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APPLICATION OF THE AUSTRALIAN WASTE DATABASE TO SOLVING PROBLEMS IN WASTE MANAGEMENT

S. Moore, S-Y Tu, B. Kung [1]
University of NSW[2]

SUMMARY : The Australian Waste Database (DATABASE) project was initiated in response to the need to provide a monitoring mechanism for Commonwealth and State policies aimed at minimising waste by certain amounts within specified time frames. An outline of these policies is provided in this paper before the objectives of the Australian Waste Database project are described. The paper then outlines a series of problems in waste management that are currently facing practitioners in the private and public sectors and shows how the reports from the DATABASE will be able to assist in their solution. The DATABASE project is now half way through a three year program and the reports described in this paper will become available in trial form in the first half of 1994.

1 INTRODUCTION

1.1 Background

A series of Conventions, Regulations and policies relating to waste management require the collection and reporting of solid and hazardous waste generation data at the interAustralian, Australian, regional and firm level. These are outlined below.

At the interAustralian level Australia has an obligation to collect and report waste data in accordance with :

- OECD Council decision C(90)178/FINAL of 31st January, 1991, namely :

  " *Member countries shall cooperate in the collection of harmonised data on waste imports and exports and make these data publicly available consistent with their Australian laws on the confidentiality of business information"* (reported in OECD, 1993)

- Agenda 21 recommendations (UNCED, 1992) :

  " To strengthen procedures for assessing waste quantity and composition changes...by the year 2000, governments should ensure the capacity to assess and monitor waste trends and to have established waste reduction programs."

  " Reduce the production of wastes destined for final disposal according to formulated goals, based on weight, volume and composition."

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[1]Stephen Moore is Senior Lecturer in Waste Management, and Project Leader for the CRC for Waste Management and Pollution Control's National Waste Database Project. Shin-Yu Tu is Research Assistant, Benita Kung is CEPA Professional Officer for the National Waste Database project. Contact address : School of Civil Engineering, University of NSW, PO Box 1 Kensington, NSW 2033; Ph 02 697 5073; Fax 02 663 2188; email stephenm@civeng.unsw.au.oz

At the Australian and State level, governments as well as industry umbrella groups have established policies that require the monitoring and reporting of waste generation. Government policies include :

- The Australian Waste Minimisation and Recycling Strategy (CEPA, 1992) , which includes a target of reducing the quantity of waste (on a per capita basis) being disposed to landfill by 50% of 1990 levels by yr 2000.

- The Australian Kerbside Recycling Strategy, (1992) which includes recycling targets for particular materials by 1995, namely:

-Plastic containers	25% -	Aluminium cans	65%
-Glass	45% -	Liquid paperboard containers	20%
-Steel cans	25% by 1996	Newsprint	40%
	(40% by 2000)	Paper packaging	71% input to be secondary fibre

  In addition, ANZECC was to establish a Australianly agreed method of measuring waste generation and a procedure for monitoring changes.

- The Intergovernmental Agreement on the Environment (February 1992) signed by Commonwealth, State and Local Government clarifies their roles and responsibilities and provides a mechanism for a cooperative Australian approach to the environment. Included in the Agreement is the requirement that a Australian Environment Protection Agency (which will supersede ANZECC) may establish measures for the protection of the environment for the environmental impacts associated with hazardous wastes and the reuse and recycling of used materials; and that NEPA shall monitor and report on the implementation and effectiveness of these measures.

- The ANZECC Australian Packaging Guidelines (July 1991) set targets of reducing packaging waste requiring disposal by 50kg per capita (approximately 5% p.a.) of the amount sent for disposal in 1991. ANZECC will monitor the implementation and effectiveness of these guidelines.

In addition to these documents, a series of recommendations developed by the Ecologically Sustainable Development consultation process in Australia (particularly the Manufacturing Working Group) imply the requirement for waste and environmental quality data collection and reporting (ESD Working Groups, 1991).

