

Derbyshire Waste Management Strategy

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February 1999

PREFACE

This strategy sets out the strategic principles for waste management in Derbyshire and describes the mechanisms for putting these principles into practice. It provides general guidance on the measures that can be adopted to make an early impact on sustainable waste management targets and on the process of moving towards a fully integrated approach

The strategy has been prepared jointly by the Waste Disposal and Collection Authorities in Derbyshire working in partnership. Key organisations were invited to comment on its proposals and changes were made as a result. The strategy has now been adopted by the partner authorities as a basis for preparing detailed waste management proposals for the sub-areas of Derbyshire. It will also provide a context for the preparation of the Derby and Derbyshire Waste Local Plan, in due course.

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DERBYSHIRE WASTE MANAGEMENT STRATEGY

EXECUTIVE SUMMARY

Introduction

1. The strategy has been prepared jointly by the Waste Disposal and Collection Authorities in Derbyshire. It sets out the strategic principles for waste management over the period to 2011 and beyond and describes the mechanisms for putting these into practice. It adopts a flexible approach, recognising the need to respond to changes during a period of uncertainty and rapid development of new ideas and opportunities.

Strategic Context

2. The national policy objectives for sustainable waste management are set out in the Government's White Paper *Making Waste Work* (1995). This confirms the importance of the **Waste Hierarchy** which ranks, in order of general priority, the various waste management options, as **Reduction; Re-Use; Recovery of value from waste; Disposal**. The White Paper makes it clear that whilst the waste hierarchy establishes the general principle, the preferred option for any individual waste stream should be the **Best practical environmental option (BPEO)**. The BPEO takes into account the environmental and economic costs and benefits in the long term as well as the short term. These general principles are re-affirmed in the Government's Consultation Paper *Less Waste : More Value* (1998).
3. In pursuit of the waste hierarchy objectives, the White Paper has set a number of **national targets**, including reducing the proportion of controlled waste going to landfill from 70% to 60% by 2005; recovering value from 40% of municipal waste by 2005; and recycling or composting 25% of household waste by 2000. The Government has also introduced financial measures (the landfill tax, recycling credits) to help give effect to the waste hierarchy. Other national strategic guidance deals with the relationship between pollution control and land-use planning, and establishes **the proximity principle**. This means that any waste created should be disposed of or otherwise managed in close proximity to the point at which it is generated.

Waste Arisings

4. The total municipal waste produced in the county in 1996/97 was 442,400 tonnes, of which 411,500 tonnes was household waste. About 5.9% of household waste was recycled or composted compared with the national target of 25%. The proportion of municipal waste from which some value was recovered by recycling or composting was 5.8% compared with a national target of 40%. A total of some 1,383,600 tonnes of controlled waste goes to landfill disposal, ie about 73% of total

controlled waste arisings and compares with a national average of 70%, and a national target of 60%.

5. Over the period to 2011, the annual household waste arisings are forecast to increase from 411,500 tpa to 473,000 tpa, based on anticipated household growth. Future industrial and commercial waste arisings are difficult to predict but it is assumed that they will continue broadly at present levels.

Sub-Areas of Derbyshire

6. Derbyshire is a county of contrasts exhibiting great variety in key factors which influence waste management options, ie, population concentration, geology, transport infrastructure, and conservation constraints. Derbyshire can be divided into 3 sub-areas determined by these factors; the sparsely populated Western Sub-Area most of which lies in the Peak National Park; the North East Sub-Area centred on Chesterfield; and the South East Sub-Area centred on Derby City. The importance of the proximity principle and the different characteristics in each sub-area is likely to lead to variations in waste management solutions in each sub-area.

A Sustainable and Integrated Strategy

7. The challenge for this strategy is to maximise the progress towards sustainable waste management in practice. The cost-effectiveness of alternative ways of achieving this will be assessed in the light of the Government's financial measures, and the level of resources available to local authorities. Alternative waste management methods fall into two broad categories.
8. Firstly, there are relatively low cost, readily available options which can make some early progress towards targets. These should be used in combination; the most appropriate combination will be determined by the particular circumstances in each sub-area, including factors such as the nature of waste profiles, car ownership levels and other socio-economic factors. Available evidence indicates that programmes which appear to offer good potential for achieving these aims cost-effectively are:-

- § **Waste Minimisation and Public Awareness**
- § **Home Composting**
- § **C A Site Composting**
- § **Kerbside and bring schemes co-ordinated to maximise benefits and minimise costs.**
- § **Flexible provision of Waste Transfer Sites and C A Sites.**
- § **Recovery of energy from Landfill.**

9. Secondly, there are relatively high cost options requiring a longer-term commitment which have potential for making further progress towards targets. These include accelerated composting, and energy-from-waste technologies such as anaerobic digestion and incineration. The most appropriate of these options will again be

determined by the particular circumstances in each sub-area, but some use of them is likely to be necessary in order to maintain progress towards sustainable waste management. What is called for is a complementary mix of methods in each sub-area which, in due course, will make use of options in both categories. Measures which are adopted to make an early impact on targets will need to be integrated with the emerging longer-term options. Because of the long lead-times for adopting these longer-term options research into them will be pursued as soon as possible.

10. **POLICY 1 : THE WASTE COLLECTION AND DISPOSAL AUTHORITIES IN DERBYSHIRE WILL ADOPT AN INTEGRATED STRATEGIC APPROACH TO THE MANAGEMENT OF CONTROLLED WASTE, HAVING REGARD TO THE NATIONAL AND REGIONAL WASTE STRATEGIES AND THE NEED TO MAXIMISE PROGRESS TOWARDS SUSTAINABLE WASTE MANAGEMENT. IN PARTICULAR, WASTE WILL BE MANAGED:-**
 1. ACCORDING TO THE FOLLOWING STRATEGIC HIERARCHY OF PRIORITIES:-
 - A. MINIMISING THE PRODUCTION AND USE OF MATERIALS THAT WILL BECOME WASTE.
 - B. RE-USING PRODUCTS TO PREVENT OR DELAY THEM BECOMING WASTE.
 - C. RECOVERING VALUE FROM WASTE BY RECYCLING, COMPOSTING AND ENERGY RECOVERY TECHNIQUES.
 - D. SAFE DISPOSAL OF WASTE MATERIALS, AND
 2. USING AN INTEGRATED COMBINATION OF METHODS WHICH WILL BE DETERMINED BY:-
 - I) THE BEST PRACTICAL ENVIRONMENTAL OPTION FOR INDIVIDUAL WASTE TYPES.
 - II) THE PRINCIPLE THAT WASTE SHOULD BE MANAGED AND DISPOSED OF IN PROXIMITY TO WHERE IT ARISES.
 - III) THEIR COST-EFFECTIVENESS IN THE LIGHT OF LOCAL CIRCUMSTANCES, AND
 - IV) THE LEVEL OF FINANCIAL RESOURCES AVAILABLE.

Sub-Area Strategies

11. When considering ways of moving towards a fully-integrated strategy the

characteristics of each of the three sub-areas identified will be key factors in determining the preferred solutions. It is therefore part of the strategic approach that, after the preparation of this document, detailed strategies will be prepared for each of the three sub-areas identified. These sub-area strategies will put forward measures which reflect local priorities and aim to put into practice the principles set out in Policy 1. They will enable the authorities with a responsibility for waste management to be involved in putting forward joint proposals for their areas.

12. **POLICY 2 : THE WASTE COLLECTION AND DISPOSAL AUTHORITIES IN THE WESTERN, NORTH-EASTERN AND SOUTH-EASTERN SUB-AREAS OF DERBYSHIRE, WILL ESTABLISH PARTNERSHIP ARRANGEMENTS FOR MANAGING WASTE IN EACH SUB-AREA. THESE PARTNERSHIPS WILL BE CO-ORDINATED BY THE COUNTY COUNCIL AND WILL BE RESPONSIBLE FOR PREPARING SUB-AREA STRATEGIES WHICH WILL:-**

1. PUT INTO PRACTICE THE PRINCIPLES ESTABLISHED IN THIS DERBYSHIRE STRATEGY,
2. REFLECT LOCAL CIRCUMSTANCES AND PRIORITIES,
3. MAKE AN EARLY IMPACT ON SUSTAINABILITY GOALS,
4. SEEK THE BEST COMBINATION OF ALL AVAILABLE WASTE MANAGEMENT METHODS FOR THE LONGER TERM IN ORDER TO ADOPT A FULLY-INTEGRATED APPROACH, AND
5. ESTABLISH THE SUB-AREA PRIORITIES WHICH SHOULD GUIDE THE TENDERING AND CONTRACT PROCESSES FOR ALL WASTE MANAGEMENT CONTRACTS.

Monitoring and Review

13. An essential aspect of the flexible approach of this Strategy will be the establishment of a process of regular monitoring and periodic review. Annual monitoring reports should be produced early in each financial year, based on up-to-date information on waste arisings during the previous year. It will also be important to monitor the wider context regionally, nationally and at EU level, which will have a bearing on the future development of the strategy. When it becomes apparent that one or more of these changes has altered the overall context; it will be necessary to carry out a review to consider whether, and how, the strategy should be modified.

14. **POLICY 3 : THE WASTE COLLECTION AND DISPOSAL AUTHORITIES IN DERBYSHIRE WILL MONITOR, ON A REGULAR BASIS:-**

1. THE QUANTITY AND NATURE OF WASTE ARISING AND DISPOSED OF IN DERBYSHIRE,

2. THE EFFECTIVENESS OF MEASURES IN OPERATION TO MANAGE THIS WASTE,
3. THE AVAILABILITY OF NEW OR DEVELOPING WASTE MANAGEMENT METHODS,
4. ANY CHANGES IN THE OVERALL CONTEXT OF THE STRATEGY.

PART I - INTRODUCTION

CHAPTER I - A STRATEGIC APPROACH

Purpose of the Strategy

- 1.1 The aim of this document is to provide a framework to enable strategic decisions to be taken on the management of waste in Derbyshire over the period up to 2011 and beyond. It adopts a flexible approach, recognising the need to respond to changes during a period of considerable uncertainty and rapid development of new ideas and opportunities. The strategy covers both municipal waste and private sector waste but, inevitably, it concentrates on the municipal sector where local authorities have a direct responsibility and influence. However, the strategy has full regard to the relationship between private sector and municipal sector in developing its approach.
- 1.2 Under the provisions of the Environment Act 1995, the waste regulation functions of county councils were transferred to the Environment Agency and the duty of waste regulation authorities to prepare waste disposal (management) plans was repealed. These plans will be replaced by a National Waste Strategy and by Regional Waste Strategies. None of these have yet been prepared although the first step towards a national strategy has been taken by the publication of a Government White Paper, *AMaking Waste Work*, which has established some policy guidance and set national targets.
- 1.3 The last Waste Disposal Plan for Derbyshire was published in 1985 and is now out of date both in terms of its information base and its overall approach. This Strategy is needed, therefore, in order to ensure that Derbyshire will make an appropriate contribution towards national targets and to provide a policy context for achieving more sustainable waste management. It is also needed to provide the context for preparing the Derbyshire Waste Local Plan, a separate, statutory document which will deal with the land use planning implications of the strategy.
- 1.4 The Strategy has been jointly prepared by Derbyshire County Council (as waste disposal and planning authority) in partnership with Derby City Council (waste collection, disposal and planning authority) and the Derbyshire District Councils (as waste collection authorities).

The Context of the Strategy

- 1.5 The national policy objectives for waste management are set out in the Government White Paper *AMaking Waste Work*, published in December 1995, as follows:-
 - ∃ to reduce the amount of waste that society produces;

- ∃ to make the best use of the waste that is produced, and
- ∃ to choose waste management practices which minimise the risks of immediate and future environmental pollution and harm to human health.

1.6 In order to achieve these objectives, the White Paper emphasises the importance of the Waste Hierarchy which was put forward in the Government's Sustainable Development Strategy in January 1994. This hierarchy, which was re-affirmed in the Government's Consultation Paper *Less Waste : More Value*, ranks the various waste management options in order of general priority, as follows:-

- ∃ Reduction
- ∃ Re-Use
- ∃ Recovery of Value from waste
 - by recycling or composting
 - by recovering energy
- ∃ Disposal

1.7 Hence, the first priority for achieving more sustainable waste management is *Reduction*, ie, to reduce the production of materials which will become waste to the minimum that is consistent with economic sustainability. Related to reduction is *Re-use*; that is putting objects back into use so that they do not enter the waste stream, eg re-treading tyres or re-filling bottles. The first two levels of the hierarchy are therefore concerned with the minimisation of waste to be treated, processed or disposed of. The third level is the broad category of waste *Recovery*, including recycling, composting and the recovery of energy from waste. In *Less Waste : More Value* the Government suggests that incineration with energy recovery should not be undertaken if it inhibits a move to a higher level of recycling. Existing measures to encourage recycling and composting are described in Chapter 4. Waste disposal comes at the bottom of the hierarchy as, generally, the least attractive option, although disposal will inevitably remain a component of the waste strategy.

1.8 The White Paper makes it clear that an important aspect of the waste hierarchy is that, while it provides the guiding principles for the management of waste arisings as a whole, the preferred option for any individual waste stream will depend upon which is the *best practical environmental option* (BPEO). This acknowledges the necessity of taking account of the environmental and economic costs and benefits for the long term as well as the short term. It means, for example, that the BPEO for some wastes will, for the foreseeable future, continue to be disposal by landfill, notwithstanding the position of this option at the bottom of the hierarchy.

1.9 In order to encourage progress towards its broad objectives, *Making Waste Work* has set a number of national targets which are intended to send a strong

message to all who are involved in waste management decision-making.

These targets are:-

Primary Targets

1. To reduce the proportion of **controlled waste**¹ going to landfill (from 70%) to 60% by 2005.
2. To recover value from 40% of **municipal waste**² by 2005.

NB The Government intends to set a target for the overall reduction of waste.

- 1.10 To help achieve these targets, the White Paper has also set a number of secondary targets relating to particular waste streams. Secondary targets 2-6 are intended to help achieve secondary target 1.

Secondary Targets

1. To recycle or compost 25% of **household waste** (currently about 7.5%) by the year 2000.
2. 40% of domestic properties with a garden to carry out composting by the year 2000.
3. All Waste Disposal Authorities to cost and consider the potential for establishing central composting schemes by the end of 1997.
4. Establish easily accessible recycling facilities for 80% of households by the year 2000.

¹ Excludes agricultural and mine and quarry wastes, sewage sludge and dredged spoils, which are subject to regimes other than the waste regulation systems (see, also, para 2.2).

² Comprises all waste collected by, or on behalf of, local authorities, including all household waste, street cleaning waste and some commercial waste (trade waste).

5. Nationally, one million tonnes of organic household waste per annum to be composted by the year 2001.
 6. To increase the use of recycled waste materials as aggregates in England from 30 to 55 million tonnes per annum by 2006 (an 83% increase).
- 1.11 These targets are indicative, not statutory, and are to be achieved nationally rather than in every area. This document therefore aims to establish a framework which will ensure that Derbyshire makes an appropriate contribution to meeting the national targets.
- 1.12 Making Waste Work² provided the first step towards the eventual preparation of a National Waste Survey of Industry and Commerce and Less Waste : More Value³ prepared the ground for the preparation of a draft strategy in 1999. A National survey of waste arisings is being carried out in advance of the strategy. The regional office of the Environment Agency is coordinating the regional survey of waste arisings as part of the national survey.

