

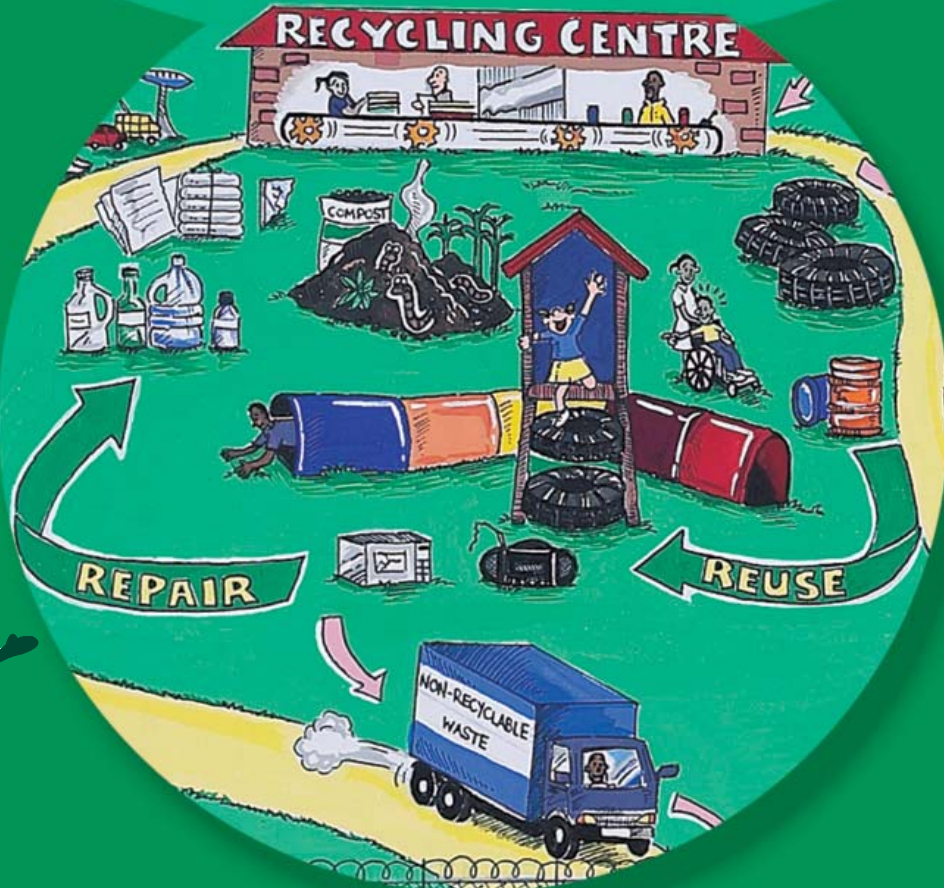


DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM  
OF SOUTH AFRICA

# WORKING WITH WASTE



## GUIDELINE ON RECYCLING OF SOLID WASTE



DANIDA  
Supported by the  
Royal Danish Embassy



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OF SOUTH AFRICA

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# ACKNOWLEDGEMENTS

These guidelines were developed with input and guidance from the following:

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EnviroServ Waste Management

Institute of Waste Management of Southern Africa

Plastics Federation, for plastics recycling poster included in this document

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# FOREWORD

The focus of waste management in South Africa is changing. No longer is the emphasis on the disposal of waste, but rather on avoiding its generation and minimising the waste stream wherever possible.

South Africa has a policy on Integrated Pollution and Waste Management in place and a comprehensive National Waste Management Strategy and Action Plans to implement that Policy. The need for user-friendly guidelines to implement the National Waste Management Strategy was identified.

This series of 'WORKING WITH WASTE' guidelines has been specially prepared to give very practical, easy to follow steps that a municipality should take to manage its waste. This is one of a series of guidelines that deal with management of waste. These guidelines are easy to read, updateable and have been designed with colourful section divider cards to double as awareness raising and capacity building resource materials when municipalities work in communities and consult with their residents.

The accompanying attractive full colour 'WORKING WITH WASTE' poster completes the package. This is primarily an awareness-raising resource and shows where the particular topic, dealt with in each guideline, fits into the broader integrated waste management system.

These guidelines have been workshopped at a national and local level and it is hoped that municipalities will use them extensively to make their waste systems more sustainable. The Department would also like to receive feedback on how they have been used, how useful they are, and where they could be improved.

If we are going to reach the goals adopted in the Polokwane Declaration at the National Waste Summit of September 2001 and work towards a waste free environment, each resident in every municipality will have to become a responsible manager of waste.

These guidelines are a step towards achieving this.



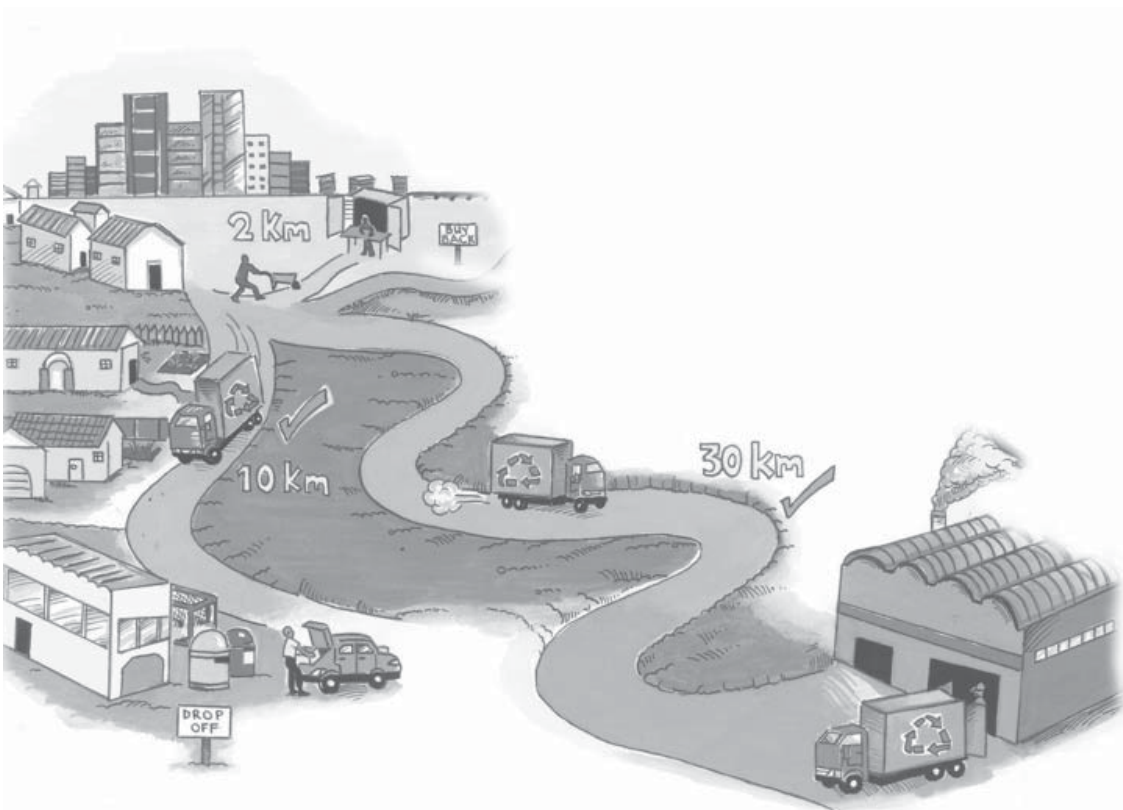


# GUIDELINE ON RECYCLING OF SOLID WASTE

## PURPOSE OF THIS GUIDELINE

This is one of a series of guidelines to assist municipalities in the implementation of the National Waste Management Strategy.

This document focuses on the recycling component of an integrated waste management system and deals particularly with solid waste.





# HOW TO USE THIS GUIDELINE

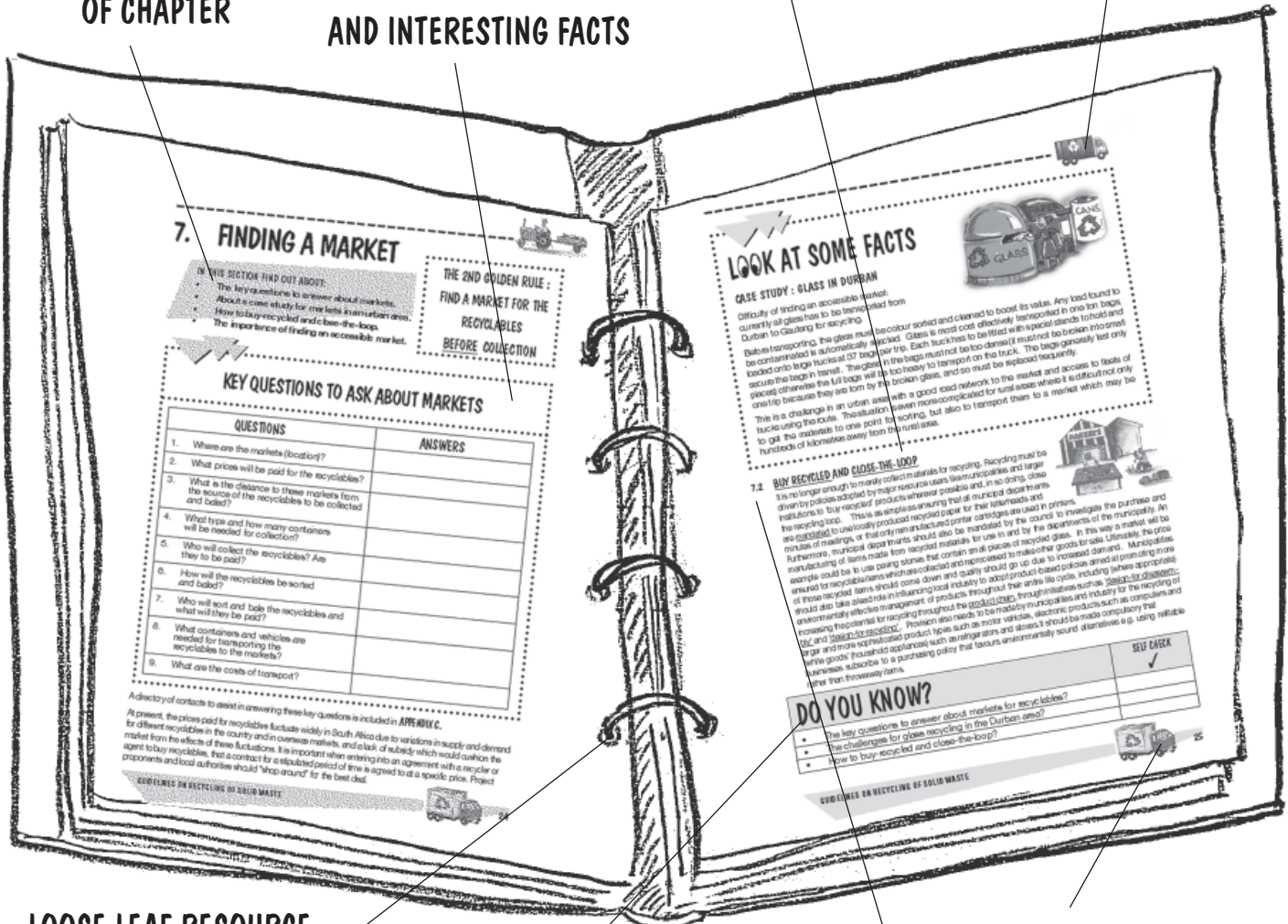
LOOSE LEAF FILE

CERTAIN WORDS UNDERLINED  
AND EXPLAINED IN GLOSSARY

CHAPTER ICON

OUTLINES CONTENTS  
OF CHAPTER

CASE STUDIES  
AND INTERESTING FACTS



LOOSE LEAF RESOURCE  
FILE FOR USER TO  
ADD OWN NOTES

SELF CHECK BOX AT END OF EACH  
CHAPTER FOR READERS TO REVIEW  
THEIR LEARNING

GUIDELINE ICON

TEXT GIVING STEP BY  
STEP GUIDELINES

DIVIDER CARDS

Numbered colour divider cards can be removed from each chapter and used as capacity building resources, together with the poster, when working with communities. Remember to put them back!

POSTER

The poster has facilitator notes on the reverse side. If read from top to bottom, the poster shows the different functional elements of waste management (avoidance, generation, storage, collection, etc). If read from left to right it shows waste minimisation methods (green background), general non-hazardous waste management (yellow background) and hazardous waste management (orange background) technologies.





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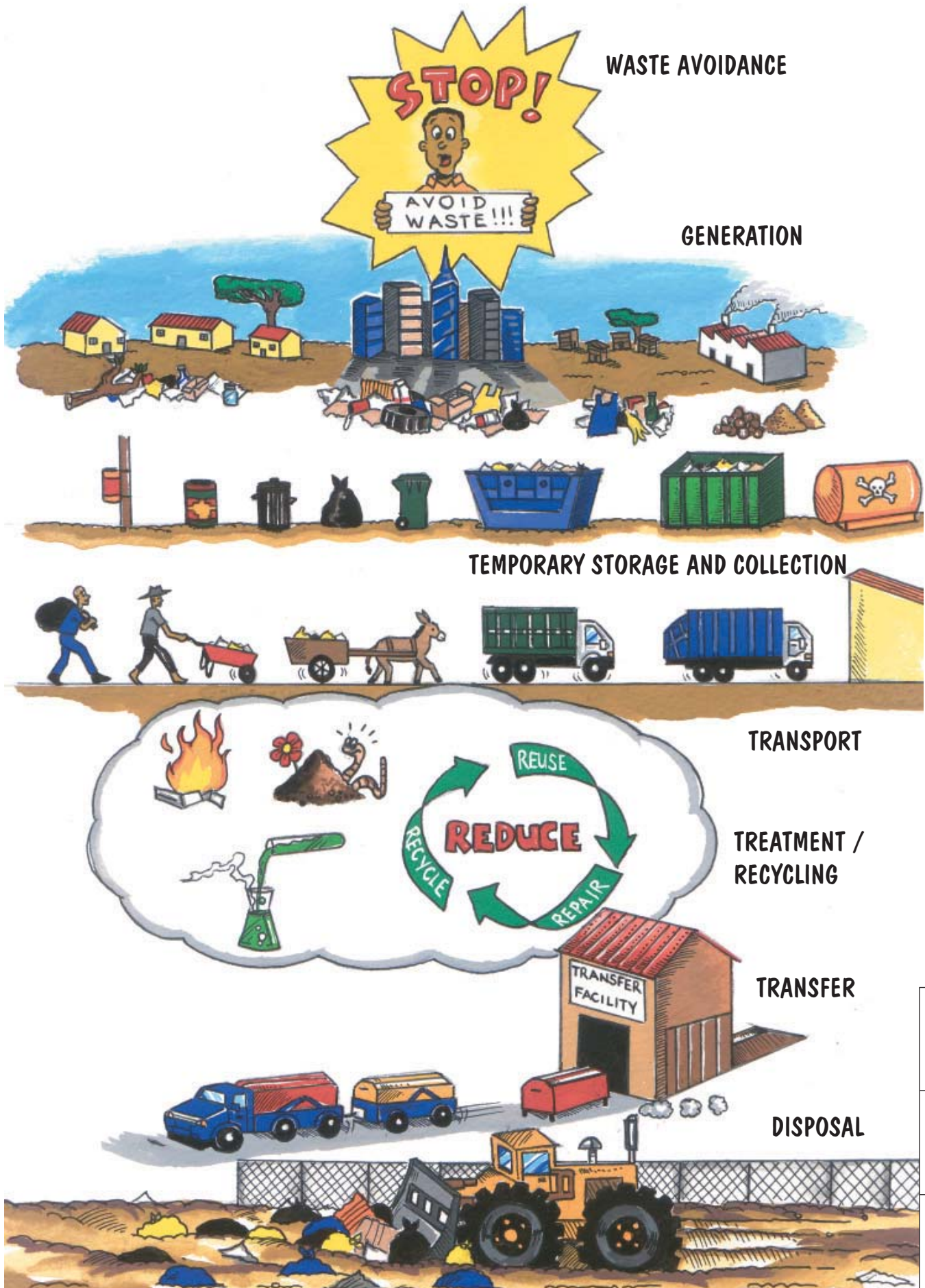
# DIVIDER CARDS

## GUIDELINES FOR RECYCLING

- R1A Elements of a waste management system - illustrated
- R1B Hierarchical Management of Waste
- R2A What can we recycle?
- R2B What cannot be recycled?
- R3A Municipalities have a role to play in recycling
- R3B Municipalities can promote recycling
- R4A Did you know?
- R4B Plan a recycling project with community participation
- R5A Waste streams in different communities
- R5B Do a waste stream investigation
- R6A Options for recycling schemes
- R6B Cost-benefit analysis
- R7A Appropriate haulage distances for various recycling options
- R7B Key questions to ask about markets
- R8A How to set up a recycling centre: Steps 1 to 5
- R8B Paper Recycling
- R8C How to set up a recycling centre: Steps 6 to 10
- R8D Plastic Recycling
- R9A Monitoring progress in recycling
- R9B Metal Recycling
- R9C Ongoing education and awareness raising
- R9D Glass Recycling
- R10A Recycling of Used oil
- R10B Composting of biodegradable plant wastes

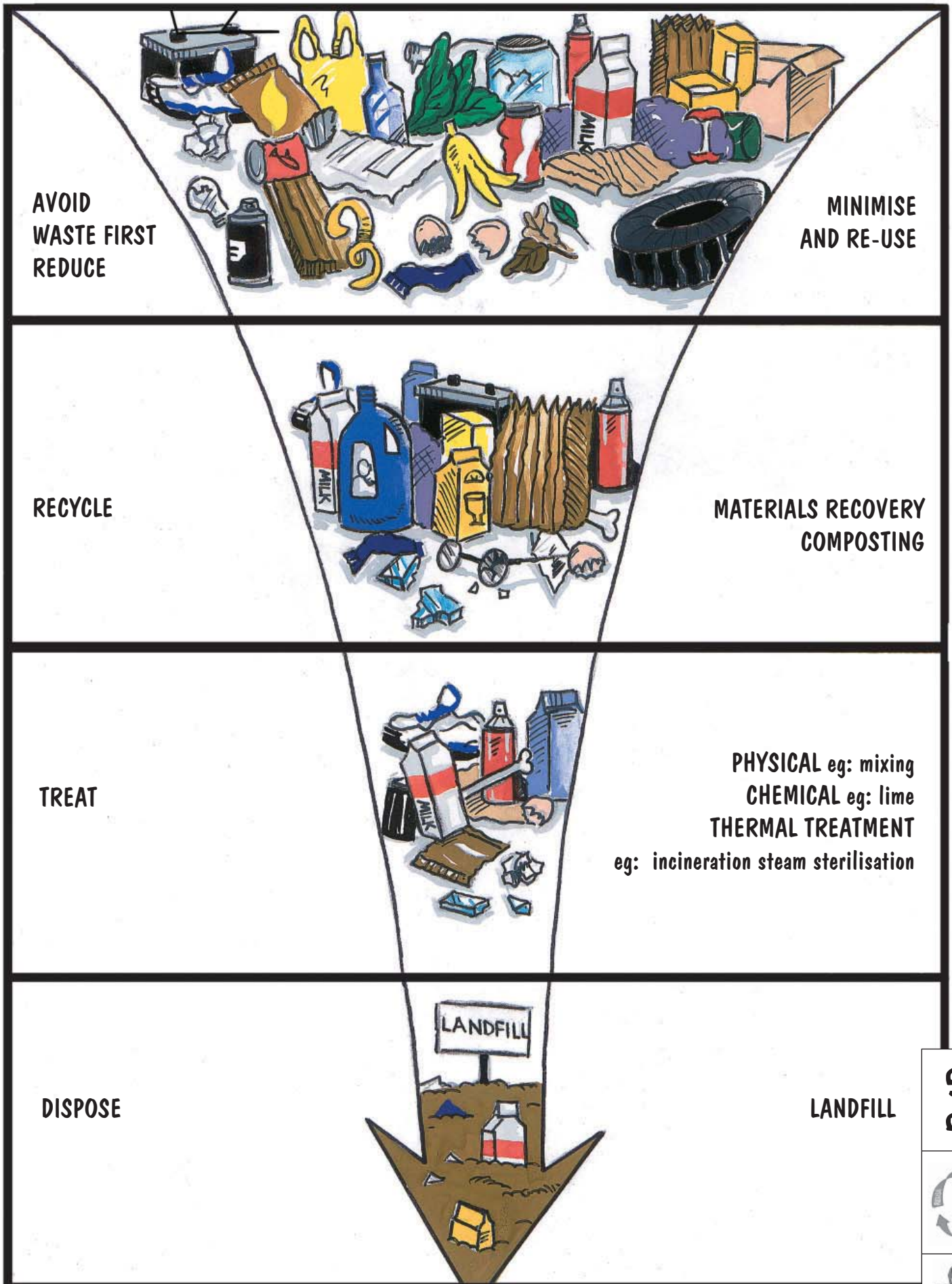


# ELEMENTS OF A WASTE MANAGEMENT SYSTEM



**R 1A**

# HIERARCHICAL MANAGEMENT OF WASTE



**R 1B**

Department of Environmental Affairs and Tourism

# 1. INTRODUCTION

## IN THIS SECTION FIND OUT ABOUT:

- Sustainable living
- Integrated Waste Management
- The National Waste Management Strategy
- How recycling fits into the broader picture of waste management



## 1.1 SUSTAINABLE LIVING

Municipalities are in a unique position to encourage the kind of lifestyle choices that will promote sustainable living. They can achieve this by taking into account economic, social and natural environmental factors in their decisions and the activities that they undertake.

Our constitution embodies the principle that all citizens have the right to live in an environment that is not detrimental to their health and well being - municipal councillors and officials have a legal duty to make choices that will ensure that the areas under their control do not become degraded or polluted. The way that a municipality controls and manages the waste that is generated within its boundaries has a significant effect on the quality of life of its residents.

When we produce waste it eventually returns to the natural environment - to land, water or the air, and if it is not properly managed it causes pollution which can be easily transferred from one part of the environment to another, e.g. uncontrolled burning of waste results in air pollution. The environment that receives the waste must be able to assimilate it (take it up) without becoming degraded or polluted. Waste must be managed in a way that does not have an adverse effect on the environment, and that is affordable, acceptable and as convenient as possible to the people who might be affected by it.

## 1.2 MOVING AWAY FROM 'END OF PIPE' SOLUTIONS

In South Africa there has been a very important change in the way that we manage our waste. The traditional 'end of pipe' solution, which focused on dealing with waste once it was produced is, no longer adequate. Now, instead of concentrating on the storage, collection and disposal components of the waste management system more attention is given to the avoidance of waste as a first priority. We must make sure that we have tried every possible way to prevent or reduce waste before we consider re-using or recycling waste material. If we are sure that the waste cannot be made useful, only then should it be treated and disposed of. Recycling activities are just one part of the whole integrated waste management system (Cards R1A and R1B).

## ELEMENTS OF AN INTEGRATED WASTE MANAGEMENT SYSTEM

- WASTE AVOIDANCE
- WASTE GENERATION
- SOURCE SEPARATION FOR MATERIALS RECOVERY (RECYCLING)
- TEMPORARY ON-SITE STORAGE
- COLLECTION
- TRANSPORT
- TRANSFER
- MATERIALS RECOVERY (RECYCLING)
- TREATMENT / PROCESSING
- DISPOSAL





The diagram on the card divider (Card R1B) clearly illustrates the hierarchy of waste management (order of priority) in which available waste management tools should be applied. Ideally, and in accordance with Department of Environmental Affairs & Tourism's National Waste Management Strategy and Action Plans, a potentially large amount of waste (depicted by the width of the arrow) can be significantly reduced by preventing and minimising waste as a first priority. Combinations of waste management options must be optimised for the most efficient and appropriate management of waste.

of recyclable materials and simultaneously stimulating demand for products made from recycled materials.

### 1.4 REGULATIONS

Government might set targets to promote recycling. Although there is currently no law requiring recycling, future recycling targets might be regulated by law. Such targets should set realistic levels of recycling within achievable timeframes and be agreed in consultation with the key role-players in the recycling chain. A phased approach should be adopted to achieve such targets:

- Inclusion of recycling options in Integrated Waste Management Plans which should be an element of an Integrated Development Plan, required of every municipality by law.
- Requiring business and industry to produce recycling plans as part of their broader environmental strategy
- Municipalities and other government departments adopting a procurement (purchasing) policy that requires a certain proportion of the products they purchase to contain recycled material e.g. paper, lubricating oil, traffic cones, envelopes, plastic desktop accessories, refillable ink cartridges
- Registration of recyclers operating within the municipal area.
- Municipal support for recycling initiatives in the form of bylaws that facilitate the location, operation and use of such facilities.