Industry umbrella groups have also developed policies to guide their members in improving environmental performance. Many of these include requirements for waste generation data collection and monitoring, often associated with the setting of benchmarks and the monitoring of their achievement. Examples include :

- The Australian Manufacturing Council's Best Practice Environmental Management, which recommends the establishment of comprehensive Environmental Management Systems which include "*environmental indicators* (and) *environmental measuring and reporting, based on total quality principles*" (AMC, 1992)

- The Australian Chemical Industry Council's Responsible Care program. The Waste Management Code of Practice in this program requires, under the "General" section (ACIC, 1992), that companies :

  "5.4 Maintain a quantitative inventory updated annually of all wastes generated (measured, or estimated at the point of generation or release) and the method and location of their treatment and/or disposal.

  5.5 Develop and maintain a waste management plan and set specific targets for reduction of waste.

  5.6 Communicate the waste management plan and its implementation to employees, government and the public."

1.2 Project Need

It can be seen from this brief review that there is a wide spectrum of requirements for the collection and reporting of information on waste generation and management. The danger is that, through a lack of coordination and standards, information will be collected in forms that do not facilitate aggregation and comparison across industry sectors, nor across State and Australian borders.

An examination of the current state of waste data collection and reporting in Australia (CRCWMPC, 1992) has highlighted how inadequate current systems are in meeting the demands placed on them by the new and developing waste policies described above. There is an urgent need to develop uniform methods of classification, data collection, storage and reporting so that the target setting and monitoring demands of these various government and industry waste policies can be met. In addition, such a uniform system would facilitate cross industry and interstate and interAustralian comparisons.

The Australian Waste Database (DATABASE) project was initiated by the CRC for Waste Management and Pollution Control Ltd and the Commonwealth EPA to meet the need for such a system. An outline of the objectives and scope of the DATABASE project are described in the following section before addressing the topic of how the reports from the DATABASE can assist in the solution of a range of waste management problems.

2 THE AUSTRALIAN WASTE DATABASE PROJECT

2.1 Aim and Objectives

The aim of the project is to establish a database on waste generation in Australia which can be used by State and Commonwealth environmental and waste management agencies, and other interested organisations to set and monitor the achievement of Australian waste minimisation targets.

To achieve this aim, the following objectives will need to be met:

(a) Review and establish Australian agreed classification systems for various groups.
(b) Establish a protocol for sampling and characterising urban solid wastes.
(c) Establish an Australian waste generation database to provide fundamental information on the generation of different types of waste by region and in relation to relevant parameters.
(d) Review Australian and overseas waste generation trends and suggest waste minimisation benchmarks for each waste type by region.

For the purpose of the DATABASE, 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, and for hazardous wastes in Figure 3. The points in the system at which data will be collected for the solid waste and hazardous waste generation database modules of the DATABASE are indicated in Figure 2 and Figure 3 with a " * ".

The Database will cover both solid waste (non-hazardous waste arising from municipal, commercial, industrial, building and demolition activities) and hazardous waste (generally liquid industrial wastes which are precluded from disposal to the sewerage system) disposed to off-site treatment and disposal facilities. Details of the solid waste component are provided in a recent paper by Moore et al (1993a), and activities related to the hazardous waste field are described in a separate paper by Moore et al (1993b). A summary of the two major components of the DATABASE project are provided below.

2.2 Solid Waste Component of the Australian Waste Database

In relation to the above objectives of the project, the major tasks that need to be completed for the solid waste component of the project are outlined below.

2.2.1 Establish a Australian Solid Waste Classification System

Following a review of classification systems in Australia, NZ and other OECD countries a Technical Review Group was established from representatives of Local, State and Commonwealth waste and environment agencies to formulate a Australian Solid Waste Classification system. This system has been submitted for ANZECC endorsement and will be used on a trial basis for 12 months before final revisions are made. The proposed Draft Australian Solid Waste Classification system is provided in Table 1 and Table 2. A detailed description of how the tables should be used in practice is provided in Moore et al (1993a) and CRCWMPC (1993).

Existing classification systems in use in Australia and overseas will be translated to the new system to enable existing Australian data to be used and to enable comparisons with OECD waste data to be made.