Other Strategic Measures

- 1.13 As well as setting targets as a way of making progress towards strategic aims, the government has also adapted its market-based approach by the introduction of the **landfill tax**, in October 1996. The central purpose of this is to make landfill disposal less attractive relative to other options by ensuring that the costs of landfill reflect its environmental costs and, more positively, to use the proceeds to finance projects which promote sustainable waste management practices and other related environmental aims.
- 1.14 The strategic aims are also reflected in two important **EU Directives** dealing respectively with waste arising from the packaging of goods, and the nature of waste disposed of by landfill. Under the EU Directive on Packaging Waste, value should be recovered through recycling and other recovery methods from at least 50% of such waste by the year 2001. The EU Landfill Directive aims to deal with issues which include reducing significantly the amount of organic waste going to landfill, the pre-treatment of waste, phasing out co-disposal, securing after-care provisions covering at least 50 years, and enforcing minimum distances between landfill sites and dwellings. The implications of these Directives for the strategy is considered in Part III of this document.
- 1.15 Other national strategic guidance has been published (in 1994) by the Department of the Environment, on planning and pollution control (PPG23). This guidance, which is currently being revised, deals with the relationship between pollution control and planning functions, and sets out other strategic principles. It re-affirms the importance of the waste hierarchy and the principle of the Best Practical Environmental Option and, further, establishes the **proximity principle**⁴ and the

principle of **regional self-sufficiency**. Publication of PPG10 on Waste Planning is anticipated in the near future.

- 1.16 The **proximity principle** means that any waste created should be disposed of or otherwise managed in close proximity to the point at which it is generated. It is acknowledged, however, that this may be difficult in some areas, eg for physical or geological reasons. The principle of **regional self-sufficiency** establishes, for each regional forum (to be set up by the government) a key role in assessing regional waste arisings and requirements, and ensuring that facilities with sufficient capacity are provided to enable the waste for its area to be managed, for a minimum period of 10 years. Whilst there is the potential for conflict between these two principles in areas close to regional boundaries, this should be resolved by the principle of Best Practical Environmental Option (which PPG23 also re-affirms); in general, regional boundaries should not be a barrier to the proximity principle.

The Form and Content of the Document

- 1.17 The strategy covers the whole of the geographic County of Derbyshire, including Derby City, and relates to the period from 1996 to 2011 and beyond.
- 1.18 Following the first two introductory Chapters of Part I, the document is divided into four main sections. Part II examines the existing waste arisings in Derbyshire, the current arrangements for collection, recycling and composting of waste and an outline of the arrangements for waste disposal under existing contracts. Part III explores future options for the management of waste investigating future waste arisings, future landfill constraints and waste management methods. Part IV sets out the general principles to be adopted in the management of waste with accompanying waste management policies, and identifies the need for a sub area approach to waste management. It also deals with the way in which the strategy will be monitored and the future arrangements for periodic review of the strategy.

CHAPTER 2 - THE WASTE MANAGEMENT PROCESS

Introduction

- 2.1 This chapter outlines the process to be followed in preparing the waste management strategy. It describes the way in which wastes are categorised for the purpose of this document and for collecting and using information about quantities of waste, it indicates how these categories relate to national waste management targets. The process itself is illustrated in Figure 1 and the terms used in this illustration to describe the categories of waste are defined below.
- 2.2 The strategy is concerned with all controlled wastes but takes into account other wastes where they may have implications for the overall management of waste. Controlled wastes comprise all kinds of household, industrial, commercial, clinical and special wastes, which require a waste licence for treatment, transfer or disposal. Wastes which are excluded are mine, quarry and farm wastes and sewage sludge. Radioactive and explosive wastes are controlled by other legislation and procedures.

Categories of Controlled Waste

Municipal Waste

- 2.3 Municipal waste is the waste collected by the District and City Councils as Waste Collection Authorities (WCAs). It includes household waste, some commercial and industrial waste and represents the majority of wastes for which Waste Disposal Authorities (WDA) have a statutory duty to arrange for treatment or disposal. It includes all household collected waste, WCA bring site waste, WDA civic amenity site waste and trade waste (see below).

Household Waste

- 2.4 Household waste is mainly waste generated by the regular weekly collection from domestic properties including the separate bulky items collection service (furniture, white goods, garden waste etc). It includes small quantities of specific types of clinical waste which is collected separately from households. Whilst these quantities are still small, they are growing as a consequence of care in the community policies. The definition includes street litter, street sweepings and gully waste, and also includes wastes from municipal parks and fly-tipped waste. However, these latter two categories are excluded from the description of household waste for the purpose of calculating progress towards the Government's waste recycling and composting target.

WCA Bring-Site Waste

- 2.5 This is mainly household waste delivered by the public to unmanned recycling sites operated by the District and City Councils. These sites are located in public car

parks, supermarket car parks or other public areas and consist mainly of small containers dedicated to glass, cans, plastic or paper which is recycled through a merchant. They are mostly operated by Waste Collection Authorities although increasing numbers are operated by commercial or retail organisations.

WDA Civic Amenity Site Waste

- 2.6 Civic Amenity (CA) waste is household waste taken by the public to sites provided by the Waste Disposal Authorities. They are more centrally located with bigger catchment populations and generally use larger containers, usually skips.

Trade Waste

- 2.7 The term 'Trade Waste' is a generally accepted term describing the commercial waste which is collected by Waste Collection Authorities. These Authorities have a duty to collect this waste if requested, and is collected from small shops and other commercial premises.

Industrial and Commercial Waste

- 2.8 Industrial and Commercial Waste covers a broad range of waste types from manufacturing, utility and transport sectors to commercial businesses. Whilst most **commercial** arisings are similar in their properties to household waste, those arising from the **industrial** sectors range in their physical state from solids to liquids. This latter group includes most of the wastes that are classified as special wastes (see below). Waste Disposal Authorities do not have any statutory duty to arrange for the disposal of industrial and commercial waste except that which is collected by the Waste Collection Authority (ie 'Trade' waste).

Construction and Demolition Waste

- 2.9 This waste group consists of rubble, hardcore and soils from the building and construction industries, local authorities or general industry. The waste can vary greatly in nature and can include wood, metal, paper, plaster or other building material. The biodegradable element has the potential for pollution. This waste is classified as controlled waste but may be exempt from the licensing system, eg, when deposited at its site of production. The total quantity arising is therefore difficult to identify. It is also subject to great variation in production due to seasonal or economic factors.

Clinical Waste

- 2.10 Clinical waste is generally that which arises from medical, veterinary or pharmaceutical practices. The definition and handling requirements are closely defined with some types being permitted to be landfilled whilst a proportion must be incinerated. The major producer is the National Health Service Trusts, with the remainder arising at private hospitals, veterinary and dental practices and nursing

homes. Currently most of this waste group is handled by contractors or in-house services with little being directed for disposal elsewhere. (See household clinical waste, paragraph 2.4)

Special Waste

- 2.11 Current special waste regulations (September 1996) control the movements of the most dangerous wastes. These wastes are special if they exhibit any of a number of listed properties, eg if they are irritant, toxic, harmful, corrosive, carcinogenic or have a low flash-point. Special wastes can arise in any of the above waste categories though, in practice, they are predominantly commercial and industrial wastes. The majority of such wastes are likely to be managed and disposed of by private contractors or in-house services over which the Waste Disposal Authority has no control. The regulation of these wastes is the responsibility of the Environment Agency by means of the consignment note system and the licensing system for disposal facilities.

Outline of the Strategic Process

- 2.12 The process followed in preparing the strategy is outlined in the flow chart in Figure 1. The information collected on waste arisings is illustrated in the first two columns of Figure 1. It has been organised to enable easy reference to the progress that has been or will be made towards national waste management targets, as well as providing the basis for forecasting waste arisings to 2011. This will facilitate monitoring and, at appropriate stages, review of the strategy.
- 2.13 The groups of waste referred to in national waste management targets are:-
- (i) Controlled waste : Figure 1 deals comprehensively with controlled waste and is identified in the items within the two left-hand columns of the chart.
 - (ii) Landfilled waste : This is identified in the bottom right-hand box on the chart. Waste disposal of by other methods, eg energy from waste schemes, is shown in the top right-hand box.
 - (iii) Municipal waste : This is identified by items H1, H2, H3, H4 and C1 on the chart.
 - (iv) Overall waste reduction : This is identified (together with re-use and recovery) in the three items at the centre of the chart.
 - (v) Household Waste : This is identified in items H1, H2 and H3. Government advice is that, for the purpose of calculating progress towards the recycling and composting target, household waste excludes fly-tipped and municipal parks wastes.

(vi) A Recycled Aggregates : This is identified in the bottom of the three central items in the chart.

2.14 The chart also shows how the household forecasts for the County to 2011 will be applied to the existing household waste figures to obtain a profile of forecast arisings over the period of the strategy. Similarly an assessment will be made of the future industrial and commercial arisings up to 2011. The chart indicates that from these gross figures, will be deducted the forecast effects of measures to reduce, re-use and recover waste, and this, in turn enables the net quantities of waste requiring disposal over the period to 2011 to be estimated. These procedures are discussed in more detail in Chapter 6.

CHAPTER 3 - CONTROLLED WASTE ARISING

Introduction

- 3.1 This chapter details the types and quantities of waste arising and disposed of within Derbyshire. The details are based on information provided by the Waste Collection and Disposal Authorities and from the Waste Regulation Authority (Environment Agency). There are a number of gaps in the available information which it has not been possible to fill, particularly on the level of imports/exports and on quantities of some waste categories that are re-cycled or composted. However, the information collated does provide a sufficient basis on which to forecast waste management needs in the key strategic areas over the timescale of the strategy.
- 3.2 As outlined in the previous chapter, this information has been collated in a way which allows easy reference to the categories in national waste management targets. A summary of waste arising is set out in Table 1 in which the categories of waste correspond to those illustrated in Figure 1 and the same reference numbers are used.

Municipal Waste

- 3.3 Information on municipal waste is provided in the top half of Table 1. This shows, in column 1, that the total municipal waste produced in the county in 1996/97 was 442,400 tonnes, of which 411,500 tonnes was Ahousehold≅ waste and 30,900 tonnes was Atrade≅ waste.
- 3.4 The waste which is collected regularly from domestic properties is referred to as Acollected household≅ waste. This amounted to 333,200 tonnes in 1996 (Column 1, Table 1). This quantity, when added to quantities received at bring sites and C A sites, amounts to 408,100 tonnes of Atargeted≅ household waste, ie, the quantity to which national household recycling and composting targets relate. Of this amount column 3 indicates that, 24,000 tonnes were recycled or composted. **This is about 5.9% of the total, compared with the national target of 25% by the year 2000.** It has not been possible to identify a split between the quantities recycled and the quantities composted although it is estimated that of the 3,800 tonnes of collected household waste (column 3) around 800 tonnes was composted.
- 3.5 Column 5 of the table shows the quantities of waste disposed of at Derbyshire landfill sites. It shows that the total of municipal waste disposed of was 395,400 tonnes of which 365,500 tonnes was household and 29,900 tonnes >trade= waste. Therefore, **the proportion of municipal waste from which some value was recovered by recycling or composting was 5.8% compared with a national**

target of 40% to be achieved by the year 2005.

Private Sector Waste

- 3.6 No information is available specifically on the amounts of non-municipal waste produced in Derbyshire. Waste Arisings are therefore identified, in Table 1, as quantities received at Derbyshire disposal sites on which information is available from the site licensing system via the Waste Regulation Authority. The quantities of each category which are imported and exported are not known but the quantities received at Derbyshire sites (Table 1, Column 1) are likely to include some imports.
- 3.7 Similarly, the quantities of wastes in this sector which are recycled are unknown except in the case of scrap metal which amounted to 294,000 tonnes recycled in 1996/97. The absence of information on the recycling of construction and demolition waste causes particular difficulties because it relates both to national waste management targets and to minerals planning targets for the use of secondary aggregates.
- 3.8 The table shows that the quantities of waste incinerated are 168,000 tonnes of special waste, and 8,400 tonnes of construction and demolition waste. It is estimated (bearing in mind the incompleteness of information) that some 988,200 tonnes of private sector waste is disposed of at landfill sites, amounting to about 68% of what is received (column 1). Together with municipal waste, some 1,383,600 tonnes of controlled waste goes to landfill disposal. **This is about 73% of total controlled waste arisings and compares with a national average of 70%, and a national target of 60% to be achieved by the year 2005.**

General Observations

- 3.9 It is clear that the absence of some items of information prevents the construction of a complete picture of the present waste streams in Derbyshire. This confirms the importance of establishing effective information gathering systems which the Government has already made a priority in its White Paper *Making Waste Work*. The effect of commercial arisings to private sites is unknown as yet because the information is held in the commercial sector and will only be available when the Environment Agency publish their National Survey.
- 3.10 However, enough of the picture can be seen to enable the main features to be identified and waste management priorities and policies to be determined. In particular the scale of the progress that needs to be made in order to contribute to the main targets, relating to household and municipal waste, is clear enough.

TABLE 1**Summary of Controlled Waste Arising and Disposed of in Derbyshire (1996/97)**

Waste Type	Arisings			Disposal	
	Produced in County	Export/Import -/+	Recycled/Composted	Disposed of in County	
				Incinerated	Landfill
	1	2	3	4	5
<u>Municipal</u>					
H1 Collected Household	333,200	-20,000	3,800	500 ⁵	308,900
H2 Bring Sites (WCA)	14,900	0	14,900	0	0
H3 Civic Amenity - (WDA)	60,000	0	6,000	0	54,000
(Targeted Household)	(408,100)	(-20,000)	(24,700)	(500)	(362,900)
H4 Mun, Pks/Fly-tip	3,400	0	800	0	2,600
(Total Household)	(411,500)	(-20,000)	(25,500)	(500)	(365,500)
C1 >Trade=	30,900	-1,000	0	0	29,900
<u>TOTAL MUNICIPAL</u>	442,400	-21,000	25,500	500	395,400
<u>Private Sector</u>					
C2 Industrial & Comm=l	762,000o	unknown	294,000 ⁵	0	468,000;
C3 Construction & Dem=n	496,700o	unknown	unknown	8,400	488,300;
C4 Clinical	400o	unknown	0	0	400;
C5 Special	199,500o	unknown	unknown	168,000	31,500;
<u>TOTAL PRIVATE</u>	1,458,600		294,000⁵	176,400	988,200
<u>TOTAL CONTROLLED WASTE</u>	1,901,000	-21,000	319,500⁴	176,900	1,383,600

Notes

1. Includes unknown quantities of Airports≅ from outside Derbyshire.
2. Scrap Metal only; this figure must be a minimum, because other recycled is unknown.
3. Amounts will be maxima due to Aunknowns≅.
4. This figure is a minimum due to unknowns in column 3.
5. Incinerated outside County (Sheffield)

CHAPTER 4 - EXISTING RECYCLING AND COMPOSTING ARRANGEMENTS

RECYCLING

Introduction

- 4.1 Recycling is the processing of waste materials to produce a usable raw material or product. This enables the same materials to be used more than once, so extending their life and maximising the value extracted from them, it can lead to energy savings and reduces the amount of waste that needs disposal. Furthermore it enables members of the public to become aware and directly involved in waste management.
- 4.2 However recycling is not an option to be pursued at any cost. Disadvantages include the environmental and economic costs of collection, transport and reprocessing, the sometimes higher costs of recycled materials and the difficulty of finding stable markets for recycled goods. Whilst industry has been recycling for some time, the rate of recycling of commercial and household waste is much lower, currently only about 5% of household waste is recycled.

National Policy - Targets

- 4.3 In view of the advantages of recycling the Government, in 'Making Waste Work', has set targets to encourage greater recycling of household waste:
- 1) to recycle or compost 25% of household waste by the year 2000 (equivalent to about half of all the household waste that can be recycled or composted);
 - 2) to have easily accessible recycling facilities for 80% of households by the year 2000.

'Easily accessible' means either provision of kerbside collection or, for bring schemes, the location of a stand alone facility within about 2 mile or within 2 miles where that recycling facility is co-located with other frequently used facilities such as shopping centres, car parks, sports centres or schools.

