. Auditors recorded whether a load was domestic, commercial and industrial (C&I) or construction and demolition (C&D) in origin as best they could from their observations of the type of vehicle and type of waste. The classification of some loads was amended

after reviewing weighbridge data. Most loads delivered were C&I with domestic the other largest proportion.

Load Types by Waste Stream From Weighbridge Report
Mugga Lane Landfill

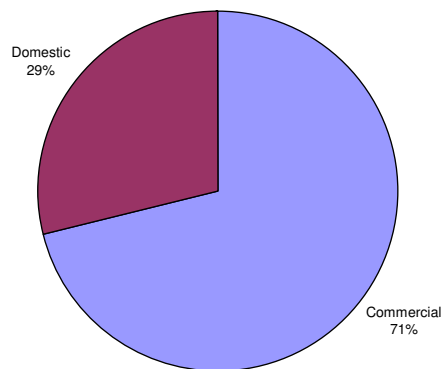


Figure 33 - Load Types by Waste Stream from Weighbridge Report

Information provided by ACT NOWaste generated from weighbridge data collected during the audit period is shown in Figure 33 above. ACT NOWaste has indicated that it is aware that weighbridge operators incorrectly classify C&D data as C&I and it is also apparent that about 8-9% of loads are classified as domestic when they are commercial or a combination of C&D/commercial/industrial, for example, home renovations.

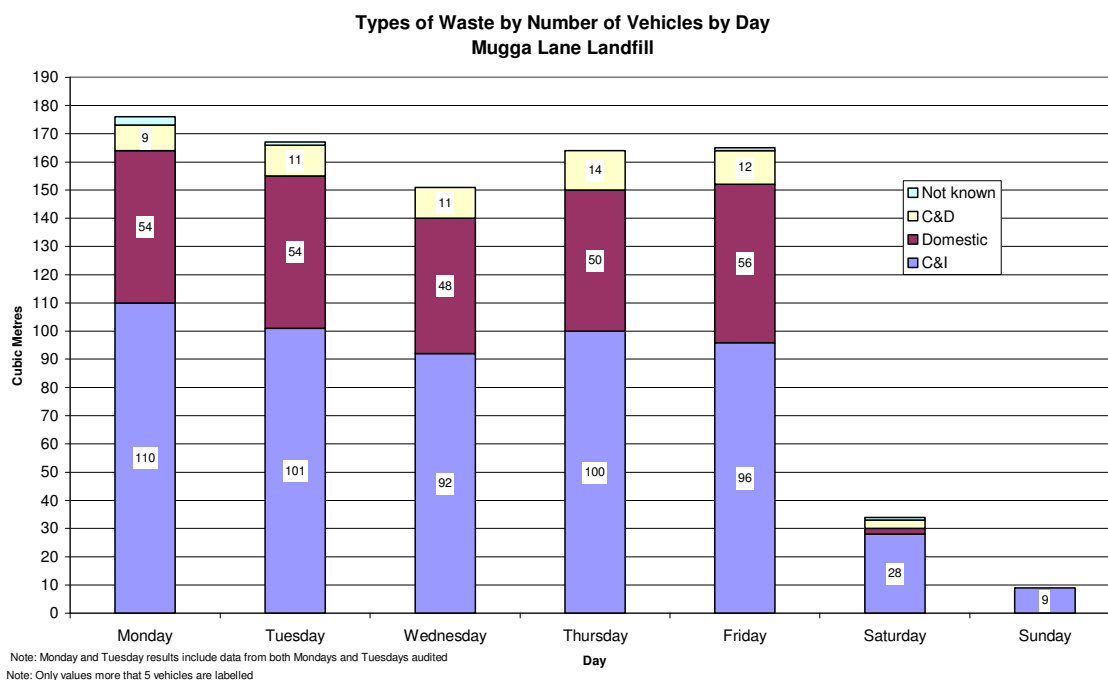


Figure 34 – Types of Waste by Number of Vehicles by Day at Mugga Lane Landfill

Figure 34 shows the number of loads of different types deposited at the landfill during the audit period. Fewer loads were delivered on Wednesday due to lower numbers of both domestic and C&I loads.

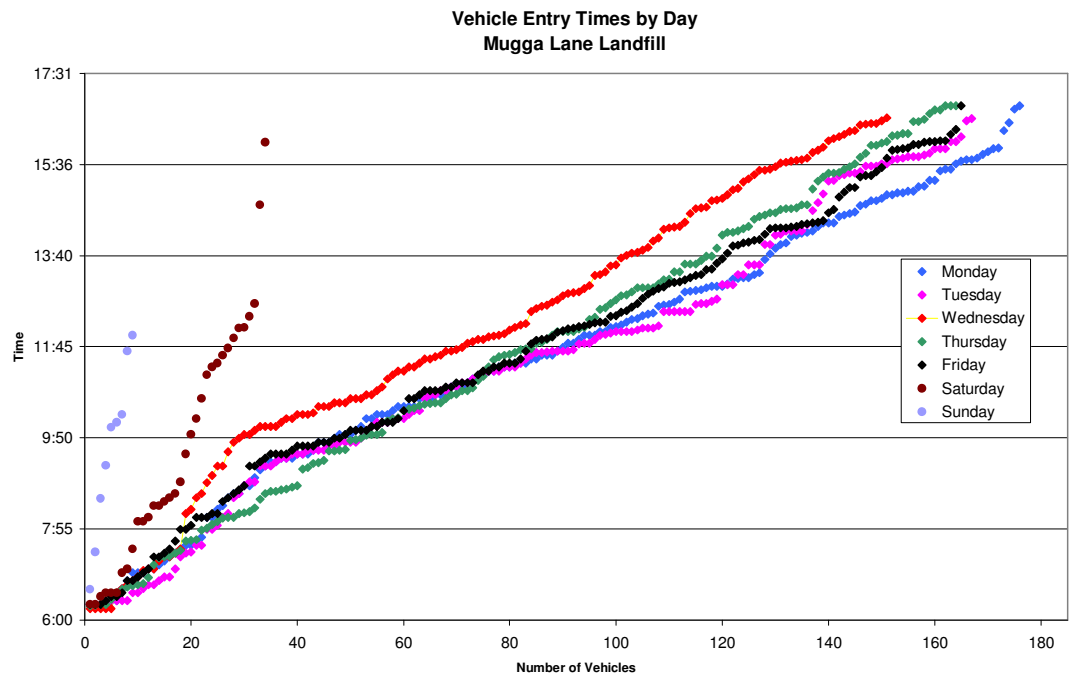


Figure 35 – Vehicle Entry Times by Day at Mugga Lane Landfill

Figure 35 shows the times that vehicles of all types were recorded tipping each day. The slope of the lines shows the frequency of visits. The steeper the slope, the fewer the visits. The closer together the points are the more frequent the visits. The chart shows, for example, that there were very few vehicles tipping at the landfill on the weekend. In fact only two vehicles tipped either weekend day after 12:40 pm. On Saturday, there are two times of greatest activity, between 8:00 am and 8:40 am and between 11:10 and 12:40 pm.

All vehicles tended to arrive for tipping at similar regular intervals (the slope of all lines tends to be the same angle) throughout each weekday after about 9:30 am. Before that, there are fewer vehicles. This trend is most pronounced on Wednesdays, which has the steepest weekday curve until about 10:00 am. Monday has the flattest curve, although only slightly, indicating it is the busiest day with more loads being delivered.

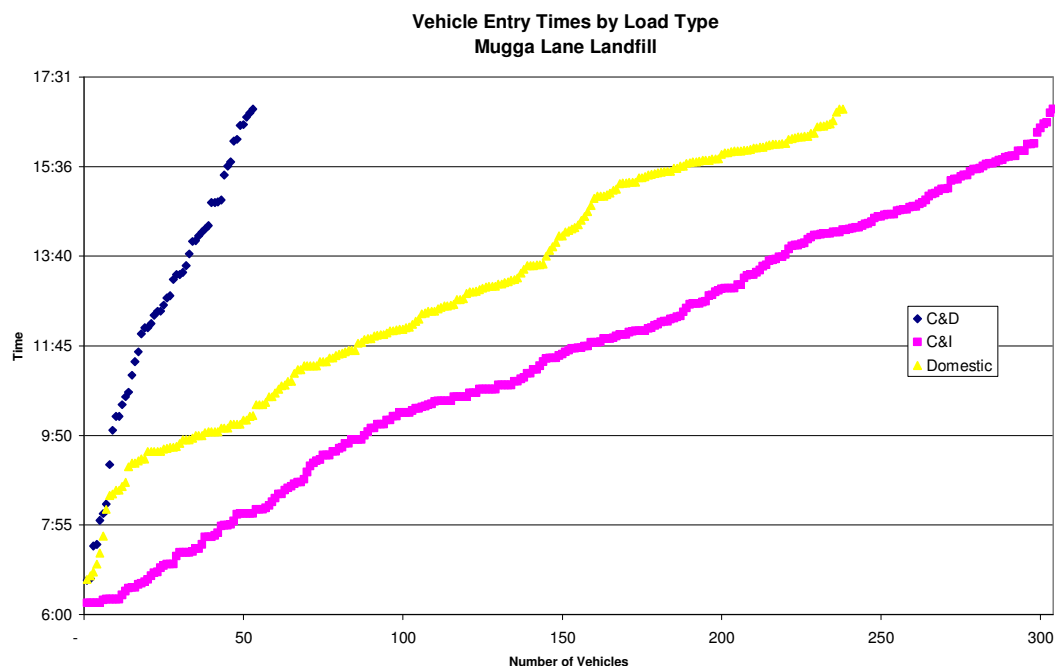


Figure 36 – Vehicle Entry Times by Load Type at Mugga Lane Landfill

Figure 36 shows the times that loads of different types were recorded tipping on all weekdays. The slope of the lines shows the frequency of visits. The steeper the slope, the fewer the visits. The closer together the points are the more frequent the visits. The chart shows, for example, that fewer C&D loads were delivered at the landfill and most of these arrived after midday.

Although the slope of the C&I and domestic lines are similar after about 10 am, before that, the domestic slope is much steeper indicating fewer vehicles deliver in the three or so hours after the gates open. This is because the domestic kerbside collection trucks do not arrive until about 9.30 am. By contrast, C&I trucks deliver consistently through the day from the time the gates open. Both curves steepen at the end, indicating fewer loads are delivered after about 4.00 pm.

3.4 Original Results - Mugga Lane Transfer Station – Without Garbage Bag Details

3.4.1 Volume Results

Table 20 below shows the composition in litres of the waste deposited at Mugga Lane Transfer Station during the audit period. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 20 Composition of Landfilled Waste at Mugga Lane Transfer Station by Audit Day – Litres – Without Garbage Bag Details

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Office Paper	-	-	-	-	-	200	-	200	0.0%
Paper - all other	3,900	1,500	950	900	950	3,000	700	11,900	0.9%
Dry cardboard	58,700	12,250	14,050	11,980	10,160	23,635	22,670	153,445	11.0%
Wet cardboard	300	1,000	-	-	-	150	-	1,450	0.1%
Food / Kitchen	250	500	-	-	-	-	-	750	0.1%
Vegetation / garden	26,350	14,500	16,800	10,310	20,500	12,550	13,200	114,210	8.2%
Wood - furniture, painted wood	23,400	24,710	12,160	10,970	16,050	37,885	32,740	157,915	11.3%
Wood - chipboard, MDF	22,700	7,350	4,750	700	2,470	200	1,050	39,220	2.8%
Wood - board/pole, untreated	13,000	2,750	2,550	3,450	5,850	5,560	3,100	36,260	2.6%
Wood - board/pole, treated	9,250	1,750	1,700	6,100	3,720	5,725	7,400	35,645	2.6%
Textiles - carpet & underlay	16,850	10,400	3,650	6,250	7,550	12,800	9,050	66,550	4.8%
Textiles - cloth	27,900	7,050	8,500	6,400	4,985	9,270	5,600	69,705	5.0%
Textiles - cloth & leather- covered furniture	9,500	12,650	8,550	1,800	6,910	18,850	13,700	71,960	5.1%
Textiles /leather other	3,750	1,850	950	1,500	1,350	2,600	1,500	13,500	1.0%
Rubber - tyres, tubes	450	200	100	150	1,700	400	700	3,700	0.3%
Rubber other	-	-	200	-	2,200	300	100	2,800	0.2%
Glass - containers	1,350	350	200	450	200	410	550	3,510	0.3%
Glass - plate	1,300	300	500	600	450	925	360	4,435	0.3%
Plastic - containers recyclable	1,700	-	-	100	850	1,000	750	4,400	0.3%
Plastic - film	1,300	3,100	6,450	6,850	3,720	3,490	3,360	28,270	2.0%
Plastic - Polystyrene foam	6,850	2,800	1,750	1,300	680	3,845	3,370	20,595	1.5%
Plastic - other	40,350	11,700	7,500	5,700	10,970	17,160	12,740	106,120	7.6%
Metals - ferrous steel	10,500	2,700	2,400	4,570	4,350	14,230	19,110	57,860	4.1%
Metals - non-ferrous	12,600	8,950	6,500	3,950	4,450	5,420	4,400	46,270	3.3%
Concrete / cement	1,700	850	850	250	10	200	800	4,660	0.3%
Bricks/Tiles	1,850	1,100	450	1,850	1,350	200	600	7,400	0.5%

Plasterboard	12,500	8,500	3,950	3,910	2,100	3,100	2,060	36,120	2.6%
Rock/dirt/soil	3,050	1,950	1,000	200	650	470	1,850	9,170	0.7%
Tiles, ceramics	6,200	1,500	600	350	1,910	950	1,360	12,870	0.9%
Asphalt	-	-	-	-	-	-	-	-	0.0%
Hazardous / special	3,620	-	20	-	100	400	210	4,350	0.3%
Garbage bags of rubbish	34,550	49,800	32,700	20,010	22,980	28,245	39,300	227,585	16.3%
Computers / office equipment/Toner cartridges	4,200	1,350	520	100	700	2,020	900	9,790	0.7%
Ducting and insulation							150	150	0.0%
Electrical equipment		1,500		100				1,600	0.1%
Fibro board			100	250	500			850	0.1%
Mattresses	2,250	2,700	4,300	2,350	3,500	10,800	6,400	32,300	2.3%
Total (litres)	362,170	197,610	144,700	113,400	143,865	225,990	209,780	1,393,315	100%

Table 20 shows that almost 1.4 million litres, or almost 1,400 cubic metres, of waste were recorded as landfilled during the audit period. The largest amounts were delivered on Monday.

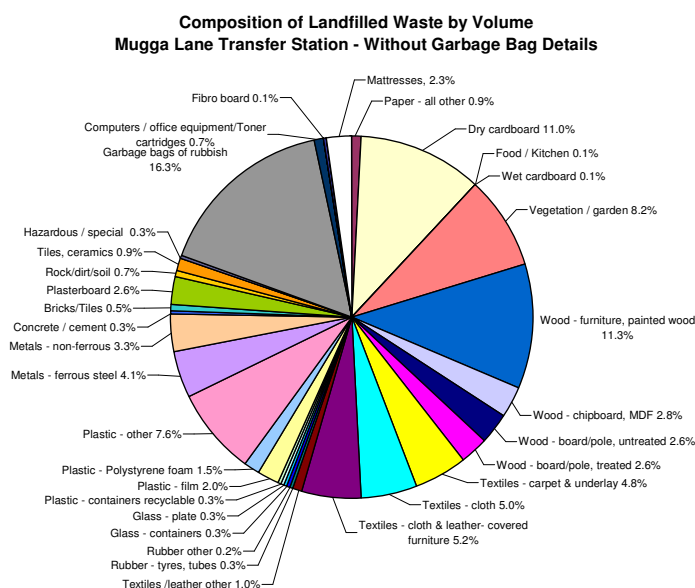


Figure 37 – Composition of Landfilled Waste by Volume at Mugga Lane Transfer Station – Without Garbage Bag Details

Figure 37 shows that the largest proportion of waste being landfilled was garbage bags of rubbish although this was just 16.3%. The composition of the contents of the bags is not known. Other significant proportions included wood furniture and painted wood (11.3%), dry cardboard (11.0%), vegetation and garden waste (8.2%) and other plastic (7.6%).

Table 21 below shows the aggregated composition in cubic metres of the waste deposited at Mugga Lane Transfer Station during the audit period. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12.

Table 21 Aggregated Total Composition of Mugga Lane Transfer Station Stream – Cubic Metres – Without Garbage Bag Details

	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Category	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	62.9	14.8	15.0	12.9	11.1	27.0	23.4	167.0	11.9%
Organics	26.6	15.0	16.8	10.3	20.5	12.6	13.2	115.0	8.2%
Wood and timber products	68.4	36.6	21.2	21.2	28.1	49.4	44.3	269.0	19.3%
Textiles and rubber	58.5	32.2	22.0	16.1	24.7	44.2	30.7	228.2	16.3%
Glass	2.7	0.7	0.7	1.1	0.7	1.3	0.9	7.9	0.6%
Plastics	50.2	17.6	15.7	14.0	16.2	25.5	20.2	159.4	11.4%
Metals	23.1	11.7	8.9	8.5	8.8	19.7	23.5	104.1	7.5%
Building material	25.3	13.9	7.0	6.8	6.5	4.9	6.8	71.2	5.1%

Category	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Hazardous	3.6	-	0.0	-	0.1	0.4	0.2	4.4	0.3%
Bags and loose garbage	34.6	49.8	32.7	20.0	23.0	28.2	39.3	227.6	16.3%
E-waste and office equipment	4.2	1.4	0.5	0.1	0.7	2.0	0.9	9.8	0.7%
Other	2.3	4.2	4.3	2.5	3.5	10.8	6.4	33.9	2.4%
Total (cubic metres)	362.2	197.6	144.7	113.4	143.9	226.0	209.8	1,397.5	100.0%

This data is shown as percentages in Figure 38 below.

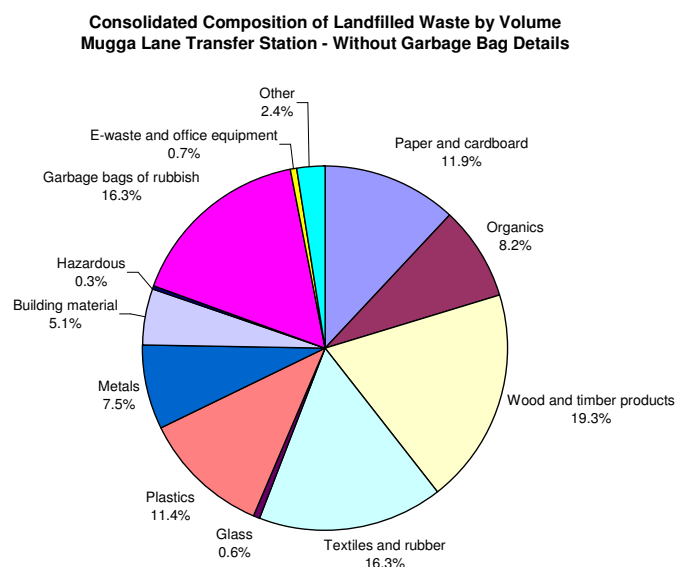


Figure 38 – Consolidated Composition of Landfilled Waste by Volume at Mugga Lane Transfer Station – Without Garbage Bag Details

Figure 38 shows that wood and timber products at 19.3% form the largest proportion of waste deposited for landfilling at Mugga Lane Transfer Station. This is despite there being a section of the tipping area dedicated for recyclable timber. Other significant components include textiles and rubber (16.3%), bags of garbage (16.3%), paper and cardboard (11.9%) and plastics (11.4%).

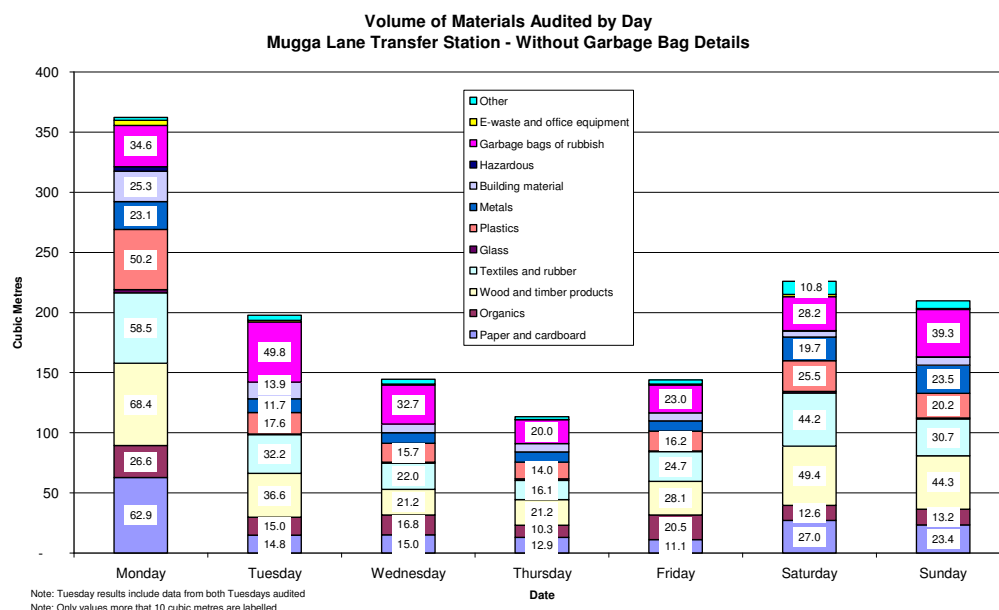


Figure 39 – Volume of Materials Audited by Day at Mugga Lane Transfer Station – Without Garbage Bag Details

Figure 39 shows the volume in cubic metres of the aggregated categories deposited at the transfer station each day of the audit. Clearly most waste is deposited on Monday. The amounts reduce as the week goes on with the smallest amounts being deposited on Wednesday. Quantities increase again towards the weekend. There does not appear to be any significant changes in composition between different days, with increases in overall quantities corresponding with increases in most components.

Table 22 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mugga Lane Transfer Station each day.

Table 22 Quantities Landfilled by Stream by Volume

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	253,950	104,160	85,800	64,860	95,245	211,230	206,710	1,021,955	73.1%
C&I	71,720	70,350	55,750	37,020	38,870	10,910	550	285,170	20.4%
C&D	29,000	23,100	3,150	11,520	9,750	3,850	2,520	82,890	5.9%
No Known	7,500	-	-	-	-	-	-	7,500	0.5%
Total (litres)	362,170	197,610	144,700	113,400	143,865	225,990	209,780	1,397,515	100%

This data is shown in the two figures below.

**Proportion of Streams Landfilled by Volume
Mugga Lane Transfer Station**

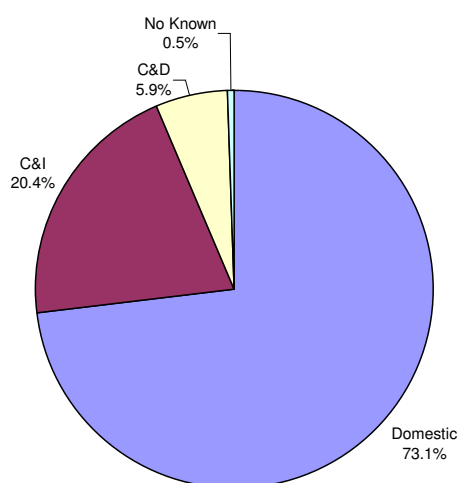


Figure 40 – Proportion of Stream Landfill by Volume at Mugga Lane Landfill

Figure 40 shows the proportion by volume of the different streams landfilled. Domestic waste comprises the largest proportion by far with C&I the next most significant.

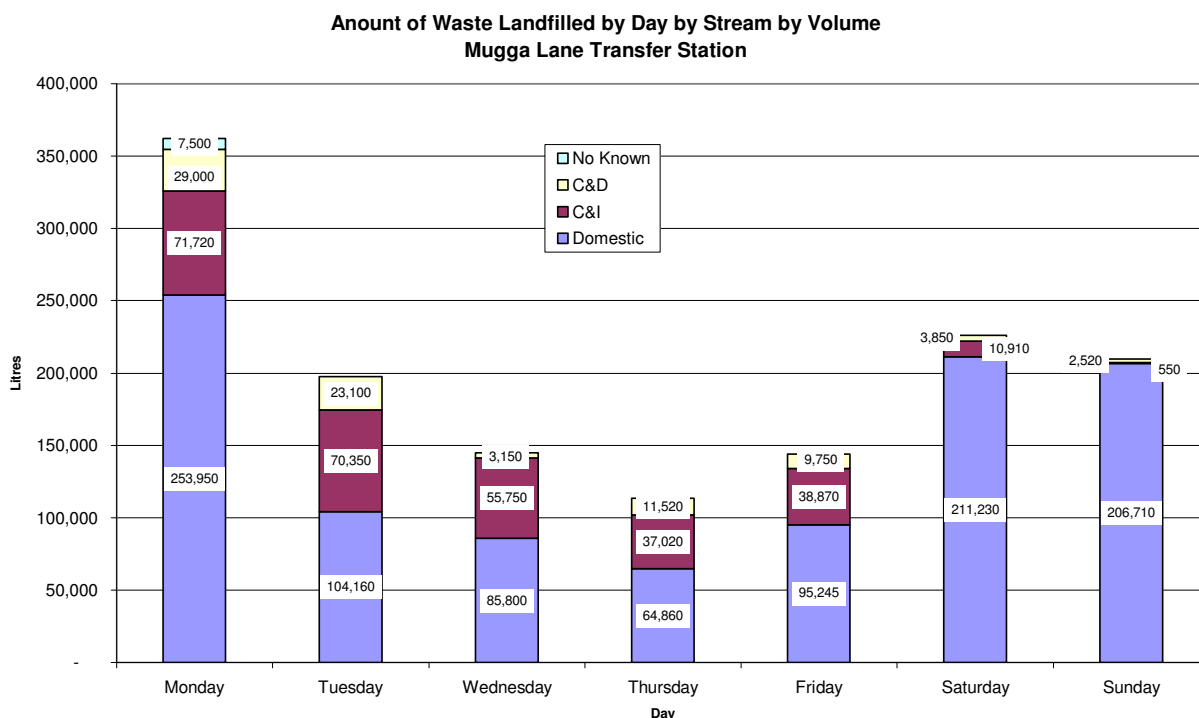


Figure 41 – Amount of Waste Landfilled by Day by Stream and by Volume at Mugga Lane Transfer Station

Figure 41 shows the composition and volume in litres of waste landfilled each day at for the domestic, C&I and C&D streams. Domestic waste was the most common type of waste deposited especially on the weekends and on Mondays. Although overall quantities were lower during the week, this was also substantially domestic in origin.

3.4.2 Weight Results

Table 23 below shows the composition in kilograms (to the nearest half kilogram) of the waste deposited at Mugga Lane Transfer Station during the audit period. These figures were calculated by converting the volume of each material recorded during the audit to weigh using the Resource NSW conversion factors. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 23 Composition of Landfilled Waste at Mugga Lane Transfer Station by Audit Day – Kilograms – Without Garbage Bag Details

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total	Percent
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Office Paper	390.0	-	-	-	-	74.0	-	74.0	0.0%
Paper - all other	2,935.0	150.0	95.0	90.0	95.0	300.0	70.0	1,190.0	0.5%
Dry cardboard	150.0	612.5	702.5	599.0	508.0	1,181.8	1,133.5	7,672.3	3.1%
Wet cardboard	82.5	500.0	-	-	-	75.0	-	725.0	0.3%
Food / Kitchen	3,952.5	165.0	-	-	-	-	-	247.5	0.1%
Vegetation / garden	3,978.0	2,175.0	2,520.0	1,546.5	3,075.0	1,882.5	1,980.0	17,131.5	6.9%
Wood - furniture, painted wood	5,675.0	4,200.7	2,067.2	1,864.9	2,728.5	6,440.5	5,565.8	26,845.6	10.8%
Wood - chipboard, MDF	1,560.0	1,837.5	912.5	175.0	617.5	50.0	262.5	9,530.0	3.9%
Wood - board/pole, untreated	1,665.0	330.0	306.0	414.0	702.0	667.2	372.0	4,351.2	1.8%
Wood - board/pole, treated	2,527.5	315.0	216.0	1,098.0	669.6	1,030.5	1,332.0	6,326.1	2.6%
Textiles - carpet & underlay	3,627.0	1,560.0	547.5	937.5	1,132.5	1,920.0	1,357.5	9,982.5	4.0%
Textiles - cloth	855.0	916.5	1,105.0	832.0	648.1	1,205.1	728.0	9,061.7	3.7%
Textiles - cloth & leather- covered furniture	262.5	1,138.5	769.5	162.0	621.9	1,696.5	1,233.0	6,476.4	2.6%
Textiles /leather other	90.0	129.5	66.5	105.0	94.5	182.0	105.0	945.0	0.4%
Rubber - tyres, tubes	-	40.0	20.0	30.0	340.0	80.0	140.0	740.0	0.3%
Rubber other	378.0	-	52.0	-	572.0	78.0	26.0	728.0	0.3%
Glass - containers	468.0	98.0	56.0	126.0	56.0	114.8	154.0	982.8	0.4%
Glass - plate	136.0	108.0	180.0	216.0	162.0	333.0	129.6	1,596.6	0.6%
Plastic - containers recyclable	91.0	-	-	8.0	68.0	80.0	60.0	352.0	0.1%
Plastic - film	205.5	217.0	451.5	479.5	260.4	244.3	235.2	1,978.9	0.8%
Plastic - Polystyrene foam	6,859.5	84.0	52.5	39.0	20.4	115.4	101.1	617.9	0.2%
Plastic - other	2,940.0	1,989.0	1,275.0	969.0	1,864.9	2,917.2	2,165.8	18,040.4	7.3%
Metals - ferrous steel	3,150.0	756.0	602.0	1,279.6	1,218.0	3,984.4	5,350.8	16,130.8	6.5%
Metals - non-ferrous	1,258.0	2,237.5	1,625.0	987.5	1,112.5	1,355.0	1,100.0	11,567.5	4.7%

Concrete / cement	980.5	629.0	629.0	185.0	7.4	148.0	592.0	3,448.4	1.4%
Bricks/Tiles	4,000.0	583.0	238.5	980.5	715.5	106.0	318.0	3,922.0	1.6%
Plasterboard	2,836.5	2,720.0	1,264.0	1,251.2	672.0	992.0	659.2	11,558.4	4.7%
Rock/dirt/soil	3,286.0	1,813.5	930.0	186.0	604.5	437.1	1,720.5	8,528.1	3.4%
Tiles, ceramics	-	795.0	265.0	185.5	1,012.3	503.5	720.8	6,768.1	2.7%
Asphalt	-	-	-	-	-	-	-	-	0.0%
Hazardous / special	7,946.5	-	-	-	-	-	-	-	0.0%
Garbage bags of rubbish	630.0	11,454.0	7,521.0	4,602.3	5,285.4	6,496.4	9,039.0	52,344.6	21.1%
Computers / office equipment/Toner cartridges	-	202.5	78.0	15.0	105.0	303.0	135.0	1,468.5	0.6%
Ducting and insulation		-					13.5	13.5	0.0%
Electrical equipment		480.0	32.0	32.0				544.0	0.2%
Fibro board		-		37.5	75.0			112.5	0.0%
Mattresses	382.5	459.0	731.0	399.5	595.0	1,836.0	1,088.0	5,491.0	2.2%
Total Audit (kg)	63,298.0	38,695.7	25,310.2	19,833.0	25,638.9	36,829.0	37,887.8	247,492.6	100%

The composition of the waste landfilled at Mugga Lane Transfer Station by weight, converted from volume, is shown in Figure 42.

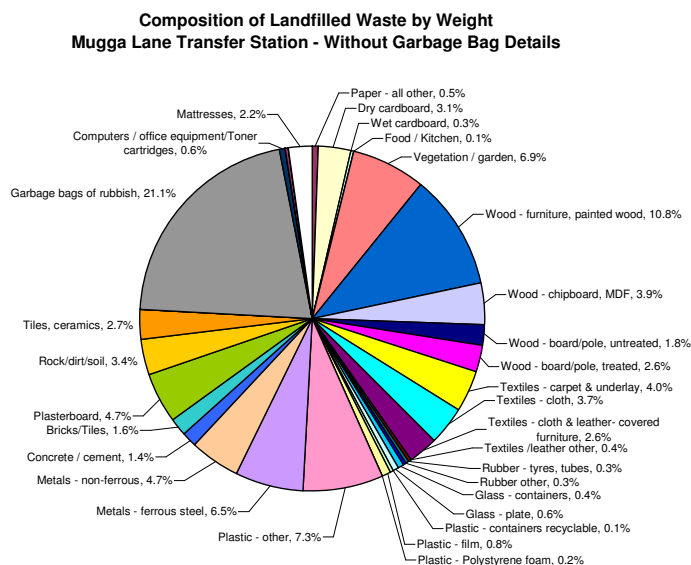


Figure 42 - Composition of Landfilled Waste by Weight at Mugga Lane Transfer Station – Without Garbage Bag Details

Figure 42 shows that the largest proportion of material by weight was garbage bags of rubbish (21.1%) with wood furniture and painted wood (10.8%), plastic other (7.3%) and vegetation/garden (6.9%) the next largest proportions.

Table 24 below shows the aggregated composition in kilograms, converted from litres, of the waste deposited at the landfill at Mugga Lane Transfer Station during the audit period. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12.

Table 24 Aggregated Total Composition of Mugga Lane Transfer Station Stream – Kilograms – Without Garbage Bag Details

Category	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total	Percent
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Paper and cardboard	3,475.0	1,262.5	797.5	689.0	603.0	1,630.8	1,203.5	9,661.3	3.9%
Organics	4,035.0	2,340.0	2,520.0	1,546.5	3,075.0	1,882.5	1,980.0	17,379.0	7.0%
Wood and timber products	12,878.0	6,683.2	3,501.7	3,551.9	4,717.6	8,188.2	7,532.3	47,052.9	19.0%
Textiles and rubber	7,362.0	3,784.5	2,560.5	2,066.5	3,409.0	5,161.6	3,589.5	27,933.6	11.3%
Glass	846.0	206.0	236.0	342.0	218.0	447.8	283.6	2,579.4	1.0%
Plastics	7,292.0	2,290.0	1,779.0	1,495.5	2,213.7	3,356.9	2,562.1	20,989.2	8.5%
Metals	6,090.0	2,993.5	2,227.0	2,267.1	2,330.5	5,339.4	6,450.8	27,698.3	11.2%
Building material	12,743.5	6,999.5	4,057.5	3,225.2	3,681.7	4,022.6	5,112.0	39,842.0	16.1%

Category	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Hazardous ¹³	-	-	-	-	-	-	-	-	0.0%
Bags and loose garbage	7,946.5	11,454.0	7,521.0	4,602.3	5,285.4	6,496.4	9,039.0	52,344.6	21.1%
E-waste and office equipment	630.0	682.5	110.0	47.0	105.0	303.0	135.0	2,012.5	0.8%
Other	-	-	-	-	-	-	-	-	0.0%
Total (kg)	63,298.0	38,695.7	25,310.2	19,833.0	25,638.9	36,829.0	37,887.8	247,492.6	100.0%

This data is shown as percentages in Figure 43 below.

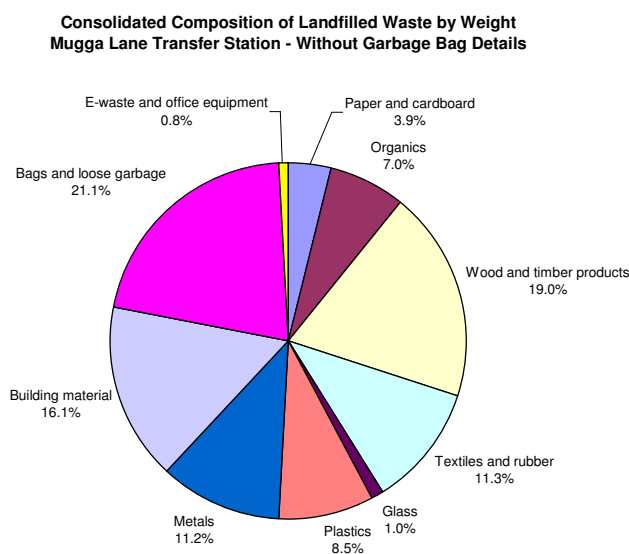


Figure 43 – Consolidated Composition of Landfilled Waste by Weight at Mitchell Transfer Station – Without Garbage Bag Details

Figure 43 shows that organic material, both paper and cardboard, wood and timber or vegetation and kitchen waste, were the largest proportions of this stream. They totalled 29.9%. A further 37.6% was plastics and other potentially recoverable materials.

Table 25 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mugga Lane Transfer Station each day.

Table 25 Quantities Landfilled by Stream by Weight

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	45,412.5	20,036.2	15,228.7	11,676.1	16,561.3	34,562.5	37,263.6	180,740.9	73.0%
C&I	9,738.0	13,268.0	9,553.5	6,054.9	6,822.4	1,612.5	126.5	47,175.8	19.1%
C&D	6,970.0	5,391.5	528.0	2,102.0	2,255.2	654.0	497.7	18,398.4	7.4%

¹³ No conversion factors are available for hazardous waste and as this was only a small proportion no figures are provided

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
No Known	1,177.5	-	-	-	-	-	-	1,177.5	0.5%
Total (kg)	63,298.0	38,695.7	25,310.2	19,833.0	25,638.9	36,829.0	37,887.8	247,492.6	100%

This data is shown in the two figures below.

