

Appendix 1

Survey methodology

1 An overview of the Survey Methodology

The main steps involved in the survey are outlined below:

Step 1 – Design of C&I waste stream survey methodology

DECCW developed a survey methodology in consultation with the panel of waste auditors and the waste facilities to be surveyed.

A desktop study of the C&I Waste disposal tonnages in Sydney was used to select the most representative survey sites. It included extensive consultation with waste facilities receiving C&I waste for transfer or disposal.

Step 2 – Pre-field survey

DECCW selected the survey sites and compiled site-specific information for the waste auditors to use.

Tender documents were prepared and proposals invited from the current panel of waste auditors. Waste Audit and Consultancy Services was appointed to undertake the gatehouse survey and visual assessment of C&I loads. EC Sustainable Environment Consultants were appointed to undertake the garbage bag survey.

A field audit survey schedule and OHS and Work Method Statements were finalised by the auditors to the satisfaction of each participating site and DECCW.

Step 3 – Field survey

A gatehouse survey was undertaken at each participating site on the two days used for the survey to record the type and source of waste and delivery vehicle details.

All the mixed C&I loads received at six landfills and six transfer stations were visually assessed, as in the survey schedule.

Garbage bags picked up from five landfills and four transfer stations were physically sorted by weight at a nominated site.

DECCW staff inspected the survey in progress at all sites.

Auditors provided weekly progress reports.

Step 4 – Data analysis and reporting

Site-specific raw data were provided to each site in a summarised format.

Both auditors analysed the data in detail;

The composition of the garbage bags was distributed across the C&I waste stream.

The auditors produced draft reports for DECCW's feedback and the reports were finalised for internal use.

DECCW further analysed the survey results using the database that contains disposal tonnages recorded from the on-line Waste Contributions Monthly Reporting (WCMR) completed by disposal facilities, and prepared this report for publishing.

2 Visual assessment of loads

The methodology employed for the visual assessment of loads was consistent with that used for the baseline survey in 2003. Where necessary it was modified for waste densities and classifications as a result of subsequent disposal-based surveys done in other regions and states.

The field survey was undertaken between 16 June and 8 August 2008. The surveys were completed over two week days at each site.

The survey schedule for the sites is shown in Table 1.

Table A1-1: Survey schedule

Site	Type	General solid waste type accepted	Survey period
Site A	Transfer station	Putrescible	17 and 18 June 2008
Site B	Landfill	Non-putrescible	17 and 18 June 2008
Site C	Transfer station	Putrescible	19 and 20 June 2008
Site D	Transfer station	Putrescible	23, 24 and 25 June 2008
Site E	Transfer station	Non-putrescible	26 and 27 June 2008
Site F	Landfill	Putrescible	8 and 9 July 2008
Site G	Landfill	Non-putrescible	10 and 11 July 2008
Site H	Landfill	Putrescible	22 and 23 July 2008
Site M	Landfill	Non-putrescible	24 and 25 July 2008
Site J	Transfer station	Non-putrescible	29 and 30 July 2008
Site K	Landfill	Non-putrescible	31 July and 1 August 2008
Site L	Transfer station	Non-putrescible	5 and 6 August 2008

An auditor was stationed in the gatehouse at each site to survey drivers about their loads so as to identify the source of waste such as the Local Government Area (LGA), industry sector and waste collection company. The vehicle type; weight and size were also recorded.

Auditors were stationed at all general waste disposal points to make a visual audit of C&I general waste loads. They recorded load composition by material type.

The two teams communicated using two-way radios. The data from the visual auditors was matched to the gatehouse auditor data via vehicle registration number and time.

2.1 Auditor training

Before the survey began, the survey team attended a training session. Auditors were briefed on the overall project objectives and methodology. Survey sheets were reviewed and categories discussed to ensure common understanding. All of the auditors involved in this project were employed on previous disposal-based surveys.

To ensure their skills were current, particularly visual auditing skills of material identification and volume

estimates, all auditors attended the first site together for a practical session. During the session they jointly audited loads and compared results. This practical session was designed to 'calibrate eyes' so that percentage composition and material types were consistent between all auditors.

This was followed by a detailed occupational health and safety (OHS) session when the OHS plan was reviewed and specific site hazards discussed. All auditors were reminded of safety protocols and personal protective equipment (PPE) required for the project

Throughout the field survey the Project Director and the Senior Technical Auditor reviewed the auditors' performance by comparing results such as observed compositions and percentages.

2.2 Data collection and management

2.2.1 Waste audit forms and document control

Data sheets used for the gatehouse survey and the visual assessment are included in **Appendix 4 as Forms 1 and 2 respectively**.

All sheets were printed with a unique sequential number. Sheet numbers for each type of sheet were logged by the data manager. Sheets were signed out to auditors each day. At the end of each day, auditors returned all used sheets to the survey manager. At the end of the survey period all sheets were returned and recorded against those issued.

A daily reconciliation took place to ensure that all sheets were accounted for.

2.2.2 Data collection and recording

One auditor was stationed at the gatehouse to record the load details for all C&I vehicles entering the site in accordance with the following procedure:

Vehicle registration, type and size, transport agency, date and time of entry were recorded on approach to gatehouse. The net weight of the load was recorded either upon entry to the site or upon leaving the site, depending on the site practices.

The driver was questioned as to the vehicle's volume, the source industry/business type, and source LGA/suburb.

The auditor then classified the load in terms of waste stream (eg C&I, transfer station or Material Recycling Facilities).

The gatehouse auditor then confirmed which disposal point the vehicle was being directed to and advised the visual auditors.

Where the load covered a number of different business types, typically front lift compactors, and a main industry sector could not be identified, the industry type was classified as 'X' – mixed Small to Medium Enterprises (SMEs).

All C&I loads being disposed as general waste at each of the sites were visually assessed. Information was recorded on the Visual Audit Data Recording Sheets as follows:

- i. Vehicle registration, date and time of entry.
- ii. Waste company name.
- iii. Level of compaction of the waste.
- iv. Total volume of the load.

- v. Type of mix – clumped or highly mixed.
- vi. The auditor then visually assessed (V1) of each load after it was dumped. Auditors recorded the percentage composition, (based on volume) for each load, using the categories as detailed in Table A1–5.
- vii. Where time and safety permitted, a second visual assessment (V2) was made to verify the initial assessment.

Throughout the survey OHS was paramount. In a number of cases visual observations may have been limited or temporarily held off due to the risk of compromising the auditors' safety.



Photo 24 – An auditor visually assessing a load.

2.2.3 Database

The survey used a Microsoft Access database. All data were entered into the source data file, which included all information on the gatehouse data recording sheet and the visual data recording sheets. Loads were entered by percentage composition by material.

Once data from each load was entered, the volume data was converted to weight data and the results displayed in a separate linked table.

2.2.4 Data quality management

Data sheets were entered on a daily basis.

Data checks were made on a daily basis during the process to ensure the data was accurate. The checks included,

- auto sum functions to ensure a total of 100% was entered by the visual auditors;
- a cross-check of visual sheets to gatehouse sheets to ensure all sheets were entered and accounted for;
- a visual review of data sheets and ad hoc review of at least 40% of entries to check accuracy of input.

2.3 Classification

2.3.1 Vehicle type

All vehicles logged during the survey process were given a code for their size/capacity and type. The codes and their descriptions are summarised in Table A1–2.

Table A1–2: Vehicle classification

Vehicle class	Vehicle type
1	Cars and station wagons
2	Utilities and trailers (up to 6 x 4 ft)
3	Utilities and trailers (greater than 6 x 4 ft)
4	Skips (1–6 m ³)
5	Bulk bins (7 m ³ to 30 m ³)
6	Front lift trucks
7	Side lift trucks
8	Rear lift trucks
9	On-site compactors
10	Other
11	Transfer truck

2.3.2 Industry sector

Industry codes were allocated in accordance with the Australian and New Zealand Standard Industry Classification (ANZSIC). Table A1–3 lists the industry classifications. As with previous surveys, other codes were allocated to those industries that were not specifically covered under the ANZSIC system. These include Trades (TR) and Commercial Garden Maintenance Services (LG).

Front lift compactors typically collect waste from a variety of industry sectors within a single load. Where it was possible for the driver to identify one particular industry sector that the majority of the load was taken from, the load was classified according to the code corresponding to that industry. Where that was not possible, the load was given 'Code X', representing material from a variety of small to medium enterprises (SMEs). Where possible the SME loads were identified as Retail (XG) or Hospitality/Accommodation (XH).

Table A1–3: Industry sector classification

Industry code	Industry name	Subsectors
A	Agriculture/forestry/fisheries	Agriculture
		Services to agriculture; hunting and trapping
		Forestry and logging
		Commercial fishing
B	Mining	Coal mining
		Oil and gas extraction
		Metal ore mining
		Other mining
		Services to mining
C	Manufacturing	Food, beverage and tobacco manufacturing
		Textile, clothing, footwear and leather manufacturing
		Wood and paper product manufacturing
		Printing, publishing and recorded media
		Petroleum, coal, chemical and associated product manufacturing
		Non-metallic mineral product manufacturing
		Metal product manufacturing
		Machinery and equipment manufacturing
Other manufacturing		
D	Services supply	Electricity and gas supply
		Water supply, sewerage and drainage services
E	Construction	General construction
		Construction trade services
F	Wholesale trade	Basic material wholesaling
		Machinery and motor vehicle wholesaling
		Personal and household good wholesaling
G	Retail trade	Food retailing
		Personal and household good retailing
		Motor vehicle retailing and services
		Shopping centres
H	Hospitality	Accommodation, cafes and restaurants
I	Transport and storage	Road transport
		Rail transport
		Water transport
		Air and space transport
		Other transport
		Services to transport
		Storage
J	Communication services	Communication services
K	Finance & insurance	Finance
		Insurance
		Services to finance and insurance

Industry code	Industry name	Subsectors
L	Property & business services	Property services
		Business services
		Offices
M	Government/admin/defence	Government administration
		Defence
N	Education	Education
O	Health and community services	Health services
		Community services
P	Cultural and entertainment	Motion picture, radio and television services
		Libraries, museums and the arts
		Sport and recreation
Q	Personal and other	Personal services
		Other services
		Private households employing staff
TR	Trade (plumber, kitchen fitter)	
W	C&d recycling centre	
LG	Garden maintenance (commercial)	
LGS	Municipal (local government services)	
X	Mixed smes	
XG	Smes (mainly retail)	
XH	Smes (mainly hospitality/mainly accommodation)	
U	Unknown	

2.3.3 Waste Streams

Each load was classified by source or waste stream as follows:

Table A1–4: Waste streams

Description	Received at	Assessment
C&I – Mixed loads	Six landfills and six transfer stations	Visually assessed
C&I – Single material loads (including from MRFs & AWTs)	Six landfills	Sighted and recorded as residues
Loads from transfer station	Landfills	Recorded

2.3.4 Waste category

All relevant loads were visually assessed and the material categorised as per the following table.

The material categories listed in Table A1-5 were sourced from the Australian Waste Database (CSIRO 1993) and were further refined to address the NSW waste and recycling industry needs, practical limitations related to the visual assessment process, and the detection of high volume materials during the survey.

The inclusions assisted the surveyors to group and record the categories in a consistent manner.

Table A1-5: Waste categories

Waste category	Includes
Asphalt	Asphalt, road paving, bitumen
Bricks	Full bricks, broken bricks
Bulka bags	Bulka bags
Cardboard	All grades
Ceramic	Hard brittle material, including crockery, toilet bowls, bathtubs etc.
Christmas decoration	Christmas decorations, including synthetic Christmas trees
Clay	Ranging from clayey sands and silts to firmer clays
Clean fill/soil	Indistinguishable mixture of clay, soil, crushed rock/rubble up to 150 mm
Computer/office equipment	Computers, monitors, fax machines, printers
Concrete/cement	Any concrete, bags of cement dust etc.
Corflute	Ribbed plastic
Dirt	Any unclean substance, such as mud and filth
Dry cardboard packaging (compacted and loose)	Dry cardboard boxes, printed and branded cardboard.
Dry cardboard production spoils (compacted and Loose)	Cardboard off-cuts, cardboard rolls, clean dry cardboard.
Electrical and electronic – other	Television etc.
Electrical and electronic – Sydney	Sydney appliances
Electrical and electronic – whitegoods	Washing machines, fridges etc.
Fibreglass	Material consisting of matted fine glass fibres
Food kitchen	Pre- and post-consumer fruit, vegetable, meat, fat and bones
Food dense	Food production waste, eg dough
Foundry sand	A by-product of metal casting. With time, the sand can no longer be used. The spent sand contains silica and iron.
Frozen animals	Dead frozen animals
Garbage bags	Enclosed garbage bags.
Glass – container	Glass bottles and jars
Glass – plate	Window glass, windscreens, broken bottles, non-recyclable glass, such as wine glasses
Hazardous/special – chemicals, clinical waste	Chemicals, clinical waste, including sharps and cytotoxic wastes, contaminated material and batteries, including larger lead/acid batteries
Hazardous/special – light gloves	Presence of light globes, including fluorescent tubes
Insulation	Materials used for insulating
Linoleum	Floor covering made of hessian or jute.
Manure	Manure
Metal ferrous (steel)	Any items that are mainly steel/iron