Measures to increase the recycling of household waste

- 4.4 The Government has introduced a number of measures in the Environmental Protection Act 1990, in the Environment Act 1995 and elsewhere, including fiscal measures, to promote the recycling of household waste, including:
- 1) a requirement for all waste collection authorities to produce waste recycling plans;

- 2) the introduction of recycling credits so that the full savings on disposal costs could be passed to recyclers. In most cases they will be paid by the Waste Disposal Authority to the Waste Collection Authorities in its' area when waste is diverted from the waste stream for recycling. They may also be paid to third parties such as voluntary groups and businesses;
- 3) competitive tendering and divestment of local authority waste disposal functions - to clarify the real costs of waste disposal;
- 4) Supplementary Credit Approvals to fund local authority recycling infrastructure and related projects;
- 5) the producer responsibility initiative which requires that industry assumes an increased share of the responsibility for the wastes arising from the disposal of its products, eg, through the EU Directive on Packaging Waste;
- 6) the provision of Government grants through the Environmental Action Fund, to voluntary groups which run recycling projects; and
- 7) the Landfill Tax which, although not targeted directly at recycling, aims to make landfill disposal less attractive relative to other waste management options, including recycling.

Recycling Credits

- 4.5 Collection Authorities/Third parties submit claims to the Waste Disposal Authority for each tonne recycled which is paid at a level which reflects the full disposal cost (ie the highest disposal contract sum in each authority area). So far in Derbyshire, this practice has not led to a corresponding saving in the actual waste disposal contract cost, although it is possible that, without this scheme, amounts of waste going for disposal might otherwise be greater. The potential for increasing recycling tonnages must therefore be carefully weighed against the increasing costs of recycling credits.

Existing situation in Derbyshire

- 4.6 All of the Collection Authorities in the county have published Recycling Plans and introduced initiatives to encourage recycling. The quantity of waste recycled by the public in 1996/7 is shown on Table 2.
- 4.7 The most popular initiative in the county is the provision of 'bring sites' which involve free standing containers placed at specific locations where the public can deposit a variety of materials including paper, newspapers, card, books, textiles, glass, cans and plastics. These vary in size from small facilities ie 1 or 2 containers in car parks

to larger facilities on dedicated sites collecting a wider range of materials. Bring sites are mainly operated by the Collection Authorities although increasing numbers are operated by commercial or retail organisations.

- 4.8 Members of the public can also take materials to any of the civic amenity sites within the county. These serve a wider area of population than the bring sites. They usually house large containers in the form of skips for recycling a wide variety of materials including paper, glass, cardboard, metal, timber, builders rubble, garden waste, oil, textiles, batteries etc. The sites are provided by the Waste Disposal Authority managed under contract by private companies.
- 4.9 A number of Collection Authorities have introduced kerbside collection schemes involving house to house collections of separated recyclables. The householder separates recyclables into a dedicated box/bag or second bin. These are collected either simultaneously with general household waste or separately.
- 4.10 Once recyclables have been collected they are either sent straight to a recycler in cases where they are already sorted adequately, for example in some bottle banks, or to an interim facility for further treatment of some sort. This may involve storage until sufficient economic quantities are collected before being sent for reprocessing. These interim facilities are known as Material Recycling Facilities (MRFs).

COMPOSTING

Introduction

- 4.11 Composting has been practised by farmers and gardeners throughout the world for centuries. It involves the natural breakdown of organic waste, such as kitchen and garden waste, in the presence of air to produce a material which can be used to improve soil structure and enrich the soil. However, since organic matter forms about 20% of the household waste stream there is considerable potential for increasing the rate of composting throughout the country.
- 4.12 Such an increase would have several advantages. Firstly, it would reduce the amount of waste that needs disposal; secondly, removing organic material from waste can reduce problems associated with landfill such as methane gas, groundwater contamination etc; thirdly the use of waste derived composts as soil improvers and mulches in horticulture and landscaping would lead to a reduction in the use of natural peat. In addition, composting can be viable on both a small and large scale, from home compost heaps/bins to community and municipal compost schemes.
- 4.13 There can be problems associated with composting, especially large scale schemes, such as odours, bacteria and fungi and leachate, although these can be overcome by careful siting and good process control. Perhaps the biggest problem

facing an increase in large scale composting is the need to find suitable markets. Whilst there may be markets for current schemes (for example many local authorities use the compost for their parks and gardens) for an increase in large scale composting to be successful, substantial inroads will have to be made into markets for soil improvers and growing media. This is unlikely whilst the present concerns about the quality and reliability of waste derived compost remain.

National Policy - Composting Targets

4.14 In view of the potential for increasing the amount of waste recovered by composting the Government, in 'Making Waste Work', has set the following targets:

- 1) to recycle or compost 25% of household waste by 2000. (as previously referred to at para 4.3).
- 2) 40% of domestic properties with a garden to carry out home composting by the year 2000.
- 3) all waste disposal authorities in England and Wales to cost and consider the potential for establishing central composting schemes for garden waste and other organic waste from commercial sources by the end of 1997.
- 4) 1 million tonnes of organic and household waste to be composted by the year 2001
- 5) 40% of the total market requirements for soil improvers and growing media in the UK to be supplied by non-peat materials within the next 10 years.

Targets 2-5 are intended to help achieve Target 1.

Existing Situation in Derbyshire

4.15 Most of the Waste Collection Authorities in the county have introduced initiatives to increase the level of composting as set out in Table 3.

Home Composting

4.16 Composting, as previously noted, has been practised for many years by keen gardeners. It is however difficult to quantify the number of households that compost or the amount of material involved in this activity hence Table 3 does not include such figures.

4.17 Recently several of the Collection Authorities have attempted to encourage home composting through the sale of subsidised compost bins. The figures in columns 4 and 5 of Table 3 relate to the number of bins sold under local authority schemes. All of the schemes started in 1997 and therefore this table does not evaluate their success or how far future levels of home composting can be increased by this method. Using the number of bins sold as a measure of home composting in the county only about 2% of households with a garden are involved in home

composting compared to the 40% target set by the Government. There is the potential for nuisance from some kinds of home composters and care must be taken to avoid these effects for schemes to be successful in the future.

Central Composting

- 4.18 Some Authorities have undertaken trials, providing a household collection service of garden/kitchen waste which is taken to a central composting point. The compost produced is used by the authorities for in house projects such as tree planting schemes and parks and gardens. The figures in column 4 of Table 3 relate to the number of households covered by the schemes for the period 1996/7.
- 4.19 In addition, at some of the Civic Amenity sites to which members of the public can deliver waste, specific skips for garden/kitchen waste have been provided. This waste is transported to a central composting site at Langar, Nottinghamshire . The contract for running the Civic Amenity sites, awarded by the Waste Disposal Authority, allows for a proportion of the tonnage to be returned to the site in the form of compost for sale. The level of organic waste collected at the sites is shown on Table 3.

Table 2 - Recycling in Derbyshire 1996/7

AUTHORITY	NO OF BRING SITES	TONNES	VOLUNTARY GROUPS- TONNES	CIVIC AMENITY SITES- LOCATION	C/A TONNES	KERBSIDE TONNES	COMMENTS	TOTAL TONNES
HIGH PEAK	62	1,340	156	GLOSSOP	214	-	BRING SITES - 12 LARGE, 50 MINI KERBSIDE PAPER - TO START 1998	1,710
DERBYS DALES	65	1,577	19	BIRCHWOOD	155	562	KERBSIDE PAPER - STARTED AUG 96 EXTENDED FEB 97	2,313
CHESTERFIELD	80	1,963	-	STONEGRAVELS	496	430	KERBSIDE PAPER	2,889
NORTH EAST	13	269	5	-	-	-		274
BOLSOVER	23	495	-	-	-	-		495
AMBER VALLEY	35	1,112	91	LOSCOE	997	36	KERBSIDE TRIAL SCHEME STARTED SEP 96 270 HH'S COVERED - SECOND BIN - FORTNIGHTLY COLLECTION MATERIAL TAKEN TO RECYCLING PLANT AT SOMERCOTES	2,236
DERBY CITY	76	4,586	82	RAYNESWAY	2,500	1,215	MAIN RECYCLING CENTRES(20) IN PUBLIC PLACES/COMMUNITY RECYCLING CENTRES(CRC)(56) CLOSER TO WHERE PEOPLE LIVE - COMMUNITY GROUPS CAN ADOPT A CRC THEY RECEIVE AN ANNUAL PAYMENT OF ,104 PLUS A PAYMENT PER TONNE OF WASTE TAKEN TO THE CENTRE - THE GROUP HAS TO KEEP THE SITE TIDY AND PROMOTE ITS USE PLASTIC MRF - MATERIAL SORTED/STORED/BULKED-UP SENT TO BE PROCESSED OIL RECYCLING BANK AT 4 PETROL FILLING STATIONS KERBSIDE PAPER - 'PAPERBACK' SCHEME STARTED JUL 96 BECAME CITYWIDE MAR 97 -FORTNIGHTLY COLLECTION - BAG NEXT TO BIN	8,383
EREWASH	19	2,025	95	ILKESTON	448	615	KERBSIDE PAPER - COVERS 13,000 HH'S	3,183
SOUTH DERBYS	80	1,015	21	BRETRY	84	225	KERBSIDE PAPER - COVERS 25,000 HH'S	1,345
TOTALS		14,382	469		4,894	3,083		22,828

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Table 3 - Composting in Derbyshire 1996/7

AUTHORITY	TYPE OF SCHEME HOME/CENTRAL	START DATE OF SCHEME	NO OF HH'S ON THE SCHEME	% OF TOTAL HH'S WITH GARDEN HOME COMPOSTING	LOCATION OF SCHEME	WASTE COLLECTED (TONNES) 1/4/96 -31/3/97	COMMENTS	END USE	C/A COLLECTED (TONNES) 1/4/96-31/3/97
HIGH PEAK	H	JUN 97	1000	3.2	BOROUGH WIDE		SUBSIDISED BIN SCHEME COST ,15 PUBLICITY - LEAFLETED WHOLE BOROUGH	HOME	
DERBYS DALES	H	FEB 97	3700	14.4	DISTRICT WIDE		SUBSIDISED BIN SCHEME COST ,12 PUBLICITY - LEAFLETED WHOLE DISTRICT	HOME	
CHESTER-FIELD	H	JULY 97	500	1.3	BOROUGH WIDE		SUBSIDISED BIN SCHEME COST ,15 PUBLICITY - BOROUGH MAGAZINE	HOME	
NORTH EAST DERBYS	H	SEP 96	950	2.5	COAL ASTON/ WINGERWORTH		TRIAL SCHEME-SUBSIDISED BINS OFFERED TO SELECTED AREAS TAKE UP 34% COST ,10	HOME	
BOLSOVER	-	-	-	-	-	-	-	-	
AMBER VALLEY	H	MAR 97	2000	4.6	BOROUGH WIDE		SUBSIDISED BIN SCHEME COST - RANGE OF BINS OFFERED PUBLICITY - BOROUGH MAGAZINE/SALE DAY	HOME	288
DERBY	-	-	-	-	-	-	-	-	534
EREWASH	C	APR 95	2400		SAWLEY/ OCKBROOK	595.57	SEPARATE WHEELED BIN FOR GARDEN/KITCHEN WASTE - FORTNIGHTLY COLLECTION 97/98 3,600 MORE HH'S ON SCHEME HOPE TO COVER 13,000 HH'S BY YR 2000	EBC'S PARKS AND GARDENS DEPT	251
SOUTH DERBYS	C	SEP 96	1250		ETWALL/ EGGINTON	211.79	TRIAL SCHEME- SEPARATE WHEELED BIN FOR GARDEN/KITCHEN WASTE - FORTNIGHTLY COLLECTION	SDDC'S WOODLAND & TREE PLANTING	

									SCHEMES	
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CHAPTER 5 : WASTE DISPOSAL CONTRACTS

Background

- 5.1 Waste Disposal Authorities, have a duty under Section 51 of the Environmental Protection Act 1990 to arrange for the disposal of the controlled waste collected in their areas by the Waste Collection Authorities. The waste disposal service in Derbyshire was privatised in 1995 and to comply with this duty, the County Council let contracts with the private sector for the disposal of this waste. Contracts were let for up to ten years for landfill sites and up to five years for civic amenity sites.
- 5.2 The contracts were prepared with the intention of providing a delivery point in each collection authority area and a civic amenity site near each major town. Contracts were accepted on the basis of lowest cost whilst meeting the Authority's stated environmental aims and objectives. The waste delivery patterns in the county in 1996, under the contractual arrangements, are illustrated on Map 1.

Strategic Implications

- 5.3 The primary objective of securing a disposal facility in each Waste Collection Authority area was largely achieved. However, for this situation to be maintained throughout the contract period to 2005, all the facilities nominated in the contract, will need to be commissioned including, in due course, those identified to replace existing facilities when completed. Under the terms of the contracts, the contractor must provide replacement facilities, or acceptable alternatives, or face financial penalty for any extra costs arising to the disposal or collection authorities.
- 5.5 The future replacement facilities identified in the contracts are all landfill sites. This reflects the dependence on this method of waste management historically, given the availability of suitable land and relatively low development costs. Should any of these future sites not be provided for any reason, the provision of alternative landfill facilities would be likely to be further afield leading, potentially, to unacceptably long road journeys. Changes to the contract schedule of sites would also mean a change in delivery patterns, possibly involving more travel for the Collection Authorities. Some authorities currently deliver some of their waste sufficient distance to enable them to claim excess travelling costs from the County Council.
- 5.6 Changing environmental standards, including regulatory measures, are significantly reducing the opportunities for securing acceptable landfill sites, particularly at key locations, such as near conurbations. Any failure to provide sites either in the short-term, or the medium-term, would mean a subsequent increased pressure on existing facilities and fore-shortening of the life of those facilities.
- 5.7 A feature of the contracts is that each disposal site has a range of tonnages, between a minimum and a maximum, that can be directed to it. The minimum

tonnage is guaranteed financially. The range is necessary to enable the WDA to direct the collected waste for disposal in the most cost-effective manner, and take into account likely changes in quantities of waste delivered due to population factors or the impact of recycling initiatives. Other changes are likely in the future due to legislative measures or advances in alternative technologies, driven by the need to meet current Government targets aimed at reducing quantities of waste requiring disposal.

- 5.8 The current contracts should be able to accommodate such reductions up to around 30% of waste quantities presently being delivered, without financial penalty to the Waste Disposal Authority. Waste disposal contractors as well as local authorities will need to review their strategies, with particular regard to the level of reliance on landfill disposal and to alternative waste management measures such as central composting, recycling, or energy from waste schemes.

Civic Amenity Site Contracts

- 5.9 Since the Refuse Disposal (Amenity) Act 1978, Waste Disposal Authorities have been obliged to provide sites where the public may dispose of household waste free of charge at all reasonable times. The County Council was required to privatise waste disposal services under the Environmental Protection Act 1990 and invited tenders to provide and/or operate civic amenity facilities in the county. Fewer sites were tendered for than had previously been operated by the Authority.
- 5.10 Seven sites were the subject of contracts awarded in 1995, of which six are expected to remain until expiry in the year 2000. Two sites are attached to waste transfer stations and one is now the responsibility of Derby City Council following local government reorganisation. Contracts were let for all facilities offered, but large areas, mainly the western parts of the county were left without facilities nearby (see Map 2). Operators are encouraged in the contracts to recycle wastes at their sites.
- 5.11 With the reduction in the number of civic amenity sites since privatisation, the Waste Collection Authorities have received an increased call upon their bulky waste collection services. Whilst this service may reduce the number of individual journeys to distant facilities, it is not a satisfactory substitute. There appears to be no firm evidence to suggest that fly-tipping has increased as a result of these shortfalls, although this is an area of more recent concern which is perhaps more likely to be related to the effects of the introduction of the landfill tax. Against a backdrop of increasing public demand, however, any reduction in service below existing levels may well increase the likelihood of problems.
- 5.12 To provide additional civic amenity facilities in areas of under provision, the WDA would have to invite tenders from the private sector, and there would be no guarantee that any facilities would be offered. The WDA could develop a site itself, but, being normally unable to hold a Waste Management Licence, would have to

seek tenders to manage the facility. Both alternatives clearly have cost implications.