## APPROPRIATE TECHNOLOGY

In developing countries, problems result if unsuitable methods and equipment (inappropriate technology) are chosen for waste collection and recycling systems. The technology must be appropriate:

- It must adequately address the specific needs of a developing country rather than just be transplanted, unchanged, from a developed country, for example, installing imported equipment where spares are not available locally.
- It must make use of manual labour wherever possible rather than make too much use of machines: labour-intensive methods create employment and can optimise the overall system.
- It must take into account the socio-economic and cultural factors that determine the way the public behaves, for example, equipment should not be provided to a community where there is a lack of local capacity to maintain the equipment mechanically.

### 1.3 ECONOMIC INCENTIVES

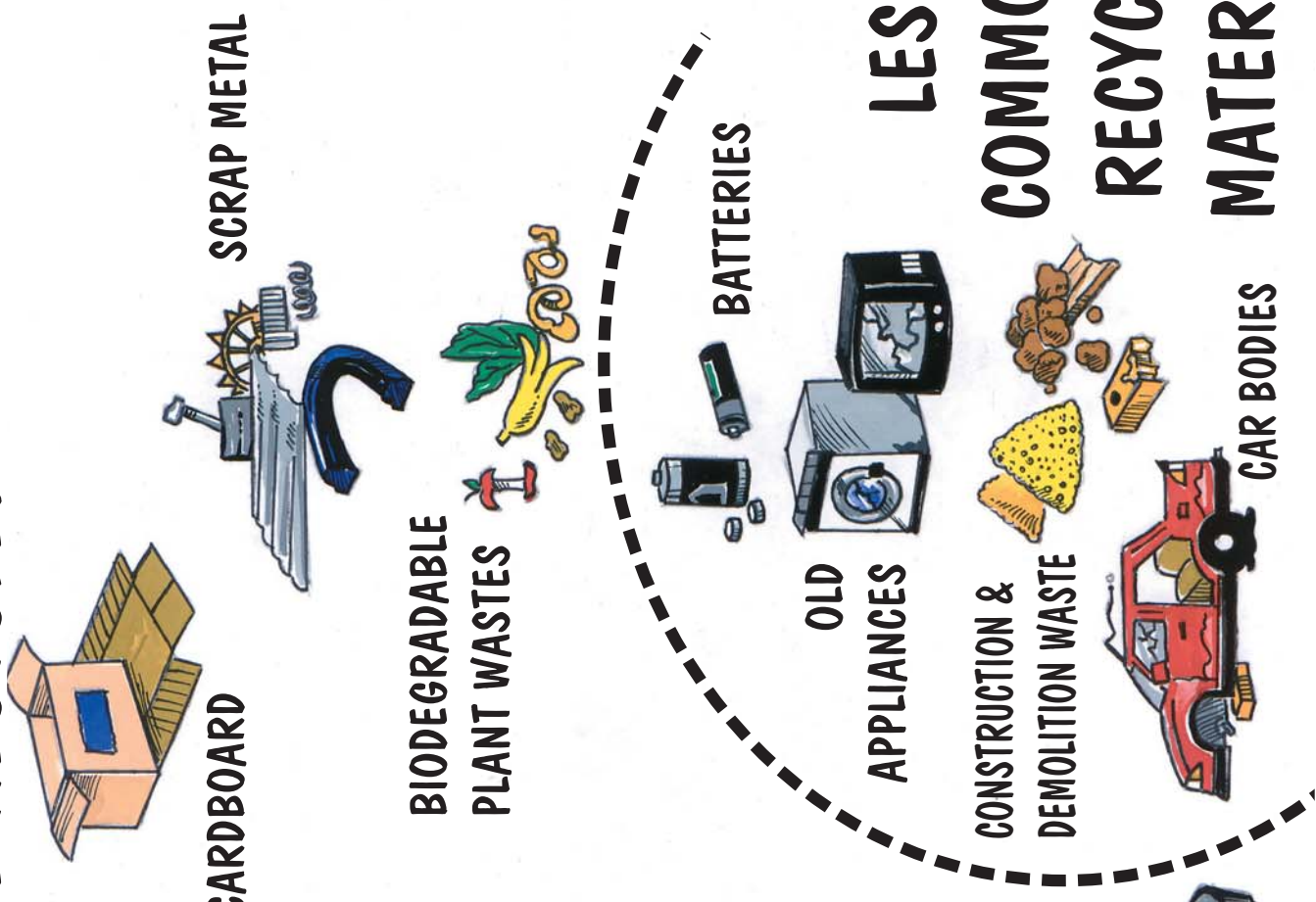
Recycling is an activity that needs both financial and logistical support, especially in the early stages of an initiative, if it is to be successful and sustainable. Such support could include the following:

- Direct cash payment in return for materials delivered or collected e.g. at a buy back facility
- Subsidies for collection and transport of materials for recycling
- Tax incentives, including tax exemption for recyclers who purchase new recycling equipment; low interest loans for purchase of recycling capital equipment; landfill charges or taxes; and raw material charges.
- Enhancing market conditions for recycling by ensuring the supply

DO YOU KNOW?	SELF CHECK ✓
• What is meant by sustainable living?	
• What is meant by an Integrated Waste Management system and the hierarchy of waste management?	
• What is the difference between the approach in the National Waste Management Strategy and the traditional approach towards waste management?	



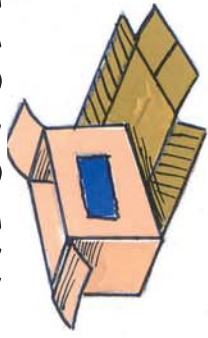
# WHAT CAN WE RECYCLE?



METAL CANS



PAPER



CARDBOARD



GLASS



PLASTIC



TEXTILES

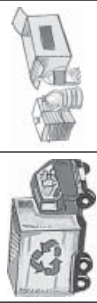


USED OIL



TYRES

R 2A



# WHAT CANNOT BE RECYCLED?



**CAR WINDSCREENS, MIRRORS**



**GENERAL WASTE MIXED WITH  
HAZARDOUS WASTE  
(eg: HEALTH CARE WASTE)**



**LAMINATES  
eg: PAPER AND PLASTIC**



**VERY DIRTY  
RECYCLABLES**



# 2. DEFINITIONS



## IN THIS SECTION FIND OUT ABOUT:

- What wastes can be recycled
- What wastes cannot be recycled
- The benefits of recycling



### 2.1 WHAT IS WASTE?

Waste can be defined as anything that is no longer useful and needs to be disposed of. In the waste management process, waste is considered to be any material that has been discarded and, as such, needs to be disposed of in an environmentally acceptable manner.

This guideline focuses on the reclamation or recovery of materials out of the solid waste stream for recycling; it does not deal with liquid waste or gaseous emissions into the atmosphere.



### 2.2 WHAT IS RECYCLING & WHERE DOES IT FIT IN TERMS OF INTEGRATED WASTE MANAGEMENT?

Recycling is the process whereby discarded products and materials are reclaimed or recovered, refined or reprocessed, and converted into new or different products. This term is often used in a wider sense to describe the complete cycle, from collection to production of new objects, or secondary raw materials, from reclaimed material.

Recycling is just one of the ways we can minimise waste.

Other waste minimisation methods include re-use (using an item again for the same purpose for which it was original made, e.g. re-using a container such as a bottle or glass jar) and repair (mending an item which was unserviceable because of damage or malfunction).

Another way of reducing the amount of waste we produce is to divert certain waste materials or substances which have been discarded by one generator to another manufacturer who can use them as raw materials in a different process. This is called waste exchange.

Yet another way to reduce the waste stream is to compost the rapidly biodegradable fraction of the waste stream and use the compost to enrich the soil for growing vegetables or other plants. This is in reality a form of recycling. Another form of composting which uses earthworms to speed up the breakdown of organic waste is called 'vermiculture'.

Biodegradable/organic waste is waste that will decay and eventually go back into the soil and nature. It includes garden refuse (e.g. grass clippings) and animal, fruit or vegetable leftovers resulting from the handling, preparation or cooking of foods.

Biodegradable waste includes the 'wet fraction' or putrescible fraction (materials that rot) of the general waste stream. If the 'wet fraction' is separated at the point of generation from the 'dry fraction' (largely the recyclable packaging materials), the dry fraction remains 'clean' and therefore more valuable for recycling.

#### SOLID WASTE IS CLASSIFIED INTO TWO MAIN CATEGORIES: GENERAL & HAZARDOUS WASTE

##### GENERAL WASTE

Waste which does not pose an immediate threat to people or the environment, i.e. household waste, builder's rubble, garden waste, dry industrial and commercial waste (DWAF 1998).

It may, however, with decomposition and infiltration by water produce leachate (the brown liquid that oozes out of waste) with an unacceptable pollution potential.

##### HAZARDOUS WASTE

Any waste which may, by the circumstances of its use or because of its quality, concentration, physical or infectious characteristics, cause or be likely to cause, danger to health or to the environment, whether by itself or when in contact with other waste (DWAF 1998).

There are different classes of hazardous waste which include substances that are explosive, corrosive, chemically very reactive, poisonous, biohazardous (e.g. containing infectious disease organisms), radioactive or cancer-causing.







## 2.2.1 THE RELEVANCE OF RECYCLING TO SOUTH AFRICA

There is a viable recycling industry in South Africa even though there are currently no laws to enforce it.

Recycling should be promoted and supported in order for it to reach its full potential and to maximise formal and informal employment opportunities.



WHY WHY WHY WHY?

### 2.2.2 WHY SHOULD WE RECYCLE?

#### RECYCLING HAS THE FOLLOWING BENEFITS:

- It reduces the waste stream going to landfill sites, thus saving landfill airspace
- It can create jobs
- It helps reduce pollution and conserve natural resources
- It conserves energy and reduces manufacturing costs
- It reduces litter
- It can reduce informal salvaging from landfill sites

### 2.2.3 WHAT CAN BE RECYCLED?

- common items (Card R2A) include paper, cardboard, cans, scrap metal, plastic, glass, tyres, lubricating oils.
- unusual items (Card R2B) include motor vehicles, white goods (e.g. old fridges and microwaves), electronic products, batteries, construction and demolition.

### 2.2.4 WHAT CANNOT BE RECYCLED?

- Dirty recyclable materials
- Laminates made of mixed material e.g. plastic-paper, paper-metal foil laminates
- Laminated glass such as car windscreens
- Materials that are uneconomical to recycle because of insufficient volumes, or transport distances to markets are too great.

DO YOU KNOW?	SELF CHECK
• What wastes are commonly recycled	✓
• What wastes are less commonly recycled	
• What materials cannot be recycled	
• What are the benefits of recycling?	



# MUNICIPALITIES HAVE A ROLE TO PLAY IN RECYCLING

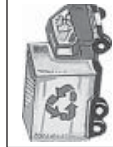


**MUNICIPALITIES MUST SET TARIFFS THAT PROMOTE RECYCLING AND THE ECONOMICAL, EFFICIENT AND EFFECTIVE USE OF RESOURCES (MSA section 4)**

**DRAW UP AN INTEGRATED DEVELOPMENT PLAN WHICH INCLUDES MANAGING THE ENVIRONMENT AND REDUCING WASTE**

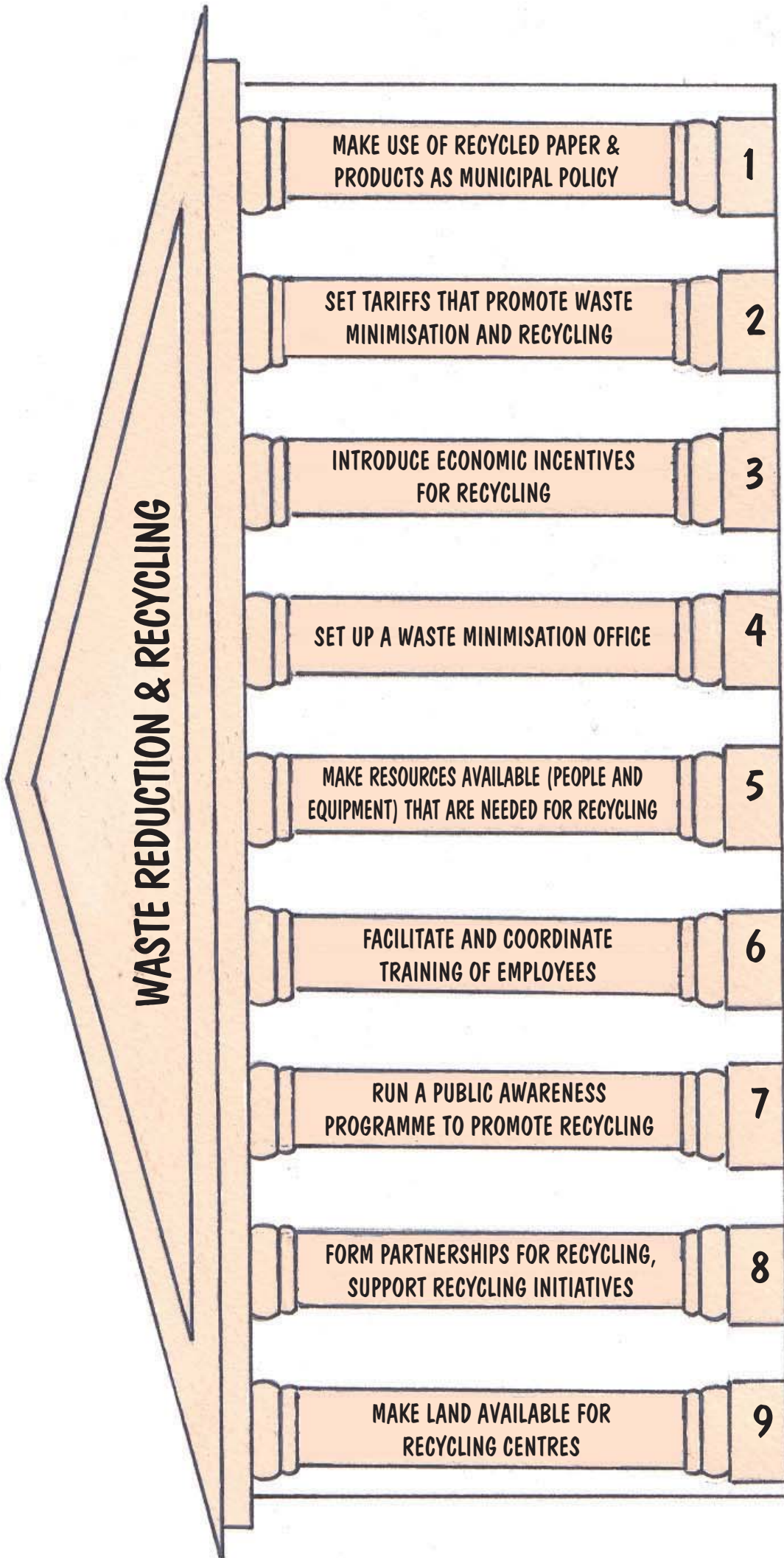
**MUNICIPALITIES MUST ENSURE THAT NATURAL RESOURCES ARE USED SUSTAINABLY. THE PRODUCTION OF WASTE MUST BE AVOIDED OR MINIMISED (NEMA)**

**NEMA - National Environmental Management Act (Act 107 of 1998)  
MSA - Municipal Systems Act (Act 32 of 2000)**



**R 3A**

# MUNICIPALITIES CAN PROMOTE RECYCLING



# 3. WHAT THE LAW SAYS ABOUT RECYCLING



## IN THIS SECTION FIND OUT ABOUT:

- Waste Management policy (the White Paper)
- The most important laws that govern waste
- The Polokwane Declaration (September 2001)

## WASTE MANAGEMENT POLICY

While central and provincial government departments and agencies have the responsibility of setting policy and specific targets for waste reduction and recycling, municipalities are responsible for general waste management planning, and the development of by-laws which include economic incentives to support waste minimisation and recycling in their areas. There is currently no legislation making recycling a legal requirement. Recycling is at this stage entirely voluntary and not associated with any incentives or rewards from the Government.

### THE 4 R'S:

**Reduce**  
**Reuse**  
**Recycle**  
**Repair**

The White Paper (Policy) on Integrated Pollution and Waste Management sets out the principles that underpin the National Waste Management Strategy (NWMS). This NWMS translates the policy principles into strategic plans and actions. By law, municipalities have the responsibility of waste collection and disposal. In terms of the NWMS and the White Paper it is envisaged that new laws will be passed dealing with recycling and environmental economics (e.g. incentives, taxes). The National Environmental Management Act also emphasises the need for development to be sustainable and requires that 'waste is avoided, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner'.



## 3.1 THE MAIN LAWS THAT CONTROL WASTE MANAGEMENT IN SOUTH AFRICA INCLUDE:

- Constitution of the Republic of South Africa (Act 108 of 1996)
- Environment Conservation Act (Act 73 of 1989)
- National Environmental Management Act (Act 107 of 1998)
- Health Act (Act 63 of 1977)
- National Water (Act 36 of 1998)
- Local Government: Municipal Structures Act (Act 117 of 1998)
- Local Government: Municipal Systems Act (Act 32 of 2000)
- Occupational Health and Safety Act (Act 85 of 1993)
- Hazardous Substances Act (Act 15 of 1973)
- National Road Traffic Act (Act 93 of 1996)
- Provincial laws
- Local Municipal Bylaws





# LEGAL FRAMEWORK

Waste management is mostly controlled through municipal by-laws and, since each municipality makes its own by-laws, there are often discrepancies in enforcement, regulation and administration of waste management functions between the different municipalities. The Department of Environmental Affairs and Tourism is drafting minimum standards for the recycling of waste in South Africa in order to promote the culture and implementation of recycling and a reduction in the amount of waste going to landfill.

Every municipality is now required in terms of the Municipal Systems Act to prepare an Integrated Development Plan (IDP). One of the elements within the IDP should be an Integrated Waste Management Plan which, in terms of the National Waste Management Strategy, must implement the hierarchical management of waste with emphasis on waste avoidance and minimization, through to responsible disposal. The Municipal Systems Act also includes recycling as one of the activities to be promoted by municipalities when setting tariffs for waste management services.

The White Paper and NWMS propose a comprehensive Waste Management Act regulating the management of solid waste based on the “Hierarchy of waste management” (Card R1B). The Department of Environmental Affairs & Tourism is currently drafting a new waste management law that will address issues of extended producer responsibility, recycling and promotion of waste related businesses with job creation.

At the National Waste Summit held in Polokwane in September 2001, the **Polokwane Declaration** was adopted which commits South Africa to a reduction of 50% in the amount of waste being landfilled by 2012 and to zero waste by 2022. Future waste legislation will promote reuse and recycling, and require manufacturers to develop products that do not create waste and that can easily be recycled.

## 3.2 WHOSE RESPONSIBILITY IS IT?



It is everybody’s responsibility to try to avoid making waste in the first place, then to reuse, recycle and repair unwanted items before they are discarded as waste. In this way we do not use up the earth’s natural resources like oil, minerals and trees too quickly.

### The role of government departments in recycling:

At a National level, the Department of Environmental Affairs & Tourism is the lead agent for waste management and has overall responsibility for implementing the Waste Minimisation and Recycling Action plan of the National Waste Management Strategy. Part of its role is to engage other Government Departments where necessary, for example, the Department of Trade and Industry and the Dept of Finance where economic instruments are being considered to promote waste minimisation and recycling.

At a Provincial level the Provincial Environmental Departments are responsible for integrated waste management planning which includes waste minimisation and recycling.

The Municipal Systems Act requires all Municipalities to prepare an Integrated Development Plan. As part of this, Local Municipalities are responsible for drawing up Integrated Waste Management Plans which include waste minimisation and recycling. They should also promote the development of recycling centres, waste minimisation clubs and collect information on recycling material types and quantities for the regional Waste Information System.

DO YOU KNOW?	SELF CHECK
<ul style="list-style-type: none"> <li>What the most important laws are that deal with waste management in South Africa.</li> </ul>	✓
<ul style="list-style-type: none"> <li>What key municipal planning document should address the management of waste from generation to disposal.</li> </ul>	
<ul style="list-style-type: none"> <li>How a municipality can promote recycling</li> </ul>	
<ul style="list-style-type: none"> <li>What the Polokwane Declaration is and what recycling goals are set in this document.</li> </ul>	



# DID YOU KNOW?

**1 tonne**



**RECYCLING 1 TONNE OF PAPER SAVES 17 TREES**



**11 RECYCLED PET\* PLASTIC BOTTLES CAN MAKE 1 PAIR OF MEN'S TROUSERS**



**RECYCLING 1 GLASS BOTTLE SAVES ENOUGH ELECTRICITY TO LIGHT A 100watt BULB FOR 4 HOURS**

\* PET - Polyethylene terephthalate

**R 4A**



# PLAN A RECYCLING PROJECT WITH COMMUNITY PARTICIPATION

1

PLEASE GO AND SEE WHAT RECYCLING WILL WORK IN UNIT X

OK, I'LL ORGANISE IT



2

WE NEED TO DO A WASTE SURVEY IN UNIT X

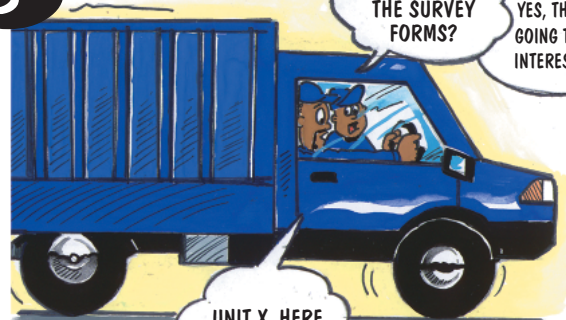


3

HAVE YOU GOT THE SURVEY FORMS?

YES, THIS IS GOING TO BE INTERESTING

UNIT X, HERE WE COME!



4

RECYCLE!

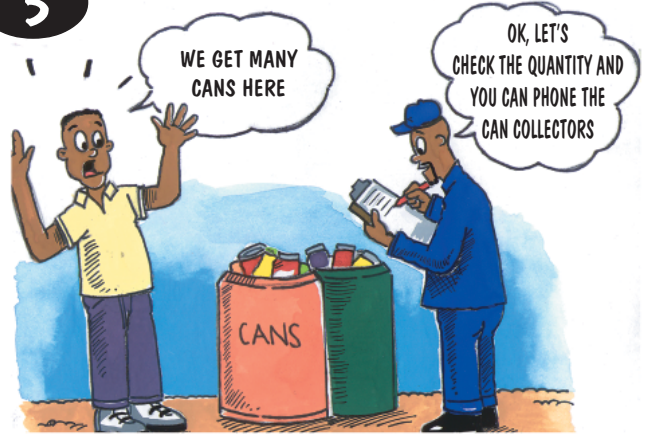
WHAT CAN YOU DO WITH YOUR WASTE?



5

WE GET MANY CANS HERE

OK, LET'S CHECK THE QUANTITY AND YOU CAN PHONE THE CAN COLLECTORS



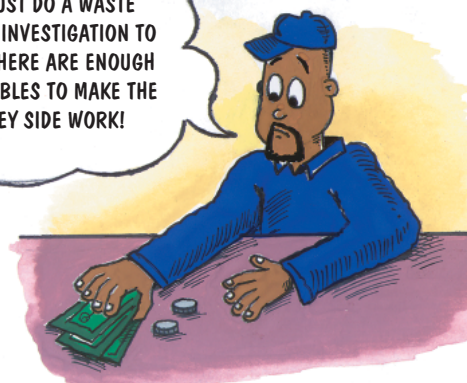
6

WE WANT TO MAKE COMPOST FOR OUR GARDENS



7

WE MUST DO A WASTE STREAM INVESTIGATION TO SEE IF THERE ARE ENOUGH RECYCLABLES TO MAKE THE MONEY SIDE WORK!



CONTINUED ON CARD R5B

R4B





# 4. ROLE OF THE PUBLIC IN RECYCLING

## IN THIS SECTION FIND OUT ABOUT:

- How much waste each South African produces
- What responsibility the public and individuals have to recycle
- How to conduct a 'willingness to participate survey'
- Ways to improve the quality of recyclables



## LOOK AT SOME FACTS

- Each person in South Africa produces between a half a kilogram and two kilograms of waste daily.
- This amounts to two bins per week in an urban household.
- In urban areas, waste is put in rubbish bags or bins and taken away by municipal waste removal trucks where it is disposed of in landfill sites.
- In rural areas, waste is often buried or burned.
- By recycling 1 ton of paper, 17 trees can be preserved.
- By recycling 125 aluminium cans, enough energy can be saved to power one home for one day.
- 11 PET Plastic cooldrink bottles can be recycled to make enough material for a pair of men's trousers.
- Recycling one bottle of glass saves enough electricity to light a 100 W bulb for 4 hours.

## MUNICIPALITIES CAN PROMOTE RECYCLING BY...

- Providing suitable storage bins or facilities for different types of waste.
- Showing people how to use these facilities.
- Providing an efficient and affordable refuse collection system with waste separation and recycling options.
- Initiating and supporting the development of recycling centres and transfer stations where needed.
- Setting aside suitable areas for landfill sites and Materials Recovery Facilities (MRF's).

It is important for municipalities to put personnel in place who have sufficient capacity and knowledge to undertake the support and planning of waste minimisation and recycling schemes (See card R3B).

