

**CRC1.2 National Waste Database
National Solid Waste Classification System
Version 6**

September 1993

1 BACKGROUND TO DRAFT SOLID WASTE CLASSIFICATION SYSTEM

1.1 Introduction

The Draft Solid Waste Classification system has been developed as part of the CRC for Waste Management & Pollution Control's project to establish a National Waste Database for the Commonwealth EPA. The Database project encompasses aspects of classification system development, waste sampling and analysis, and waste generation database establishment, for solid wastes and hazardous industrial wastes. It will not include sewage wastes, and direct emissions to waters and the atmosphere.

For the purpose of this document, wastes are defined as materials that currently have a negative value to their owner, ie the generator incurs costs in managing them (importantly, this does not prevent them from having positive value to another owner at another location in space or time). For the purpose of collection of waste generation data from a number of jurisdictions, wastes are those materials designated as such in the jurisdiction in which they arise.

The flow of wastes in urban societies is part of a larger system of materials use and flows, as illustrated in Figure 1 (Baccini and Brunner, 1991). The waste management process in Figure 1 is illustrated in more detail for solid wastes in Figure 2. The points in the system at which data will be collected for the solid waste generation database module of the National Waste Database are indicated in Figure 2. This paper proposes a classification system that will enable this solid waste generation data to be collected in a consistent manner around Australia.

Other modules of the Database will be concerned with the type and quantity of recycled materials used in the manufacture of goods, and with hazardous wastes. The classification systems and Database issues associated with these other modules are not part of the scope of this paper. They will be dealt with in subsequent papers.

1.2 Solid Waste Classification System

In the past, there has been little uniformity among the classification systems used for solid waste by various agencies in Australia. This is particularly the case for the waste stream categories. Waste composition broad categories are reasonably consistent, but there are differences in the material detail sub-categories.

In developing a proposal for a uniform national system, a number of principles were recognised :

- ◆ The need to clearly differentiate between waste streams and the composition of those waste streams . Waste streams are flows of waste materials (in units of mass per unit time, e.g. tonnes of solid waste per day) arising from characteristic sources such as Municipal processes or Commercial and Industrial processes (refer to the Glossary for detailed definitions). Waste composition refers to the quantity of material types in particular waste streams (as a % or wt/wt, eg the Municipal - Domestic waste stream in the Sydney region is composed of 23 % paper; 2.3g lead per kg Domestic waste).
- ◆ The need to ensure national uniformity in the broad categories in both the waste streams and the compositional analysis, and at the same time provide flexibility in the sub-categories to account for local regional needs; for instance, to enable data to be collected for the purpose of designing an incinerator, a materials recovery facility or a landfill with gas recovery as appropriate to local conditions.

- ◆ The need to enable data to be collected which will satisfy the monitoring requirements of national waste policies and strategies such as the various industry targets (paper, plastics, packaging etc).
- ◆ To the greatest extent possible, data collection should be on the basis of making use of existing data collection requirements, such as for the payment of levies, as required by licence conditions, and for recycling rebate determination. An additional layer of data collection at the depot should be avoided where possible.

At this point a distinction needs to be made between waste designation and waste classification. Waste designation refers to the legal definition of solid waste as written into State and, where appropriate, Commonwealth, Acts and Regulations. These designations are usually (often for historical reasons) unique to each jurisdiction and enable Authorities such as the EPAs to enforce their Acts. This paper does not deal with this issue - it is a matter for individual States to determine to suit their own circumstances.

This paper is solely concerned with the second concept of waste classification systems, which are designed to facilitate data collection and monitoring across a range of jurisdictions. Waste classification systems require prior application of designation systems in order to define (or designate) a material as "waste". This very important and difficult question of whether a material is "waste", is not, therefore, addressed by this paper.

2 WASTE STREAMS

2.1 The Waste Stream Classification System

2.1.1 Overview

Waste streams, as noted above, are flows (tonnes per day, tonnes per month etc) of the total waste materials and are principally characterised by the process (source) giving rise to the stream. The processes giving rise to waste streams are categorised into :

- ◆ Principal sources :
 - Municipal
 - Commercial & Industrial
 - Building & Demolition
- ◆ Secondary sources to provide a more detailed description of these principal sources :
 - Municipal
 - Domestic
 - Other Domestic
 - Other Council
 - Commercial & Industrial-
 - Major ASIC industry groups
 - Waste processing facilities themselves
 - Building & Demolition -
 - Secondary sources described above.