- 5.13 Sites need to be located within areas of high population density to maximise access to a high proportion of householders and, thus to be cost-effective. This has environmental benefits by minimising the lengths of journeys to sites, but it also means that land acquisition is usually difficult and potentially costly. Planning conditions and Waste Management Licences would impose high standards and have further obvious cost implications. Civic Amenity sites, developed as Recycling sites, could play an important role in recycling, but manned facilities are needed to accept the broad range of household waste and to maximise the benefits of such sites. New sites could be operated by the private sector as individual sites or as part of other facilities such as transfer stations, or central composting sites.

CHAPTER 6 - FUTURE WASTE ARISING

Introduction

- 6.1 There are two main factors affecting the quantities of waste arising in the future. These are the changes in numbers of households, in the case of household waste, and the level and nature of future economic activity, in the case of commercial and industrial waste.
- 6.2 Clearly, it is hoped that other factors will achieve reductions in quantities of waste produced, whether as a result of government measures, or changes in lifestyles, or through increased public awareness of the effects of our actions on the environment. However, the purpose of this chapter is to estimate future waste arisings in the absence of any influence from these waste reduction measures. This is because it is important to assess the scale of the waste quantities to be managed without presuming what might be achieved by any particular waste management option, including waste minimisation.

Household Waste

- 6.3 In the past, population forecasts have been used to estimate future household waste arisings. However, the significant reductions in average household sizes in recent years have revealed that the quantity of waste produced is more closely related to household numbers than population size. For this reason, forecast household waste arisings have been calculated on a household basis using the household forecasts derived from the Derbyshire Structure Plan. The household forecasts take into account significant factors including changes in age structure, household formation rates and the level of population migration anticipated.
- 6.4 The starting point for forecasting household waste arisings over the period of the strategy is the quantity of household waste produced in 1996 for each District (Table 1; H1 + H2 + H3 + H4). These arisings were divided by the number of households to obtain an average tonnage per household for each District. Multiplying this figure by the forecast number of households produces the forecast household waste arising in each District up to 2011, as shown in Figure 2. The actual figures for each District/Sub-area are shown at Appendix B.

6.5 From these calculations the annual total household waste arising in Derbyshire is forecast to increase by some 61,500 tonnes from 411,500 tonnes in 1996 to around 473,000 tonnes in 2011, an increase of nearly 15%, as shown in Figure 3 and in Appendix B. Overall, these forecasts show that approximately 7 million tonnes of household waste could be expected to arise in the county between 1996 and 2011, taking into account the expected growth in the number of households in the county. Other factors, such as the general state of the economy will, of course, also influence the amount of waste that people will produce but, like the factors affecting the level of future private sector waste arisings, they are much more difficult to predict.

Private Sector Waste

6.6 Until recently, the levels of employment in various industrial sectors have been used as a basis for estimating future changes in industrial and commercial waste production. However, in recent times, increases in industrial production have been achieved through greater efficiency rather than by employing more people, and often even with reductions in the workforce.

6.7 It is, in practice, very difficult to predict future changes in the levels of industrial and commercial waste production over even a 5-year period, due to the effects of unknown regional or national events. This is highlighted by the changes that have taken place over the last 10 to 15 years. The biggest changes over this period have been as a result of events such as the collapse of the deep-mined coal industry, changes in electricity generation leading to the near disappearance of pulverised fuel ash (PFA) as a waste, and the duration and depth of the economic recession in the early 1990s.

6.8 Figure 4 illustrates the scale of private sector waste arisings over the last 15 years. It shows that if the quantities of waste PFA from power stations are excluded from the figures, the overall levels of other waste produced have remained remarkably steady over this period. This gives a clear indication that the starting point should be to consider waste management options for the future on the basis that the levels of industrial and commercial waste production will remain broadly constant, and to ensure that effective monitoring and review procedures are in place.

6.9 The justification for this approach is further strengthened when the potential for legislative and policy changes is considered. Far-reaching changes are likely to result from a range of measures being implemented or likely to be implemented, including the EU Directive on landfill, the Packaging Regulations, new Government Planning Guidance, landfill tax changes and a range of measures which is likely to come from the National Waste Strategy when it is prepared. The potential for unpredictability is enormous when the effects of even relatively minor changes are considered; some examples are given below.

6.10 The construction and demolition industries can give rise to fairly regular levels of waste production, although long-term forecasting can be difficult due to the influence

of a small number of large construction projects, such as major housebuilding or highway schemes. However, since the introduction of the landfill tax, in October 1996, tonnages of construction and demolition waste for disposal appear to have reduced substantially. This is because waste is now being diverted to Aexempt≡ schemes (ie exempt from waste licensing) rather than being recorded as waste arisings, in order to avoid payment of Landfill Tax.

- 6.11 Changes in legislation have dictated that some wastes previously regarded as Anon-hazardous≡ industrial waste, and now recorded as Aindustrial≡, are, in future to be described as Aspecial≡ waste. However, most special waste is directed to processing plants. These by their nature, are long term facilities whose use will be dictated by market conditions and which would appear capable of catering for the special waste produced in Derbyshire.
- 6.12 The main producers of clinical waste are the NHS Trusts who deal with this waste by in-house contractors. The clinical waste collected by waste collection authorities is only a fraction of the total but is increasing significantly due to care in the community health policies. It is difficult to predict what the long-term effects of these and other health care policies might be.
- 6.13 It is clear, therefore, that forecasting industrial and commercial arisings with any reliability is extremely difficult. Nevertheless, establishing a working assumption about future arisings is an essential part of developing a strategy. Taking into account both the evidence from past trends and the potential for unpredictable change in the future, it is concluded that alternative strategies should be developed on the assumption that industrial and commercial arisings will continue, broadly, at present levels. This should, however, be allied to flexibility in the strategy and regular monitoring and review procedures.

CHAPTER 7 - FUTURE LANDFILL CONSTRAINTS AND WASTE MANAGEMENT SUB-AREAS

Background

- 7.1 Traditionally, landfill could be relied upon to provide replacement sites to ensure the continuity of available landfill disposal capacity. Although numbers of sites have been decreasing, availability was generally maintained in the desired location. The Waste Disposal Plan was published in 1985 as a requirement of the Control of Pollution Act 1974. It attempted to establish a plan for controlled waste for a ten-year period. The Plan identified 36 major landfill sites which at that time handled 88% of the commercial and industrial waste. Municipal waste was dealt with at 11 dedicated municipal waste sites, ie, 10 landfill sites and 1 incinerator, at Derby.
- 7.2 A follow-up study identified 37 potential future sites suitable for receiving municipal waste. Most of these have since become unsuitable because their geology makes them unable to comply with current environmental protection measures. Ten sites were active or imminently active, at the time of the study; three of these sites are still active, having been since extended. One site, at Arden Quarry in Hayfield, has since become operational. The Erin landfill site, near Staveley, has recently received approval.
- 7.3 Two main changes have significantly altered this situation for the future, irrespective of any national waste management targets. Firstly, changes in the coal industry have meant that opportunities at open-cast coal sites have been drastically reduced. Since the coal industry is now in the private sector, the provision of new landfill capacity will now depend entirely upon commercially driven decisions. Secondly, wide areas of the county are now affected by strict environmental protection measures to protect aquifers, particularly sand and gravels in the south and limestone in the west.
- 7.4 The effect of these two major changes is that increasing constraints on the supply of suitable landfill capacity are unavoidable, and it appears that shortfalls can be anticipated in some areas, if not generally. This trend has already led to increased transport costs for deliveries in some areas, in order to reach more distant sites.

The Effects of the Draft EU Landfill Directive

- 7.5 Constraints are also likely to be placed upon landfill provision by the effects of the European Union Directive on Landfill (Draft) which, if approved, will take effect in the year 2000. Basically, this is an attempt to level the playing field on standards throughout EU, and aims to protect the environment from the effects of landfill waste disposal. The main elements of the Draft Directive are:-

- ∃ Targets reducing the proportion of biodegradable waste in landfill.
- ∃ Reducing methane production to the atmosphere.
- ∃ The eventual banning of Aco-disposal and banning the landfill of tyres.
- ∃ Establishing the true cost of landfill by having to include the long-term costs of aftercare.

7.6 In line with the established waste hierarchy, landfill is seen as the least acceptable means of waste management and disposal, and the intention is to stimulate waste reduction re-use and recovery. The Directive sets national targets for reducing the biodegradable content of municipal waste going to landfill, as follows:-

- by 2006, to 75% of total biodegradable municipal waste produced in 1995
- 2009, to 50% of total biodegradable municipal waste produced in 1995
- 2016, to 35% of total biodegradable municipal waste produced in 1995

7.7 Member States such as the UK which, in 1995, put more than 80% of collected municipal waste into landfill, may put back these dates by four years under Article 5.2 of the directive.

Sub-Areas of Derbyshire

7.8 It is especially significant that the situation in different parts of the county varies greatly due to a number of factors, namely,

- ∃ population distribution
- ∃ geology
- ∃ transport infrastructure
- ∃ conservation constraints

Map 3 shows the towns over 10,000 population, areas where there may be geological potential for landfill disposal, the main road links and the National Park boundary. It illustrates how Derbyshire can be divided into three sub-areas which are determined by these factors, when considering the waste management and disposal needs of the county. It shows that the main contrast can be drawn between the more sparsely populated west of the county, with less than 20% of the population, and the eastern side of the county with more than 80% of the population. It also shows that the east of the county can be considered in two parts based on the two main concentrations of population centred on Chesterfield and Derby, respectively.

7.9 **The western sub-area** gives rise to less than 20% of municipal waste in the county, and a relatively small proportion of industrial waste. Much of the area lies within the Peak National Park and is therefore subject to particular conservation constraints. Because of environmental protection concerns, the geology of most of this area, would be suitable for receiving only inert waste at landfill sites. The transport links are clearly more limited in this area and this, combined with geological and conservation constraints, means that there is always the potential for

high costs of transporting waste to more distant facilities. Currently, municipal waste is transfer-loaded to sites outside the area because of a shortfall in local disposal facilities. These concerns particularly apply to the north west of the sub area where the towns are separated from the rest of the County by the Peak National Park. However, this area lies adjacent to the Greater Manchester conurbation offering potential for cross boundary flows of waste.

- 7.10 **The north-eastern sub-area** is centred on Chesterfield and is largely urban in character. Most of the area lies on the exposed coalfield and therefore, geologically, has the potential for providing landfill opportunities. The area gives rise to around 27% of municipal waste produced in the county and has good transport links for municipal and industrial arisings. Almost all the municipal waste arising in the sub-area is currently disposed of in this sub-area.
- 7.11 **The south eastern sub-area** is centred on Derby City and produces more than half of the county's municipal waste (around 55%). Part of the area lies in the exposed coalfield and therefore offers some potential, geologically, for the development of landfill sites. Transport links in the area are very good radially although, because of the size of the built-up area, accessibility across the area can sometimes be constrained. Most of the municipal waste is currently transferred out of the area for disposal.
- 7.12 Each of the three sub-areas have differing geographical characteristics and differing patterns of supply of and demand for landfill capacity. Based on current inputs to existing licensed facilities, Figure 5 illustrates this and indicates potential shortfalls on this basis. It is clear that the nature of the county and the different characteristics between the sub-areas will have to be taken fully into account in the development of alternative strategies.

Conclusion

- 7.13 Even disregarding national waste management targets, there is an imperative for change away from landfill disposal. The practical and regulatory constraints are substantial. However, the availability of landfill capacity will continue to be an issue in the foreseeable future because, firstly, major movement up the waste hierarchy is likely to take time to achieve in practice and, secondly, despite being at the bottom of the waste hierarchy, landfill will continue to be the best practical environmental option for some wastes. The importance of the proximity principle will mean that the different patterns of supply and demand for waste management facilities in different parts of the county, and the contrasting characteristics of those areas, will be key factors in considering how waste should be managed in both the short term and the long term.

CHAPTER 8 - WASTE MANAGEMENT METHODS

Introduction

- 8.1 Chapter 1 describes the principles of the Waste Hierarchy which established the government's priorities for achieving sustainable waste management in practice. All the available waste management methods can be placed somewhere on this hierarchy ranging from measures to reduce the quantity of waste produced in the first place, at the top of the hierarchy, to landfill disposal at the bottom. The challenge for any waste strategy is to manage waste using methods as far up the waste hierarchy as possible.
- 8.2 However, whilst this is valid as a general principle, the best practical environmental option (BPEO) will be different for different waste streams. The Environment Agency is investigating the scope for life cycle analysis of a range of waste management methods to determine the BPEO for different wastes. **This chapter provides a general summary of the various waste management methods available and a brief assessment of their advantages and disadvantages.** Most methods are applicable to the management of private sector and municipal waste although particular attention has been paid to the direct influence of local authorities on waste management which is restricted to the municipal sector.

WASTE MANAGEMENT METHODS

Minimisation of Waste

- 8.3 Waste Reduction is reducing the production of materials which will become waste, and Re-use is putting items back into use instead of throwing them away. They are taken together in this chapter under the heading of Minimisation because they are both concerned with minimising the quantities of waste generated, by preventing or delaying materials entering the waste stream.
- 8.4 Minimising waste is the most important priority in any waste strategy. Much of the responsibility for this lies with business and industry through what is actually produced and how it is packaged. The EU Packaging Directive has set a target for recovering 50-65% of packaging waste, with a recycling target of 25-45%. Local authorities can play a major role in waste minimisation through educational and promotional campaigns. These can aim to encourage householders to reduce waste, such as by buying unpackaged goods and recycled products and not throwing items away before the end of their useful life. Eventually this will have wider benefits, eg, by encouraging participation in waste recycling schemes, and by improving the market for recycled goods which will, in turn, assist recycling policies. It will, then help to complete the recycling loop.
- 8.5 Local Authorities can also encourage waste reduction among local business and industry by providing information pointing out the significant financial savings to be

made by reducing waste. Local authorities' own policies can shape the behaviour of households; for example, large wheeled bins offer advantages to householders but evidence suggests that they can redirect waste from other sources leading to an increase in the amount of waste to be collected by around 25%³.

- 8.6 A key difficulty in pursuing waste minimisation measures is that their effectiveness is not easy to measure with precision, and therefore their cost-effectiveness is also difficult to assess. It is unfortunate that, whilst it is now firmly established that minimising waste is the first priority of any waste strategy, no national targets have yet been set for making progress towards this objective. The government (in *AMaking Waste work*) gave a commitment to improving the available data on waste arisings and setting a target for waste reduction in 1998.

Home Composting

- 8.7 Home composting has been practised for many years by keen gardeners. Chapter 4 provides an outline of composting; it is the natural breakdown of organic waste in the presence of air to produce material which can be used to improve soil structure and enrich the soil. Organic waste includes kitchen waste, such as potato peelings and food scraps, and garden waste. Home composting can be encouraged through the sale of subsidised compost bins. Typically they cost around £30 and are sold to householders for between £10 and £15 in Derbyshire, although there are cases elsewhere in the country where bins have been provided free.
- 8.8 The benefits of home composting are considerable. Whilst it is actually a form of waste recovery because the waste is first produced and then put through a process, it is sometimes regarded as waste reduction because it is one of the most effective ways of reducing the quantity of waste collected and therefore has similar benefits to waste minimisation. This is emphasised by the Audit Commission (in *AWaste Matters; Good Practice in Waste Management*) which lists the advantages of home composting in the following terms:-

- ⊖ reducing waste for collection saves both collection costs and management/disposal costs
- ⊖ reducing the transport needed for collection and disposal also reduces the pollution and energy costs associated with it;
- ⊖ there is minimal ongoing expenditure after the initial capital outlay to purchase the bin;
- ⊖ no market is required for the end product; and
- ⊖ composting raises the overall environmental awareness of householders.