**Proportion of Streams Landfilled by Weight
Mugga Lane Transfer Station**

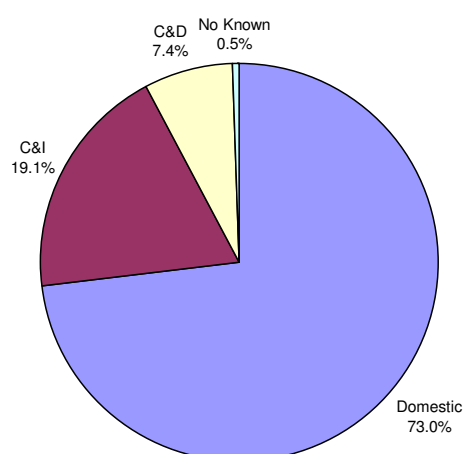


Figure 44 – Proportion of Stream Landfill by Weight at Mugga Lane Landfill

Figure 44 shows the proportion by weight of the different streams landfilled. Domestic waste comprises the largest proportion by far with C&I the next most significant.

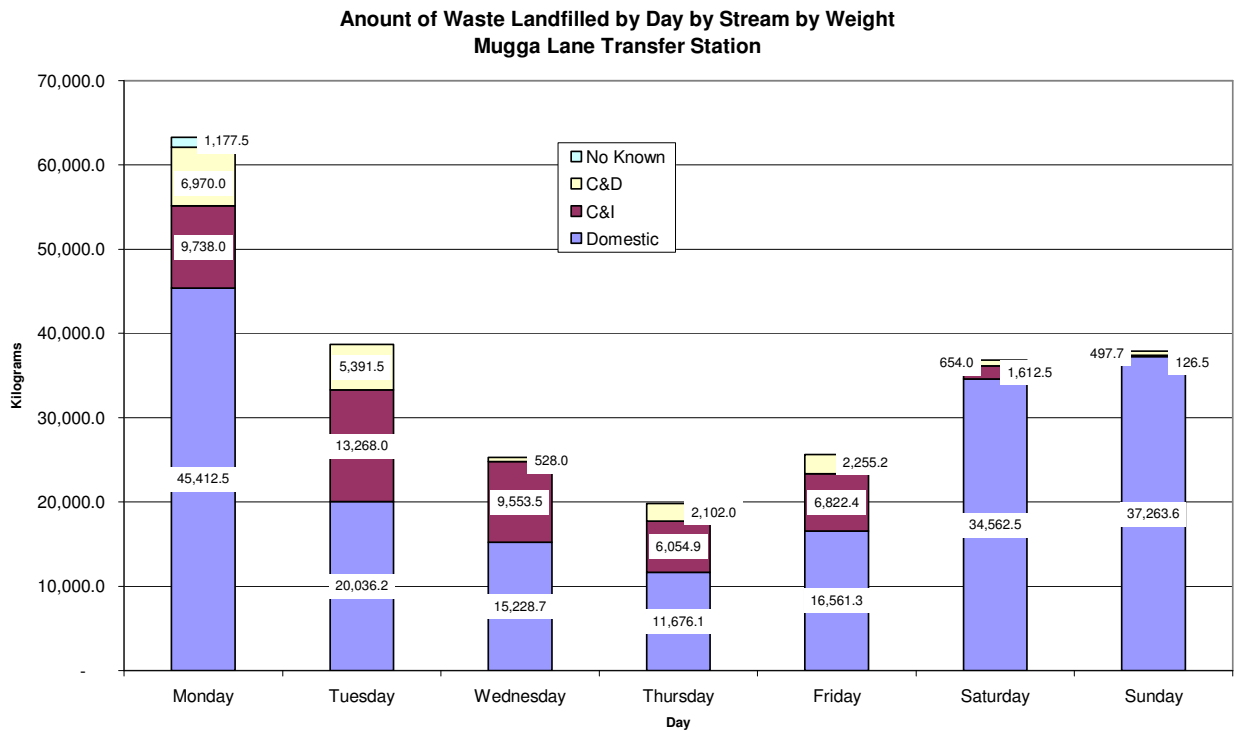


Figure 45 – Amount of Waste Landfilled by Day by Stream and by Weight at Mitchell Transfer Station

Figure 45 shows the composition and weight in kilograms of waste landfilled each day at for the domestic, C&I and C&D streams. Most waste is deposited on Monday, dipping on Thursday with the smallest quantities before rising again on the weekend. Most waste deposited was domestic in origin, especially at the weekend.

3.4.3 Other Results

A number of other sets of data were extracted relating to vehicle types using the transfer station and these are shown in the following section.

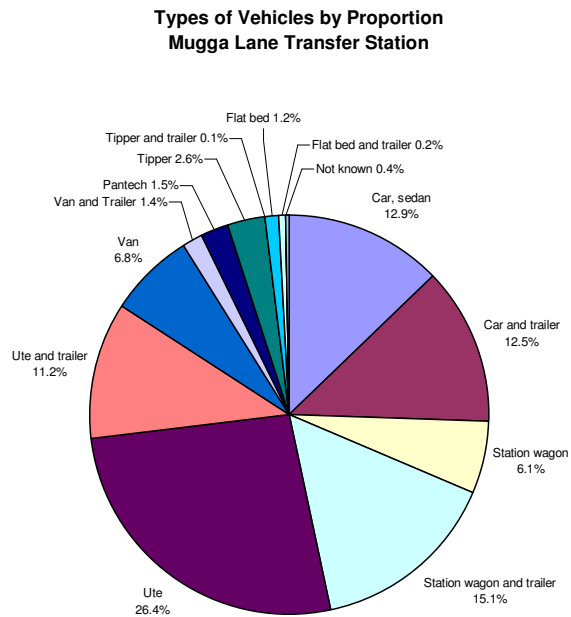


Figure 46 – Types of Vehicles by Proportion at Mugga Lane Transfer Station

Figure 46 shows the proportions of different vehicle types delivering to the transfer station. For consistent data recording, auditors were provided with a vehicle identification sheet, a copy of which can be found in Appendix A. The descriptions and classifications of vehicles shown in that document are those used in the charts.

Except in particular circumstances, small vehicles are not allowed to tip at the main landfill and are directed to the transfer station. As a result most of the vehicles shown delivering to the transfer station in the chart are small. No front lift or rear lift commercial vehicles and no domestic side lift vehicles were recorded at Mitchell Transfer Station. A variety of small cars, utes, vans and station wagons, with and without trailers, were the most common vehicles (a total of 92.4%). Vehicles towing trailers made up 40.2% of those delivering.

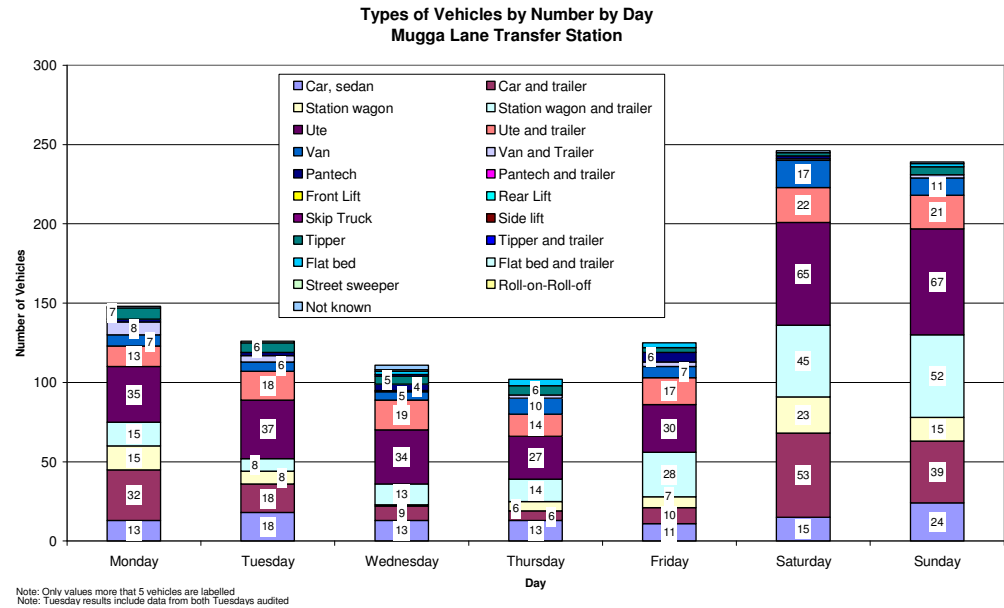


Figure 47 – Types of Vehicles by Number by Day at Mugga Lane Transfer Station

Figure 47 shows the number of different types vehicles delivering to the transfer station each day. In contrast to the landfill, at the transfer station, most vehicles deliver on the weekends. There is still a significant difference in the numbers each weekend day with numbers of deliveries highest on Monday and decreasing to Thursday before increasing again on Friday. During the week there are about half as many vehicles delivering each day except Monday. The composition of vehicles each weekday is also interesting with utes, cars and station wagons with trailers maintaining a constant number and the overall decrease due to reductions in the numbers of cars with trailers and station wagons.

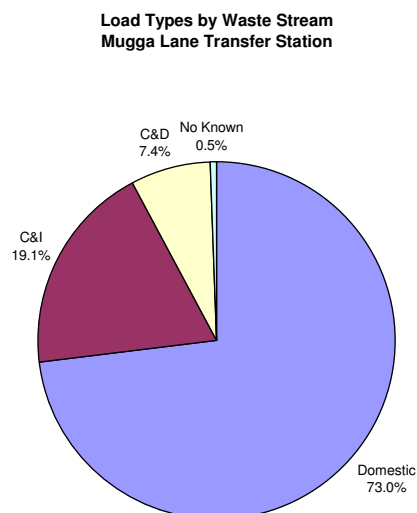
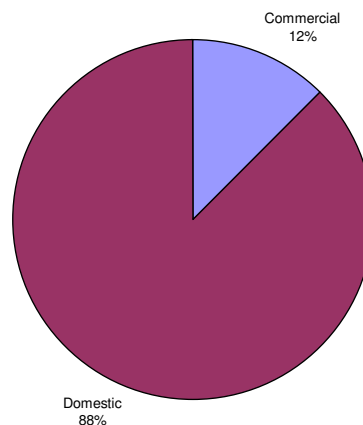


Figure 48 – Load Types by Waste Stream - Mugga Lane Transfer Station

Figure 48 shows the proportion of loads of different types deposited at the transfer station. Auditors recorded whether a load was domestic, commercial and industrial (C&I) or construction and demolition (C&D) in origin as best they could from their observations of the type of vehicle and type of waste. Unsurprisingly most loads delivered were domestic.

Load Types by Waste Stream From Weighbridge Report
Mugga Lane Transfer Station

**Figure 49 - Load Types by Waste Stream from Weighbridge Report**

Information provided by ACT NOWaste generated from weighbridge data collected during the audit period is shown in Figure 49 above. ACT NOWaste has indicated that it is aware that weighbridge operators incorrectly classify C&D data as C&I and it is also apparent that about 8-9% of loads are classified as domestic when they are commercial or a combination of C&D/commercial/industrial, for example, home renovations.

Figure 50 – Types of Waste by Number by Day at Mugga Lane Transfer Station

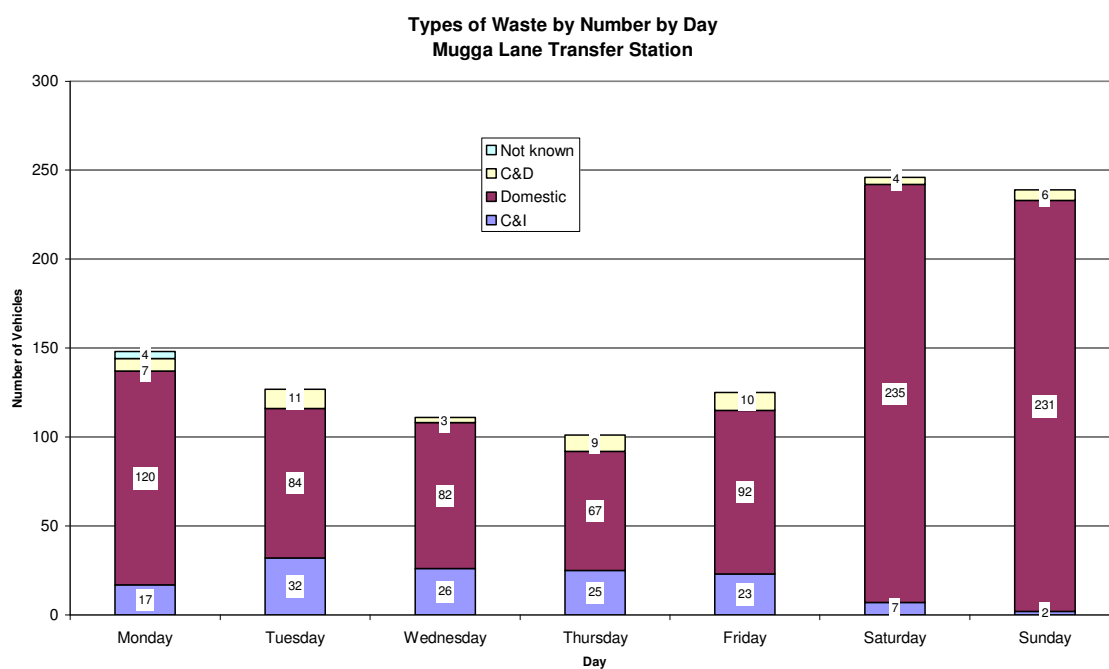


Figure 50 shows the number of loads of different types deposited at the landfill during the audit period. On weekdays, the number of domestic loads delivered was significantly lower than that of the weekends while reverse was the case for C&I with more loads delivered during the week. Most loads delivered on the weekend were domestic.

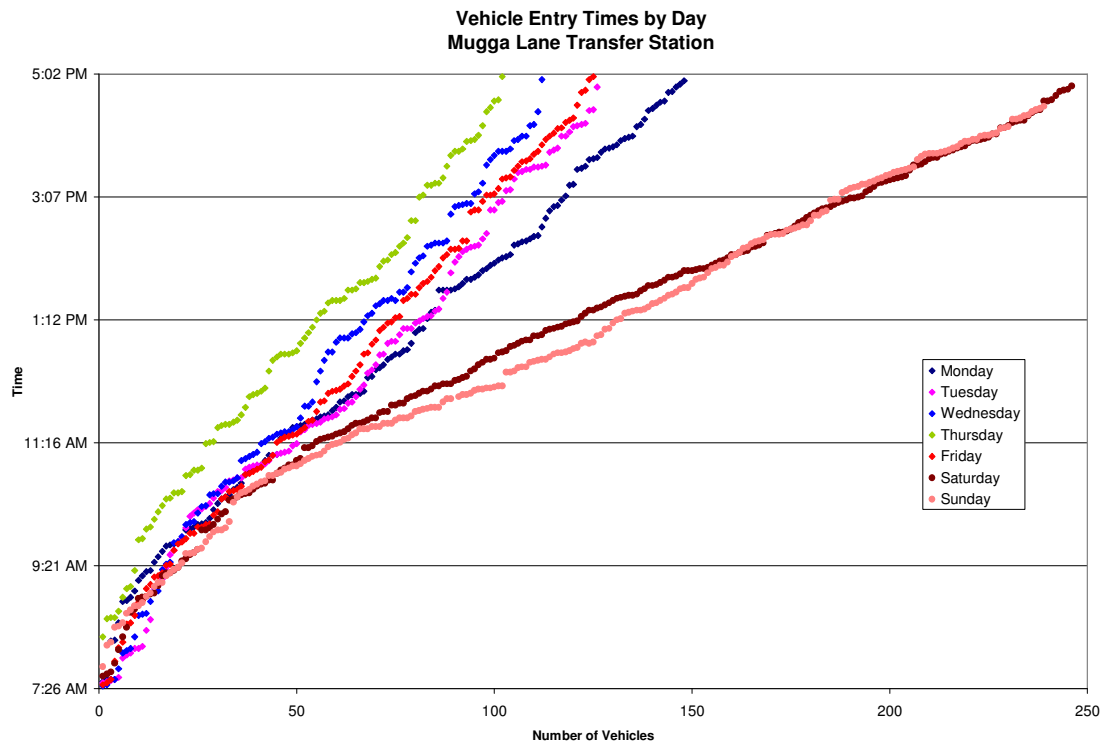


Figure 51 – Vehicle Entry Times by Day at Mugga Lane Transfer Station

Figure 51 shows the times that vehicles of all types were recorded tipping each day at the transfer station. The slope of the lines shows the frequency of visits. The steeper the slope is, the fewer the visits. The closer together the points are the more frequent the visits. The chart shows, for example, that there were many more loads delivered in Saturday and Sunday compared to weekdays. The curve for Saturday and Sunday also becomes significantly flatter after 10.30 am indicating the frequency of deliveries increases.

Other than on Thursday all vehicles tended to arrive for tipping on weekdays at similar regular intervals (the slope of all lines tends to be the same angle) from opening time until about 11.30 am. After this time the curves spread out with Tuesday, Wednesday and Friday showing similar characteristics while Monday becomes flatter indicating more frequent deliveries.

While the curve for Thursday is about the same steepness as the other days, it is steeper up until about 9.30 when fewer loads arrived.

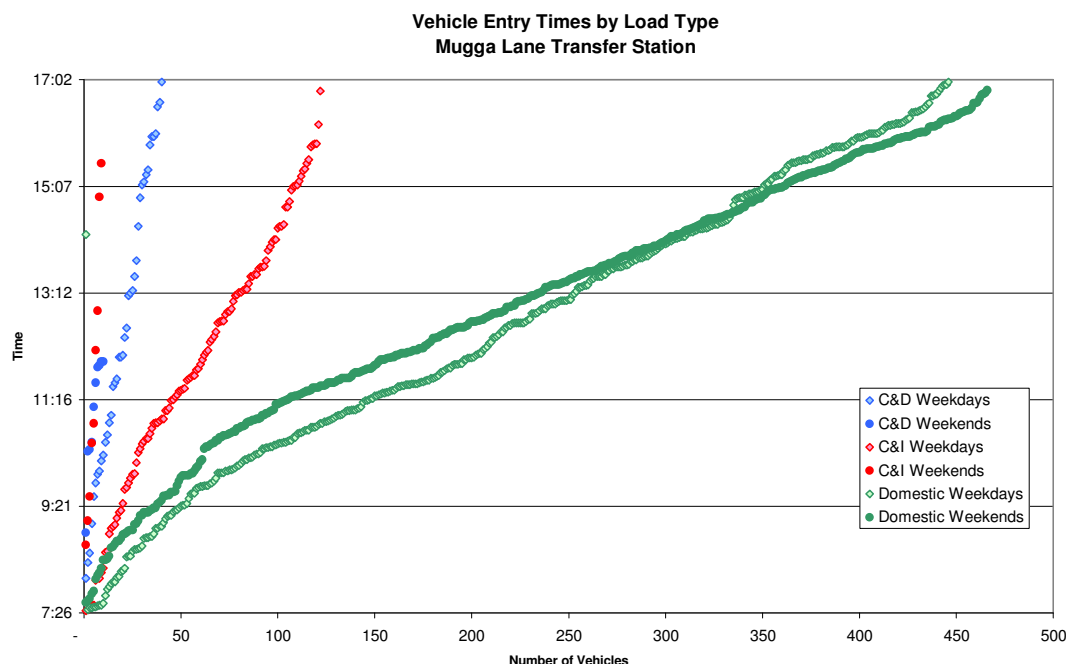


Figure 52 – Vehicle Entry Times by Load Type at Mugga Lane Transfer Station

Figure 52 shows the times that loads of different types were recorded tipping on both weekdays and weekends. The slope of the lines shows the frequency of visits. The steeper the slope, the fewer the visits. The closer together the points are the more frequent the visits. The chart shows, for example, that fewer C&D loads were delivered at any time, especially on weekends.

There is a marked difference in the slope of the C&I curves with very few loads being delivered on the weekend.

The slopes for domestic weekends and weekdays is similar with the weekends slope steeper until about 10.30 am when it flattens out indicating increase frequency of deliveries. A similar feature is seen in the weekday slope although not as pronounced. The weekend slope is flatter through the day and does not feature the steepening of the slope seen on the weekday curve between about 12 noon and 12.40 pm (lunchtime) indicating a reduced frequency of deliveries.

3.5 Original Results - All Sites – Without Garbage Bag Details

3.5.1 Results by Volume

Table 26 below shows the composition in litres of the total amount of waste recorded as deposited at each site during the audit period. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 26 Composition of Landfilled Waste at Mugga Lane Landfill by Audit Day – Litres – Without Garbage Bag Details

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Office Paper	1,700	20,250	200	22,150	0.2%
Paper - all other	23,500	178,350	11,900	213,750	1.6%
Dry cardboard	166,700	881,300	153,445	1,201,445	8.8%
Wet cardboard	1,700	11,600	1,450	14,750	0.1%
Food / Kitchen	3,850	76,600	750	81,200	0.6%
Vegetation / garden	394,760	835,850	114,210	1,344,820	9.8%
Wood - furniture, painted wood	144,950	102,000	157,915	404,865	3.0%
Wood - chipboard, MDF	96,400	72,000	39,220	207,620	1.5%
Wood - board/pole, untreated	70,100	210,000	36,260	316,360	2.3%
Wood - board/pole, treated	94,900	166,500	35,645	297,045	2.2%
Textiles - carpet & underlay	75,350	200,800	66,550	342,700	2.5%
Textiles - cloth	96,650	64,550	69,705	230,905	1.7%
Textiles - cloth & leather- covered furniture	98,200	108,100	71,960	278,260	2.0%
Textiles /leather other	25,100	15,000	13,500	53,600	0.4%
Rubber - tyres, tubes	2,000	4,600	3,700	10,300	0.1%
Rubber other	6,300	7,700	2,800	16,800	0.1%
Glass - containers	5,650	32,500	3,510	41,660	0.3%
Glass - plate	8,650	6,000	4,435	19,085	0.1%
Plastic - containers recyclable	14,550	30,850	4,400	49,800	0.4%
Plastic - film	49,450	245,850	28,270	323,570	2.4%
Plastic - Polystyrene foam	51,610	97,850	20,595	170,055	1.2%
Plastic - other	164,250	216,100	106,120	486,470	3.6%
Metals - ferrous steel	36,570	51,600	57,860	146,030	1.1%
Metals - non-ferrous	25,700	60,750	46,270	132,720	1.0%
Concrete / cement	48,750	6,250	4,660	59,660	0.4%
Bricks/Tiles	23,400	22,500	7,400	53,300	0.4%
Plasterboard	38,600	66,750	36,120	141,470	1.0%
Rock/dirt/soil	18,500	196,600	9,170	224,270	1.6%

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Tiles, ceramics	18,300	5,600	12,870	36,770	0.3%
Asphalt	-	-	-	-	0.0%
Hazardous / special	1,210	-	4,350	5,560	0.0%
Garbage bags of rubbish	221,000	6,085,650	227,585	6,534,235	47.8%
Computers / office equipment/Toner cartridges	9,270	20,600	9,790	39,660	0.3%
Car parts	2,000	-		2,000	0.0%
Dead animals		750		750	0.0%
Ducting and insulation	12,350	-	150	12,500	0.1%
Dust		3,750		3,750	0.0%
Electrical equipment	20,020	-	1,600	21,620	0.2%
Household items		2,000		2,000	0.0%
Fibro board			850	850	0.0%
Hotwater system	500			500	0.0%
Luggage	200			200	0.0%
Mattresses	37,480	56,800	32,300	126,580	0.9%
Total (litres)	2,110,170	10,163,950	1,397,515	13,671,635	100.0%

Table 26 shows that about 13.7 million litres, or about 137,000 cubic metres, of waste were recorded as landfilled during the audit period. Naturally the largest amounts were delivered to the Mugga Lane Landfill.

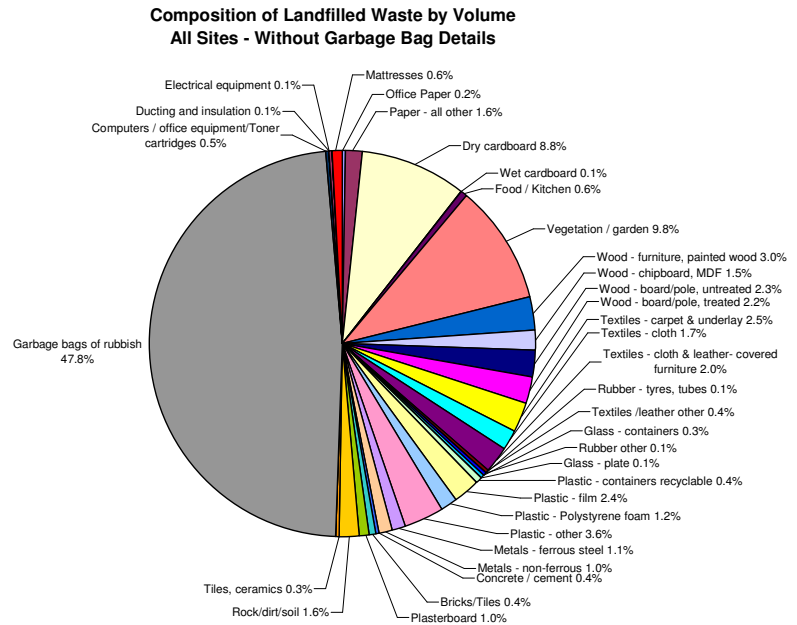


Figure 53 – Composition of Landfilled Waste at All Sites by Volume – Without Garbage Bag Details

Figure 53 shows that the largest proportion of waste being landfilled at all sites was garbage bags of rubbish. This material mostly came from domestic waste vehicles as well as commercial waste delivered in compactor vehicles or in roll-on-roll-off compactors. The composition of the contents of the bags is not known.

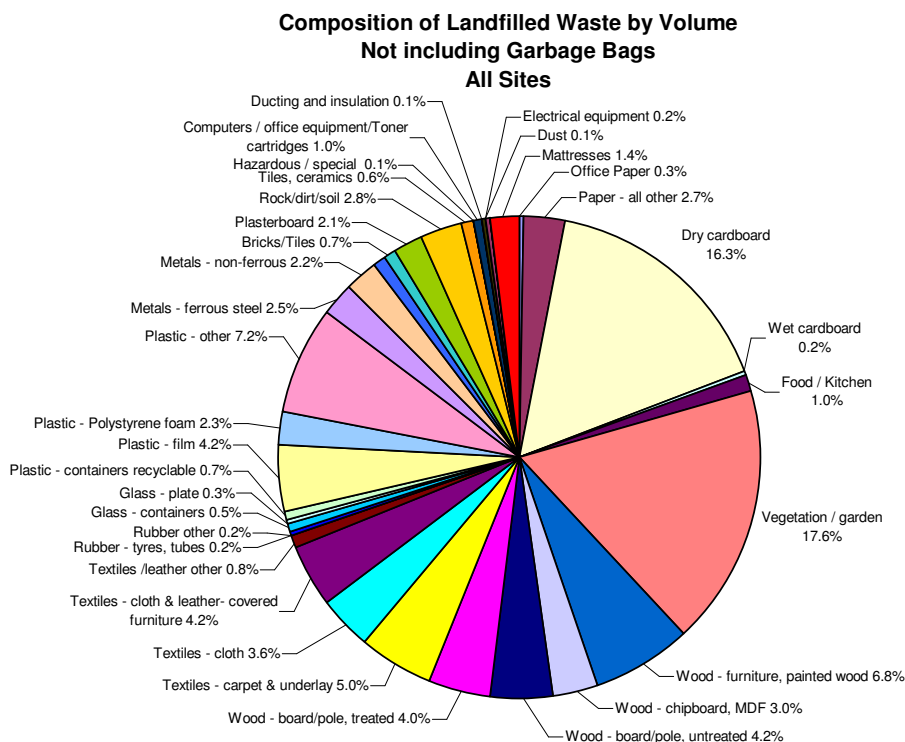


Figure 54 – Composition of Landfilled Waste at All Sites by Volume – Not including Garbage Bags

With the garbage bags removed Figure 54 above shows the composition of the landfilled stream at all sites is composed of large proportions of dry cardboard (16.3%) and vegetation (17.6%). In fact 56.1% of the landfilled stream, not including the garbage bags, is organic - vegetation, kitchen waste, timber and paper.

Table 27 below shows the aggregated composition in cubic metres of the waste deposited for landfilling at all sites during the audit period.

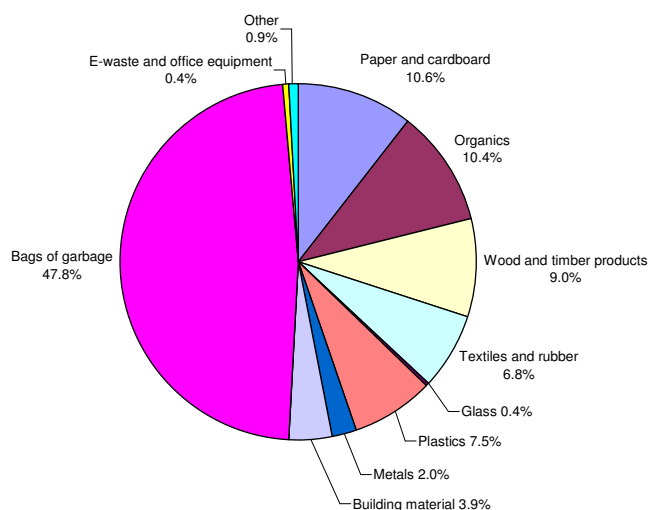
Table 27 Aggregated Total Composition of All Sites – Cubic Metres – Without Garbage Bag Details

Site	Mitchell Transfer Station	Mugga Lane landfill	Mugga Lane Transfer Station	Total	Percent
Paper and cardboard	193.6	1,091.5	167.0	1,452.1	10.6%
Organics	398.6	913.2	115.0	1,426.8	10.4%
Wood and timber products	406.4	550.5	269.0	1,225.9	9.0%
Textiles and rubber	303.6	400.8	228.2	932.6	6.8%
Glass	14.3	38.5	7.9	60.7	0.4%
Plastics	279.9	590.7	159.4	1,029.9	7.5%

Metals	64.3	112.4	104.1	280.8	2.1%
Building material	159.9	301.5	71.2	532.6	3.9%
Hazardous	1.2	-	4.4	5.6	0.0%
Bags and loose garbage	221.0	6,085.7	227.6	6,534.2	47.8%
E-waste and office equipment	29.3	20.6	11.4	61.3	0.4%
Other	38.2	58.8	32.3	129.3	0.9%
Total (cubic metres)	2,110.2	10,164.0	1,397.5	13,671.6	100.0%

This data is shown as percentages in Figure 55 below.

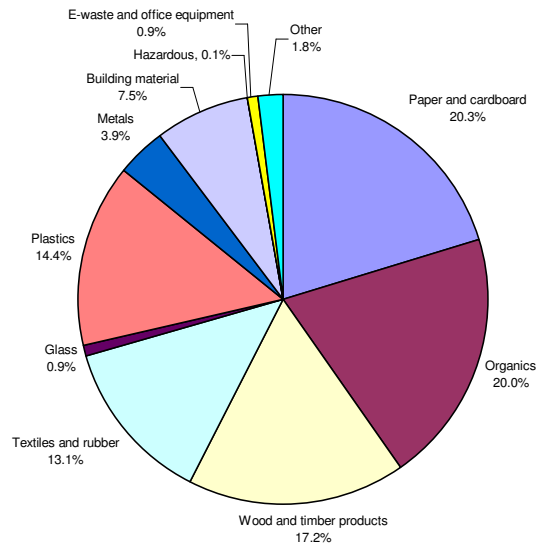
**Consolidated Composition of Landfilled Waste by Volume
All Sites - Without Garbage Bag Details**



**Figure 55 – Consolidated Composition of Landfilled Waste at All Sites by Volume
– Without Garbage Bag Details**

Figure 55 shows that garbage bags form the largest proportion at 47.8% with paper, cardboard, wood, timber and other organic materials forming a total of 30.0%. The chart below shows the aggregated composition of this stream without the garbage bags.

**Consolidated Composition of Landfilled Waste by Volume
Not including garbage bags
All Sites**



**Figure 56 – Consolidated Composition of Landfilled Waste at All Sites by Volume
– Not including Garbage Bags**

Figure 56 shows that organic material, at 57.5%, makes up more than half the landfilled stream, not including bags of garbage. A further 27.6% is potentially recoverable plastics, glass, metals, building material and electronic materials.

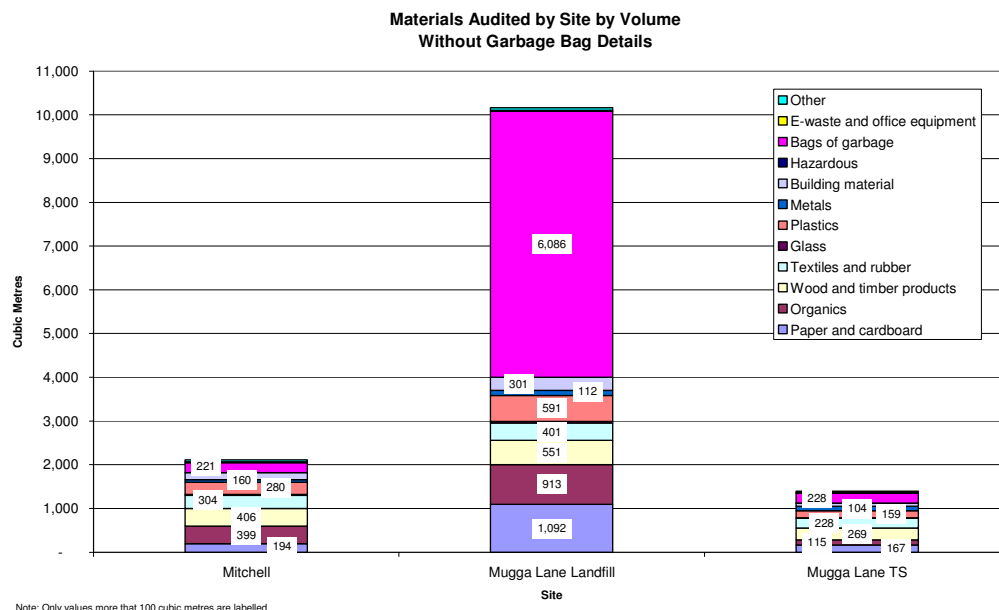


Figure 57 – Materials Audited by Volume by Site – Without Garbage Bag Details

Figure 57 shows the volume in cubic metres of the aggregated categories deposited for landfilling at each site. Clearly most waste is deposited at Mugga Lane Landfill and most of this is garbage bags, mainly from domestic collections and large-scale commercial collections. The total amounts deposited at the transfer stations are comparatively small. The amounts deposited at Mitchell Transfer Station are slightly higher than at Mugga Lane Transfer Station, perhaps as Mitchell is the only transfer station in the northern part of Canberra it attracts some loads that, if entering Mugga Lane would be diverted to the landfill for disposal.

3.5.2 Results by Weight

Table 28 below shows the composition of the total amount of waste recorded by volume as deposited at each site during the audit period and then converted to weight.