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

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	**A : Municipal Waste**	**1 Domestic waste**	0 All, Weighbridge	0 Mixed
2 Composting		**2 Other Domestic**	1 Cars, station wagons	1 Paper/cardboard
3 Incineration		**3 Other Council**	2 Utes, p/vans, sgl axle trailers	2 Food/kitchen
4 Landfill			3 lge utes, multiple axle trailers	3 Garden
5 On-site	**B : Comm. & Ind.**	0 Unknown	4 Open trucks, Gross wt < 5t	4.1 Wood
		A Agriculture	5 Open trucks, 5t<Gr wt <12t	4.2 Trees > 150mm dia
		B Mining	6 Open trucks, Gross wt >12t	5 Tyres
		C Manufacturing	7 Compactors, bins <8m^3	6 Glass
		D Electricity, Gas and Water	8 Compactors, bins 8 - 12 m^3	7 Plastic
		F Wholesale and Retail Trade	9 Compactors, bins 12 - 19m^3	8.1 Ferrous - mixed
		G Transport and Storage	10 Compactors, bins 19 - 32m^3	8.2 Ferrous - cars
		HIJ Services sector	11 Compactors, bins >32m^3	9.1 Special - Other
		K Community services(hlth,ed)	12 Other	9.2 Special - Sewage sldg
		L Recreation, Tourism		9.3 Special - Dusty waste
				9.4 Putrescible/Organic (K)
	C : Bldg. and Demo.	X Waste Processing Facility		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

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.

2.2.2 Establish a Protocol for Sampling and Analysing Solid Waste

Following a review of sampling and analysis methods for solid waste composition studies in Australia and overseas, an assessment of their usefulness for a Manual on waste composition studies will be made. Guidelines on the conduct of waste composition studies for the three major waste streams will be prepared, including :

- Guidance on the sampling technique (answering, "where from?, how many?, what size?")
- Guidance on equipment and procedures for waste sorting
- An OH & S guideline

A Manual on waste testing protocols (moisture content etc), using established Standards where possible, will be prepared.

As part of the DATABASE project, undertake waste sampling, sorting and analysis from the Municipal, and Commercial and Industrial waste streams in the Eastern suburbs of Sydney; building on the work of Ho(1981), van den Broek (1969) and others to prepare and test drafts of the Guidelines described above.

2.2.3 Establish a Australian Waste Generation Database

Trial databases for waste stream data and waste composition data will be established using dBASEIV and ACCESS. Existing data translated to the Draft Australian System will be used to produce trial reports for comment. Feed-back from potential users on report formats will be obtained, and the database structure and reports will be refined. An Operating Manual for the ongoing maintenance of the Database will be prepared.

Example reports in graphical form are illustrated in Figure 4.

2.3 Hazardous Waste Component of the Australian Waste Database

Hazardous wastes for the purpose of the DATABASE are those wastes which are not allowed to be disposed of to the sewer or to municipal solid waste landfills; if the generator has no means or treating and disposing of them on-site, they must be tankered to an off-site treatment plant. Each State has their own regulations defining hazardous wastes, sometimes by the use of "Prescribed Waste lists". Most of the major metropolitan areas in Australia have established manifest systems which track and record the transport of these hazardous wastes from the generator to the off-site treatment plant, and in so doing build up a database of information on their generation.(see Figure 5)

Different classification systems have been used to characterise the manifested wastes, with the 1986 AEC system being the basis of the systems used in Sydney, Victoria and S.A., and simpler lists being used in Brisbane and Perth. ANZECC is currently revising the AEC classification system for use in a Australian Manifest System which will facilitate the transfer of hazardous wastes between States and which will enable data from different States to be compared.

The DATABASE project, in the hazardous waste field, will :

- Contribute to the revisions to the hazardous waste classification system being undertaken by ANZECC, by suggesting structures and details which will inherently improve the integrity of the data (removing potential ambiguity) from the perspective of teh DATABASE and enable the Australian system to be directly compared to InterAustralian systems developed by the OECD and UNEP.

- Obtain aggregated monthly data on the generation of each type of hazardous waste in each region covered by a manifest system and using the Australian hazardous waste classification system. Data will be aggregated by industry type using 4 digit ANZSIC (Australian New Zealand Standard Industry Classification) codes, which are entered onto the manifest forms and subsequently into the manifest database.