### 4.1 WHO SHOULD RECYCLE?

The community and individuals have to be reminded continually of the fact that they produce waste and that ethically they need to ensure that they minimise the waste they produce and support the systems put in place by the recycling industry to collect recyclables.







## 4.2 HOW TO CONDUCT A WILLINGNESS TO PARTICIPATE SURVEY FOR A RECYCLING SCHEME



Communities and individuals have a responsibility to support government initiatives for recycling, but according to law and policy they must be fully consulted before the start of any project to ensure that it will receive support. Municipalities should apply the Batho Pele Principles in dealing with the public. Municipal employees are required to put people first. There are eight principles to follow in consulting with and listening to the needs of the public:

### "BATHO PELE" PRINCIPLES ("PEOPLE FIRST")

1. **CONSULTATION**  
Consult with residents about the level and quality of service.
2. **SERVICE STANDARDS**  
Tell people what services they are entitled to receive and the available options.
3. **ACCESS TO SERVICES**  
Make services equally available to all, including disadvantaged communities.
4. **COURTESY**  
Treat everyone with consideration and respect.
5. **INFORMATION**  
Always provide residents with full and accurate information about services they are entitled to receive.
6. **OPENNESS AND TRANSPARENCY**  
Be honest and open about how municipalities are managed, the cost involved and who is in charge.
7. **REDRESS**  
Respond to complaints speedily, apologise if you have not delivered a promised service, and offer an explanation.
8. **VALUE FOR MONEY**  
Eliminate wastage and always provide services that give the best value for money.

It is also important to offer incentives to communities to support a proposed scheme. These could differ from community to community, as one group might support a drop-off centre to protect the environment, while another will use a buy-back centre to generate much-needed income for the unemployed.

An indication of the support that the project will receive can be estimated using a questionnaire survey.

Samples of two surveys, one for commerce and industry and one for householders, can be found in APPENDIX A.

## BEFORE UNDERTAKING THE WILLINGNESS TO PARTICIPATE SURVEY...

- Estimate the degree of literacy of the community/organisation.
- Find out their preferred language of communication. If the majority of people cannot read or write in a particular area, appoint and fund teams to undertake the survey by phone or door-to-door.
- Select team members from the survey area so they are known to the community to build trust and facilitate accurate responses.
- Select a sample of neighbourhoods or organisations in which to undertake the survey.

The survey of members of the public can be undertaken at local shopping centres. To ensure a good response rate it is better to undertake a survey face-to-face as most members of the public are not willing or do not have the time to fill in questionnaires themselves and return them.

Ongoing surveys should be conducted once the project has started, and throughout its duration at six-monthly or annual intervals to ensure that the chosen recycling scheme continues to be supported. Survey results will alert the team to any problems and facilitate pro-active trouble shooting to ensure that the project is able to continue.





### 4.3 IMPROVING THE QUALITY OF RECYCLABLES

Recyclable wastes should be separated as near to source (the place they are made) as possible. This limits the costs of labour and machinery associated with sorting after collection and will prevent recyclables like paper being soiled (dirtied) by wastes such as food if mixed in with the waste stream. Once paper or cardboard is soiled, it cannot be recycled. Other items, if soiled, will have to be cleaned before being recycled. Separating recyclables into types will also increase their value when sold to the processors of the materials.

The recycling industry needs to be supported to improve the quality of the recycled items that are bought and to bring their prices down. As many recyclables as possible should be collected locally for recycling and as many recycled items should in turn be bought by the public.

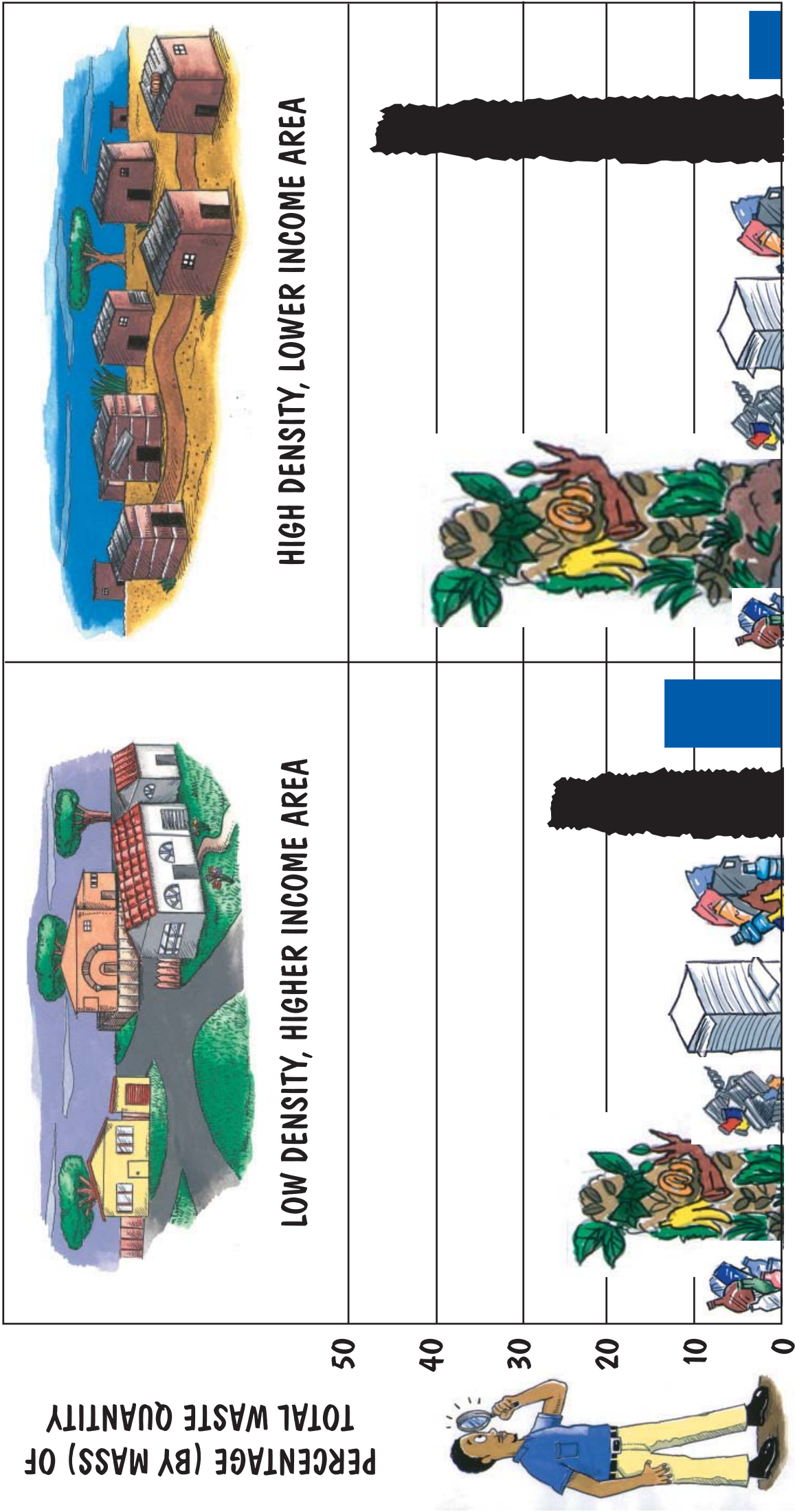
This issue is examined more fully in a later section under Cost Benefit Analysis (Section 6.3).



DO YOU KNOW?	SELF CHECK ✓
• How much waste does each South African produce daily?	
• What responsibility do the public and individuals have to recycle?	
• How to conduct a 'willingness to participate survey'?	
• Ways to improve the quality of recyclables?	



# WASTE STREAMS IN DIFFERENT COMMUNITIES



PERCENTAGE (BY MASS) OF TOTAL WASTE QUANTITY



**R 5A**

# DO A WASTE STREAM INVESTIGATION

1



2



3



4



		<b>R 5B</b>
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# 5. MEASURE WHAT YOU WANT TO REDUCE

## IN THIS SECTION FIND OUT ABOUT:

- The typical waste stream composition for different
- How to perform a detailed waste stream analysis
- How to undertake a simple waste audit

**THE 1ST GOLDEN RULE :**  
**'YOU MUST FIRST**  
**MEASURE WHAT YOU**  
**WANT TO MINIMISE'**

## 5.1 WASTE STREAM COMPOSITION (CARD R5A)

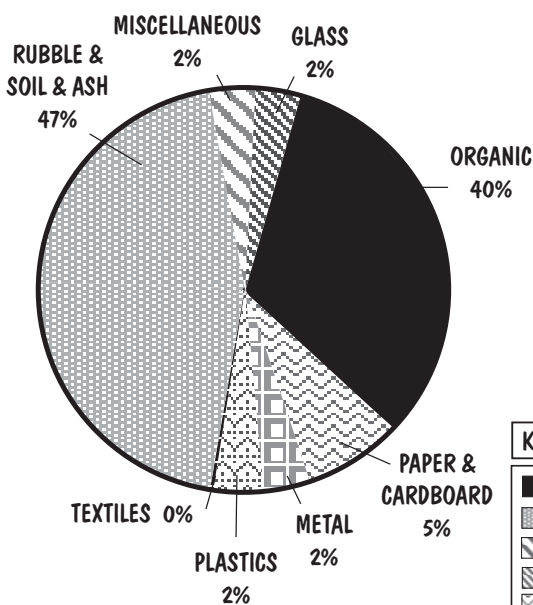
If you want to recover recyclables before they enter the waste stream, find out what types of waste make up the waste stream. This can differ widely from urban to rural areas, and from higher income to lower income areas. The waste stream's composition in an area relates to the lifestyles of the people in that area, e.g. how much disposable income (spending money) they have and what fuel they use for cooking and heating.

Examples of typical waste profiles found in both high density, lower income and low density, higher income communities follow. The first example comes from a densely settled, low income urban area, while the second is based on a waste profile from a low density high income area. Note the difference in composition of waste by mass. The figures will differ even more if the composition of waste is measured by volume instead of by mass.

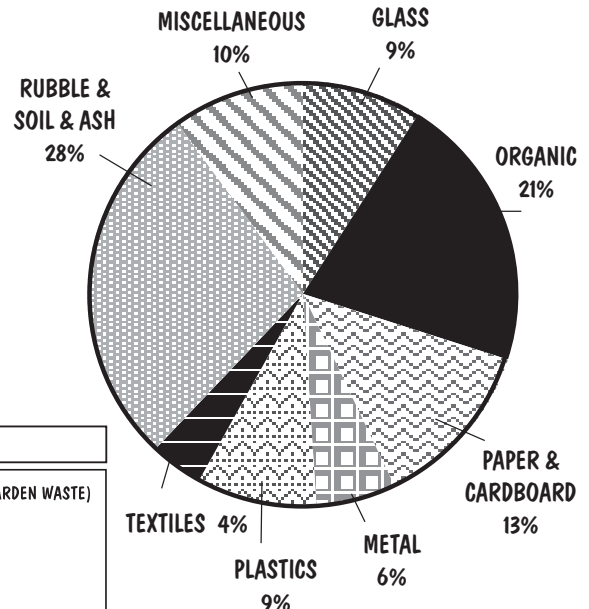


## TYPICAL MUNICIPAL WASTE COMPOSITION FOR DIFFERENT COMMUNITIES IN AN URBAN AREA (% by mass)

### HIGH DENSITY, LOWER INCOME AREA



### LOW DENSITY, HIGHER INCOME AREA



KEY	
	ORGANIC (KITCHEN AND GARDEN WASTE)
	RUBBLE & SOIL & ASH
	MISCELLANEOUS
	GLASS
	PAPER & CARDBOARD
	METAL
	PLASTICS
	TEXTILES





## BEFORE STARTING A RECYCLING SCHEME IN ANY AREA FIRST FIND OUT:

- Whether sufficient quantities of waste suitable for recycling are produced in the area.
- By what percentage and at what cost the waste stream will be reduced if the recyclables are removed.
- If there are markets close to the source of waste at which recyclables can be sold.

It is expensive to transport waste or recyclables any distance greater than 30km (Card R7A). The costs to transport each load of recyclables to the relevant market plus labour, equipment and processing costs must be considered. These costs are then offset compared to what the items can be sold for and the value of the landfill space saved by temporarily diverting these items for recycling.

To measure what is to be minimised (and to be able to estimate the costs) a waste stream analysis needs to be carried out. This can be as sophisticated and expensive as employing a team of consultants to perform a detailed analysis involving calibrated scales and measuring containers to gauge volumes, or it can be as simple as using a hanging scale to work out the weight of materials in a sample of the different components of waste from refuse bags or other similar containers.



## 5.2 WASTE STREAM SAMPLING AND ANALYSIS

### Follow these steps to sample and undertake a detailed analysis of the waste stream (Card R5B):

1. Form teams for data collection each consisting of a trained investigator, two labourers and a light delivery vehicle.
2. Give each team a calibrated scale to perform measurements of weight, and a typical 240 litre (volume) waste container for use in unit weight and total weight measurements.
3. Mark each 240 litre waste container with lines denoting 10 litre increments in volume. This provides quick and accurate estimation of volume of contents.
4. Before each collection, calibrate (check) each scale and standardise the volume estimates amongst the individual trained investigators to ensure uniformity, and so data collected by each investigator can be used in comparative studies.
5. Assign teams daily to specific regions of the area for the collection of waste.
6. Each team collects waste containers at random from their designated regions. The team estimates and records the volume of waste in each container before placing the contents onto the light delivery vehicle.
7. When each light delivery vehicle is full, teams transport its contents to the nearest waste disposal site or transfer facility.
8. At the waste disposal site or transfer facility, before emptying the bins each team weighs each bin of waste and the weight is recorded. A selection of empty bins must be weighed first and the average weight calculated. This empty bin weight must be subtracted from the weight of each bin of waste. The scale must be placed on a flat surface and protected from wind, which could influence the weights recorded. The scale platform needs to be large enough to support the base of each bin as it is weighed without the sides or wheels of the bin overhanging the platform of

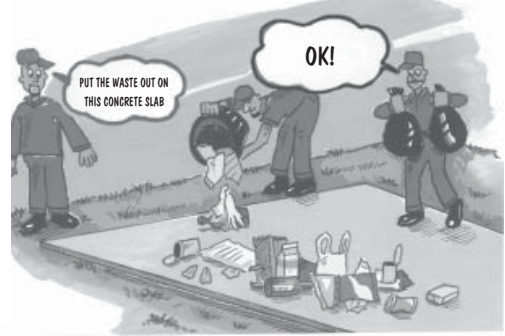


the scale. Scales can be hired from scale manufacturing companies if not to be purchased for ongoing use.



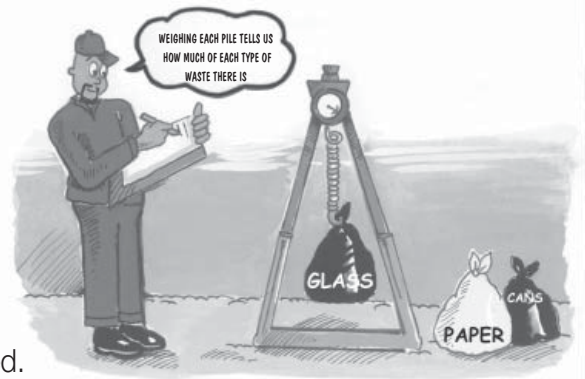
9. Teams empty waste onto a hardened area, or platform/table. Equipment needed for the sorting process includes:

- Overalls
- Heavy-duty aprons
- Gloves
- Closed / heavy-duty shoes or boots
- Masks
- Spades
- Ablution facilities will be needed for the sorting team
- A roof to shade the sorting area is recommended



10. Place one member of each team in charge of the waste to ensure no external elements interfere with the collection, sorting and weighing.

11. Teams commence sorting into pre-defined components (e.g. paper, cardboard, glass, metals & cans, plastic, compostable waste, etc). Volume and mass measurements are performed on these sorted piles and the masses recorded.



12. Once all the data is collected, the total amounts of each different types of materials in the waste stream are calculated and an assessment made as to what materials can be viably recycled.

### 5.3 SAMPLE WASTE AUDIT FOR AN ORGANISATION

In APPENDIX B is a sample audit sheet that can be used to analyse the waste stream contents for a business or office. The audit determines the size and type of organisation, what the organisation currently does to manage its waste, how much this costs, and what categories and quantities of recyclables there are in the waste stream. The complexity of the waste stream audit needs to be simplified and adapted for smaller operations and reduced to fewer, basic categories eg. white paper, cardboard. The waste and recyclables for such an audit are weighed on a hanging scale in bags. The cost of equipment and labour need to be factored into the audit.



DO YOU KNOW?	SELF CHECK
	✓
• The typical waste stream composition for higher income and lower income communities?	
• How to perform a detailed waste sampling and analysis?	
• How to undertake a waste audit for an organisation?	



# OPTIONS FOR RECYCLING SCHEMES



**R 6A**



# COST BENEFIT ANALYSIS

**COSTS**  
(NEGATIVE FACTORS)

**BENEFITS**  
(POSITIVE FACTORS)

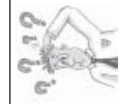
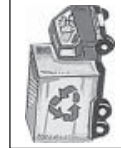
OPERATING COSTS	R
SALARIES	R
EQUIPMENT COSTS	R
JOB CREATION	R
LANDFILL SAVINGS	R
MONEY RECEIVED FOR RECYCLABLES	R

VALUE (RANDS)

EXTERNAL

INTERNAL

**THE BENEFITS HERE OUTWEIGH THE COSTS AND THEREFORE  
A PROPOSED PROJECT WOULD BE VIABLE**



R 6B



# 6. RECYCLING SCHEME OPTIONS

## IN THIS SECTION FIND OUT ABOUT:

- The relative costs of landfill, incineration, drop-offs and kerbside recycling
- Which partners make up the recycling chain
- Establishing drop-off and buy-back centres, separation at source, salvaging on landfill sites
- How to perform a cost/benefit analysis



### 6.1 PLANNING CAREFULLY FOR A SUCCESSFUL RECYCLING SCHEME

After the analysis of the waste stream contents, the costs and benefits relating to the type and viability recycling options need to be assessed.

A study by the University of East Anglia in 1999 on countries in the European Union shows that recycling is economical when drop-off points are established. The report states that the cheapest option for managing domestic waste was recycling drop-off, followed by landfill, incineration and then composting (See table below).

COMPARATIVE COSTS OF WASTE DISPOSAL IN EUROPE (Quoted in: Lombard, 1999)			
DISPOSAL METHOD	RELATIVE DISPOSAL COST (EURO PER TONNE)		
	ECONOMIC COST	ENVIRONMENTAL COST	NETT COST
Landfill	95.3	2 to 20	97 to 115
Incineration	156.1	11 to 23	167 to 179
Drop off recycling	80.8	-282 to -17	-201 to 64
Kerbside recycling	109.8	-230 to 41	-120 to 69

The table shows that the benefits of recycling cannot only be judged on economic costs. The cost to the environment also needs to be included in the sum.

In the table above the negative values indicate a benefit. We often forget that the recycling process itself (involving chemicals, water and fuel usage) is an added cost to the environment. In terms of costs and benefits, the market value of land used for a landfill could also be compared to the same land being used for housing. The economic costs of landfilling are also still relatively cheap in South Africa and this could make it appear as if the purely monetary costs of landfilling are lower than for recycling.





Although initially recycling may in economic terms cost more than landfilling, one needs to consider long-term strategic goals (and strategic planning) when one is deciding on what route to follow for waste minimisation, recycling and disposal. Recycling can be cost-effective if established along accepted business lines. If recycling is unsuitable for a particular area (due to, for example, the high costs of transporting the recyclables to market, or the low income base of the community, which means that little packaging waste such as cardboard or plastic is generated) re-use or composting need to be considered.

## 6.2 WHAT ARE THE OPTIONS? (CARD R6A)

Most of the current collection initiatives have been developed on an ad hoc basis and funded by the private sector in partnership with communities, with major financial inputs from municipalities. Anyone - young or old, disadvantaged or advantaged, government official or private citizen - can become a collector of recyclables to exchange for cash.

### STAKEHOLDERS IN THE RECYCLING CHAIN INCLUDE:

- **Consumers:** (households, retailers, industries, Small Medium and Micro Enterprises, service sector, municipalities and institutions).
- **Government Departments**
- **Collectors:** (municipalities, private organisations, informal sector)
- **Waste processors:** (private sector companies, informal sector)
- **Brokers:** those who buy and sell recyclable materials
- **Converters and their agents:** those who buy recyclable material and alter it into a form that is readily usable by a manufacturer eg. recycled plastic pellets to be used by plastic extruders
- **End-use markets:** that purchase recovered/converted materials to make new feedstock
- **Waste disposal operators:** private sector, municipalities
- **Policy makers**
- **NGOs, Community and Consumer Groups**
- **Research groups**

#### 6.2.1

### CHARITIES, COMMUNITY GROUPS AND SCHOOLS

Some schools, environmental organisations, community groups and charities are involved in the collection of recyclable materials, namely cans, paper and returnable bottles, to sell to the recyclers and their agents, and earn money for supplementing their budgets and livelihoods. They usually have low or no overheads as the recyclables are brought in and sorted on a voluntary basis.





# LOOK AT SOME FACTS?

*Western Cape success stories:  
DROP-OFF RECYCLING DEPOTS*

## **KRONENDAL SCHOOL DEPOT, HOUT BAY**

- Associated with a high income residential area.
- Well-motivated local volunteer manager has been in charge since 1997
- Supported by school community, residents and business sector
- Collect paper, glass, cans, cardboard, and five types of plastics collected, sorted, sold - LDPE, HDPE, PET.
- Drop off facility operates 7 days a week for smaller quantities of recyclables
- Manager collects larger quantities from commercial and housing estates which reduces their waste management costs
- Promoted and supported by municipality
- Seven full time staff employed
- Used as educational venue
- Financial management system is in place
- Recyclables market trends and prices are monitored and prices negotiated
- It is the main recycling centre in area, with no competition from other centres
- Effective sorting and storage systems for recyclables are in place
- Some agents collect paper & glass from the depot, but the manager takes other materials to buyers to get better prices
- In 2001 the centre recycled 635 tonnes of materials and made R 108 000.00



## **OASIS WORKSHOP FOR MENTALLY HANDICAPPED DEPOT**

- Located in high density area
- Staff include a manager, supervisor/driver and 20 workers who sort materials into bags and containers.
- Supported by recycling companies and people motivated to help the institution
- Collects commercial, light industrial and residential waste
- Materials: all paper grades, cardboard, glass, cans, two plastic types, LDPE film and PET
- Drop-off facility operates 7 days a week
- Collection of larger quantities is done by workshop driver using the institution's bus
- In 2001 recycled 410 tonnes of materials and the proceeds are an important source of income for the institution.

*Source: Barbara Jenman: Fairest Cape Association*





## 6.2.2 RECYCLING CENTRES

Recycling drop-off and buy-back centres, scrap metal buy-in shops and garden waste drop-off centres which provide containers for the collection of recyclables have been established in several large cities. The public can deposit waste they have already separated into different waste streams (such as glass, paper/cardboard, cans, scrap metal - ferrous and non-ferrous - plastics, garden waste and oil) free of charge. The recycling industry usually supplies collection containers whether the recycling centres are established and/or run by the municipality or a private individual or organization.

### LEGAL REQUIREMENTS

In most instances, before setting up one of these facilities, a minimum requirement of environmental and planning authorities in terms of legal permissions and in terms of Environmental Impact Assessment regulations is a scoping report to ensure that any negative environmental impacts on the surrounding areas are minimised. Further requirements for a garden waste drop-off or transfer station, would be its rezoning in terms of town planning requirements and a permit to operate in terms of the Environment Conservation Act issued by the Department of Water Affairs & Forestry. All of these processes will involve an element of public participation in order to identify the issues and impacts of the development and ensure that the concerns are addressed and the impacts minimised.

### LOCATION

It is important to select the most suitable site for the location of a drop-off or a buy-back centre. While the site must be close enough to the community it is serving to be convenient, it is also necessary to ensure that the operations associated with the site will not create a nuisance for those located in the immediate vicinity. For example, problems such as rodent or vermin infestation can create a health hazard if the collected materials are not properly stored. Vehicles used to access the site to drop off or collect materials could add to an already unacceptable load on the roads in a particularly busy area. Liaison is needed with health, planning and traffic control authorities to address these potential problems before building of the centre commences. A good location for a buy-back centre is close to an industrial and commercial hub where sufficient quantities of recyclables from packaging waste can be obtained will ensure its viability.

### LAND ACQUISITION

If land for a centre is to be acquired from the private sector, the partners involved in the project will need to include fundraising in their plan to purchase or rent the land from the owners. If land is to be obtained from the municipality, permission must be sought to buy or rent the land from the council. Again, funds will have to be raised for this purpose. Municipalities could consider charging reduced rental and rates for council-owned properties for the first three years of the project. This would lend support to the entrepreneurs establishing and operating the centre, many of whom may come from previously disadvantaged communities and may be unable to obtain sufficient capital from investors. The acquisition of suitable land should be considered right from the outset of the project. Negotiations with various parties and the authorities can be extremely time-consuming and subject to uncertainty in terms of correct land use allocation and possible rezoning procedure which must be followed.