Waste category	Includes
Metal non-ferrous	Aluminium siding, aluminium foil, copper wire, any items that are mainly metal but not steel/iron
Mulch	Mulch
Office paper	Photocopy paper, books, printing and writing papers, magazines, catalogues, brochures and leaflets
Other	Indistinguishable materials
Paper – all other	Newspapers, brown kraft paper, rolls of low-grade paper, handtowels, contaminated paper.
Plasterboard	All varieties
Plasterboard	Plasterboard, gypsum.
Plastic – bags and film	Film wrap, plastic bags (not filled).
Plastic – bags and film	Cling wrap; stretch wrap; shrink wrap; bags; PET; HDPE
Plastic – containers recyclable	Plastic bottles and jars
Plastic – hard	PVC pipe; vinyl flooring; milk crates; pails; plastic roofing
Plastic – other	All other plastics not elsewhere classified – includes industrial plastic containers and plastic drums
Polystyrene	Sheeting; packaging; cups
Polystyrene/foam	Packaging foam.
Rock	Stones, aggregates
Rubber – other	Rubber mats, rubber tubes, rubber washers and foam rubber
Rubber – tyres, tubes	All tyres (full and shredded) and inner tubes
Sawdust	Fine particles of wood
Sludge	Any muddy or slushy sediment such as sewage.
Soil/Clean fill	Uncontaminated soil
Sweepings	Road sweepings
Textile – carpet and underlay	Rolls of carpet, carpet off-cuts, carpet tiles, felt or foam underlay, synthetic underlay (but no rubber or plastic underlay).
Textile – cloth and leather – covered furniture – mattresses	Cloth mattresses.
Textile – cloth	Clothes, rags, rolls of fabric, fabric off-cuts
Textile – cloth and leather – covered furniture – chairs and couches etc.	Material/leather covered chairs and couches, etc
Textile/leather other	Leather off-cuts
Tiles	Roof tiles, clay tiles – whole or broken
Toner cartridges	Toner cartridges from photocopiers and printers etc.
Transformers	Transformers
Vegetation/garden	Garden waste; lawn clippings; trees, branches, tree stumps and logs.
Waxed cardboard	Fruit boxes
Wet cardboard	Wet cardboard and soiled cardboard
Wood – board/pole, treated	Pieces of solid timber with visible signs of chemical treatment
Wood – board/pole, untreated	Pieces of solid timber without any visible signs of treatment; may include timber off-cuts, posts
Wood – chipboard/ MDF	Any engineered timber products, old kitchen benches and chipboard
Wood – furniture, painted wood	Wardrobes, painted fence posts, varnished furniture, wooden chairs, doors, etc.
Wood – pallets	Timber pallets

2.3.5 Waste densities

Table A1–6: Waste densities

Waste material	Density – kilograms per cubic metre		
	[L] Low	[M] Medium	[C] Compacted
Office – paper	76	152	228
Paper – all other	76	152	228
Compacted dry cardboard	130	130	130
Compacted dry cardboard production spoils	130	130	130
Compacted wet cardboard	260	260	260
Loose dry cardboard	55	55	55
Loose dry cardboard production spoils	55	55	55
Loose wet cardboard	190	190	190
Waxed cardboard	55	92	130
Food/kitchen	343	514	1029
Food – dense	514	1029	1029
Vegetation – branches/grass clips	91	227	445
Vegetation – tree stumps /logs	150	450	900
Wood – pallets/other	156	156	156
Wood – furniture	160	170	400
Wood – fencing/board/pole (treated)	180	220	260
Wood – fencing/board/pole (untreated)	120	160	360
Wood – MDF/chipboard	156	156	156
Textile – furniture	90	100	450
Textile – carpet/underlay	100	150	350
Textile – mattress	50	50	50
Textile – cloth	91	120	240
Textile – leather/other	91	120	240
Rubber – other	200	200	200
Rubber – tyres/tubes	200	200	200
Rubber – shredded tyres	200	200	400
Glass – containers/other	280	280	280
Glass – pane	411	411	411
Plastic – bags and film	39	78	156
Plastic – recyclable containers	72	72	72
Plastic – hard	170	170	360
Plastic – other	170	170	360
Polystyrene/foam	14	21	28
Garbages	87	170	348
Tiles	470	550	640
Metal – ferrous	120	120	120
Metal – non-ferrous	139	139	139
Soil/clean fill	922	922	922
Rock	818	828	828
Rubble >150 mm	1048	1048	1048
Clay	1150	1150	1150

Concrete/cement	830	830	830
Bricks	828	828	828
Asphalt	680	680	680
Plasterboard	227	227	227
Foundry sand	1000	1000	1000
Hazardous/special – chemical/clinical	227	227	227
Hazardous/special – light globes	285	285	285
Whitegoods – washing machine/fridges	105	113	120
Electronics/electrical television etc.	265	265	265
Toner cartridges	188.5	188.5	188.5
Computer/office equipment	265	265	265
Electrical/electronic – Sydney	265	265	265
Other	87	170	348

These densities are as provided by DECCW and, where appropriate, from previous landfill surveys.

3 Methodology used for the weight-based garbage bag survey

Garbage bags are a significant component of the mixed C&I waste stream in Sydney. Based on the visual assessment of the C&I waste stream undertaken in 2008, garbage bags account for 18.65% of the mixed C&I waste stream in Sydney.

EC Sustainable Environment Consultants sampled an agreed number of bags from various industry sectors to obtain representative data that could be used to extrapolate the contents of garbage bags across the entire C&I waste stream.

For this study, garbage bags were defined as black, white, green, pink or other bin liners, purchased waste disposal bags and bulka bags (hessian or plastic) that are used to dispose of waste from mixed waste stream sources. They exclude paper bags, shopping carrier bags and bags containing bulk non specific material from manufacturing processes or packaging materials wrapped in plastic.

Figure 1 provides an example of a type of bag excluded from the study. These types of bags are excluded because the material composition is already assessed through the visual survey process.

The garbage bag survey is designed to identify the composition of garbage bag contents from eight selected industry sectors to provide data to assist with strategies to improve resource recovery, particularly organic and packaging components.

Garbage bags were picked up from the following pre-determined industry sectors:

- Manufacturing
- Retail Trade
- Hospitality (Accommodation, Cafes and Restaurants)
- Services (Property and Business Services)
- Health and Community Services
- Shopping Centres
- Offices
- Mixed SMEs.

A sample constituted 10 garbage bags and the number of samples collected from each sector is shown in Table A1-7.

Table A1-7: Sectors surveyed By ANZSIC Code and Sub-code

Sector name	Sub-sector name	Sector		Acceptable results obtained	Proportion of total samples (%)
		Code	Sub-code		
Manufacturing	Food, beverage & tobacco		21	8	3.1
	Textile, clothing, footwear & leather		22	7	2.7
	Printing, publishing & recorded media	C	24	7	2.7
	Machinery & equipment manufacturing		28	7	2.7
	Other manufacturing		29	10	3.9
Retail trade	Food retailing		51	10	3.9
	Personal & household good retailing	G	52	15	5.8
	Motor vehicle retailing & services		53	9	3.5
Accommodation, cafes and restaurants		H	57	21	8.1
Property and business services	Property services		77	8	3.1
	Business services	L	78	25	9.7
Health and community services	Health services	O and O/Q	86	16	6.2
	Community services		87/96	28	10.8
Offices		Office		32	12.4
Shopping centres		Shopping centre		20	7.8
Mixed SMEs	Retail trade	SME	R	35	13.6
	Total sectors	8	Total bags	258	100%

Figure 1 shows what constitute a 'garbage bag' for this survey.

Figure A1-1 – Examples of Included and Excluded

Bag types			
			
			

3.1 Purpose and objectives

The purpose of the garbage bag survey is to:

Determine the composition of the material components of garbage bag waste disposed in Sydney as commercial and industrial waste and generated by eight pre-determined industry sectors (and sub-sectors).

Determine the organic and packaging components within bags in the C&I waste stream.






Provide data to Waste Audit and Consultancy Services (WACS) to assist with the overall C&I waste stream composition.

Figure 1 shows examples of bags that were treated as 'garbage bags'.

3.2 Sampling methodology

Figure 2 provides an illustration of the project sampling method. In summary, samples of garbage bags from available truckloads in eight industry sectors were randomly sampled from nine waste and recycling facilities across Sydney. A sample consisted of 10 garbage bags.

Figure A1–2 – Garbage bag sampling process

	<p>Step 1</p> <p>The survey team waits in the base survey area until a suitable load arrives at the facility. When the survey team at the gatehouse communicates about the arrival of a vehicle carrying C&I waste, the two-person team prepares to pick up bags.</p>
	<p>Step 2</p> <p>The identified C&I waste truck tips material at the waste facility. The rego and delivery truck details are recorded and the team takes up a position at a safe distance.</p>
	<p>Step 3</p> <p>The team approaches the load once the garbage delivery truck exits the area. The team checks the surroundings to ensure a safe collection environment and takes a trolley to the stockpile to carry the bags with minimal manual handling risk.</p>
	<p>Step 4</p> <p>The team makes an assessment of the type and colour of bags delivered and the size of the bags in the load and randomly selects 12 bags from identifiable industry sector. The bags are placed in hessian bags to move them intact to the base survey area.</p>
	<p>Step 5</p> <p>The bags are taken to the base survey area so the bag sources can be checked and two bags of the 12 sampled are removed if they are not from the same industry source or two bags are removed at random if all of the bags are from the same source. The bags are then weighed and a volume measured and loaded onto truck in hessian bags (one or two per sample of 10 bags). The bags are delivered to the sorting site.</p>

3.3 Sampling sites

Table A1–8 lists the sampling sites.

Table A1–8 Sampling sites

Site identity	Site type	General solid waste type accepted
Site M	Landfill	Non-putrescible
Site H	Landfill	Putrescible
Site G	Landfill	Non-putrescible
Site F	Landfill	Putrescible

Site K	Landfill	Non-putrescible
Site E	Transfer station	Non-putrescible
Site D	Transfer station	Putrescible
Site J	Transfer station	Non-putrescible
Site A	Transfer station	Putrescible

3.4 Industry sectors

Five of the eight agreed C&I sectors are based on ANZSIC coding and sub-coding system where a code and sub-code exists. The remaining three sectors, offices, SMEs and shopping centres, have no ANZSIC codes. The industry sectors and codes are provided in Table A1-9.





Table A1-9 Sampling sectors and ANZSIC codes and cub-code

Agreed C&I sectors	Sector code	Sub-sector	Sub-sector code
Manufacturing	C	Food, beverage & tobacco	21
		Textile, clothing, footwear & leather	22
		Wood & paper product manufacturing	23 *
		Printing, publishing & recorded media	24
		Petroleum, coal, chemical & associated product manufacturing	25 *
		Non-metallic mineral product manufacturing	26 *
		Metal product manufacturing	27 *
		Machinery & equipment manufacturing	28
		Other manufacturing (incl. Pre-fabricated building manufacturing & furniture manufacturing)	29
		Machinery & equipment	28
Retail trade	G	Food retailing	51
		Personal & household good retailing	52
		Motor vehicle retailing & services	53
Hospitality (accommodation, cafes & restaurants)	H	Accommodation, cafes & restaurants	57
Property & business services	L	Property services	77
		Business services	78
Health & community services	O	Health services	86
	O/q	Community services (incl. Religious organisations & charities)	87/96
Shopping centres	None	Shopping centres	None
Offices	None	Offices	None (Sub-code based on the code most relevant to the office type)
Mixed smes	Sme	Retail trade	G
	Sme	Hospitality	H
	Sme	Other	O

* Note: It was agreed with DECCW that these sub-sectors are either unlikely to be present in Sydney or that the waste is unlikely to contain garbage bags. Such sub-sectors are not included.

Figure 3 provides an illustration of the project sorting methods.

Figure A1-3 – Garbage bag sorting process

	<p>Step 1</p> <p>The sorting teams receive the garbage bags at the sorting site and line them up in order of the sample number. Bags from the same load are placed on top of each other.</p>
	<p>Step 2</p> <p>In the sample number order, the bags are sorted by the sorting teams of up to eight staff. There are 3-4 people on each team, including one auditor for data entry, sorting compliance checking and general methods analysis.</p> <p>The bags are first weighed individually to ensure the weight reconciles with the weight recorded at the collection site.</p>
	<p>Step 3</p> <p>The composition of the ten bags in each of the sorting categories are sorted by the teams into 60L sorting bins, each labelled with the material category using laminated sorting bin labels. The sorting categories are provided in Table A1-9.</p>
	<p>Step 4</p> <p>The auditor records the weight of each material category in the 60L sorting bins. The data recorder takes tare and gross bin weight. The material is then tipped into 240 L MGBs for recycling or disposal.</p>

3.5 Sorting categories

The sorted categories of material are shown below in Table A1–10.