Other attributes of the waste streams which enable their identification, definition or provide useful information on them, are provided in fields (refer Tables 1 & 2) describing :

- ◆ the processing/disposal route for the waste stream
- ◆ the transport/measurement mode for the waste stream
- ◆ whether the waste stream consists of mixed material types, or whether source segregation has been undertaken.

It is intended to either directly or indirectly measure the total quantity of each waste stream on a daily basis, with monthly regional arisings being reported to the National Waste Database by a State Authority.

2.1.2 Waste Stream Classification Tables

The Classification System described above is presented in detail in Tables 1 and 2. Table 1 illustrates the minimum amount of data that should be reported on waste stream arisings in regions by States, to the NWD. Table 2 illustrates the full version of the Classification System, which will rarely be used routinely by any State. Individual States may desire to report on parts of the full version (Table 2) on a routine basis, and on other parts on an ad-hoc intensive survey basis. The purpose of providing the full version is to encourage States to use a uniform system whenever they have the need to collect data beyond the minimum described in Table 1. The decision on how much of the full version to use, and the frequency of use, will remain with the relevant State Authority.

Table 1
Draft Solid Waste Classification
Waste Streams - Version 6, Abridged version
September 1993

Processing/Disposal Route	Waste Stream : Principal Source	Sub - stream 1 : Secondary Source	Sub - stream 2 Measurement/ Transport mode	Sub - stream 3 Material composition
1 Recycling 2 Composting 3 Incineration 4 Landfill 5 On-site	A : Municipal Waste B : Commercial & Industrial C : Building and Demolition	1 Domestic waste 2 Other domestic 3 Other Council X Waste Processing facility	0 Weighbridge 1 Truck count 20 Other	0 Mixed

Notes :

- 1 Those descriptors in bold to be the preferred minimum data collected on a daily basis at the gatehouse of the landfill.
- 2 Other descriptors to be used selectively to suit local needs, or in total for intensive surveys or as technology becomes available to make comprehensive routine data collection feasible. Refer Table 2.
- 3 Recycling includes the processing of (waste) materials for re-use; processing may involve administrative action as well as cleaning, relabelling etc.

A detailed description of the Waste Streams is provided in the next section, and examples of how the system can be applied are provided in Section 2.2.

2.1.3 Detailed Description of Solid Waste Classification Systems

Processing/Disposal Route

The National Waste Database will attempt to be a waste generation database, ie to measure and record arisings of material regarded as waste by the generator. Initially the focus will be on recording waste disposed of to landfill, with waste being treated (recycled, composted or incinerated) being incorporated as resources and data become available. Because of some of the informal un - monitored arrangements in this latter group (eg recycling and composting) it may never be possible to fully account for all waste arisings. The waste Disposal Routes to be included in the Database include :

- ◆ Recycling; including kerbside recycling, MRF recycling and direct recycling arrangements between the generator of the waste and the consumer of the material.
- ◆ Composting
- ◆ Incineration
- ◆ Landfill (owned or operated on behalf of Municipal Authorities, or licensed to accept wastes generated by parties other than the owner)
- ◆ On-site Disposal, including landfill owned by the generator and only accepting waste from the owner.

A number of States are developing systems of classifying landfills, including sub -categories such as inert waste landfills, sanitary landfills, secure landfills etc. If National Standards are established in this area, then the NWD would include these sub -categories and it may be possible to translate existing State systems into a future National system. States are encouraged to record data according to any classes of landfills that they may have established, but until a Nationally agreed classification system has been developed, data should be aggregated into "Landfill" for reporting to the NWD.

Care will to be taken to ensure double counting does not occur. For example, rejects from a compost plant will only be counted as they enter a landfill for final disposal; the amount to be counted for compost disposal will be the difference between the input to the plant and the rejects from the plant (not the compost product amount as this will exclude some of the waste mass converted to CO₂ and water). This issue does not affect the structure of the Classification System, but is important for collection of data. States should report total waste mass inputs to waste processing and disposal facilities, and the Database will undertake the arithmetic to ensure double counting does not occur.