**THEFT OF METAL FOR SCRAPS**

Where scrap metal buy-in shops, or “bucket shops” as they are commonly known are involved, serious problems are being experienced nationwide with the theft of council and government property made out of metal - such as bridge railings, water meters, traffic lights, and electricity and telephone cables - for sale as scrap metal in the market. This can be limited with the co-ordinated commitment and co-operation of all parties to stop this practice that is costing municipalities thousands of rand each month. Durban is the first city to set up a specialised police unit to crack down on the theft of these metal items. Major stakeholders such as the SA Police Services, Metro Rail, Spoornet, the eThekweni Council, the SA National Defence Force, the Road Traffic Inspectorate and electricity provider, Eskom, have backed the initiative started in November 2001. The unit is to monitor thefts and arrest the perpetrators in the scrap metal dealing industry. Municipalities need to ensure that scrap metal buy-in shops and dealers are constantly monitored and educated to ensure they do not receive and buy in stolen municipal and government property.





## 6.2.2.1 BUY-BACK CENTRES

### LOCATION

Buy-back or buy-in centres should ideally be located close to a commercial/industrial area where a good percentage of recyclables from packaging are present in the waste stream. Buy-back centres work well if they are accessible to lower income communities because they create the opportunity for the exchange of recyclables for cash.

### HOW BUY-BACK CENTRES WORK

These centres promote job creation as they attract unemployed collectors of recyclables in the informal sector who usually sell their items to the centres for a better price than is offered by the mobile agents that collect recyclables from vehicles on behalf of some formal recycling companies on an ad hoc basis on street corners. The latter (using vehicles to collect recyclables from street corners) creates problems in the cities as the pavements are already congested with pedestrians. The material collected, mainly cardboard, is also frequently stacked untidily into piles for several hours before collection, attracting litter from passers by. The benefit of the buy-back centre is that collectors can return when they like, selling their collected recyclables and ensuring that the items are weighed correctly on an accurate scale. The collectors are also then free to find more items and return later to sell them at the centre. It is extremely important that these centres are conveniently placed in the areas where collectors find the recyclables. Each centre should be strategically located to service collectors within a maximum of a 2 to 5km radius around the centre. This is because recyclables like cardboard are heavy to haul by hand or in barrows for long distances. If the centre is not close enough to the collectors, they will not support it and will rather sell their recyclables to mobile agents.

### OPPORTUNITIES

Jobs are created at each centre as an entrepreneur is required to operate and manage each centre, sorters and balers are

needed to accept and process the material for collection by the recycling companies, and informal collectors can be licensed to supply each centre in return for preferential (special) rates and value-added benefits such as storage lockers for their belongings. If the material is well sorted and baled in bulk, higher prices can be obtained - especially where paper, plastic and metal are concerned. The recycling industry or entrepreneur usually funds the rental for the centre and the transport of the recyclables to the processing factory, using profits from the sale of the recyclable items to the recycling industry. If municipal property is used for the centre, reduced rental and rates for the site are recommended for a minimum of the first three years in support of the business, until a stable clientele is established by the entrepreneur.

To ensure the viability of the centre, the entrepreneur should also be advised to go out and secure recyclables themselves from known sources like businesses in the area.

The buy-back centre entrepreneur also needs to build up a good relationship with informal collectors in the area, and consult them about prices they want for the sale of their recyclables.



## 6.2.2.2 DROP-OFF CENTRES

### LOCATION

A drop-off centre is ideally located where it is convenient for higher income communities to drop off recyclable materials without being paid for the materials.

### HOW DROP-OFF CENTRES WORK

People deposit recyclable items into various containers available at drop-off sites. Sites have to be secure, safe and conveniently situated for the public who use the facility. This is why shopping centres and garden refuse sites are popular as drop-off sites. Before siting a drop-off facility, the local community around the proposed site should be involved in commenting on and advising the process.

### NEED FOR CONTROLS

If there is no access control, it is difficult to monitor what is deposited into the containers, litter is frequently associated with unsupervised operations, and people scavenge out of these facilities because they can make money from the contents. An unsupervised site will become unpopular with the public who will put pressure on the recycling industry and municipality to remove it. Further problems are experienced when the containers are removed, as the people often continue to deliver their recyclables to the site, dumping them on the empty space.

Less formal forms of drop-off facilities for recyclables are the bottle and paper collection banks owned by charities and NGOs. These are placed on verges and open spaces on either public or private property, again in large cities. Collection banks experience the same problems as drop-off centres if there is no access control and are unpopular with municipalities who are faced with funding frequent clean-ups of the area surrounding the banks. The owners of the banks seldom have the resources to ensure the areas surrounding the banks are kept litter-free. Vandalism of the containers is also a problem.

If a bank is to be situated on public property the municipality must be approached to give permission for its siting. If it is to be on private property, the owners of the ground need to be similarly canvassed. Due to problems, many municipalities are now insisting that banks are located in controlled areas, preferably on private property where there is a constant human presence to discourage vandalism and misuse.



## LOOK AT SOME FACTS

DROP OFF CENTRE AT FULTON SCHOOL FOR THE DEAF, WINSTON PARK  
WASTE MANAGEMENT PROJECT: 1990 - 1997

### The school's objectives were:

- To increase awareness of the need to save resources by recycling
- To reduce litter and environmental pollution
- To generate income for the school in an informal and educational way

### Some facts about the centre:

- Multi-material drop off facility located at a school for the deaf situated in a high income area
- Two dedicated teachers with a vision for recycling were in charge, assisted by the children, particularly from special needs classes
- Supported by school staff, learners and the residential communities in the area, seen as a good cause.
- Collected glass, paper, cans, plastic (until the plastic market collapsed), used oil, also milk bottles and egg boxes for re-use by local farmers, reusable containers for small business.
- Operated 7 days a week
- All recyclable materials were fetched from the school by the recycling agents
- Outcomes based learning programmes were drawn up with the recycling theme applied at many levels for Accounting (unit cost prices), Bookkeeping, Economics (small business was set up), Technical Drawing, and Maths (mass and volume concepts). Practical skills such as toy making, brick laying, plastering, metal work, welding and electrical skills, were learned while building and equipping the recycling centre and its related activities.
- Management of financial aspects by accountancy class was run as a small business (small business was set up buying cleaning materials in bulk, decanting into second-hand containers and selling)
- Practical and on-going class activities were associated with the centre
- A competition run within the school with prizes/outings for the class contributing the most recyclables.
- Over the years proceeds from the sale of recyclables bought various items needed by the school e.g. tennis ball machine for sports practice, chain saw for a tree felling business set up by the learners, old motor car for teaching mechanics.
- The project was nominated at a finalist in the Green Trust Award and in the Eskom Environmental Competition at the time.
- Activities ceased when the committed teachers retired.

Source: Ms Jean Lindsay, Durban





# QUICK CHECKLIST FOR BUY-BACK & DROP-OFF CENTRES

QUESTIONS	ANSWERS
1. What types of recyclables are available in your area?	
2. What quantities are being produced?	
3. At what rate are these being generated?	
4. How often are they available? Around holiday seasons only? All the time?	
6. How far are these companies from your area?	
7. Do you have transport to take your waste to the companies?	
8. Do you have enough and appropriate storage space for your waste?	
9. For a buy-back centre: have you worked out prices at which to buy from the community?	
10. Will you benefit from this activity? Briefly, match the needs of recycling companies to the recyclables available in your community.	

## 6.2.3 SEPARATION AT SOURCE

A number of attempts at kerbside recycling in Durban and Johannesburg have failed due to public apathy (Lombard, 1999). There are currently no formalised municipal systems for source separation and kerbside collection of recyclables in South Africa, although various trials are underway, notably in Benoni, Gauteng where the bags for recyclables are supplied by the recycling industry and the recyclables are collected by the municipality for sorting and sale. Kerbside collection of recyclables is possible where communities have kerbside refuse collection services.



A kerbside collection system presents challenges in obtaining suitable vehicles to collect the recyclables, as specialised transport is needed. In Benoni a trailer was manufactured that hitches onto the back of the normal refuse collection vehicle. It is divided into compartments for the different recyclables. The vehicle uses more fuel per kilometre due to the extra weight. Modifications also had to be made to the trailer to ensure the sides were not too high for workers to empty the bags of recyclables into the compartments easily.







A number of companies also divert waste for recycling in order to reduce their waste disposal bills. The most common materials put aside for recycling by companies not formally involved in the recycling industry, are paper and cardboard. Desk bins often supplied by recycling companies for paper are placed next to ordinary bins at each work station so office workers can separate out the waste at source. Cardboard is also separated out and left for the informal collectors to take away to be sold. Paper is usually collected by the established recycling companies or their agents, and the business is often paid a sum of money for the material recovered. Thus, not only is the business making money from the paper sold, but also saving money by disposing of less waste.

#### 6.2.4 SORTING FROM THE MIXED WASTE STREAM



A number of capital-intensive recycling plants have been unsuccessful in South Africa, for example Robinson's Deep Waste Flow Plant in Johannesburg and the Resource Recycling Plant in Randburg. These were both examples of materials recovery facilities (MRF's) which mechanically and labour-intensively separated collected mixed recyclables by type so that they could be recycled into new products. A labour intensive, low technology initiative in Durban by Tempo Recycling, also failed, largely because of unacceptable health risks to workers when quantities of illegally dumped health care wastes appeared in the general waste stream.

Although the mechanical plants worked from a technical point of view, their failure has been attributed to an overestimation of the value of recoverable materials, unrealistic requirements of the municipalities involved, a down-turn in the economy at the time that the projects were launched and decreases in the value of recycled materials.

### POTENTIAL PROBLEMS WITH INFORMAL COLLECTORS AND COLLECTION AT SOURCE

There are several potential problems associated with informal collectors of cardboard from households, businesses and industry. Collectors sometimes dampen the cardboard to get more money for its sale as it is heavier when wet.

This not only creates pollution of readily available water sources such as rivers and streams, but recyclers deduct a percentage from money paid out for wet cardboard, according to how damp it is. The collectors should be made aware of the implications of this practice via an ongoing education programme. Collectors are also inclined to discard waste that they cannot sell which is inside or attached to the cardboard, such as polystyrene and plastic film and strapping. This creates a serious litter problem. Suitable receptacles need to be available in the collection and sorting vicinity in which the discarded waste can be deposited for disposal. Collectors should also be encouraged to take the items to a designated area with waste collection facilities where it can be sorted and packed for sale. Again, an ongoing education programme is needed to prevent this litter, not only with the collectors but with members of the public who put out their cardboard for collection.

The latter need to be requested to remove all waste, other than cardboard, from the boxes they put out for collection.





## 6.2.5 SALVAGING ON LANDFILL SITES

Due to the large quantities of recyclable materials in the waste arriving at landfill sites, informal salvaging is widespread in South Africa. The salvagers pick through the waste and sell the recyclables to agents on the site.

This practice can lead to unacceptable health and safety risks for the salvagers, as well as operating problems for the landfill manager. Salvaging on landfill sites often goes against the permit conditions that apply to the sites. Attempts by municipal authorities to stop the activity have sometimes met with great opposition from the salvagers with threats of violence, as they earn a living from this practice.

A compromise is to divert vehicles containing potentially recyclable wastes to an area adjacent to the landfill where the salvagers are able to pick through the waste. The remainder can then be sent to landfill. In the informal sector, especially in less developed areas, waste is recycled by, for example, converting it into bags, mats, toys and other items that are used within the household or sold. There is also often a brisk trade in items like old bricks on landfill sites.

If this practice is followed it is advisable to formally identify a defined group of salvagers and register/license them with the municipality, in consultation with the community adjacent to the landfill site and the landfill monitoring committee. The municipality or landfill operator then needs to provide licensed salvagers with protective clothing, such as gloves, masks, heavy duty aprons and boots to reduce the risk associated with direct contact with the waste while sorting.



## LOOK AT SOME FACTS

### MATERIALS RECOVERY FACILITY AT THE MALMESBURY LANDFILL SITE

- Malmesbury: The town is 70 km north of from Cape Town
- Population: approximately 40 000 people
- There is cooperation between the municipality, landfill contractor/recycler and sorters
- A waste sorting and a processing plant is located at the GSB- landfill site
- Contractor invested in processing plant with conveyer belt and baler to recover recyclables from the waste stream in order to extend the life of the site.
- The facility recovers paper and newspaper, cardboard, cans, glass, plastic crates and PET bottles from selected loads of the 60 tonne per day mixed municipal waste stream
- The operation does not have any high technology mechanical sorting machinery. Workers recover recyclables manually from the mixed waste on the conveyor belt and sort them into bins.
- The facility employs 22 workers with financial incentives.
- A manager oversees maintenance and marketing of materials
- The municipality collects and drops off residential mixed waste and clean commercial waste at the processing plant.
- In 2001 25% of the total incoming mass of mixed waste was processed for recycling and 25% of airspace was saved on the GSB- landfill site.
- The town saves one million rand per year. The profits from the recycling scheme do not cover the recovery project, but income generated through the extension of the landfill lifespan supports and subsidises the recovery scheme.
- It is estimated that the recycling of waste will reduce the waste stream to the extent that the expected life of the landfill site is more than doubled.

**Source:** Mr Hein Baumgarten, Malmesbury Landfill Manager





## 6.3 COST BENEFIT ANALYSIS

At present the local recycling industry is not subsidised in the same way as it is in some overseas countries that have economic instruments such as green taxes and government grants. Recycling is a competitive business where prices paid for recyclables are subject to the fluctuations of the market, and supply and demand. If there is no market for the collected recyclables or if the public are not prepared to buy items made from recycled material, recycling in South Africa will ultimately fail. Many unemployed people in the informal sector rely on the collection and sale of recyclables to earn a basic wage.

It is important to critically evaluate any proposed recycling scheme before an extensive and expensive programme is embarked on. Recycling cannot be viewed as a quick and easy way to make money. Municipalities' motivation for recycling should not be solely to make money out of the resale of the recyclable items, but rather to save money by conserving landfill airspace and by reducing collection and disposal site operation costs due to handling reduced volumes.

The easiest way to estimate whether a proposed recycling scheme makes financial sense is to perform a cost benefit analysis. A recycling operation will only succeed if it can cover its capital and running costs through the sale of recovered/produced materials. A cost benefit analysis will need to be undertaken to establish and weigh up the internal costs and benefits (internal to the operation) and the external costs and benefits (See Card R6B).

### AN EXAMPLE OF RECYCLING COSTS & BENEFITS

#### INTERNAL COSTS

Equipment, salaries and running costs.

#### INTERNAL BENEFITS

Recyclables sorted and baled in bulk and sold for profit.

#### EXTERNAL COSTS

Neat, secure and enclosed building and yard to attract customers and prevent public complaints.

#### EXTERNAL BENEFITS

Job creation reducing unemployment, saving landfill space.

**NOTE :** The costs must be less than the benefits so that a profit is made and the operation remains economically viable (See card R6B).



There is debate as to the validity of cost benefit analysis, especially among environmental activists, who feel that this method is not sustainable.

It fails to take into account the true cost to the environment and, by extension, future generations, of the use of resources and the production of pollutants in the simple process of collecting, sorting and baling the materials to be sent for recycling in the industry. If you are going to do a cost benefit analysis it is advisable to consult experts on this discipline.

You will find them in the economics departments of universities and technical colleges.





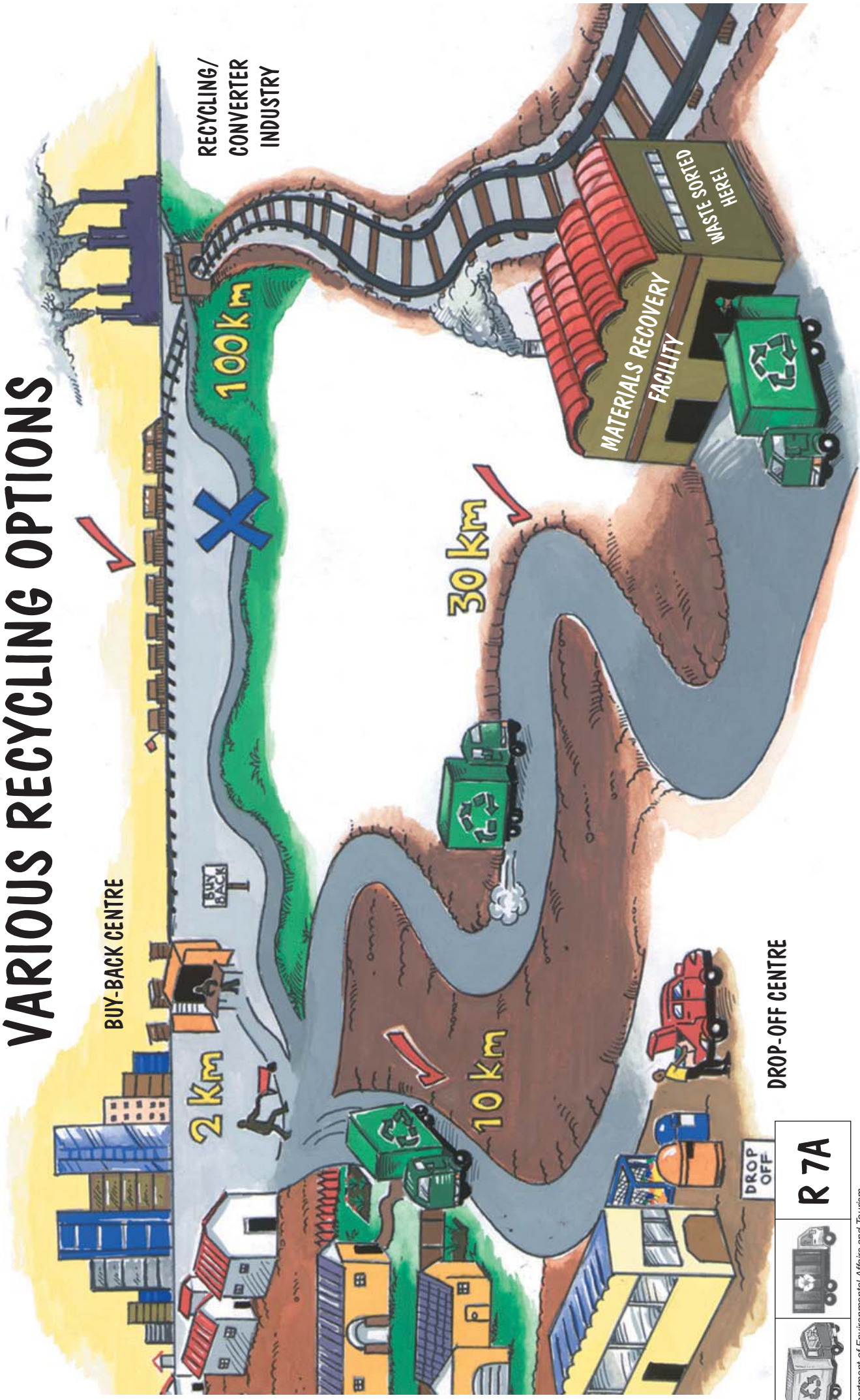
## KEY QUESTIONS TO ASK ABOUT COSTS AND BENEFITS



QUESTIONS	ANSWERS
1. Is there a need for the recycled materials; do supply and demand fluctuate greatly; are people willing to use products made from recycled materials?	
2. Is the waste easily recyclable; is it valuable?	
3. Can the costs of collection of items for recycling be recovered from the sale of the recyclable goods?	
4. Can collected and recycled goods be economically transported to the markets or are they too far away?	
5. Are the batches of recyclable goods of a size that they can be economically handled?	
6. Is the proposed operation based on technically and environmentally sound principles?	

DO YOU KNOW?	SELF CHECK
	✓
• The relative costs of landfill, incineration, drop-offs and kerbside recycling.	
• Which partners make up the recycling chain?	
• Where is the best place to establish a drop-off centre and a buy-back centre, with reasons?	
• What is separation at source?	
• What are the issues around salvaging on landfill sites?	
• How do we perform a cost/benefit analysis?	



# APPROPRIATE HAULAGE DISTANCES FOR VARIOUS RECYCLING OPTIONS



		<b>R 7A</b>
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# KEY QUESTIONS TO ASK ABOUT MARKETS

1. WHERE ARE THE MARKETS?
2. PRICES FOR RECYCLABLES?
3. HAULAGE DISTANCE TO THE MARKETS?
4. TYPE AND NUMBER OF CONTAINERS NEEDED?
5. WHO WILL COLLECT RECYCLABLES?
6. HOW WILL RECYCLABLES BE SORTED AND BALED?
7. WHO WILL SORT AND BALE?
8. HOW WILL RECYCLABLES BE TRANSPORTED AND BY WHOM?
9. COSTS OF TRANSPORT





# 7. FINDING A MARKET

## IN THIS SECTION FIND OUT ABOUT:

- The key questions to answer about markets
- About a case study for markets in an urban area
- How to buy-recycled and close-the-loop
- The importance of finding an accessible market

**THE 2ND GOLDEN RULE :**  
**FIND A MARKET FOR THE**  
**RECYCLABLES**  
**BEFORE COLLECTION**

## KEY QUESTIONS TO ASK ABOUT MARKETS

QUESTIONS	ANSWERS
1. Where are the markets located?	
2. What prices will be paid for the recyclables?	
3. What is the distance to these markets from the source of the recyclables to be collected and baled?	
4. What type and how many containers will be needed for collection?	
5. Who will collect the recyclables? Are they to be paid?	
6. How will the recyclables be sorted and baled?	
7. Who will sort and bale the recyclables and what will they be paid?	
8. What containers and vehicles are needed for transporting the recyclables to the markets?	
9. What are the costs of transport?	

A directory of contacts to assist in answering these key questions is included in **APPENDIX C**.

At present, the prices paid for recyclables fluctuate widely in South Africa due to variations in supply and demand for different recyclables in the local and overseas markets, and a lack of subsidy which would cushion the market from the effects of these fluctuations. It is important when entering into an agreement with a recycler or agent to buy recyclables, that a contract for a stipulated period of time is agreed to at a specific price. Project proponents and local authorities should “shop around” for the best deal.





# LOOK AT SOME FACTS

## CASE STUDY : GLASS IN DURBAN

There is difficulty in finding an accessible market: currently all clear, amber and green glass has to be transported from Durban to Gauteng for recycling.



Before transporting, the glass must be colour-sorted and cleaned to boost its value. Any load found to have mixed colours or to be contaminated with other waste (e.g. metal or plastic) is automatically rejected. Glass is most cost effectively transported in one ton bags, loaded onto large trucks at 37 bags per trip. Each truck has to be fitted with special stands to hold and secure the bags in transit. The glass in the bags must not be too dense (it must not be broken into small pieces) otherwise the full bags will be too heavy to transport on the truck. The bags generally last only one trip because they are torn by the broken glass, and so must be replaced frequently.

This is a challenge in an urban area with a good road network to the market and access to fleets of trucks using the route. The situation is even more complicated for rural areas where it is difficult not only to get the materials to one point for sorting, but also to transport them to a market which may be hundreds of kilometres away.

### 7.2 BUY RECYCLED AND CLOSE-THE-LOOP

It is no longer sufficient to merely collect materials for recycling. Recycling must be driven by policies adopted by major resource users like municipalities and larger institutions to buy recycled products wherever possible and, in so doing, close the recycling loop. This is as simple as ensuring that all municipal departments are mandated to use locally-produced recycled paper for their letterheads and minutes of meetings, or that only remanufactured printer cartridges are used in printers. Furthermore, municipal departments should also be mandated by the council to investigate the purchase of items made from recycled materials for use in the departments of the municipality. An example could be to use paving stones that contain small pieces of pulverised recycled glass. In this way a market will be ensured for recyclable items which are collected and reprocessed to make other goods for sale. Ultimately, the price of those recycled items should come down and quality should go up due to increased demand. Municipalities should also take a lead role in influencing local industry to adopt product-based policies aimed at promoting more environmentally effective management of products throughout their entire life cycle, including (where appropriate) increasing the potential for recycling throughout the product chain, through initiatives such as 'design-for-disassembly' and 'design-for-recycling'. Provision also needs to be made by municipalities and industry for the recycling of larger and more sophisticated product types such as motor vehicles, electronic products such as computers and 'white goods' (household appliances) such as refrigerators and stoves. It should be made compulsory for businesses to subscribe to a purchasing policy that favours environmentally sound alternatives e.g. using refillable rather than throwaway items.



## DO YOU KNOW?

### SELF CHECK



- The key questions to answer about markets for recyclables?
- The challenges for glass recycling in the Durban area?
- How to buy-recycled and close-the-loop?