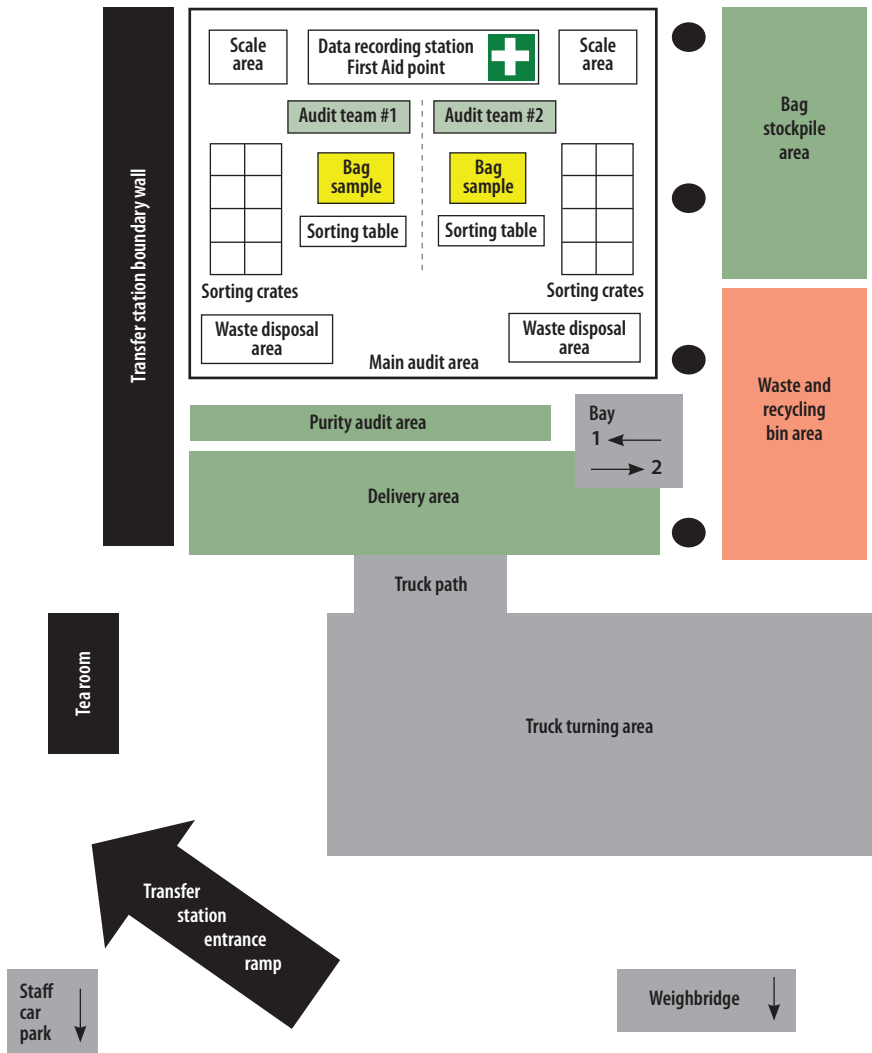
Table A1–10 Survey sorting categories

Material Category			Material Category			
Paper and cardboard	Office paper	Photocopy paper*	Glass	Containers*		
		Printing/writing*		Plate*		
		Magazines/catalogues*	Plastic	Containers recyclable*		
		Brochures and leaflets*		Film**		
		Books*		Polystyrene foam*		
	Paper other	Newsprint*	Metal	Other**		
		Brown kraft paper*		Ferrous, (steel)s*		
		Rolls of low-grade**	Non-ferrous*			
		Hand towels**	Construction and Demolition (C&D)	Concrete/cement*		
	Contaminated paper^^^	Bricks*				
	Cardboard	Dry packaging*		Tiles*		
		Dry production spoils*		Plasterboard*		
		Wet**		Rock/dirt/soil*		
		Waxed		Asphalt*		
Organic (wood and compostable)	Compostables	Food/kitchen**	Hazardous	Special	Chemicals, clinical waste and contaminated material	
		Vegetation/garden*			Light globes including fluorescent tubes*	
		Liquid (not in food)^^			Batteries including lead acid and other*	
	Wood/timber	Furniture, painted*		Electrical	Computer, office equipment**	
		Chipboard, MDF**			Toner Cartridges*	
		Pallets*			Electrical and electronic items (WEEE)**	
		Board/pole, untreated*	Other	Fines (< 10mm)^		
	Board/pole, treated	Miscellaneous (specify)				
	Organic other	Textiles and leather	Carpet and underlay**	<p>Key</p> <p>* = recoverable material</p> <p>** = potentially recoverable material</p> <p>^ Note: Classified as the individual material category if the material is homogenous and under 10 mm or fines if it is not homogenous and less than 10 mm.</p> <p>^^ Note: Liquid is determined to be non-recoverable by DECCW as it should be treated as leachate.</p> <p>^^^ Note: Some of this material category may also be recoverable in an AWT.</p>		
			Cloth**			
Covered furniture						
Other						
Rubber		Tyres, tubes*				
		Other*				

3.6 Sorting site layout

An example of the sorting site layout is shown in Figure 4.

Figure A1-4 – Example sorting site layout



3.7 Data recording forms

Examples of collection and sorting data recording forms are included in **Appendix 4 as Forms 3 and 4 respectively.**

3.8 Survey Monitoring

Up to four dedicated management staff members were assigned the role of monitoring the survey including factors such as:

- Ensuring the security of the data
- Monitoring OH&S compliance and facilitating inductions and procedure management
- Overseeing the correct collection of samples

- Observing the correct sorting of materials.
- Auditing purity and making any necessary data corrections
- Witnessing the correct logging of weights (weight verification)
- Calibrating the scales
- Testing equipment, such as scales, to ensure accuracy
- Answering stakeholder questions about the project at collection and sorting sites
- Verifying correct data entry.

3.9 OH&S methods and hazard assessment

General work method statements were developed for collection and sorting and provided to DECCW for sign-off. They were then used to create tailored hazard assessment checks for individual sites and daily checks before work began each day and provided to the collection and sorting sites.

In addition, an Occupational Health and Safety Management System (OHSMS) was developed for the fieldwork. All staff wore PPE as outlined in the Safe Work Method Statement and shown in Table A1-11

No negative OH&S incidents were experienced during the eight weeks of field surveys.

Table A1-11 Personal protective equipment (PPE) used

PPE required	Applicable standard compliance
Dust mask (optional, except when advised by a manager)	AS/NZS 1715: 1994 – Selection, use and maintenance of respiratory protective devices.
Gloves – heavy duty rubber or neoprene dipped	AS/NZS 2161: 2000 – Occupational protective gloves.
Eye protection (optional) – Low impact goggles with indirect ventilation	AS/NZS 1336: 1997 – Recommended practices for occupational eye protection.
Hearing protection – ear plugs or ear muffs	AS/NZS 1270: 1999 – Acoustics – hearing protectors.
Overalls – full length protective trousers and shirts/ overalls	Not Applicable.
Safety boots – steel toe capped fully enclosed boots	Not Applicable.
High visibility vest – fluorescent with reflective strips	AS/ NZS 4602: 1999 – High visibility safety garments.
Sunscreen – very high protection – SPF 30+ (at all times when working outside)	AS/ NZS 2604: 1998 – Sunscreen products, evaluation and classification.

3.10 Confidentiality

All survey staff signed a confidentiality agreement before the fieldwork. Staff agreed to maintain the privacy of information when handling the waste materials throughout the fieldwork.

In addition, results are only provided in an aggregated form in this report due to confidentiality requirements. No results are provided for individual businesses or loads.

Appendix 2

Detailed breakdown of C&I waste stream composition

The detailed breakdown of the composition of C&I waste in Sydney is given below:

Table A2-1 Mixed C&I waste – garbage bag as a category

Material composition categories	2007-08 Total	
	Tonnes	(%)
Garbage bags	324,067	18.7%
Food/kitchen	229,958	13.2%
Wood – pallets/other	139,218	8.0%
Plastic – bags and film	915,98	5.3%
Plastic – hard	90,084	5.2%
Compacted dry cardboard	81,793	4.7%
Wood – MDF/chipboard	79,554	4.6%
Other	68,460	3.9%
Paper – all other	67,421	3.9%
Vegetation – branches/grass clips	50,574	2.9%
Wood – furniture	36,251	2.0%
Rubble >150 mm	33,135	1.9%
Soil/clean fill	30,699	1.8%
Textile – carpet/underlay	30,224	1.7%
Concrete/cement	29,455	1.7%
Metal – ferrous	25,412	1.5%
Food – dense	23,109	1.3%
Textile – cloth	21,796	1.3%
Plastic – other	21,786	1.3%
Loose dry cardboard	20,091	1.2%
Plasterboard	19,532	1.1%
Clay	19,454	1.1%
Paper – office	15,465	0.9%
Tiles	14,308	0.8%
Compacted wet cardboard	14,078	0.8%
Stormwater	11,172	0.6%
Textile – furniture	10,721	0.6%
Wood – fencing/board/pole (treated)	10,045	0.6%
Glass – plate	10,040	0.6%
Sawdust	9,217	0.5%
Electronics/electrical television etc.	8,531	0.5%
Rubber – other	8,512	0.5%

Material composition categories	2007–08 Total	
	Tonnes	(%)
Bricks	8,374	0.5%
Polystyrene/foam	8,360	0.5%
Rock	7,728	0.4%
Hazardous/special – chemical/clinical	6,218	0.4%
Plastic – recyclable containers	5,557	0.3%
Wood – fencing/board/pole (untreated)	5,532	0.3%
Rubber – tyres/tubes	5,380	0.3%
Glass – containers/other	5,253	0.3%
Foundry sand	4,812	0.3%
Loose wet cardboard	4,650	0.3%
Sludge	4,116	0.2%
Vegetation – tree stumps/logs	3,675	0.2%
Textile – leather/other	3,401	0.2%
Rubber – shredded tyres	2,798	0.2%
Textile – mattress	2,362	0.1%
Metal – non-ferrous	2,298	0.1%
Christmas decorations	1,931	0.1%
Compacted dry cardboard production spoils	1,529	0.1%
Insulation	1,519	0.1%
Waxed cardboard	1,465	0.1%
Whitegoods – washing machine/fridges	1,191	0.1%
Fibreglass	853	< 0.1%
Animals	764	< 0.1%
Sand	519	< 0.1%
Ceramic	441	< 0.1%
Computer/office equipment	392	< 0.1%
Hazardous/special – light globes	270	< 0.1%
Asphalt	240	< 0.1%
Dirt	152	< 0.1%
Loose dry cardboard production spoils	54	< 0.1%
Batteries	0	< 0.1%
Toner cartridges	0	< 0.1%
Total	1,737,594	100%

Composition of garbage bags – average of all sectors

Table A2–2 Composition of garbage bags

Garbage bags from all sectors	Total
Material categories	(%)
Food/kitchen	27.74%
Paper – all other	18.55%
Paper – office	10.61%
Plastic – bags and film	7.77%
Other	7.13%
Plastic – recyclable containers	4.79%
Textile – cloth	4.19%
Glass – containers/other	3.65%
Loose dry cardboard	2.66%
Plastic – other	2.08%
Vegetation – branches/grass clips	1.57%
Rock	1.40%
Hazardous/special – chemical/clinical	1.27%
Metal – ferrous	1.26%
Metal – non-ferrous	1.09%
Loose wet cardboard	1.02%
Rubber – other	0.71%
Electronics/electrical television etc.	0.52%
Polystyrene/foam	0.47%
Waxed cardboard	0.33%
Glass – plate	0.17%
Batteries	0.12%
Textile – furniture	0.12%
Wood – fencing/board/pole (untreated)	0.12%
Textile – leather/other	0.1%
Wood – fencing/board/pole (treated)	0.1%
Loose dry cardboard production spoils	0.07%
Toner cartridges	0.07%
Computer/office equipment	0.06%
Textile – carpet/underlay	0.05%
Tiles	0.04%
Bricks	0.03%
Wood – furniture	0.03%
Rubber – tyres/tubes	0.03%
Wood – MDF/chipboard	0.02%
Hazardous/special – light globes	0.01%
Concrete/cement	0.01%
Wood – pallets/ other	0.01%
Plasterboard	< 0.01%
Asphalt	< 0.01%

Garbage bags from all sectors	Total
Material categories	(%)
Compacted dry cardboard	< 0.01%
Compacted dry cardboard production spoils	< 0.01%
Compacted wet cardboard	< 0.01%
Food – dense	< 0.01%
Vegetation – tree stumps/logs	< 0.01%
Sawdust	< 0.01%
Textile – mattress	< 0.01%
Rubber – shredded tyres	< 0.01%
Plastic – hard	< 0.01%
Garbage bags	< 0.01%
Soil/clean fill	< 0.01%
Rubble >150 mm	< 0.01%
Clay	< 0.01%
Insulation	< 0.01%
Dirt	< 0.01%
Sand	< 0.01%
Fibreglass	< 0.01%
Whitegoods – washing machine/fridges	< 0.01%
Foundry sand	< 0.01%
Sludge	< 0.01%
Stormwater	< 0.01%
Animals	< 0.01%
Christmas decorations	< 0.01%
Ceramic	< 0.01%
Total	100%

Table A2-3 Mixed C&I waste – garbage bag contents distributed

Material composition categories	2007-08 Total	
	Tonnes	(%)
Food/kitchen	282,735	16.3%
Food – dense	20,429	1.2%
All food	303,164	17.4%
Wood – pallets/ other	142,079	8.2%
Wood – mdf/chipboard	77,329	4.5%
Wood – furniture	37,512	2.2%
Wood – fencing/board/pole (untreated)	14,587	0.8%
Wood – fencing/board /pole (treated)	11,911	0.7%
Sawdust	4,948	0.3%
All wood	288,366	16.7%
Plastic – bags & film	136,102	7.8%
Plastic – hard	84,727	4.9%
Plastic – other	40,766	2.3%
Plastic – recyclable containers	22,414	1.3%
Polystyrene/foam	9,732	0.6%
All plastic	293,741	16.9%
Paper – all other	128,969	7.4%
Paper – office	48,531	2.8%
All paper	177,501	10.2%
Compacted dry cardboard	77,499	4.4%
Loose dry cardboard	25,998	1.5%
Compacted wet cardboard	13,224	0.8%
Loose wet cardboard	5,320	0.3%
Waxed cardboard	2,181	0.1%
Compacted dry cardboard production spoils	1,254	<0.1%
Loose dry cardboard production spoils	270	<0.1%
All cardboard	125,747	7.2%
Textile – carpet / underlay	39,745	2.3%
Textile – cloth	30,512	1.8%
Textile – furniture	11,968	0.7%
Textile – leather/other	3,305	0.2%
Textile – mattress	2,017	0.1%
All textile	87,548	5.1%
Metal – ferrous	32,314	1.9%
Metal – non ferrous	5,317	0.3%
All metal	37,631	2.2%
Glass – containers/other	15,542	0.9%
Glass – plate	9,091	0.5%
All glass	24,632	1.4%
Vegetation – branches/grass clips	53,003	3.1%
Vegetation – tree stumps /logs	3,479	0.2%
All vegetation	56,482	3.3%
Rubber – shredded tyres	1,538	<0.1%