Most facilities will represent only one of these disposal routes, but where a number of activities are undertaken on the one site the waste stream will have to be split among the various routes. This should not be a major issue, as most of these facilities will be undertaking this exercise for the purposes of landfill levy and recycling rebate calculations anyway.

Waste Stream's Principal Source

In line with international practice that could be identified and most current Australian practice, the Waste Streams were categorised according to the principal origin of the waste, as shown in Table 1, namely :

Urban Solid Wastes : Those processed/disposed of to recycling, composting, incineration or landfill :

- ◆ Municipal Waste : wastes arising from domestic premises and Council activities largely associated with servicing residential areas; such as street sweepings, street tree lopping, parks and gardens, and litter bins.
- ◆ Commercial and Industrial : wastes arising from institutional, commercial, industrial activities (non hazardous) and being disposed of to facilities owned by urban authorities (Councils, Waste Authorities etc).
- ◆ Building and Demolition : wastes arising from demolition and building activities.

Solid Wastes Disposed On-site :

These are non - hazardous wastes arising from activities such as mining, agriculture and power generation, and which are disposed of to landfills or emplacements on the site of the waste generator :

In order to provide a more detailed description of these major waste streams, a series of sub-streams have been defined, Table 2, to provide additional information on the aspects described below. These sub-streams will be used either in full when intensive surveys (lasting one day to one week) are undertaken or selectively on a continual basis to suit local regional needs. The decision on which sub-streams to use, and the frequency of intensive gatehouse surveys, will remain with the local authority.

Sub-stream 1 : Secondary Source

This provides a more detailed description of the waste generation source. For Municipal waste, Domestic waste refers to that waste put out by households in a range of bin sizes (55 - 240L bins); Other domestic includes large packaging that cannot fit into the domestic waste bin, clean-up waste, garden waste, and disused furniture; Other Council waste includes street sweepings, litter bin contents and street tree loppings.

The Source sub-stream for Commercial and Industrial waste follows the ASIC classification system. E has been omitted because Building activities are covered in the Building and Demolition stream. HIJ includes both public and private sector services. Hotels and restaurants are included in L.

Building and Demolition waste will typically have O : Unknown as its source, but there may be regions which in time will be able to detail the source as 2 : Other Domestic (for residential renovations); 3 : Other Council (for footpath replacement etc) or an ASIC code. There may be some unavoidable differences in application of the Classification System in the area of Building and Demolition waste arising from residential sources; in addition to the above code, some weighbridge operators may charge and therefore classify this waste as 4 Landfill//A : Municipal waste//2 : Other Domestic//1,2 (cars, small trailers)//11,12 etc. If material composition was recorded in the data collection, this would not be a significant issue, as these two interpretations could be reconciled in the National Waste Database; however, this material composition data may not always routinely be collected, and Landfill owners should be encouraged to use the Building and Demolition waste stream where possible.

Sub-stream 2 : Measurement/Transport mode

Landfills not equipped with weighbridges and required to estimate through-put often do so through the use of vehicle counts applied to average weight of waste for each class of vehicle. The categories suggested have been taken from typical vehicle classes. Where transfer stations and similar facilities are to be designed, the daily arrival pattern of vehicle types is required for the design of tipping face length and storage capacity. This data is usually determined from vehicle count studies at existing landfills in the region. As data, already being collected, is forwarded to the National Waste Database, it will be possible to estimate typical arrival patterns based on characteristics of the waste catchment area, without the need to undertake special traffic studies.

Transport mode also provides additional information on the source of the waste, particularly for the Other Domestic stream, eg Clean-up waste can be identified by the Council or contractor truck/compactor arriving at the landfill, and this waste can be distinguished from resident hauled Other Domestic waste if this is important (for the design of receival facilities at a transfer station for instance).