Table 28 Composition of Landfilled Waste at Mugga Lane Landfill by Audit Day – Kilograms – Without Garbage Bag Details

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Office Paper	629.0	7,652.5	74.0	8,355.5	0.3%
Paper - all other	2,350.0	61,310.0	1,190.0	64,850.0	1.9%
Dry cardboard	8,335.0	117,463.0	7,672.3	133,470.3	4.0%
Wet cardboard	850.0	5,800.0	725.0	7,375.0	0.2%
Food / Kitchen	1,270.5	25,278.0	247.5	26,796.0	0.8%
Vegetation / garden	59,214.0	143,325.5	17,131.5	219,671.0	6.6%
Wood - furniture, painted wood	24,641.5	19,410.0	26,845.6	70,897.1	2.1%
Wood - chipboard, MDF	24,100.0	19,000.0	9,530.0	52,630.0	1.6%
Wood - board/pole, untreated	8,412.0	38,760.0	4,351.2	51,523.2	1.5%
Wood - board/pole, treated	17,082.0	34,010.0	6,326.1	57,418.1	1.7%
Textiles - carpet & underlay	11,302.5	32,980.0	9,982.5	54,265.0	1.6%
Textiles - cloth	12,564.5	12,891.5	9,061.7	34,517.7	1.0%
Textiles - cloth & leather-covered furniture	8,838.0	19,089.0	6,476.4	34,403.4	1.0%
Textiles /leather other	1,757.0	1,050.0	945.0	3,752.0	0.1%
Rubber - tyres, tubes	400.0	920.0	740.0	2,060.0	0.1%
Rubber other	1,638.0	2,002.0	728.0	4,368.0	0.1%
Glass - containers	1,582.0	9,100.0	982.8	11,664.8	0.4%
Glass - plate	3,114.0	2,160.0	1,596.6	6,870.6	0.2%
Plastic - containers recyclable	1,164.0	4,018.0	352.0	5,534.0	0.2%
Plastic - film	3,461.5	35,390.0	1,978.9	40,830.4	1.2%
Plastic - Polystyrene foam	1,548.3	4,456.5	617.9	6,622.7	0.2%
Plastic - other	27,922.5	53,789.5	18,040.4	99,752.4	3.0%
Metals - ferrous steel	10,239.6	14,500.5	16,130.8	40,870.9	1.2%
Metals - non-ferrous	6,425.0	16,327.5	11,567.5	34,320.0	1.0%
Concrete / cement	36,075.0	4,625.0	3,448.4	44,148.4	1.3%

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Bricks/Tiles	12,402.0	11,875.0	3,922.0	28,199.0	0.8%
Plasterboard	12,352.0	20,880.0	11,558.4	44,790.4	1.3%
Rock/dirt/soil	17,205.0	180,628.0	8,528.1	206,361.1	6.2%
Tiles, ceramics	9,699.0	2,968.0	6,768.1	19,435.1	0.6%
Asphalt	-	-	-	-	0.0%
Hazardous / special	-	-	-	-	0.0%
Garbage bags of rubbish	50,830.0	1,774,077.0	52,344.6	1,877,251.6	56.4%
Computers / office equipment/Toner cartridges	1,390.5	2,765.0	1,468.5	5,624.0	0.2%
Car parts	560.0	-	-	560.0	0.0%
Dead animals	2,099.5	247.5	-	2,347.0	0.1%
Ducting and insulation	-	-	13.5	13.5	0.0%
Dust	-	-	-	-	0.0%
Electrical equipment	3,003.0	-	544.0	3,547.0	0.1%
Household Items	-	340.0	-	340.0	0.0%
Fibro board	-	-	112.5	112.5	0.0%
Hotwater system	140.0	-	-	140.0	0.0%
Luggage	252.0	-	-	252.0	0.0%
Mattresses	3,139.2	11,556.0	5,491.0	20,186.2	0.6%
Total Audit (kg)	387,988.1	2,690,645.0	247,492.6	3,326,125.7	100.0%

Table 28 shows that about 3.3 million kilograms, or about 3,300 tonnes, of waste were recorded as landfilled during the audit period. Naturally the largest amounts were delivered to the Mugga Lane Landfill.

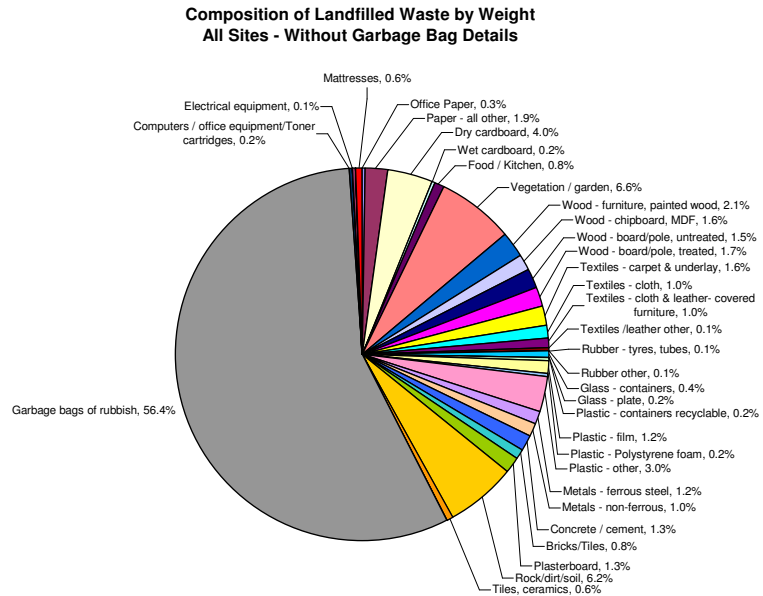


Figure 58 – Composition of Landfilled Waste at All Sites by Weight – Without Garbage Bag Details

The largest proportion of waste being landfilled at all sites was garbage bags of rubbish as shown in Figure 58. This material mostly came from domestic waste vehicles as well as commercial waste delivered in compactor vehicles or in roll-on-roll-off compactors. The composition of the contents of the bags is not known.

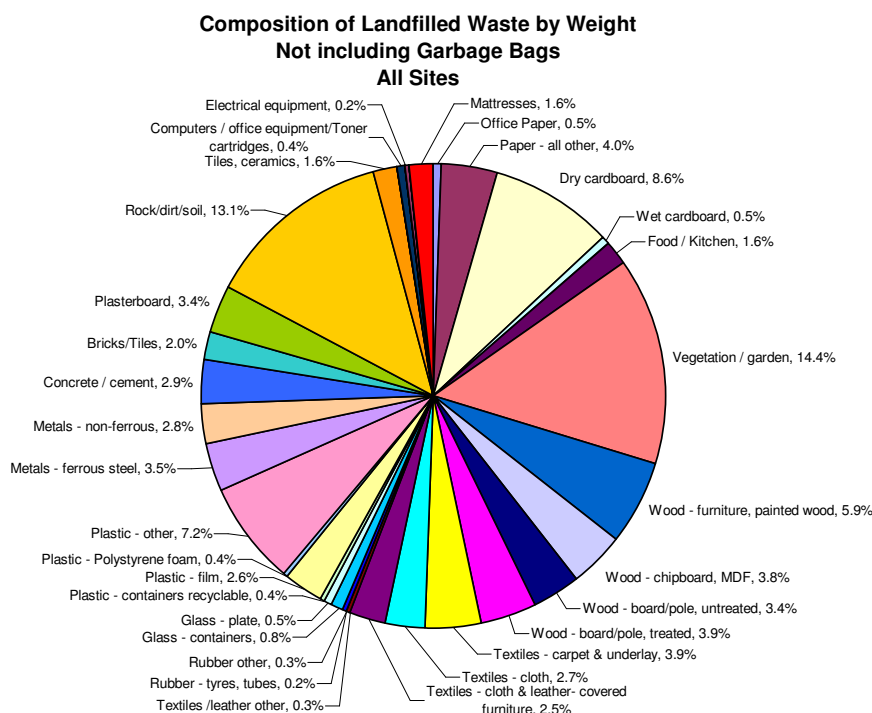


Figure 59 – Composition of Landfilled Waste at All Sites by Weight – Not including Garbage Bags

With the garbage bags removed Figure 59 above shows the composition of the landfilled stream at all sites is composed of large proportions of rock/dirt/soil (13.1%) and vegetation/garden (14.4%). In fact 46.6% of the landfilled stream by weight, not including the garbage bags, is organic - vegetation, kitchen waste, timber and paper.

Table 29 below shows the aggregated composition in kilograms of the waste deposited for landfilling at all sites during the audit period.

Table 29 Aggregated Total Composition of All Sites – Kilograms – Without Garbage Bag Details

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Paper and cardboard	12,164.0	192,225.5	9,661.3	214,050.8	6.4%
Organics	62,584.0	168,851.0	17,379.0	248,814.0	7.5%
Wood and timber products	74,235.5	111,180.0	47,052.9	232,468.4	7.0%
Textiles and rubber	36,500.0	68,932.5	27,933.6	133,366.1	4.0%
Glass	4,696.0	11,260.0	2,579.4	18,535.4	0.6%
Plastics	34,096.3	97,654.0	20,989.2	152,739.5	4.6%
Metals	17,224.6	30,828.0	27,698.3	75,750.9	2.3%
Building material	87,733.0	220,976.0	34,351.0	343,060.0	10.3%

Hazardous ¹⁴	-	-	-	-	0.0%
Bags and loose garbage	50,830.0	1,774,077.0	52,344.6	1,877,251.6	56.4%
E-waste and office equipment	4,393.5	2,765.0	2,012.5	9,171.0	0.3%
Other	3,531.2	11,896.0	5,491.0	20,918.2	0.6%
Total (kg)	387,988.1	2,690,645.0	247,492.6	3,326,125.7	100.0%

This data is shown as percentages in Figure 60 below.

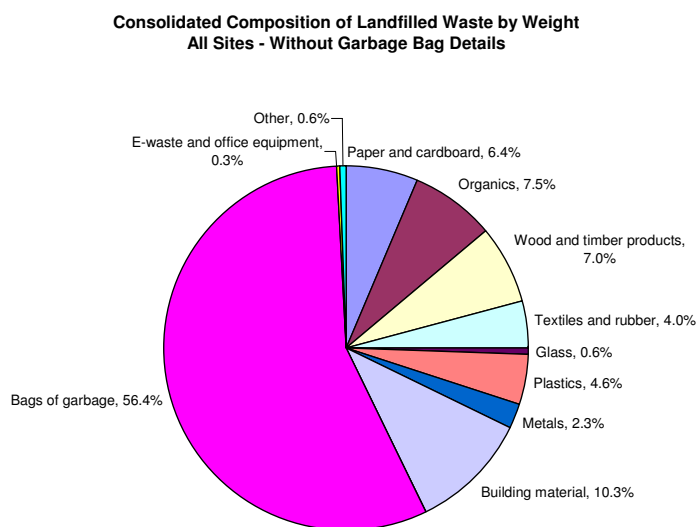
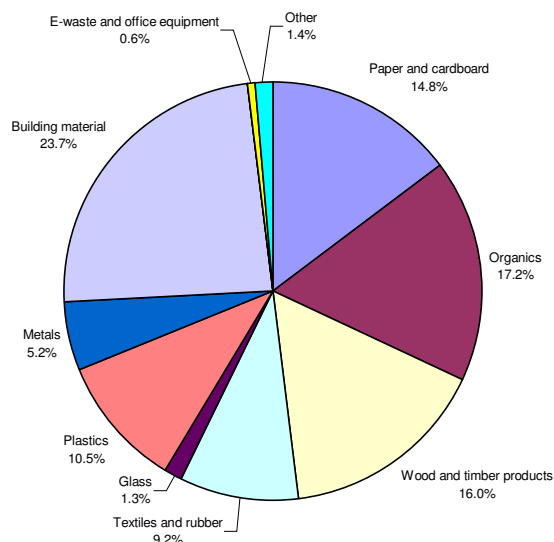


Figure 60 – Consolidated Composition of Landfilled Waste at All Sites by Volume – Without Garbage Bag Details

Figure 60 shows that garbage bags form the largest proportion at 56.4% with paper, cardboard, wood, timber and other organic materials forming a total of 20.9%. The chart below shows the aggregated composition of this stream without the garbage bags.

¹⁴ As no conversion factors are available for hazardous waste and it forms only a small proportion of this stream, no weight values were calculated

**Consolidated Composition of Landfilled Waste by Weight
Not including garbage bags
All Sites**



**Figure 61 – Consolidated Composition of Landfilled Waste at All Sites by Weight
– Not including Garbage Bags**

Figure 61 shows that organic material, (paper and cardboard, organics and wood and timber products) at 48.0%, makes up almost half the landfilled stream by weight when bags of garbage are not included. A further 41.3% is potentially recoverable plastics, glass, metals, building material and electronic items.

Table 30 below shows the quantities of each stream, domestic, C&I and C&D landfilled by volume at each site each day.

Table 30 Quantities Landfilled by Stream by Volume

Stream	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Domestic	1,258,980	3,465,300	1,021,955	5,746,235	42%
C&I	718,690	6,065,500	285,170	7,069,360	52%
C&D	111,850	583,650	82,890	778,390	6%
No Known	20,650	49,500	7,500	77,650	1%
Total (litres)	2,110,170	10,163,950	1,397,515	13,671,635	100%

This data is shown in the two figures below.

**Proportion of Streams Landfilled by Volume
All Sites**

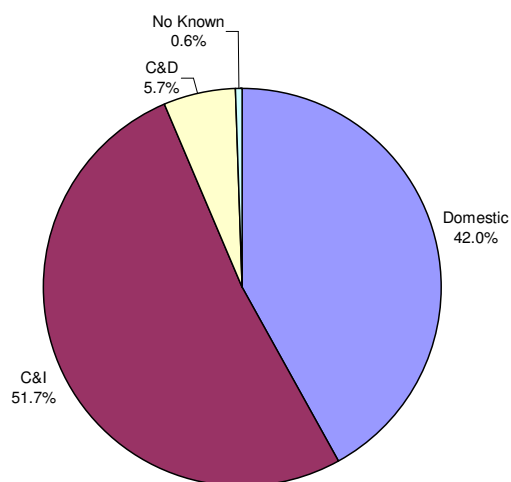


Figure 62 – Proportion of Stream Landfill by Weight at Mugga Lane Landfill

Figure 62 shows the proportion by weight of the different streams landfilled. The proportion of C&I waste is slightly greater than domestic.

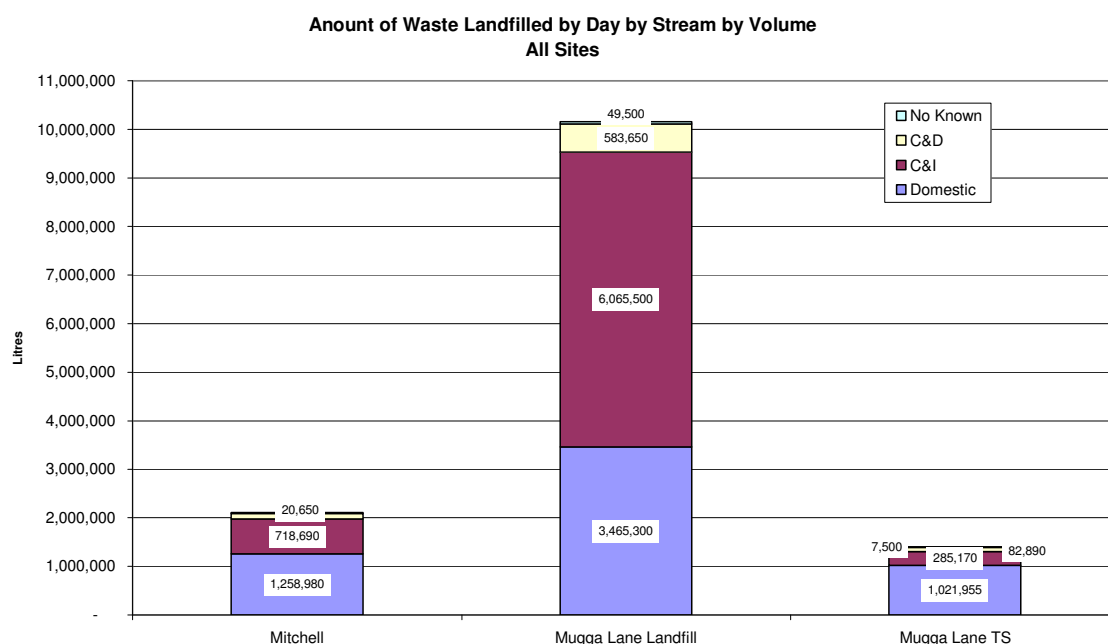


Figure 63 – Amount of Waste Landfilled by Day by Stream and by Weight at Mitchell Transfer Station

Figure 63 shows the composition and volume in litres of waste landfilled each day at all sites for the domestic, C&I and C&D streams. Most waste is deposited at Mugga Lane Landfill, about three times as much as the other two sites combined.

Table 31 below shows the quantities of each stream, domestic, C&I and C&D landfilled by weight at each site each day.

Table 31 Quantities Landfilled by Stream by Weight

Stream	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Domestic	243,818.4	1,009,404.0	180,740.9	1,433,963.3	43.1%
C&I	111,670.2	1,495,213.5	47,175.8	1,654,059.5	49.7%
C&D	29,494.5	174,752.5	18,398.4	222,645.4	6.7%
No Known	3,005.0	11,275.0	1,177.5	15,457.5	0.5%
Total (kg)	387,988.1	2,690,645.0	247,492.6	3,326,125.7	100.0%

This data is shown in the two figures below.

Proportion of Streams Landfilled by Weight
All Sites

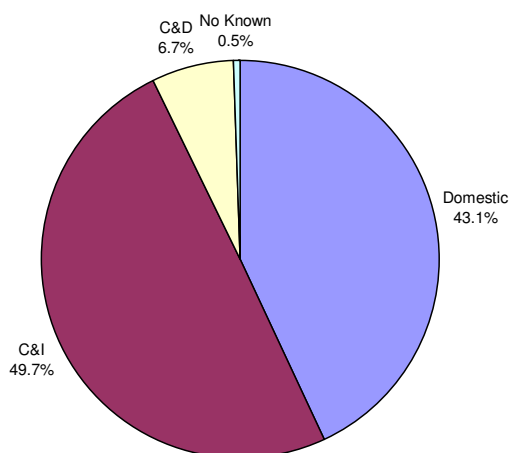


Figure 64 – Proportion of Stream Landfill by Weight at Mugga Lane Landfill

Figure 64 shows the proportion by weight of the different streams landfilled. The proportion of C&I waste is slightly greater than domestic.

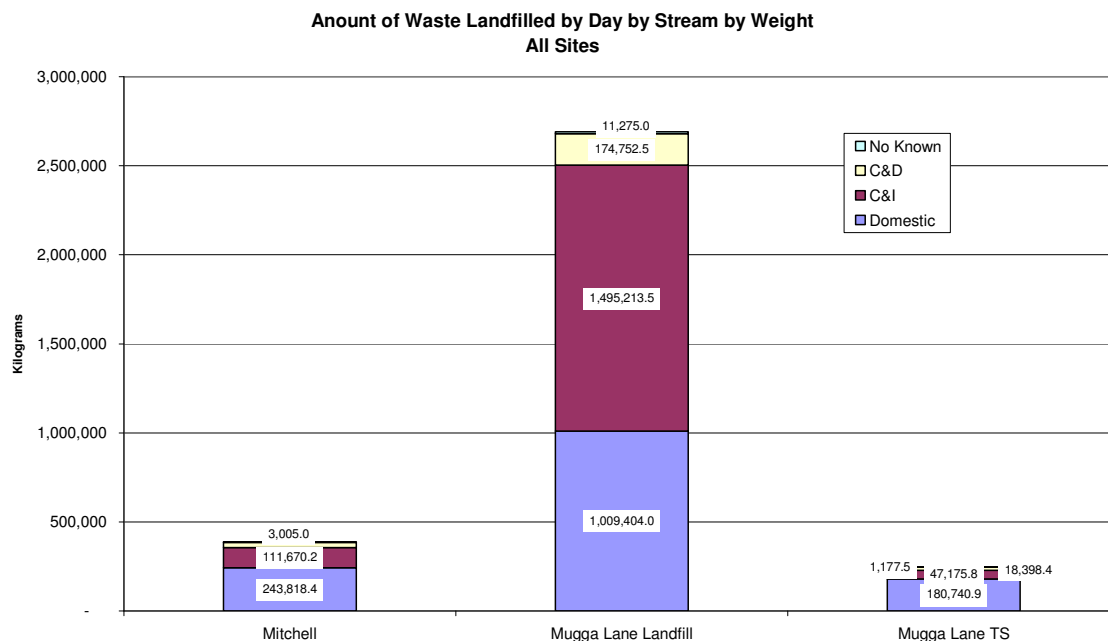


Figure 65 – Amount of Waste Landfilled by Day by Stream and by Weight at Mitchell Transfer Station

Figure 65 shows the composition and volume in litres of waste landfilled each day at all sites for the domestic, C&I and C&D streams. Most waste is deposited at Mugga Lane Landfill, about four times as much as the other two sites combined.

3.5.3 Other Results

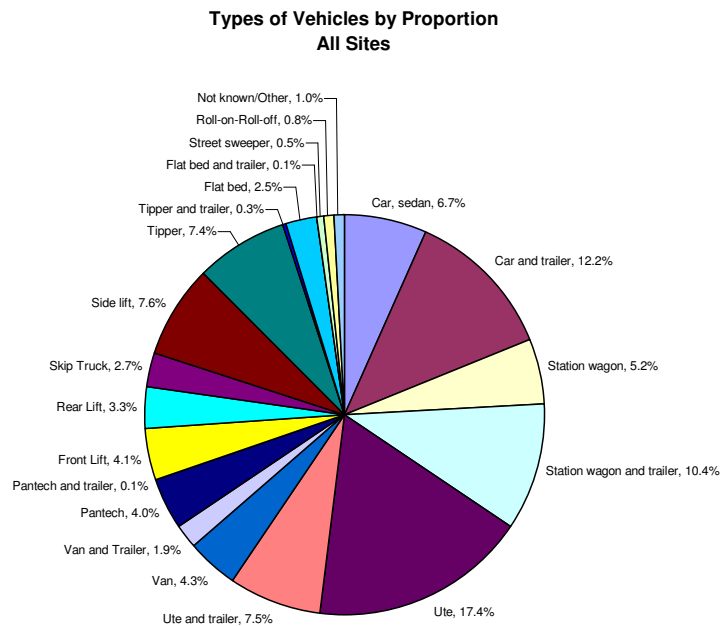


Figure 66 – Types of Vehicles by Proportion at All Sites

Figure 66 shows the proportions of different vehicle types delivering to all facilities. For consistent data recording, auditors were provided with a vehicle identification sheet, a copy of which can be found in Appendix A. The descriptions and classifications of vehicles shown in that document are those used in the charts.

By far the largest proportions of vehicles tipping materials for landfilling at all three sites are small vehicles, chiefly cars with or without trailers (total 18.9%), station wagons with and without trailers (total 15.6%), utes with and without trailers (total 24.9%) and vans with and without trailers (total 6.2%). These vehicles comprise a total of 59.4% of all those bringing loads for landfilling.

Side lift vehicles (7.6%), mostly collecting domestic waste, and tippers (7.4%), mostly collecting C&D waste, form the largest proportions of larger vehicles. There are a small number of side lift vehicles operating commercial services. The proportion of Not known¹⁵ and Other vehicles is quite small at 1.0%. Vehicles tipping landfill waste that could not be classified or were classified as 'other' included a troop carrier, an excavator and a motor cycle.

¹⁵ Vehicles of which the type could not be determined

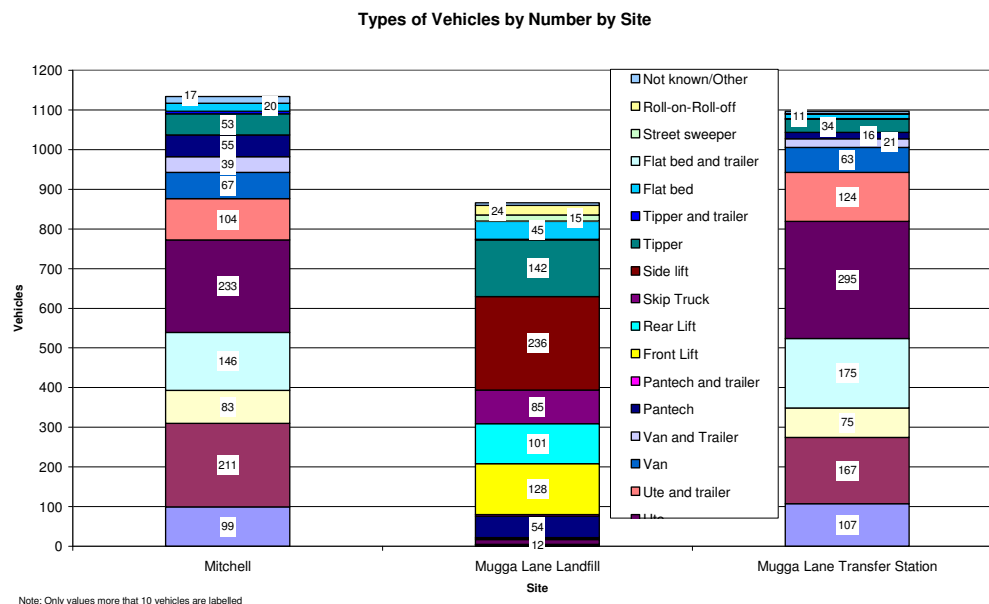


Figure 67 – Types of Vehicles by Number by Site

Figure 67 shows the number of different types vehicles delivering to each site for landfilling waste. The composition of vehicles delivering to the two transfer stations is, not surprisingly, very similar with a predominance of small vehicles. By contrast the composition of vehicles recorded at the landfill is mostly larger vehicles.

**Types of Waste by Proportion of Vehicles
All Sites**

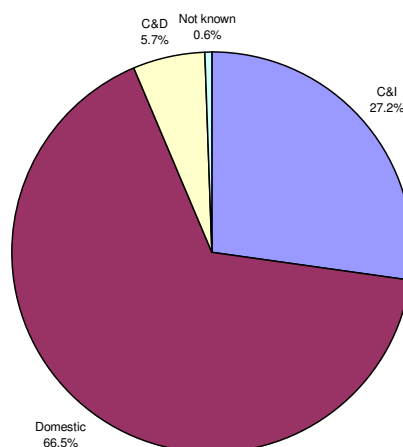


Figure 68 – Types of Waste by Proportion of Vehicles at All Sites

Figure 68 shows the proportion of loads of different types deposited at the landfill. Auditors recorded whether a load was domestic, commercial and industrial (C&I) or construction and demolition (C&D) in origin as best they could from their observations of the type of vehicle and type of waste. Most loads delivered across all sites were domestic at 66.5%.

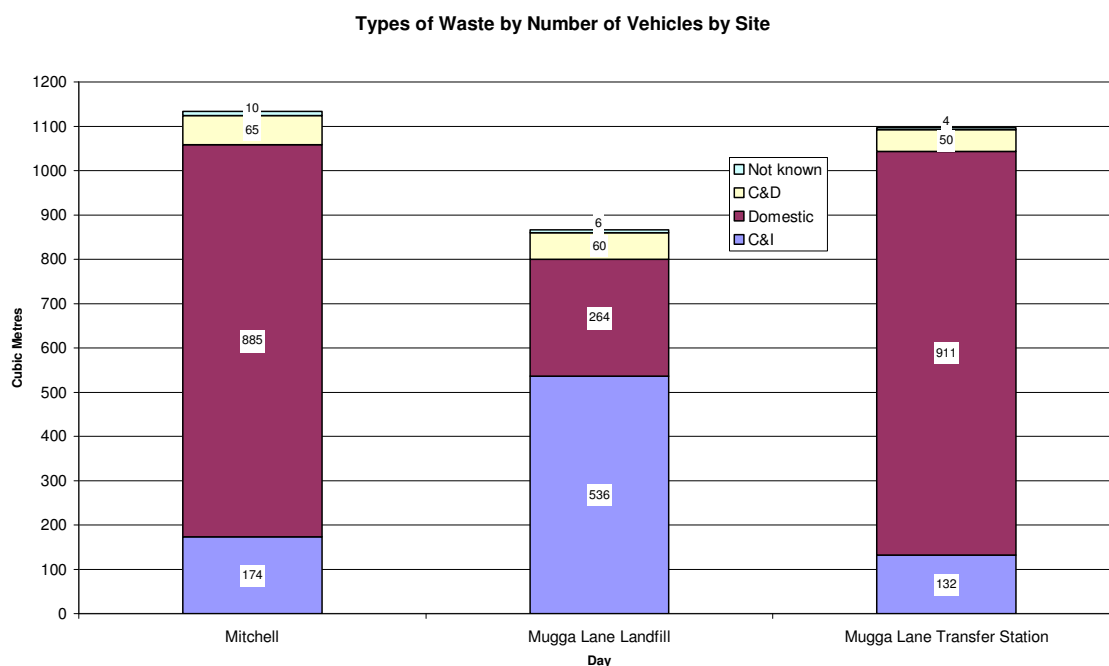


Figure 69 – Types of Waste by Number of Vehicles by Site

Figure 69 shows the number of loads of different types deposited for landfilling at each site during the audit period. Fewer loads were delivered to the landfill than the transfer stations and more of these were C&I. Most of the loads delivered to the transfer stations were domestic.

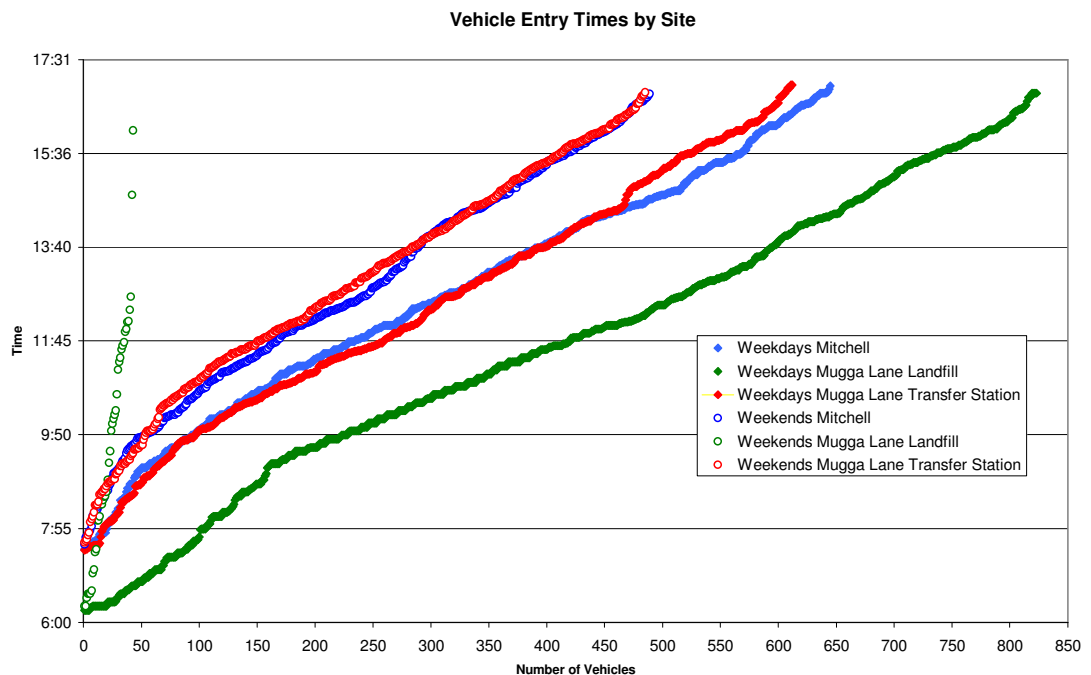


Figure 70 – Vehicle Entry Times by Site

Figure 70 shows the times that vehicles of all types were recorded tipping at each site by weekday and weekend day. The slope of the lines shows the frequency of visits. The steeper the slope, the fewer the visits. The closer together the points are the more frequent the visits. The chart shows, for example, that there were very few vehicles tipping at the landfill on the weekend. In fact only two vehicles tipped at the landfill on the weekend after 12.45 pm.

Regardless of the site or day, vehicles tended to arrive for tipping at similar regular intervals (the slope of all lines, other than landfill weekends, tends to be the same angle). All curves, other than weekend landfill, are also steeper from opening time through to about 9.30-10.15 am. This indicates a lower frequency of deliveries in this period. After this time, the curves become flatter, indicating a greater frequency of deliveries, which remains reasonably constant until closing time.

There are some wobbles along the way, most noticeably in the middle of the day at lunchtime when curves steepen slightly with reduced frequency of deliveries. A flattening of the curve, indicating a sudden increase in delivery frequency as vehicles bring loads in before lunch, sometimes precedes this.

At the end of the day, two behaviours are seen. The first is a flattening of the curve associated with increased frequency of deliveries as loads are brought in just before closing time. This is seen at the Mugga Lane landfill on weekdays. The other is a sudden steepening of the curve as the number of deliveries becomes less frequent in the half hour before closing. This can be seen at Mugga Lane Transfer Station on the weekends and weekdays and at Mitchell Transfer Station on weekdays.

3.6 Plastic Bag Audit Results

A description of the method used for the audit of plastic bags can be found in Section 2.6 and how it is integrated into the landfill audit results is described in Section 2.7.

The tables below shows figures for each site adjusted according to the method described in Section 2.7. The categories are the modified categories as described in Section 2.3 and shown in Table 4.

Table 32 shows the composition of the audited bags originating from Mitchell Transfer Station.

Table 32 Bag Audit Results for Mitchell Transfer Station

Date	1/09/2009	2/09/2009	3/09/2009		
Day	Tuesday	Wednesday	Thursday	Total	Percent
Office paper	-	-	1.5	1.5	0.1%
Newspapers & Magazines	-	2.3	79.7	82.0	4.1%
Other Paper	-	0.8	6.8	7.6	0.4%
Disposable contaminated paper	57.7	45.4	55.9	158.9	7.9%
Corrugated cardboard	-	-	-	-	0.0%
Food/Kitchen	149.0	80.9	107.4	337.3	16.8%
Vegetation/Garden	-	196.6	17.5	214.1	10.7%
Other organic wood timber	-	5.2	1.3	6.5	0.3%
Textiles clothing carpet	36.3	56.4	90.8	183.5	9.1%
Rubber Other	-	2.8	255.7	258.5	12.9%
Glass containers	-	19.4	58.2	77.7	3.9%
Glass Misc / Other	-	-	-	-	0.0%
Plastic containers	2.9	8.9	12.3	24.0	1.2%
Film / Plastic Bags	11.0	74.5	103.2	188.7	9.4%
Polystyrene	81.6	1.9	1.0	84.6	4.2%
Plastic other	-	13.1	105.1	118.3	5.9%
Steel Cans / Packaging	-	-	1.8	1.8	0.1%
Ferrous	-	19.8	6.1	25.9	1.3%
Metals non-ferrous	-	-	3.4	3.4	0.2%
Concrete / cement	-	-	-	-	0.0%
Bricks / Tiles	-	-	-	-	0.0%
Plasterboard	-	-	-	-	0.0%
Soil	-	-	-	-	0.0%

Date	1/09/2009	2/09/2009	3/09/2009		
Asphalt	-	-	-	-	0.0%
E-waste	-	-	4.0	4.0	0.2%
Household appliances big and small	-	-	-	-	0.0%
Nappies	-	3.1	-	3.1	0.2%
Ceramics	-	4.5	4.1	8.6	0.4%
Fibreglass / fibreglass batts	-	-	-	-	0.0%
Residual / other miscellaneous	82.2	47.6	85.9	215.7	10.8%
Total (kg)	420.6	583.2	1,002.0	2,005.7	100.0%

Table 33 shows the composition of the audited bags originating from Mugga Lane Transfer Station.

Table 33 Bag Audit Results for Mugga Lane Transfer Station

Date	1/09/2009	2/09/2009	3/09/2009		
Day	Tuesday	Wednesday	Thursday	Total	Percent
Office paper	23.2	3.3	-	26.5	0.8%
Newspapers & Magazines	34.3	28.9	1.9	65.1	2.1%
Other Paper	17.0	17.4	3.1	37.5	1.2%
Disposable contaminated paper	36.5	35.8	0.9	73.2	2.3%
Corrugated cardboard	6.4	-	-	6.4	0.2%
Food/Kitchen	38.7	166.5	55.2	260.3	8.3%
Vegetation/Garden	4.6	259.9	60.5	325.1	10.4%
Other organic wood timber	13.7	13.3	-	27.0	0.9%
Textiles clothing carpet	309.5	365.3	324.9	999.7	31.9%
Rubber Other	-	-	-	-	0.0%
Glass containers	25.1	80.3	-	105.4	3.4%
Glass Misc / Other	-	-	-	-	0.0%
Plastic containers	13.1	90.7	-	103.8	3.3%
Film / Plastic Bags	49.2	41.4	63.6	154.2	4.9%
Polystyrene	4.3	16.5	-	20.8	0.7%
Plastic other	15.2	27.6	2.8	45.6	1.5%
Steel Cans / Packaging	6.1	8.6	3.4	18.1	0.6%
Ferrous	-	-	-	-	0.0%

Date	1/09/2009	2/09/2009	3/09/2009		
Metals non-ferrous	0.7	26.5	1.4	28.6	0.9%
Concrete / cement	-	-	-	-	0.0%
Bricks /Tiles	-	-	-	-	0.0%
Plasterboard	99.2	-	-	99.2	3.2%
Soil	-	236.4	36.0	272.5	8.7%
Asphalt	-	-	-	-	0.0%
E-waste	-	-	-	-	0.0%
Household appliances big and small	-	-	-	-	0.0%
Nappies	7.4	249.9	-	257.3	8.2%
Ceramics	-	37.5	-	37.5	1.2%
Fibreglass / fibreglass batts	15.3	-	-	15.3	0.5%
Residual / other miscellaneous	19.1	111.8	20.2	151.1	4.8%
Total (kg)	738.6	1,817.6	574.0	3,130.2	100.0%

Table 34 shows the composition of the audited bags delivered directly to Mugga Lane Landfill.