Material composition categories	2007–08 Total	
	Tonnes	(%)
Rubber – other	10,254	0.6%
Rubber – tyres/tubes	7,734	0.4%
All rubber	19,527	1.1%
Concrete/cement	28,066	1.6%
Clay	19,587	1.1%
Plasterboard	17,894	1.0%
Rubble > 150mm	33,584	1.9%
Rock	11,530	0.7%
Tiles	10,580	0.6%
Bricks	8,055	0.5%
Soil/cleanfill	38,122	2.2%
Insulation	1357	<0.1%
Fibreglass	652	<0.1%
Asphalt	513	<0.1%
Sand	392	<0.1%
Ceramic	200	<0.1%
Dirt	71	<0.1%
All construction and demolition material	170,600	9.8%
Hazardous/special – chemical/clinical	29,665	1.7%
Hazardous/special – light globes	357	<0.1%
Batteries	346	<0.1%
All hazardous/special	30,368	1.7%
Electronics/electrical television etc.	11,003	0.6%
Computer/office equipment	716	<0.1%
Toner cartridges	191	<0.1%
Whitegoods – washing machine/ fridges	743	<0.1%
All electronic and electrical equipment	12,653	0.7%
Sludge	6,206	0.4%
Foundry sand	5,763	0.3%
Storm water	13,522	0.8%
Christmas decorations	950	<0.1%
Animals	376	<0.1%
Other	82,818	4.8%
All other	109,635	6.3%
Total	1,737,594	100%

Segregated Single material loads

Table A2-4 Breakdown of single material loads

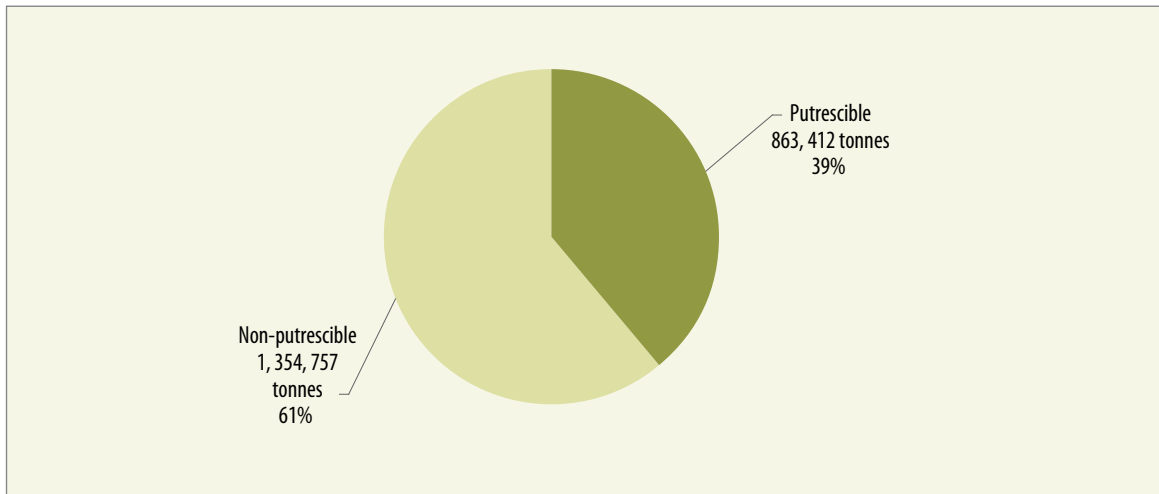
Consolidated material composition categories	2007-08 Total	
	Tonnes	(%)
Contaminated soil	265,365	54.6%
Residues or rejects	135,811	27.9%
Soil – not venm nor contaminated	20,246	4.2%
Glass	15,442	3.2%
Pharmacy or clinical	15,137	3.1%
Asbestos (N220)	13,916	2.9%
Wood, trees or timber	10,812	2.2%
Veterinary waste	3,599	0.7%
Tyres	2,247	0.5%
Grease trap waste	2,086	0.4%
Composts or mulches	1,956	0.4%
Commingled recyclables	1,517	0.3%
Ash	797	0.2%
Food or kitchen	691	0.1%
Paper or cardboard	620	0.1%
Garden or vegetation	297	<0.1%
Textiles/rags	198	<0.1%
Plastic	184	<0.1%
Dredging spoil	116	<0.1%
Plasterboard	101	<0.1%
Car bodies (ferrous)	55	<0.1%
Paint	54	<0.1%
Woolwash	47	<0.1%
Flammable liquids etc.	3	<0.1%
Aggregate/rdbase/ballast	0	<0.1%
Biosolids or manures	0	<0.1%
Carpet	0	<0.1%
FIBRE	0	<0.1%
RTA road chippings	0	<0.1%
Scavenging	0	<0.1%
Slag	0	<0.1%
Treated clinical waste	0	<0.1%
Untreated grease trap waste	0	<0.1%
Aluminium (non-ferrous)	-1	<0.1%
Hazardous waste	-3	<0.1%
Non-ferrous (not AL)	-11	<0.1%
Other (specify)	-15	<0.1%
Oil	-102	<0.1%
Batteries	-124	<0.1%
Bricks or concrete	-327	-0.1%
Ferrous (iron and steel)	-4,454	-0.9%
Total	486,262	100.0%

Note: The negative tonnages are attributable to tonnages recovered in a different reporting period.

Table A2-5 Composition of overall C&I waste stream – garbage bag contents distributed

Consolidated material composition categories	2007-08 Total	
	Tonnes	(%)
Hazardous/special	309,579	13.9%
Food	303,855	13.6%
Plastic	293,925	13.2%
Wood	288,366	13.0%
Paper	177,501	8.0%
Construction/demolition material	170,834	7.7%
Other	146,351	6.6%
Residual	135,858	6.1%
Cardboard	126,367	5.7%
Textile	87,746	3.9%
Vegetation	75,752	3.4%
Glass	40,074	1.8%
Metal	33,220	1.5%
Rubber	21,774	1.0%
Electrical/electronic equipment	12,653	0.6%
Total	2,223,856	100.0%

Chart A2-1 Disposal split of overall C&I waste stream by Landfill Type



Note: A total of 5687 tonnes of C&I Waste in 2007/08 were directed to licensed Liquid Waste and Incineration Facilities in Sydney.

Table A2–6 Composition of overall C&I Waste disposed at General solid waste putrescible landfills

Consolidated material composition categories	2007–08 Total	
	Tonnes	(%)
Food	235,956	27.3%
Plastic	118,867	13.8%
Wood	106,410	12.3%
Paper	86,007	10%
Cardboard	72,499	8.4%
Other	57,618	6.6%
Construction/demolition material	46,684	5.4%
Textile	34,784	4.0%
Vegetation	29,030	3.4%
Glass	21,374	2.5%
Hazardous/special	16,942	2.0%
Metal	15,651	1.8%
Residual	8,621	1%
Electrical/electronic equipment	6,725	0.8%
Rubber	6,243	0.7%
Total	863,412	100%

Table A2–7 Composition of overall C&I waste disposed at General solid waste non-putrescible landfills

Consolidated material composition categories	2007–08 Total	
	Tonnes	(%)
Hazardous/special	292,741	21.6%
Wood	182,691	13.5%
Plastic	175,668	13%
Residual	127,190	9.4%
Construction/demolition material	124,653	9.2%
Paper	91,771	6.8%
Other	80,131	5.9%
Food	67,977	5%
Cardboard	53,979	4%
Textile	53,147	3.9%
Vegetation	46,895	3.5%
Glass	18,720	1.4%
Metal	17,661	1.3%
Rubber	15,578	1.1%
Electrical/electronic equipment	5,954	0.4%
Total	1,354,757	100%

* A total of 5,687 tonnes of C&I waste are disposed of at incinerators and liquid waste disposal facilities

Table A2-8 Detailed breakdown of organic material in the mixed C&I waste stream

Material composition categories	2007-08 Total	
	Tonnes	(%)
Food/kitchen	282,735	27.0%
Wood – pallets/ other	142,079	13.6%
Paper – all other	128,969	12.3%
Compacted dry cardboard	77,499	7.4%
Wood – mdf/chipboard	77,329	7.4%
Vegetation – branches/grass clips	53,003	5.1%
Paper – office	48,531	4.6%
Textile – carpet / underlay	39,745	3.8%
Wood – furniture	37,512	3.6%
Textile – cloth	30,512	2.9%
Loose dry cardboard	25,998	2.5%
Food – dense	20,429	2.0%
Wood – fencing/board/pole (untreated)	14,587	1.4%
Compacted wet cardboard	13,224	1.3%
Textile – furniture	11,968	1.1%
Wood – fencing/board /pole (treated)	11,911	1.1%
Sludge	6,207	<1.0%
Loose wet cardboard	5,320	<1.0%
Sawdust	4,948	<1.0%
Vegetation – tree stumps /logs	3,479	<1.0%
Textile – leather/other	3,305	<1.0%
Waxed cardboard	2,181	<1.0%
Textile – mattress	2,017	<1.0%
Compacted dry cardboard production spoils	1,254	<1.0%
Animals	376	<1.0%
Loose dry cardboard production spoils	270	<1.0%
Total	1,045,389	100.0%

Table A2–9 Detailed breakdown of organic material in the overall C&I waste stream

Material composition categories	2007–08 Total	
	Tonnes	(%)
Food or kitchen	303,855	28.6%
Wood – pallets/ other	142,079	13.4%
Paper – all other	128,969	12.1%
Cardboard – dry	105,022	9.9%
Wood – mdf/chipboard	77,329	7.3%
Vegetation	53,300	5.0%
Paper – office	48,531	4.6%
Textile – carpet / underlay	39,745	3.7%
Wood – furniture	37,512	3.5%
Textile – cloth/rags	30,710	2.9%
Cardboard – wet	18,544	1.7%
Wood – fencing/board/pole (untreated)	14,587	1.4%
Trees and stumps	14,290	1.3%
Textile – furniture	11,968	1.1%
Wood – fencing/board /pole (treated)	11,911	1.1%
Biosolids or manures or sludge	6,207	< 1.0%
Wood – sawdust	4,948	< 1.0%
Veterinary waste (including animals)	3,975	< 1.0%
Textile – leather/other	3,305	< 1.0%
Cardboard – waxed	2,181	< 1.0%
Textile – mattress	2,017	< 1.0%
Composts or mulches	1,957	< 1.0%
Paper or cardboard (mixed)	620	< 1.0%
Total	1,063,562	100.0%

Table A2-10 Organic material composition of garbage bags in % by weight

Organic material type	All sectors	Manufacturing	Retail trade	Hospitality	Services (property and business)	Health & community services	Shopping Centres	Offices	Mixed SMEs
Office paper – photocopy paper	0.27	0.43	0.19	0.00	0.01	0.33	0.02	0.10	0.77
Office paper – printing/writing	7.75	8.46	7.16	5.10	11.45	6.90	10.96	3.06	6.89
Office paper – magazines/catalogues	1.40	1.30	0.63	0.91	2.35	0.94	2.35	1.92	1.28
Office paper – brochures and leaflets	0.62	0.41	0.90	0.26	0.93	0.33	1.05	0.21	0.78
Office paper – books	0.58	0.08	0.13	0.27	0.66	0.64	2.76	0.06	0.33
Paper other – newsprint	3.48	1.74	2.27	3.34	5.70	2.52	7.18	2.89	3.60
Paper other – brown kraft paper	0.80	0.63	0.77	0.48	0.48	1.09	0.93	0.92	1.10
Paper other – rolls of low-grade	1.83	4.33	1.71	4.56	1.51	0.32	0.63	0.89	0.33
Paper other – hand towels	6.58	6.34	5.12	3.79	7.89	7.72	11.73	3.18	5.60
Paper other – contaminated paper	5.86	6.45	4.98	8.38	4.38	4.07	6.04	10.46	5.01
Dry cardboard packaging	2.66	2.86	2.84	2.01	2.81	2.24	3.07	2.30	2.92
Dry cardboard production spoils	0.07	0.03	0.02	0.30	0.08	0.00	0.08	0.03	0.09
Wet cardboard	1.02	0.74	0.83	2.23	0.55	0.53	1.35	1.15	1.49
Waxed cardboard	0.33	0.00	0.01	0.05	0.00	1.20	0.02	0.00	1.01
Food/kitchen	27.74	21.35	35.18	28.76	19.29	30.23	24.11	39.30	29.03
Vegetation/garden	1.57	1.15	1.48	0.00	1.48	3.49	0.17	2.72	1.52
Wood – furniture, painted wood	0.03	0.12	0.00	0.00	0.00	0.01	0.06	0.00	0.00
Wood – chipboard, MDF	0.02	0.00	0.00	0.02	0.00	0.12	0.02	0.00	0.00
Wood – pallets	0.01	0.01	0.03	0.00	0.00	0.00	0.02	0.00	0.00
Wood – board/pole, untreated	0.12	0.11	0.09	0.27	0.15	0.06	0.12	0.09	0.11
Wood – board/pole, treated	0.10	0.10	0.08	0.39	0.01	0.03	0.12	0.05	0.11
Textiles – carpet & underlay	0.05	0.00	0.02	0.00	0.01	0.00	0.39	0.00	0.05
Textiles – cloth	4.19	7.03	8.71	1.10	5.19	3.77	1.24	0.76	1.58
Textiles – cloth and leather covered furniture	0.12	0.01	0.00	0.05	0.04	0.01	0.01	0.12	0.76
Textiles/leather other	0.10	0.00	0.20	0.00	0.11	0.08	0.12	0.01	0.27
Nappies	2.10	0.12	0.30	0.50	1.77	10.10	0.19	0.61	0.77
Total	69.38	63.80	73.66	62.77	66.84	76.72	74.73	70.83	65.39