Sub-stream 3 : Material Composition

Some materials such as garden waste and timber pallets are often segregated when they arrive at the landfill because of the nature of the waste generation activity. This segregation of waste is likely to increase, and to be extended to other wastes, as landfill owners and the Authorities that set their licence conditions provide a range of price incentives to encourage segregation of recyclable material. The third sub-stream enables landfill operators to record waste material composition where segregation allows a simple observation to determine this. Many landfill

operators are already doing this because of differential charging for tyres, large trees from sub-division construction etc.

The term "Material Composition" has been in this table to distinguish it from Material Type in the Waste Composition table. The same terms have been used in both tables, and it can be seen that terms have been taken from all three columns of the Waste Composition table - it would therefore be confusing to label this column "Material Type" as this column in the Waste Composition does not contain all the terms required.

Category 9 contains special wastes that arrive in segregated form and are charged at special rates to reflect their higher costs of disposal. Only commonly occurring special wastes are listed separately, with smaller quantities of other segregated special wastes being grouped into 9.1 Other Special Wastes. If a region used its solid waste processing and disposal facilities for disposal of hazardous waste, and the region used a manifest system with the AEC classification system (soon to be replaced by an ANZECC revised version), then 9.1 would represent the total quantity of all manifested hazardous wastes. Detailed breakdowns of the quantity in 9.1 would then be obtained from the hazardous waste manifest database (as will be undertaken in the National Waste Database for all regions with this facility). However most major industrial waste generating regions have (or plan to have) separate hazardous waste treatment and sometimes dedicated disposal facilities, so that these hazardous wastes will not appear in significant quantities in the solid waste data collection system.

2.2 Example Application of Waste Stream Classification System

The waste stream classification system can be applied in two ways :

- ◆ Directly applied in a region or a State using the terms suggested in Table 1 and 2. Where possible this is preferred.
- ◆ Indirectly applied by using different words for the waste streams and sub - streams listed in Table 1 and 2. This may be necessary in some regions because of the use of particular words in legislation. However there should be a direct 1 : 1 relationship between the quantity of waste in the national stream or sub - stream and the regional equivalent; partial relationships should be avoided.

The first of these two application methods are illustrated in the following examples.

2.2.1 Direct Application

Solid waste collected on a weekly or twice weekly frequency from residential areas by Council owned or contracted compactor trucks and disposed of to a landfill with a weighbridge would be classified as :

4 Landfill / A Municipal Waste / 1 Domestic waste / 0 all, weighbridge / 0 mixed : 6.5t
or for actual recording purposes : 4 / A / 1 / 0 / 0 : 6.5t

If convenient, transport mode should be recorded routinely; otherwise occasional intensive one week surveys to meet the needs of the local region will be sufficient. If the landfill is not supplied with a weighbridge, and the quantity of waste is required for levy calculation purposes, then transport mode will probably be routinely recorded (unless topographic surveys are used) and the waste stream would be classified as :

4 Landfill / A Municipal Waste / 1 Domestic waste / 8 Compactors, bins 12 - 19 m³ / 0 Mixed : 6.5t
or simply : 4 / A / 1 / 8 / 0 : 6.5t

With the current state of technology it will be difficult to assess the ASIC industry group from which C & I waste arose (questioning drivers during occasional intensive surveys may be possible) and so a typical classification of C & I waste arriving at a landfill without a weighbridge would be :

4 Landfill / B Commercial & Industrial / 0 Unknown / 10 Compactors, bins 19 - 32 m³ / 0 mixed : 10.2t
or simply 4 / B / 0 / 10 / 0 : 10.2t

It can be seen that a number of the data fields will always be the same for the one facility, so that data entry for each load of waste can be simplified by producing standard hardcopy forms with default values inserted or by inserting default values into the spreadsheet or database computer data entry form. Hence only two or three numbers/letters will need to be recorded for each load, taking less than 30 seconds.

3 WASTE COMPOSITION

Currently there are no regulations to require, or direct incentives to encourage, the conduct of waste composition studies by the owners and managers of solid waste. Councils, Waste Authorities, Industry Associations and EPAs are undertaking these studies for their own benefit in terms of investigating the feasibility of material recovery systems, monitoring the changes in waste composition over time and improving the existing waste management systems. In most cases there is little commercially confidential information involved, and it is hoped that most organisations undertaking these studies will conduct them in a manner that is consistent with the National system and will then forward data on to the National Waste Database.