³ *AWaste Matters; Good Practice in Waste Management*, Audit Commission, 1997

It is acknowledged that there needs to be a large scale take up of home composting to obtain savings in pollution and energy costs associated with collection and disposal.

- 8.9 The same report also emphasises the significant environmental benefits of diverting organic waste from landfill. Once buried in landfill sites, organic waste has no access to oxygen and its decomposition results in the release of methane - a dangerous and potent global warming gas - and leachate - a noxious liquid that can lead to ground water pollution. The EU Directive on landfill sets tough new targets for progressively reducing the bio-degradable content of landfill waste over a time-scale similar to this strategy.
- 8.10 Home composting initiatives would assist in achieving these targets as well as being necessary to achieve the Government's target of ensuring that 40% of domestic properties with a garden carry out home composting by the year 2000. Measuring the actual quantities of household waste that is home composted as a result initiatives is more difficult but estimates are feasible through follow-up surveys and through monitoring changes in the collected waste profile. Home composting initiatives are not applicable to the management of private sector waste.

Recycling and Composting via Kerbside Collection

- 8.11 There are two main types of Waste Collection Authority recycling schemes available, kerbside collection schemes and Bring schemes, both involving the separation of waste at source; the latter type is discussed in the next section. With kerbside schemes materials are collected directly from the householder. Different ways of collecting are used, whether by using wheeled bins, plastic boxes, sacks or no container at all, and each method has its advantages and disadvantages. Any of these can be integrated with the refuse collection services; in general, integrated services offer financial and environmental benefits and the Audit Commission recommend that authorities moving to kerbside recycling schemes should integrate their refuse and recycling collections.
- 8.12 The average net cost per tonne (taking account of income and recycling credits) for kerbside schemes is £107, six times that for Bring schemes.³

However, the quantity of waste that is recycled is about double that for bring schemes. The cost-effectiveness of kerbside schemes depends upon a wide variety of factors but a key consideration appears to be the variable costs associated with particular materials. For example, on average, paper is the second largest component (after organic) of household waste, and the evidence indicates that a paper-only kerbside collection is the most cost-efficient. The evidence is also that the target to recycle or compost 25% of household waste is unlikely to be achieved without at least some kerbside collection schemes. However, schemes that do not incorporate effective public awareness programmes, clear instructions on how to participate and feedback to residents are likely to fail either through non-participation or because householders do not properly sort materials.

- 8.13 Some authorities have introduced kerbside collection schemes for organic waste with the organic material being taken to a centralised point for composting. This is convenient for the householder but there are the disadvantages that the materials can more easily become contaminated, the variability of the material makes it more difficult to produce a marketable product, and there are cumulative costs associated with collection and the centralised composting process. On balance the potential benefits of home composting are considered to outweigh those of a kerbside/central composting scheme. Kerbside collection is not applicable to Private Sector waste management.
- 8.14 The success of any recycling scheme is dependent on an available market for the material. The markets for glass, metals and textiles are fairly well established, while demand for plastics is in the early stages of development. The paper industry is subject to a cyclical market that is often very sensitive. The market for compost demands a good quality product although there are other productive uses for compost such as in-house uses. The impact of Private Sector recycling schemes may influence markets which in turn will affect Waste Collection Authority schemes.

Recycling and Composting via Bring/C A Sites

- 8.15 As the name suggests, Abring \cong recycling schemes involve members of the public sorting their own recyclables and bringing them to a collection site. Increasing the number of bring facilities can boost the level of recycling in an area and, on average, the cost per tonne, is one sixth of that for kerbside schemes. However, the quantity of recyclable materials that can be collected through bring schemes is limited and, on average, is about half that for kerbside schemes. This may be partly due to the proportion of households who do not have a car (still a large proportion, especially in the least affluent areas) and who cannot participate in bring schemes. Another consideration is that householders who make car journeys just to deposit recyclables are contributing to traffic congestion and air pollution.
- 8.16 As noted under the previous heading, most bring schemes are inexpensive in comparison with kerbside schemes, and increasing the bring site density to one per 750 households can be a cost efficient means of recycling. However, where bring schemes exist, the introduction of kerbside schemes is likely to reduce their use in respect of those materials involved, and therefore a co-ordinated and integrated

approach is required.

- 8.17 A Bring schemes can simply involve the provision of separate containers (igloos) on unsupervised sites, in accessible locations such as car parks and are usually provided by the Waste Collection Authority. In addition Waste Disposal Authorities have a duty to provide Civic Amenity sites where members of the public can deposit refuse free of charge at all reasonable times. They are located at secure sites that are supervised during opening hours. Generally, these sites receive separated green waste from the public and, increasingly, they encourage the separation of other waste materials. Civic Amenity Sites could be made available for use by the private sector (small businesses) to enable greater quantities of material to be recycled.
- 8.18 The success of any recycling scheme is dependent on an available market for the material as previously discussed in paragraph 8.14. Central composting schemes which use garden waste from CA sites are among the most successful and there is considerable scope for the development of central composting schemes of this kind. There can be problems with such schemes such as from odours, bacteria and fungi and leachate but these can be overcome with careful siting and good design and process control. There are also potential difficulties of limited markets for the final product. However, some councils have succeeded in packaging the compost and selling it back to the public as a soil improver and mulch, whilst others have made use of it in their own parks and gardens.
- 8.19 As with kerbside schemes, the success of bring schemes is dependent on effective publicity to encourage householder participation. Securing this involvement requires targeted educational and promotional campaigns, and ongoing publicity is required to reassure participants that their efforts are appreciated.

Waste Delivery Methods

- 8.20 There are two methods of municipal waste delivery from the Waste Collection Authority - direct delivery and transfer delivery. Direct delivery is the simplest and most cost effective over short distances, involving the delivery of waste in collection vehicles direct for treatment or disposal. Where longer distances are involved it is more economical for the waste to be transferred to bulk containers at waste transfer stations before delivery to the treatment or disposal facility. Waste Transfer stations require capital investment for their development but offer the opportunity of volume reduction, by compaction or the separation of waste materials.
- 8.21 Sites which carry out further separation or treatment of materials are commonly known as material recycling facilities (MRFs). They range widely in the size of the facility and the number of different materials that are handled. MRFs seek to add value to recyclables by processes such as sorting, washing and storing until a larger, more economical, quantity is obtained. There is clearly scope for combining the functions of MRFs and Waste Transfer stations with CA/bring sites in certain key locations and, where appropriate, for making some facilities available for use by the

private sector.

Central Accelerated Composting

- 8.22 Central composting in its simplest form has been mentioned under a previous heading (8.18). This involves treating collected organic waste by shredding it and allowing it to decompose naturally. Ensuring that there is the correct quantity of air, by turning the material regularly, is important and enables a good soil conditioner to be produced. This is a relatively low-cost alternative compared with other forms of central composting.
- 8.23 In an accelerated scheme, the natural breakdown of the organic material is encouraged by reducing the air available and increasing the temperature in a confined vessel. This option generally involves a substantial capital cost, perhaps upwards of ,1 million depending on the size of the plant, but provides a much increased throughput of material. It has the potential to provide a good quality product depending on a number of conditions, including adequate prior separation of contaminants. It would be particularly suitable for composting large quantities of green waste from the private sector.
- 8.24 Some proposals include a minimum of prior separation of non-organic materials involving an input which would comprise the bulk of the municipal waste system. As a result the quality of the product is in doubt and there are not, as yet, any working examples of such schemes from which helpful conclusions could be drawn. Whether schemes of this kind will help to contribute towards Arecovery≡ targets will depend upon the extent the product would be marketable, or at least capable of displacing the use of primary resources, such as peat, and whether the product would still be required to be managed as Awaste≡.

Energy-From-Waste - Anaerobic Digestion

- 8.25 Anaerobic digestion is a further development of the process described above. It involves the natural breakdown of organic material but in the absence of air. The result is a more complete breakdown of the material and the production of methane gas which can be sold or used to power turbines to produce electricity which can be sold to the national grid. The residue from the process, or Adigestate≡, can be used as a landsread for agricultural or horticultural purposes. The energy produced by this process may be sold to an initial guaranteed market for electricity if the scheme is accepted under the Non-Fossil Fuel Obligation (NFFO).
- 8.26 The viability of anaerobic digestion schemes improves with a larger throughput of material; hence it is appropriate for managing both private sector and municipal waste. A plant with a capacity of around 100,000 tonnes per year might involve a capital cost of around ,20 million, although a smaller plant could be built as a first step to confirm feasibility, and then expanded in modular fashion. The effectiveness of the system may also improve if prior separation of metals, glass and plastic is

carried out although precise thresholds in the composition of the feedstock are uncertain.

- 8.27 This method of waste management is used widely on the continent. Although there are, as yet, no working examples in this country, one or two schemes are proposed, eg, at Southampton, and several waste disposal authorities have established a preference, in principle, for anaerobic digestion in the longer term. A House of Commons Environment Committee Report on Recycling (1994) recommended that more encouragement should be given to EFW Anaerobic Digestion schemes.

Energy-From-Waste - Incineration

- 8.28 Incinerators have been used for many years to treat municipal and other (private sector) wastes, such as clinical and special wastes. Incineration can reduce municipal waste by up to 90% by volume and 50% by weight and requires a landfill site for disposal of the residue. It is therefore, like anaerobic digestion, a waste treatment method, not a waste disposal method. The incinerator plant can be designed to generate power or make use of the heat generated, or both. Schemes which combine both (Combined Heat and Power) offer far larger energy benefits than those which generate electricity alone or these without any form of energy recovery. The energy produced by this process may be sold to an initial guaranteed market for electricity under the Non-Fossil Fuel Obligation (NFFO) as previously referred to in paragraph 8.25.
- 8.29 Economies of scale apply to incinerator plants and, therefore, viability is likely to require long-term contracts for both the waste management and the energy production aspects. An incinerator is likely to cost between ,30m and ,40m and require an input of at least 100,000 to 200,000 tonnes per year, but can readily receive industrial and commercial waste. It therefore offers the potential of diverting private sector waste from landfill disposal. However, Incineration will always be needed for some clinical and special wastes. Owing to the need for large scale inputs, incinerators can discourage prior separation of materials such as paper and therefore work against waste minimisation initiatives; and because of the need for long-term contracts, reliance on incineration could restrict future disposal options. On the other hand, because energy can be recovered from a large proportion of the waste stream, national targets can be easy to reach.
- 8.30 The major disadvantage of incinerator plants is the perception that they produce harmful flue-gas emissions. However, since December 1996, when EU Directives came into effect, emission standards have been extremely stringent. Bottom ash from the furnace, and particularly fly-ash from the gas cleaning plants, contain pollutants including metals in a more mobile form than in the waste as delivered. Suitable landfill disposal facilities are needed for these wastes.

Disposal to Land

- 8.31 Landfill is the use of waste to fill voids in the ground. Around 70% of waste in the

UK is disposed of by this method. In a modern landfill site, waste is compacted into layers in a void that has been engineered with impermeable base and sides to enable emissions of methane gas and leachate to be controlled through extraction and treatment systems. Energy can be recovered from the methane if it is present in sufficient quantity and quality. While the volume of waste going to landfill remains large the recovery of energy from landfill will have a role in the generation of energy from waste. The future role of recovering energy from landfilled waste will be primarily one of ameliorating the impact of methane gas rather than large scale energy production.

- 8.32 Some landfill sites are licensed to receive only inert wastes which are mainly those arising from the Construction and Demolition Sector. Others, which receive biodegradable waste, can be engineered to encourage the decomposition processes to reduce the likelihood of leaving the site in a long-term, potentially active state. There are a few wastes which cannot be landfilled, namely, volatile liquids, or wastes which contaminate the leachate or interfere with the biological processes in the landfill site. Other potential environmental effects of landfill sites are odour, litter, vermin and dust, but most of these can be resolved through good working practices.
- 8.33 The cost of landfill disposal is rising and is likely to continue to rise steadily for a number of reasons:-
- ∃ the availability of suitable void space resulting from mineral operations is becoming scarcer due to changes in minerals industries.
 - ∃ increasing environmental restrictions on where landfill disposal is acceptable in order to protect ground water.
 - ∃ improving environmental standards at landfill sites including the reduction in organic content of waste, and an emphasis on comprehensive monitoring and long-term after-care.
 - ∃ landfill tax which, is forecast to increase progressively over the next decade.

There will always be a need for landfill in the future, at the very least for the disposal of residue from other waste management methods. However, the Municipal Waste Sector and Private Sector will have to share this diminishing and more costly void space.

- 8.34 Waste can also be used to build up or re-contour land in A land-raising schemes. These offer advantages in improved leachate control, but gas collection is more difficult than at below-ground sites. Clearly, the potential visual impacts of such schemes may be greater than landfill sites, although there are exceptions.
- 8.35 Agricultural wastes and by-products, for example, manure and slurry can be spread on land providing valuable nutrients which allow farmers to reduce the amount of inorganic fertilizer applied and can lead to improvement in soil structure. Similarly

sewage sludge and certain industrial wastes, for example, paper sludge and food processing waste may be spread on land beneficially. Provided that care is taken to avoid soil contamination from a concentration of some elements and the pollution of water, landspreading represents a potentially economic and environmentally-safe way of recovering value from organic waste.

A COMPARISON OF WASTE MANAGEMENT METHODS

- 8.36 A brief comparison of the available waste management methods is provided in Table 4. Consideration of the scale of investment in the first column relates to the total cost of schemes regardless of who would bear those costs. It shows a marked contrast between the methods in the top half of the table compared with those towards the bottom. On the one hand there are the relatively short term commitment, low cost, readily available options which can make an early impact in progressing towards national targets. On the other hand are the high cost, long-term commitment options which appear to have a high potential for progress in relation to national targets but on which there is insufficient available information to justify an early commitment to proceed.

Waste Management Method	Scale of Investment	Short/Long Term Commitment	Lead Time	Level of Available Information	Likely Changes in Technology	Potential for Progress Towards Targets	Waste Hierarchy
1. Minimisation	Low	Short	Short	High	No	N.A	{Reduction {Re-use }
2. Home Comp	Low	Short	Short	High	No	Low	
3. Kerbside	Med	Med	Short	High	No	Med	
4. Bring/C.A.	Low	Short/med	Short	High	No	Low	
5. MRF/Transfer	Med	Med	Short	High	No	Med	
6. Accel Comp	High	Long	Med	Low	Yes	Uncertain	}Recovery }
7. EFW an dig	High	Long	Long	Low	Yes	High?	
8. EFW inc	High	Long	Long	Med	Some	High	}Disposal
9. Landfill	Increasing	Med	Med/Long	High	No	None	

8.37 Nevertheless, a fully integrated approach, involving some energy from waste initiatives is likely to be necessary for major progress towards sustainable waste management. Fortunately, however, methods 1 to 5 in the table can be pursued without prejudicing any future decision on any long-term project, because their cost can be relatively low and the commitment can be relatively short term.

Conclusions

8.38 The conclusions to be drawn from the assessment in this chapter are, therefore, as follows:-

- ∃ The waste strategy should adopt a fully integrated approach to managing waste using a range of waste management methods and moving away from being dominated by landfill
- ∃ Methods 1-5 should be used to make an early impact on progress towards an Integrated Strategy.
- ∃ One or more of the methods 6 to 8 will be required in the longer term to secure a fully integrated strategy. However, as the lead-time for adopting the options 6 to 8 is potentially long (perhaps 5 years) research into these options should be actively pursued especially in view of the waste disposal contract period ending in 2005.
- ∃ Methods 1 to 5 should be used in combination; the most appropriate

combination is likely to vary and will depend upon the different characteristics in each sub-area and/or each District. However, in adopting any of these measures regard should be had to the emerging longer-term priorities and the need to maintain flexibility, eg, in terms of the length of contract periods.