# HOW TO SET UP A RECYCLING CENTRE STEPS 1 TO 5

1



**CONSIDER NEED, OPTIONS AND COSTS**

2



**SEEK FUNDING**

3



**ORGANISE A COORDINATING TEAM**

4



**APPOINT A RESPONSIBLE BODY**

5

**DECIDE DETAILS OF RECYCLABLES AND MARKETS**



**R 8A**

USE PAPER PRODUCTS



MAKE NEW PRODUCTS



RECOVER USED PAPER



SHRED & DIGEST



PULP

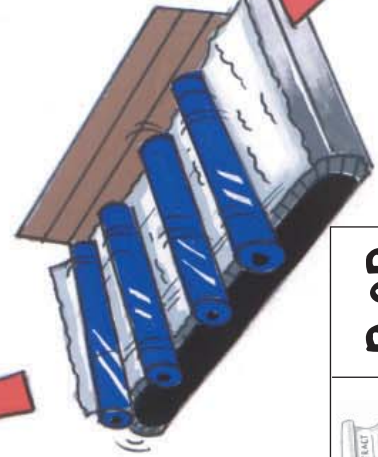
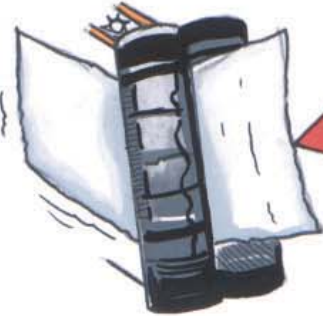


WASH DE-INK



# PAPER RECYCLING

PUT THROUGH ROLLERS AND CUT TO SIZE



ROLL & SQUEEZE OUT LIQUID



SPREAD OUT & DRY



R 8B

# HOW TO SET UP A RECYCLING CENTRE STEPS 6 TO 10

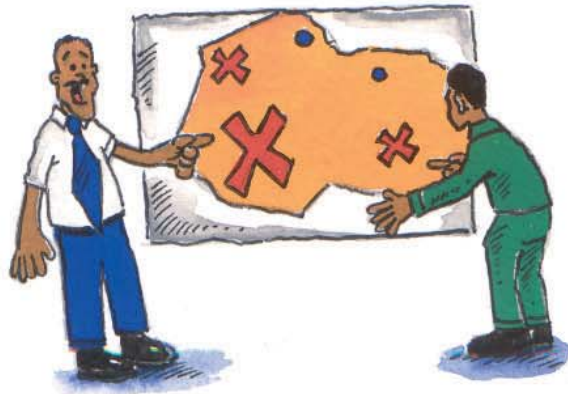


**NEGOTIATE CONTRACT WITH RECYCLERS**



**CONFIRM LOGISTICS AND METHOD OF PAYMENT**

**CONFIRM LOCATION OF CENTRE AND FULFIL REQUIREMENTS FOR ITS ACQUISITION. EG: REZONING, PERMIT, LEASE**

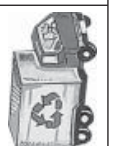


**IMPLEMENT A PUBLIC AWARENESS PROGRAMME**



**MONITOR PAYMENTS AND RELATED BENEFITS TO THE COMMUNITY**

**R 8C**



RECOVER USED PLASTIC

SORT INTO PLASTIC TYPES

EACH TYPE OF PLASTIC  
PROCESSED SEPARATELY

USE  
PLASTIC  
PRODUCTS

SHRED

WASH SHREDED  
PLASTIC

DRY

MELT

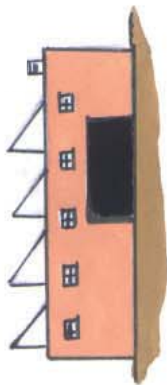
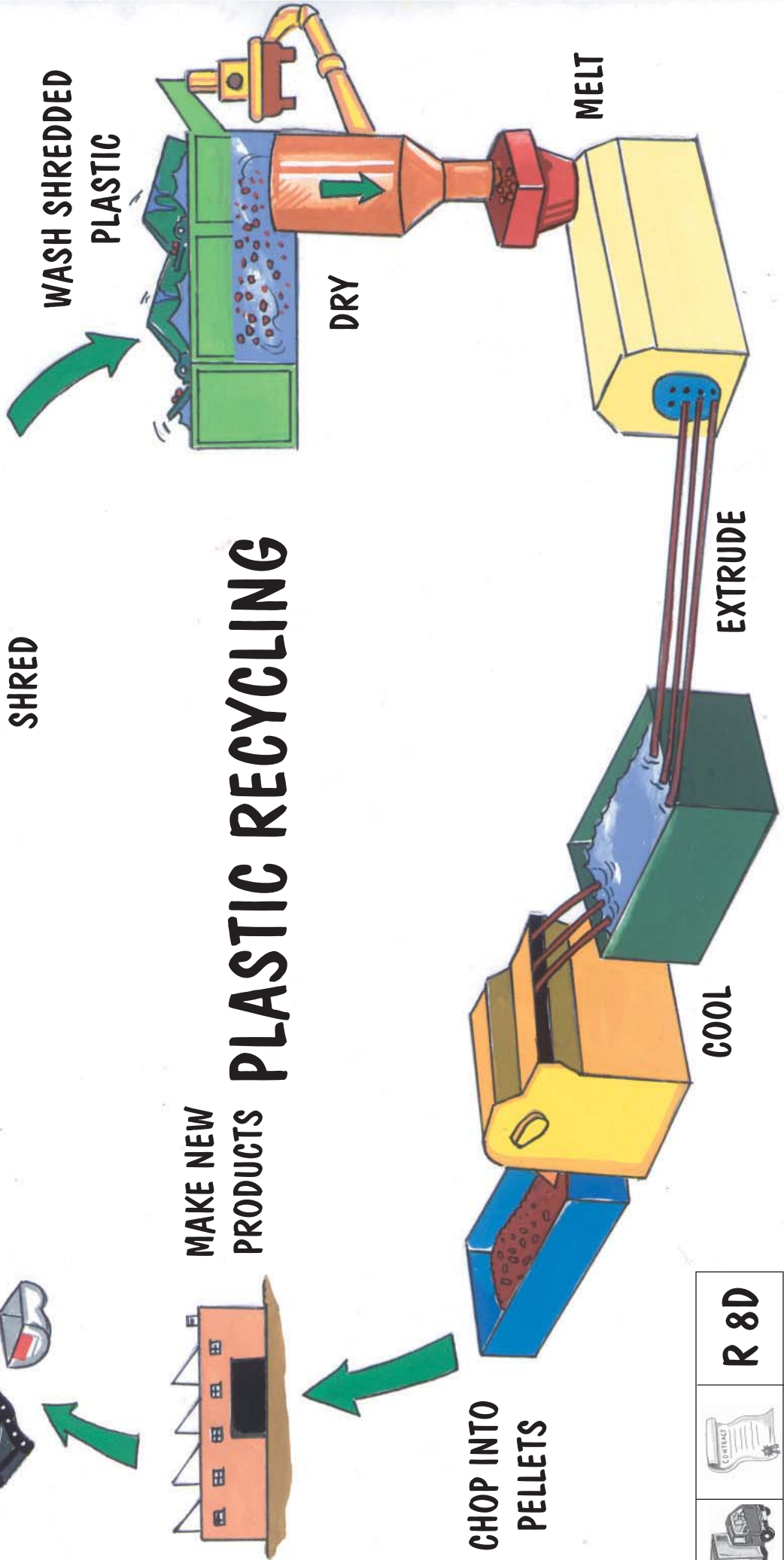
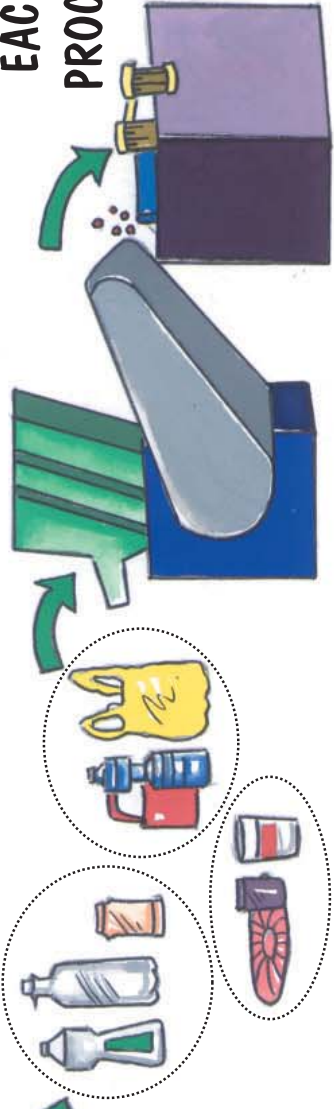
EXTRUDE

COOL

MAKE NEW  
PRODUCTS

# PLASTIC RECYCLING

CHOP INTO  
PELLETS



		<b>R 8D</b>
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## 8. HOW TO NEGOTIATE A CONTRACT AND SET UP A COLLECTION DEPOT FOR RECYCLABLES

### IN THIS SECTION FIND OUT ABOUT:

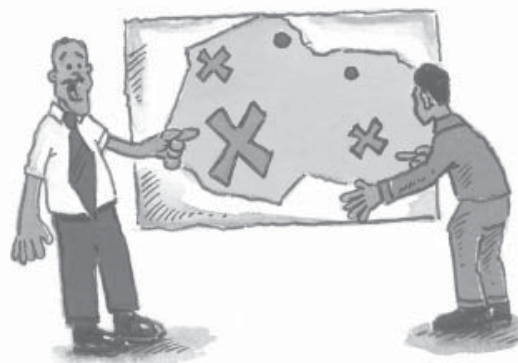
- 10 easy steps to follow to set up a drop-off or buy-back centre
- Step-by-step guide to setting up a depot

### 8.1 STEP-BY-STEP GUIDE TO SETTING UP A DEPOT:

#### THERE ARE 10 BASIC STEPS TO SETTING UP EITHER A DROP-OFF OR BUY-BACK DEPOT FOR RECYCLABLES

(See cards R8A and R8C)

1. **Consider the need for the centre:** and the location of any existing centres and decide on what type of collection system is appropriate for recyclables i.e. drop-off or buy-back point. Consider the relative wealth of the surrounding community - if many people are unemployed a buy-back centre will be suitable to create employment. For wealthier communities a drop-off centre is suitable as they are likely to collect waste for recycling to reduce waste in their bins and save natural resources. The municipality, in conjunction with the recycling industry and their agents, should be drawn into undertaking market research to establish the viability and associated costs of the centre before funding is sought.
2. **Seek funding:** for the establishment of the centre. Many recycling companies and agents provide free containers for collection if the recyclables are sold directly to them and if there are sufficient quantities coming into the centre, for example, a shipping container for the bulk storage of paper, a scale to weigh the paper and a cash float to pay out if running a buy-back centre. Additional funding will be needed to set up the centre: funding for fencing, a paved slab on which to operate, an office building (e.g. shipping container) with equipment, ablution facilities, toilets (possibly portable), etc. Funding can be sought from the recycling industry, private companies, the municipality or from central government departmental funds like the Poverty Alleviation Fund for the creation of permanent jobs, as administered by the Department of Environmental Affairs and Tourism. To apply for funding a proposal is required with a business plan showing the anticipated potential income from the centre as against the projected operating costs for the same. Most funders will not supply funding for operating costs, only for capital and equipment costs. They also require some form of financial guarantees from either the concessionaire / entrepreneur running the centre or municipality involved in the development of the centre for any equipment that they sponsor or provide.
3. **Organise an elected co-ordinating team:** from the benefiting community, school, municipality and / or business that will assist in deciding who will be contracted to run the centre and how the money from the sale of the recyclables collected will be allocated. Running a recycling centre or scheme involves partnerships between recyclers, the community and the municipality. It is also important to consider who will train the entrepreneur contracted to run the centre, and what expertise will be needed for this. Often recycling companies will perform this role at no cost, if a supplier's agreement for recyclables is entered into with them. Provision needs to be made in any funding proposal and budget for training costs.



- 
4. **Appoint a concessionaire/contractor to operate:** the drop-off or buy-back centre. It is advisable to put the position out to tender. In the advertisement the proposed location of the centre should be stated, the estimated amount of materials anticipated that will be accepted into the centre and their approximate worth, the proposed operating hours and conditions for the centre, and the income that can be expected from the centre.



**NOTE:** The establishment of recycling centres is not always a municipal initiative. Often they are set up by the recycling companies themselves, independently of the municipality. It is important to take existing initiatives into account and avoid duplication when considering such an initiative.

5. **Confirm types of recyclables and markets:** which items are to be collected before collection begins and identify a buyer/ broker/agent/recycler who will pay for the collected recyclable goods.
6. **Negotiating contract with recyclers:** Get them to identify exactly what they want collected and then negotiate a price. Sign a contract with all parties (including the concessionaire/contractor) for a specified period of time. APPENDIX D contains a sample contract with the conditions of operation for a drop-off or buy-back centre. This example can be modified for other facilities.



7. **Confirm logistics and method of payment:**

Confirm from the buyer / broker / agent / recycler the following:

- who will broker/buy the recyclables
- what containers they will provide for the collection of the items;
- how often they will empty those containers;
- what amount of recyclables they require before they will collect them;
- their contact details;
- if they will provide a daily cash float for payment for the recyclables (buy-back only);
- when payment for the collected recyclables will be received;
- what method of payment is to be used
- how the recyclables will be transported
- what infrastructure will be provided and by whom.

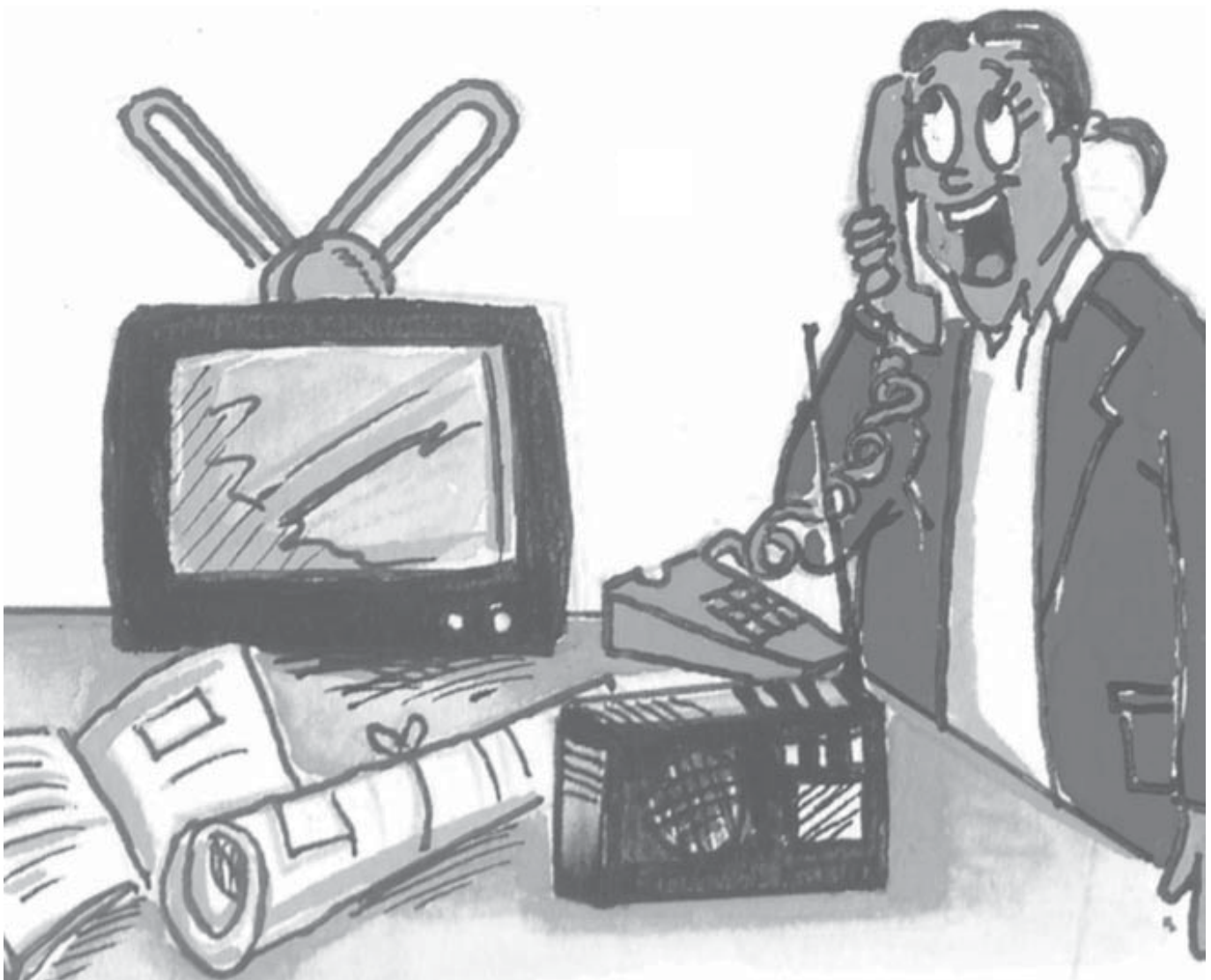
8. **Confirm location and legal requirements:** Confirm the location for the centre in consultation with the co-ordinating team (including a municipal representative), the agents and the recycling companies involved in the scheme. Confirm if the concessionaire/contractor is required to pay rental and rates for the proposed site. If the containers are to be placed on public property permission needs to be obtained from the municipality, and the conditions for placement of the containers there. Pending the zoning of the site, a scoping report and/or environmental impact assessment would probably be required by the environmental authorities to gauge the impact of the centre on the receiving environment and community of the area. A recycling centre will also require a permit to operate as a waste facility from the Department of Water Affairs & Forestry. Suitable security must also be organised for the centre if the exchange of cash for recyclables is involved.



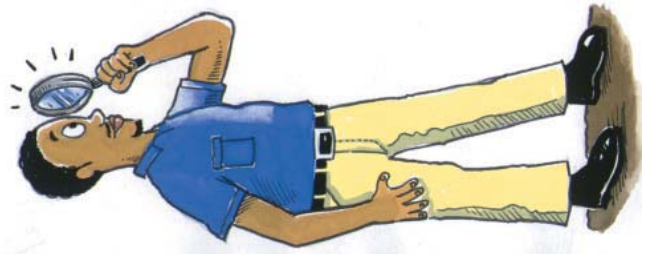
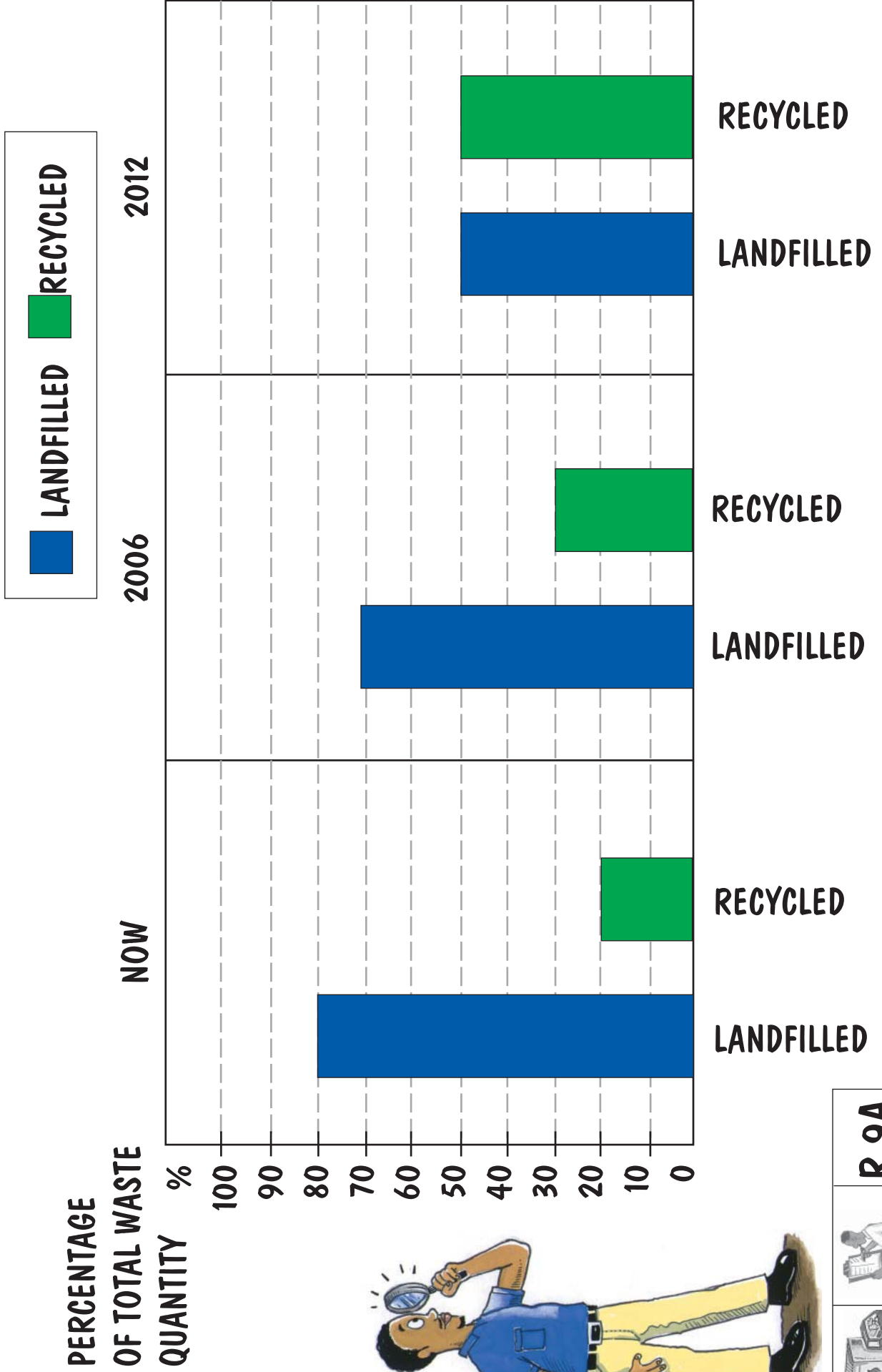


9. **Implement a public awareness programme:** Once the centre is in place, publicise it thoroughly with the local and wider community and potential users of the centre. If possible use the centre as an educational venue to educate the users and public about recycling and correct waste management. The centre can also be advertised in public places via displays at shopping centres and libraries in the vicinity of the venue. On no account should the centre be used as a deposit and exchange facility for hazardous waste. The community and centre entrepreneurs need to be educated by the municipality about what waste is hazardous, that this is not accepted at the centre, and where it may be taken for safe disposal.
10. **Monitor payments and related benefits to the community:** Ensure the payments for the recyclable materials go back into the funds of those who collected the items, or benefit the receiving community. Most importantly keep everyone informed of the progress on the project.