In designing the classification system it has been recognised that waste composition studies will be undertaken with different levels of resources and for different purposes. Example applications for different levels of resource and purposes are illustrated in Section 3.2.

Waste composition should be expressed as :

- ◆ Material Type and Material Detail as a % of the whole waste sample, with the weight of waste sample and number of samples analysed stated. Information on variance about the mean should also be supplied.
- ◆ and/or Weight of Material Type and Material Detail, with variance information.
- ◆ and density of Material Type and Material Detail. Development of standard methods of measuring density is currently underway and will be documented in the accompanying Manual.

3.1 The Waste Composition Classification System

Material type and material detail and associated sub-categories are listed in Table 3. (P) indicates the material detail is a packaging derived waste. The waste composition classification system has been designed to be applied to all three major urban solid waste streams, not just the Municipal waste stream.

The basis of this system of categorising the components of urban solid waste is described below. The three fields of Material Type, Material Detail and Material Detail Sub-category 1 have been designed to satisfy the needs of the National Waste Minimisation Strategy and related documents at the Commonwealth and State level. Material Detail Sub-category 2, as yet undefined, will not be a formal part of the National Classification System but will be developed to suit regional specific needs and project specific needs by regional Authorities. Suggestions on alternatives for specific needs (eg. incineration, composting, recycling etc) are being developed in an accompanying Manual.

- ◆ **Material Type :**

The major material type categories correspond to the predominant material types found in urban solid waste and largely follows the practice of previous waste composition studies in Australia. The Material Type categories are compatible with, but not exactly the same as the NZ "Primary Classification". This will enable existing waste composition data to be utilised at the Material Type level into the future. The "Other" category has been kept as small as possible and largely consists of inert waste materials.

- ◆ **Material Detail :**

Material detail categories enable more detailed description of broad material types. The categories have generally been selected on the basis of the recycling potential of the waste component and sometimes whether the component is derived from packaging (otherwise this aspect is covered in the Material Detail sub-category 1). Packaging derived wastes have been identified because of the national minimisation targets set by and for the packaging industry. The basis for Material Detail in each Material Type group is :

- Paper material detail categories relate to the value of the paper for recycling, and the processes and products into which the recycled paper can be turned. Packaging materials have been identified with a (P).
- Organic compostable materials have been divided into the two readily segregated components. This data will also be essential in the design of collection, transport, storage and compost processing plant. "Organic" in this instance is taken to include all compound of carbon (as used in the definition of organic chemistry).
- Other organic wastes have been grouped together to avoid having them in the "Other" Material Type category, and because of their common organic nature which would be convenient for incineration design.
- Glass has been simply categorised according to whether or not it was derived from packaging. Deposit verses non-deposit containers are identified in Sub-category 1. This would be useful in evaluating the effectiveness of deposit legislation where this is in place, and the effect that deposit legislation may have on this component where it is being considered for implementation.
- Plastic has been categorised into the major chemical types. With increasing use of the plastic recycling identification symbols on plastic packaging and products, this identification is becoming easier. Where common items do not have an identifying symbol, it will be a simple matter to ascertain this once from the manufacturer and to add it to a list in a Manual that is being developed to accompany the Classification System.
- Ferrous materials have been categorised into packaging and other, with further detail being provided in the Sub-category 1.
- Non-ferrous generally follows the ferrous system.
- Household hazardous waste has been divided into a small number of categories representing the commonly occurring chemicals, rather than using the very detailed AEC hazardous waste classification system with some 80 categories. "Household" hazardous waste materials may also arise in the Commercial and Industrial, and the Building and Demolition waste streams.
- Others largely consists of inert materials. A special category has been introduced to cover those hazardous wastes normally found in urban solid waste or dealt with by the urban solid waste system (as opposed to the hazardous waste system).

◆ **Material Detail Sub-category 1**

Sub-category 1 provides for more detailed descriptions of waste components. The categories for glass and plastics have been discussed above. The rationale for the categories in the other Material Types are listed below :

- Sub-category 1 for Other Organics provides more descriptive information, particularly relevant to the recyclability of the material.

- Ferrous and Non-ferrous packaging waste is further divided into beverage and other cans , and other packaging because of the interests of the industry groups in separately monitoring these materials in the waste streams.