Table 34 Bag Audit Results for Mugga Lane Landfill

Date	1/09/2009	2/09/2009	3/09/2009		
Day	Tuesday	Wednesday	Thursday	Total	Percent
Office paper	27.6	79.7	114.0	221.3	3.9%
Newspapers & Magazines	38.2	21.9	54.3	114.4	2.0%
Other Paper	63.7	38.7	82.8	185.1	3.3%
Disposable contaminated paper	321.3	210.2	302.3	833.8	14.7%
Corrugated cardboard	31.3	24.4	68.0	123.7	2.2%
Food/Kitchen	337.7	290.2	283.4	911.3	16.1%
Vegetation/Garden	17.8	41.0	66.5	125.3	2.2%
Other organic wood timber	1.0	3.2	32.6	36.8	0.7%
Textiles clothing carpet	456.6	363.4	420.8	1,240.9	21.9%
Rubber Other	8.9	14.6	3.4	26.9	0.5%
Glass containers	108.7	122.1	36.8	267.6	4.7%
Glass Misc / Other	10.0	0.8	0.2	11.0	0.2%
Plastic containers	89.2	61.0	54.8	205.0	3.6%

Date	1/09/2009	2/09/2009	3/09/2009		
Film / Plastic Bags	183.5	116.2	181.1	480.8	8.5%
Polystyrene	21.1	11.6	9.7	42.4	0.7%
Plastic other	117.6	31.7	127.2	276.5	4.9%
Steel Cans / Packaging	22.6	15.2	11.8	49.6	0.9%
Ferrous	4.0	1.0	4.0	8.9	0.2%
Metals non-ferrous	11.6	12.4	38.3	62.3	1.1%
Concrete / cement	0.2	-	-	0.2	0.0%
Bricks / Tiles	-	-	-	-	0.0%
Plasterboard	28.4	-	-	28.4	0.5%
Soil	-	-	-	-	0.0%
Asphalt	-	-	-	-	0.0%
E-waste	0.1	-	-	0.1	0.0%
Household appliances big and small	-	-	-	-	0.0%
Nappies	4.5	88.2	35.4	128.1	2.3%
Ceramics	1.2	2.9	4.5	8.6	0.2%
Fibreglass / fibreglass batts	-	-	-	-	0.0%
Residual / other miscellaneous	102.7	62.2	107.6	272.5	4.8%
Total (kg)	2,009.4	1,612.8	2,039.3	5,661.5	100.0%

The proportions of the contents of the bags found at each site were applied to the quantities of bags found at that site during the original landfill audit to arrive at the combined results shown in the following sections.

3.7 Combined Results - Mitchell Transfer Station – With Garbage Bag Details

3.7.1 Volume Results

Table 35 below shows the composition in litres of the waste deposited at Mitchell Transfer Station during the audit period. The figures for Tuesday include those quantities recorded the afternoon of May 5 and the morning of May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 35 Composition of Landfilled Waste at Mitchell Transfer Station by Audit Day – Litres – With Garbage Bag Details

Date	4-May-09	5-May-09 12-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total	Percent
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Office paper	1,353	101	4	102	4	7	161	1,733	0.1%
Newspapers & Magazines	3,276	3,251	4,829	2,750	5,921	5,759	7,338	33,124	1.6%
Other Paper	1,353	547	1,875	802	792	585	271	6,225	0.3%
Disposable contaminated paper	3,572	1,509	4,876	2,291	2,970	3,692	4,489	23,399	1.1%
Corrugated cardboard	23,775	8,230	19,201	15,590	28,879	24,012	50,116	169,803	8.0%
Food/Kitchen	5,617	2,263	8,205	3,358	3,731	6,588	3,045	32,806	1.6%
Vegetation/Garden	82,555	33,103	86,844	76,467	34,804	45,306	53,446	412,524	19.5%
Other organic timber	69,329	23,944	54,916	62,889	47,599	60,685	88,160	407,521	19.3%
Textiles clothing carpet	41,576	22,561	62,265	26,077	50,155	52,038	60,403	315,075	14.9%
Rubber Other	1,010	332	935	2,141	1,270	5,382	3,284	14,355	0.7%
Glass containers	1,077	1,085	1,425	1,031	1,298	963	3,086	9,964	0.5%
Glass Misc / Other	1,579	1,282	1,810	1,646	1,043	1,377	254	8,991	0.4%
Plastic containers	2,028	517	3,501	5,398	7,411	1,155	921	20,931	1.0%
Film / Plastic Bags	10,998	4,375	10,036	6,270	15,847	17,316	21,230	86,072	4.1%
Polystyrene	13,226	3,618	10,829	9,309	17,288	11,085	12,601	77,956	3.7%
Plastic other	27,401	9,015	34,534	20,994	30,763	16,854	32,286	171,848	8.1%
Steel Cans / Packaging	4,379	2,572	448	355	3,702	2,442	23,477	37,375	1.8%
Ferrous	138	60	188	93	135	191	258	1,062	0.1%
Metals non-ferrous	8,124	1,000	2,621	2,774	5,527	4,064	2,193	26,303	1.2%
Concrete / cement	31,611	2,304	2,865	1,956	2,756	3,804	3,501	48,797	2.3%
Bricks / Tiles	7,800	1,950	5,600	6,400	4,650	10,000	5,300	41,700	2.0%
Plasterboard	3,176	4,281	1,406	6,345	5,042	10,476	8,204	38,929	1.8%
Soil	4,335	2,604	2,238	4,379	1,374	3,547	607	19,085	0.9%
Asphalt	-	-	-	-	-	-	-	-	0.0%
E-waste	9,304	1,122	3,556	3,943	5,286	3,560	2,566	29,337	1.4%
Household appliances	-	-	-	-	-	-	-	-	0.0%
Nappies	10	5	13	7	14	24	37	110	0.0%
Ceramics	88	36	122	54	59	56	48	463	0.0%
Fibreglass / fibreglass batts	-	-	-	-	-	-	-	-	0.0%
Residual / other miscellaneous	10,170	12,003	15,920	12,969	11,641	6,100	5,880	74,683	3.5%
Total (litres)	368,860	143,670	341,060	276,390	289,960	297,070	393,160	2,110,170	100.0%

Table 35 shows that about 2.1 million litres, or about 2,100 cubic metres, of waste were recorded as landfilled during the audit period. The largest amounts were delivered on Monday and Sunday.

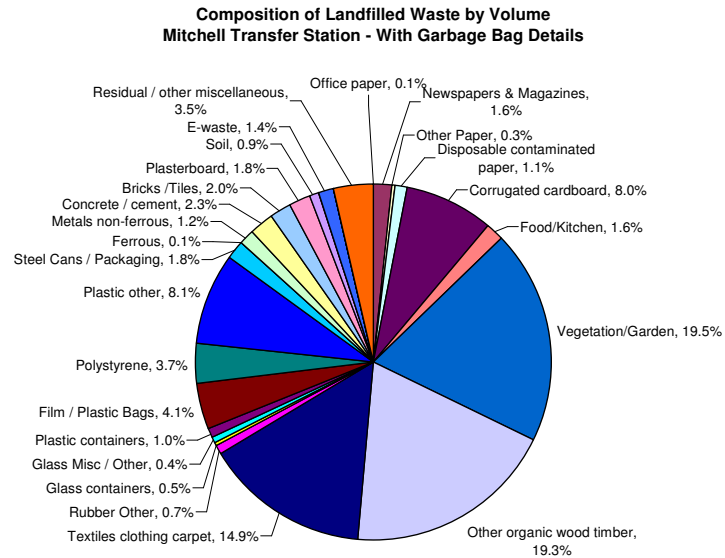


Figure 71 - Composition of Landfilled Waste by Volume at Mitchell Transfer Station – With Garbage Bag Details

Figure 71 shows that a large range of materials were deposited. The largest proportion was vegetation and garden waste at 19.5%, with other organic wood timber (19.3%), textiles clothing and carpet (14.9%) and plastic other (8.1%) the next largest proportions.

Data was aggregated into nine key composition groups. These are shown in Table 36 below with the categories included in each.

Table 36 Composition Groups and Aggregated Categories

Composition Group	Category
Paper and cardboard	Office paper
	Newspapers & Magazines
	Other Paper
	Disposable contaminated paper
	Corrugated cardboard
Organics	Food/Kitchen
	Vegetation/Garden
Wood and timber products	Other organic wood and timber
Textiles and rubber	Textiles clothing carpet
	Rubber Other
Glass	Glass containers
	Glass Misc / Other
Plastics	Plastic containers
	Film / Plastic Bags
	Polystyrene
	Plastic other
Metals	Steel Cans / Packaging
	Ferrous
	Metals non-ferrous
Building material	Concrete / cement
	Bricks / Tiles
	Plasterboard
	Soil
	Asphalt
	Fibreglass / fibreglass batts
E-waste and office equipment	E-waste
	Household appliances big and small

Composition Group	Category
Other	Nappies
	Ceramics
	Residual / other miscellaneous

Table 37 below shows the aggregated composition in cubic metres of the waste deposited at the landfill at Mitchell Transfer Station during the audit period. The figures for Monday and Tuesday include those quantities also recorded on the following Monday May 11 and Tuesday May 12.

Table 37 Aggregated Total Composition of Mitchell Transfer Station Stream – Cubic Metres – With Garbage Bag Details

	4-May-09	5-May-09 12-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Composition Group	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	33.3	13.6	30.8	21.5	38.6	34.1	62.4	234.3	11.1%
Organics	88.2	35.4	95.0	79.8	38.5	51.9	56.5	445.3	21.1%
Wood and timber products	69.3	23.9	54.9	62.9	47.6	60.7	88.2	407.5	19.3%
Textiles and rubber	42.6	22.9	63.2	28.2	51.4	57.4	63.7	329.4	15.6%
Glass	2.7	2.4	3.2	2.7	2.3	2.3	3.3	19.0	0.9%
Plastics	53.7	17.5	58.9	42.0	71.3	46.4	67.0	356.8	16.9%
Metals	12.6	3.6	3.3	3.2	9.4	6.7	25.9	64.7	3.1%
Building material	46.9	11.1	12.1	19.1	13.8	27.8	17.6	148.5	7.0%
E-waste and office equipment	9.3	1.1	3.6	3.9	5.3	3.6	2.6	29.3	1.4%
Other	10.3	12.0	16.1	13.0	11.7	6.2	6.0	75.3	3.6%
Total (cubic metres)	368.9	143.7	341.1	276.4	290.0	297.1	393.2	2,110.2	100.0%

This data is shown as percentages in Figure 72 below.

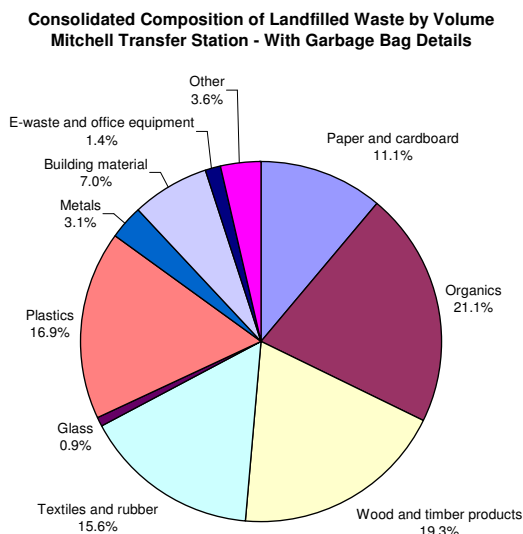


Figure 72 – Consolidated Composition of Landfilled Waste by Volume at Mitchell Transfer Station – With Garbage Bag Details

Figure 72 shows that organic material, paper and cardboard, textiles and rubber, wood and timber and plastics were the largest proportions of this stream. These five categories comprised 84.0% of this stream.

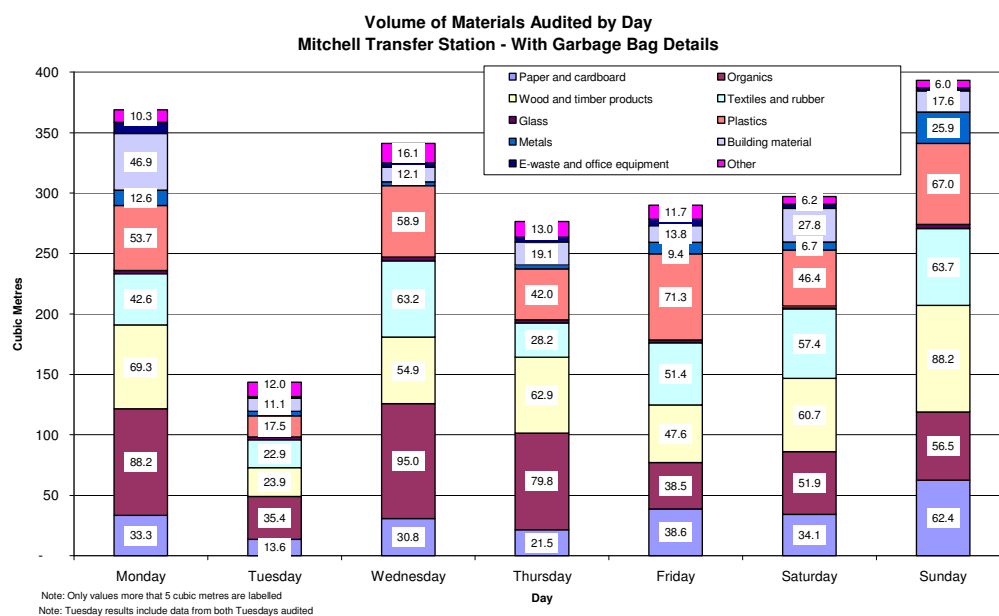


Figure 73 – Volume of Materials Audited by Day at Mitchell Transfer Station – With Garbage Bag Details

Figure 73 shows the volume in cubic metres of the aggregated categories deposited at Mitchell Transfer Station each day of the audit. Apart from Tuesday, the volumes of waste deposited each day are reasonably consistent, between about 300 and 400 cubic metres.

Greater quantities of organics are deposited on Monday, Wednesdays and Thursday, but otherwise the amounts of most materials are relatively consistent across all weekdays, with the exception of Tuesday. It is not immediately obvious why there are such smaller quantities on Tuesday. Later charts show that the number of vehicles delivering on Tuesday is consistent with other others days. An examination of the average load size however, shows that on Tuesday this was 1.2 m³ compared to over 2 m³ on other weekdays (up to 3 m³ on Wednesday).

The quantities of each stream, domestic, C&I and C&D landfilled at Mitchell Transfer Station each day are shown in Table 38.

Table 38 Quantities Landfilled by Stream by Volume – Mitchell Transfer Station

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	200,260	50,420	137,250	114,670	128,900	247,420	380,060	1,258,980	59.7%
C&I	160,400	77,850	183,060	146,370	127,060	13,600	10,350	718,690	34.1%
C&D	-	12,850	13,650	14,550	34,000	36,050	750	111,850	5.3%
Not known ¹⁶	8,200	2,550	7,100	800	-	-	2,000	20,650	1.0%
Total (litres)	368,860	143,670	341,060	276,390	289,960	297,070	393,160	2,110,170	100%

¹⁶ Vehicles for which the stream of origin could not be determined

This data is shown in the two figures below.

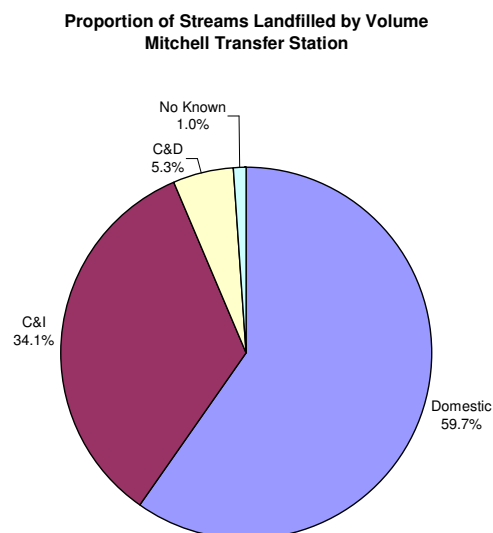


Figure 74 – Proportion of Stream Landfill by Volume at Mitchell Transfer Station

Figure 74 shows the proportion by volume of the different streams landfilled. Domestic waste comprises the largest proportion by far with C&I the next most significant.

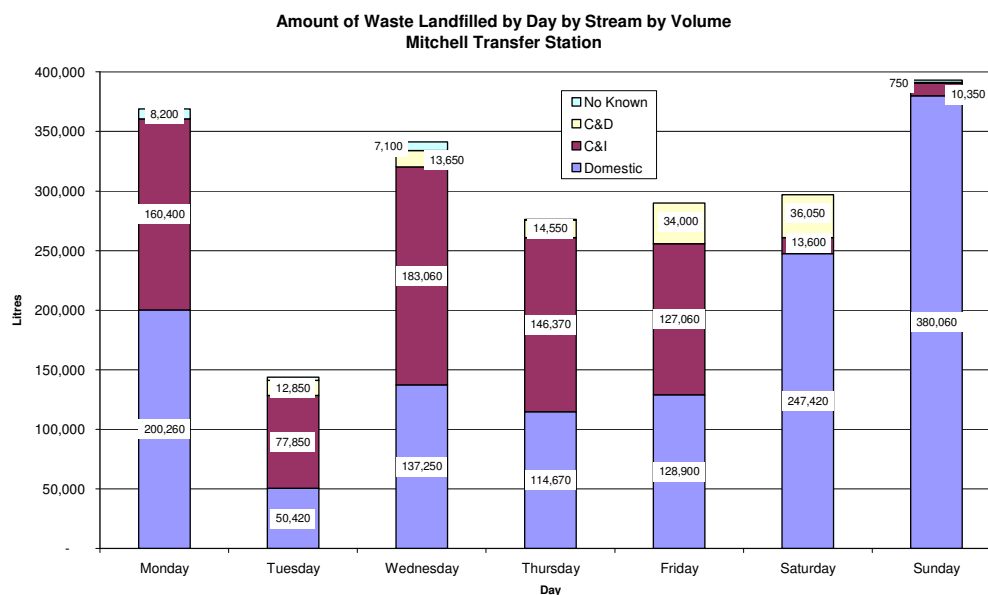


Figure 75 – Amount of Waste Landfilled by Day by Stream and by Volume at Mitchell Transfer Station

Figure 75 shows the composition and volume in litres of waste landfilled each day at for the domestic, C&I and C&D streams. The most waste deposited in a single day was on Sunday with almost 400,000 litres (400 cubic metres). Almost all of this was domestic waste. During the week the proportion of domestic and C&I was closer to half each.

3.7.2 Weight Results

Table 39 below shows the composition in kilograms (to the nearest half kilogram) of the waste deposited at Mitchell Transfer Station during the audit period. These figures were calculated by converting the volume of each material recorded during the audit to weigh using the Resource NSW conversion factors. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 39 Composition of Landfilled Waste at Mitchell Transfer Station by Audit Day – Kilograms (Estimated from Volume) – With Garbage Bag Details

Date	4-May-09	5-May-09 12-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total (Estimated)	Percent (Estimated)
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Office paper	501.4	37.9	2.5	38.4	2.7	4.8	62.8	650.5	0.2%
Newspapers & Magazines	390.1	353.1	566.6	319.3	665.3	692.4	903.6	3,890.5	1.0%
Other Paper	173.9	70.4	240.7	103.4	104.0	80.6	44.4	817.3	0.2%
Disposable contaminated paper	507.8	217.0	690.6	332.2	455.2	605.3	779.6	3,587.8	0.9%
Corrugated cardboard	1,328.8	413.5	1,102.1	962.5	1,536.7	1,247.4	2,686.0	9,277.0	2.4%
Food/Kitchen	2,472.2	1,007.0	3,553.5	1,502.1	1,731.3	2,778.8	1,721.2	14,766.0	3.8%
Vegetation/Garden	12,556.6	5,042.7	13,259.1	11,591.7	5,417.4	7,103.9	8,461.0	63,432.4	16.3%
Other organic wood timber	12,684.7	4,157.3	9,974.6	11,226.1	8,992.9	11,099.3	16,402.8	74,537.6	19.2%
Textiles clothing carpet	5,005.0	2,770.7	7,543.7	3,035.7	6,458.7	6,455.8	7,240.9	38,510.4	9.9%
Rubber Other	401.1	151.2	425.3	662.0	528.9	1,746.7	1,386.4	5,301.5	1.4%
Glass containers	378.6	337.5	503.1	341.2	442.6	386.2	1,025.8	3,415.0	0.9%
Glass Misc / Other	574.9	464.0	660.4	596.4	379.2	498.1	91.7	3,264.6	0.8%
Plastic containers	201.3	57.9	333.3	457.0	625.7	133.7	124.5	1,933.4	0.5%
Film / Plastic Bags	938.7	380.7	929.6	555.5	1,291.6	1,489.1	1,878.1	7,463.2	1.9%
Polystyrene	449.2	132.6	394.4	317.9	587.6	448.6	552.6	2,883.1	0.7%
Plastic other	4,743.1	1,570.8	5,984.2	3,629.9	5,332.6	3,031.6	5,733.3	30,025.3	7.7%
Steel Cans / Packaging	1,241.8	726.6	147.2	109.0	1,046.2	691.4	6,578.0	10,540.2	2.7%
Ferrous	60.7	26.5	82.0	41.2	62.0	90.9	125.8	489.3	0.1%
Metals non-ferrous	2,039.7	253.7	667.2	699.0	1,388.1	1,023.0	555.8	6,626.5	1.7%
Concrete / cement	23,393.8	1,705.9	2,122.6	1,448.7	2,040.4	2,815.4	2,590.5	36,117.3	9.3%
Bricks / Tiles	4,134.0	1,033.5	2,968.0	3,392.0	2,464.5	5,300.0	2,809.0	22,101.0	5.7%
Plasterboard	1,021.1	1,371.7	456.4	2,033.1	1,616.0	3,354.1	2,625.4	12,477.9	3.2%
Soil	4,065.3	2,435.4	2,127.6	4,092.3	1,296.6	3,310.1	565.8	17,893.1	4.6%
Asphalt	-	-	-	-	-	-	-	-	0.0%
E-waste	1,400.0	170.3	539.0	594.8	799.1	545.0	401.6	4,449.9	1.1%
Household appliances	-	-	-	-	-	-	-	-	0.0%
Nappies	3.9	1.8	5.1	3.0	5.6	9.8	15.0	44.2	0.0%
Ceramics	61.2	25.3	84.2	37.7	43.2	44.5	43.9	340.0	0.1%
Fibreglass / fibreglass batts	-	-	-	-	-	-	-	-	0.0%
Residual / other miscellaneous	1,864.7	2,245.5	2,576.9	1,924.0	1,812.5	1,344.8	1,384.8	13,153.2	3.4%
Total Audit (kg)	82,593.5	27,160.5	57,940.0	50,046.0	47,126.7	56,331.1	66,790.3	387,988.1	100.0%

Weighbridge (kg)	33,876.0	21,198.6	27,575.3	27,081.7	31,487.3	33,148.3	24,740.9	199,108.0
Difference¹⁷ (kg)	48,717.5	5,961.9	30,364.7	22,964.3	15,639.4	23,182.8	42,049.4	188,880.1
Percent	244%	128%	210%	185%	150%	170%	270%	195%

The table also shows the corresponding weights recorded at the weighbridge each day, the differences between the weighbridge weights and the converted volume weights and the percent difference. Clearly there are significant differences on most days. Overall the weight converted from volume was about 195% of the weight recorded at the weighbridge.

There are a number of variables that go towards accounting for this:

- ▶ The volumes recorded during the audit are only estimates made by visual observation;
- ▶ The conversion values are averages calculated over hundreds of loads, the original figures for which spanned a range of values; and
- ▶ Most vehicles delivering at this site were small vehicles¹⁸, so no weight was recorded. Instead estimates were made of the weight and there could be significant variation between these estimates and actual load weights.

The formula used to calculate the average weight of small vehicles can be found in Section 2.5.4. The average weights of small loads calculated for Mitchell Transfer Station can be seen in Table 40 below.

Table 40 Estimated Average Small Vehicle Load Weights – Mitchell Transfer Station

Load Size Classification	Estimated Average Weight (kg)
D1 – Small Domestic Load	0.055
D2 – Medium Domestic Load	0.110
D3 – Large Domestic Load	0.165

As a result, at the request of ACT NOWaste, the figures for each category in Table 39 have been adjusted according to the difference between the weight and volume figures so that the weight of the components adds up to the weight recorded at the weighbridge. These adjusted figures are shown in Table 41.

Table 41 Composition by Adjusted Weight – Mitchell Transfer Station

Component	Adjusted Weight
Office paper	333.8

¹⁷ Difference between weighbridge weight and converted audit weight as a percentage of the weighbridge weight

¹⁸ Over the course of the week about 86% of loads were classified as small vehicles at the weighbridge and no weight recorded. This proportion was as high as 98% on the weekends.

Component	Adjusted Weight
Newspapers & Magazines	1,996.5
Other Paper	419.4
Disposable contaminated paper	1,841.2
Corrugated cardboard	4,760.8
Food/Kitchen	7,577.6
Vegetation/Garden	32,552.3
Other organic wood timber	38,251.3
Textiles clothing carpet	19,762.8
Rubber Other	2,720.6
Glass containers	1,752.5
Glass Misc / Other	1,675.3
Plastic containers	992.2
Film / Plastic Bags	3,830.0
Polystyrene	1,479.5
Plastic other	15,408.4
Steel Cans / Packaging	5,409.0
Ferrous	251.1
Metals non-ferrous	3,400.6
Concrete / cement	18,534.7
Bricks / Tiles	11,341.8
Plasterboard	6,403.4
Soil	9,182.4
Asphalt	-
E-waste	2,283.6
Household appliances big and small	-
Nappies	22.7
Ceramics	174.5
Fibreglass / fibreglass batts	-
Residual / other miscellaneous	6,749.9
Total (kg)	199,108.0

The composition of the waste landfilled at Mitchell Transfer Station by weight, converted from volume, is shown in Figure 76.

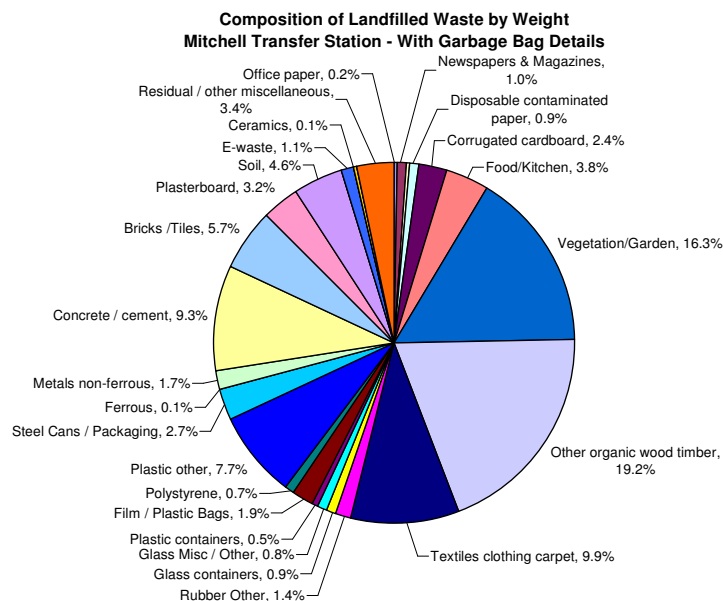


Figure 76 - Composition of Landfilled Waste by Weight at Mitchell Transfer Station – With Garbage Bag Details

Figure 76 shows that the largest proportion of material by weight was other organic wood timber at 19.2%, with vegetation/garden (16.3%), textiles and carpets (9.9%) and concrete and cement (9.3%) the next largest proportions.

Table 42 below shows the aggregated composition in kilograms, converted from litres, of the waste deposited at the landfill at Mitchell Transfer Station during the audit period. Details of the original categories included in aggregated composition groups can be found in Table 36. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12.

Table 42 Aggregated Total Composition of Mitchell Transfer Station Stream – Kilograms – With Garbage Bag Details

	4-May-09	5-May-09 12-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Composition Group	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	2,902	1,092	2,602	1,756	2,764	2,630	4,476	18,223.2	4.7%
Organics	15,029	6,050	16,813	13,094	7,149	9,883	10,182	78,198.4	20.2%
Wood and timber products	12,685	4,157	9,975	11,226	8,993	11,099	16,403	74,537.6	19.2%
Textiles and rubber	5,406	2,922	7,969	3,698	6,988	8,202	8,627	43,811.9	11.3%
Glass	953	801	1,164	938	822	884	1,118	6,679.6	1.7%
Plastics	6,332	2,142	7,641	4,960	7,837	5,103	8,289	42,305.0	10.9%
Metals	3,342	1,007	896	849	2,496	1,805	7,260	17,655.9	4.6%
Building material	32,614	6,547	7,675	10,966	7,418	14,780	8,591	88,589.3	22.8%
E-waste and office equipment	1,400	170	539	595	799	545	402	4,449.9	1.1%
Other	1,930	2,273	2,666	1,965	1,861	1,399	1,444	13,537.3	3.5%
Total (kg)	82,593.5	27,160.5	57,940.0	50,046.0	47,126.7	56,331.1	66,790.3	387,988.1	100.0%

This data is shown as percentages in Figure 77 below.

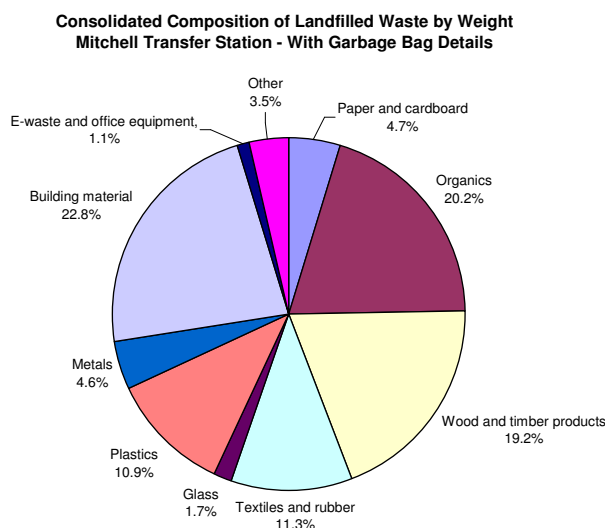


Figure 77 – Consolidated Composition of Landfilled Waste by Weight at Mitchell Transfer Station – With Garbage Bag Details

Figure 77 shows that organics, wood and timber, textiles and rubber, plastics and building materials, were the largest proportions of this stream. These four categories

comprised at total of totalled 84.4% of this stream. Depending on available and viable systems and markets, 96.5% of this stream may be recoverable.

Table 43 below shows these figures projected to yearly and apportioned based on a total of 205,000 tonnes.

Table 43 Composition of Average Daily and Projected Quantities Apportioned by Annual Amounts – With Garbage Bag Details

Tonnes	Average Daily (t)	Projected Annual (t)¹⁹	Projected Annual Based on 205,000 tonnes per year
Paper and cardboard	2.6	950	9,629
Organics	11.2	4,077	41,317
Wood and timber products	10.6	3,887	39,383
Textiles and rubber	6.3	2,284	23,149
Glass	1.0	348	3,529
Plastics	6.0	2,206	22,353
Metals	2.5	921	9,329
Building material	12.7	4,619	46,808
E-waste and office equipment	0.6	232	2,351
Other	1.9	706	7,153
Total	55.4	20,231	205,000

Table 44 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mitchell Transfer Station each day.

Table 44 Quantities Landfilled by Stream by Weight – Mitchell Transfer Station

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	55,603	10,429	23,361	23,723	20,838	44,945	64,920	243,818	62.8%
C&I	25,541	13,979	27,866	21,731	19,208	1,834	1,512	111,670	28.8%
C&D	-	2,437	5,790	4,457	7,081	9,552	178	29,495	7.6%
Not known ²⁰	1,450	316	923	136	-	-	180	3,005	0.8%
Total (kg)	82,594	27,161	57,940	50,046	47,127	56,331	66,790	387,988	100%

This data is shown in the two figures below.

¹⁹ Average daily amounts multiplied by 365

²⁰ Vehicles for which the stream of origin was Not known

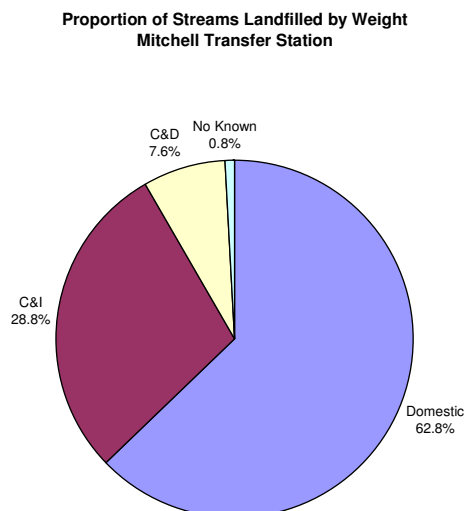


Figure 78 – Proportion of Stream Landfill by Weight at Mitchell Transfer Station

Figure 78 shows the proportion by weight of the different streams landfilled. Domestic waste comprises the largest proportion by far with C&I the next most significant.

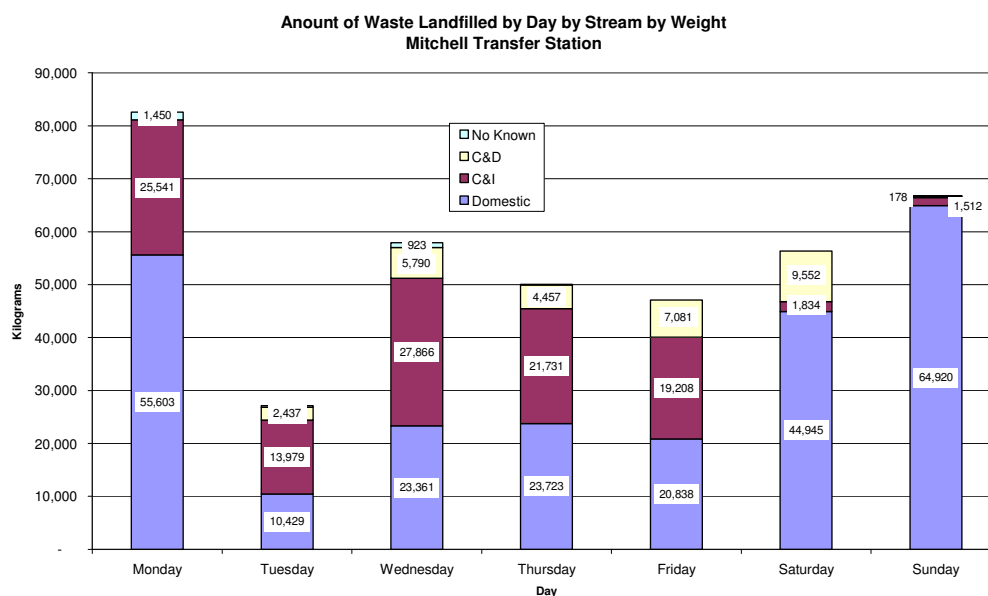


Figure 79 – Amount of Waste Landfilled by Day by Stream and by Weight at Mitchell Transfer Station

Figure 79 shows the composition and weight in kilograms of waste landfilled each day at for the domestic, C&I and C&D streams. The most waste deposited in a single day was on Monday with more than 80,000 kg (80 tonnes). The composition of the waste deposited on Saturday, Sunday and Monday was most similar, with higher proportions

of domestic waste. On the other week days the proportion of domestic and C&I was closer to half each.

Table 45 below shows the average daily amounts by stream and the projected annual amounts and the apportioned amounts based on a total annual amount of 215,000 tonnes.

Table 45 Projected Quantities by Stream – Mitchell Transfer Station – Apportioned by Annual Amounts

Stream	Total Tonnes	Average Daily (t)	Projected Annual Estimate (t)	Projected annual estimate based on expected annual amount of 215,000 t
Domestic	243.8	34.8	12,713	135,110
C&I	111.7	16.0	5,823	61,881
C&D	29.5	4.2	1,538	16,344
Not known ²¹	3.0	0.4	157	1,665
Total	388.0	55.4	20,231	215,000

Proportion of Streams Landfilled by Weighbridge Weight Mitchell Transfer Station

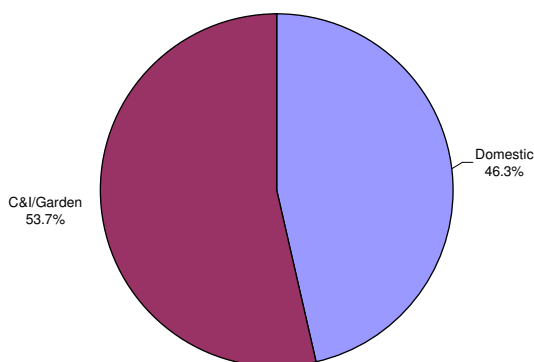


Figure 80 - Proportion of Streams Landfilled by Weighbridge Weight - Mitchell Transfer Station

Figure 80 shows the proportion of C&I/Garden waste and domestic waste disposed of through Mitchell Transfer Station. This data shows that according to weighbridge data, most waste (53.7%) is C&I /Garden waste.