Table A2-11 Packaging material found in the garbage bags

Packaging material type	All sectors	Manufacturing	Retail trade	Hospitality	Services (property and business)	Health & community services	Shopping centres	Offices	Mixed SMEs
Dry cardboard packaging	2.66	2.86	2.84	2.01	2.81	2.24	3.07	2.30	2.92
Wet cardboard	1.02	0.74	0.83	2.23	0.55	0.53	1.35	1.15	1.49
Waxed cardboard	0.33	0.00	0.01	0.05	0.00	1.20	0.02	0.00	1.01
Paper other – rolls of low-grade	1.83	4.33	1.71	4.56	1.51	0.32	0.63	0.89	0.33
Paper other – brown kraft paper	0.80	0.63	0.77	0.48	0.48	1.09	0.93	0.92	1.10
Glass – containers	3.65	2.23	4.73	6.04	2.73	1.86	2.77	2.67	7.08
Plastic – containers recyclable	4.79	3.58	4.19	5.13	5.03	4.75	4.48	6.15	6.12
Plastic – film	7.77	7.44	8.39	11.68	5.70	6.58	6.69	10.22	7.66
Plastic – polystyrene foam	0.47	0.59	0.41	0.21	0.43	0.45	0.69	0.46	0.48
Metals – ferrous (steel)s	1.26	0.79	0.88	1.17	1.34	1.56	1.16	0.72	2.34
Metals – non-ferrous	1.09	0.83	0.91	0.86	1.21	0.91	1.19	1.22	1.75
Toner cartridges	0.07	0.08	0.00	0.00	0.03	0.12	0.12	0.00	0.14

Composition of mixed C&I waste stream from the key industry sectors

Table A2–12 Detailed breakdown of the composition of mixed C&I loads from Mixed SMEs (garbage bags distributed)

Mixed SME sector	2007–08 Total	
Material composition categories	Tonnes	(%)
Office – paper	31,557	4.0%
Paper – all other	72,101	9.2%
All paper	103,658	13.2%
Compacted dry cardboard	51,020	6.5%
Compacted dry cardboard production spoils	83	<0.1%
Compacted wet cardboard	9,452	1.2%
Loose dry cardboard	12,672	1.6%
Loose dry cardboard production spoils	206	<0.1%
Loose wet cardboard	5,366	0.7%
Waxed cardboard	3,121	0.4%
All cardboard	81,921	10.4%
Food/kitchen	230,572	29.5%
Food – dense	7,394	0.9%
All food	237,966	30.4%
Vegetation – branches/grass clips	24,491	3.1%
Vegetation – tree stumps /logs	412	0.1%
All vegetation	24,903	3.2%
Wood – pallets/ other	29,847	3.8%
Wood – furniture	7,345	0.9%
Wood – fencing/board /pole (treated)	412	0.1%
Wood – fencing/board/pole (untreated)	583	0.1%
Wood – mdf/chipboard	35,124	4.5%
All wood	73,311	9.4%
Textile – furniture	3,597	0.5%
Textile – carpet / underlay	9,320	1.2%
Textile – mattress	647	0.1%
Textile – cloth	11,839	1.5%
Textile – leather/other	1,754	0.2%
All textile	27,157	3.5%
Rubber – other	3,146	0.4%
Rubber – tyres/tubes	4,861	0.6%
Rubber – shredded tyres	2,798	0.4%
All rubber	10,805	1.4%
Glass – containers/other	18,121	2.3%
Glass – plate	3,553	0.5%
All glass	21,673	2.8%
Plastic – bags & film	62,771	8.0%
Plastic – recyclable containers	14,847	1.9%

Mixed SME sector	2007–08 Total	
Material composition categories	Tonnes	(%)
Plastic – hard	47,752	6.1%
Plastic – other	6,993	0.9%
Polystyrene/foam	4,538	0.6%
All plastic	136,901	17.5%
Metal – ferrous	12,598	1.6%
Metal – non ferrous	5,008	0.6%
All metal	17,606	2.2%
Soil/cleanfill	6,777	0.9%
Rubble > 150mm	319	< 0.1%
Concrete/cement	637	0.1%
Bricks	152	< 0.1%
Tiles	4,332	0.6%
Plasterboard	3,798	0.5%
Construction & demolition material	16,014	2.2%
Hazardous/special – light globes	294	< 0.1%
Hazardous/special – chemicals, etc	1,676	0.2%
All hazardous/special	1,970	0.3%
Whitegoods – washing machine/ fridges	372	< 0.1%
Computer/office equipment	196	< 0.1%
Toner cartridges	294	< 0.1%
Electronics/electrical television etc.	2,048	0.3%
All electrical & electronic equipment	2,911	0.4%
Other	25,014	3.1%
Total disposed	781,673	100.0%

Table A2–13 Detailed breakdown of the composition of mixed C&I loads from SMEs (garbage bags as a category)

Mixed SME sector Material composition categories	2007–08 Total	
	Tonnes	(%)
Office – paper	9,609	1.2%
Paper – all other	37,951	4.9%
Paper	47,561	6.1%
Compacted dry cardboard	51,020	6.5%
Compacted dry cardboard production spoils	83	< 0.1%
Compacted wet cardboard	9,452	1.2%
Loose dry cardboard	6,302	0.8%
Loose dry cardboard production spoils	0	< 0.1%
Loose wet cardboard	2,107	0.3%
Waxed cardboard	921	0.1%
Cardboard	69,886	8.9%
Food/kitchen	165,389	21.2%
Food – dense	7,394	0.9%
Food	172,783	22.1%
Vegetation – branches/grass clips	21,173	2.7%
Vegetation – tree stumps/logs	412	0.1%
Vegetation	21,585	2.8%
Wood – pallets/ other	29,847	3.8%
Wood – furniture	7,345	0.9%
Wood – fencing/board /pole (treated)	172	< 0.1%
Wood – fencing/board/pole (untreated)	338	< 0.1%
Wood – mdf/chipboard	35,124	4.5%
Wood	72,826	9.3%
Textile – furniture	1,931	0.2%
Textile – carpet / underlay	9,217	1.2%
Textile – mattress	647	0.1%
Textile – cloth	8,394	1.1%
Textile – leather/other	1,176	0.2%
Textile	21,365	2.7%
Rubber – other	1,661	0.2%
Rubber – tyres/tubes	4,753	0.6%
Rubber – shredded tyres	2,798	0.4%
Rubber	9,212	1.2%
Glass – containers/other	2,661	0.3%
Glass – plate	3,028	0.4%
Glass	5,689	0.7%
Plastic – bags & film	46,046	5.9%
Plastic – recyclable containers	1,480	0.2%
Plastic – hard	47,752	6.1%
Plastic – other	3,170	0.4%
Polystyrene/foam	3,484	0.4%

Mixed SME sector	2007-08 Total	
Material composition categories	Tonnes	(%)
Plastic	101,932	13.0%
Garbage bags	218,359	27.9%
Metal – ferrous	7,492	1.0%
Metal – non ferrous	1,186	0.2%
Metal	8,678	1.2%
Soil/cleanfill	1,568	0.2%
Rubble > 150mm	319	<0.1%
Concrete/cement	637	0.1%
Bricks	152	< 0.1%
Tiles	4,332	0.6%
Plasterboard	3,793	0.5%
C&d materials	10,800	1.4%
Hazardous/special – light globes	54	< 0.1%
Hazardous/special – chemicals, clinical waste & contaminated material	0	< 0.1%
Hazardous/special	54	< 0.1%
Whitegoods – washing machine/ fridges	372	< 0.1%
Computer/office equipment	0	< 0.1%
Toner cartridges	0	< 0.1%
Electronics/electrical television etc.	1,710	0.2%
All electrical and electronic equipment	2,083	0.3%
Other	18,860	2.4%
Total disposed	781,673	100.0%

Table A2–14 Detailed breakdown of the composition of mixed C&I loads from manufacturing (garbage bags distributed)

Manufacturing industry sector Material composition categories	2007–08 Total	
	Tonnes	(%)
Office – paper	5,297	1.7%
Paper – all other	22,477	7.1%
All paper	27,774	8.8%
Compacted dry cardboard	10,026	3.2%
Compacted dry cardboard production spoils	1,421	0.4%
Compacted wet cardboard	1,867	0.6%
Loose dry cardboard	4,866	1.5%
Loose dry cardboard production spoils	54	0.0%
Loose wet cardboard	960	0.3%
Waxed cardboard	20	0.0%
All cardboard	19,214	6.1%
Food/kitchen	25,212	8.0%
Food – dense	12,309	3.9%
All food	37,521	11.8%
Vegetation – branches/grass clips	5,674	1.8%
Vegetation – tree stumps /logs	735	0.2%
All vegetation	6,409	2.0%
Wood – pallets/ other	37,825	11.9%
Wood – furniture	2,332	0.7%
Wood – fencing/board /pole (treated)	6,292	2.0%
Wood – fencing/board/pole (untreated)	29	< 0.1%
Wood – mdf/chipboard	16,852	5.3%
All wood	63,330	20.0%
Textile – furniture	1,715	0.5%
Textile – carpet / underlay	2,122	0.7%
Textile – mattress	647	0.2%
Textile – cloth	4,787	1.5%
Textile – leather/other	240	0.1%
All textile	9,511	3.0%
Rubber – other	5,459	1.7%
Rubber – tyres/tubes	250	0.1%
Rubber – shredded tyres	0	< 0.1%
All rubber	5,709	1.8%
Glass – containers/other	1,495	0.5%
Glass – plate	3,484	1.1%
Glass	4,978	1.6%
Plastic – bags & film	30,612	9.7%
Plastic – recyclable containers	4,596	1.5%
Plastic – hard	17,381	5.5%
Plastic – other	12,182	3.8%
Polystyrene/foam	3,224	1.0%

Manufacturing industry sector	2007–08 Total	
	Tonnes	(%)
All plastic	67,995	21.5%
Metal – ferrous	5,581	1.8%
Metal – non ferrous	317	0.1%
All metal	5,898	1.9%
Soil/cleanfill	1,823	0.6%
Rock	123	< 0.1%
Rubble > 150mm	8,693	2.7%
Clay	0	< 0.1%
Concrete/cement	4,087	1.3%
Bricks	206	0.1%
Tiles	74	< 0.1%
Asphalt	49	< 0.1%
Plasterboard	490	0.2%
C&d material	15,543	4.9%
Hazardous/special – chemical/clinical	2,764	0.9%
Hazardous/special – light globes	98	< 0.1%
Hazardous	2,862	0.9%
Whitegoods – washing machine/ fridges	181	0.1%
Electronics/electrical television etc.	1,700	0.5%
Computer/office equipment	20	< 0.1%
Toner cartridges	15	< 0.1%
All electrical and electronic equipment	1,916	0.6%
Foundry sand	3,822	1.2%
Shot blast	0	< 0.1%
Sludge	0	< 0.1%
Casting dust	0	< 0.1%
Other	43,842	13.8%
All other	47,664	15.1%
Total disposed	316,690	100.0%

Table A2–15 Detailed breakdown of the composition of mixed C&I loads from manufacturing (garbage bags as a category)

Manufacturing industry sector	2007–08 Total	
	Tonnes	(%)
Office – paper	2,960	0.9%
Paper – all other	17,430	5.5%
Paper	20,389	6.4%
Compacted dry cardboard	10,026	3.2%
Compacted dry cardboard production spoils	1,421	0.4%
Compacted wet cardboard	1,867	0.6%
Loose dry cardboard	4,003	1.3%
Loose dry cardboard production spoils	49	0.0%
Loose wet cardboard	779	0.2%
Waxed cardboard	20	0.0%
Cardboard	18,165	5.7%
Food/kitchen	19,689	6.2%
Food – dense	12,201	3.9%
Food	31,890	10.1%
Vegetation – branches/grass clips	5,439	1.7%
Vegetation – tree stumps /logs	735	0.2%
Vegetation	6,174	1.9%
Wood – pallets/ other	37,819	11.9%
Wood – furniture	2,308	0.7%
Wood – fencing/board /pole (treated)	6,267	2.0%
Wood – fencing/board/pole (untreated)	0	0.0%
Wood – mdf/chipboard	16,852	5.3%
Wood	63,246	19.9%
Textile – furniture	1,715	0.5%
Textile – carpet / underlay	1,475	0.5%
Textile – mattress	647	0.2%
Textile – cloth	3,298	1.0%
Textile – leather/other	181	0.1%
Textile	7,316	2.3%
Rubber – other	5,067	1.6%
Rubber – tyres/tubes	250	0.1%
Rubber – shredded tyres	0	0.0%
Rubber	5,317	1.7%
Glass – containers/other	941	0.3%
Glass – plate	3,641	1.1%
Glass	4,582	1.4%
Plastic – bags & film	27,764	8.8%
Plastic – recyclable containers	3,518	1.1%
Plastic – hard	17,381	5.5%
Plastic – other	11,711	3.7%
Polystyrene/foam	3,033	1.0%
Plastic	63,408	20.1%

Manufacturing industry sector	2007–08 Total	
	Tonnes	(%)
Material composition categories		
Garbage bags	26,186	8.3%
Metal – ferrous	5,312	1.7%
Metal – non ferrous	289	0.1%
Metal	5,601	1.8%
Soil/cleanfill	1,710	0.5%
Rock	123	< 0.1%
Rubble > 150mm	8,693	2.7%
Clay	0	0.0%
Concrete/cement	4,087	1.3%
Bricks	206	0.1%
Tiles	74	< 0.1%
Asphalt	49	< 0.1%
Plasterboard	490	0.2%
C&d materials	15,430	4.9%
Hazardous/special – chemical/clinical	2,445	0.8%
Hazardous/special – light globes	49	< 0.1%
Hazardous/special	2,494	0.8%
Whitegoods – washing machine/ fridges	181	0.1%
Electronics/electrical television etc.	1,480	0.5%
All electrical and electronic equipment	1,661	0.6%
Foundry sand	3,822	1.2%
Shot blast	0	0.0%
Sludge	0	0.0%
Casting dust	0	0.0%
Other	40,799	12.9%
All other	44,621	14.1%
Total disposed	316,690	100.0%