DO YOU KNOW?	SELF CHECK ✓
<ul style="list-style-type: none"><li>10 easy steps to follow to set up a drop-off or buy-back centre?</li></ul>	



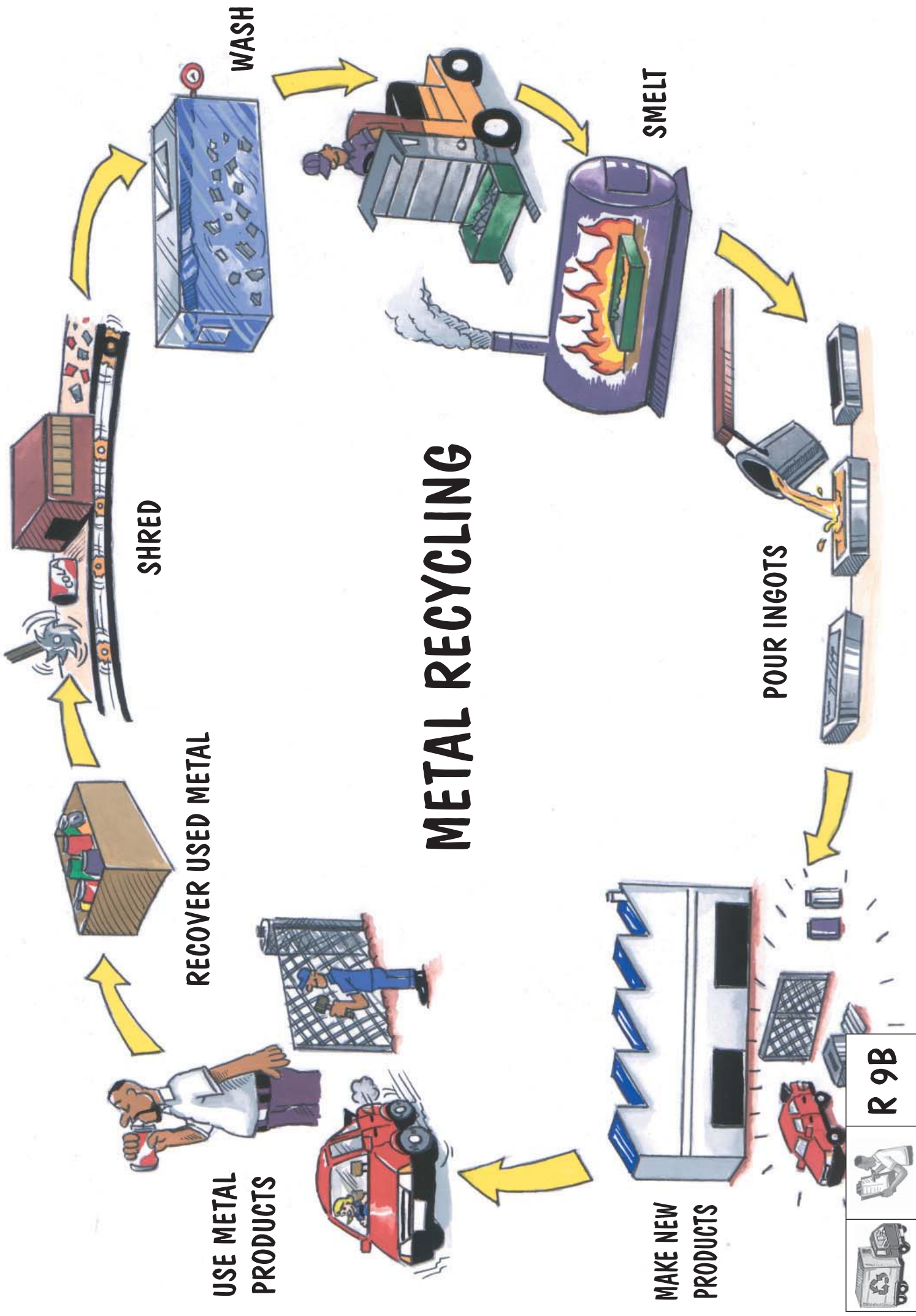
# MONITORING PROGRESS IN RECYCLING



R 9A







# METAL RECYCLING

# ONGOING EDUCATION AND AWARENESS RAISING FOR RECYCLING

COMMUNITY GROUPS



HOUSEHOLD



MECHANICAL WORKSHOPS



OFFICES



SHOPPING CENTRES



SCHOOLS



INDUSTRIES



R 9C



**USE GLASS PRODUCTS**



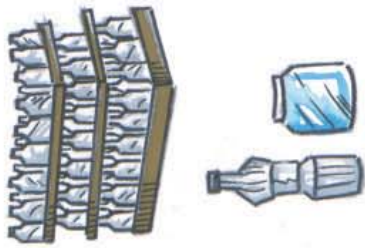
**TRANSPORT TO FACTORY**



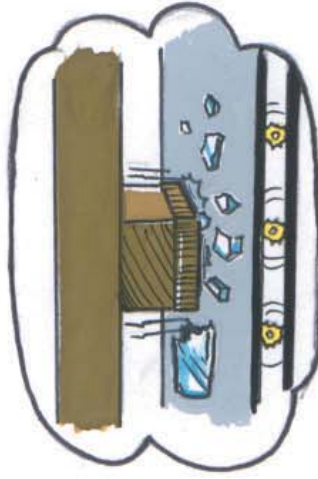
**RECOVER USED GLASS (KEEP COLOURS SEPARATE)**

# GLASS RECYCLING

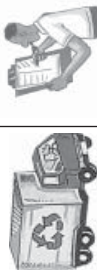
**MAKE NEW PRODUCTS**



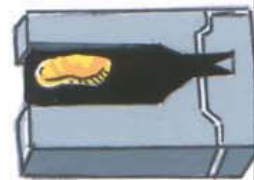
**BREAK UP GLASS**



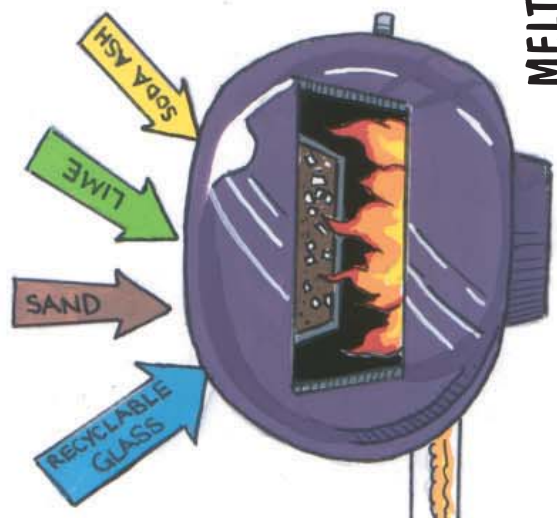
**R 9D**



**MOULD GLASS INTO NEW PRODUCTS**



**MOLTEN GLASS**



**MELT IN FURNACE WITH NEW PRODUCT**

# 9. MONITORING



## IN THIS SECTION FIND OUT ABOUT:

- How to keep records for the recycling project
- How to monitor markets for recyclables
- About the importance of an ongoing education campaign



## 9.1 RECORD KEEPING

Record keeping for the recycling scheme is essential to continually gauge its success. Daily record sheets should be drawn up before the start of the project, in consultation with the concessionaire or operator of the recycling scheme.

The type (e.g. K4 - cardboard, CMW - common mixed waste, SBC - steel beverage cans, copper wire, etc), weight and value of each batch of recyclables received from the public and then sold to the recycling agents should be recorded. A receipt for each batch of recyclables received and traded needs to be issued by the operators of the centre to the depositors/sellers (public), and receipts should be issued by the buyers (recycling agents/brokers) to the centre operators. Each day the amounts of recyclables taken in and their value should be calculated against the price they have been traded for to brokers or agents.

The operating costs of the centre (e.g. transport, site rental, insurance, security, salaries, etc) are then subtracted from the total income from the exchange to establish the profit.

This detailed financial analysis should be submitted monthly to the co-ordinating committee for examination and evaluation so that changes can be made where necessary to ensure the viability of the recycling scheme.

Ideally, all the collectors (formal and informal) associated with any recycling scheme should be formally registered with the municipality to facilitate the smooth functioning of the scheme and ensure that any agreed-upon standards are maintained. It is desirable that this information should also be fed into a national database of recycling for the country.

## 9.2 MONITORING MARKETS

It is also essential to monitor the markets and prices paid for the recyclables every month. If the recycling industry or agents reduce or raise the prices paid for recyclables this will in turn affect the prices paid by the concessionaire to the collectors, and the profits for the scheme. The prices paid for the recyclables will have to be adjusted accordingly. If the collectors are not being paid sufficient monies they will not support the centre or scheme.

To guard against market fluctuations, it is vital that a contract be signed (see previous section) that lays down the price that will be paid for each type and batch of recyclables for an agreed set period of time.





### 9.3 ONGOING EDUCATION AND AWARENESS RAISING

The Department of Environmental Affairs & Tourism is tasked with facilitating environmental education and awareness (See services offered in Appendix C). The Environmental Capacity Building Unit focuses on capacity building on environmental issues within government. The Department is responsible for conducting programmes for recycling which create awareness and promote the benefits of source separation.

The users of the centre or scheme will need to know how to obtain updates on the prices paid for materials and be trained in the operating procedures for the project.

Ongoing public education and awareness programmes will be needed to optimise the popularity of the recycling schemes.

Once a recycling centre is in place, it should be publicised thoroughly with the local and wider community and potential users of the centre or scheme. Community newspapers should be contacted and articles publicising the centre or scheme placed - usually free of charge. The project can also be publicised through radio interviews - often free of charge.

A door-to-door publicity exercise for householders and businesses in the area is also recommended, although this can be expensive. For municipalities, the education exercise could be undertaken by the refuse collectors for each area, on their weekly visits to householders and businesses to collect waste, if they receive sufficient training. Health educators from the Health Department of the municipality could also be included in the education campaign.

The recycling centre itself can be used as an educational venue to educate the users and public about recycling and correct waste management - with tours of facilities organised. The centre or scheme can also be advertised in public places via displays at shopping centres and libraries in the vicinity of the venue. The users of a recycling centre or scheme will need updates on the prices paid for materials and the operating procedures for the project.

Outreaches need to be organised and undertaken at schools, community groups, business forums, environmental forums, community policing forums, etc. in the area to publicise the centre or scheme.

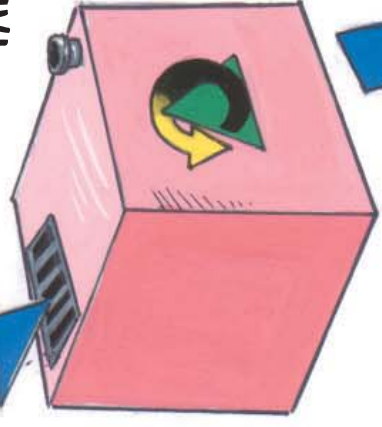
<b>DO YOU KNOW?</b>	<b>SELF CHECK</b> ✓
• How to keep records for the recycling project?	
• How to monitor markets for recyclables?	
• What should be include in an ongoing education campaign?	



USE OIL PRODUCTS  
(MOTOR OIL, HYDRAULIC  
OIL, MACHINE OIL,  
GEAR OIL)



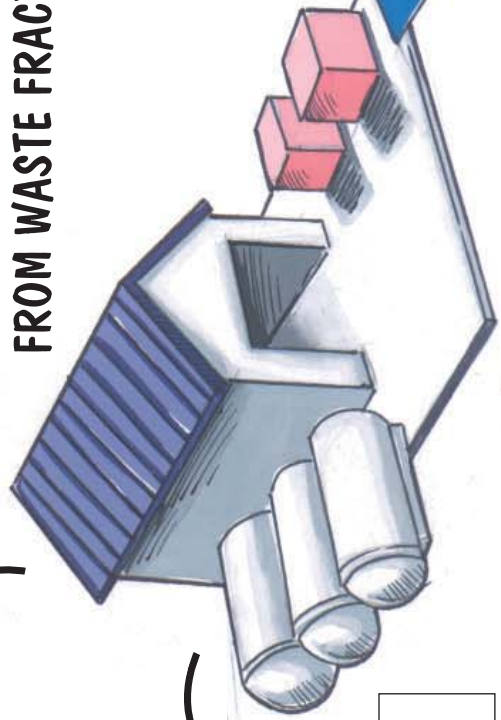
DEPOSIT IN  
ROSE MINI  
TANKER



RECOVER USED OIL

# RECYCLING OF USED OIL

RECOVER OIL FRACTION  
FROM WASTE FRACTION



TRANSPORT  
TO OIL  
RECYCLER



HAZARDOUS  
LANDFILL  
SITE

SLUDGE WASTE

ROSE - RECYCLING OIL SAVES THE ENVIRONMENT

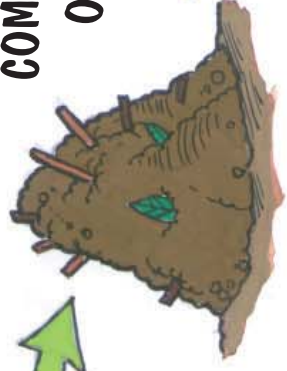


R 10A

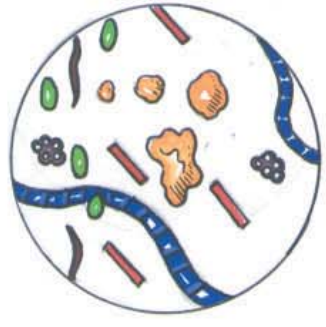


**GRASS CUTTINGS,  
GARDEN AND  
KITCHEN WASTE**

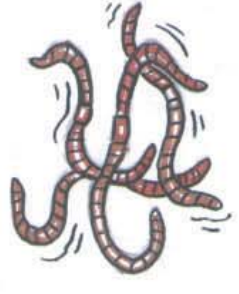
**COMPOST HEAP - TURN  
OVER TO AERATE!**



**BACTERIA & FUNGI**



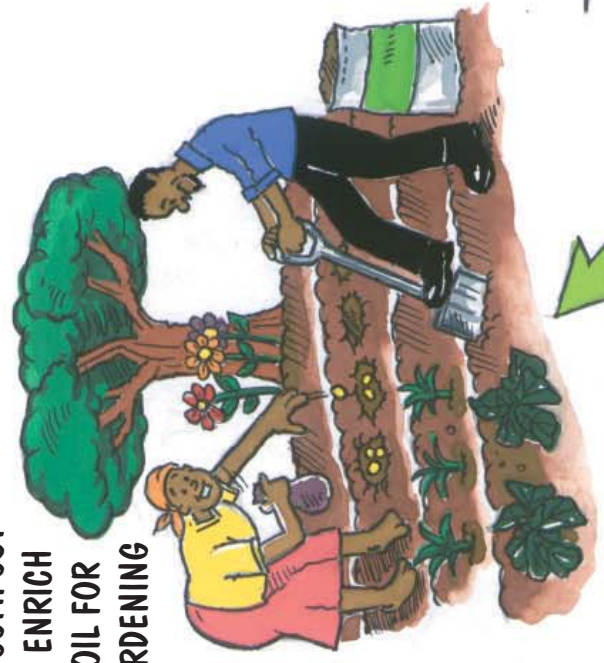
**EARTHWORMS**



**BREAKDOWN OF ORGANIC MATTER**

# COMPOSTING OF BIODEGRADABLE PLANT WASTES

**USE COMPOST  
TO ENRICH  
SOIL FOR  
GARDENING**



**BAGGED  
COMPOST**



**COMPOST**



**SIEVE OUT THE FINER FRACTION**



**R 10B**

# FREQUENTLY ASKED QUESTIONS







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# 10. FREQUENTLY ASKED QUESTIONS...

These questions and answers are included as a guide to municipal councillors and officials who might be faced with similar questions from the public.

## 10.1. WHY SHOULD WE RECYCLE?

The resources of earth are made up of renewable and non-renewable resources. Examples of renewable resources are trees used to make paper. Although they are a renewable resource, trees take time to grow and consume valuable water. Non-renewable resources are metals such as tin, iron and aluminium used to make cans, and oil used to make plastics. If we recycle, we conserve these valuable resources. If we recycle we also save landfill space, and put what would otherwise be considered waste to good re-use. Businesses have an added incentive to recycle because it cuts down the amount of waste being sent to landfill and therefore the cost of disposing this waste.

## 10.2. HOW CAN I MAKE MONEY FROM RECYCLING?

Firstly establish what quantity and quality of recyclables are present in the waste stream. Do this by undertaking a waste audit which appears in Section 5 'Measure What You Want to Reduce'. Then find out how close the markets are to the point where the recyclables are generated and separated from the waste, what you will need to pay those sorting the waste from the recyclables, the costs associated with transporting the recyclables to this market, and what you will be paid for them. Consult Section 7, 'Finding a Market' in order to find out how to do this. Then you will have sufficient information to gauge if you can make money from recycling.

## 10.3. HOW DO I START A RECYCLING BUSINESS?

There are several steps to follow in order to create a sound recycling business which will be sustainable. Follow the user friendly guide from section to section. In other words: start with a 'Willingness to Participate Survey' found in Section 4 'Role of the Public in Recycling'. Then 'Measure What You Want to Reduce' (Section 5) to find out what is in the waste stream. Follow this up by examining the different 'Recycling Scheme Options' (Section 6) and undertaking a 'Cost Benefit Analysis' of the preferred option. Follow this with an exercise geared towards 'Finding a Market' (Section 7), for the recyclables. It is important that a contract is negotiated by all parties to be involved in the recycling scheme and this can be found in 'How to Negotiate a Contract and Set Up a Collection Depot for Recyclables' (Section 8). Finally don't forget about 'Monitoring' (Section 9) the progress of the business and advertising the service that you are offering.

## 10.4. WHY SHOULD WE NEED LANDFILLS IF WE CAN RECYCLE? IS ZERO WASTE ACHIEVABLE?

At present in South Africa not all waste that is generated can be recycled. Nevertheless we need to ensure that we minimise waste - in other words avoid producing waste in the first place. We then need to re-use what we produce, where viable, recycle and compost as much as possible of what remains - and send what is left for final and safe disposal to landfill. Traditionally South Africans have relied on end-of-pipe solutions like landfills in order to deal with their waste. The recent Integrated Pollution and Waste Management Policy seeks to change the way waste is dealt with and is mandating municipalities to ensure that waste minimisation, recycling and composting of waste features in the integrated development plans of local governments instead of a total reliance on landfilling of refuse. A move towards zero waste will involve a radical change in mindset for all South Africans about waste. The Polokwane Declaration adopted at the National Waste Summit in September 2001 commits





government, business and civil society to reducing by 50% the amount of waste going to landfills by 2012 and to zero waste by 2022. It is therefore essential that waste minimisation be built into waste management plans and that municipalities put pressure on communities, business and industry to avoid and minimise waste wherever possible. Every citizen will have to take responsibility for minimising and managing the waste that he/she generates.

#### **10.5. WHY DON'T WE SEPARATE AT SOURCE INTO DIFFERENT COLOURED BAGS LIKE THEY DO IN EUROPE AND AMERICA?**

Households in Europe and America pay for the recycling services they use. Often part of the service fees that they pay goes towards the purchase of containers like bags into which they place their recyclables for collection. A portion of the tax paid by those using the landfill sites for waste disposal also goes towards containers for collection of recyclables. At present there are many communities in South Africa that do not yet receive a waste collection service and that cannot afford to pay for such a service. Municipalities are therefore cash-strapped and only able to afford the most basic waste collection system which would finance a maximum of one bag per household per week.

#### **10.6. WHO PROCESSES THE RECOVERED MATERIAL?**

There are several established recyclers in South Africa who process the recovered recyclables. Find out more about them in the section 'Definitions' which refers to that can be recycled, and refer to the relevant divider cards which show materials that can be recycled and how they are processed and recycled. A 'Directory of Contacts' for recyclers and organisations that can supply information is included in Appendix C.

#### **10.7. WHERE IS THE CLOSEST DROP-OFF POINT FOR A PARTICULAR MATERIAL?**

For a comprehensive list of contacts who can point you to your nearest drop-off point for recyclables in your particular area, consult the 'Directory of Contacts' which is included in Appendix C.

#### **10.8. SHOULD I START A WASTE PROCESSING OPERATION WHICH RECOVERS DIFFERENT MATERIALS FROM THE MIXED WASTE STREAM?**

Waste processing is a complicated process with many different national, provincial and local government statutes and by-laws which govern the operations. The infrastructure to process the waste can also be costly, and competition in the market place is fierce as recycling is yet to be subsidised in South Africa by green taxes or incentives. It is important to consult the appropriate authorities when planning a waste processing operation which is likely to have an effect on the surrounding environment. Contact the Department of Environmental Affairs and Tourism or the Institute of Waste Management of Southern Africa for contacts who can advise you in your own particular area - see 'Directory of Contacts' in Appendix C.

#### **10.9. WHAT IS THE BUSINESS POTENTIAL FOR RECYCLING A PARTICULAR MATERIAL IN SA?**

Recycling in South Africa is not subsidised by green taxes or incentives at present and so is therefore subject to market forces from fluctuations in supply and demand. It is important to establish a market for the recyclable material you plan to collect and sell. Consult recycling industry representatives that can be found in the 'Directory of Contacts' in Appendix C.





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#### **10.10. WHY DO PAPER RECYCLERS IMPORT WASTE PAPER FROM OVERSEAS TO RECYCLE?**

It is often cheaper for recyclers to import waste paper from overseas to use in their processing mills than it is to collect it locally in South Africa. There are also insufficient quantities and qualities of particular types of waste paper available locally for recycling. If people in South Africa recycled more paper, the need to import waste paper would fall away.

#### **10.11. WHY DOES CAN RECOVERY SEEM TO BE MORE SUCCESSFUL THAN OTHER MATERIALS?**

The recovery and purchase of cans for recycling in South Africa is subsidised via a percentage of profits from sales of newly manufactured cans paid by the steel manufacturing companies annually to Collect-a-Can. This guarantees that the company can buy every can brought in by collectors at a set fee which is not affected by market fluctuations.

#### **10.12. WHAT PERCENTAGE OF THE TOTAL WASTE STREAM (BY MASS) CAN REALISTICALLY BE RECOVERED FOR RECYCLING?**

The composition of waste in the waste stream differs from community to community and relates to the amount of disposable income available in that community. An accurate answer to this question for a particular area can be established by undertaking a waste audit of the waste stream which appears in the section 'Measure What You Want to Reduce' (Section 5).

#### **10.13. WHERE SHOULD I COLLECT RECYCLABLE MATERIALS IN MY COMMUNITY?**

Before you can establish where recyclables are located in a community it is necessary to undertake a survey of community attitudes towards waste, recycling and waste disposal. This will indicate if any recycling schemes are already in operation in a particular area. A sample survey is located in Appendix A with instructions on how to use it in Section 4, 'The Role of the Public in Recycling'. In order to find out where the recyclables are located you then need to do a waste audit which appears in 'Measure What You Want to Reduce'. The section titled 'Recycling Scheme Options' gives hints on how to choose the right scheme for a particular community and 'Finding a Market' gives advice on where to establish the scheme - close to the source of recyclables but also not far from the markets.

#### **10.14. WHY SHOULDN'T I SALVAGE RECYCLABLE MATERIALS DIRECTLY FROM THE WORKING AREA ON A LANDFILL SITE?**

It is government policy to discourage salvaging of waste directly from the operational area of a landfill site. Landfill sites are basically construction sites where areas are excavated, waste is deposited into these excavated areas, compacted and finally covered with a layer of soil. It is very dangerous, sometimes with fatal consequences, for unauthorised people to salvage materials from the working area because of the operation of large vehicles and heavy machinery that ensure the final compaction and safe disposal of the waste. It is also unhygienic and unsafe for salvagers to come into direct contact with a highly mixed waste stream which could contain toxic and contaminated materials (for example household chemicals or infectious waste) - even from residential or commercial sources. Since, for some people, salvaging waste from landfill sites is their only source of income, informal salvaging cannot easily be eliminated.





Until such time as it is eliminated, 'salvaging at the working face of the landfill should be discouraged, formalised and controlled to minimise safety and health risks' (DWAF 1998 Vol 2). It is more suitable for vehicles containing selected loads of potentially recyclable materials to be diverted at the weigh-bridge of a landfill site to a sectioned off area. Here the materials can be deposited onto a sorting floor for recovery of recyclable materials before the non-recyclable residue is collected for final disposal in the landfill. This affords greater control over salvaging from the waste stream and in this way the activity becomes formalised. Salvagers should also wear protective clothing to prevent direct contact with the wastes.

### **10.15. HOW DO I CHOOSE BETWEEN KERBSIDE RECYCLING, DROP-OFF CENTRES AND BUY-BACK CENTRES?**

See Section 6 'Recycling Scheme Options' which will assist you in making the right decision for your community.

### **10.16. IF WE SEPARATE WASTE AT SOURCE, WILL IT PUT A DROP-OFF CENTRE IN THE SAME AREA OUT OF BUSINESS?**

It is important to establish the most appropriate recycling scheme option for each different community. If one is to operate separation at source with kerbside collection of recyclables, the community receiving the service will have to be sufficiently affluent to finance that service via the rates base of the municipality. If insufficient funds are available, a drop-off centre might be a more appropriate option. Both options are available in some areas overseas with no noticeable effect on either. A drop-off centre is unlikely to work in a community where living standards are low and unemployment levels high. A buy-back centre which creates the opportunity for the exchange of recyclables for cash would be more appropriate.

## **11. REFERENCES**

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Department of Environmental Affairs and Tourism, National Waste Management Strategy Framework for sustainable post consumer recycling in South Africa

Department of Environmental Affairs and Tourism, Programme for the Implementation of the National Waste Management Strategy, Starter Document for Waste Recycling, A Framework for Sustainable Post Consumer Recycling in South Africa Final Draft - May 2000

Department of Environmental Affairs and Tourism, Undated, Buy-back centres or depots pamphlet

Department of Water Affairs & Forestry 1998 Minimum Requirements Waste Management Guideline Series Vol 2 Minimum Requirements for waste disposal by landfill

Durban Solid Waste 1995 A Step by Step Guide to Starting up a Depot, pamphlet, eThekweni Metro

Durban Solid Waste 1995, Let's Reduce and Recycle: Manual for Solid Waste Awareness - Lesson Plans for Primary and High School Classes, Mari van der Merwe, Keep Durban Beautiful Association

Durban Solid Waste 2000, Simple Waste Audit, Mary Mkhize, eThekweni Metro

Durban Solid Waste and Tulloch Consultants 2000 Memorandum of Agreement for Recycling Centres, Alan Davis

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Keep America Beautiful 1991 Waste in the Workplace.

Kneale Liz 1995, Willingness to Participate Surveys, Waste-Aware, Eastern Gauteng Services Council (now Ekurhuleni Metro)

Lombard Ray 1999. Resource Recovery in South Africa Globe Conference on Integrated Solid Waste Management. Reduce, Recycle, Reuse. Parliament of SA, Cape Town.

Packaging Council of South Africa 1999 Recycling in the packaging and related industries in South Africa

Southwood, Alan 1999 Recycling Directory - Port Elizabeth, Third Edition, The Eastern Province Region of the Wildlife and Environment Society of South Africa



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# 12. GLOSSARY

## **AUDIT**

A formal inspection and check for compliance with a number of predetermined criteria.