- ☐ It should be acknowledged that some of the most effective and sustainable methodologies are difficult to measure in terms of progress towards targets, eg, waste minimisation initiatives and home composting. Whilst national targets are an important part of any waste strategy they cannot provide a complete picture of the most sustainable approach.

CHAPTER 9 - FINANCIAL ASPECTS OF WASTE MANAGEMENT

Introduction

9.1 Earlier chapters have highlighted certain financial aspects of waste management in relation to particular targets or objectives. These have concerned matters such as landfill tax, recycling credits and the overall scale of investment required to implement particular waste management methods. Both the Government's Sustainable Development Strategy and the White Paper *Making Waste Work* underline the importance of using the market as a way of achieving environmental aims. It is necessary therefore to review the effectiveness of the Government's market-based strategy in the context of the resources available to local authorities, and how this constrains what authorities can achieve.

Landfill Tax

9.2 The introduction of the landfill tax in October 1996 marked a significant strand of the market-based strategy. The tax applies to all waste disposed of at landfill sites at a standard rate of ,7 per tonne - increased to ,10 per tonne in April 1999 and due to be decreased by ,1 per tonne per year thereafter; a reduced rate of ,2 per tonne applies for inert waste.

9.3 The central purpose of the tax is to ensure that the cost of landfill waste disposal reflects its environmental impact thereby encouraging business and consumers to produce less waste, to recover value from more of the waste that is produced and to dispose of less waste in landfill sites ie: to encourage the management of waste by methods higher up the waste hierarchy. The expectation was that the landfill tax would be passed on, in full, to waste producers, making them aware of the true cost of their activities, in line with the polluter should pay principle.

9.4 However, this link with waste producers does not always operate. The tax can work as an economic incentive to reduce waste where the generators and disposers of waste are the same, as in the private sector. However, in the municipal sector the situation is quite different because the cost of the tax is borne by Waste Disposal Authorities who are not the generators of the waste and are not able to pass the tax on directly to those who are, as an encouragement to produce less and re-use and recycle more. The effect of this is that the off-setting savings are not made by the local authorities who are left with fewer resources to carry out the new initiatives necessary to provide for the more sustainable practices.

Environmental Trusts

- 9.5 Related to the landfill tax, and helping to re-inforce its objectives, is the Environmental Trusts Scheme which is funded through rebates of the tax. Whilst the tax aims to reflect the environmental costs of landfill, the trusts aim to promote sustainable waste management practices through environmental projects dealing with a wide range of matters including the remediation of closed landfill sites; research; pilot projects and training schemes. The trusts are non-profit distributing bodies and 10% of their funds are contributed by the waste management industry. There are early indications that the system of credits payable to environmental bodies will be very successful in terms of the response of the industry and the beneficial take-up of the funds.

Recycling Credits

- 9.6 Recycling Credits were introduced in April 1992 under Section 52 of the Environmental Protection Act 1990 and DoE Circular 4/92 sets out the purpose for their introduction and eligibility for making payments. The recycling credits scheme is an economic measure intended to encourage recycling and a consequent reduction in the quantities of waste requiring disposal. It is designed to ensure that any savings made by the Waste Disposal Authorities as a result of reduced disposal costs are passed on to the Collection Authorities, or others, who carry out the recycling. The intention is that the >full saving= made is passed through to the recycler as a way of encouraging the market, at no extra cost to the Disposal Authority.
- 9.7 In practice, however, this does not happen for two reasons:-
- a) the level of the credit has to reflect the highest-rate contract site used by the Collection Authority, and has to include any excess mileage payment that may be present. This credit rate applies to all claims even if only a small proportion of waste uses the high-rate site, and
 - b) so far, in Derbyshire, the system has not led to a corresponding saving in the actual waste disposal contract cost, although the reasons for this are not clear.
- 9.8 There are other ways in which the scheme can lead to higher than intended costs. Currently, the majority of claims for recycling credits are made in respect of materials deposited at bring sites. There is some evidence that some material deposited at these sites is from commercial sources but as the sites are unmanned, the amounts are unquantifiable. As recycling credits should be paid only in respect of household waste, any credits paid for these (unknown) quantities of materials from commercial sources would represent an unwarranted and unintended cost to the WDA. It is possible that this might partly explain the mis-match referred to in paragraph 9.7 (b) between the cost of recycling credits and any corresponding

saving in disposal costs.

- 9.9 It seems clear that the recycling credits system is not operating quite as originally intended and, as a result, is not fully achieving its objectives. It is hoped, therefore, that the system will, in due course, be revised to produce a more realistic and effective scheme. It is important, however, that the operation of the scheme is carefully monitored to ensure that the potential for the increasing costs of recycling credits is taken into account when considering the financial implications of recycling measures.

Future Waste Disposal Costs

- 9.10 As indicated earlier in this chapter, it is necessary to have regard both to the resources available to local authorities for implementing the strategy and to the possible future costs of any particular waste management measures. This can be illustrated by looking at the possible future costs of waste disposal in Derbyshire, based on a variety of assumptions.
- 9.11 The graph in Figure 6 shows the effects of certain assumptions regarding the growth in waste arisings and changes in recycling rates on the contract costs for the remainder of the waste disposal contract term, ie until the year 2005. Line G1 shows the expected costs of the waste disposal contracts at the time the contracts were awarded in 1994. It assumed a growth factor of 2% pa, an inflation rate of 3% pa and an increased recycling rate from 5% to 15% over the period. The 2% growth factor was based on population forecasts plus an element of flexibility to allow for fluctuations in the economy.
- 9.12 Line G2 shows the effect of changing the growth figure from 2% to a growth rate which accords with the household forecasts in Chapter 6 (and Appendix B). If however no further recycling takes place beyond current levels and the higher growth rate is maintained the costs are reflected in G3. The shaded area between G2 + 2LFT, G3 + 2LFT, shows the impact of doubling the rate of landfill tax to ,14/tonne compared with scenarios G2 and G3. Line G4 shows the effect of a reduction in quantities of waste for disposal in line with a 25% recycling and composting rate. It can be seen that this is the only scenario which shows a projected cost dipping below G5. Line G5 shows the existing Derbyshire budget for disposal contracts, increased in line with a realistic assumed growth in the overall local authority budget settlements (3% pa) over the remaining contract period.

Conclusion

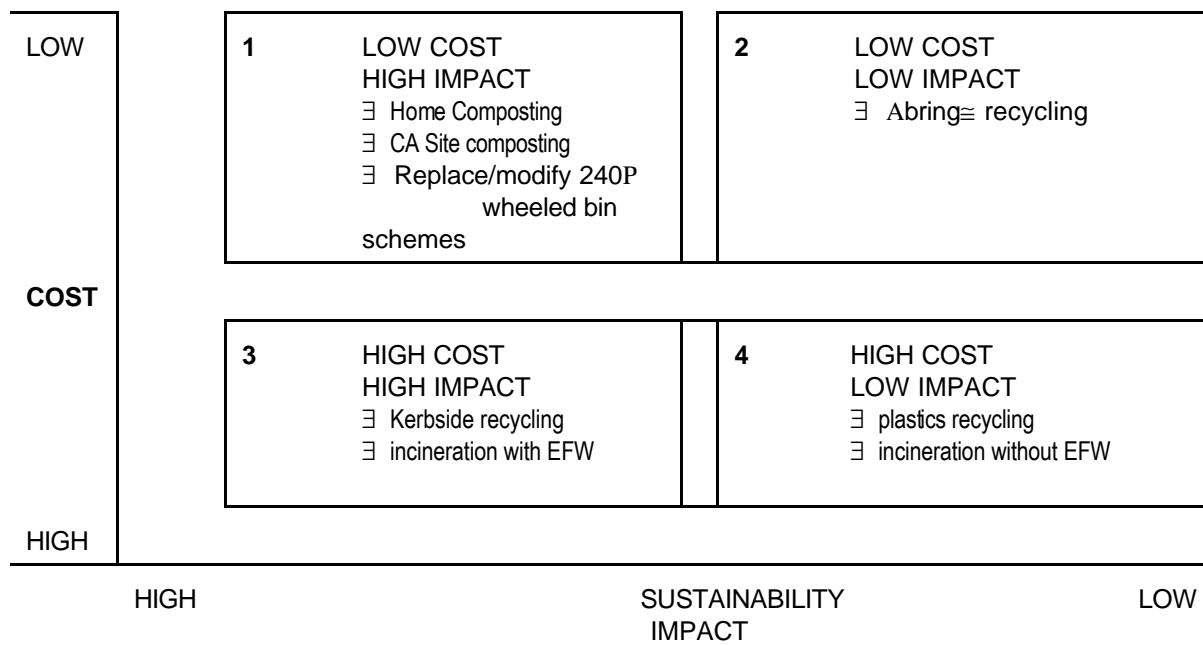
- 9.13 This chapter touches upon the potential difficulties that may be faced by local authorities in seeking to implement a more sustainable approach to waste management. The financial measures that have been introduced nationally aim to move waste management up the waste hierarchy. Whilst these measures have had some impact on recycling rates they appear to have had little discernible impact either on the quantities of waste requiring disposal or on the level of waste arising, notwithstanding the position of waste minimisation at the top of the hierarchy.
- 9.14 Clearly, any future strategy needs to reflect the position of waste minimisation and recycling in the hierarchy. Unfortunately the unintended effects of economic measures introduced so far have left authorities less well equipped financially to pursue these objectives. It should be remembered, however, that this strategy looks well beyond the existing contract periods to the period to 2011 during which there are certain to be many changes to the context for waste management including the probable introduction of more effective economic instruments. The aim should be to monitor all these changes and adopt a strategic approach which is sufficiently flexible to take them into account while maximising progress towards sustainable waste management.

CHAPTER 10 - A SUSTAINABLE AND INTEGRATED APPROACH

Introduction

- 10.1 Chapter 8 examined the alternative waste management methods available in developing a strategic approach. It is evident that each methodology examined has advantages and disadvantages and that some have implications for others. It is also clear that the balance of these considerations can vary between sub-areas and between districts, leading to different combinations in different parts of Derbyshire. It follows that what is called for is a complementary mix of methods, agreed to and adopted by the different authorities involved, in order to minimise the overall costs and maximise the environmental benefits, ie, a move towards an integrated approach.
- 10.2 The Audit Commission in its recent publication *A Waste Matters* (1997) examined the value for money of different methodologies and concluded that the practical alternatives of councils can be placed on a cost-sustainability matrix which suggests priorities for future strategies. These conclusions were reached after fieldwork analysis which developed earlier work of the Commission, and which looked at the experiences of a number of authorities, indicating what can be achieved.

FIGURE 7 COST - SUSTAINABILITY MATRIX



Audit Commission, 1997

- 10.3 The matrix indicates that the most cost-effective way of making an impact on sustainability objectives is likely to be to develop the programmes listed in box 1. This is broadly compatible with the assessments set out in Chapter 8. To make further progress towards sustainability objectives it is necessary to consider the alternatives in boxes 2 and 3, where the A_{cost} and A_{impact} are more in balance. Box 4 lists the programmes which the evidence suggests are, in general, the least cost-effective.
- 10.4 It should be emphasised that these are general conclusions and that the way these programmes are designed and implemented should draw upon experience gained locally and elsewhere; this is true in relation to the box 1 schemes, as well as the box 2 and box 3 schemes. Nevertheless, provided this is followed through, there appears to be a presumption in favour of adopting box 1 proposals and seriously considering box 2 and 3 proposals, depending upon local circumstances.
- 10.5 The main conclusion from Chapter 8 is that a dual approach is appropriate. Short-term measures should be adopted to make use of relatively low cost, programmes that can be implemented quickly to maximise early progress towards objectives; at the same time a long-term perspective is essential involving detailed research to enable decisions to be made on higher cost, long-term schemes in order to move towards a fully integrated approach.

Making an Early Impact

- 10.6 In the light of these findings measures should be implemented which:-
1. Make early progress towards waste minimisation and recovery targets by pursuing a cost-effective mix of measures which reflect local circumstances,
 2. Establish appropriate parameters for the contract process for new C.A. sites and for waste collection arrangements, and
 3. Encourage appropriate pilot schemes to test out the cost-effectiveness of innovative waste management schemes.
- 10.7 **The measures described in the following paragraphs are those which can make an early impact on sustainability objectives and which can be implemented in the short to medium term. This does not mean that their role is short term; on the contrary, there will be a long term need for measures of this kind.** Where and how they should be implemented will depend on local circumstances and will evolve both in the light of experience and in response to the implementation of longer-term schemes and a more fully integrated approach.

Drawing upon the assessments in Chapter 8 and the conclusions of the Audit Commission's Cost-Sustainability Matrix, the following programmes appear to offer good potential for achieving these aims:-

- ☐ Waste Minimisation and Public Awareness
- ☐ Home Composting
- ☐ C A Site Composting
- ☐ Kerbside and bring schemes co-ordinated to maximise benefits and minimise costs.
- ☐ Flexible provision of Waste Transfer Sites and C A Sites.
- ☐ Recovery of energy from Landfill.

Waste Minimisation and Public Awareness

- 10.8 Waste minimisation is the most important priority in any waste strategy because it is the most sustainable approach. Whilst the biggest responsibility of this lies with business and industry which, in Derbyshire generates 78% of estimated total waste arising, local authorities can make a major contribution to both reducing the quantity and the hazardousness of waste requiring disposal. This can be done through public awareness campaigns and through local authorities policies.
- 10.9 Public awareness campaigns can change householders' purchasing habits for example by encouraging the purchase of more unpackaged, longer life, re-useable and concentrated products; in appropriate amounts, in refillable containers, and avoiding single-use disposable products. As public awareness is also an essential component in all recycling schemes if they are to maximise their success, it will be more cost-effective to ensure that these campaigns are co-ordinated.
- 10.10 The traditional dustbin and sack system has been gradually replaced by the wheeled bin system in all but one collection authority in Derbyshire. These are two and a half times the capacity of traditional bins. They are popular with householders for their capacity and with collection authorities for improved efficiency/safety/hygiene of collection, but they usually result in increased overall waste arisings. However, this effect can be off-set by the benefits of separate kerb-side waste collection when this is integrated with normal refuse collection.
- 10.11 **Waste minimisation measures:-**
- ☐ **adopt educational programmes and public awareness campaigns which aim to:-**
 - a) **encourage waste minimisation practices,**
 - b) **target both householders and businesses and,**
 - c) **complement recycling programmes.**

§ **consider modifying the provision of wheeled bins by:-**

- a) **integrating the system with separate collection of materials, or**
- b) **gradual replacement with smaller bins as part of the longer term integrated system (240R bins replaced with 140R bins).**

Home Composting

10.12 The advantages of home composting are set out in the previous chapter as follows:-

- ☐ reducing waste for collection saves both collection costs and management/disposal costs
- ☐ reducing the transport needed for collection and disposal also reduces the pollution and energy costs associated with it;
- ☐ there is minimal ongoing expenditure after the initial capital outlay to purchase the bin;
- ☐ no market is required for the end product; and
- ☐ composting raises the overall environmental awareness of householders.

It is acknowledged that there needs to be a large scale take up of home composting to obtain savings in pollution and energy costs associated with collection and disposal. A further concern is the difficulty in measuring the quantity of waste that is home composted although this is feasible through careful monitoring.