Table A2–16 Detailed breakdown of the composition of mixed C&I loads from retail sector (garbage bags distributed)

Retail industry sector	2007–08 Total	
	Tonnes	(%)
Office – paper	2,700	2.4%
Paper – all other	6,032	5.4%
Paper	8,732	7.8%
Compacted dry cardboard	6,600	5.9%
Compacted dry cardboard production spoils	24	0.0%
Compacted wet cardboard	1,735	1.6%
Loose dry cardboard	2,514	2.3%
Loose dry cardboard production spoils	5	0.0%
Loose wet cardboard	730	0.7%
Waxed cardboard	387	0.3%
Cardboard	11,995	10.8%
Food/kitchen	36,303	32.5%
Food – dense	2,269	2.0%
Food	38,572	34.5%
Vegetation – branches/grass clips	833	0.7%
Vegetation – tree stumps /logs	132	0.1%
Vegetation	965	0.9%
Wood – pallets/ other	7,806	7.0%
Wood – furniture	3,121	2.8%
Wood – fencing/board /pole (treated)	588	0.5%
Wood – fencing/board/pole (untreated)	88	0.1%
Wood – mdf/chipboard	1,970	1.8%
Wood	13,573	12.2%
Textile – furniture	608	0.5%
Textile – carpet / underlay	5,361	4.8%
Textile – mattress	167	0.1%
Textile – cloth	4,131	3.7%
Textile – leather/other	701	0.6%
Textile	10,966	9.7%
Rubber – other	206	0.2%
Rubber – tyres/tubes	113	0.1%
Rubber – shredded tyres	0	0.0%
Rubber	318	0.3%
Glass – containers/other	1,674	1.5%
Glass – plate	823	0.7%
Glass	2,497	2.2%
Plastic – bags & film	4,704	4.2%
Plastic – recyclable containers	1,200	1.1%
Plastic – hard	4,606	4.1%
Plastic – other	2,185	2.0%
Polystyrene/foam	446	0.4%
Plastic	13,142	11.8%

Retail industry sector	2007–08 Total	
Material composition categories	Tonnes	(%)
Metal – ferrous	1,671	1.5%
Metal – non ferrous	294	0.3%
Metal	1,965	1.8%
Rock	162	0.1%
Rubble > 150mm	289	0.3%
Concrete/cement	1,470	1.3%
Tiles	402	0.4%
Plasterboard	59	0.1%
Bricks	59	0.1%
C&D material	2,440	2.3%
Hazardous/special – chemicals, clinical waste	44	0.0%
Hazardous/chemicals – batteries	88	0.1%
Hazardous/special – light globes	73	0.1%
Hazardous/special	206	0.2%
Whitegoods – washing machine/ fridges	83	0.1%
Electronics/electrical television etc.	1,049	0.9%
Computer/office equipment	392	0.4%
All electrical and electronic equipment	1,524	1.4%
Other	4,557	4.1%
Total disposed	111,571	100.0%

Table A2-17 Detailed breakdown of the composition of mixed C&I loads from retail sector (garbage bags as a category)

Retail industry sector	2007-08 Total	
	Tonnes	(%)
Office – paper	319	0.3%
Paper – all other	2,009	1.8%
Paper	2,328	2.1%
Compacted dry cardboard	6,600	5.9%
Compacted dry cardboard production spoils	25	0.0%
Compacted wet cardboard	1,735	1.6%
Loose dry cardboard	1,749	1.6%
Loose dry cardboard production spoils	0	0.0%
Loose wet cardboard	495	0.4%
Waxed cardboard	382	0.3%
Cardboard	10,986	9.8%
Food/kitchen	26,475	23.7%
Food – dense	2,269	2.0%
Food	28,744	25.8%
Vegetation – branches/grass clips	407	0.4%
Vegetation – tree stumps /logs	132	0.1%
Vegetation	539	0.5%
Wood – pallets/ other	7,796	7.0%
Wood – furniture	3,121	2.8%
Wood – fencing/board /pole (treated)	564	0.5%
Wood – fencing/board/pole (untreated)	64	0.1%
Wood – mdf/chipboard	1,897	1.7%
Wood	13,441	12.1%
Textile – furniture	608	0.5%
Textile – carpet / underlay	5,356	4.8%
Textile – mattress	167	0.1%
Textile – cloth	1,651	1.5%
Textile – leather/other	642	0.6%
Textile	8,423	7.5%
Rubber – other	98	0.1%
Rubber – tyres/tubes	78	0.1%
Rubber – shredded tyres	0	0.0%
Rubber	176	0.2%
Glass – containers/other	387	0.3%
Glass – plate	789	0.7%
Glass	1,176	1.1%
Plastic – bags & film	2,386	2.1%
Plastic – recyclable containers	127	0.1%
Plastic – hard	4,606	4.1%
Plastic – other	1,622	1.5%
Polystyrene/foam	397	0.4%
Plastic	9,139	8.2%

Retail industry sector	2007–08 Total	
Material composition categories	Tonnes	(%)
Garbages	27,152	24.3%
Metal – ferrous	1,431	1.3%
Metal – non ferrous	54	0.0%
Metal	28,636	1.3%
Rock	118	0.1%
Rubble > 150mm	289	0.3%
Concrete/cement	1,470	1.3%
Tiles	402	0.4%
Plasterboard	59	0.1%
C&d materials	2,337	2.1%
Hazardous/special – light globes	69	0.1%
Whitegoods – washing machine/ fridges	83	0.1%
Electronics/electrical television etc.	809	0.7%
Computer/office equipment	392	0.4%
All electrical and electronic equipment	1,352	1.2%
Other	4,219	3.8%
Total disposed	111,571	100.0%

Table A2–18 Detailed breakdown of the composition of mixed C&I loads from property and business services (garbage bags distributed)

Property & business services industry sector	2007–08 Total	
	Tonnes	(%)
Office – paper	867	0.8%
Paper – all other	2,166	2.1%
Paper	3,033	2.9%
Compacted dry cardboard	1,602	1.5%
Compacted dry cardboard production spoils	0	0.0%
Compacted wet cardboard	147	0.1%
Loose dry cardboard	1,534	1.5%
Loose dry cardboard production spoils	5	0.0%
Loose wet cardboard	323	0.3%
Waxed cardboard	5	0.0%
Cardboard	3,616	3.5%
Food/kitchen	951	0.9%
Food – dense	0	0.0%
Food	951	0.9%
Vegetation – branches/grass clips	8,830	8.4%
Vegetation – tree stumps /logs	1,460	1.4%
Vegetation	10,291	9.8%
Wood – pallets/ other	11,413	10.9%
Wood – furniture	6,748	6.4%
Wood – fencing/board/pole (treated)	1,044	1.0%
Wood – fencing/board/pole (untreated)	3,420	3.3%
Wood – mdf/chipboard	5,199	5.0%
Wood	27,824	26.6%
Textile – furniture	2,872	2.7%
Textile – carpet / underlay	4,533	4.3%
Textile – mattress	446	0.4%
Textile – cloth	686	0.7%
Textile – leather/other	113	0.1%
Textile	8,649	8.2%
Rubber – other	274	0.3%
Rubber – tyres/tubes	127	0.1%
Rubber – shredded tyres	0	0.0%
Rubber	402	0.4%
Glass – containers/other	108	0.1%
Glass – plate	931	0.9%
Glass	1,039	1.0%
Plastic – bags & film	735	0.7%
Plastic – recyclable containers	142	0.1%
Plastic – hard	5,116	4.9%
Plastic – other	167	0.2%
Polystyrene/foam	172	0.2%
Plastic	6,331	6.1%

Property & business services industry sector	2007-08 Total	
	Tonnes	(%)
Metal – ferrous	2,450	2.3%
Metal – non ferrous	167	0.2%
Metal	2,617	2.5%
Soil/cleanfill	7,698	7.3%
Rock	1,152	1.1%
Rubble > 150mm	4,793	4.6%
Clay	4,028	3.8%
Concrete/cement	4,739	4.5%
Bricks	4,371	4.2%
Asphalt	0	0.0%
Tiles	4,660	4.4%
Plasterboard	4,650	4.4%
C&d material	36,091	34.3%
Hazardous/special – chemicals, clinical waste & contaminated material	39	0.0%
Hazardous/chemicals – batteries including lead acid and other	0	0.0%
Hazardous/special – light globes	34	0.0%
Hazardous/special	74	0.1%
Whitegoods – washing machine/ fridges	270	0.3%
Electronics/electrical television etc.	1,215	1.2%
Toner cartridges	0	0.0%
Computer/office equipment	0	0.0%
All electrical and electronic equipment	1,485	1.5%
Foundry sand	147	0.1%
Other	2,200	2.1%
All other	2,347	2.2%
Total disposed	104,750	100.0%

Table A2–19 Detailed breakdown of the composition of mixed C&I loads from property and business services (garbage bags as a category)

Property & business services industry sector	2007–08 Total	
	Tonnes	(%)
Office – paper	451	0.4%
Paper – all other	1,637	1.6%
Paper	2,087	2.0%
Compacted dry cardboard	1,602	1.53%
Compacted dry cardboard production spoils	0	< 0.1%
Compacted wet cardboard	147	0.14%
Loose dry cardboard	1,455	1.39%
Loose dry cardboard production spoils	5	< 0.1%
Loose wet cardboard	309	0.29%
Waxed cardboard	5	< 0.1%
Cardboard	3,523	3.4%
Food/kitchen	456	0.4%
Food – dense	0	0%
Food	456	0.4%
Vegetation – branches/grass clips	8,791	8.4%
Vegetation – tree stumps /logs	1,460	1.4%
Vegetation	10,251	9.8%
Wood – pallets/ other	11,412	10.9%
Wood – furniture	6,747	6.4%
Wood – fencing/board /pole (treated)	1,044	1.0%
Wood – fencing/board/pole (untreated)	3,415	3.3%
Wood – mdf/chipboard	5,199	5.0%
Wood	27,818	26.6%
Textile – furniture	2,933	2.8%
Textile – carpet / underlay	4,533	4.3%
Textile – mattress	446	0.4%
Textile – cloth	549	0.5%
Textile – leather/other	108	0.1%
Textile	8,568	8.2%
Rubber – other	250	0.2%
Rubber – tyres/tubes	127	0.1%
Rubber – shredded tyres	0	< 0.1%
Rubber	377	0.3%
Glass – containers/other	34	< 0.1%
Glass – plate	931	0.9%
Glass	965	0.9%
Plastic – bags & film	588	0.6%
Plastic – recyclable containers	10	< 0.1%
Plastic – hard	5,116	4.9%
Plastic – other	127	0.1%
Polystyrene/foam	162	0.2%
Plastic	6,003	5.8%

Property & business services industry sector	2007–08 Total	
	Tonnes	(%)
Material composition categories		
Garbages	2,661	2.5%
Metal – ferrous	2,421	2.3%
Metal – non ferrous	132	0.1%
Metal	5,214	2.4%
Soil/cleanfill	7,497	7.2%
Rock	1,152	1.1%
Rubble > 150mm	4,792	4.6%
Clay	4,028	3.8%
Concrete/cement	4,738	4.5%
Bricks	4,371	4.2%
Asphalt	0	0%
Tiles	4,660	4.4%
Plasterboard	4,650	4.4%
C&d material	35,889	34.2%
Hazardous/special – chemical/clinical	0	0%
Hazardous/special – light globes	34	< 0.1%
Hazardous/special	34	< 0.1%
Whitegoods – washing machine/ fridges	270	0.3%
Electronics/electrical television etc.	1,205	1.2%
Toner cartridges	0	0%
Computer/office equipment	0	0%
All electrical and electronic equipment	1,475	1.5%
Foundry sand	147	0.1%
Other	2,004	1.9%
All other	2,151	2.0%
Total disposed	104,750	100.0%

Table A2–20 Composition of garbage bags from mixed SMEs

C&I waste disposed – mixed loads		
Mixed SMEs industry sector	2007–08 Total	
Aggregated composition categories	Tonnes	(%)
Food	63,390	29.03%
Paper	56,097	25.69%
Plastic	34,959	16.01%
Glass	15,984	7.32%
Cardboard	12,032	5.51%
Metal	8,931	4.09%
Other	7,795	3.57%
Textile	5,808	2.66%
Construction/ demolition material	5,219	2.39%
Vegetation	3,319	1.52%
Hazardous/special	1,922	0.88%
Rubber	1,594	0.73%
Whitegoods/ electrical	830	0.38%
Wood	480	0.22%
Total disposed	218,359	100.00%

Table A2–21 Composition of garbage bags from manufacturing sector

C&I waste disposed – mixed loads		
Manufacturing industry sector	2007–08 Total	
Aggregated composition categories	Tonnes	(%)
Paper	7,382	28.19%
Food	5,523	21.09%
Plastic	4,590	17.53%
Other	3,150	12.03%
Textile	2,194	8.38%
Cardboard	1,047	4.00%
Glass	587	2.24%
Metal	474	1.81%
Hazardous/special	364	1.39%
Whitegoods/ electrical	259	0.99%
Vegetation	236	0.90%
Rubber	186	0.71%
Construction/ demolition material	113	0.43%
Wood	81	0.31%
Total disposed	26,186	100.00%

Table A2–22 Composition of garbage bags from the retail sector

C&I waste disposed – mixed loads		
Retail industry sector	2007–08 Total	
Aggregated composition categories	Tonnes	(%)
Food	9,536	35.12%
Paper	6,405	23.59%
Plastic	4,065	14.97%
Textile	2,547	9.38%
Glass	1,379	5.08%
Cardboard	1,005	3.70%
Other	630	2.32%
Metal	481	1.77%
Vegetation	429	1.58%
Whitegoods/ electrical	242	0.89%
Hazardous/special	138	0.51%
Rubber	138	0.51%
Construction/ demolition material	103	0.38%
Wood	54	0.20%
Total disposed	27,152	100.00%