◆ **Material Detail Sub-category 2**

This Sub-category has been provided to enable regions to further sub-divide waste into components that are of specific interest to the end use of the results of the survey. For example, different coloured glass may attract differing prices in a region, so that region may wish to further sub-divide non-deposit glass into three colours; a region may wish to obtain information on the quantity of disposable nappies going to landfill, so this could be included as a sub-category under "Composite, mostly paper" as appropriate.

Packaging paper components may be further divided into contaminated and non-contaminated to enable differing values to be put on each type. It must be recognised that contamination may be inherent in the process giving rise to the waste paper (paper kitchen towels for example) or it may occur subsequently in the waste management system, ie. in the kitchen storage bin, the household storage bin, the compactor truck or the storage container at a transfer station.

As is the case for all of Sub-category 2, the intended use of the data needs to be borne in mind when deciding whether to use this Sub-category. Ideally, sampling should be undertaken at the point in the waste management system that coincides with where the material will subsequently be segregated for recycling or processing. If this is not possible, then judgements will have to be made by the classification staff as to whether the waste would be likely to be contaminated after the changed collection procedures were put in place. If this is not possible then consideration should be given to **not** measuring this aspect of the waste materials as the results are likely to be too difficult to interpret. This issue will be expanded upon in the Manual accompanying the Classification system.

Suggested categories for common specific uses will be provided in the Manual accompanying the Classification system.

3.2 Example Application

Depending on the resources available to the study, the waste will be sorted into components according to :

- ◆ Material Type (column 1) only for studies with limited resources
- ◆ Material Detail and Material Detail Sub - category (columns 2 and 3) for more comprehensive studies, including all studies undertaken by State EPAs for their information and monitoring needs.

If the composition study is being undertaken for the purpose of designing a waste treatment and/or disposal facility, then additional data will need to be collected under the unspecified column Material Detail Category 2. Examples include the moisture content of the major Material Types and some Material Details, the nutrient content of particular Material Details, and calorific value of some Material Types.

Some waste composition studies are undertaken by organisations interested in the quantity of a particular material (such as aluminium or steel) or the quantity of packaging waste for instance. Where feasible, it is hoped these studies will also sort for the major Material Types, or at least specify the quantity of particular materials as a % of the whole waste sample. In this way, all such data will be of interest to the National Waste Database.

4 SUPPORTING MANUAL

As has been mentioned at various places in the preceding discussion, there is a need to provide a guidance manual accompanying this Classification System so that users in different regions apply the system in a common way, and in accordance with the principles on which the System is based. Aspects to be included in the Manual will be :

- ◆ An explanation of the principles and rationale behind the Classification System, largely as presented in this paper.
- ◆ Proforma for collection of waste stream and waste composition data, on sheets and set up on an Excel spreadsheet and in dBASE IV
- ◆ An outline of how the data and the summary reports may be used, eg for monitoring achievement of targets, design of facilities, etc.
- ◆ Examples of waste components, including photographs, so that the waste composition system can be applied by different users in a consistent manner, eg a list of plastic products and their chemical composition.
- ◆ A discussion and guidance on the contamination issue in waste composition studies.
- ◆ Guidance on the development of regional specific and project specific Material Detail Sub-category 2, eg What data should be collected for design of an incinerator, or a compost plant or a MRF. This area involves professional judgement and should not be part of a prescribed national standard.
- ◆ A case study illustrating how to use the Classification System and pointing out how difficulties were overcome.
- ◆ Guidance on the conduct of waste composition studies, including sampling and OH & S issues.

Suggestions on other topics to be included in the Manual will be welcomed.

5 ACKNOWLEDGEMENTS

The Draft Solid Waste Classification System has been developed as part of the National Waste Database, a project in the Waste Minimisation program of the CRC for Waste Management & Pollution Control Ltd, which has been established and supported under the Australian Governments Cooperative Research Centres Program. The project is funded by the Commonwealth EPA and the CRCWMPC.

The Draft Solid Waste Classification System has been developed through a series of meetings with a Technical Review Group consisting of representatives from State, Commonwealth and Local Government Waste Management agencies. This final version has benefited from a formal review by CRCWMPC members and a Project Advisory Committee formed for the Project.