²¹ Vehicles for which the stream of origin could not be determined

3.8 Combined Results - Mugga Lane Landfill – With Garbage Bag Details

3.8.1 Volume Results

Table 46 below shows the composition in litres of the waste deposited at the landfill at Mugga Lane during the audit period. The figures for Monday and Tuesday include quantities recorded on the afternoon of May 5 and 6 and the morning of May 11 and May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 46 Composition of Landfilled Waste at Mugga Lane Landfill by Audit Day – Litres – With Garbage Bag Details

Date	4-May-09 11-May-09	5-May-09 12-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Office paper	11,723	12,104	12,680	16,052	9,528	2,000	-	64,088	0.6%
Newspapers & Magazines	73,666	40,946	75,420	109,911	38,253	7,153	5,273	350,620	3.4%
Other Paper	65,549	70,084	47,260	50,849	52,510	11,581	4,278	302,112	3.0%
Disposable contaminated paper	193,905	213,651	151,126	164,954	169,903	21,715	8,022	923,274	9.1%
Corrugated cardboard	156,715	146,993	282,087	269,966	193,090	47,895	19,070	1,115,817	11.0%
Food/Kitchen	211,276	203,610	126,580	136,786	139,872	50,662	23,259	892,045	8.8%
Vegetation/Garden	203,743	257,958	173,257	252,107	164,235	24,788	4,724	1,080,812	10.6%
Other organic wood timber	94,006	148,769	128,296	88,484	108,461	20,810	2,668	591,495	5.8%
Textiles clothing carpet	279,587	298,628	176,127	241,201	262,838	17,585	4,833	1,280,799	12.6%
Rubber Other	2,508	1,747	1,328	6,179	3,518	-	-	15,281	0.2%
Glass containers	31,140	30,444	30,926	34,648	24,863	6,265	5,576	163,862	1.6%
Glass Misc / Other	3,788	3,874	1,819	5,918	1,988	704	260	18,352	0.2%
Plastic containers	66,479	74,580	54,021	65,783	63,676	8,143	3,008	335,690	3.3%
Film / Plastic Bags	251,717	279,265	182,071	213,531	200,555	48,754	11,768	1,187,661	11.7%
Polystyrene	60,713	73,640	39,635	63,252	49,837	15,738	2,674	305,490	3.0%
Plastic other	68,190	84,038	88,094	74,127	69,976	6,545	2,494	393,464	3.9%
Steel Cans / Packaging	18,746	21,189	8,420	25,397	9,993	2,551	573	86,868	0.9%
Ferrous	2,617	2,705	1,721	1,817	1,883	646	239	11,627	0.1%
Metals non-ferrous	7,509	12,608	16,757	21,198	33,626	1,013	874	93,586	0.9%
Concrete / cement	330	333	203	2,211	4,219	348	36	7,680	0.1%
Bricks / Tiles	14,000	2,000	4,000	6,100	2,000	-	-	28,100	0.3%
Plasterboard	12,555	19,776	9,018	10,199	28,539	2,679	251	83,016	0.8%
Soil	54,515	19,042	34,446	24,139	62,639	18,706	446	213,934	2.1%
Asphalt	-	-	-	-	-	-	-	-	0.0%
E-waste	501	2,501	2,001	9,601	6,001	-	-	20,606	0.2%
Household appliances	-	-	-	-	-	-	-	-	0.0%
Nappies	8,125	9,412	7,154	7,966	8,176	-	-	40,834	0.4%
Ceramics	2,509	2,562	1,593	1,669	1,732	683	252	11,000	0.1%
Fibreglass / batts	-	-	-	-	-	-	-	-	0.0%
Residual / other miscellaneous	140,837	116,540	83,009	79,103	87,138	29,037	10,172	545,837	5.4%
Total (litres)	2,036,950	2,149,000	1,739,050	1,983,150	1,799,050	346,000	110,750	10,163,950	100.0%

The table shows that about 10.2 million litres, or about 10,200 cubic metres, of waste were recorded as landfilled during the audit period. The largest amounts were delivered on Monday and Tuesday. This composition is shown in Figure 81 below.

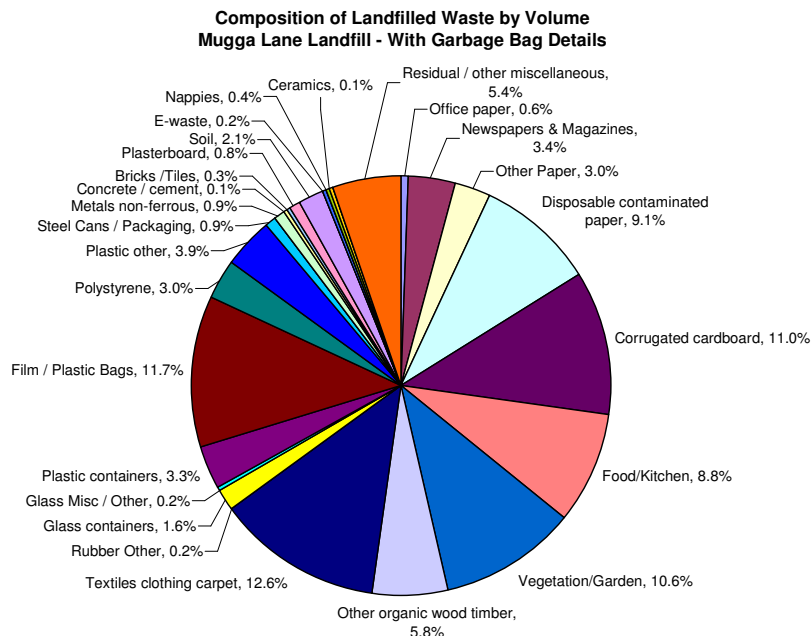


Figure 81 –Composition of Landfilled Waste by Volume at Mugga Lane Landfill – With Garbage Bag Details

Figure 81 shows that several materials formed significant proportions of waste being landfilled including textiles clothing and carpet (12.6%), film and plastic bags (11.7%), corrugated cardboard (11.0%), vegetation and garden waste (10.6%), disposable and contaminated paper (9.1%) and food and kitchen waste (8.8%).

Table 47 below shows the aggregated composition in cubic metres of the waste deposited at the landfill at Mugga Lane during the audit period. Details of the original categories included in aggregated composition groups can be found in Table 36. The figures for Monday and Tuesday include those quantities also recorded on the following Monday May 11 and Tuesday May 12.

Table 47 Aggregated Total Composition of Mugga Lane Landfill Stream – Cubic Metres – With Garbage Bag Details

	4-May-09 11-May-09	5-May-09 12-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Composition Groups	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	501.6	483.8	568.6	611.7	463.3	90.3	36.6	2,755.9	27.1%
Organics	415.0	461.6	299.8	388.9	304.1	75.4	28.0	1,972.9	19.4%
Wood and timber products	94.0	148.8	128.3	88.5	108.5	20.8	2.7	591.5	5.8%
Textiles and rubber	282.1	300.4	177.5	247.4	266.4	17.6	4.8	1,296.1	12.8%
Glass	34.9	34.3	32.7	40.6	26.9	7.0	5.8	182.2	1.8%
Plastics	447.1	511.5	363.8	416.7	384.0	79.2	19.9	2,222.3	21.9%
Metals	28.9	36.5	26.9	48.4	45.5	4.2	1.7	192.1	1.9%
Building material	81.4	41.2	47.7	42.6	97.4	21.7	0.7	332.7	3.3%
E-waste/office equipment	0.5	2.5	2.0	9.6	6.0	-	-	20.6	0.2%
Other	151.5	128.5	91.8	88.7	97.0	29.7	10.4	597.7	5.9%
Total (cubic metres)	2,037.0	2,149.0	1,739.1	1,983.2	1,799.1	346.0	110.8	10,164.0	100.0%

This data is shown as percentages in Figure 82 below.

**Consolidated Composition of Landfilled Waste by Volume
Mugga Lane Landfill - With Garbage Bag Details**

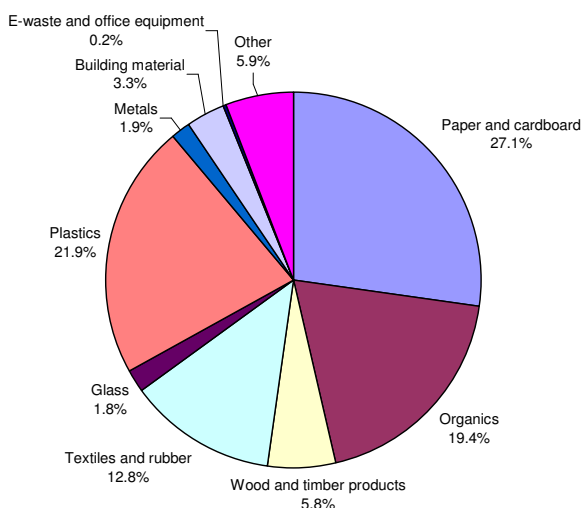


Figure 82 –Composition of Landfilled Waste by Volume at Mugga Lane Landfill – With Garbage Bag Details

Figure 82 shows that paper and cardboard form the largest proportion at 27.1%, with plastics (21.9%) and organics (19.4%) also forming significant proportions.

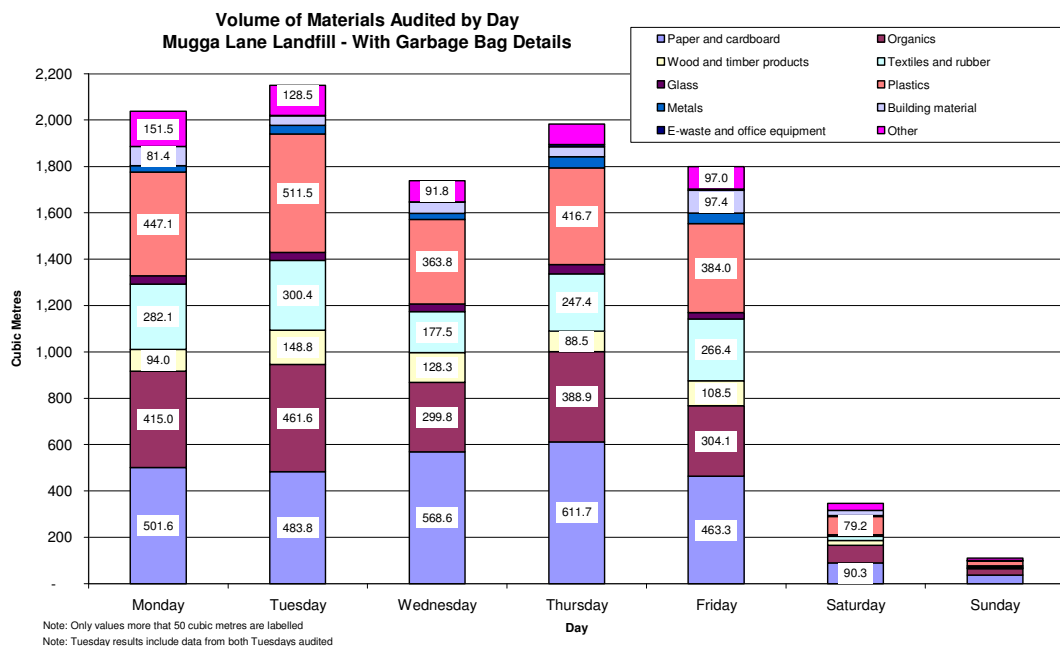


Figure 83 – Volume of Materials Audited by Day at Mugga Lane Landfill – With Garbage Bag Details

The volume in cubic metres of the aggregated categories deposited at the landfill each day of the audit is shown in Figure 83. Clearly most waste is deposited on weekdays and most of this is paper and cardboard and plastics, mainly from domestic collections and large-scale commercial collections.

Apart from greater quantities of cardboard deposited on Wednesdays and Thursday, the amounts of other materials are relatively consistent across all weekdays. The volumes of waste deposited each week day are reasonably consistent, between about 1750 and about 2200 cubic metres.

Table 48 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mugga Lane Landfill each day.

Table 48 Quantities Landfilled by Stream by Volume – Mugga Lane Landfill

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	689,050	783,000	605,750	673,500	703,000	11,000	-	3,465,300	34.1%
C&I	1,211,900	1,224,000	1,044,700	1,175,850	981,300	317,000	110,750	6,065,500	59.7%
C&D	110,000	125,500	88,600	133,800	107,750	18,000	-	583,650	5.7%
Not known ²²	26,000	16,500	-	-	7,000	-	-	49,500	0.5%
Total (litres)	2,036,950	2,149,000	1,739,050	1,983,150	1,799,050	346,000	110,750	10,163,950	100%

This data is shown in the two figures below.

**Proportion of Streams Landfilled by Volume
Mugga Lane Landfill**

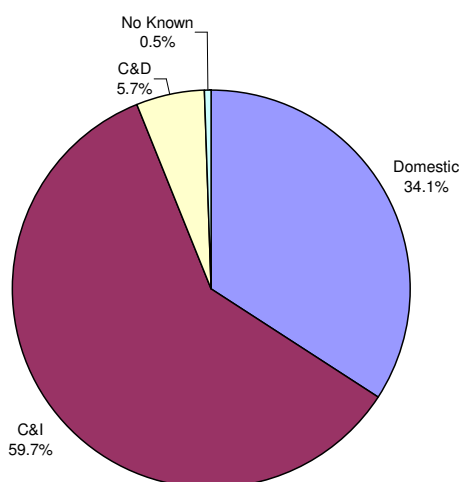


Figure 84 – Proportion of Stream Landfill by Volume at Mugga Lane Landfill

Figure 84 shows the proportion by volume of the different streams landfilled. C&I waste comprises the largest proportion by far with domestic the next most significant.

²² Vehicles for which the stream of origin could not be determined

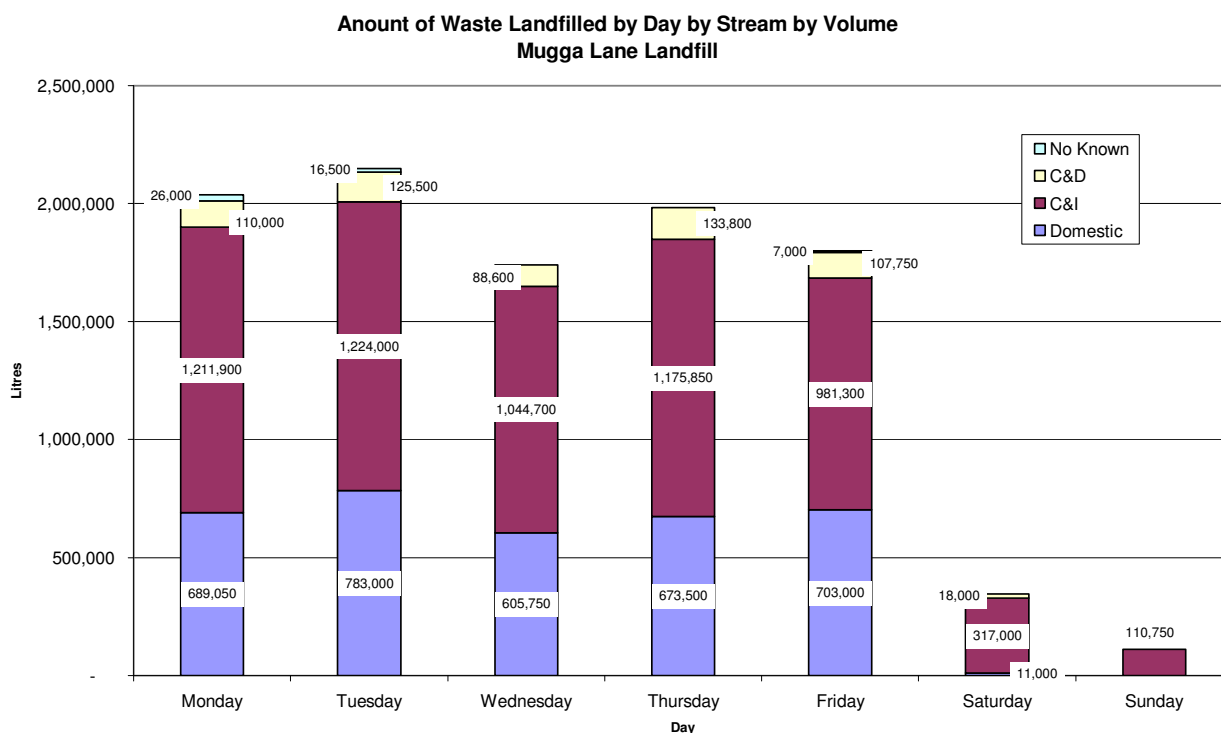


Figure 85 – Amount of Waste Landfilled by Day by Stream and by Volume at Mugga Lane Landfill

Figure 85 shows the composition and volume in litres of waste landfilled each day at for the domestic, C&I and C&D streams. The quantities and composition of waste were essentially similar on each week day with only very small quantities deposited on the weekend.

3.8.2 Weight Results

Table 49 below shows the composition in kilograms (to the nearest half kilogram) of the waste deposited at Mugga Lane Landfill during the audit period. These figures were calculated by converting the volume of each material recorded during the audit to weigh using the Resource NSW conversion factors. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 49 Composition of Landfilled Waste at Mugga Lane Landfill by Audit Day – Kilograms (Estimated from Volume) – With Garbage Bag Details

Date	4-May-09 11-May-09	5-May-09 12-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total (Est)	Percent (Est)
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Office paper	8,454	9,330	8,395	10,144	7,762	760	-	44,843.6	1.7%
Newspapers & Magazines	16,158	8,187	23,106	36,098	8,037	1,446	1,406	94,438.5	3.5%
Other Paper	12,078	13,334	9,131	9,976	10,151	1,832	686	57,188.1	2.1%
Disposable contaminated paper	38,766	43,886	31,472	34,815	35,506	3,444	1,290	189,178.5	7.0%
Corrugated cardboard	20,850	18,163	37,503	36,034	23,286	7,617	3,974	147,427.5	5.5%
Food/Kitchen	112,809	115,558	73,517	79,930	80,556	25,116	10,895	498,381.2	18.5%
Vegetation/Garden	38,834	49,298	32,489	48,439	32,699	4,922	1,143	207,824.1	7.7%
Other organic wood timber	19,094	30,516	27,809	20,032	22,477	4,205	922	125,056.5	4.6%
Textiles clothing carpet	69,217	72,744	45,508	59,305	62,511	3,688	1,013	313,986.2	11.7%
Rubber Other	1,149	1,041	792	2,111	1,429	-	-	6,521.3	0.2%
Glass containers	15,831	16,723	14,476	16,184	13,482	2,449	1,828	80,972.5	3.0%
Glass Misc / Other	1,987	2,093	1,105	2,622	1,197	388	146	9,538.3	0.4%
Plastic containers	10,532	11,980	8,925	10,514	10,739	1,106	414	54,210.3	2.0%
Film / Plastic Bags	33,845	39,939	24,771	29,910	28,374	6,716	1,383	164,938.2	6.1%
Polystyrene	3,235	3,890	2,324	3,402	2,773	831	132	16,587.5	0.6%
Plastic other	20,649	23,812	26,794	22,551	19,442	1,905	772	115,924.9	4.3%
Steel Cans / Packaging	7,032	7,973	3,723	8,630	4,301	988	265	32,912.0	1.2%
Ferrous	1,325	1,412	899	962	975	317	119	6,009.3	0.2%
Metals non-ferrous	3,561	5,369	5,502	7,050	10,166	394	368	32,409.7	1.2%
Concrete / cement	363	377	226	1,718	3,200	294	41	6,218.9	0.2%
Bricks / Tiles	7,420	1,060	2,120	3,183	1,060	-	-	14,843.0	0.6%
Plasterboard	4,876	7,314	3,570	3,784	9,891	725	122	30,281.3	1.1%
Soil	51,048	19,793	33,327	23,435	59,572	18,050	665	205,890.0	7.7%
Asphalt	-	-	-	-	-	-	-	-	0.0%
E-waste	27	277	302	1,367	802	-	-	2,774.5	0.1%
Household appliances	-	-	-	-	-	-	-	-	0.0%
Nappies	4,235	4,962	3,772	4,235	4,331	-	-	21,534.3	0.8%
Ceramics	2,111	2,223	1,382	1,467	1,484	562	210	9,439.9	0.4%
Fibreglass / fibreglass batts	-	-	-	-	-	-	-	-	0.0%
Residual / other miscellaneous	50,332	45,107	29,250	30,993	31,654	10,207	3,773	201,314.8	7.5%
Total Audit (kg)	555,821.5	556,362.5	452,187.5	508,889.5	487,856.5	97,962.5	31,565.0	2,690,645.0	100.0%
Weighbridge (kg)	712,102.9	681,307.2	544,687.1	616,075.0	586,197.2	174,683.6	35,080.0	3,350,133.1	
Difference (kg)	- 156,281.4	- 124,944.7	- 92,499.6	- 107,185.5	- 98,340.7	- 76,721.1	- 3,515.0	- 659,488.1	
Percent	78%	82%	83%	83%	83%	56%	90%	80%	

The table also shows the corresponding weights recorded at the weighbridge each day, the differences between the weighbridge weights and the converted volume weights and the percent difference. The differences are consistent on most days. Overall the weight converted from volume was about 80% of the weight recorded at the weighbridge.

There are a number of variables that go towards accounting for this:

- ▶ The volumes recorded during the audit are only estimates may by visual observation; and
- ▶ The conversion values are averages calculated over hundreds of loads, the original figures for which spanned a range of values.

As a result, at the request of ACT NOWaste, the figures for each category in Table 49 have been adjusted according to the difference between the weight and volume figures so that the weight of the components adds up to the weight recorded at the weighbridge. These adjusted figures are shown in Table 50.

Table 50 Composition by Adjusted Weight – Mugga Lane Landfill – With Garbage Bag Details

Component	Adjusted Weight
Office paper	58,855.2
Newspapers & Magazines	120,883.7
Other Paper	69,311.8
Disposable contaminated paper	237,486.4
Corrugated cardboard	192,747.7
Food/Kitchen	583,610.2
Vegetation/Garden	263,187.3
Other organic wood timber	162,436.9
Textiles clothing carpet	403,614.0
Rubber Other	8,558.9
Glass containers	100,349.0
Glass Misc / Other	11,300.3
Plastic containers	67,681.0
Film / Plastic Bags	205,735.7
Polystyrene	20,668.1
Plastic other	148,696.8
Steel Cans / Packaging	40,975.0
Ferrous	6,894.0
Metals non-ferrous	41,300.9
Concrete / cement	7,819.9
Bricks / Tiles	19,480.8
Plasterboard	38,724.7

Component	Adjusted Weight
Soil	264,655.1
Asphalt	-
E-waste	3,641.3
Household appliances big and small	-
Nappies	28,262.9
Ceramics	10,627.6
Fibreglass / fibreglass batts	-
Residual / other miscellaneous	232,627.8
Total (kg)	3,350,133.1

The composition of the waste landfilled at Mugga Lane Landfill by weight, converted from volume, is shown in Figure 86.

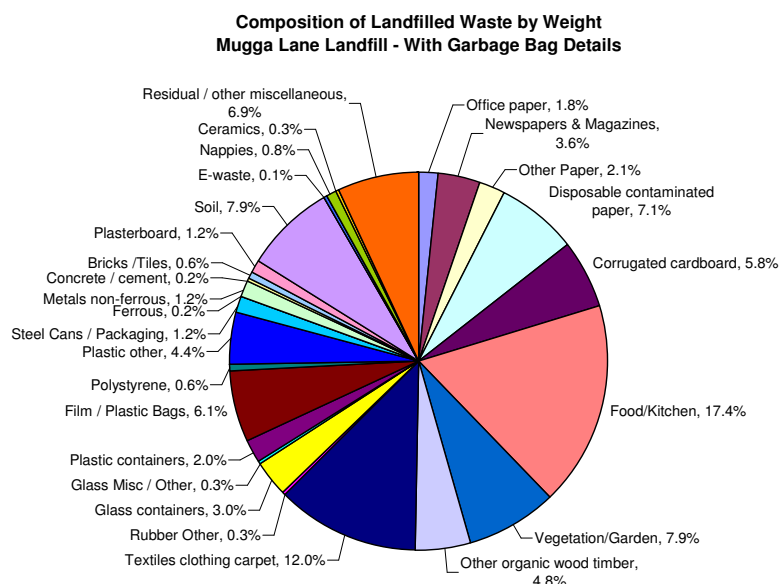


Figure 86 - Composition of Landfilled Waste by Weight at Mugga Lane Landfill – With Garbage Bag Details

Figure 86 shows that the largest proportion of material by weight was food and kitchen waste at 18.5%, with textiles clothing and carpet (11.7%) the next largest proportion.

Table 51 below shows the aggregated composition in kilograms, converted from litres, of the waste deposited at the landfill at Mugga Lane Landfill during the audit period. Details of the original categories included in aggregated composition groups can be found in Table 36. The figures for Monday and Tuesday include those quantities also recorded on the following Monday May 11 and Tuesday May 12.

Table 51 Aggregated Total Composition of Mugga Lane Landfill Stream – Kilograms – With Garbage Bag Details

	4-May-09 11-May-09	5-May-09 12-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Composition Groups	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	96,306	92,901	109,606	127,067	84,741	15,100	7,356	533,076	19.8%
Organics	151,644	164,856	106,006	128,369	113,254	30,038	12,038	706,205	26.2%
Wood and timber products	19,094	30,516	27,809	20,032	22,477	4,205	922	125,056	4.6%
Textiles and rubber	70,366	73,785	46,300	61,416	63,939	3,688	1,013	320,507	11.9%
Glass	17,819	18,816	15,580	18,806	14,679	2,837	1,973	90,511	3.4%
Plastics	68,262	79,621	62,815	66,377	61,328	10,558	2,700	351,661	13.1%
Metals	11,919	14,754	10,124	16,642	15,442	1,698	751	71,331	2.7%
Building material	63,707	28,544	39,243	32,120	73,724	19,068	827	257,233	9.6%
E-waste and office equipment	27	277	302	1,367	802	-	-	2,774	0.1%
Other	56,678	52,292	34,404	36,694	37,469	10,769	3,983	232,289	8.6%
Total (kg)	555,821.5	556,362.5	452,187.5	508,889.5	487,856.5	97,962.5	31,565.0	2,690,645.0	100.0%

This data is shown as percentages in Figure 87 below.

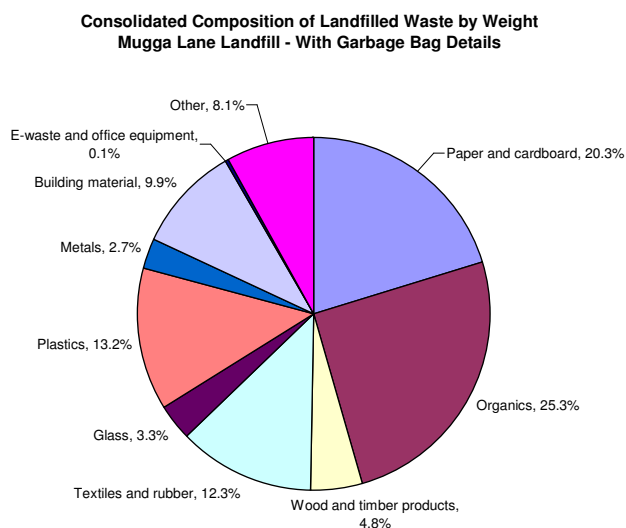


Figure 87 – Consolidated Composition of Landfilled Waste by Weight at Mugga Lane Landfill – with Garbage Bag Details

Figure 87 shows that organics was the largest proportions of this stream at 26.2% with paper and cardboard (19.8%) also forming a significant proportion.

Table 52 below shows these figures projected to yearly and apportioned based on a total of 205,000 tonnes.

Table 52 Composition of Average Daily and Projected Quantities Apportioned by Annual Amounts – With Garbage Bag Details

Tonnes	Average Daily (t)	Projected Annual (t)²³	Projected Annual Based on 205,000 tonnes per year
Paper and cardboard	76.2	27,796	40,615
Organics	100.9	36,824	53,806
Wood and timber products	17.9	6,521	9,528
Textiles and rubber	45.8	16,712	24,419
Glass	12.9	4,719	6,896
Plastics	50.2	18,337	26,793
Metals	10.2	3,719	5,435
Building material	36.7	13,413	19,599
E-waste and office equipment	0.4	145	211
Other	33.2	12,112	17,698
Total	384.4	140,298	205,000

Table 53 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mugga Lane Landfill each day.

Table 53 Quantities Landfilled by Stream by Weight – Mugga Lane Landfill

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	201,033	226,710	176,472	198,370	205,270	1,550	-	1,009,404	37.5%
C&I	322,129	302,693	242,427	282,849	233,617	79,935	31,565	1,495,214	55.6%
C&D	27,260	22,335	33,289	27,671	47,720	16,478	-	174,753	6.5%
Not known ²⁴	5,400	4,625	-	-	1,250	-	-	11,275	0.4%
Total (kg)	555,822	556,363	452,188	508,890	487,857	97,963	31,565	2,690,645	100%

This data is shown in the two figures below.

²³ Average daily amounts multiplied by 365

²⁴ Vehicles for which the stream of origin could not be determined

**Proportion of Streams Landfilled by Weight
Mugga Lane Landfill**

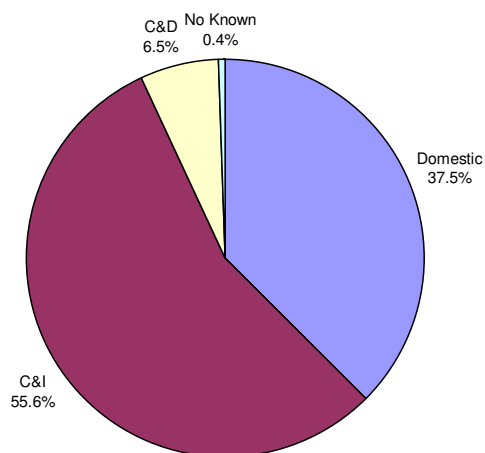
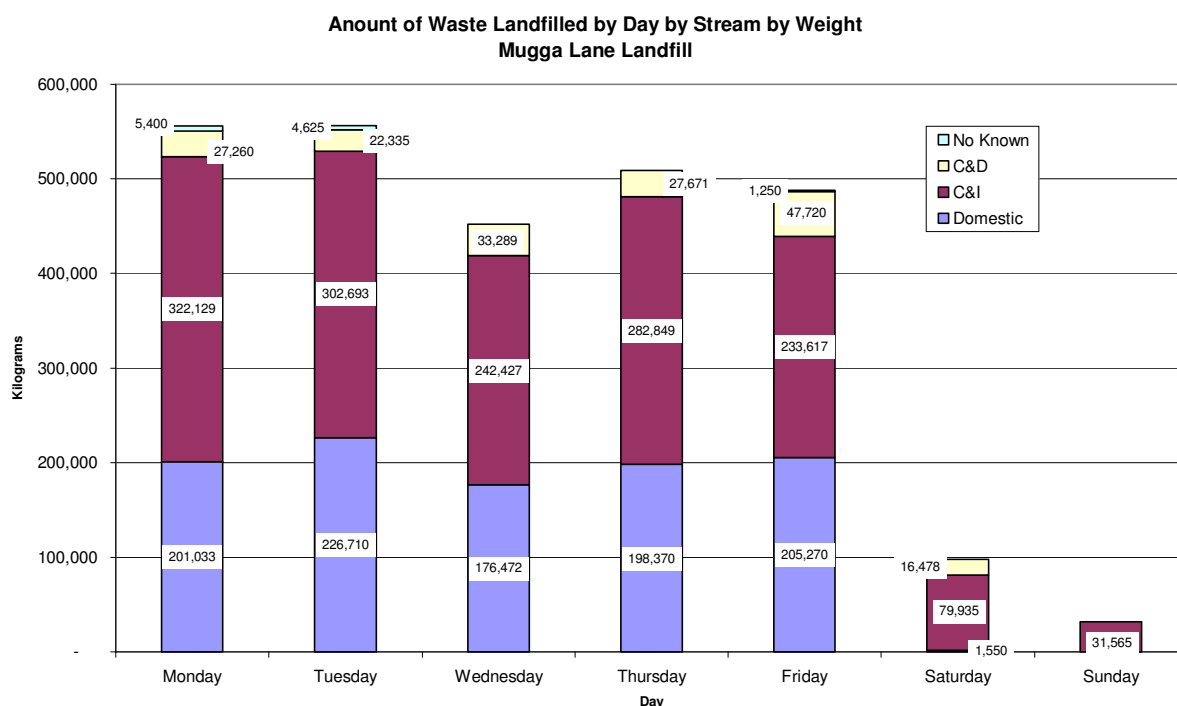


Figure 88 – Proportion of Stream Landfill by Weight at Mugga Lane Landfill

Figure 88 shows the proportion by weight of the different streams landfilled. C&I waste comprises the largest proportion by far with domestic the next most significant.

**Figure 89 – Amount of Waste Landfilled by Day by Stream and by Weight at
Mugga Lane Landfill**



The composition and weight in kilograms of waste landfilled each day at for the domestic, C&I and C&D streams is shown in Figure 89. Most waste is deposited on Monday and Tuesday with similar amounts through the week other than at weekends when only small amounts were deposited.

Table 54 below shows the average daily amounts by stream and the projected annual amounts and the apportioned amounts based on a total annual amount of 215,000 tonnes.

Table 54 Projected Quantities by Stream – Mugga Lane Landfill – Apportioned by Annual Amounts

Stream	Total Tonnes	Average Daily (t)	Projected Annual Estimate (t)	Projected annual estimate based on expected annual amount of 215,000 t
Domestic	1,009.4	144.2	52,633	135,110
C&I	1,495.2	213.6	77,965	61,881
C&D	174.8	25.0	9,112	16,344
Not known ²⁵	11.3	1.6	588	1,665
Total	2,690.6	384.4	140,298	215,000

²⁵ Vehicles for which the stream of origin could not be determined

Proportion of Streams Landfilled by Weighbridge Weight
Mugga Lane Landfill

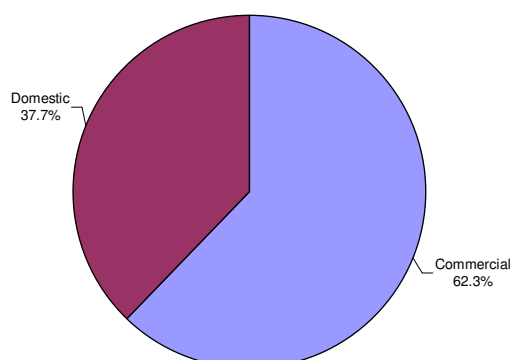


Figure 90 - Proportion of Streams Landfilled by Weighbridge Weight – Mugga Lane Landfill

Figure 90 shows the proportion of commercial and domestic waste disposed of through Mugga Lane Landfill. This data shows that according to weighbridge data, most waste (62.3%) is commercial.

3.9 Combined Results - Mugga Lane Transfer Station – With Garbage Bag Details

3.9.1 Volume Results

Table 55 below shows the composition in litres of the waste deposited at Mugga Lane Transfer Station during the audit period. The figures for Tuesday include those quantities also recorded on the afternoon of May 5 and the afternoon of May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 55 Composition of Landfilled Waste at Mugga Lane Transfer Station by Audit Day – Litres – With Garbage Bag Details

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Office paper	93	73	64	32	49	293	135	738	0.1%
Newspapers & Magazines	4,995	3,054	1,977	1,526	1,673	3,902	1,958	19,085	1.4%
Other Paper	959	2,063	1,180	798	783	598	771	7,153	0.5%
Disposable contaminated paper	1,836	3,897	2,237	1,510	1,487	1,159	1,499	13,624	1.0%
Corrugated cardboard	59,284	13,800	14,375	12,195	10,379	23,978	22,926	156,937	11.2%
Food/Kitchen	3,014	7,498	3,819	2,676	2,479	1,435	1,726	22,647	1.6%

Vegetation/Garden	29,683	18,556	19,656	11,973	22,558	15,480	17,344	135,249	9.7%
Other organic wood timber	68,618	36,975	21,425	21,385	28,274	49,582	44,582	270,842	19.4%
Textiles clothing carpet	68,960	41,850	29,522	20,243	28,327	54,002	45,069	287,973	20.6%
Rubber Other	-	-	200	-	2,200	300	100	2,800	0.2%
Glass containers	2,012	1,351	846	850	651	939	1,282	7,931	0.6%
Glass Misc / Other	1,329	402	551	638	482	932	364	4,699	0.3%
Plastic containers	3,715	2,499	1,745	1,122	2,104	2,758	3,233	17,176	1.2%
Film / Plastic Bags	5,403	9,766	10,634	9,495	6,609	6,638	7,673	56,218	4.0%
Polystyrene	8,045	4,555	2,894	2,004	1,482	4,813	4,714	28,507	2.0%
Plastic other	40,863	12,560	8,034	6,040	11,337	17,547	13,267	109,647	7.8%
Steel Cans / Packaging	10,647	2,991	2,571	4,683	4,465	14,329	19,240	58,925	4.2%
Ferrous	26	94	47	35	29	6	4	242	0.0%
Metals non-ferrous	12,790	9,213	6,676	4,056	4,574	5,578	4,621	47,508	3.4%
Concrete / cement	1,704	864	857	255	14	201	801	4,697	0.3%
Bricks / Tiles	8,050	2,600	1,050	2,200	3,260	1,150	1,960	20,270	1.5%
Plasterboard	12,930	8,913	4,274	4,085	2,342	3,508	2,646	38,699	2.8%
Soil	3,479	2,422	1,348	396	904	861	2,407	11,819	0.8%
Asphalt	-	-	-	-	-	-	-	-	0.0%
E-waste	4,200	2,850	520	200	700	2,020	900	11,390	0.8%
Household appliances	-	-	-	-	-	-	-	-	0.0%
Nappies	1,451	1,134	991	499	762	1,448	2,101	8,386	0.6%
Ceramics	120	171	113	69	79	98	137	786	0.1%
Fibreglass / fibreglass batts	117	92	80	40	61	117	169	677	0.0%
Residual / other miscellaneous	7,846	7,367	7,016	4,393	5,801	12,318	8,152	52,892	3.8%
Total (litres)	362,170	197,610	144,700	113,400	143,865	225,990	209,780	1,397,515	100%

Table 55 shows that almost 1.4 million litres, or almost 1,400 cubic metres, of waste were recorded as landfilled during the audit period. The largest amounts were delivered on Monday.