- Transfer the monthly data into a relational database, such as dBASEIV or ACCESS, with the waste entity having attributes of waste type (using the revised ANZECC classification system), waste quantity, month generated, ANZSIC code of generator, treatment type provided, and region in which generated.

- Generate standard reports on the generation of waste types in each region on a routine basis and prepare special reports on request. The design of these reports will be developed through initial consultation with users, followed by trialing and refinement. Preliminary examples are shown in Figure 6.

With the exception of leaching tests for determining the hazardous characteristics of wastes, sampling and analysis protocols for hazardous wastes are unlikely to require the attention and development that will be devoted to solid wastes.

2.4 Project Liaison and Networking

A Technical Advisory Group has been established with representatives from each State to provide a focus for liaison with organisations in each State. This Technical Advisory Group will assist with trialing of components of the DATABASE and will facilitate implementation of the final products.

As the project gains definition and evolves from a concept to reality, further presentations and consultations will take place with Local Government and with Industry. Presentations at relevant waste conferences will be made, information will be distributed to a mailing list of interested individuals, and information will be posted in networks such as CouncilNet. All these activities are now well underway.

In the final year of the project, interested individuals and organisations will be able to receive trial outputs from the Database and their comments will be used to make final adjustments to the DATABASE.

2.5 Linkages to Other Databases

The hazardous waste database will be a sub-set of the proposed Australian Pollutant Inventory (NPI), which will attempt to record all emissions from facilities in a similar manner to the US EPA Toxics Release Inventory. NPI data will have to be aggregated by region to enable it to be complementary with data from the Australian Waste Database. This will be easily achieved as the NPI will know either the exact location of the facility (from a GIS) or at least its postcode.

An important link to the extensive ABS database is via the ANZSIC code and ABS defined statistical regions. This will enable relationships between waste generation and a range of standard economic and demographic statistics to be investigated. It is these relationships which could form the basis of a series of Unit Production Indices of hazardous and solid waste generation that could be useful measures of environmental performance in regions and in industry groups.

3 SELECTED PROBLEMS IN WASTE MANAGEMENT

As discussed in the introduction to this paper, the DATABASE project was initiated to solve some specific problems relating to monitoring the achievement of waste minimisation targets in recent waste policies developed at the Commonwealth and State government level. The methods to be used to produce a Database which will solve these problems have been described in Section 2, and it is likely that the DATABASE will be functioning and meeting the monitoring needs of these waste policies by June 1995.

In addition to these primary uses of the DATABASE, it is possible that solutions to a range of other waste management problems experienced by industry, local government, and State and Commonwealth governments may be assisted by application of the reports from the DATABASE. A selection of such problems and an indication of how the DATABASE can assist in their solution follows in the remainder of this section.

3.1 Waste Problems in Industry

3.1.1 What measures or indices for environmental performance are appropriate in Environmental Management Plans?

Industry is facing a number of challenges in managing their interface with the environment. Moore & Worrall (1993) suggest a framework for Environmental and Waste Management Plans that might proactively deal with these challenges. Detailed guidelines have been developed by a number of organisations to assist companies to develop and implement environmental management systems or plans, including :

- ACM's Best Practice Environmental Management and ACIC's Responsible Care program, referred to in Section 1.1.
- Standards Australia (1991) draft Australian Standard on Environmental Management Systems
- The Environmental Self Assessment Program based on the InterAustralian Chamber of Commerce 's Business Charter for Sustainable Development, developed by the Global Environmental Management Initiative (1992).

All of these plans and programs have environmental improvement objectives and require, implicitly or explicitly, the development of environmental quality indices against which performance can be measured. It is important to develop rational measures so that benchmarks can be established and facilities can measure their improvement over time, against both their own and industry-wide standards.

Many areas of human activity demonstrate the power of monitoring and feedback in influencing behaviour towards desired ends, including the field of waste minimisation (Hirschhorn, 1991). This means that the establishment and monitoring of environmental quality indices itself, as part of a comprehensive Environmental Management Plan, is likely to result in improved performance, through simple actions of "paying attention" to the processes related to the environmental quality index.