## **BUY-BACK CENTRE**

A central collection site for one or more types of recyclable materials (like cans, or paper) where individuals can hand in and receive payment for recyclables that they have collected.

## **BUY-RECYCLED**

Purchasing goods that are manufactured from recycled material or have a significant proportion of recycled material in their total content.

## **CALIBRATED SCALE**

An instrument that has been set against a standard to measure accurately e.g. to measure mass

## **CAPITAL-INTENSIVE**

Using high cost equipment and assets.

## **CLOSE-THE-LOOP**

Making sure that the outputs of one process can be used as inputs for another rather than being discarded as waste.

## **CONCESSIONAIRE**

The longer term contractor who enters into a long term municipal services agreement with a municipality, often taking over the responsibility to operate and maintain a facility on behalf the municipality.

## **DESIGN-FOR-DISASSEMBLY AND DESIGN-FOR-RECYCLING**

The whole life cycle of future products should be considered in advance so that it is made of recyclable materials in such a way that the discarded product can be taken apart easily, thus facilitating the recovery of the various component parts.

## **DROP-OFF CENTRE**

A central collection site for one or more types of recyclable materials where individuals can deliver and deposit recyclables into designated containers.

## **ENVIRONMENTAL IMPACT ASSESSMENT**

The detailed study of the environmental consequences of a proposed course of action, whether a policy, project or programme, used as a planning tool for comparing different options and making decisions in terms of the Environment Conservation Act and NEMA.

## **FACTORED INTO**

Included as a consideration in a calculation or evaluation.

## **HIERARCHY OF WASTE MANAGEMENT**

The systematic order, or hierarchy, in which we must approach the management of wastes. Even before creating waste we must try to avoid generating it. Then we must recover materials for recycling, reuse and repair as far as is practical and economically feasible. After this, what is left should be responsibly treated and / or disposed of in such a way as to minimise the potentially adverse impacts of waste on people and the natural environment.

## **INTEGRATED DEVELOPMENT PLAN (IDP)**

In terms of Section 25 of the Municipal Systems Act, Act 32 of 2000, it is a single, inclusive strategic plan for the development of a municipality which integrates all planning for development, takes into account the resources and capacity of the municipality, and sets the policy framework for the annual municipal budget.



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## **INTEGRATED WASTE MANAGEMENT PLAN**

In terms of the National Waste Management Strategy, this is a comprehensive strategic plan for the integrated management of waste in the municipal area which must apply the hierarchy of waste management (See Card R1B).

### **LANDFILL AIRSPACE**

The space at a landfill site which can be occupied by waste.

### **LANDFILLED**

Waste disposed of on land, whether by use of waste to fill excavations or by creation of a landform above ground level, where the term 'fill' is used in the engineering sense.

### **LDPE, HDPE, PET**

Types of plastic: Low Density Polyethylene (LDPE)  
High Density Polyethylene (HDPE)  
Polyethylene Teraphthalate (PET)

### **MANDATED**

Given an instruction to carry out

### **OFFSET**

A compensation or a consideration which lessens or neutralises the effect of a contrary one.

### **PRODUCT CHAIN**

The different products that form part of the manufacturing life cycle of goods

### **PUTRESCIBLE**

Can decay

### **RECYCLING**

The process whereby discarded products and materials are reclaimed or recovered, refined or reprocessed, and converted into new or different products. This term is often used in a wider sense to describe the complete cycle, from collection to production of new objects, or secondary raw materials, from reclaimed material.

### **REDUCE WASTE**

Avoid making waste by using cleaner technology or buying goods that are not overpackaged; make less waste by re-using discarded items, recovering recyclable materials from the waste stream and composting plant wastes. Another way of reducing the amount of waste we produce is to divert certain waste materials or substances which have been discarded by one generator to another manufacturer who can use them as raw material in a different process. This is called waste exchange.

### **REPAIR**

Mend an item which was unserviceable because of damage or malfunction

### **RE-USING**

Using an item again for the same purpose for which it was originally made, e.g. re-using a container such as a bottle or glass jar

### **REZONING**

The legal procedure that changes the land use on a Town Planning map

### **SALVAGING**

Informal recovery of goods of value from the waste stream



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## **SCOPING REPORT**

A report, submitted to the environmental authorities as a legal requirement of the EIA process, which lists the possible issues and preliminarily assesses the environmental impact of a proposed activity. The authority either authorises the activity, requests that further investigations and assessments of impacts take place or refuse authorisation.

## **SOURCE**

The place from which something comes or originates

## **SUSTAINABLE LIVING**

Living in such a way that we meet the needs of the present generation without compromising the ability of future generations to meet their own needs. It means that development must be “Development that delivers basic environmental, economic and social services to all without threatening the viability of the natural, built and social systems upon which these services depend.” (International Council for Local Environmental Initiatives, ICLEI). In terms of the Municipal Systems Act environmentally sustainable municipal services will ensure that the risk of harm to the environment and human health and safety will be minimised; potential benefits maximised; and legislation relating to these aspects complied with.

## **WASTE STREAM COMPOSITION**

The types and relative quantities of wastes that make up the mixed waste stream e.g. paper, metal, glass, plastic, garden refuse, ash, etc

## **WASTE EXCHANGE**

A way of reducing the amount of waste we produce is to divert certain waste materials or substances which have been discarded by one generator to another manufacturer who can use them as raw material in a different process.

## **WASTE INFORMATION SYSTEM**

A strategic action plan of the National Waste Management Strategy is to set up an updateable electronic waste data system which has input from local, through provincial to national level.

## **WASTE STREAM**

The total waste flow from an entity, comprising general and hazardous wastes. In the case of a municipality it will be all the waste that is generated by households, institutions, business and industry.

## **WASTE STREAM ANALYSIS**

The process of sampling a mixed waste stream and measuring and recording the types and relative proportions of the different components.

## **WEIGH-BRIDGE**

A weighing machine for vehicles, usually having a plate set into the road for vehicles to drive on to.





# APPENDIX A

## 1) WILLINGNESS TO PARTICIPATE IN RECYCLING SCHEME SURVEY - HOUSEHOLDERS

..... (organisation, name of municipality, etc) in conjunction with..... (names of organisations, recycling industries involved in recycling scheme) is concerned about the correct handling of waste.

..... (organisation, name of municipality) would like to promote recycling in.....(place).

But first we would like to know:how you feel about recycling.

whether you recycle at the moment.

whether you would recycled if you knew WHY, HOW and WHERE.

By completing this questionnaire (and returning it to)..... (place) you personally can assist the promotion of recycling.

You do not have to give us your name but we would like to know in which area you live.

The results of this survey will remain confidential/are to be published in the press.

NAME:.....

STREET:.....

SUBURB:.....

TOWN:.....

RECYCLING INVOLVES SORTING OUR WASTE INTO ITEMS SUCH AS GLASS, PAPER AND CARDBOARD, CANS THAT CAN BE RE-USED TO MAKE NEW PRODUCTS

- There are drop-off (and buy-back) points for recycling in your area. (At schools, shopping centres, community centres, churches, garden refuse sites, in commercial areas, etc)

If you would be willing to recycle a specific item, provided that you knew how and where, please indicate such:

Please place an X in the applicable column to show if you are involved in recycling at drop-off points (no cash return) at the moment	Yes	No	Will Do
a) Do you sort your paper and cardboard and take it to a drop-off point?			
b) Do you put your paper (recyclables) out as part of the collection programme (eg Mondi Paper Pick-up, Benoni Kerbside Collection Scheme)?			
c) Do you take your glass bottles and jars to bottle banks?			
d) Do you sort your cans and take them to a can collection point?			
e) Do you take your plastics to a plastic collection cage?			
f) Do you take your plastic bags back to the supermarket for recycling?			
g) Do you make compost from your garden and kitchen waste?			



Please place an X in the applicable column to show if you are involved in recycling at buy-back centres (in exchange for cash) at the moment	YES	NO	Will Do
a) Do you collect, and sort paper and cardboard and take it to a buy-back centre for sale? If yes, how much do you get per kg? If yes, what means of transport do you use?(Bakkie,trolley,etc) If yes, what area(s) do you collect from?			
b) Do you collect garden refuse for cash and take this to the disposal (garden refuse) site or sell/use it for composting? If yes, what means of transport do you use? (Bakkie, trolley, etc) If yes, what area(s) do you collect from and how much do you charge per kg (tonne)?			
c) Do you collect and take glass bottles and jars to a buy-back centre for sale? If yes, how much do you get per kg? If yes, what means of transport do you use? (Bakkie, trolley, etc) . If yes, what area(s) do you collect from?			
d) Do you collect and sort cans and take them to a can collection buy-back centre for sale? If yes, how much do you get per kg? If yes, what means of transport do you use? (Bakkie, trolley, etc) If yes, what area(s) do you collect from?			
e) Do you collect and take plastics to a buy-back centre for sale? If yes, how much do you get per kg? If yes, what means of transport do you use? (Bakkie, trolley, etc) If yes, what area(s) do you collect from?			
f) Do you collect and take scrap metal to a scrap metal bucket shop for recycler for sale? If yes, how much do you get per kg? If yes, what means of transport do you use? (Bakkie, trolley, etc) If yes, what area(s) do you collect from?			

2. I do not sort and separate waste because (mark the relevant reason with an X)			
a) I do not know which items to separate.			
b) I do not see any benefit from doing so.			
c) It is too much trouble.			
d) I don't get any (enough) money for it.			
e) I do not have the space.			
f) I do not know where to take the items?			
h) I don't have transport to take the items.			
i) The drop-off (buy-back) points are unsafe.			
j) The drop-off (buy-back) points are too far away.			
k) I reuse the items for other purposes eg. re-use. State			
l) Other	(state)		



3. I will sort and separate recyclables if:			
a) My waste collection tariff is reduced.			
b) I get cash for the items.			
c) The material is collected from my house (stand or premises).			
d) I received another form of benefit (Describe).			
e) The drop-off/buy-back points are conveniently placed.			
f) This can lead to job creation for others.			
g) A charity or needy organisation will receive cash.			
h) I get access to transport the items to a drop off/buy-back centre.			
i) This can lead to job creation for myself.			
J) Other	(State)		

4. There are a number of products available which are made from recycled materials

Would you specifically buy or make a point of buying recycled products?	YES	NO

If your answer is "yes" please list the applicable products.	YES	NO
a)		
b)		
c)		
d)		
e)		

5. If your answer is "No", what is the reason? (please mark with an X)	YES	NO
a) the price is too high.		
b) the quality is not acceptable.		
c) I am not sure about the 'hygienic' aspects		
d) I don't know what they look like or where to get them.		
e) I have never seen any recycled products.		



6. Are you a member of a club, community organisation, an environmental organisation, etc? If yes, please state name/s	YES	NO

7. Would you like information on	YES	NO
a) recycling opportunities in your area?		
b) products made from recycled materials?		

If so please provide your full address and contact details:

ADDRESS:.....CODE.....

TEL:..... FAX:.....

E-MAIL:.....

Do you have any ideas or recommendations about alternative uses for materials separated from waste?

.....  
 .....

If you have comments on any of the items in the questionnaire please state them

.....  
 .....

THANK YOU FOR YOUR COOPERATION



## 11) WILLINGNESS TO PARTICIPATE IN RECYCLING SCHEME SURVEY - BUSINESS AND INDUSTRY

.....(organisation, name of municipality, etc) in conjunction with..... (names of organisations, recycling industries involved in recycling scheme) is concerned about the correct handling of waste.

.....(organisation, name of municipality) would like to promote recycling in..... (place). But first we would like to know:-  
 how you feel about recycling.  
 whether you recycle at the moment.  
 whether you would recycle if you knew WHY, HOW and WHERE.

By completing this questionnaire (and returning it to)..... (place) you personally can assist the promotion of recycling.

The results of this survey will remain confidential/are to be published in the press.

NAME OF CONTACT PERSON:..... NAME OF COMPANY:.....  
 SUBURB:.....TOWN:.....  
 BUSINESS ADDRESS:.....  
 TEL:.....FAX:.....E-MAIL:.....

RECYCLING INVOLVES SORTING OUR WASTE INTO ITEMS SUCH AS GLASS, PAPER AND CARDBOARD, CANS THAT CAN BE RE-USED TO MAKE NEW PRODUCTS

There are a number of recycling systems in operation which include collection from sites and dropping off at collection points and sale of items to buy-back centres.

Please mark your involvement with an X and where appropriate, give answers	YES	NO
a) Do you separate your paper/cardboard? If yes do you sell it for cash? If yes to above, to whom and where? If yes to above, how much per kg?		
b) Do you separate glass? If yes, do you sell it for cash? If yes to above, to whom and where? If yes to above, how much per kg?		
c) Do you separate plastics? If yes, do you sell it for cash? If yes to above, to whom and where? If yes to above, how much per kg?		
d) Do you separate cans? If yes, do you sell it for cash? If yes to above, to whom and where? If yes to above, how much per kg?		
e) Do you separate scrap metal? If yes, do you sell it for cash? If yes to above, to whom and where? If yes to above, how much per kg?		



<p>f) Do you separate motor oil?</p> <p>If yes, do you sell it for cash?</p> <p>If yes to above, to whom and where?</p> <p>If yes to above, how much per kg?</p>		
<p>g) Do you separate wood?</p> <p>If yes, do you sell it for cash?</p> <p>If yes to above, to whom and where?</p> <p>If yes to above, how much per kg?</p>		
<p>h) Do you separate any other materials (Please list)</p> <p>If yes, do you sell it/them for cash?</p> <p>If yes to above, to whom and where?</p> <p>If yes to above, how much per kg?</p>		

2. If you answered "NO" to any of these questions please indicate with an X what products you would separate, if you had the relevant information.

<p>a) Paper/cardboard</p> <p>b) Glass</p> <p>c) Plastics</p> <p>d) Aluminium cans</p> <p>e) Steel cans</p> <p>f) Scrap metal</p> <p>g) Used motor oil</p> <p>h) Wood</p> <p>i) Other (please list products)</p>	
---	--

<p>3. I do not sort and separate waste because (mark the relevant reason with an X)</p> <p>a) I do not know which items to separate</p> <p>b) I do not see any benefit from doing so</p> <p>c) It is too much trouble</p> <p>d) It is unhygienic to store waste on my site</p> <p>e) I do not have the space</p> <p>f) I do not know where to take them/who will collect them</p> <p>g) I prefer the municipality to take all my waste</p> <p>h) Other (Please list)</p>	
--	--



4. I will sort and separate waste if	
a) the material is collected from my site b) I receive a reduction in the refuse removal tariffs c) I receive cash d) I receive another form of benefit (state) e) the collection/drop-off/buy-back points are conveniently placed f) this can lead to job creation g) a charity or needy organisation will receive cash h) Other (Please list)	

5. Do you have any waste that may be considered useful to someone else (wood/fabric/offcuts, etc) Please list the products and quantities per month (approximate): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. There are a number of products available which are made from recycled materials	YES	NO
Would you specifically buy or make a point of buying recycled products If your answer is "YES" please list the applicable products		
a) b) c) d) e)		

7. If your answer is "NO" what is the reason (please mark with an X)	
a) the price is too high b) the quality is not acceptable c) I am not sure about the 'hygienic' aspects d) I don't know what they look like e) I have never seen any recycled products	

8. Are you or your company a member of a club, community organisation, an environmental organisation, etc?

If yes, please state name/s: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. Would you like information on	YES	NO
a) recycling opportunities in your area?		
b) products made from recycled materials?		

Do you have any ideas or recommendations about alternative uses for materials separated from waste?

If you have comments on any of the items in the questionnaire please state them: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

THANK YOU FOR YOUR COOPERATION





# APPENDIX B

## SAMPLE WASTE STREAM AUDIT

Here is a sample audit sheet that can be used to analyse the waste stream contents for a business or office. The waste and recyclables for such an audit are weighed on a hanging scale in bags. Again, cost of equipment and labour need to be factored into the audit.

### WASTE AUDIT SHEET

Date of audit: \_\_\_\_\_ Name of Business / Organisation: \_\_\_\_\_  
 Physical Address: \_\_\_\_\_  
 Postal Address: \_\_\_\_\_ Code: \_\_\_\_\_  
 Contact No. (T) \_\_\_\_\_ (F) \_\_\_\_\_ Email: \_\_\_\_\_  
 Contact person: \_\_\_\_\_ Designation: \_\_\_\_\_

#### FUNCTION

- Leisure/Catering (restaurant, hotel)
- Manufacturer
- Retail
- Office
- Construction
- Service (plumber, electrician, etc)
- Transport (taxi rank, bus depot, etc)
- General (hairdressing, etc)
- Service Station
- Educational Institution (school, university, college, etc)
- Other (doctor's rooms, small business, informal, etc)

#### NUMBER OF EMPLOYEES

- Under 5
- 5 - 20
- 21 - 50
- 51 - 100
- 100 plus

#### TYPES OF WASTE PRODUCED

- HAZARDOUS
  - solid
  - liquid
  - gaseous
  - medical
  - fluorescent lights
  - other (state) \_\_\_\_\_

#### NON HAZARDOUS

- general
- recyclables (paper, cardboard, cans, glass, plastic, metal)
- organic (biodegradable)
- inert/construction and demolition (bricks, mortar, cement etc)
- tyres
- polystyrene
- other (state) \_\_\_\_\_

#### TYPES OF RECYCLING

- None
- Formal (via agent - Mondi, Sappi, Collect-a-Can, etc)
- Informal (door-to-door cardboard, scrap metal, wooden pallet collectors, etc)

#### LIST OF RECYCLABLES IN WASTE STREAM AND ESTIMATED AMOUNTS (Volume or kg)

- Plastics**
  - PET bottles (2 litre cooldrink bottles, preserved fruit containers, washing liquid bottles)
  - AMOUNT: \_\_\_\_\_  
PE-HD (milk bottles, motor oil containers, buckets, crates, bags)  
AMOUNT: \_\_\_\_\_
  - PVC (clear trays for foods and toiletries, clear bottles, pipes, gutters)  
AMOUNT: \_\_\_\_\_



- PE-LD (frozen vegetable bags, garbage bags, building film, soft squeezable bottles)  
AMOUNT: \_\_\_\_\_
- PP (bottle caps, automotive battery cases, cups, plates)  
AMOUNT: \_\_\_\_\_
- PS (disposable plates and cups, take-away food tubs, toys)  
AMOUNT: \_\_\_\_\_
- Other (mostly engineering plastics)  
AMOUNT: \_\_\_\_\_

**Aluminium**

- Cans  
AMOUNT: \_\_\_\_\_
- Foil  
AMOUNT: \_\_\_\_\_
- Other (rain gutters, containers, etc)  
AMOUNT: \_\_\_\_\_

**Steel**

- Food cans  
AMOUNT: \_\_\_\_\_
- Beverage cans  
AMOUNT: \_\_\_\_\_
- Other (sheets, instruments)  
AMOUNT: \_\_\_\_\_

**Scrap metal**

- Iron  
AMOUNT: \_\_\_\_\_
- Copper  
AMOUNT: \_\_\_\_\_
- Silver  
AMOUNT: \_\_\_\_\_
- Lead  
AMOUNT: \_\_\_\_\_
- Other (state) \_\_\_\_\_  
AMOUNT: \_\_\_\_\_

**Paper and cardboard**

- K3 (clean cardboard)  
AMOUNT: \_\_\_\_\_
- K4 (corrugated cardboard)  
AMOUNT: \_\_\_\_\_
- CMW(common mixed waste - white and coloured, including junk mail)  
AMOUNT: \_\_\_\_\_

- HL1 (white computer paper)  
AMOUNT: \_\_\_\_\_
- SBM (magazines)  
AMOUNT: \_\_\_\_\_
- FN (flat news - newspapers)  
AMOUNT: \_\_\_\_\_
- SN (special news - schools, paper banks)  
AMOUNT: \_\_\_\_\_
- SMW (super mixed waste - high grade office paper)  
AMOUNT: \_\_\_\_\_

**Glass**

- Amber (brown)  
AMOUNT: \_\_\_\_\_
- Green  
AMOUNT: \_\_\_\_\_
- Clear  
AMOUNT: \_\_\_\_\_
- Blue  
AMOUNT: \_\_\_\_\_
- Other (state)  
AMOUNT: \_\_\_\_\_

**Organics**

- Food waste  
AMOUNT: \_\_\_\_\_
- Garden refuse (grass clippings, branches, leaves, etc)  
AMOUNT: \_\_\_\_\_

**Oil**

AMOUNT: \_\_\_\_\_

**Other (state)**

AMOUNT: \_\_\_\_\_

**NAME OF WASTE CONTRACTOR:** \_\_\_\_\_

- Copy of waste disposal certificate/weighbridge slip

**PRESENT TOTAL AMOUNT AND COST OF WASTE DISPOSED OF (kg)**

- Weekly \_\_\_\_\_ x  
(cost per kg to landfill) \_\_\_\_\_  
= R \_\_\_\_\_
- Monthly \_\_\_\_\_ x  
(cost per kg to landfill) \_\_\_\_\_  
= R \_\_\_\_\_



Annually \_\_\_\_\_ x  
 (cost per kg to landfill) \_\_\_\_\_  
 = R \_\_\_\_\_

**PRESENT COST OF WASTE DISPOSED OF  
 (MONTHLY FIGURE):**

**NUMBER OF CONTAINERS FILLED DAILY:**

- Bags
- 240 litre containers
- Skips (size: \_\_\_\_\_)
- Compaction unit (volume: \_\_\_\_\_)

**CONVERTED TO MONTHLY FIGURE:**

\_\_\_\_\_ (kg) \_\_\_\_\_ (cubic metres)

**CONTAINERS USED TO STORE RECYCLABLES  
 FOR COLLECTION:**

- No recycling takes place
- Bags (state type of bag, capacity, number, and materials collected) \_\_\_\_\_
- 240 litre containers (state number and materials collected) \_\_\_\_\_
- Drums (state capacity, number and materials collected) \_\_\_\_\_
- Skips (state capacity, number and materials collected) \_\_\_\_\_
- Other (specify type, number, capacity, type of materials collected) \_\_\_\_\_

**AMOUNT RECYCLED (MONTHLY IN kg)**

- None
- Formally (figures should be available from agents)
  - Paper \_\_\_\_\_
  - Cardboard \_\_\_\_\_
  - Cans (steel and aluminium) \_\_\_\_\_
  - Scrap metal \_\_\_\_\_
  - Glass \_\_\_\_\_
  - Plastic \_\_\_\_\_
  - Oil \_\_\_\_\_
  - Wood \_\_\_\_\_
  - Construction and demolition waste \_\_\_\_\_
  - Other (state) \_\_\_\_\_

- Informally (weight figure will be a 'guesstimate')
  - Cardboard \_\_\_\_\_
  - Scrap metal \_\_\_\_\_
  - Wood \_\_\_\_\_
  - Other (state) \_\_\_\_\_

**VALUE OF RECYCLED AMOUNT (MONTHLY):**

- None
- FORMALLY (Figures should be made available from agents)
  - Paper \_\_\_\_\_
  - Cardboard \_\_\_\_\_
  - Cans (steel and aluminium) \_\_\_\_\_
  - Scrap metal \_\_\_\_\_
  - Glass \_\_\_\_\_
  - Plastic \_\_\_\_\_
  - Oil \_\_\_\_\_
  - Wood \_\_\_\_\_
  - Construction and demolition waste \_\_\_\_\_
  - Other (state) \_\_\_\_\_

- INFORMALLY (figure will be a 'guesstimate')
  - Cardboard \_\_\_\_\_
  - Scrap metal \_\_\_\_\_
  - Wood \_\_\_\_\_
  - Other (state) \_\_\_\_\_

**ESTIMATED COST SAVINGS FROM  
 RECYCLING ACTIVITIES**

- None
- Potential tonnages of materials that could be sent for recycling x cost of disposal to landfill (per kg or ton)  
 = R \_\_\_\_\_
- Present tonnages sent for recycling x cost of disposal to landfill (per kg or ton)  
 = R \_\_\_\_\_



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# APPENDIX C

## DIRECTORY OF CONTACTS

### **COLLECT-A-CAN (PTY) LTD**

P O Box 30500

Kyalami 1684

Tel. 011- 466 2939

Fax. 011-466 2941

Email: wendy@collectacan.co.za

Website: www.collectacan.co.za

What they provide:

The Company was founded by Iscor, Nampak (Metal Box) and Crown Cork in 1993 to address its shareholder's responsibilities towards the environment and the 'cradle-to-grave' needs of the steel beverage can industry. Its core business is the recovery of steel used beverage cans but it also recovers aerosol, aluminium, food, oil and paint cans.

The Company has five branches in South Africa - three in Gauteng in Pretoria, Aeroton JHB and Vanderbijlpark - one in Durban and one in Cape Town.

The Company has appointed agents in some 120 cities/towns in South Africa where there is no Collect-A-Can branch.

For further information: consult C-A-C's website, or telephone Marketing Manager on (011) 466 2939 or dial the tollfree line 0800 111 232.