Table A2–23 Composition of garbage bags from the property and business sector

C&i waste disposed – mixed loads		
Property & business services industry sector	2007–08 Total	
Aggregated composition categories	Tonnes	(%)
Paper	947	35.58%
Food	492	18.50%
Plastic	328	12.31%
Construction/ demolition material	203	7.62%
Other	196	7.38%
Textile	141	5.31%
Cardboard	93	3.49%
Glass	77	2.89%
Metal	64	2.40%
Vegetation	42	1.56%
Hazardous/special	40	1.52%
Rubber	22	0.84%
Whitegoods/ electrical	12	0.44%
Wood	4	0.16%
Total disposed	2,661	100.00%

Key findings of delivery vehicle distribution

Chart A2-2 Distribution based on number of vehicles delivering C&I loads

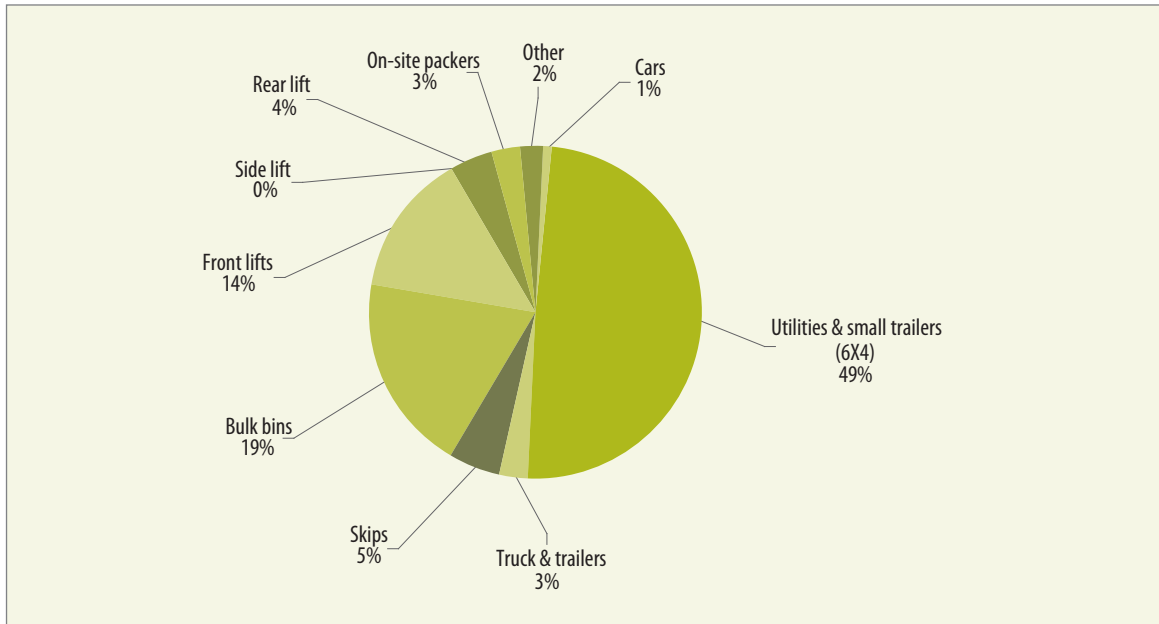


Chart A2-3 Distribution based on tonnage delivered by vehicles

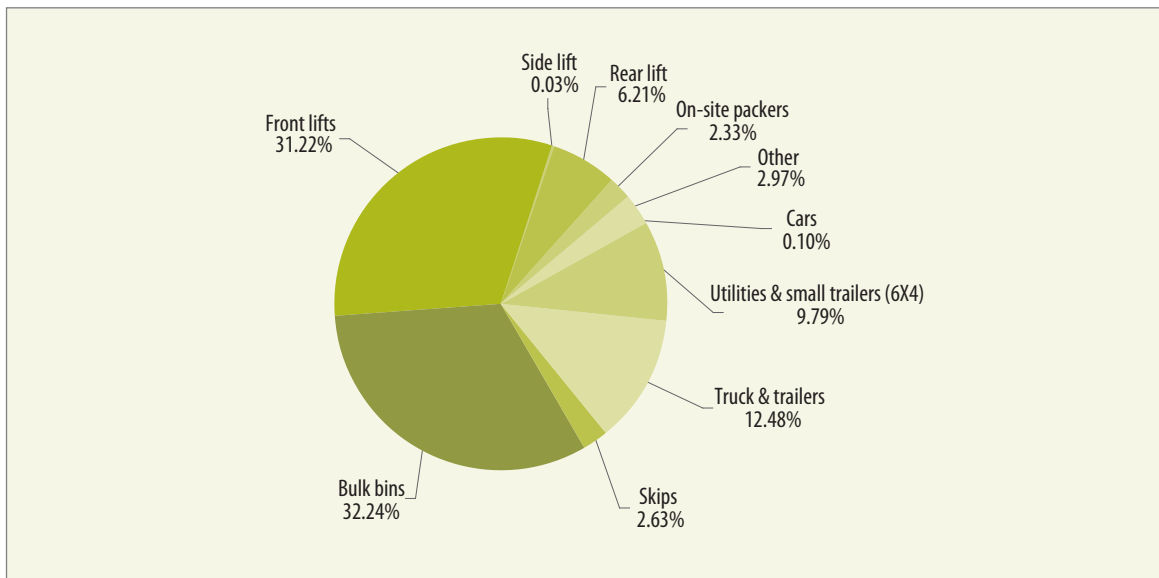


Chart A2-4 Distribution based on tonnage delivered by vehicles from mixed SMEs

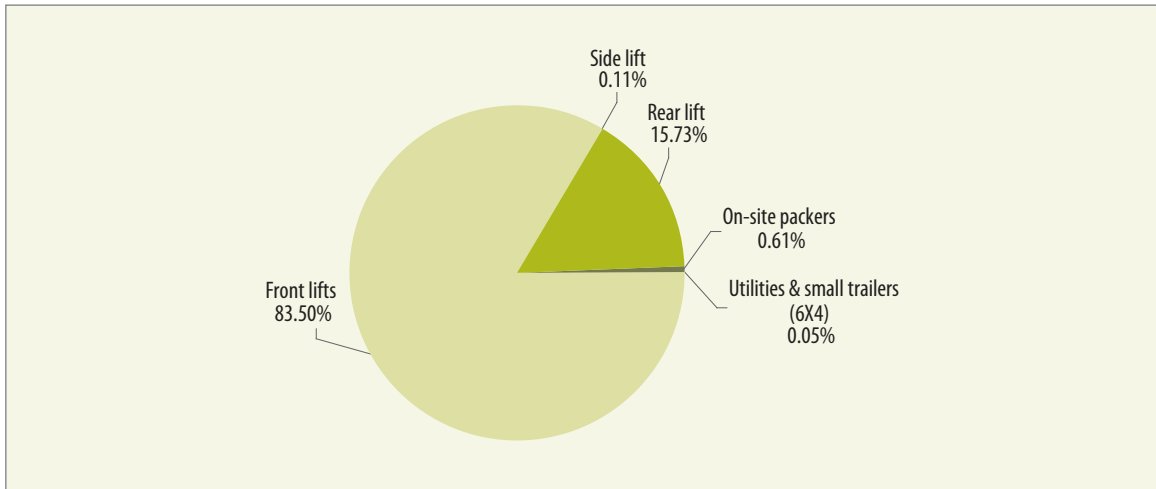


Chart A2-5 Distribution based on tonnage delivered by vehicles from manufacturers

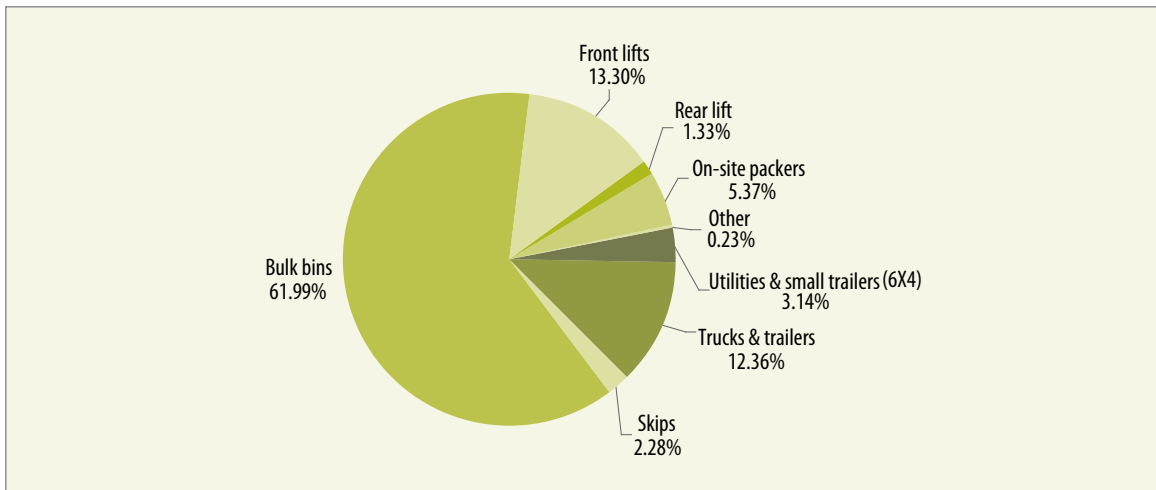


Chart A2-6 Distribution based on tonnage delivered by vehicles from retail sector

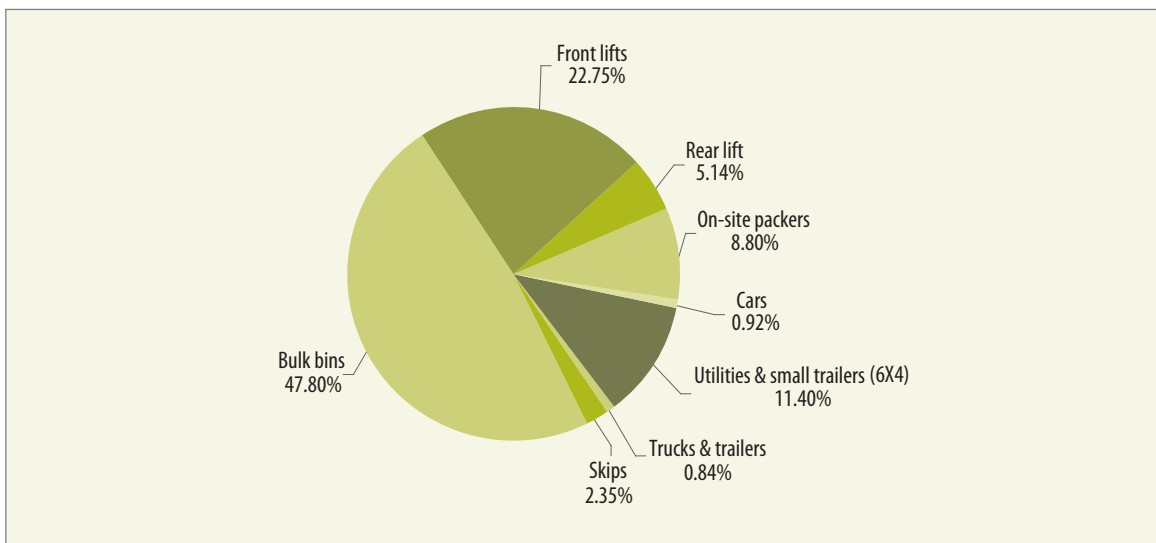


Chart A2-7 Distribution based on tonnage delivered by vehicles from property and business services

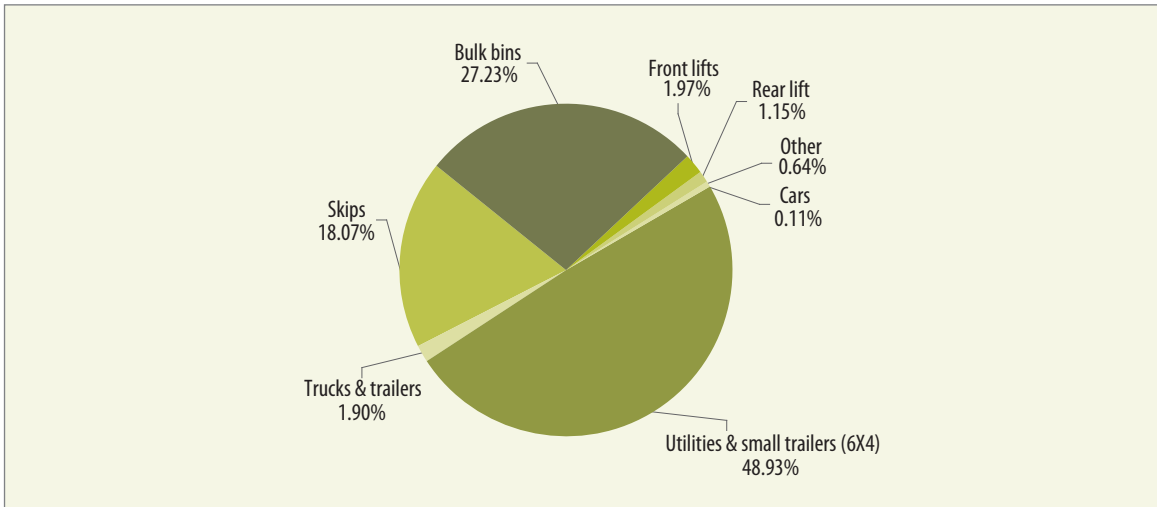


Chart A2-8 Distribution based on tonnage delivered by vehicles from the construction and demolition sector