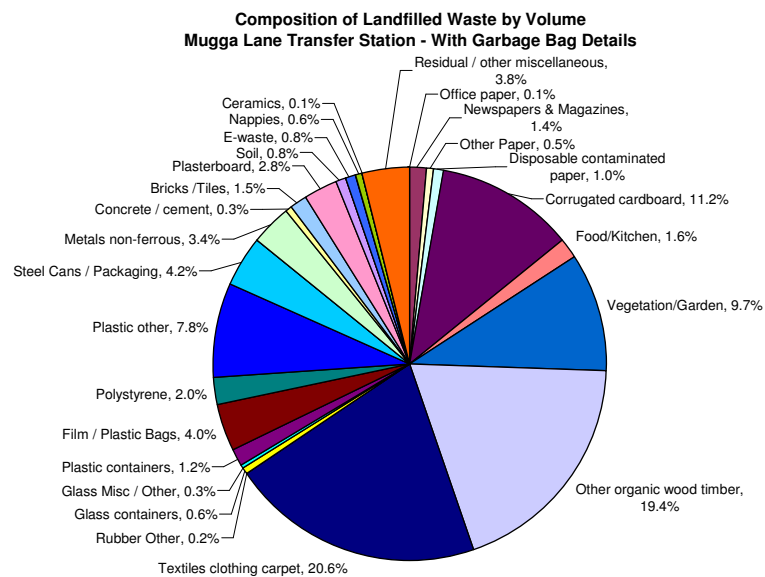


Figure 91 – Composition of Landfilled Waste by Volume at Mugga Lane Transfer Station – With Garbage Bag Details

Figure 91 shows that the largest proportions of waste being landfilled were textiles clothing and carpet (20.6%) and other organic wood and timber (19.4%). Other significant proportions included corrugated cardboard (11.2%), vegetation and garden waste (9.7%) and other plastic (7.8%).

Table 56 below shows the aggregated composition in cubic metres of the waste deposited at Mugga Lane Transfer Station during the audit period. Details of the original categories included in aggregated composition groups can be found in Table 36. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12.

Table 56 Aggregated Total Composition of Mugga Lane Transfer Station Stream – Cubic Metres – With Garbage Bag Details

	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Category	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	67.2	22.9	19.8	16.1	14.4	29.9	27.3	197.5	14.1%
Organics	32.7	26.1	23.5	14.6	25.0	16.9	19.1	157.9	11.3%
Wood and timber products	68.6	37.0	21.4	21.4	28.3	49.6	44.6	270.8	19.4%
Textiles and rubber	69.0	41.9	29.7	20.2	30.5	54.3	45.2	290.8	20.8%
Glass	3.3	1.8	1.4	1.5	1.1	1.9	1.6	12.6	0.9%
Plastics	58.0	29.4	23.3	18.7	21.5	31.8	28.9	211.5	15.1%
Metals	23.5	12.3	9.3	8.8	9.1	19.9	23.9	106.7	7.6%
Building material	26.3	14.9	7.6	7.0	6.6	5.8	8.0	76.2	5.4%
E-waste and office equipment	4.2	2.9	0.5	0.2	0.7	2.0	0.9	11.4	0.8%
Other	9.4	8.7	8.1	5.0	6.6	13.9	10.4	62.1	4.4%
Total (cubic metres)	362.2	197.6	144.7	113.4	143.9	226.0	209.8	1,397.5	100.0%

This data is shown as percentages in Figure 92 below.

**Consolidated Composition of Landfilled Waste by Volume
Mugga Lane Transfer Station - With Garbage Bag Details**

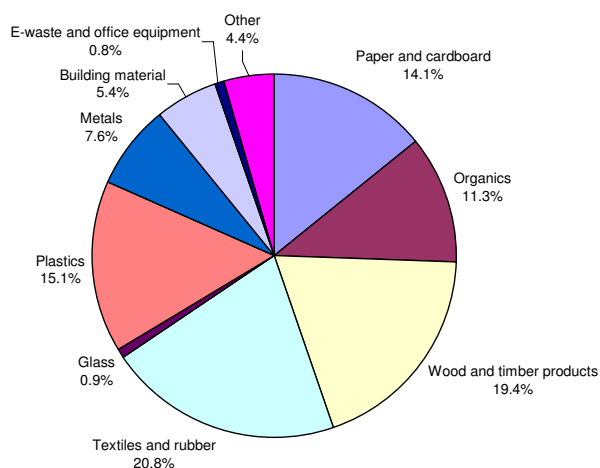


Figure 92 – Consolidated Composition of Landfilled Waste by Volume at Mugga Lane Transfer Station – With Garbage Bag Details

Figure 92 shows that five materials for the largest proportions of this stream; textiles and rubber (20.8%), wood and timber products (19.4%), plastics (15.1%), paper and

cardboard (14.1%) and organics (11.3%). This is despite facilities at the waste management centre for disposal of recyclable timber, organics and paper and cardboard.

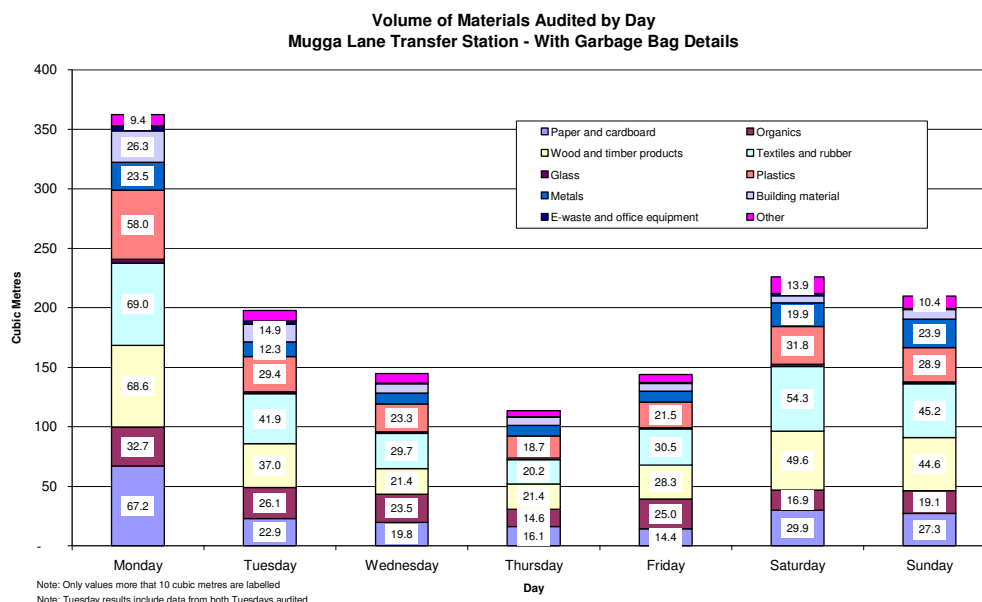


Figure 93 – Volume of Materials Audited by Day at Mugga Lane Transfer Station – With Garbage Bag Details

Figure 93 shows the volume in cubic metres of the aggregated categories deposited at the transfer station each day of the audit. Clearly most waste is deposited on Monday. The amounts reduce as the week goes on with the smallest amounts being deposited on Wednesday. Quantities increase again towards the weekend. There does not appear to be any significant changes in composition between different days, with increases in overall quantities corresponding with increases in most components.

Table 57 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mugga Lane Transfer Station each day.

Table 57 Quantities Landfilled by Stream by Volume – Mugga Lane Transfer Station

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	253,950	104,160	85,800	64,860	95,245	211,230	206,710	1,021,955	73.1%
C&I	71,720	70,350	55,750	37,020	38,870	10,910	550	285,170	20.4%
C&D	29,000	23,100	3,150	11,520	9,750	3,850	2,520	82,890	5.9%
Not known ²⁶	7,500	-	-	-	-	-	-	7,500	0.5%
Total (litres)	362,170	197,610	144,700	113,400	143,865	225,990	209,780	1,397,515	100%

²⁶ Vehicles for which the stream of origin could not be determined

This data is shown in the two figures below.

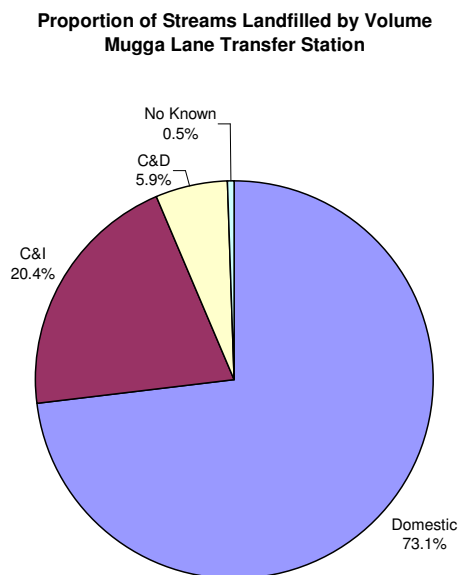


Figure 94 – Proportion of Stream Landfill by Volume at Mugga Lane Transfer Station

Figure 94 shows the proportion by volume of the different streams landfilled. Domestic waste comprises the largest proportion by far with C&I the next most significant.

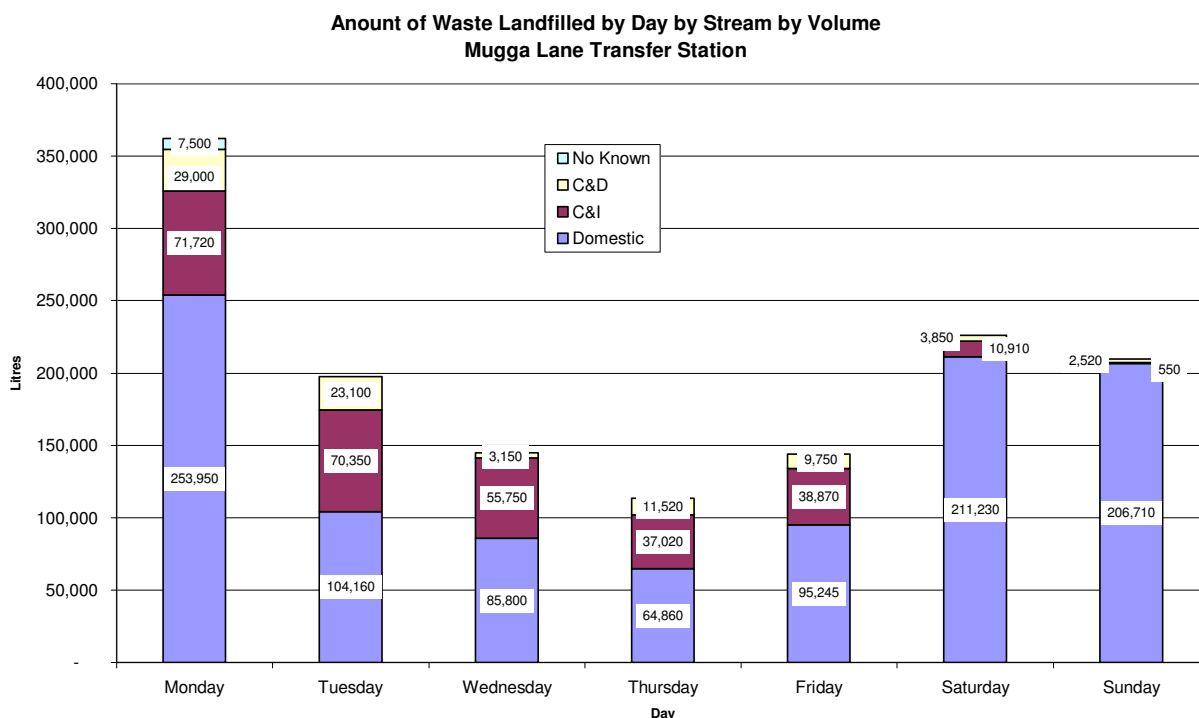


Figure 95 – Amount of Waste Landfilled by Day by Stream and by Volume at Mugga Lane Transfer Station

Figure 95 shows the composition and volume in litres of waste landfilled each day at for the domestic, C&I and C&D streams. Domestic waste was the most common type of waste deposited especially on the weekends and on Mondays. Although overall quantities were lower during the week, this was also substantially domestic in origin.

3.9.2 Weight Results

Table 58 below shows the composition in kilograms (to the nearest half kilogram) of the waste deposited at Mugga Lane Transfer Station during the audit period. These figures were calculated by converting the volume of each material recorded during the audit to weight using the Resource NSW conversion factors. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 58 Composition of Landfilled Waste at Mugga Lane Transfer Station by Audit Day – Kilograms (Estimated from Volume) – With Garbage Bag Details

Date	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09	Total (Estimated)	Percent (Estimated)
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Office paper	51	40	35	18	27	125	74	371.0	0.1%
Newspapers & Magazines	548	362	238	176	197	433	257	2,211.0	0.9%
Other Paper	132	270	157	105	105	87	114	969.1	0.4%
Disposable contaminated paper	254	511	298	199	200	168	221	1,851.6	0.7%
Corrugated cardboard	3,105	1,150	725	614	523	1,271	1,152	8,539.8	3.5%
Food/Kitchen	1,320	3,172	1,659	1,153	1,083	677	833	9,897.2	4.0%
Vegetation/Garden	4,682	3,022	3,129	1,896	3,517	2,534	2,905	21,683.7	8.8%
Other organic wood timber	12,948	6,787	3,569	3,593	4,765	8,244	7,610	47,516.8	19.2%
Textiles clothing carpet	9,386	5,612	3,989	2,850	3,951	7,036	6,378	39,201.7	15.8%
Rubber Other	-	-	52	-	572	78	26	728.0	0.3%
Glass containers	644	477	306	278	232	333	458	2,728.4	1.1%
Glass Misc / Other	481	153	203	233	176	336	131	1,713.0	0.7%
Plastic containers	373	286	202	125	214	289	356	1,844.5	0.7%
Film / Plastic Bags	501	848	856	731	542	569	683	4,731.0	1.9%
Polystyrene	257	156	101	68	54	158	161	956.0	0.4%
Plastic other	6,984	2,186	1,400	1,047	1,951	3,014	2,299	18,880.4	7.6%
Steel Cans / Packaging	2,998	866	667	1,322	1,262	4,025	5,405	16,545.2	6.7%
Ferrous	10	37	19	14	12	2	1	94.9	0.0%
Metals non-ferrous	3,218	2,327	1,686	1,024	1,156	1,413	1,182	12,005.8	4.9%
Concrete / cement	1,262	642	635	190	11	149	592	3,481.1	1.4%
Bricks / Tiles	981	583	239	981	716	106	318	3,922.0	1.6%
Plasterboard	4,203	2,908	1,414	1,331	785	1,186	939	12,765.7	5.2%
Soil	3,422	2,432	1,394	445	946	977	2,492	12,109.0	4.9%
Asphalt	-	-	-	-	-	-	-	-	0.0%
E-waste	630	683	110	47	105	303	135	2,012.5	0.8%
Household appliances	-	-	-	-	-	-	-	-	0.0%
Nappies	498	389	340	171	261	497	721	2,878.6	1.2%
Ceramics	3,377	917	347	235	1,071	580	828	7,356.1	3.0%
Fibreglass / fibreglass batts	30	23	20	10	16	30	43	171.6	0.1%
Residual / other miscellaneous	1,004	1,858	1,520	977	1,190	2,206	1,571	10,326.8	4.2%
Total Audit (kg)	63,298.0	38,695.7	25,310.2	19,833.0	25,638.9	36,829.0	37,887.8	247,492.6	100%
Weighbridge (kg)	40,557.2	35,035.2	29,760.0	27,712.9	35,831.5	67,208.5	67,454.6	303,560.0	
Difference (kg)	22,740.8	3,660.5	- 4,449.8	- 7,879.9	- 10,192.6	- 30,379.5	- 29,566.8	- 56,067.4	
Percent	156%	110%	85%	72%	72%	55%	56%	82%	

The table also shows the corresponding weights recorded at the weighbridge each day, the differences between the weighbridge weights and the converted volume weights and the percent difference. The differences are consistent on most days.

Overall the weight converted from volume was about 82% of the weight recorded at the weighbridge.

There are a number of variables that go towards accounting for this:

- ▶ The volumes recorded during the audit are only estimates may by visual observation;
- ▶ The conversion values are averages calculated over hundreds of loads, the original figures for which spanned a range of values; and
- ▶ Most vehicles delivering were small vehicles²⁷, so no weight was recorded. Instead estimates were made of the weight and there could be significant variation between these estimates and actual load weights.

The formula used to calculate the average weight of small vehicles can be found in Section 2.5.4. The average weights of small loads calculated for Mugga Lane Transfer Station can be seen in Table 59 below.

Table 59 Estimated Average Small Vehicle Load Weights – Mugga Lane Transfer Station

Load Size Classification	Estimated Average Weight (kg)
D1 – Small Domestic Load	0.146
D2 – Medium Domestic Load	0.292
D3 – Large Domestic Load	0.439

As a result, at the request of ACT NOWaste, the figures for each category in Table 58 have been adjusted according to the difference between the weight and volume figures so that the weight of the components adds up to the weight recorded at the weighbridge. These adjusted figures are shown in Table 60.

Table 60 Composition by Adjusted Weight – Mugga Lane Transfer Station – With Garbage Bag Details

Component	Adjusted Weight
Office paper	457.0
Newspapers & Magazines	2,701.2
Other Paper	1,151.3
Disposable contaminated paper	2,201.0
Corrugated cardboard	10,515.3
Food/Kitchen	11,670.3
Vegetation/Garden	26,642.8

²⁷ Over the course of the week about 76% of loads were classified as small vehicles at the weighbridge and no weight recorded. This proportion was as high as 90% on the weekends.

Component	Adjusted Weight
Other organic wood timber	58,526.8
Textiles clothing carpet	48,232.5
Rubber Other	896.9
Glass containers	3,317.4
Glass Misc / Other	2,101.4
Plastic containers	2,246.7
Film / Plastic Bags	5,748.8
Polystyrene	1,169.6
Plastic other	23,234.6
Steel Cans / Packaging	20,366.7
Ferrous	109.6
Metals non-ferrous	14,781.7
Concrete / cement	4,286.1
Bricks / Tiles	4,831.8
Plasterboard	15,719.4
Soil	14,876.6
Asphalt	-
E-waste	2,479.3
Household appliances big and small	-
Nappies	3,546.4
Ceramics	9,049.4
Fibreglass / fibreglass batts	211.5
Residual / other miscellaneous	12,488.0
Total (kg)	303,560.0

The composition of the waste landfilled at Mugga Lane Transfer Station by weight, converted from volume, is shown in Figure 96.

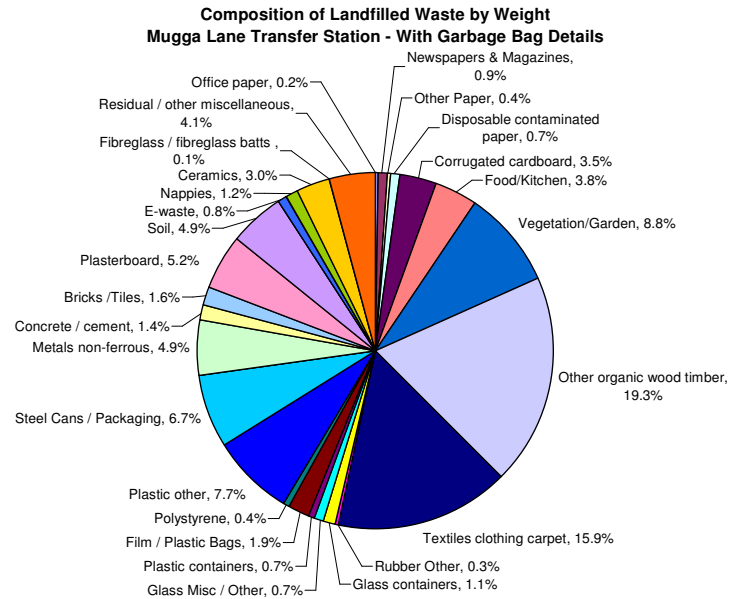


Figure 96 - Composition of Landfilled Waste by Weight at Mugga Lane Transfer Station – With Garbage Bag Details

Figure 96 shows that the largest proportion of material by weight was organic wood and timber (19.2%) with textiles clothing and carpet (15.8%), vegetation and garden waste (8.8%), plastic other (7.6%) and steel cans/packaging (6.7%) the next largest proportions.

Table 61 below shows the aggregated composition in kilograms, converted from litres, of the waste deposited at the landfill at Mugga Lane Transfer Station during the audit period. Details of the original categories included in aggregated composition groups can be found in Table 36. The figures for Tuesday include those quantities also recorded on the following Tuesday May 12.

Table 61 Aggregated Total Composition of Mugga Lane Transfer Station Stream – Kilograms – With Garbage Bag Details

	4-May-09	5-May-09	6-May-09	7-May-09	8-May-09	9-May-09	10-May-09		
Category	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Paper and cardboard	4,091	2,333	1,453	1,111	1,052	2,084	1,818	13,942	5.6%
Organics	6,002	6,193	4,788	3,049	4,600	3,212	3,738	31,581	12.8%
Wood and timber products	12,948	6,787	3,569	3,593	4,765	8,244	7,610	47,517	19.2%
Textiles and rubber	9,386	5,612	4,041	2,850	4,523	7,114	6,404	39,930	16.1%
Glass	1,124	630	509	511	408	669	590	4,441	1.8%
Plastics	8,115	3,476	2,558	1,972	2,761	4,030	3,499	26,412	10.7%
Metals	6,227	3,229	2,372	2,360	2,430	5,441	6,588	28,646	11.6%
Building material	9,896	6,588	3,703	2,957	2,473	2,448	4,385	32,449	13.1%
E-waste and office equipment	630	683	110	47	105	303	135	2,013	0.8%
Other	4,879	3,165	2,208	1,383	2,523	3,283	3,121	20,561	8.3%
Total (kg)	63,298	38,696	25,310	19,833	25,639	36,829	37,888	247,493	100.0%

This data is shown as percentages in Figure 97 below.

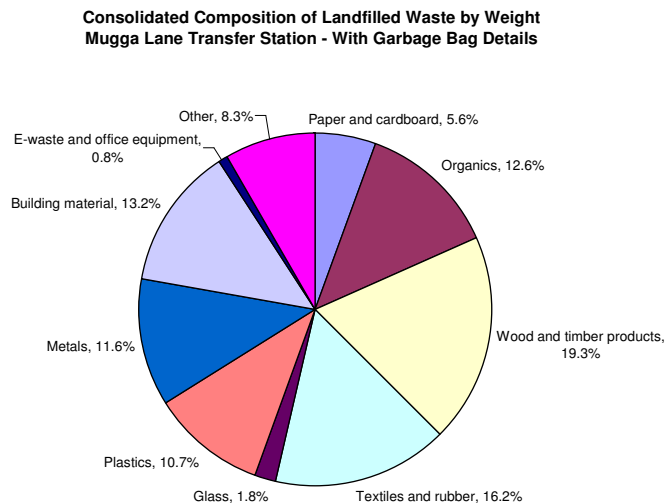


Figure 97 – Consolidated Composition of Landfilled Waste by Weight at Mugga Lane Transfer Station – With Garbage Bag Details

Figure 97 shows that six materials comprised the largest proportions of this stream; wood and timber (19.2%), textiles and rubber (16.1%), building material (13.1%), organics (12.8%), metals (11.6%) and plastics (10.7%). These six totalled 83.5%.

Table 62 below shows these figures projected to yearly and apportioned based on a total of 205,000 tonnes.

Table 62 Composition of Average Daily and Projected Quantities Apportioned by Annual Amounts – With Garbage Bag Details

Tonnes	Average Daily (t)	Projected Annual (t)²⁸	Projected Annual Based on 205,000 tonnes per year
Paper and cardboard	2.0	727	11,549
Organics	4.5	1,647	26,159
Wood and timber products	6.8	2,478	39,359
Textiles and rubber	5.7	2,082	33,074
Glass	0.6	232	3,679
Plastics	3.8	1,377	21,877
Metals	4.1	1,494	23,728
Building material	4.6	1,692	26,878
E-waste and office equipment	0.3	105	1,667
Other	2.9	1,072	17,031
Total	35.4	12,905	205,000

Table 63 below shows the quantities of each stream, domestic, C&I and C&D landfilled at Mugga Lane Transfer Station each day.

Table 63 Quantities Landfilled by Stream by Weight – Mugga Lane Transfer Station

Stream	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	Percent
Domestic	45,412.5	20,036.2	15,228.7	11,676.1	16,561.3	34,562.5	37,263.6	180,740.9	73.0%
C&I	9,738.0	13,268.0	9,553.5	6,054.9	6,822.4	1,612.5	126.5	47,175.8	19.1%
C&D	6,970.0	5,391.5	528.0	2,102.0	2,255.2	654.0	497.7	18,398.4	7.4%
Not known ²⁹	1,177.5	-	-	-	-	-	-	1,177.5	0.5%
Total (kg)	63,298.0	38,695.7	25,310.2	19,833.0	25,638.9	36,829.0	37,887.8	247,492.6	100%

This data is shown in the two figures below.

²⁸ Average daily amounts multiplied by 365

²⁹ Vehicles for which the stream of origin could not be determined

Proportion of Streams Landfilled by Weight
Mugga Lane Transfer Station

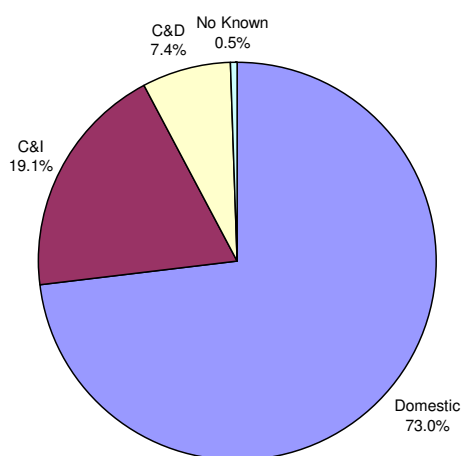


Figure 98 – Proportion of Stream Landfill by Weight at Mugga Lane Landfill

Figure 98 shows the proportion by weight of the different streams landfilled. Domestic waste comprises the largest proportion by far with C&I the next most significant.

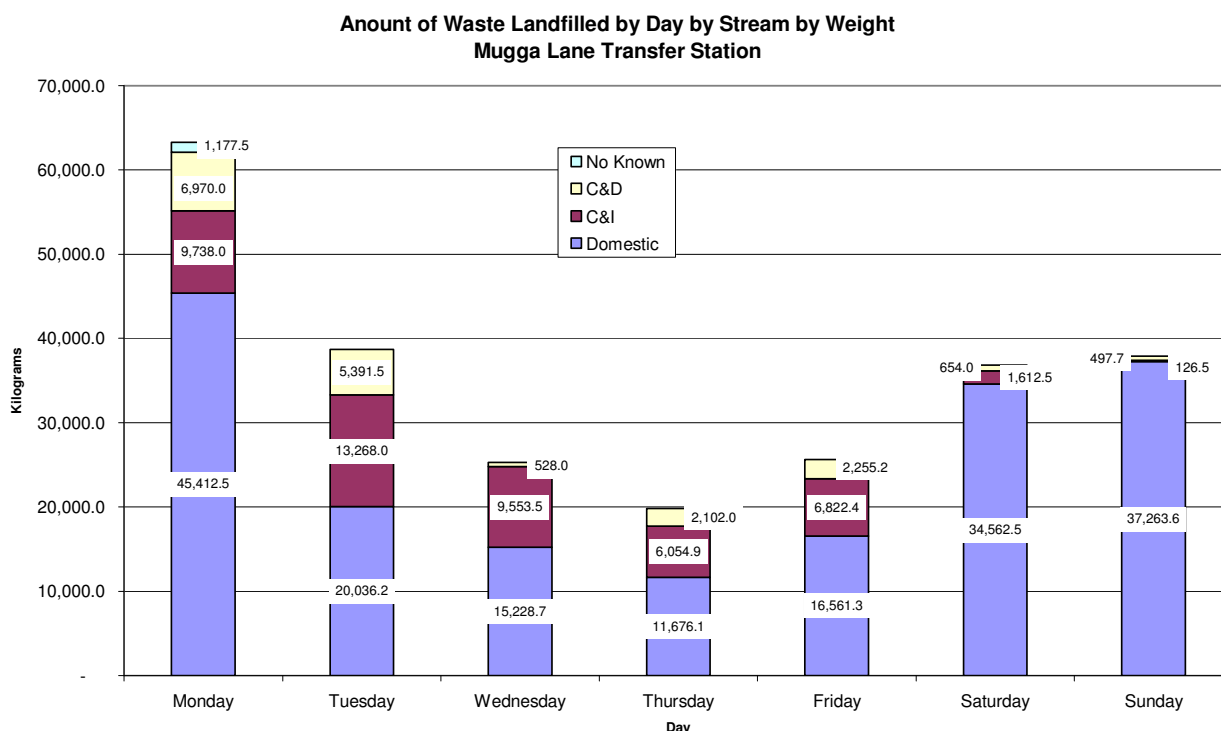


Figure 99 – Amount of Waste Landfilled by Day by Stream and by Weight at Mugga Lane Transfer Station

Figure 99 shows the composition and weight in kilograms of waste landfilled each day at for the domestic, C&I and C&D streams. Most waste is deposited on Monday, dipping on Thursday with the smallest quantities before rising again on the weekend. Most waste deposited was domestic in origin, especially at the weekend.

Table 64 below shows the average daily amounts by stream and the projected annual amounts and the apportioned amounts based on a total annual amount of 215,000 tonnes.

Table 64 Projected Quantities by Stream – Mugga Lane Transfer Station – Apportioned by Annual Amounts

Stream	Total Tonnes	Average Daily (t)	Projected Annual Estimate (t)	Projected annual estimate based on expected annual amount of 215,000 t
Domestic	180.7	25.8	9,424	135,110
C&I	47.2	6.7	2,460	61,881
C&D	18.4	2.6	959	16,344
Not known ³⁰	1.2	0.2	61	1,665

³⁰ Vehicles for which the stream of origin could not be determined

Stream	Total Tonnes	Average Daily (t)	Projected Annual Estimate (t)	Projected annual estimate based on expected annual amount of 215,000 t
Total	247.5	35.4	12,905	215,000

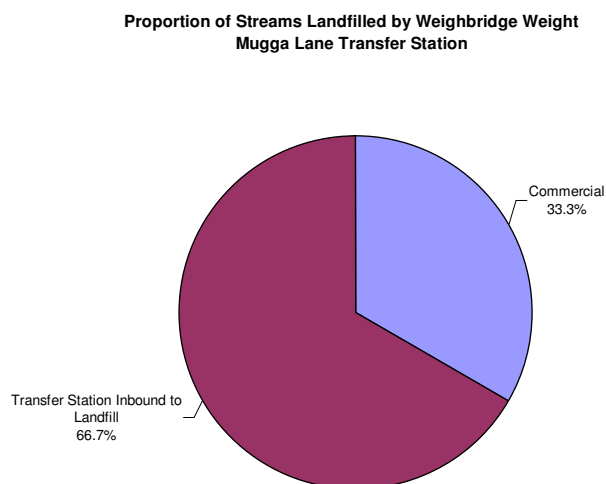


Figure 100 - Proportion of Streams Landfilled by Weighbridge Weight – Mugga Lane Transfer Station

Figure 100 shows the proportion of commercial and other waste disposed of through Mugga Lane Transfer Station. This data shows that according to weighbridge data, most waste (66.7%) is classified Transfer Station Inbound to Landfill.

3.10 Combined Results - All Sites – With Garbage Bag Details

3.10.1 Results by Volume

Table 65 below shows the composition in litres of the total amount of waste recorded as deposited at each site during the audit period. The categories are those specified in the project proposal as well as some identified during the audits at all three sites.

Table 65 Composition of Landfilled Waste by Site – Litres – With Garbage Bag Details

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Office paper	1,733	64,088	738	66,559	0.5%
Newspapers & Magazines	33,124	350,620	19,085	402,829	2.9%

Other Paper	6,225	302,112	7,153	315,490	2.3%
Disposable contaminated paper	23,399	923,274	13,624	960,298	7.0%
Corrugated cardboard	169,803	1,115,817	156,937	1,442,557	10.6%
Food/Kitchen	32,806	892,045	22,647	947,497	6.9%
Vegetation/Garden	412,524	1,080,812	135,249	1,628,585	11.9%
Other organic wood timber	407,521	591,495	270,842	1,269,858	9.3%
Textiles clothing carpet	315,075	1,280,799	287,973	1,883,847	13.8%
Rubber Other	14,355	15,281	2,800	32,436	0.2%
Glass containers	9,964	163,862	7,931	181,757	1.3%
Glass Misc / Other	8,991	18,352	4,699	32,041	0.2%
Plastic containers	20,931	335,690	17,176	373,797	2.7%
Film / Plastic Bags	86,072	1,187,661	56,218	1,329,951	9.7%
Polystyrene	77,956	305,490	28,507	411,953	3.0%
Plastic other	171,848	393,464	109,647	674,959	4.9%
Steel Cans / Packaging	37,375	86,868	58,925	183,168	1.3%
Ferrous	1,062	11,627	242	12,930	0.1%
Metals non-ferrous	26,303	93,586	47,508	167,397	1.2%
Concrete / cement	48,797	7,680	4,697	61,174	0.4%
Bricks / Tiles	41,700	28,100	20,270	90,070	0.7%
Plasterboard	38,929	83,016	38,699	160,643	1.2%
Soil	19,085	213,934	11,819	244,838	1.8%
Asphalt	-	-	-	-	0.0%
E-waste	29,337	20,606	11,390	61,333	0.4%
Household appliances	-	-	-	-	0.0%
Nappies	110	40,834	8,386	49,330	0.4%
Ceramics	463	11,000	786	12,249	0.1%
Fibreglass / fibreglass batts	-	-	677	677	0.0%
Residual / other miscellaneous	74,683	545,837	52,892	673,412	4.9%
Total (litres)	2,110,170	10,163,950	1,397,515	13,671,635	100.0%

Table 65 shows that about 13.7 million litres, or about 137,000 cubic metres, of waste were recorded as landfilled during the audit period. Naturally the largest amounts were delivered to the Mugga Lane Landfill.

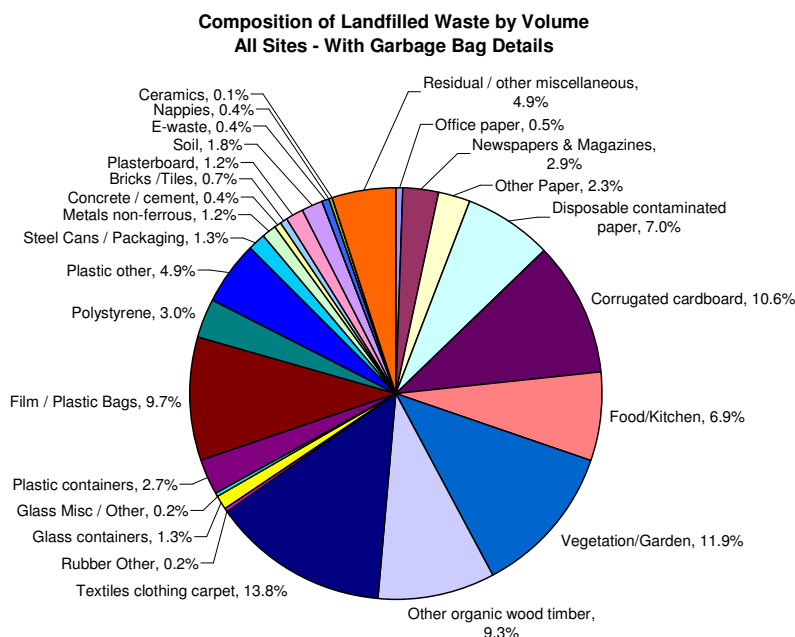


Figure 101 – Composition of Landfilled Waste at All Sites by Volume – With Garbage Bag Details

Figure 101 shows that seven materials comprised the largest proportions of materials waste being landfilled at all sites. These included textiles clothing and carpet (13.8%), vegetation and garden waste (11.9%), corrugated cardboard (10.6%), film and plastic bags (9.7%), other organic wood and timber (9.3%) disposable and contaminated paper (7.0%) and food and kitchen waste (6.9%).