6 ABBREVIATIONS

AEC	Australian Environment Council (forerunner of ANZECC)
ANZECC	Australian New Zealand Environment & Conservation Council
ASIC	Australian Standard Industrial Code
EPA	Environment Protection Authority
HDPE	High Density Polyethylene
LDPE	Low Density Polyethylene
MRF	Materials Recovery Facility
NWD	National Waste Database
OH&S	Occupational Health & Safety

PET Polyethylene Terephthalate
PVC Polyvinyl Chloride

7 GLOSSARY OF TERMS

Standards Australia is forming a committee to develop standard meanings for common waste management terms. The list below will be submitted to the committee for their consideration, and this paper will be amended when a standard is finalised.

Composting :	The controlled biological decomposition of organic solid waste materials under aerobic conditions. Composting can be accomplished in windrows, static piles, and enclosed vessels. (Tchobanoglous, 1993)
Flux :	Rate of flow of materials across a given area in a given time, mass/unit area (regional boundary area)/unit time
Goods :	Movable property, merchandise, wares (OED)
Kerbside recycling :	System of recycling where the generator segregates wastes according to material type and places them in containers on the kerbside for separate collection. Normally refers to Domestic Waste
Materials :	Matter from which thing is made, elements, constituent parts (OED)
MRF :	Facility for separating commingled collected recyclables into their material types.
Process :	Series of operations to achieve a particular end
Recycling :	Separating a given material type (eg glass) from the waste stream and processing it so that it may be used again as a useful material for products which may or may not be similar to the original. (adapted from Tchobanoglous, 1993)
Reuse :	The use of a waste material or product more than once.
Waste :	A material or product with a negative value to its current owner in its current location.
Waste Composition :	The component material types, by % or weight, in a waste stream.
Waste Classification :	A system to enable the unique identification of a waste stream and the composition of material types in that waste stream, so that comparable data may be collected from different regions.
Waste Designation :	A legal definition embodied in legislation that prescribes a material or product as being a waste for that particular jurisdiction.
Waste Stream :	The total weight of wastes arising from a particular source (either a principal or secondary source) in a particular region in a given time.

8 REFERENCES

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Draft National Solid Waste Classification System**

Version 6

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Table 2
Draft Solid Waste Classification
Waste Streams - Version 6, Complete version
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Proc./Disposal Route	Waste Stream Principal Source	Sub - stream 1 Secondary Source	Sub - stream 2 Measurement/Transport mode	Sub - stream 3 Material composition
1 Recycling 2 Composting 3 Incineration 4 Landfill 5 On-site	A : Municipal Waste	1 Domestic waste 2 Other Domestic 3 Other Council	0 All, Weighbridge 1 Cars, station wagons 2 Utes, p/vans, sgl axle trailers 3 lge utes, multiple axle trailers 4 Open trucks, Gross wt < 5t 5 Open trucks, 5t<Gr wt <12t 6 Open trucks, Gross wt >12t 7 Compactors, bins <8m ³ 8 Compactors, bins 8 - 12 m ³ 9 Compactors, bins 12 - 19m ³ 10 Compactors, bins 19 - 32m ³ 11 Compactors, bins >32m ³ 12 Other	0 Mixed 1 Paper/cardboard 2 Food/kitchen 3 Garden 4.1 Wood 4.2 Trees > 150mm dia 5 Tyres 6 Glass 7 Plastic 8.1 Ferrous - mixed 8.2 Ferrous - cars 9.1 Special - Other 9.2 Special - Sewage sldg 9.3 Special - Dusty waste 9.4 Putrescible/Organic (K) 9.5 Asbestos(N220) 9.6 Clinical & Pharm.(R) 10 Clean fill (mixed) 10.1 Bricks 10.2 Concrete 10.3 Carpet 10.4 Plaster board 10.5 Non-ferrous - Al. 10.6 Non-ferrous - Other 10.7 Ceramics 10.8 Clean excavated matl 11 Other segregated
	B : Comm. & Ind.	0 Unknown A Agriculture B Mining C Manufacturing D Electricity, Gas and Water F Wholesale and Retail Trade G Transport and Storage HIJ Services sector K Community services(hlth,ed) L Recreation, Tourism		
	C : Bldg. and Demo.	X Waste Processing Facility		