10.13 Home composting initiatives are required in order to work towards the government=s target of 40% of domestic properties with a garden to carry out home composting. To come close to achieving this by the target year 2000 will require major initiatives. On average, organic waste makes up about 20% of household collected waste, nationally, (20 to 30% in Derbyshire) and some local authorities that have introduced home composting programmes have been successful in reducing collected waste for those households involved, for example, Havant (15%), Adur (3.2kg per week) and some Lancashire Districts (15%).

10.14 It is clear from local experience that it will not be realistic to expect to achieve these results in all areas. Whilst the potential success of schemes may vary widely between different areas, the way that home composting is introduced will also determine its success. Therefore, to maximise the impact of schemes it is necessary both to target areas effectively and to implement schemes with the right preparation, promotion, service support and monitoring measures. On this basis, the Audit Commission=s Cost - Sustainability Matrix includes home composting as a low cost, high impact option and it is clear that priority needs to be given to it in order to aim for the Government=s targets.

10.15 **Home Composting measures should aim to:-**

- ☐ **Carry out initial survey work to assess residents knowledge of, and interest in carrying out, composting and to identify areas to be targeted.**
- ☐ **Make available subsidised composting bins combined with a variety of public education techniques and a back-up service to assist with queries.**
- ☐ **Employ some form of follow-up measurement to evaluate the success of the scheme.**
- ☐ **Consider measures to enable recycling credits to be paid, drawing on the experience of other authorities where this has been done.**

Civic Amenity Site Composting

10.16 Garden waste is by far the largest component in C A site waste- on average more than 50% nationally. This results in a reasonably uniform source of green waste which enables the most successful central composting schemes to be established at C A sites. Such schemes are compatible with home composting initiatives and offer a choice to householders who may find the more bulky garden waste difficult to compost at home. Experience elsewhere is that the potential difficulty of marketing the product can be over-come by obligations written into the C A Site contract. C A site composting appears as a relatively low cost, high impact option in the cost-sustainability matrix, though schemes will need to be fully evaluated in the light of the factors discussed in Chapter 8 including the need to minimise the environmental effects of car journeys.

10.17 **C A Site Composting Measures**

- ☐ **To cost and consider the introduction of green waste composting schemes at C A sites.**
- ☐ **Ensure that C A site contracts are written to include, where appropriate, obligations to manage waste sustainably and incentives to minimise the amount of waste delivered from the site for disposal.**
- ☐ **Consider public awareness initiatives to promote the use of facilities.**

Kerbside and Bring Schemes

10.18 The Cost-sustainability matrix indicates that bring schemes have a low cost and

low impact, and kerbside schemes have, relatively, a high cost and high impact. However, as set out in Chapter 8, there are many variations of each type of scheme including the level of provision, the mix of materials and form of collection. The costs and performance of each type of scheme varies and their effectiveness can be influenced by local circumstances; for example, the composition of the waste stream, the physical geography and socio-economic factors, such as the level of car ownership and the tradition of open fires in the home vary considerably within different parts of the County. It may be that local circumstances would justify the kerbside collection of compostable waste delivered to a central composting scheme.

10.19 The aims should be to provide an optimum combination of schemes to ensure that Waste Collection Authorities obtain the best value for money for their level of investment and local conditions.

10.20 **Kerbside and Bring Scheme Measures to be considered:-**

§ **Collect particular materials only if markets exist and it is considered financially worthwhile to do so.**

§ **Co-operate with surrounding authorities to negotiate long term materials contracts.**

Bring Schemes

§ **Aim to provide one bring site per 750 households.**

§ **Ensure that sites are conveniently located - for example, close to homes, at shopping centres or along bus routes.**

§ **Ensure that containers are emptied regularly and that the site is well maintained.**

§ **Provide litter bins on site for the collection of plastic bags or boxes used to deliver materials.**

§ **Use a variety of techniques to ensure a high level of resident awareness and understanding - for example, local press advertisements, mailshots and local meetings.**

Kerbside Schemes

- § **Consider integrating kerbside recycling with the refuse collection service.**
- § **Provide clear instructions on how to participate and how to improve the efficiency of services- that is, minimise material mixing to ease sorting; leave containers where they are easy to see and collect.**
- § **Conduct trial collections in order to identify problems and resolve them at an early stage.**
- § **Ensure a reliable service with procedures for rectifying missed collections.**
- § **Provide feedback to residents to maintain participation.**

Waste Transfer, CA Sites and Recycling Centres

- 10.21 Transfer stations provide a link between the source of the waste and the point where it is managed or disposed of; they are justified when there are long distances between these points. They enable the collection Authority to deliver waste a reasonably short distance and enable the waste to be bulked-up for onward delivery more cost-effectively. They are, therefore particularly useful in areas where there is a shortage of landfill disposal capacity such as Western Derbyshire.
- 10.22 To comply with the Environmental Protection Act 1990, the Waste Disposal Authority is required to provide sites (Civic Amenity Sites) for members of the public to deliver their household waste free of charge. Compared with WCA bring sites, C A sites have the advantage of being manned and the ability to take a wider range of household waste. In 1996; there were just 7 civic amenity sites in Derbyshire (see Map 2 Chapter 5). Since then the site at Birchwood has closed, leaving only 6 sites contracted to year 2000.
- 10.23 Historically it has been noted that Civic Amenity sites can provide a service over an area of approximately 7 miles radius, but this distance needs to be much less in more densely populated areas to minimise traffic movement and cope with larger arisings. It is important to establish an appropriate provision of sites taking into account the need to reduce the length and number of car journeys and find locations accessible to people dependent on public transport. Both these factors point to the desirability of locations close to town centres or on radial routes to town centres.

10.24 However, CA sites were conceived at a time before the principles of sustainable waste management were developed. The term Civic amenity site, never the most helpful in reflecting even the original function, is now an anachronism. A much more flexible approach - and more helpful term - is called for.

10.25 What is now required is the provision of facilities - **Recycling Centres** - which will fulfill not only the statutory functions of civic amenity sites but which can also respond to the waste management needs of their area. As well as providing for the public to deliver their household waste, Recycling Centres should be organised and managed to receive pre-separated recyclable materials and to carry out materials separation. They should also, in appropriate locations, be designed so as to be capable of operating as transfer loading facilities (eg in the western sub-area) which would complement the waste separation arrangements on the site.

10.26 **Recycling Centres and Waste Transfer Measures:-**

§ **To aim to provide recycling centres to ensure that 90% of the population are within a maximum 7 mile radius of a site, and to aim to locate them close to urban centres to maximise the number of people living within a radius of much less than 7 miles.**

§ **When existing C A site contracts are reviewed new contracts should aim to implement the more flexible approach of Recycling Centres.**

§ **To aim to provide an additional 4 to 6 sites in the areas of Whaley Bridge, Chapel-en-le-Frith, Matlock, Ashbourne, Clay Cross and Bolsover, over and above the existing CA site provision.**

X **To aim to provide at least one delivery point for collected waste within each Collection Authority's area.**

Energy from Waste - Landfill

10.27 The predominance of landfill in the waste management hierarchy in recent times means that landfill will be a part of an integrated approach for some time. Sites accepting biodegradable wastes, particularly Municipal Waste sites have for some time incorporated measures to control landfill gas by flaring and venting to atmosphere and for production of electricity, where financially viable.

10.28 Improvements in technology and operating procedures can improve the performance and recovery of energy from landfill gas, although this will not be as efficient as the more technologically controlled methods such as Incineration or Anaerobic Digestion. Further use of landfill disposal should:-

§ **maximise the recovery of energy from landfill gas, and**

- § **have the highest standards of environmental protection which secure stabilisation of the site within a reasonable timescale.**

Developing a Fully-Integrated Strategy

- 10.29 Chapter 8 concluded that major progress towards sustainability in waste management would not be achieved without a fully integrated strategy, ie; a strategy which adopts the best practical combination of all available waste management methods reflecting sustainability aims, cost-effectiveness and sensitivity to local circumstances. It also established that whilst some measures can be implemented in the short term to make an early impact on sustainability aims (as described in more detail in this Chapter) other measures, which will be necessary in order to maximise that impact, will have higher cost, involve longer-term commitments and require much more detailed investigation before they can be adopted.
- 10.30 The key factor in the decision making process on these longer-term options is the time-scale for the renewal of the existing waste disposal contracts which terminate in February 2005. It should be borne in mind that the lead-time for these options, can be as much as 5 years following a decision to proceed, and that such decisions must be based upon a thorough and detailed technical investigation of all the available options. It will therefore be necessary to make an early start on the pre-tender process for the new waste disposal contracts to ensure that:-
- ∃ contracts are awarded in the light of the best available information, based on BPEO and the concept of Best Value.
 - ∃ no options are ruled out because of insufficient lead-time.
- 10.31 This means that options will need to have been identified, researched and evaluated by the beginning of year 2000. This research can be brought into the tendering process by inviting potential contractors to put forward a number of costed options aimed at satisfying general parameters or, alternatively, tenders could be invited on the basis of more detailed requirements. However, in either case, it will be necessary to move quickly into this process during 1998.
- 10.32 At the same time the short-term measures identified previously in this chapter, which can make an early impact on strategic objectives, will need to be taken into account, evaluated and adapted in the light of the emerging preferred longer-term options. In this cyclical way, a fully-integrated approach can be developed. It is considered however, that this can only be achieved by taking local circumstances into account, preferably by collection and disposal authorities working together at sub-area level; this is discussed further in Chapter 11.
- 10.33 Earlier chapters have acknowledged the need to have regard to the Government's national policy objectives for achieving more sustainable waste management, including the waste hierarchy (with associated targets), the need to seek the best practical environmental option for each waste type, and the Proximity principle. This chapter has established the importance of identifying

cost-effective measures, in terms of sustainability aims and in light of local circumstances, and of achieving a fully-integrated approach.

POLICY 1 : A SUSTAINABLE AND INTEGRATED STRATEGY

10.34 THE WASTE COLLECTION AND DISPOSAL AUTHORITIES IN DERBYSHIRE WILL ADOPT AN INTEGRATED STRATEGIC APPROACH TO THE MANAGEMENT OF CONTROLLED WASTE, HAVING REGARD TO THE NATIONAL AND REGIONAL WASTE STRATEGIES AND THE NEED TO MAXIMISE PROGRESS TOWARDS SUSTAINABLE WASTE MANAGEMENT. IN PARTICULAR, WASTE WILL BE MANAGED:-

1. ACCORDING TO THE FOLLOWING STRATEGIC HIERARCHY OF PRIORITIES:-
 - A. MINIMISING THE PRODUCTION AND USE OF MATERIALS THAT WILL BECOME WASTE.
 - B. RE-USING PRODUCTS TO PREVENT OR DELAY THEM BECOMING WASTE.
 - C. RECOVERING VALUE FROM WASTE BY RECYCLING, COMPOSTING AND ENERGY RECOVERY TECHNIQUES.
 - D. SAFE DISPOSAL OF WASTE MATERIALS.

AND

2. USING AN INTEGRATED COMBINATION OF METHODS WHICH WILL BE DETERMINED BY:-
 - I) THE BEST PRACTICAL ENVIRONMENTAL OPTION FOR INDIVIDUAL WASTE TYPES.
 - II) THE PRINCIPLE THAT WASTE SHOULD BE MANAGED AND DISPOSED OF IN PROXIMITY TO WHERE IT ARISES.

- III) THEIR COST-EFFECTIVENESS IN THE LIGHT OF LOCAL CIRCUMSTANCES, AND
- IV) THE LEVEL OF FINANCIAL RESOURCES AVAILABLE.

CHAPTER 11 - SUB-AREA STRATEGIES

The Need for A Sub-area Approach

- 11.1 Earlier in this document, the differences in characteristics between the different parts of Derbyshire were highlighted. Chapter 7, in particular, describes differences in population concentrations, geology (in so far as it influences the potential for landfill disposal), the availability of good transport links, and the major conservation constraints associated with the Peak National Park. It will be noted from Map 3 that these sub-areas broadly correspond to groupings of local authorities as follows:-

Western Derbyshire : Derbyshire Dales District Council
High Peak Borough Council

North-Eastern Derbyshire : Chesterfield Borough Council
North East Derbyshire District Council
The District of Bolsover

South-Eastern Derbyshire : Derby City Council
Amber Valley Borough Council
Erewash Borough Council
South Derbyshire District Council

- 11.2 Chapter 10 provides guidance on the waste management measures which would enable an early impact to be made on sustainability objectives. They were identified as those which, in general, have good potential and could be implemented in the short term, but it was noted that whether, or how, they should, in practice, be implemented in any particular area should be determined by local circumstances. This is because of the factors referred to in the previous paragraph but it is also justified because of marked differences in the composition of waste in different parts of the county (waste profiles) which should be taken into account when considering the appropriateness of particular measures.
- 11.3 An assessment of household waste profiles (Appendix C) shows a number of significant variations between different sub-areas of the county. For example, although in the south east of the county around 20% of the municipal waste stream is Aorganic≡ (kitchen and garden waste), as much as 30% is organic waste in western Derbyshire. Also of particular note is the presence of ash and dust in only the north east and south east of the county. This probably reflects the legacy of concessionary coal, and hence coal fires, and could explain the low paper content found in the waste arisings in the north east of the county. Other socio-economic factors which vary between sub-areas, such as levels of car ownership, can also influence the relative effectiveness of particular schemes. In fact, the level of affluence appears to affect the overall level of waste arisings which in 1996/97 varied on average from 0.98 tonnes in north eastern Derbyshire to 1.15 tonnes in western Derbyshire, indicating that the potential for minimisation and materials

recovery may be greater in the western sub-area.

- 11.4 Similarly, when considering ways of moving towards a fully-integrated strategy in the longer term, the characteristics of each of the three sub-areas identified will be the key factors in determining the preferred solutions. Certainly, for the more capital intensive schemes, the proximity principle and the size of the main concentrations of population, and therefore the quantities of waste arisings in each sub-area are likely to be critical to the cost-effectiveness of options. This will be affected both by the forecast household waste arisings (see Appendix B) and by the future quantities of commercial and industrial waste which are likely to be greatest in the south-eastern and north-eastern sub-areas, respectively.
- 11.5 It should, therefore, be an essential part of the strategic approach to waste management in Derbyshire that, after the preparation of this document, detailed strategies should be prepared for each of the three sub-areas identified. These sub-area strategies will put forward local measures which reflect local priorities and aim to put into practice the principles set out in Policy 1, ie, for making an early impact on sustainability aims and for developing a fully-integrated strategy.

Working Arrangements

- 11.6 The advantage of working at sub-area level is that it will enable the involvement of all the authorities with a responsibility for waste management in putting forward joint proposals for their areas. In the past, waste collection and disposal authorities actions have not always complemented each other. It is an important part of an integrated strategy that different authorities need to work together to develop mutually acceptable and complementary waste management programmes.
- 11.7 It will, for example, provide the opportunity for each Authority to have an input, through the sub-area strategies, to all the contracts involved in managing the waste in their areas, and the size of the partnerships will enable the Recycling Officers to be directly involved in finding the best ways to implement the strategic principles established in this document. It would be appropriate for the County Council to provide a co-ordinating role to ensure compatibility, as well as to develop appropriate linkages, between the emerging sub-area strategies. It will be necessary to maintain joint officer working arrangements county-wide to secure this co-ordination and it will be for the authorities in each of the sub-areas to establish appropriate arrangements for developing proposals for their areas.
- 11.8 These arrangements may, furthermore, provide the opportunity for financial benefits. In order to counter the financial and statutory constraints on their activities, local authorities should seek partnerships with other organisations, including the private sector, voluntary organisations and adjoining authorities where appropriate. The aim should be to exploit the potential for economies of scale whether in the purchasing process (equipment technology or services required for waste management) or in the marketing process (for selling materials recovered). The potential for partnerships with the private sector, which facilitate the use of private

capital to fund waste management schemes in return for guaranteed revenue over time, should especially be explored. The sub-areas should provide a credible basis on which these partnerships could be focused. On a different level, working with Voluntary Organisations should also encourage the widest possible awareness and involvement of community groups and individuals in sustainable waste management practices.