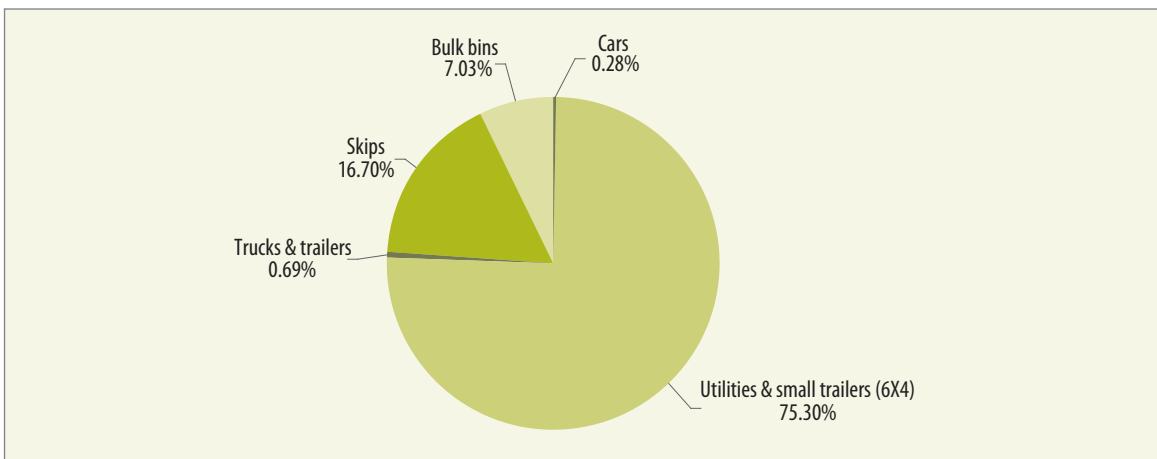


Table A2–24 Summary of E-waste, whitegoods and electronic items observed during the survey at six sites

Item	Site A	Site E	Site B	Site G	Site F	Site L
Television/plasma screen	5	1	1		2	3
Monitor	12	5	1	4	4	11
Computer	22	1				13
Printer	7	4	1			2
Microwave oven		1			4	2
Heater	1					
Dishwasher	3	1				
Stereo		3				
Refrigerator						
Computer hard drive	2	1				
Photocopier				1		1
Dryer						
Stove top						
Fax					1	1
Vacuum cleaner	2					
Keyboard		2	1		1	
DVD/video player		2				
Hot water unit	1	1				
Fan						
Washing machine						
Oven	1					
Laptops						
Digital grill	2					
Speakers	2					
Toaster						
Blender	2					
AV leads	2					
Air conditioner						
Lawn mower						
Typewriter						
Total	64	22	4	5	12	33



Photo 25 – A few large photocopiers



Photo 26 – Electronic goods from a retailer

Table A2-24 (Continued) – Summary of E-waste, whitegoods and electronic items observed during the survey at the remaining six sites – remaining six sites

Item	Site K	Site C	Site J	Site D	Site H	Site M	Total
Television/plasma screen	2	9	4	10	9	56	102
Monitor	1	4	5	13	3	17	80
Computer		1	3	2		2	44
Printer		3	3	3		5	28
Microwave oven	1	2	1	3		1	15
Heater		1		5	5		12
Dishwasher	1	3		2	2		12
Stereo			1	2	3	2	11
Refrigerator	2		3	2	3		10
Computer hard drive			2	1		4	10
Photocopier	1			2	2		7
Dryer	1		3	1			5
Stove top			2	1	2		5
Fax	1	1				1	5
Vacuum cleaner				3			5
Keyboard							4
DVD/video player				1		1	4
Hot water unit	2						4
Fan		1		2			3
Washing machine	1		2				3
Oven				2			3
Laptops						3	3
Digital grill							2
Speakers							2
Toaster		1		1			2
Blender							2
AV leads							2
Air conditioner						2	2
Lawn mower				1			1
Typewriter					1		1
Total	13	26	29	57	30	94	389



Photo 27 – Load containing 42 plasma screens still in their packaging

Tyres/rubber

Tyres/rubber accounted for 1% (21,773 tonnes) of the total C&I waste stream in Sydney in 2008. This was made up of 2,247 tonnes in single material loads and 19,526 in mixed loads. The single material loads are mainly full tyres and the mixed loads consist of full and shredded tyres and other rubber as shown in Table A2-26 below.

Table A2-25 Breakdown of tyres/rubber in C&I stream in Sydney

Sub-category	2007–08 Total		
	Mixed C&I Tonnes	C&I Single material loads Tonnes	Total Tonnes
Tyres/tubes	5,380	2,247	7,627
Shredded rubber	2,798	0	2,798
Rubber other	8,512	0	8,512
Total	16,690	2,247	18,937

(13) National Environment Protection Council Study into End of Life Tyres. web reference: www.ephc.gov.au

Appendix 3

Composition of organic material as recorded in the National Greenhouse and Energy Reporting Scheme (NGERS)

Grouping of material categories as recorded in the National Greenhouse and Energy Reporting Scheme (NGERS) and 2008 C&I Survey.

Table A3-1 Grouping of material categories to help calculate methane emissions

NGER composition categories	2008 C&I Waste Stream Survey (Sydney) composition categories
Food	Food or kitchen
Paper and paper board	Paper – all other Paper – office Cardboard – dry Cardboard – waxed Cardboard – wet Paper or cardboard (mixed)
Garden and park	Composts or mulches Vegetation Trees and stumps
Wood and wood waste	Wood – furniture Wood – fencing/board/pole (untreated) Wood – fencing/board/pole (treated) Wood – MDF/chipboard Wood – pallets/other Wood – sawdust
Textiles	Textile – carpet /underlay Textile – cloth/rags Textile – furniture Textile – mattress
Sludge	Bio-solids or manures
Nappies	
Rubber and leather	Textile – leather/other Rubber – other Rubber – tyres/tubes

NGER composition categories	2008 C&I Waste Stream Survey (Sydney) composition categories
Inert waste (including concrete, metal, plastic and glass)	Glass Plastic – hard Plastic – bags and film Plastic – other/mixed Plastic – recyclable containers Polystyrene/foam Metal – ferrous Metal – non-ferrous Aggregate/rdbase/ballast Ash Bricks or concrete Ceramics, tiles, pottery Plasterboard Other – C&D Soil – not venm nor contaminated Asbestos Batteries Contaminated soil Hazardous Waste Residues – MRF/AWT Residues – Metal rec Residues – Other Whitegoods – washing machine/fridges Computer/office equipment Electronics/electrical/television etc Toner cartridges Transformers Fines Grease trap waste Other (non-recyclable) Other (commingled recyclables) Other – other Pharmacy or clinical Veterinary waste

Appendix 4

Survey data recording forms

Form 1 – Gatehouse log sheet

Form 2 – Visual assessment recording sheet

Form 3 – Garbage bag collection recording sheet

Form 4 – Garbage bag sorting data recording sheet

Form 1 – Gatehouse log sheet

GA CONTROL DOCUMENT NUMBER : 1

GATEHOUSE LOG SHEET

Date: _____

Site: _____

Auditor: _____

Details	Vehicle 1	Vehicle 2	Vehicle 3
Time (00.00 – 24.00)			
Rego Number			
Company			
Vehicle Type (1,2,3 etc)			
Industry Description eg. (School)			
Vehicle Volume (m ³) (estimate)			
Suburb			
Disposal Point			
Waste Type (C&I; C&D; Dom; private)			
Net Weight (T)			
Main Industry Code			
Sub Sector			
Comment			

Details	Vehicle 4	Vehicle 5	Vehicle 6
Time (00.00 – 24.00)			
Rego Number			
Company			
Vehicle Type (1,2,3 etc)			
Industry Description eg. (School)			
Vehicle Volume (m ³) (estimate)			
Suburb			
Disposal Point			
Waste Type (C&I; C&D; Dom; private)			
Net Weight (T)			
Main Industry Code			
Sub Sector			
Comment			

Details	Vehicle 7	Vehicle 8	Vehicle 9
Time (00.00 – 24.00)			
Rego Number			
Company			
Vehicle Type (1,2,3 etc)			
Industry Description eg. (School)			
Vehicle Volume (m ³) (estimate)			
Suburb			
Disposal Point			
Waste Type (C&I; C&D; Dom; private)			
Net Weight (T)			
Main Industry Code			
Sub Sector			
Comment			

Form 2 – Visual assessment recording sheet

VA CONTROL DOC. No : VAR

«LIST»

VISUAL AUDIT LOG SHEET DECC C&I AUDIT 2008

Date: _____	Site: _____	Auditor: _____				
Details	Vehicle 1			Vehicle 2		
Time (00.00 – 24.00)						
Registration Number						
Company						
Vehicle Type (compactor/skip)						
Disposal Point (general; etc)						
Observed Volume (m ³)						
Degree of Compaction (L,M,C)	L <input type="checkbox"/>	M <input type="checkbox"/>	C <input type="checkbox"/>	L <input type="checkbox"/>	M <input type="checkbox"/>	C <input type="checkbox"/>
Load mix	Clumped <input type="checkbox"/>	Highly mixed <input type="checkbox"/>		Clumped <input type="checkbox"/>	Highly mixed <input type="checkbox"/>	
Description	Visual 1 %	Visual 2 %	Counts / Comments	Visual 1%	Visual 2%	Counts / Comments
Office - Paper						
Paper – all other						
Compacted Dry Cardboard						
Compacted Dry Cardboard production spoils						
Compacted Wet Cardboard						
Loose Dry Cardboard						
Loose Dry Cardboard production spoils						
Loose Wet Cardboard						
Waxed Cardboard						
Food / Kitchen						
Food – dense						
Vegetation – branches / grass clips						
Vegetation – tree stumps /logs						
Wood – Pallets / Other						
Wood - Furniture						
Wood – Fencing (treated)						
Wood – Fencing (untreated)						
Wood – MDF/Chipboard						
Textile - Furniture						
Textile – Carpet / Mattress /Underlay						
Textile – Cloth /Leather / Other						
Ruber Tyres / Rubber Other (specify)						
Glass –Containers /Plate / Other						
Plastic - Bags & Film						
Plastic – recyclable containers						
Plastic - Hard						
Plastic - Other						
Polystyrene / foam						
Garbags						
Tiles						
Metal - Ferrous						
Metal - Non ferrous						
Soil / Cleanfill / Clay / Dirt						
Rock / Bricks						
Rubble > 150mm						
Concrete / Cement						
Asphalt						
Plasterboard						
Hazardous/Special – chemical/clinical						
Hazardous/Special – light globes						
Whitegoods (detail)						
Electronics (detail)						
Foundry Sand						
Total						

Form 3 – Garbage bag collection recording sheet

Collection Data Recording Form

DECC Commercial and Industrial Waste Survey
2008 Garbage Bag Survey

EC Sustainable Environment Consultants
Tel: 1300 88 55 66

Load Number	Waste Facility Name	Day (xxx)	Date (dd/mm)	Load Arrival Time (24hr, hr:min)	Waste Source (Company)	Waste Source (Address/Suburb)	Waste Source (Sector & Sub-Sector)	Vehicle Type	Vehicle Rego	No. Bags Sampled	No. Bags Sent for Sorting	Bag Types Sourced (e.g. 1 bulka bag, 9 cleaner bags)	Volume of Total Bags Sent (litres)	Weight of Total Bags Sent (kg) (2 d.p.)	Other Notes (e.g.sharps, heavy)
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															

Day
 Audit Date
 Audit Start Time
 Audit Finish Time

Industry Sector:
 Industry Sub-sector:
 Company Source:
 No. of Bags Received:

Waste Facility Source:
 Rego:
 Vehicle Type:

Date Load Sampled:
 Load Number (e.g. x of 30): of
 No. of Bags Sorted:
 Time Bags Sampled:

Bag Number	1	2	3	4	5	6	7	8	9	10
Bag Type (e.g. Bulka bag, black cleaner bag, white cleaner bag)										
Weight of Bag (kg) (2 d.p.)										
Volume of Bag (Litres)										

Code Name and Sub-Code Name	Weight in Kilograms (kg) / Volume (L)											
	Container 1			Container 2			Container 3			Container 4		
	GROSS	TARE	VOLUME	GROSS	TARE	VOLUME	GROSS	TARE	VOLUME	GROSS	TARE	VOLUME
Office Paper – Photocopy paper												
Office Paper – Printing / writing												
Office Paper – Magazines / catalogues												
Office Paper – Brochures and leaflets												
Office Paper – Books												
Paper Other – Newsprint												
Paper Other – Brown kraft paper												
Paper Other – Rolls of low-grade												
Paper Other – Hand towels												
Paper Other – Contaminated paper												
Dry cardboard packaging												
Dry cardboard production spalls												
Wet cardboard												
Waxed cardboard												
Food / kitchen												
Vegetation / garden												
Wood – furniture, painted wood												
Wood – chipboard, MDF												
Wood – pallets												
Wood – board / pole, untreated												
Wood – board / pole, treated												
Textiles – carpet & underlay												
Textiles – cloth												

Day	Industry Sector:	Waste Facility Source	Date Load Sampled:
Audit Date	Industry Sub-sector:	Rego	Load Number (e.g. x of 30):
Audit Start Time	Company Source:	Vehicle Type	No. of Bags Sorted:
Audit Finish Time	No. of Bags Received:	Other Notes	Time Bags Sampled:
Textiles – cloth & leather covered furniture			
Textiles / leather other			
Rubber – tyres, tubes			
Rubber other			
Glass – containers			
Glass – plate			
Plastic – containers recyclable			
Plastic – film			
Plastic – polystyrene foam			
Plastic other			
Metals – ferrous (steel)s			
Metals – non-ferrous			
Concrete / cement			
Bricks			
Tiles			
Plasterboard			
Rock / dirt / soil			
Asphalt			
Hazardous / special – chemicals, clinical waste & contaminated material			
Hazardous / special – light globes including fluorescent tubes			
Hazardous / chemicals - batteries including lead acid and other			
Computer / office equipment			
Toner cartridges			
Electrical and electronic items			
Fines (less than (<) 10 mm)			
Other items (individually specify below)			