Notes :

- 1 Those descriptors in bold to be the preferred minimum data collected on a daily basis at the gatehouse of the landfill.
- 2 Other descriptors to be used selectively to suit local needs, or in total for intensive surveys or as technology becomes available to make comprehensive routine data collection feasible.
- 3 "Other" in Transport mode allows for the introduction of special equipment such as dual compartment recyclable/waste storage in collection vehicles. When a special vehicle becomes widely used it will be added to the list as a separate item.
- 4 Recycling includes the processing of (waste) materials for re-use; processing may involve administrative action as well as cleaning, relabelling etc.

**CRC1.2 National Waste Database
Draft National Solid Waste Classification System**

SUMMARY OF CHANGES FROM MARCH 1993 VERSION TO APRIL 1993 VERSION

To facilitate comments on the April 1993 version of the National Solid Waste Classification System, the major changes from the March 1993 version are summarised below :

Section 2.1 The Waste Stream Classification System

An additional Disposal Route of "On-site" has been added, which eliminates the need for Waste Streams D,E,F,and G.

More detailed discussion is provided under "Sub-stream 1 : Source" in the area of Building and Demolition Waste stream classification.

A "0 All, weighbridge" has been added to Sub-stream 2 : Transport Mode.

An "12 Other" category has been added to Sub-stream 2 : Transport mode to cater for the development of new collection vehicles such as dual compartment recyclables/waste collection vehicles.

Changes have been made to Sub-stream 3 : Material Composition to make the hazardous wastes listed under Special consistent with the proposed ANZECC hazardous waste classification system.

Section 2.2.2 has been deleted as the NSW EPA is still developing it's Classification system and reference to non-standard terms may lead to confusion when the document is released for more general comment and use.

Section 3 Waste Composition

Clarification of the use of the term "organic" has been included. The more general definition used has been taken from the Concise Oxford and Morrison & Boyd's Organic Chemistry.

Thanks to WA, Brisbane City Council and ACT for their comments which have lead to a simpler and more comprehensive Classification System.

Table 3
Solid Waste Composition Classification

Code	Material Type	Material Detail	Material Detail Sub-Category 1
A01 A02 A03 A04 A05 A06 A07 A08 A09	Paper	Newspaper Magazine Misc. Packaging(P) Corrugated cardboard(P) Package board(P) Liquid Paper Containers(P) Disposable paper product Printing & writing paper (incl. books) Composite, mostly paper	
B01 B02 B03	Organic Compostable	Food / Kitchen Garden Other Putrescible	
C011 C012 C02 C03 C041 C042 C051 C052	Other Organic	Wood Textile/rags Leather Rubber Oils	furniture packaging, offcuts footware tyres, tubes engine, lubricating cooking oil
D011 D012 D021 D022	Glass	Packaging glass /containers Misc/other glass	Deposit / refillable Nondep./Cullet Plate glass Other glass
E011 E012 E021 E022 E031 E032 E041 E042 E051 E052 E061 E062 E071 E072 E073 E074 E08	Plastic	1 PET 2 HDPE 3 PVC 4 LDPE 5 Polypropylene 6 Polystyrene 7 Other 8 Composite, mostly plastic	Package Non-package Package Non-package Package Non-package Package Non-package Package Non-package Package Non-package Foams - PU Foams - other Film Other
F011 F012 F021 F022 F023 F031 F032	Ferrous	Steel packaging other Composite, mostly ferrous	Cans other packaging white goods other appliances other car bodies other
G011 G012 G013 G021 G022 G03	Nonferrous	Aluminium Other Composite, mostly non-ferrous, non aluminium	Cans other packaging composites copper other
H01 H02 H03 H04 H051 H052	Household hazardous	Paint Fluorescent globes Dry cell batteries Car batteries H'hold chemicals	pharmaceuticals other h'hold chemicals
I01 I02 I03 I041 I042	Others	Ceramics Dust/ dirt/ rock/inert Ash Special	asbestos pathogenic, infectious