Table 66 below shows the aggregated composition in cubic metres of the waste deposited for landfilling at all sites during the audit period. Details of the original categories included in aggregated composition groups can be found in Table 36.

Table 66 Aggregated Total Composition of All Sites – Cubic Metres – With Garbage Bag Details

Compositional Groups	Mitchell Transfer Station	Mugga Lane landfill	Mugga Lane Transfer Station	Total	Percent
Paper and cardboard	234.3	2,755.9	197.5	3,187.7	23.3%
Organics	445.3	1,972.9	157.9	2,576.1	18.8%
Wood and timber products	407.5	591.5	270.8	1,269.9	9.3%
Textiles and rubber	329.4	1,296.1	290.8	1,916.3	14.0%
Glass	19.0	182.2	12.6	213.8	1.6%
Plastics	356.8	2,222.3	211.5	2,790.7	20.4%
Metals	64.7	192.1	106.7	363.5	2.7%
Building material	148.5	332.7	75.5	556.7	4.1%

E-waste and office equipment	29.3	20.6	11.4	61.3	0.4%
Other	75.3	597.7	62.7	735.7	5.4%
Total (cubic metres)	2,110.2	10,164.0	1,397.5	13,671.6	100.0%

This data is shown as percentages in Figure 102 below.

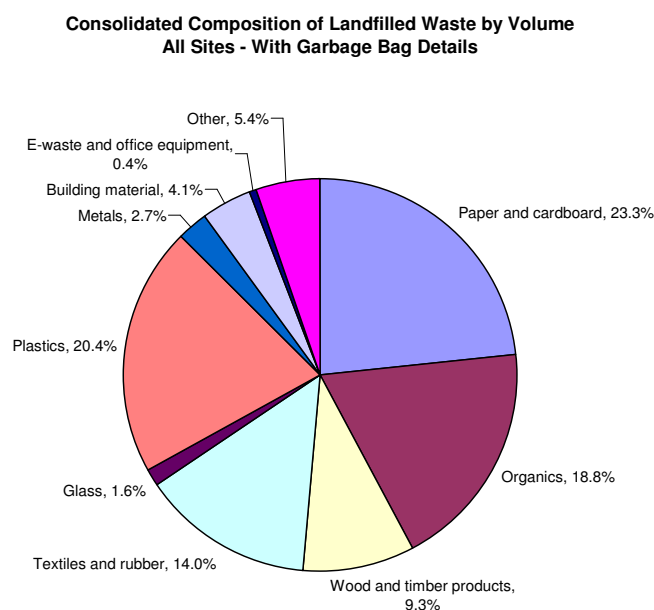


Figure 102 – Consolidated Composition of Landfilled Waste at All Sites by Volume – With Garbage Bag Details

Figure 102 shows that paper and cardboard formed the largest proportion at 23.3% with plastics also making up 20.4%. Other materials found in significant proportions included organics (18.8%), textiles and rubber (14.0%) and wood and timber products (9.3%).

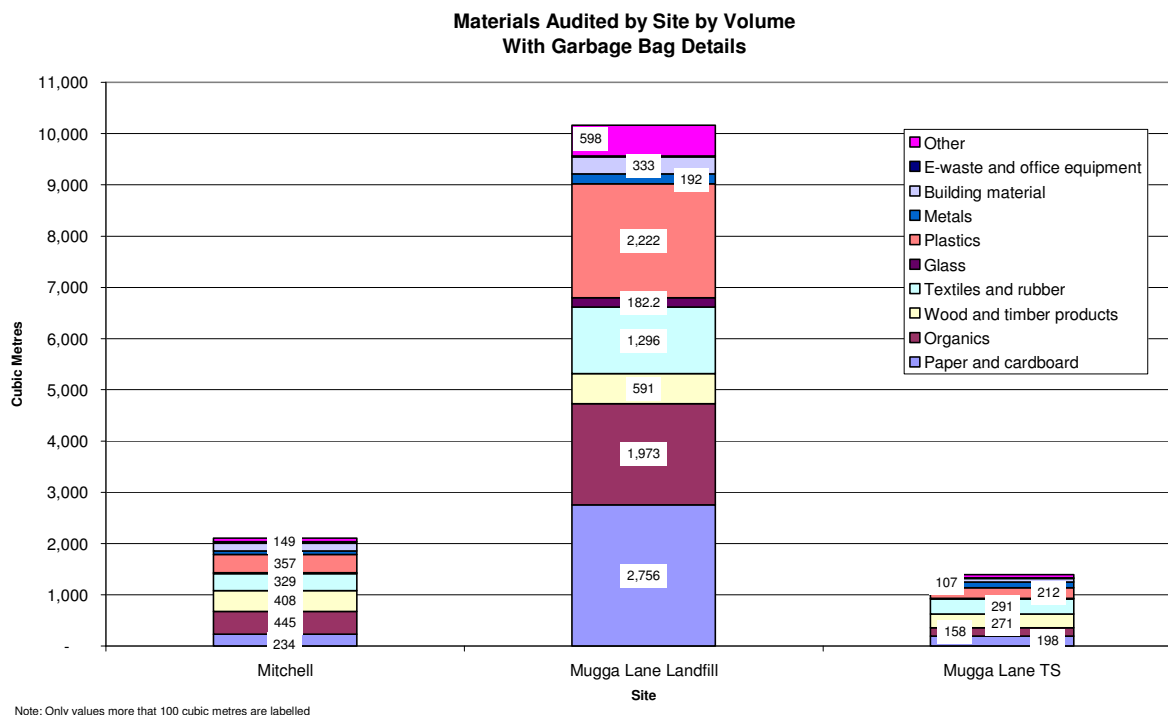


Figure 103 –Materials Audited by Volume by Site – With Garbage Bag Details

Figure 103 shows the volume in cubic metres of the aggregated categories deposited for landfilling at each site. Clearly most waste is deposited at Mugga Lane Landfill and most of this is paper and cardboard, plastics and organics. The total amounts deposited at the transfer stations are comparatively small. The amounts deposited at Mitchell Transfer Station are slightly higher than at Mugga Lane Transfer Station, perhaps as Mitchell is the only transfer station in the northern part of Canberra it attracts some loads that, if entering Mugga Lane would be diverted to the landfill for disposal.

3.10.2 Results by Weight

Table 67 below shows the composition of the total amount of waste recorded by volume as deposited at each site during the audit period and then converted to weight.

Table 67 Composition of Landfilled Waste at Mugga Lane Landfill by Audit Site – Kilograms – With Garbage Bag Details

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total (Estimate)	Percent (Estimate)
Office paper	650.5	44,843.6	371.0	45,865.1	1.4%
Newspapers & Magazines	3,890.5	94,438.5	2,211.0	100,540.0	3.0%
Other Paper	817.3	57,188.1	969.1	58,974.5	1.8%
Disposable contaminated paper	3,587.8	189,178.5	1,851.6	194,617.8	5.9%
Corrugated cardboard	9,277.0	147,427.5	8,539.8	165,244.3	5.0%
Food/Kitchen	14,766.0	498,381.2	9,897.2	523,044.4	15.7%
Vegetation/Garden	63,432.4	207,824.1	21,683.7	292,940.2	8.8%
Other organic wood timber	74,537.6	125,056.5	47,516.8	247,110.9	7.4%
Textiles clothing carpet	38,510.4	313,986.2	39,201.7	391,698.2	11.8%
Rubber Other	5,301.5	6,521.3	728.0	12,550.8	0.4%
Glass containers	3,415.0	80,972.5	2,728.4	87,116.0	2.6%
Glass Misc / Other	3,264.6	9,538.3	1,713.0	14,516.0	0.4%
Plastic containers	1,933.4	54,210.3	1,844.5	57,988.2	1.7%
Film / Plastic Bags	7,463.2	164,938.2	4,731.0	177,132.4	5.3%
Polystyrene	2,883.1	16,587.5	956.0	20,426.6	0.6%
Plastic other	30,025.3	115,924.9	18,880.4	164,830.7	5.0%
Steel Cans / Packaging	10,540.2	32,912.0	16,545.2	59,997.3	1.8%
Ferrous	489.3	6,009.3	94.9	6,593.5	0.2%
Metals non-ferrous	6,626.5	32,409.7	12,005.8	51,042.0	1.5%
Concrete / cement	36,117.3	6,218.9	3,481.1	45,817.3	1.4%
Bricks / Tiles	22,101.0	14,843.0	3,922.0	40,866.0	1.2%
Plasterboard	12,477.9	30,281.3	12,765.7	55,524.9	1.7%
Soil	17,893.1	205,890.0	12,109.0	235,892.1	7.1%
Asphalt	-	-	-	-	0.0%
E-waste	4,449.9	2,774.5	2,012.5	9,236.9	0.3%
Household appliances	-	-	-	-	0.0%
Nappies	44.2	21,534.3	2,878.6	24,457.2	0.7%
Ceramics	340.0	9,439.9	7,356.1	17,135.9	0.5%

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total (Estimate)	Percent (Estimate)
Fibreglass / fibreglass batts	-	-	171.6	171.6	0.0%
Residual / other miscellaneous	13,153.2	201,314.8	10,326.8	224,794.8	6.8%
Total Audit (kg)	387,988.1	2,690,645.0	247,492.6	3,326,125.7	100.0%
Weighbridge (kg)	199,108.0	3,350,133.1	303,560.0	3,852,801.1	
Difference (kg)	188,880.1	- 659,488.1	- 56,067.4	- 526,675.4	
Percent	195%	80%	82%	86%	

Table 67 shows that about 3.3 million kilograms, or about 3,300 tonnes, of waste were recorded as landfilled during the audit period. Naturally the largest amounts were delivered to the Mugga Lane Landfill.

The table also shows the total weights recorded at the weighbridge at each site during the audit period, the differences between the weighbridge weights and the converted volume weights and the percent difference. Because the weight is not recorded for small domestic vehicles classified as D1 – Small Domestic, D2 – Medium Domestic and D3 Large Domestic, estimates of the weight of each vehicle was made based on a mass balance of material entering and leaving the site. The formula used to calculate the average weight of small vehicles can be found in Section 2.5.4.

At the request of ACT NOWaste, the figures for each category in Table 67 have been adjusted according to the difference between the weight and volume figures so that the weight of the components adds up to the weight recorded at the weighbridge. These adjusted figures are shown in Table 68.

Table 68 Composition by Adjusted Weight – With Garbage Bag Details

Component	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total
Office paper	333.8	58,855.2	457.0	59,646.1
Newspapers & Magazines	1,996.5	120,883.7	2,701.2	125,581.5
Other Paper	419.4	69,311.8	1,151.3	70,882.6
Disposable contaminated paper	1,841.2	237,486.4	2,201.0	241,528.5
Corrugated cardboard	4,760.8	192,747.7	10,515.3	208,023.8
Food/Kitchen	7,577.6	583,610.2	11,670.3	602,858.1
Vegetation/Garden	32,552.3	263,187.3	26,642.8	322,382.4
Other organic wood timber	38,251.3	162,436.9	58,526.8	259,215.0
Textiles clothing carpet	19,762.8	403,614.0	48,232.5	471,609.3
Rubber Other	2,720.6	8,558.9	896.9	12,176.4

Component	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total
Glass containers	1,752.5	100,349.0	3,317.4	105,418.9
Glass Misc / Other	1,675.3	11,300.3	2,101.4	15,077.0
Plastic containers	992.2	67,681.0	2,246.7	70,919.8
Film / Plastic Bags	3,830.0	205,735.7	5,748.8	215,314.4
Polystyrene	1,479.5	20,668.1	1,169.6	23,317.3
Plastic other	15,408.4	148,696.8	23,234.6	187,339.8
Steel Cans / Packaging	5,409.0	40,975.0	20,366.7	66,750.8
Ferrous	251.1	6,894.0	109.6	7,254.6
Metals non-ferrous	3,400.6	41,300.9	14,781.7	59,483.2
Concrete / cement	18,534.7	7,819.9	4,286.1	30,640.7
Bricks / Tiles	11,341.8	19,480.8	4,831.8	35,654.4
Plasterboard	6,403.4	38,724.7	15,719.4	60,847.6
Soil	9,182.4	264,655.1	14,876.6	288,714.1
Asphalt	-	-	-	-
E-waste	2,283.6	3,641.3	2,479.3	8,404.3
Household appliances big and small	-	-	-	-
Nappies	22.7	28,262.9	3,546.4	31,831.9
Ceramics	174.5	10,627.6	9,049.4	19,851.5
Fibreglass / fibreglass batts	-	-	211.5	211.5
Residual / other miscellaneous	6,749.9	232,627.8	12,488.0	251,865.8
Total (kg)	199,108.0	3,350,133.1	303,560.0	3,852,801.1

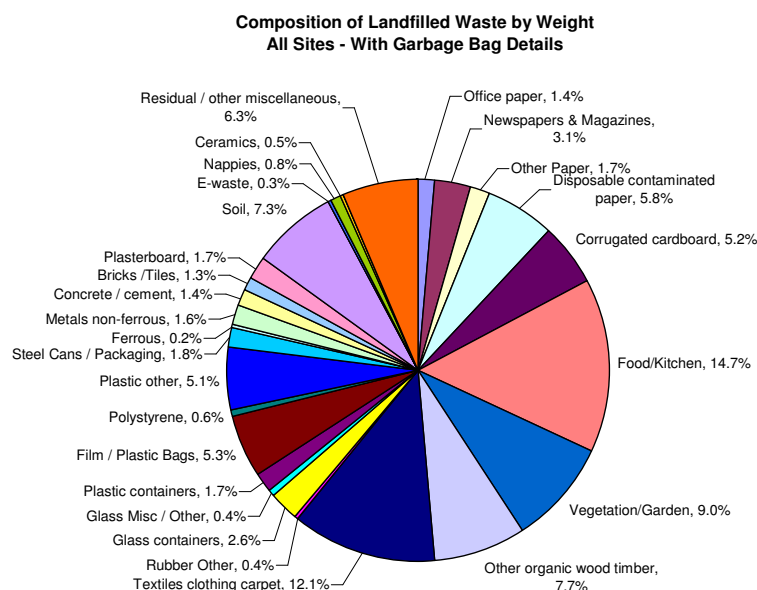


Figure 104 – Composition of Landfilled Waste at All Sites by Weight – With Garbage Bag Details

Figure 104 shows that the largest proportion of waste being landfilled at all sites by weight was food and kitchen waste (15.7%) with textiles clothing and carpet (11.8%), vegetation and garden (8.8%), other organic wood and timber (7.4%), soil (7.1%) and residual and other miscellaneous (6.8%) also forming significant proportions.

Table 69 below shows the aggregated composition in kilograms of the waste deposited for landfilling at all sites during the audit period. Details of the original categories included in aggregated composition groups can be found in Table 36.

Table 69 Aggregated Total Composition of All Sites – Kilograms – With Garbage Bag Details

Site	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Paper and cardboard	18,223	533,076	13,942	565,242	17.0%
Organics	78,198	706,205	31,581	815,985	24.5%
Wood and timber products	74,538	125,056	47,517	247,111	7.4%
Textiles and rubber	43,812	320,507	39,930	404,249	12.2%
Glass	6,680	90,511	4,441	101,632	3.1%
Plastics	42,305	351,661	26,412	420,378	12.6%
Metals	17,656	71,331	28,646	117,633	3.5%
Building material	88,589	257,233	32,278	378,100	11.4%
E-waste and office equipment	4,450	2,774	2,013	9,237	0.3%

Other	13,537	232,289	20,733	266,559	8.0%
Total (kg)	387,988.1	2,690,645.0	247,492.6	3,326,125.7	100.0%

This data is shown as percentages in Figure 105 below.

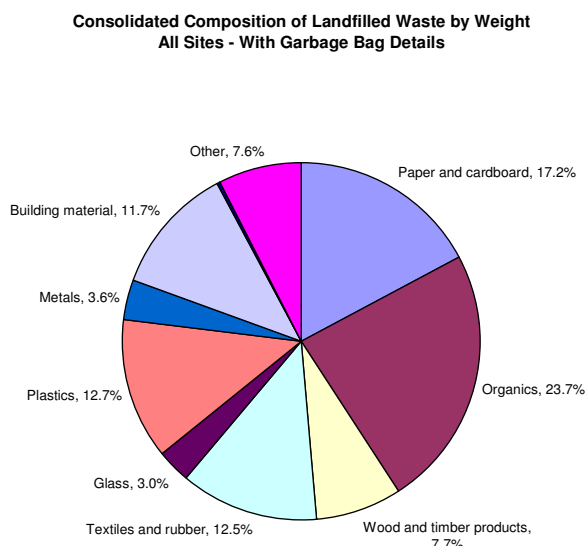


Figure 105 – Consolidated Composition of Landfilled Waste at All Sites by Volume – With Garbage Bag Details

Figure 105 shows that organics forms the largest proportion at 24.5% with paper, cardboard (17.0%), plastics (12.6%), textiles and rubber (12.2%) and building material (11.4%) also forming significant proportions.

Table 70 below shows the quantities of each stream, domestic, C&I and C&D landfilled by volume at each site each day.

Table 70 Quantities Landfilled by Stream by Volume

Stream	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Domestic	1,258,980	3,465,300	1,021,955	5,746,235	42%
C&I	718,690	6,065,500	285,170	7,069,360	52%
C&D	111,850	583,650	82,890	778,390	6%
Not known ³¹	20,650	49,500	7,500	77,650	1%
Total (litres)	2,110,170	10,163,950	1,397,515	13,671,635	100%

³¹ Vehicles for which the stream of origin could not be determined

This data is shown in the two figures below.

**Proportion of Streams Landfilled by Volume
All Sites**

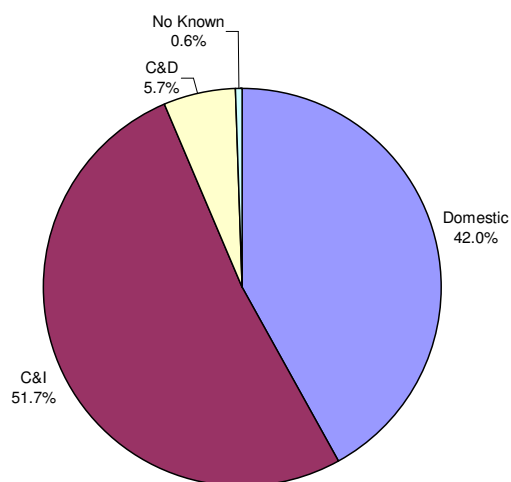


Figure 106 – Proportion of Stream Landfill by Weight at All Sites by Volume

Figure 106 shows the proportion by weight of the different streams landfilled. The proportion of C&I waste is slightly greater than domestic.

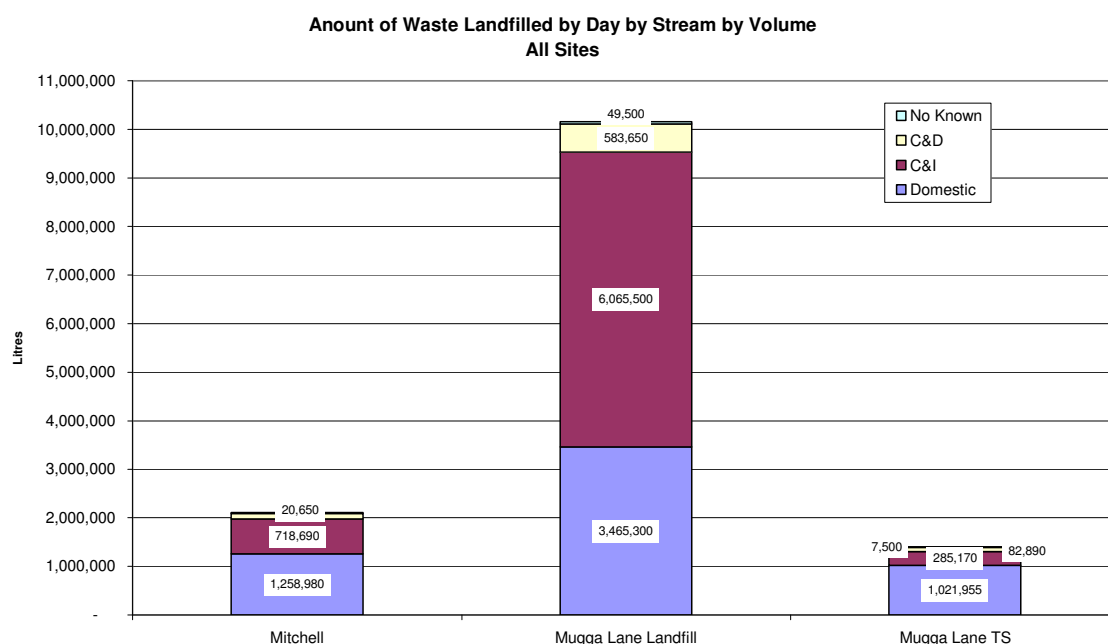


Figure 107 – Amount of Waste Landfilled by Day by Stream and by Weight at Mitchell Transfer Station

Figure 107 shows the composition and volume in litres of waste landfilled each day at all sites for the domestic, C&I and C&D streams. Most waste is deposited at Mugga Lane Landfill, about three times as much as the other two sites combined.

Table 71 below shows the quantities of each stream, domestic, C&I and C&D landfilled by weight at each site each day.

Table 71 Quantities Landfilled by Stream by Weight

Stream	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	Total	Percent
Domestic	243,818.4	1,009,404.0	180,740.9	1,433,963.3	43.1%
C&I	111,670.2	1,495,213.5	47,175.8	1,654,059.5	49.7%
C&D	29,494.5	174,752.5	18,398.4	222,645.4	6.7%
Not known ³²	3,005.0	11,275.0	1,177.5	15,457.5	0.5%
Total (kg)	387,988.1	2,690,645.0	247,492.6	3,326,125.7	100.0%

This data is shown in the two figures below.

Figure 108 – Proportion of Stream Landfill by Weight at Mugga Lane Landfill

³² Vehicles for which the stream of origin could not be determined

**Proportion of Streams Landfilled by Weight
All Sites**

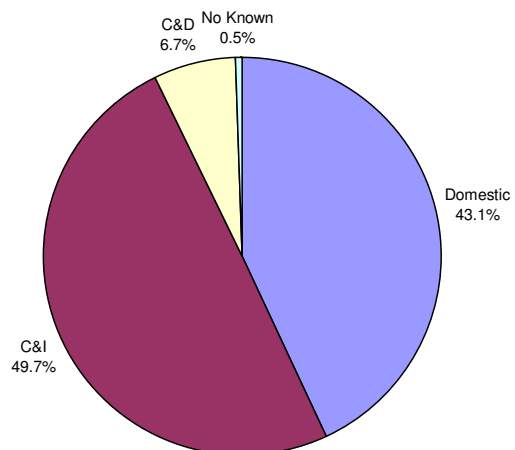


Figure 108 shows the proportion by weight of the different streams landfilled. The proportion of C&I waste is slightly greater than domestic.

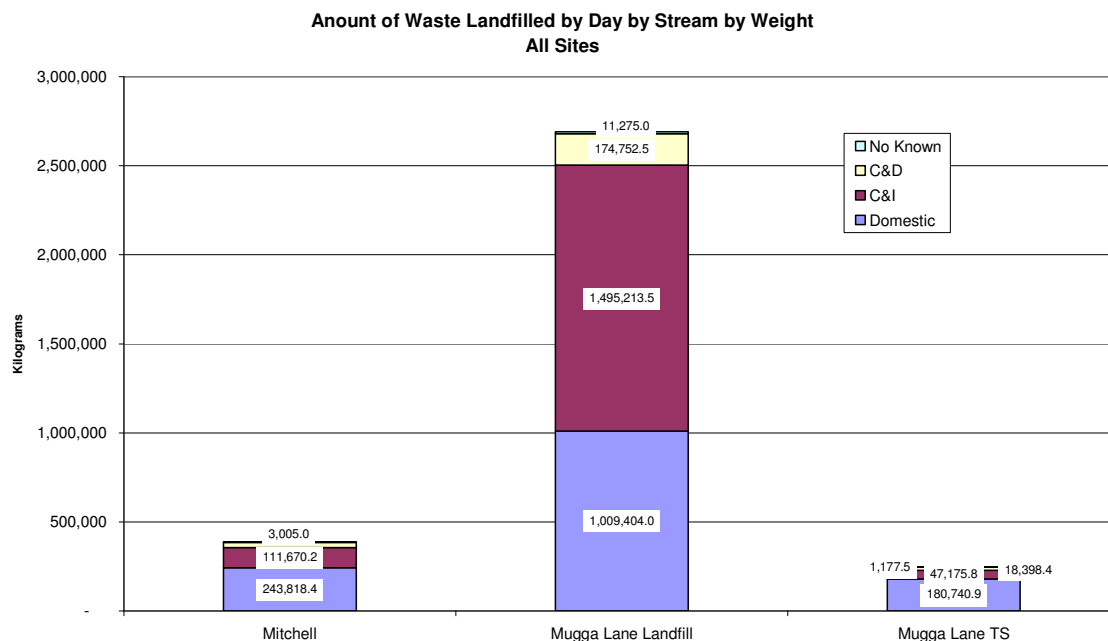


Figure 109 – Amount of Waste Landfilled by Day by Stream and by Weight at Mitchell Transfer Station

Figure 109 shows the composition and volume in litres of waste landfilled each day at all sites for the domestic, C&I and C&D streams. Most waste is deposited at Mugga Lane Landfill, about four times as much as the other two sites combined.

3.11 C&I and C&D Quantities

Table 72 below shows the estimated weight of components of the C&I stream per year. These figures have been calculated by converting the volume composition figures recorded during the landfill audit for those vehicles classified as C&I. Estimated quantities of the components of plastic bags, based on the separate audit of plastic bags, were also included. Table 73 shows these figures as percentages.

Table 72 Estimated Weight of C&I Stream per Year

Material	Mitchell Transfer Station (t)	Mugga Lane Landfill (t)	Mugga Lane Transfer Station (t)	Total (t)
Office paper	30.6	2,024.5	6.7	2,061.8
Newspapers & Magazines	44.0	846.1	16.5	906.6
Other Paper	48.0	4,444.4	20.7	4,513.0
Disposable contaminated paper	85.2	6,166.9	18.6	6,270.7
Corrugated cardboard	139.6	6,790.4	118.6	7,048.7
Food/Kitchen	180.9	7,821.0	74.6	8,076.5
Vegetation/Garden	1,706.5	7,211.0	352.7	9,270.2
Other organic wood timber	859.6	4,863.6	254.1	5,977.3
Textiles clothing carpet	801.8	11,443.7	544.5	12,790.0
Rubber Other	150.7	349.4	3.7	503.8
Glass containers	66.4	2,307.1	29.6	2,403.1
Glass Misc / Other	25.3	175.0	3.7	204.0
Plastic containers	60.1	1,674.0	34.2	1,768.3
Film / Plastic Bags	133.8	5,133.4	65.5	5,332.6
Polystyrene	85.7	534.9	10.2	630.8
Plastic other	537.3	4,513.3	157.6	5,208.2
Steel Cans / Packaging	1.0	366.7	4.6	372.3
Ferrous	68.5	656.2	53.1	777.8
Metals non-ferrous	55.8	965.5	104.1	1,125.4
Concrete / cement	32.7	1.8	9.6	44.1
Bricks / Tiles	60.6	80.1	22.0	162.8
Plasterboard	74.9	634.7	141.6	851.2
Soil	116.1	5,257.9	131.9	5,505.9
Asphalt	-	-	-	-
E-waste	85.6	144.2	24.3	254.0
Household appliances big and small	-	-	-	-
Nappies	1.7	947.5	65.2	1,014.4
Ceramics	68.0	135.2	68.8	272.0
Fibreglass / fibreglass batts	54.8	-	3.9	58.7

Material	Mitchell Transfer Station (t)	Mugga Lane Landfill (t)	Mugga Lane Transfer Station (t)	Total (t)
Residual / other miscellaneous	231.8	2,262.8	2,565.5	5,060.1
Total	5,806.9	77,751.1	4,906.3	88,464.2

Table 73 Estimated Percent Composition of C&I Stream per Year

Material	Mitchell Transfer Station (t)	Mugga Lane Landfill (t)	Mugga Lane Transfer Station (t)	Total (t)
Office paper	0.5%	2.6%	0.1%	2.3%
Newspapers & Magazines	0.8%	1.1%	0.3%	1.0%
Other Paper	0.8%	5.7%	0.4%	5.1%
Disposable contaminated paper	1.5%	7.9%	0.4%	7.1%
Corrugated cardboard	2.4%	8.7%	2.4%	8.0%
Food/Kitchen	3.1%	10.1%	1.5%	9.1%
Vegetation/Garden	29.4%	9.3%	7.2%	10.5%
Other organic wood timber	14.8%	6.3%	5.2%	6.8%
Textiles clothing carpet	13.8%	14.7%	11.1%	14.5%
Rubber Other	2.6%	0.4%	0.1%	0.6%
Glass containers	1.1%	3.0%	0.6%	2.7%
Glass Misc / Other	0.4%	0.2%	0.1%	0.2%
Plastic containers	1.0%	2.2%	0.7%	2.0%
Film / Plastic Bags	2.3%	6.6%	1.3%	6.0%
Polystyrene	1.5%	0.7%	0.2%	0.7%
Plastic other	9.3%	5.8%	3.2%	5.9%
Steel Cans / Packaging	0.0%	0.5%	0.1%	0.4%
Ferrous	1.2%	0.8%	1.1%	0.9%
Metals non-ferrous	1.0%	1.2%	2.1%	1.3%
Concrete / cement	0.6%	0.0%	0.2%	0.0%
Bricks / Tiles	1.0%	0.1%	0.4%	0.2%
Plasterboard	1.3%	0.8%	2.9%	1.0%
Soil	2.0%	6.8%	2.7%	6.2%
Asphalt	0.0%	0.0%	0.0%	0.0%

Material	Mitchell Transfer Station (t)	Mugga Lane Landfill (t)	Mugga Lane Transfer Station (t)	Total (t)
E-waste	1.5%	0.2%	0.5%	0.3%
Household appliances big and small	0.0%	0.0%	0.0%	0.0%
Nappies	0.0%	1.2%	1.3%	1.1%
Ceramics	1.2%	0.2%	1.4%	0.3%
Fibreglass / fibreglass batts	0.9%	0.0%	0.1%	0.1%
Residual / other miscellaneous	4.0%	2.9%	52.3%	5.7%
Total	100%	100%	100%	100%

The data for all sites is also shown in Figure 110 below.

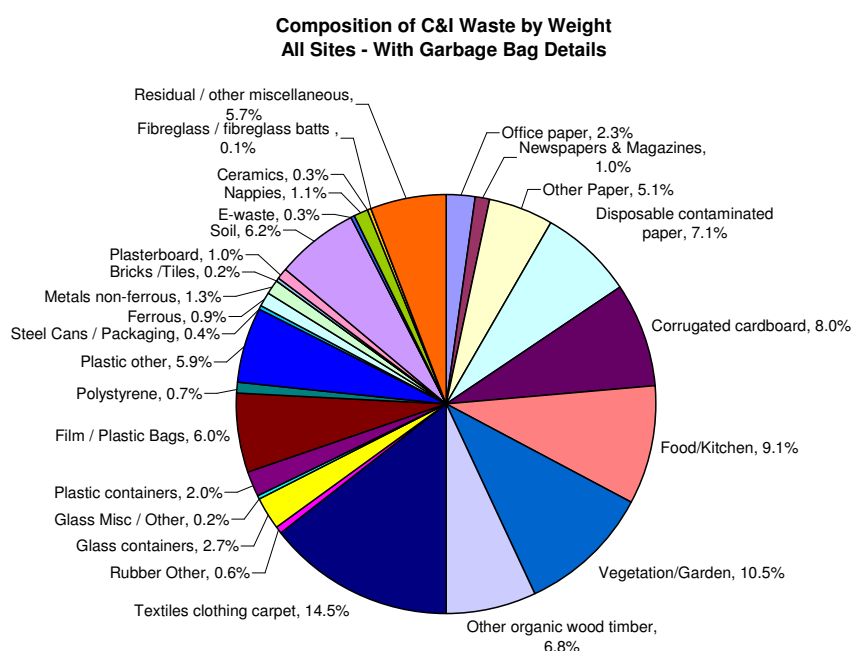


Figure 110 – Composition of C&I Waste by Weight – All Sites – With Garbage Bag Details

The chart shows that half the stream (49.2%) is made up of five main materials, textiles clothing and carpet (14.5%), vegetation and garden waste (10.5%), food and kitchen waste (9.1%), corrugated cardboard (8.0%) and disposable and contaminated paper (7.1%)

Table 74 below shows the estimated weight of components of the C&D stream per year. These figures have been calculated by converting the volume composition figures recorded during the landfill audit for those vehicles classified as C&D. Estimated quantities of the components of plastic bags, based on the separate audit of plastic bags, were also included. Table 77 shows these figures as percentages.

Table 74 Estimated Weight of C&D Stream per Year

Material	Mitchell Transfer Station (t)	Mugga Lane Landfill (t)	Mugga Lane Transfer Station (t)	Total (t)
Office paper	2.9	28.0	0.9	31.9
Newspapers & Magazines	3.1	14.5	2.2	19.8
Other Paper	7.6	49.5	1.3	58.3
Disposable contaminated paper	6.0	105.6	2.5	114.2
Corrugated cardboard	23.9	165.2	17.9	207.0
Food/Kitchen	12.8	287.0	8.9	308.7
Vegetation/Garden	45.9	105.6	20.1	171.6
Other organic wood timber	252.8	1,058.4	219.8	1,531.0
Textiles clothing carpet	22.4	995.6	111.4	1,129.4
Rubber Other	9.8	4.8	1.2	15.7
Glass containers	2.9	33.9	7.2	44.1
Glass Misc / Other	34.6	20.1	3.7	58.5
Plastic containers	1.3	28.0	3.8	33.1
Film / Plastic Bags	32.6	151.0	9.5	193.1
Polystyrene	8.1	7.7	0.9	16.7
Plastic other	64.6	104.4	24.5	193.6
Steel Cans / Packaging	0.1	6.3	0.6	7.0
Ferrous	9.7	117.6	7.3	134.6
Metals non-ferrous	22.2	235.4	13.3	271.0
Concrete / cement	203.9	240.5	40.8	485.3
Bricks /Tiles	246.7	537.4	52.4	836.4
Plasterboard	190.5	615.1	328.0	1,133.7
Soil	152.3	4,038.1	14.2	4,204.5
Asphalt	-	-	-	-
E-waste	0.9	0.0	-	0.9
Household appliances big and small	-	-	-	-
Nappies	0.1	16.2	8.8	25.1
Ceramics	121.6	83.8	42.6	248.0
Fibreglass / fibreglass batts	46.0	-	2.5	48.4

Material	Mitchell Transfer Station (t)	Mugga Lane Landfill (t)	Mugga Lane Transfer Station (t)	Total (t)
Residual / other miscellaneous	8.2	37.3	967.2	1,012.7
Total	1,533.7	9,087.1	1,913.4	12,534.3

Table 75 Estimated Percent Composition of C&D Stream per Year

Material	Mitchell Transfer Station (t)	Mugga Lane Landfill (t)	Mugga Lane Transfer Station (t)	Total (t)
Office paper	0.2%	0.3%	0.0%	0.3%
Newspapers & Magazines	0.2%	0.2%	0.1%	0.2%
Other Paper	0.5%	0.5%	0.1%	0.5%
Disposable contaminated paper	0.4%	1.2%	0.1%	0.9%
Corrugated cardboard	1.6%	1.8%	0.9%	1.7%
Food/Kitchen	0.8%	3.2%	0.5%	2.5%
Vegetation/Garden	3.0%	1.2%	1.0%	1.4%
Other organic wood timber	16.5%	11.6%	11.5%	12.2%
Textiles clothing carpet	1.5%	11.0%	5.8%	9.0%
Rubber Other	0.6%	0.1%	0.1%	0.1%
Glass containers	0.2%	0.4%	0.4%	0.4%
Glass Misc / Other	2.3%	0.2%	0.2%	0.5%
Plastic containers	0.1%	0.3%	0.2%	0.3%
Film / Plastic Bags	2.1%	1.7%	0.5%	1.5%
Polystyrene	0.5%	0.1%	0.0%	0.1%
Plastic other	4.2%	1.1%	1.3%	1.5%
Steel Cans / Packaging	0.0%	0.1%	0.0%	0.1%
Ferrous	0.6%	1.3%	0.4%	1.1%
Metals non-ferrous	1.4%	2.6%	0.7%	2.2%
Concrete / cement	13.3%	2.6%	2.1%	3.9%
Bricks / Tiles	16.1%	5.9%	2.7%	6.7%
Plasterboard	12.4%	6.8%	17.1%	9.0%
Soil	9.9%	44.4%	0.7%	33.5%
Asphalt	0.0%	0.0%	0.0%	0.0%

Material	Mitchell Transfer Station (t)	Mugga Lane Landfill (t)	Mugga Lane Transfer Station (t)	Total (t)
E-waste	0.1%	0.0%	0.0%	0.0%
Household appliances big and small	0.0%	0.0%	0.0%	0.0%
Nappies	0.0%	0.2%	0.5%	0.2%
Ceramics	7.9%	0.9%	2.2%	2.0%
Fibreglass / fibreglass batts	3.0%	0.0%	0.1%	0.4%
Residual / other miscellaneous	0.5%	0.4%	50.5%	8.1%
Total	100%	100%	100%	100%

The data for all sites is also shown in Figure 111 below.