Moore & Tu (1993b) suggest a number of indices which can be derived from the DATABASE and which can play a significant part in the development of benchmarks for environmental quality measures for the waste management issues in the EMP, namely :

- *Annual quantity of each waste type per production employee in each ASIC industry group*. An example of this is shown in Table 3, and similar tables for each year will be generated by standard reports from the Australian Waste Database for each region which adopts the ANZECC Australian Hazardous Waste Classification and Manifest system. Currently this is limited to Sydney, Victoria and South Australia, but should become more widespread from 1994.
- *Quantity of each waste type per $value added in each ASIC industry group*. This measure would overcome the productivity complication of the above measure.
- *Quantity of each waste type per unit of goods (or services?) produced by the ASIC industry group*. This measure would be one of the most useful as it directly removes the uncertainty associated with the productivity of employees (including how much overtime that each employee might work). Appropriate units of production such as tonnes of steel produced, tonnes of aluminium produced, number of vehicles (or an equivalent standard vehicle which would account for differences between types of vehicles) should be able to be decided upon with advice from Industry Associations. This measure would be of particular use to individual facilities in monitoring their performance against waste minimisation benchmarks.

It may be possible to combine these indices for individual wastes into an overall environmental quality index for hazardous waste generation at an industrial site, providing a single measure for the hazardous waste component of the EMP.(see Moore & Tu, 1993b).

3.2 Waste problems in Local Government

3.2.1 Which set of policies, able to be implemented by Local Government, are most effective and efficient in achieving particular waste management goals such as waste reduction and waste recycling ?

Local Government have taken on the task of implementing many of the waste minimisation policies formulated at State and Commonwealth levels described in Section 1.1. Their ability to affect waste generation by legislative means is limited, and they must largely rely on a mix of education, pricing, infrastructure provision and service provision to achieve their objectives. Their is a large range of alternatives within this policy mix and the problem confronting Local Government is to decide on which is the most effective and efficient.

The DATABASE will report information on the generation of solid waste by region, which may be as fine as Local Government Area. This information can be used to develop indices based on waste quantity generated per capita (for the Municipal Waste Stream) and waste quantity generated per unit of production (for Commercial and Industrial waste) etc. By regression analysis it should be possible to develop a model which predicts the effect of different waste policies on waste generation, thereby enabling Local Government to choose the system most appropriate for their area.

3.2.2 How can Local Government most efficiently obtain the data required to design waste management facilities such as transfer stations and Materials Recovery Facilities ?

Design of waste management facilities usually passes through at least two phases :

- A preliminary design phase using "desk-top" methods to ascertain the feasibility of the facility. This requires the availability of typical data on waste characteristics for the region that can be used to develop preliminary designs and economic analyses.

- A detailed design phase requiring a more detailed waste characterisation, possibly specific to the region. Guidance on standard procedures for this characterisation is required and ideally, small amounts of new data collection for the specific region should have the ability of being enhanced through correlation with a larger database.

By choosing a similar region in Australia, the DATABASE will be able to provide information on waste characterisation for most regions in Australia, even if they have collected no or little region specific data. The development of the regression models referred to above will assist this exercise. Information will also be available on typical traffic generation patterns arriving from catchments to different types of facilities. This will enable receival facilities to be designed with more confidence.

The DATABASE will provide detailed guidance on waste data collection (both sampling and analysis) so that data collected will be comparable to that already in the DATABASE. This will enable enhancement of key data collected for the region by the much larger store of data in the DATABASE, thereby efficiently enabling more reliable detailed designs to be prepared.

3.3 State and Commonwealth Government

3.3.1 How can waste minimisation targets, and incentives/penalties to achieve these targets, be fairly and rationally set ?

Some companies and regions have been active in waste reduction and recycling for a decade and have achieved significant reductions in their waste streams. Uniform waste reduction targets penalise the organisations and regions that have already achieved the "easy" gains in waste minimisation.