### **DEPARTMENT OF WATER AFFAIRS AND FORESTRY**

Directorate: Water Quality Management: Waste Management

Department of Water Affairs and Forestry

P/Bag X313

Pretoria 0001

Tel. 012-336 7552

Fax. 012-323 0321

Email: TEA@dwaf.gov.za

Website: [http://www.dwaf.gov.za/Dir\\_WQM/](http://www.dwaf.gov.za/Dir_WQM/)

What they provide:

In terms of the definition of a disposal site as outlined in Section 1 of the Environment Conservation Act, 1989 (Act 73 of 1989), waste recycling facilities are regarded as disposal sites. This Department therefore can provide the necessary advice on the permit procedure applicable to recycling facilities.

### **DEPARTMENT OF ENVIRONMENT AFFAIRS AND TOURISM (DEAT)**

The Department of Environmental Affairs and Tourism (DEAT) develops and provides a regulatory framework (policies, legislation, standards, regulations and targets). It also provides support in the form of financial assistance, expertise and awareness and educational resources.

Contact details

Waste Management and Community Programs

Private Bag X447

Pretoria, 0001

012 310 3911 (tel)

012 310 1167 (fax)

### **FUEL FIRING SYSTEMS**

P O Box 25102

Sea View

4073

Tel: 031-4653103

Fax: 031-4651430

Email: ffs@ffs.co.za

Website: www.ffa-refiners.com



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What they provide:

Environmental Commitment:

The dumping of used motor oil has become an urgent problem and there is a need to minimise this type of waste. FFS contributes towards solving this pressing problem in the waste energy field, developing the technology required to utilise waste oil materials that would otherwise become a burden on the environment.

The oil recovery plants are equipped with full effluent treatment facilities to ensure that the aqueous effluents discharged fall within prescribed limits. The recovered oil is the preferred fuel for environmentally sensitive applications, since the low sulphur products minimise air pollution.

The company is committed to maintaining high environmental standards and has SABS ISO 14001 accreditation for all of its plants (Cape Town, Durban, Chloorkop, Pietermaritzburg, Secunda).

For further information please consult the website.

#### **GLASS RECYCLING ASSOCIATION**

P O Box 5303

Delmenville 1403

Tel. 011-827 0338

Fax. 011-827 6944

Email: [gra@glassrecycling.co.za](mailto:gra@glassrecycling.co.za)

Website: [www.glassrecycling.co.za](http://www.glassrecycling.co.za)

What they provide:

The Glass Recycling Association (GRA) is a non-profit organisation that was formed by Consol Glass and Metal Box Glass, the two glass container producers, with the objective of developing an industry approach to the recovery of used glass bottles and jars from a wide spectrum of the domestic, commercial and industrial sectors of southern Africa.

The GRA engages the services of contractors throughout southern Africa to recover glass on its behalf and provides an advisory service aimed at broadening public awareness on the need to recycle glass. New sources of recovery of used glass containers are continually sought out by the Association. The Association consults with local governments for the establishment of buy-back centres and provides the required start up assistance to prospective entrepreneurs for the operation of these centres.

#### **INSTITUTE OF WASTE MANAGEMENT OF SOUTHERN AFRICA**

P O Box 79

Allen's Nek 1737

Tel. 011-675 3462

Fax. 011-675 3465

Institute Administrator

Email: [IWMSA@iafrica.com](mailto:IWMSA@iafrica.com)

Website: [www.iwmsa.co.za](http://www.iwmsa.co.za)

What they provide: The Institute of Waste Management Southern Africa (IWMSA) is committed to protecting the environment and people of Southern Africa from the adverse effects of poor waste management. It has five Branches in South Africa, Chapters in Botswana, Zambia and Zimbabwe and members throughout the SADC region. The IWMSA is committed to moving away from uncoordinated methods of dealing with waste towards consideration of the entire life cycle of waste to minimise its impacts on air, water and land.

#### **MONDI RECYCLING**

P O Box 1685

Vorna Valley 1686

Tel: 011-315 8450

Fax: 011-315 8313

Email: [mondi\\_recycling@mondi.co.za](mailto:mondi_recycling@mondi.co.za)

Website: [www.mondi.co.za](http://www.mondi.co.za)

Website: Kerbside, Paper Banks and Buy-back Centres: <http://www.paperpickup.co.za>

Tollfree: 0800 022112

What they provide: Training, mentoring, assistance with site selection for buy-back centres, equipment including bins, bags, scales, PaperBarrows, Zozo Hut offices.



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### **NAMPAK PAPER RECYCLING**

P O Box 19545  
Pretoria West 0117  
Tel. 012-318 2066  
Fax. 012-318 2026  
Freecall: 0800 018 818  
Email: ChristieRC@Nampak.co.za

What they provide:

- Purchase of all grades of recyclable waste paper and cardboard.
- National network of branches and agents.
- Confidential document destruction.
- Supply of waste paper handling equipment and aids, subject to certain criteria.
- Advice, guidance, training and assistance with the development of paper recycling.

### **NATIONAL RECYCLING FORUM**

P O Box 79  
Allen's Nek 1737  
Tel. 011-675 3462  
Fax. 011-675 3465  
Enquiries: Tel: 031 - 763 3222

What they provide: The National Recycling Forum (NRF) is a non-profit organisation that was created to further the interests of the formal recycling industries in South Africa. In carrying out this activity, the NRF has facilitated the formation of regional forums, that draw their memberships from enthusiastic and interested volunteers as well as small recyclers, in the major centres of South Africa. These regional organisations are also represented at meetings of the NRF. The NRF interacts with national and provincial government to encourage the recycling of glass, paper, plastics and tin-plate steel. Organisations such as Waste Aware, the Fairest Cape Association and Pikitup participate in the activities of the NRF. The NRF has encouraged the establishment of Buy-back Centres and Drop-off Points through the activities of its members in the various centres. The NRF has been used to improve the performance of agents of the various recyclers from time to time.

### **PACKAGING COUNCIL OF SOUTH AFRICA (PACSA)**

P O Box 782205  
Sandton 2146  
Tel. 011-783 4782  
Fax. 011-883 7170  
Email: packagec@cis.co.za

What they provide:

The Packaging Council of South Africa is a national voluntary association of raw material suppliers, packaging manufacturers, packaging users, fillers, retailers, packaging designers/consultants and other organisations with similar aims:-

1. To initiate and support programmes and policies relating to the protection and improvement of the environment.
2. To provide and information resource service.
3. To provide a forum for debate and discussion of packaging related issues.
4. To establish a communications network to promote awareness and understanding of the role and value of packaging to all relevant constituencies, and focus attention on the concerns regarding, and threats to, the packaging industry.

### **PLASTICS FEDERATION OF SOUTH AFRICA**

P/Bag X68  
Halfway House 1685  
Tel. 011-314 4021  
Fax. 011-314 3764  
Email: enquiries@plasfed.co.za  
Website: www.plasticsinfo.co.za

What they provide:

1. Technical Support - the technical support division can provide a service to both individuals and companies eg. choice of material, product design, machine selection choice, provide solutions.
2. Data Base - data base programme contains list of plastics companies with contact details and products.
3. Education and Training Services - provide courses eg. 'Introduction to Plastics, Raw Materials, Blow Moulding,



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Injection Moulding, Quality Awareness, etc’.

4. Environmental Division - The Plastics Enviromark: Litter Awareness, Train the Trainer Workshops, Resource and Educational Material, Displays and Presentations, The Green Cage Project (recovery of plastics).

#### **ROSE FOUNDATION**

Suite A9

Waverley Court

7 Kotzee Road

Mowbray 7700

Tel. 021-448 7492

Fax. 021-448 7563

Tollfree collection number: 0800 107 107

Email: [usedoil@iafrica.com](mailto:usedoil@iafrica.com)

Website: [www.rosefoundation.org.za](http://www.rosefoundation.org.za)

What they provide:

The Rose Foundation manages the environmentally acceptable collection, storage and reprocessing of used lubricating oil throughout SA.

Used oil is any lubricating oil no longer fit for use in mechanical equipment such as engines, hydraulic systems and gear boxes.

The Rose Foundation accepts the following types of used oil - engine oil, gear oil from cars, trucks and buses, lube oil in earthmoving equipment - including gear oil, engine oil and hydraulic oil, as well as air compressor oil, industrial gear oil, and industrial hydraulic oil.

What can Rose Foundation offer the Municipal Waste Manager?

- Used oil mini tanks for your public recycling depots - 1000 or 2200 litre.
- Collections of bulk volumes of used oil from factories, mines and motor repair workshops.
- Advice and guidance on managing used lube oil.
- Toll free used oil collection number nationwide - call 0800 107 107.
- Website for information.
- SUMPY for DIY motorists plus 400 DIY drop off points.

#### **SAPPI WAR ON WASTE**

P O Box 32706

Braamfontein 2017

Tel. 011-407 8071

Fax. 011-339 6929

Email: [garrettm@za.sappi.com](mailto:garrettm@za.sappi.com)

Website: [www.war-on-waste.com](http://www.war-on-waste.com)

Sharecall: 0860 221 330

What they provide:

- Sappi “War On Waste” RECYCLING CENTRE PROGRAMME.  
The Sappi “War on Waste” RECYCLING CENTRE PROGRAMME has been operating since 1994 on a national basis. With the establishment of these centres, Sappi not only sources SECONDARY fibre from the community but is also able to create employment IN THE INFORMAL SECTOR.
- Assets  
Sappi will provide assets as per agreement with the entrepreneur i.e. scale, bags, container and signage. It will also assist the entrepreneur to market its centre for support.
- Future Plans  
Sappi is focusing on opening up more recycling centres around the country and would like the opportunity to work with other recycling companies, council members and the community. Through the expansion of our recycling centre network we are confident that we can create employment, clean the environment and recycle more fibre - **THUS REDUCING THE IMPACT OF OUR ENVIRONMENTAL footprint.**



# APPENDIX D

## MEMORANDUM OF AGREEMENT FOR RECYCLING CENTRE

made and entered into by and between

THE \_\_\_\_\_ COUNCIL, its successor or assign, a body corporate seated at City Hall (street address).....(hereinafter called "The COUNCIL")  
and.....  
(hereinafter called "The CONCESSIONAIRE")  
and.....  
(hereinafter called "The BENEFICIARY")  
and.....  
(hereinafter called "The LAND OWNER")  
and.....  
(hereinafter called "The RECYCLER")

WHEREAS:-

- (a) The COUNCIL is desirous that 'drop-off' Recycling Centres (hereinafter called "Centre") be established within the.....(area, region, etc) for the reduction of the quantity of solid waste being disposed of by landfill.
- (b) The COUNCIL is prepared to assist in the operation and maintenance of the Centres in the interest of good governance and to provide a healthy and litter free environment.
- (c) The LANDOWNER is prepared to allow a portion of land on Sub....., more clearly defined in the drawing attached hereto as Annexure A, to be utilised for the purpose of a Centre.
- (d) The LANDOWNER is prepared to allow the CONCESSIONAIRE on behalf of BENEFICIARY (IES) to obtain income from the RECYCLER as a result of the operation of the Centre.

AND WHEREAS:-

- (a) On.....20...the COUNCIL agreed to the establishment of a Centre at..... to be known as the "....." Centre and accepted the conditions attached hereto;

NOW THESE PRESENT WITNESS that it has been agreed as follows:-

### 1.0 DEFINITIONS

Unless inconsistent with the context, the following words and phrases shall have the following meanings assigned to them: -

- (i) Agreement: This Memorandum of Agreement and the annexures hereto.
- (ii) Probationary Period: A period of 60 days from date of signature of this Agreement for the establishment of the Centre.
- (iii) Agreement Period: A period of 12 Calendar months from the end of the Probationary Period or when the Centre first accepts recycled material.
- (iv) Renewable Period: The Agreement shall be renewed for a period of 12 months on expiry of the Agreement Period provided all parties are in agreement.
- (v) Notice of Termination: The LANDOWNER or The COUNCIL may after the Agreement Period give 60 days notice of its intention to no longer continue with the operation of The Centre.
- (vi) Executive Director: The Executive Director of.....of the.....Council or his nominee.

### 2.0 OPERATION OF CENTRE

- 2.1 The Centre shall be operated by the CONCESSIONAIRE on behalf of BENEFICIARY or BENEFICIARIES and who will be responsible for entering into agreements with the RECYCLER for the acceptance and payment to the BENEFICIARY of the agreed payments for the collected materials. The COUNCIL and LANDOWNER shall approve these agreements.





- 
- 2.2 The CONCESSIONAIRE on behalf of the BENEFICIARY(IES) will maintain the recycling containers and surrounds to the satisfaction of the LANDOWNER and the COUNCIL.  
If the surrounds are not maintained in a satisfactory manner, then the COUNCIL may arrange for the surrounds to be maintained in a satisfactory manner either by its own resources or by whatever means the Executive Director deems appropriate.  
Alternatively the CONCESSIONAIRE may request the COUNCIL to carry out the maintenance but in which case the payments received from the RECYCLER will be paid into a.....(Trust fund, current account, vote number, etc) from which payments will be made for the maintenance with the surpluses being paid to the BENEFICIARY by the Trust.
- 2.3 The CONCESSIONAIRE on behalf of the BENEFICIARY(IES) will be responsible for notifying the RECYCLER that the containers are ready for emptying and to ensure that the RECYCLER carries out the operation in a neat and tidy manner. All containers shall be emptied as required and at least once a week. Should the RECYCLER fail to empty the containers in due time then following two weeks written notice to the RECYCLER the COUNCIL shall arrange for the emptying of the container and reclaim the cost plus administration charges thereof from the RECYCLER.
- 2.4 The RECYCLER shall be responsible for the provision of approved suitable containers, which shall be capable of being secured, and the openings closed to prevent access when deemed necessary to avoid vandalism and access by vagrants or informal collectors. The containers shall be regularly maintained and clearly marked to indicate the type(s) of recyclable material acceptable.
- 2.5 The COUNCIL shall provide suitable containers for the receipt of materials for which there is no RECYCLER. This shall not be for Garden Refuse nor Builders Rubble but may be unwanted waste materials after sorting.
- 2.6 The COUNCIL will at its cost provide suitable signage at the Centre on which will be indicated the names of the LANDOWNER, CONCESSIONAIRE, BENEFICIARIES, RECYCLER and the relevant maintainer of the Centre together with the name of the Centre and COUNCIL'S own identifiers. The signage will be to the approval of the relevant Municipality and the interested parties. In addition signage will be provided where necessary for traffic control. Signage will be maintained by the COUNCIL and may only be removed or altered by the COUNCIL.
- 2.7 The CONCESSIONAIRE shall take out appropriate third party liability insurance on behalf of all the Parties for the operating of the Centre to the satisfaction of the COUNCIL'S Insurance Officer.
- 3.0 RENEWAL OF CONTRACT
- 3.1 At the end of the Agreement Period all parties shall be required to notify the LANDOWNER and the COUNCIL of their intention to seek to extend the contract at least 30 days before the expiry of the Agreement Period. The failure to give the relevant notice in due time may be condoned by the other parties if circumstances so warrant.
- 3.2 At the end of the Agreement Period a period of agreement up to but not exceeding five years may be entered into. This period then becomes the Agreement Period.
- 3.3 On receipt of the notice in terms of Clause 3.1 hereof, the COUNCIL and the parties shall negotiate in good faith a just and equitable contract and terms of conditions of contract for the agreement period.
- 4.0 COMMENCEMENT AND TERMINATION OF CONTRACT
- 4.1 This Agreement shall commence on the Commencement Date and continue thereafter until the end of the Agreement Period.
- 4.2 In the event of any Party committing any breach of this Agreement and failing to remedy such breach within fourteen days (14) after receipt of written notice from any other Party calling upon such Party so to do, then and in that event, the first mentioned Party shall, subject to notifying and receiving the approval of the other Parties, be entitled to cancel this Agreement without prejudice to any other outstanding claims.



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## 5.0 PERFORMANCE STANDARDS

- 5.1 The Parties hereto acknowledge that the Centre operations are novel and that there is a wide range of aspects, which may determine what Performance is reasonable.
- 5.2 In the event of the COUNCIL wishing to make a formal complaint about the Performance of Any Party, such complaint shall, in the first instance, be directed to the defaulting Party by notice in writing.
- 5.3 The Party shall immediately investigate the complaint and timeously take such steps as may be necessary to resolve it and thereafter advise the COUNCIL in writing of the action so taken by him.
- 5.4 In the event of the Parties failing to agree what Performance of the Party constitutes a reasonable performance and/or the Party failing to rectify a Performance complaint timeously or at all; the dispute shall be referred to an Arbitrator appointed pursuant to Clause 8.0 hereof.
- 5.5 Such Arbitrator shall determine what Performance is to be considered reasonable performance and whether the Party's failure to rectify the performance complaint timeously or at all shall be deemed to be a breach of contract.

## 6.0 ASSIGNMENT OF RIGHTS

No Party may cede or assign the benefits of this Agreement or any of its rights, powers and duties herein to any other person without the consent, in writing of the COUNCIL and the LANDOWNER (which consents shall not be unreasonably withheld).

## 7.0 RECORDS, MONITORING AND INSPECTION

- 7.1 The CONCESSIONAIRE on behalf of BENEFICIARY (IES) shall keep a full and accurate set of records of the operation at the Centre including the mass of the material collected and taken by the RECYCLER(S) which shall be made available to the Executive Director at any time during the contract period.
- 7.2 The CONCESSIONAIRE shall receive all payments from the RECYCLERS into a .....(trust fund, account, etc) from which the legitimate costs of the CONCESSIONAIRE, LANDOWNER and COUNCIL shall be recovered and the remainder distributed to the BENEFICIARIES in accordance with the appendix to this Agreement.

## 8.0 ARBITRATION

- 8.1 In the event of:-  
(a) a dispute arising between the Parties hereto in relation to any matter connected with this Agreement, the Performance thereof, the Performance standards, the interpretation of its provisions, the termination thereof or any matter arising out of such termination;  
(b) the Parties failing to agree to the terms and conditions of a renewed Agreement in terms of Clause 3.0 hereof;  
then and in any such event, the dispute shall be submitted to and decided by the arbitration of a single Arbitrator agreed upon between the Parties in dispute, failing which such Arbitrator shall be appointed by the President for such time being of the ..... (area) Law Society, his nominee or successor or as agreed between the parties, and the decision of such Arbitrator shall be final and binding on all concerned.
- 8.2 Any arbitration proceeding hereunder shall be conducted as informally, expeditiously and inexpensively as possible at .....(place) or at such other place as the Arbitrator may consider shall suit the balance of convenience under the circumstances.
- 8.3 This arbitration clause is severable from the rest of the Agreement and will remain effective between the Parties hereto even if this Agreement is terminated.



9.0 WAIVER

9.1 The Agreement constitutes the entire Contract between the Parties hereto. The terms and conditions of the Agreement shall not be capable of being varied and/or waived nor may the Agreement be cancelled unless such variation and/or waiver and/or cancellation is in writing and signed by the Parties hereto.

9.2 No relaxations or indulgences which any Party may afford another shall in any way prejudice the rights of the other nor shall the first mentioned Party be stopped from exercising such rights by reason thereof.

10.0 DOMICILIA CITANDI ET EXECUTANDI: -

The parties hereunder choose as their respective domicilia citandi et executandi at the addresses set out here above.

DATED at .....this.....day of.....20...

AS WITNESSES:

- 1.
- 2.

\_\_\_\_\_  
FOR AND ON BEHALF OF THE COUNCIL

DATED at .....this.....day of.....20...

AS WITNESSES:

- 1.
- 2.

\_\_\_\_\_  
LANDOWNER

DATED at .....this.....day of.....20...

AS WITNESSES:

- 1.
- 2.

\_\_\_\_\_  
BENEFICIARY

DATED at .....this.....day of.....20...

AS WITNESSES:

- 1.
- 2.

\_\_\_\_\_  
RECYCLER

DATED at .....this.....day of.....20...

AS WITNESSES:

- 1.
- 2.

\_\_\_\_\_  
CONCESSIONAIRE



# APPENDIX E

## PARTICIPANTS AT WORKSHOPS

PROJECT TEAM	
ORGANISATION	NAME
DEAT ECBU	FREDERICK MATJOKANA
DEAT (CP & WM)	LUCAS MAHLANGU
DEAT (CP & WM)	TEMBEKA DAMBUZA
DEAT (CP & WM)	VUSI SKOSANA
DEAT COMMUNICATIONS	MOLEFE MALAMU
COWI / DANIDA	MARGOT NIELSEN
COWI / DANIDA	LYNNI RAMDEEN
ICANDO	JUNE LOMBARD
ICANDO	LORNA HILL
ICANDO	MAZWI MKHULISI
MSA	HILTON PETTERS
MSA	MVUME SIPAMLA
MSA	DUMISANI MTSHALI
ACCT	MARI VAN DER MERWE
ACCT	SARA FREEMAN
ACCT	GABI MCHUNU

STAKEHOLDER REFERENCE GROUP	
ORGANISATION	NAME
BUHLE WASTE	THEMBA BUTHELEZI
CAPE TOWN MUNICIPALITY	SALIEM HAIDER
COLLECT-A-CAN	NICK KOCK
COLLECT-A-CAN	ROBIN SMITH
DEAT EDUCATION	MARIA MOATE
DEAT EDUCATION	SOLLY MOSIDI
DELTA ENVIRONMENTAL CENTRE	ANDREW MATHABATHE
DWAF	SARAH MOFOKENG
DWAF	NAOMI TSEBE
EAST RAND METRO	DOUGIE COWLEY
EJNF	ELIAS MKHWANAZI
EMFULENI LOCAL MUNICIPALITY	ALMA LUDIDI
ENVIRO-FILL	LEON GROBBELAAR
GAUTENG DACEL	I GOVENDER
GAUTENG DACEL	DEE FISCHER
GEM	MICHELLE PRESSEND
GLASS RECYCLING ASSOCIATION	MIKE BILLS
IWMSA	STAN JEWASKIEWTIZ
IWMSA	MPUMELELO NCWADI
N PROVINCE	TREVOR MPHAHLELE
NAMPAK	ROB RODGER
PACSA	OWEN BRUYNS
PFSA	E DLAMINI
PIKITUP	CHRISTA VENTER
PLASTICS FEDERATION	DOUW STEYN
SALGA	FLORENCE MOKGOBU
SAPPI	GARRETT MILLER
TEDCOR	CLARENCE HAMMAN
TSHWANE METRO/SAWMEA	HENNIE NEETHLING
W CAPE	GOTTLIEB ARENDSE





<b>LOCAL TASK GROUPS</b>	
<b>ORGANISATION</b>	<b>NAME</b>
ABN WASTE	B POPAT
ASSOCIATION OF REFUSE CONTRACTORS	T PHUNGULA
AT ENVIRONMENTAL WASTE SOLUTIONS	L LONGBOTTOM
COLLECT-A-CAN	V ZWANE
DSW	N MGINGQIZANA
DSW WASTE MINIMISATION	M MKHIZE
ECOSYSTEMS	G EICHLER
EDUCATION OFFICER NOE	L NXUMALO
FFS REFINERS	M DE SOUZA
GLASS RECYCLING ASSOCIATION	M BILLS
GREATER KOKSTAD MUNICIPALITY	J BUDGE
ICHC	N KUBHEKA
IWOE, DURBAN METRO	G MARSHALL
IWOE, DURBAN METRO	M MBAMBO
INANDA 'C' CLINIC	M C DLADLA
INNER WEST WASTE	J PARSONS
KEEP DURBAN BEAUTIFUL ASSOCIATION	C NGCOGO
KEEP DURBAN BEAUTIFUL ASSOCIATION	B DLAMINI
KEEP TONGAAT BEAUTIFUL ASSOCIATION	T FULELA
KEEP TONGAAT BEAUTIFUL ASSOCIATION	M MTHETHWA
KEEP VERULAM BEAUTIFUL ASSOCIATION	M MDZIMBOMVU
KHUPHUKA	Z DLAMINI
KWAMASHU RECYCLING GROUP	M SHOBA
KZN HEALTH	H Z MBAMBO
KZN UMLAZI HEALTH DEPT	T P MTSHALI
MALUKAZI COMMUNITY HEALTH WORKERS	N MALINGA
MASHU INANDA NTUZUMA CONSERVATION CLUB	S SITHOLE
MASHU INANDA NTUZUMA CONSERVATION CLUB	S MKHIZE
NLOE, DURBAN METRO	K NAIDOO
ROMP	L NAIDOO
ROMP	B FOELLMER
SYO TONGAAT	N DLAMINI
SYO TONGAAT	P VILAKAZI
SYO TONGAAT	N MASUKU
SYO TONGAAT	M YENGWA
THE RECLAMATION GROUP	K SCHWAGER
TONGAAT	NONHLANHLA
UMLAZI RECYCLING COMMUNITY	E GIGABA
WASTE MANAGEMENT DIVISION, MSUNDUZI MUNICIPALITY	R RAJAH



DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM

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