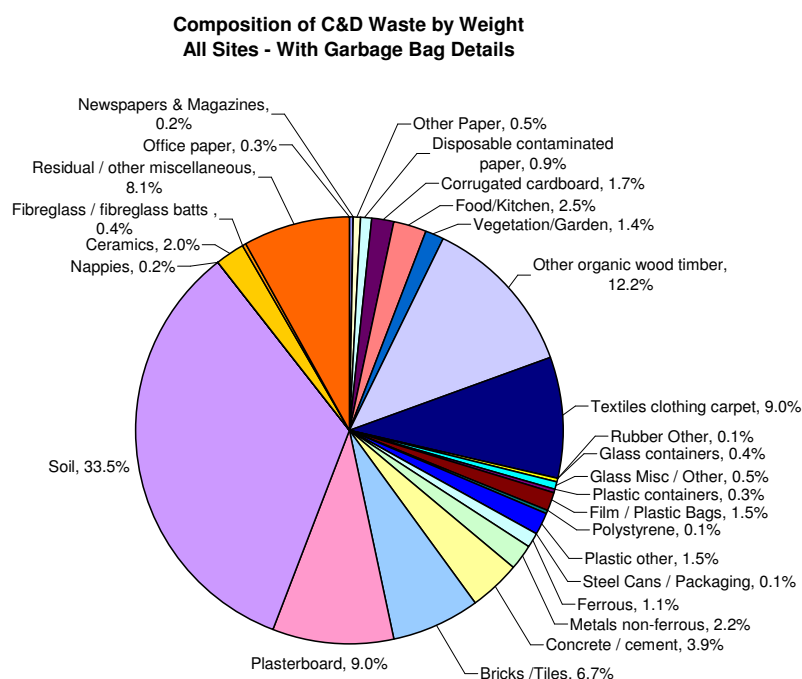


Figure 111 – Composition of C&D Waste by Weight – All Sites – With Garbage Bag Details

The chart shows that a third of the stream (33.5%) is soil with four other materials, other organic wood and timber (12.2%), plasterboard (9.0%), textiles clothing and carpet (9.0%) and residual/other miscellaneous material (8.1%) making up another 38.3%. Five materials therefore comprise the bulk of the stream at 71.8%.

4. Summary

4.1 Introduction

A total of 3097 vehicles were audited at Mugga Lane Landfill and Transfer Station and Mitchell Transfer Station over the course of the seven days of the audit. This was an average of 443 vehicles per day at all sites during the audit, about 142 vehicles per day fewer than expected. This lower number may be partially explained by the falling of Mothers Day on the Sunday of the audit. The site operators reported that the number of visitors was significantly lower than a typical Sunday.

4.2 Mitchell Transfer Station

About 2,100 cubic metres and 388 tonnes of waste were recorded as landfilled during the audit period at Mitchell Transfer Station. The largest amounts were delivered on the Monday and Sunday of the audit week.

Table 76 below shows the quantities aggregated in cubic metres and kilograms.

Table 76 Aggregated Quantities at Mitchell Transfer Station

Material Group	Cubic metres	Kilograms
Paper and cardboard	234.3	18,223.2
Organics	445.3	78,198.4
Wood and timber products	407.5	74,537.6
Textiles and rubber	329.4	43,811.9
Glass	19.0	6,679.6
Plastics	356.8	42,305.0
Metals	64.7	17,655.9
Building material	148.5	88,589.3
E-waste and office equipment	29.3	4,449.9
Other	75.3	13,537.3
Total	2,110.2	387,988.1

By volume organic material, paper and cardboard, wood and timber, vegetation and kitchen waste, was the largest proportion of this stream totalling 51.5%. A further 44.9% was metals, textiles, plastics, building material and other potentially recoverable materials.

Greater quantities of organics are deposited on Monday, Wednesdays and Thursday, but otherwise the amounts of most materials are relatively consistent across all weekdays, with the exception of Tuesday. The average load size on Tuesday was 1.2 m³ compared to over 2 m³ on other weekdays (up to 3 m³ on Wednesday).

The types of vehicles delivering to the transfer station tend to be smaller with a variety of small cars, utes, vans and station wagons, with and without trailers, recorded.

Most loads delivered were of domestic origin. On weekdays, the number of C&I and domestic loads delivered was a roughly equal but on weekends there were many more domestic loads. Overall, about twice as many loads were delivered each weekend day than on any weekday.

4.3 Mugga Lane Landfill

About 10,000 cubic metres and 2,700 tonnes of waste were recorded as landfilled during the audit period at the Mugga Lane Landfill. The largest amounts were delivered on the Monday and Tuesday of the audit period. The largest proportion of waste being landfilled was garbage bags of rubbish coming mostly from domestic waste vehicles as well as commercial RORO compactors.

Table 77 below shows the quantities aggregated in cubic metres and kilograms.

Table 77 Aggregated Quantities at Mugga Lane Landfill

Material Group	Cubic metres	Kilograms
Paper and cardboard	2,755.9	533,076
Organics	1,972.9	706,205
Wood and timber products	591.5	125,056
Textiles and rubber	1,296.1	320,507
Glass	182.2	90,511
Plastics	2,222.3	351,661
Metals	192.1	71,331
Building material	332.7	257,233
E-waste and office equipment	20.6	2,774
Other	597.7	232,289
Total	10,164.0	2,690,645.0

Paper and cardboard formed the largest proportion and with plastics and organics made up almost 70% of this stream.

Most waste is deposited at the landfill on weekdays and most of this is garbage bags, mainly from domestic collections and large-scale commercial collections.

Because small vehicles are generally not allowed to tip at the main landfill, most of the vehicles recorded there were large. Side lift vehicles delivering domestic waste were the most common but commercial front lift and rear lift vehicles also formed significant proportions.

Most vehicles delivered on weekdays and there was little significant difference in the numbers each day. Most loads delivered were C&I in origin.

4.4 Mugga Lane Transfer Station

About 1,400 cubic metres and 250 tonnes of waste were recorded as landfilled during the audit period. The largest amounts were delivered on the Monday.

Table 78 below shows the quantities aggregated in cubic metres and kilograms.

Table 78 Aggregated Quantities at Mugga Lane Transfer Station

Material Group	Cubic metres	Kilograms
Paper and cardboard	197.5	13,942
Organics	157.9	31,581
Wood and timber products	270.8	47,517
Textiles and rubber	290.8	39,930
Glass	12.6	4,441
Plastics	211.5	26,412
Metals	106.7	28,646
Building material	76.2	32,449
E-waste and office equipment	11.4	2,013
Other	62.1	20,561
Total	1,397.5	247,493

Textiles and rubber, closely followed by wood and timber products, form the largest proportions of this stream. Other significant components including organics, plastic s and paper and cardboard. Building materials, although only a small proportion by volume is significant by weight.

Most waste is deposited on Monday and amounts reduce as the week goes on with the smallest amounts being deposited on Wednesday. Quantities increase again towards the weekend and there does not appear to be any significant changes in composition between different days.

Small vehicles are directed to the transfer station and as a result no large vehicles such as front lift or rear lift commercial vehicles or domestic side lift vehicles were recorded at the transfer station. A variety of small cars, utes, vans and station wagons, with and without trailers, were the most common vehicles (a total of 93.8%).

Most vehicles deliver to the transfer station on the weekends but there is a significant difference in the numbers each weekend day with more deliveries on Monday and last on Thursday. Most loads delivered were domestic in origin.

4.5 All Sites

About 13,600 cubic metres and 3,300 tonnes of waste were recorded as landfilled during the audit period. The largest amounts were delivered to the Mugga Lane

Landfill. Most waste was garbage bags of rubbish coming from domestic waste vehicles and commercial compactors.

The composition of the landfilled stream by weight and volume at all sites is mostly dry cardboard and vegetation. Rock/dirt/soil is also a significant component by weight.

Table 79 and Table 80 below shows the quantities aggregated in cubic metres and kilograms.

Table 79 Aggregated Quantities all Sites – Cubic Metres

Material Group	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	All Sites
Paper and cardboard	234.3	2,755.9	197.5	3,187.7
Organics	445.3	1,972.9	157.9	2,576.1
Wood and timber products	407.5	591.5	270.8	1,269.9
Textiles and rubber	329.4	1,296.1	290.8	1,916.3
Glass	19.0	182.2	12.6	213.8
Plastics	356.8	2,222.3	211.5	2,790.7
Metals	64.7	192.1	106.7	363.5
Building material	148.5	332.7	76.2	556.7
E-waste and office equipment	29.3	20.6	11.4	61.3
Other	75.3	597.7	62.1	735.7
Total	2,110.2	10,164.0	1,397.5	13,671.7

Table 80 Aggregated Quantities all Sites – Kilograms

Material Group	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	All Sites
Paper and cardboard	18,223	533,076	13,942	565,242
Organics	78,198	706,205	31,581	815,985
Wood and timber products	74,538	125,056	47,517	247,111
Textiles and rubber	43,812	320,507	39,930	404,249
Glass	6,680	90,511	4,441	101,632
Plastics	42,305	351,661	26,412	420,378
Metals	17,656	71,331	28,646	117,633
Building material	88,589	257,233	32,449	378,100
E-waste and office equipment	4,450	2,774	2,013	9,237
Other	13,537	232,289	20,561	266,559
Total	387,988	2,690,645	247,493	3,326,125.7

By volume, the largest proportion of the landfilled stream was paper and cardboard, with organics and plastics the next largest proportions. By weight organics was the largest proportion followed by paper and cardboard, plastics and textiles and rubber.

Most waste was deposited at Mugga Lane Landfill with only small quantities at the transfer stations.

By far the largest proportions of vehicles tipping materials for landfilling at all three sites were small vehicles. Of the remaining vehicles, side lift trucks and tippers formed the largest proportions.

The composition of vehicles delivering to the two transfer stations is very similar with a predominance of small vehicles. By contrast the composition of vehicles recorded at the landfill is mostly larger vehicles.

More C&I loads were delivered to the landfill but overall most loads across all sites were domestic.

4.6 Trash Paks

Some vehicles disposing of waste are commercial operators collecting green waste from domestic premises. ACT NOWaste is interested in the number of these vehicles tipping and the quantities. Further analysis was conducted by ACT NOWaste on the audit data and this information can be found in Appendix D.

4.7 Confidence Intervals

4.7.1 Method

Confidence intervals (CIs) for 90% accuracy were calculated for each category of waste recorded during the visual audits and during the physical bag audits. Confidence intervals were calculated for each of the transfer stations and the landfill for the visual audits and for all samples audited in the physical bag audit.

The formula used to calculate the CIs was as follows:

$$\frac{sd}{\sqrt{n} \times 1.64}$$

Where

sd is the standard deviation

n is the number of loads

1.64 is the constant for 90% level of accuracy

The 90% level of accuracy means that we can be 90% sure that the true value falls between the upper and lower CI range. The upper CI range was calculated by adding the CI to the average value for the loads audited. The lower CI range was calculated by subtracting the CI from the average value for the loads audited. The percentage variation was calculated by dividing the CI by the average.

4.7.2 Visual Audit

There was considerable variation in the CI ranges of materials recorded during the visual audits with very high percent variations for materials found in only small quantities such as concrete and cement. In the case of concrete and cement the difference between the average amount per load and the CI was 284% at Mugga Lane Transfer Station, 1162% at Mugga Lane Landfill and 3334% at Mitchell Transfer Station.

Other, more common materials had much smaller CI ranges. The difference between the average per load and the CI for dry cardboard was 29% at Mugga Lane Transfer Station, 20% at Mitchell Transfer Station and only 15% at Mugga Lane Landfill.

Table 81 below shows the CI details for each site for all visual audit loads.

Table 81 Overall Confidence Intervals – Visual Audit

Facility	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	All Facilities
Average	1,232.4	11,736.7	1,273.9	3,733.1
CI Value	153.1	371.7	58.9	179.9
Lower CI	1,079.3	11,365.0	1,215.1	3,553.2
Upper CI	1,385.5	12,108.3	1,332.8	3,913.0

Facility	Mitchell Transfer Station	Mugga Lane Landfill	Mugga Lane Transfer Station	All Facilities
sd	3143	6669	1187	6104
<i>n</i>	1,134	866	1,097	3,097
Percent Lower CI	88%	97%	95%	95%
Percent Upper CI	112%	103%	105%	105%
Percent CI	12%	3%	5%	5%

The table shows that the average volume of each load at Mitchell Transfer Station was 1,232.4 litres with a confidence interval of 153.1 litres, or 12% of the average. This means that the true overall average amount per load is 90% likely to fall between 1,079.3 litres and 1,385.4 litres a range of 12% either side of the average. The figures for Mugga Lane Landfill and Transfer Station show more accurate results with the true value for the average of all loads recorded at the landfill likely to fall within only 3% either side of the average.

4.7.3 Plastic Bag Audit

The variation in the CIs of materials recorded during the plastic bag audits was not as great as that recorded during the visual audits. The greatest CI range was found for soil, which was 818%. More common materials had much lower ranges with the CI range for disposable contaminated paper was only 15%.

Table 82 below shows the CI details for the physical bag audit samples.

Table 82 Overall Confidence Intervals – Plastic Bag Audit

Facility	Plastic Bag Audit
Average	7.31
CI Value	0.65
Lower CI	6.66
Upper CI	7.96
sd	5.4
<i>n</i>	189
Percent Lower CI	91%
Percent Upper CI	109%
Percent CI	9%

The table shows that the average weight of each sample audited was 7.31 kg with a confidence interval of 0.65 kg, or 9% of the average. This means that the true overall average amount per sample is 90% likely to fall between 6.66 kg and 7.96 kg, a range of 9% either side of the average. The small sample size is likely to produce a wide CI

range however, this is off-set somewhat by the relatively homogenous nature of the contents of the samples.

5. Conclusions

The results of the initial landfill audit showed that a full appreciation of the composition of landfilled waste deposited at the sites was not possible without an investigation of the contents of the bags of garbage that formed such a large proportion of the waste stream.

Subsequently this audit was commissioned and the results were incorporated into the overall results of the landfill audit. In this way the complete composition of the waste stream being landfilled was compiled.

An examination of the landfilled stream shows that almost 70% of the stream is comprised of seven materials; disposable and contaminated paper, corrugated cardboard, food and kitchen waste, vegetation and garden waste, other timber and wood, textiles, clothing and carpet and film and plastic bags. The 30% balance is made up of 19 other materials.

By weight the seven largest components made up less than 65%. These were; food and kitchen waste, textiles, clothing and carpet, vegetation and garden waste, other timber and wood, soil, residual/miscellaneous and disposable and contaminated paper.

Five materials were coming to both groups; disposable and contaminated paper, food and kitchen waste, vegetation and garden waste, other timber and wood and textiles, clothing and carpet were among the largest proportions of the landfilled stream whether measured by volume or by weight.

Although facilities exist at the audited sites for the separation and recovery most of these materials, clearly much material which could be separated for recovery is being landfilled. It is likely that the quantities of these materials that are currently being recycled in Canberra are those that are the most easily separated. If 50% of the recoverable materials currently going to landfill were separated, diversion would increase by 22% across all sites. Diversion would rise by 31% across all sites if 70% of the recoverable materials currently going to landfill were separated.

Aside from the space these materials occupy in landfill, there are significant implications under the Commonwealth Government's Carbon Pollution Reduction Scheme (CPRS), which is planned to come into operation in 2011. Even with a gas capture system in place, the Mugga Lane Landfill would be subject to significant liability under the CPRS if the composition of the waste stream being deposited there remains unchanged.

The good news is that liability would only be calculated on the composition of the waste streams being deposited when the CPRS begins in 2011. This leaves about two years for ACT NOWaste to reduce as much as possible the amount of organic material being landfilled. Emissions and liability can be quantified and different CPRS liability scenarios can be modelled using the compositional results of this audit.

Asking the large number of customers with small amounts of waste, who arrive at high frequency at the waste facilities, to separate their waste in order to recover the materials in question, is a logistically and educationally difficult task. A technological

solution may be required. Materials recovery facilities that are designed to handle bulky materials, like those being delivered, may be the best way to recover them.

The ability to accurately measure waste by weight is hampered somewhat by the practice of not recording the net weight of small vehicles. Although overall they do not deliver quantities as great as those from household and commercial operators, but they make up the largest proportion of entries to transfer stations and the effect of this lack of information is felt most in the analysis of the data relating to the transfer stations.

6. Recommendations

6.1 Medium Term

In the next two to three years, ACT NOWaste should investigate options and technologies for large scale mechanical and biological separation and treatment of domestic and commercial waste.

6.2 Short Term

In the next six months to a year ACT NOWaste should:

- ▶ Upgrade and expand facilities for the recovery of paper and cardboard, green waste, timber, e-waste and plastics from the commercial waste stream at the Mitchell and Mugga Lane sites;
- ▶ Increase the cost of landfilling these materials;
- ▶ Improve systems for the regular measurement of waste at the weighbridge by;
 - Recording the net weight of small vehicles;
 - Recording the destination of loads within the Mitchell and Mugga Lane facilities;
 - Recording the composition of loads; and
 - Recording more accurately the origin of loads.

Appendix A

Audit Categories

Domestic As Used	Landfill As Used	To Compare To The Domestic Audit Categories	Proposed Sorting (Backwards Compatible With Domestic Audit)	In Landfill Audit Reported As
Newspapers & Magazines	Office paper	Other Paper	Office paper	Office paper
Other Paper	Paper all other	Newspapers & Magazines	Newspapers & Magazines	Paper all other
Disposable contaminated paper		Other Paper	Other Paper	Paper all other
		Disposable contaminated paper	Disposable contaminated paper	Paper all other
Corrugated cardboard	dry cardboard	Corrugated cardboard	Corrugated cardboard	dry cardboard
	wet cardboard			
Food/Kitchen	Food/Kitchen	Food/Kitchen	Food/Kitchen	Food/Kitchen
Garden / garden organics	Vegetation/Garden	Garden / garden organics	Vegetation/Garden	Vegetation/Garden
Other organic wood timber	Wood - Furniture	Other organic wood timber	Other organic wood timber	Other organic / Wood in bags
Textiles clothing carpet	Wood - MDF			
glass packaging / containers	Wood - Solid Untreated			
Glass Misc / Other	Wood Solid Treated			
Plastic 1 PET	textiles carpet	Textiles clothing carpet	Textiles clothing carpet	Textiles clothing carpet in bags
Plastic 2 HDPE	textiles cloth			
Plastic 3 PVC	Textiles - cloth furniture			
Plastic 4 LDPE	textiles/Leather other			
Polypropylene	rubber - tyres			
Polystyrene	Rubber Other	residual / other miscellaneous	Rubber Other	Rubber Other
film / Plastic Bags	Glass containers	glass packaging / containers	Glass containers	Glass containers
Other Plastic	Glass Plate	Glass Misc / Other	Glass Misc / Other	
Liquidpaperboard	Plastic containers	Plastic containers in bags	Plastic containers	Plastic containers
Aluminium	Plastic film	film / Plastic Bags	film / Plastic Bags	Plastic film
Steel packaging	polystyrene foam	Polystyrene	Polystyrene	Polystyrene
Ferrous other	plastic other	Other Plastic	plastic other	plastic other
Fibreglass		Steel packaging	Steel Cans / Packaging	Steel Cans / packaging in bags
residual / other miscellaneous	ferrous	Ferrous other	ferrous	ferrous
Hazardous	metals non-ferrous	Aluminium	metals non-ferrous	metals non-ferrous
medical / sharps	concrete / cement	concrete	concrete / cement	concrete / cement
nappies	Bricks / Tiles	cobbles / boulders	Bricks / Tiles	Bricks / Tiles
chemicals	plasterboard	plasterboard	plasterboard	plasterboard
ceramics	soil	soil / rubble / inert	soil	soil
naturally excavated soil	Asphalt	asphalt / road construction	Asphalt	Asphalt
soil / rubble / inert	Computers/office equip/toner cart	Other Plastic	E-waste	Computers/office equip/toner cart
cobbles / boulders	Household items	Other Plastic or residual	Household appliances big and small	Household items
concrete		Nappies	Nappies	Nappies
asbestos		Ceramics	Ceramics	Ceramics
plasterboard		Fibreglass	Fibreglass / fibreglass batts	Fibreglass / fibreglass batts
asphalt / road construction	Mattresses	residual / other miscellaneous	residual / other miscellaneous	residual / other miscellaneous
fibrous cement sheet	Garbage bags of Rubbish			
	Dead Animals			
37	34	30	30	27

Appendix B

Vehicle Classifications

Appendix C

Weighbridge Classification Codes

Appendix D
Trash-Pak Data Supplied by ACT
NOWaste

Table 83 Tonnes of greenwaste to Mugga landfill by load contamination - Data from the Audit Week

Customer	% Contamination						Total Tonnes
	0%	0-5%	5-25%	25-50%	50-75%	75-100%	
ACT Government 1	8.85		0.9			1.5	11.25
ACT Government 2	4.88				0.68		5.55
Unknown	2.2		1.76	1.76	0.66	1.62	8.
Customer 1	0.3	0.68			7.7	6.7	15.38
Customer 2				0.22		13.	13.22
Customer 3	1.5			5.28		3.97	10.75
Customer 4		2.4	2.7	1.28	1.5	0.45	8.33
Customer 5	1.2		4.4	0.88	1.32	0.22	8.02
Customer 6	3.		0.6			2.18	5.78
Customer 7	2.4		0.68	1.5		0.68	5.25
Customer 8				4.4	0.77		5.17
Customer 9					3.3	0.3	3.6
Customer 10				0.9	2.03	0.68	3.6
Customer 11						3.	3.
Customer 12					3.		3.
Customer 13				1.2	1.43	0.3	2.93
Customer 14				2.7			2.7
Customer 15	2.4						2.4
Customer 16	1.5						1.5
Customer 17					1.28	0.23	1.5
Customer 18		1.31					1.31
Customer 19	1.2						1.2
Customer 20				0.45	0.6	0.11	1.16
Customer 21					0.55	0.55	1.1
Customer 22		0.9					0.9

Customer 23				0.9			0.9
Customer 24			0.75				0.75
Customer 25				0.75			0.75
Customer 26				0.6	0.11		0.71
Customer 27				0.68			0.68
Customer 28					0.66		0.66
Customer 29	0.6						0.6
Customer 30	0.6						0.6
Customer 31				0.6			0.6
Customer 32				0.3	0.23		0.53
Customer 33	0.45						0.45
Customer 34	0.45						0.45
Customer 35				0.44			0.44
Customer 36				0.38			0.38
Customer 37	0.3						0.3
Customer 38					0.3		0.3
Customer 39					0.22		0.22
Customer 40					0.15		0.15
Customer 41					0.11		0.11
Customer 42					0.08		0.08
Total Tonnes	31.83	5.29	11.79	22.52	27.49	37.31	136.21

Table 84 Tonnes of greenwaste to Mugga Transfer station by load contamination - Data from the Audit Week

Customer	% Contamination						Total Tonnes
	0%	0-5%	5-25%	50-75%	25-50%	75-100%	
Customer 1	0.3	0.15	0.9	0.44	0.74	0.37	2.9
Customer 2			0.23	0.77	1.46	0.14	2.6
Customer 3	0.05		0.64	0.69	0.76	0.22	2.35
Customer 4		0.23	0.41	0.32	0.6	0.47	2.01
Customer 5				0.98		0.15	1.13
Customer 6			0.75	0.38			1.13
Customer 7			0.75				0.75
Customer 8	0.45			0.05			0.5
Customer 9					0.45		0.45
Customer 10				0.41			0.41
Customer 11			0.04		0.3		0.34
Customer 12				0.2		0.11	0.3
Customer 13				0.19			0.19
Customer 14						0.17	0.17
Customer 15				0.12		0.05	0.17
Total Tonnes	0.8	0.38	3.71	4.52	4.31	1.65	15.36

Table 85 Tonnes of Greenwaste to Mitchell Transfer Station by Load Contamination - Data from the Audit Week

Customer	% Contamination by Weight						Total Tonnes
	0%	0-5%	5-25%	25-50%	50-75%	75-100%	
Unknown	3.8		2.4	5.62	3.32	3.	18.14
Customer 1				7.28	3.11	0.09	10.48
Customer 2				7.65	1.35	0.15	9.15
Customer 3			1.59	3.38	3.33	0.08	8.38
Customer 4			0.45	1.73	1.24	0.74	4.15
Customer 5	1.4		0.6		0.03	0.41	2.43
Customer 6	1.13	0.12	0.06	0.15	0.15	0.11	1.72
Customer 7	0.3			0.14	0.29	0.69	1.41
Customer 8	0.9						0.9
Customer 9	0.45				0.06	0.11	0.62
Customer 10				0.3		0.12	0.42
Customer 11				0.38			0.38
Customer 12					0.15		0.15
Customer 13				0.15			0.15
Customer 14						0.15	0.15
Customer 15						0.15	0.15
Customer 16	0.09					0.03	0.12
Customer 17					0.06	0.03	0.09
Customer 18					0.08		0.08
Customer 19			0.06				0.06
Total Tonnes	8.06	0.12	5.16	26.76	13.16	5.85	59.11

Table 86 Total Tonnes of Greenwaste by Load Contamination - Data from the Audit Week

Customer	Number of greenwaste loads	% Contamination by Weight						Total Tonnes
		0%	0-5%	5-25%	25-50%	50-75%	75-100%	
Unknown	166	6.		4.16	7.38	4.4	4.62	26.54
ACT Government 1	19	8.85		0.9			1.5	11.25
ACT Government 2	10	5.33				0.72		6.05
Customer 1	24	0.3	0.68			7.7	6.7	15.38
Customer 2	12	2.4		0.68	9.15	1.35	0.83	14.4
Customer 3	18				8.18	5.14	0.77	14.08
Customer 4	66				0.22		13.	13.22
Customer 5	17	1.5			5.28		3.97	10.75
Customer 6	15			1.59	3.38	3.33	0.23	8.53
Customer 7	8		2.4	2.7	1.28	1.5	0.45	8.33
Customer 8	16	4.4		1.24	0.3	0.03	2.58	8.54
Customer 9	7	1.2		4.4	0.88	1.32	0.22	8.02
Customer 10	3				4.4	0.77		5.17
Customer 11	40			0.68	3.19	2.	0.87	6.74
Customer 12	5					3.3	0.3	3.6
Customer 13	2						3.	3.
Customer 14	2					3.		3.
Customer 15	6				1.2	1.43	0.3	2.93
Customer 16	3				2.7			2.7
Customer 17	2	2.4						2.4
Customer 18	32	0.45	1.13	0.41	0.6	0.38	0.58	3.53
Customer 19	45	1.17	0.12	0.7	0.91	0.84	0.33	4.07
Customer 20	51	0.6	0.15	0.9	0.88	0.72	1.06	4.31
Customer 21	1	1.5						1.5
Customer 22	5					1.28	0.23	1.5
Customer 23	1		1.31					1.31
Customer 24	2	1.2		0.75				1.95

Customer	Number of greenwaste loads	% Contamination by Weight						Total Tonnes
		0%	0- 5%	5- 25%	25- 50%	50- 75%	75-100%	
Customer 25	4				0.45	0.6	0.11	1.16
Customer 26	2					0.55	0.55	1.1
Customer 27	1				0.9			0.9
Customer 28	1	0.9						0.9
Customer 29	1			0.75				0.75
Customer 30	1				0.75			0.75
Customer 31	2					0.6	0.11	0.71
Customer 32	5	0.6				0.06	0.03	0.69
Customer 33	1					0.68		0.68
Customer 34	4						0.66	0.66
Customer 35	2	0.45			0.45			0.9
Customer 36	4					0.98	0.15	1.13
Customer 37	3			0.75		0.38		1.13
Total Tonnes	609	39.24	5.78	20.6	52.46	43.03	43.11	204.22
Extrapolated Annual	31,668	2,040	301	1,071	2,728	2,237	2,242	10,619

* Note that the amount of greenwaste sent to landfill is highly seasonal, and it may not be appropriate to extrapolate in this way. The audit was undertaken in mid May.

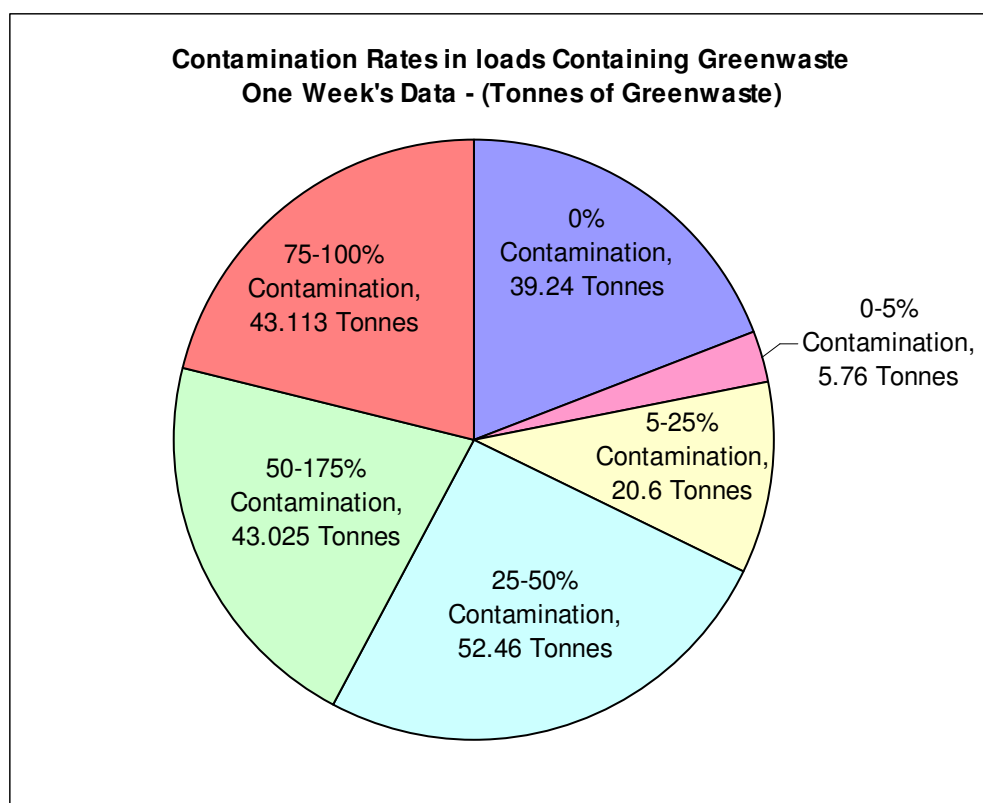


Figure 112 - Contamination Rates in Loads Containing Greenwaste

Table 87 Tonnes of Greenwaste by Contamination Rate of Loads by Source - Data from the Audit Week

SOURCE	Contamination Rates of Loads by Weight						Total Tonnes Greenwaste	Extrapolated Annual *
	0%	0-5%	5-25%	25-50%	50-75%	75-100%		
ACTGOV agencies	14.18	0.	0.9	0.	0.72	1.5	17.3	899.34
Probable Trash Pack Operators	3.6	2.4	8.53	19.48	11.13	3.04	48.17	2504.97
Other	21.46	3.38	11.17	32.98	31.17	38.58	138.75	7214.9

* Note that extrapolation from one week's data in May may not provide a reliable annual figure due to seasonal variations

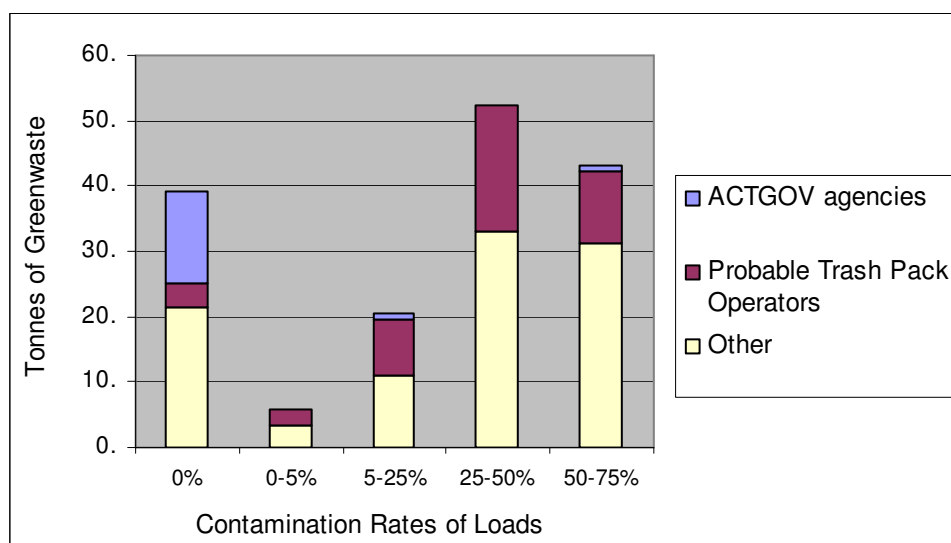


Figure 113 - Contamination Rates

Table 88 Composition of Loads Containing Greenwaste from Trash Pack Operators - Data from the Audit Week

	Trash Pack 1	Trash Pack 2	Trash Pack 3	Trash Pack 4	Trash Pack 5	Trash Pack 6	Trash Pack 7	Total Tonnes	% of Total Tonnage
Greenwaste	14.4	14.08	8.33	8.02	1.5	1.1	0.75	48.17	39.1%
Bags and loose garbage	8.17	9.2	2.99	7.5	2.19	19.8	0.	49.84	40.4%
Plastics	5.	3.85	0.7	0.3	0.33	1.64	0.	11.82	9.6%
Textiles and rubber	3.37	3.04	0.13	0.	0.32	0.	0.	6.86	5.6%
Building material	1.37	1.49	0.93	0.	0.	0.8	0.	4.59	3.7%
E-waste and office equipment	0.09	0.33	0.75	0.	0.	0.	0.	1.17	0.9%
Glass	0.	0.25	0.	0.	0.	0.28	0.	0.53	0.4%
Other	0.17	0.	0.	0.	0.	0.	0.	0.17	0.1%
Wood and timber products	0.02	0.02	0.01	0.01	0.01	0.01	0.	0.08	0.1%
Metals	0.02	0.02	0.01	0.01	0.01	0.01	0.	0.08	0.1%
Food / Kitchen	0.	0.	0.	0.	0.	0.	0.	0.	0.0%
Hazardous	0.	0.	0.	0.	0.	0.	0.	0.	0.0%

	Trash Pack 1	Trash Pack 2	Trash Pack 3	Trash Pack 4	Trash Pack 5	Trash Pack 6	Trash Pack 7	Total Tonnes	% of Total Tonnage
Total Tonnes	32.61	32.29	13.85	15.84	4.34	23.64	0.75	123.31	

* Note that an unknown number of Trash Pack operators also dispose of greenwaste to the green waste processing facility.

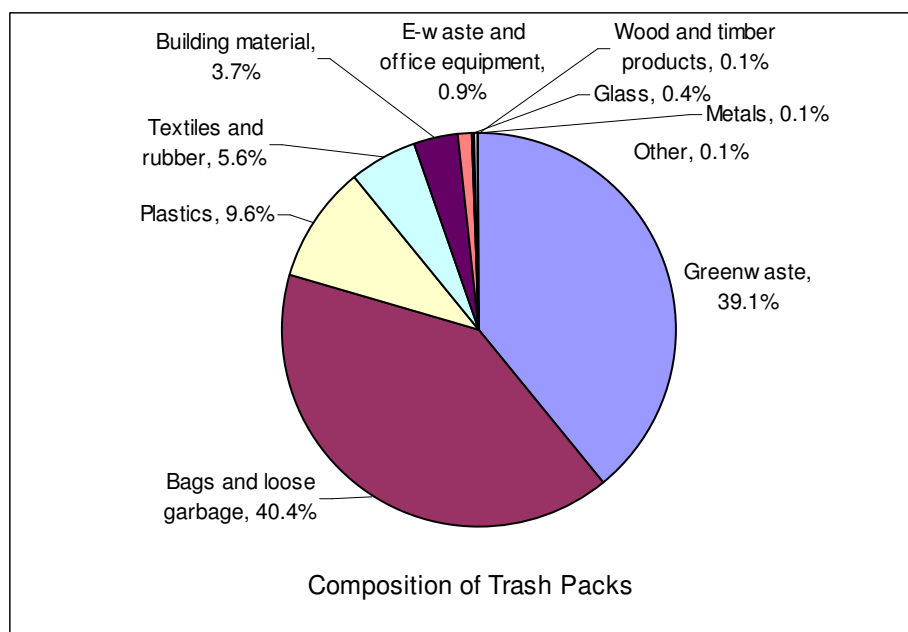


Figure 114 - Composition of Trash Packs