The derivation of waste generation indices from the DATABASE and ABS databases (refer Sections 3.1 and 3.2) will enable fair comparisons with industry and Australian averages and best practice. Development of interAustralian databases will enable comparison with interAustralian best practice. More detailed and efficient targets will be able to be set, and particular industries and regions will be more readily identified as requiring additional attention.

3.3.2 How can Australia's performance in waste management be assessed against international practice ?

Table 4 provides an interAustralian comparison of waste generation in OECD countries. This comparison is of little use as it stands, as there are a number of factors which need to be accounted for in interpreting the data. These factors include :

- The definition of hazardous waste in between countries is not uniform, and the component regarded as hazardous in Australia (or by the OECD) would need to be separated out before a comparison could be made.

- Different OECD countries have different populations, GNP, and industrial profiles, and these will influence the generation of hazardous waste.

The DATABASE will provide a translation between the ANZECC hazardous waste classification system and the OECD system, so that as information on waste generation according to the OECD system becomes available for other countries, more reliable comparisons will be able to be made. Derivation of the indices referred to in Section 3.1 for regions and the Nation will enable the GNP and industrial profile issues to be taken into account.

3.3.3 Which mix of industries should be encouraged in a region to maximise contribution to GNP, while at the same time ensuring that ESD principles are not compromised ?

This question arises both in planning regional development in Australia as well as deciding on aid allocations to developing countries. Leontief input/output analysis (ABS, 1990) is sometimes used to predict the effect of investment in a particular industry on the flow-on effects to other industries in the region, enabling total increase in GNP and employment to be assessed. Some economists (Victor, 1972) believe that it may be possible to extend input-output analysis to incorporate pollution and environmental resource degradation, producing an economic - ecologic input-output model. Brunner (Brunner, 1993, pers. comm.) believes that there are great difficulties in this approach and that a regional materials flux analysis (Baccini & Brunner, 1991) will yield better answers more readily.

Both tools require data on the generation of wastes as a function of human activity in various anthropogenic processes, such as in households and in various industry types. The DATABASE may be able to provide some of the fundamental information, in conjunction with other ABS data, to enable these two economic-ecologic models to be developed for Australia (Moore, 1993).

4 CONCLUSIONS

The DATABASE project will enable monitoring of waste minimisation targets set by government and industry. Once established, there are a range of waste management problems currently facing industry and all levels of government that will be more efficiently and reliably solved by application of the reports from the DATABASE. In many instances, however, considerable additional development work, utilising the ABS statistical databases, will be required.

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6 ABBREVIATIONS

AEC	Australian Environment Council (forerunner of ANZECC)
ABS	Australian Bureau of Statistics
ANZECC	Australian New Zealand Environment & Conservation Council
ANZSIC	Australian New Zealand Standard Industrial Classification
ASIC	Australian Standard Industrial Code
CRCWMPC	Cooperative Research Centre for Waste Management & Pollution Control
EMP	Environmental Management Plan
EPA	Environment Protection Authority
ESD	Ecologically Sustainable Development
EQI	Environmental Quality Index
GIS	Geographic Information System
HDPE	High Density Polyethylene
IGAE	Intergovernmental Agreement on the Environmental
LDPE	Low Density Polyethylene
MRF	Materials Recovery Facility
NPI	Australian Pollutant Inventory
NWD	Australian Waste Database
OH&S	Occupational Health & Safety
PET	Polyethylene Terephthalate
PVC	Polyvinyl Chloride
UNCED	United Nations Conference on Environment & Development

7 GLOSSARY OF TERMS

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 b 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.

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Table 3
Annual Quantity of Each Waste Type per Production Employee in Each ASIC Group in Sydney, 1990
(Source ; Moore & Chelliah, 1992)

Table 4
Total hazardous wastes to manage by country in 1990
(Source : OECD, 1993)

Figure 4
Example Reports from Trial Solid Waste Database

Figure 5
Operation of Manifest System in Australia

(Source : Maunsell, 1991)

Figure 6
Example Reports from Trial Hazardous Waste Database

(These are preliminary figures and are subject to alteration as source data is checked and the Database becomes refined. They are provided to illustrate the sort of information that will become available from the Database. This data should not be used for any purpose other than that noted herein.)