POLICY 2 : SUB-AREA STRATEGIES

11.9 THE WASTE COLLECTION AND DISPOSAL AUTHORITIES IN THE WESTERN, NORTH-EASTERN AND SOUTH-EASTERN SUB-AREAS OF DERBYSHIRE, WILL ESTABLISH PARTNERSHIP ARRANGEMENTS FOR MANAGING WASTE IN EACH SUB-AREA. THESE PARTNERSHIPS WILL BE CO-ORDINATED BY THE COUNTY COUNCIL AND WILL BE RESPONSIBLE FOR PREPARING SUB-AREA STRATEGIES WHICH WILL:-

1. PUT INTO PRACTICE THE PRINCIPLES ESTABLISHED IN THIS DERBYSHIRE STRATEGY,
2. REFLECT LOCAL CIRCUMSTANCES AND PRIORITIES,
3. MAKE AN EARLY IMPACT ON SUSTAINABILITY GOALS,
4. SEEK THE BEST COMBINATION OF ALL AVAILABLE WASTE MANAGEMENT METHODS FOR THE LONGER TERM IN ORDER TO ADOPT A FULLY-INTEGRATED APPROACH, AND
5. ESTABLISH THE SUB-AREA PRIORITIES WHICH SHOULD GUIDE THE TENDERING AND CONTRACT PROCESSES FOR ALL WASTE MANAGEMENT CONTRACTS.

CHAPTER 12 - MONITORING AND REVIEW

The Need for a Monitoring Strategy

- 12.1 This strategy seeks to put into practice the principles of sustainable waste management, and provides a framework for taking decisions in line with these principles. It is imperative, however, that these decisions are based on sound information, and on an adequate understanding of the existing situation, the likely future changes and the options available for responding to these.
- 12.2 As emphasised at the beginning of this document, this is a period of change in waste management which presents authorities with many uncertainties, but also opportunities for achieving environmental and other objectives. For this reason, a flexible approach has been adopted through the development of sub-area strategies in order to respond to changes and take advantage of new ideas and opportunities. An essential part of this flexible approach must be the establishment of a process of regular monitoring and periodic review.

Annual Monitoring Reports

- 12.3 This document has drawn together information on the quantities of waste arising and disposal of by categories which are relevant to the strategy. It also sets out details of the recycling and composting schemes which are operated by each collection authority and outlines the composition of the waste that is collected in each area, ie the waste profiles. However, the document has also pointed out a number of short-comings in this data. Some information necessary for making accurate assessments has not been available and it will be necessary to improve this situation in the future. It will also be necessary to collect this information, as soon as it is available each year in order to be aware of any changes that are taking place, and to enable authorities to respond effectively through the strategy.
- 12.5 Annual monitoring reports should, therefore, be produced early in each financial year, based on up-to-date information on waste arisings during the previous year. Initially, data can be drawn together by the sub-area working groups and then collated for the whole county. This will provide a basis for reviewing the effectiveness of waste management measures in operation and for deciding how these, and any new measures under consideration, should be developed. It will also enable the contribution that Derbyshire is making towards national targets to be measured.
- 12.6 The preparation of the first Annual Monitoring Report in 1999 will provide an important input to the preparation of the Sub-Area Strategies and the tendering process for the new Recycling Centre (C.A Site) contracts. In subsequent years the findings of the monitoring reports will provide a basis for reviewing the sub-area strategies.

Review of the Strategy

12.7 At a more general level, it will be important to monitor the wider circumstances regionally, nationally and at EU level, which will have a bearing on the future management of waste in Derbyshire.

These include:-

- changes in European legislation;
- publication of the national and regional waste surveys and strategies;
- changes in national legislation, or planning policy guidance relating to waste;
- new technical knowledge on waste management methods including new research and development of energy-from-waste technologies;
- new advice on Best practice based on the experience of authorities elsewhere.

12.8 When it becomes apparent that one or more of these changes has altered the overall context of the strategy it will be necessary to carry out a review to consider whether, and how, the strategy should be modified. The examples listed above have the potential to require modifications to the strategy either at county or sub-area level.

POLICY 3 : MONITORING AND REVIEW

12.9 THE WASTE COLLECTION AND DISPOSAL AUTHORITIES IN DERBYSHIRE WILL MONITOR, ON A REGULAR BASIS:-

1. THE QUANTITY AND NATURE OF WASTE ARISING AND DISPOSED OF IN DERBYSHIRE,
 2. THE EFFECTIVENESS OF MEASURES IN OPERATION TO MANAGE THIS WASTE,
 3. THE AVAILABILITY OF NEW OR DEVELOPING WASTE MANAGEMENT METHODS,
 4. ANY CHANGES IN THE OVERALL CONTEXT OF THE STRATEGY, WHETHER NATIONALLY, REGIONALLY OR LOCALLY.
- THE AUTHORITIES WILL CARRY OUT REVIEWS OF THE STRATEGY, AND/OR THE SUB-AREA STRATEGIES, WHEN THIS IS JUSTIFIED BY CHANGES IN AVAILABLE INFORMATION OR CIRCUMSTANCES.

APPENDIX A

GLOSSARY OF TERMS

Aggregates -	Sand and gravel and crushed rock used by the construction industry.
Anaerobic Digestion -	A process where biodegradable material is encouraged to breakdown in the absence of air. Material is placed into an enclosed vessel and in controlled conditions the waste breaks down into >digestate= and biogas.
Best Practical Environmental Option -	The least damage or most benefit to the environment at the most acceptable cost in the short and long-term.
Biodegradation -	The breakdown of materials by the action of micro-organisms.
Bring Sites -	Locations at which free-standing containers are placed for the public to deliver recyclable materials.
Central Composting -	Large-scale schemes which handle kitchen and garden waste from households and which may also accept suitable waste from parks and gardens. Schemes may rely on aerobic methods (see composting) or use anaerobic digesters.
Civic Amenity Waste -	A sub-group of household waste, normally delivered by the public direct to sites provided by the Waste Disposal Authority. Consists generally of bulky items such as beds, cookers and garden waste as well as recyclables.
Clinical Waste -	Waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practices, which may present risks of infection.
Colliery Spoil -	The waste shales and clays removed from coal during processing (normally from deep-mined coal).
Commercial Waste -	Waste arising from premises which are used wholly or mainly for trade, business, sport, recreation or entertainment, excluding household or industrial waste.

Composting -	An aerobic, biological process in which organic wastes, such as garden and kitchen waste are converted into a stable granular material which can be applied to land to improve soil structure and enrich the nutrient content of the soil.
Construction/Demolition Waste -	Arises from the construction, repair, maintenance and demolition of buildings and structures. It mostly includes brick, concrete, hardcore, subsoil and topsoil, but it can also contain quantities of timber and metal.
Controlled Waste -	This comprises household, industrial, commercial and clinical wastes, etc, which require a Waste Licence for treatment, transfer or disposal. The main exempted categories comprise mine, quarry and farm wastes. Radioactive and explosive wastes are controlled by other legislation and procedures.
Cover -	Material used to cover wastes tipped at a disposal site. Daily cover is used at the end of each working day to prevent odours, wind-blown litter, and insect or rodent infestation. The final cover is the layer, or layers, of material placed on the surface of the disposal site during its reclamation.
Decomposition -	Breakdown of matter into more simple chemical forms. Decomposition may be caused by physical, chemical or micro-biological action.
EC Directive -	A European Community legal instruction, which is binding on all member states, but must be implemented through the legislation of national governments within a prescribed timescale.
Energy Recovery or Energy From Waste -	Many wastes are combustible; general industrial and commercial waste has a calorific value of approximately 25% of that of coal. Some companies with high proportions of combustible wastes such as wood, have introduced in house incineration with energy recovery. Currently the investment required is considerable and could prove to be a barrier for many smaller companies, although new, small >clean= waste incinerator based energy recovery units and power gasifiers are being developed which may help

to overcome this problem.

Environment Agency -

Established in April 1996, combines the functions of WRA=s the NRA and HMIP. Intended to promote a more integrated approach to waste management and consistency in waste regulation. The Agency will conduct a national survey of waste arisings and waste facilities. The Agency will also be responsible for preparing a statutory waste strategy (see below) for the purposes of Article 7 of the EC Framework Directive on waste.

Home Composting -

Compost can be made at home using a traditional compost heap, a purpose-designed container, or a wormery.

Household Waste -

This includes waste from household collection rounds, waste from services such as street sweepings, bulky waste collection, hazardous household waste collection, litter collections, household clinical waste collection and separate garden waste collection, waste from civic amenity sites and wastes separately collected for recycling or composting through bring/drop off schemes, kerbside schemes and at civic amenity sites.

Incineration -

Is the burning of waste, either to reduce its volume, or its toxicity. Energy recovery from incineration can be made by utilising the calorific value of paper, plastic etc to produce heat or power.

Current flue-gas emission standards are very high. Ash residues still have to be disposed of to landfill. See also >Energy from Waste=.

Industrial Waste -	Waste from any factory and from any premises occupied by an industry excluding mines and quarries.
Inert Waste -	Waste which, when deposited into a waste disposal site, does not undergo any significant physical, chemical or biological transformations and which complies with the criteria set out in Annex III of the EC Directive on the Landfill of Waste.
Kerbside Collection -	Any regular collections of recyclables from premises, including collections from commercial or industrial premises as well as from households. Excludes collection services delivered on demand.
Landfill Sites -	Are areas of land in which waste is deposited. Landfill sites are often located in disused quarries. In areas where there are limited, or no ready made voids, the practice of land raising is sometimes carried out; this is where some or all of the waste is deposited above ground, and the landscape is contoured.
Landspreading -	Is the spreading of certain types of waste onto agricultural land for soil conditioning purposes. Sewage sludge and wastes from the food, brewery and paper pulp industries can be used for this purpose.
Leachate -	Liquor formed by the action of water percolating through soil, waste or rock. It may contain substances which would pollute ground water.
Licensed Site -	A waste disposal or treatment facility which is licensed under the Environmental Protection Act for that function.
Methane Gas -	Biodegradable wastes within landfills produce a mixture of flammable and asphyxiating gases produced by the anaerobic breakdown of biodegradable wastes in a landfill site. Principal constituents are methane 63.8%, carbon dioxide 33.6% and nitrogen 2.4%.

Mineral -	Rock or other material which has a commercial value for which it may be extracted. (A planning, not geological, definition).
Minerals Planning Guidance	Government Policy Statements on a variety of Notes (MPGs) - minerals/waste planning issues to be taken as material considerations, where relevant, in deciding planning applications.
Minimisation -	Achieving as much waste reduction as possible. It can be within a manufacturing process involving the review of production processes to optimise utilisation of raw materials and re-circulation processes. It can be cost effective, both in terms of lower disposal costs, reduced demand for raw materials and energy costs. It can be carried out by householders through home-composting re-using products and buying goods with reduced packaging.
Municipal Waste -	This includes household waste and any other wastes collected by a Waste Collection Authority, or its agents, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of fly-tipped materials.
Organic -	Any substance containing carbon and hydrogen derived from living animals.
Recycling -	Involves the reprocessing of wastes, either into the same product or a different one. Many non-hazardous industrial wastes such as paper, glass, cardboard, plastics and scrap metals can be recycled. Special wastes such as solvents can also be recycled by specialist companies, or by in-house equipment.
Recycled Aggregates -	See Aggregates.
Re-Use -	Can be practised by the commercial sector with the use of products designed to be used a number of times, such as re-useable packaging or use of waste materials for other process.

Householders can purchase products that use refillable containers or re-use plastic bags. The processes contribute to sustainable development and save raw materials, energy and transport costs.

Separate Collection -

Kerbside schemes where materials for recycling are collected either by a different vehicle or at a different time to the ordinary household waste collection.

Special Waste -

Is defined by the Control of Pollution (Special Wastes) Regulations 1980 as any controlled waste that contains any of the substances listed in Schedule 1 or is dangerous to life or has a flash point of 21°C or less, or is a medicinal product as defined by the Medicines Act 1968.

Sustainable Development - Development which is sustainable is that which can meet the needs of the present without compromising the ability of future generations to meet their own needs.

Tonnes -

1 Tonne = 1,000 Kg (0.984 tons).

Treatment -

Involves the chemical or biological processing of certain types of waste for the purpose of rendering them harmless, reducing volumes before landfilling or recycling certain wastes.

Unitary Authority -

A Local Authority which has the responsibilities of both Collection and Disposal Authorities, which in this County refers to Derby City Council.

Waste -

Is the wide ranging term encompassing most unwanted materials and is defined by the Environmental Protection Act 1990 Section 75 and Controlled Waste Regulations 1992. Waste includes any scrap material, effluent or unwanted surplus substances or article which requires to be disposed of because it is broken, worn out, contaminated or otherwise spoiled. Explosives are excluded.

Waste Collection Authority -

A Local Authority charged with the collection of waste from each household in its area on a regular basis. Can also collect, if requested, commercial and industrial wastes from the private sector.

Waste Disposal Authority - A Local Authority charged with providing disposal sites to which it directs the Collection Authorities for the

disposal of their controlled waste, and with providing civic amenity facilities.

In Derbyshire this means;
Derbyshire County Council
Derby City Council

Waste Hierarchy -

First published by the UK Government in the Sustainable Development Strategy 1994. The Hierarchy is intended to be used as a guide to encourage more sustainable waste management practices, and to minimise the amount of waste produced. The hierarchy is as follows, in order of preference:

- 1) Reduction
- 2) Re-Use
- 3) Recovery, including
 - i) recycling and composting
 - ii) energy recovery (through burning waste or utilising landfill gas)
- 4) Disposal, by incineration/landfill without energy recovery.

More waste management practices should move up the waste hierarchy, although this should be in a measured manner and should be governed by the principle of using the best practical environmental option (BPEO).

Waste Strategy -

The Government's waste strategy for England and Wales was published in December 1995. The Strategy aims to apply the principles of sustainable development to waste management. It is not a statutory document, but is meant to pave the way for a statutory national waste strategy to be produced by the Environment Agency and will replace waste management plans drawn up under Section 50 of the EPA 1990.

The draft strategy contains a number of indicative targets intended to guide the development of waste management plans. These are summarised in Chapter 1 of this document.

Waste Transfer Station -

A site to which waste is delivered for sorting prior to transfer to another place for recycling treatment or disposal.

List of Abbreviations -

BPEO - Best practical environmental option.
COPA 1974 - Control of Pollution Act 1974.
DOE - Department of the Environment.
EFW - Energy from waste.
EPA 1990 - Environmental Protection Act 1990.
LAWDC - Local Authority Waste Disposal Company.
MRF - Material Reclamation Facility.
MSW - Municipal Solid Waste.
NFFO - Non Fossil Fuel Obligation
PFA - Pulverised Fuel Ash.
RCV - Refuse Collection Vehicle
WCA - Waste Collection Authority.
WDA - Waste Disposal Authority.
WRA - Waste Regulation Authority.

APPENDIX B

Forecast Household Waste Arisings 1996 - 2011 by District and Sub-Area

DERBYSHIRE - Districts

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	TOTAL
High Peak	40,500	40,945	41,391	41,836	42,282	42,727	43,161	43,596	44,029	44,464	44,898	45,336	45,773	46,211	46,648	47,087	700,885
Derbys Dales	32,900	33,228	33,556	33,883	34,211	34,539	34,864	35,190	35,517	35,842	36,168	36,490	36,812	37,134	37,457	37,779	565,570
Chesterfield	43,000	43,396	43,792	44,187	44,583	44,979	45,375	45,770	46,166	46,560	46,956	47,352	47,748	48,143	48,538	48,934	735,479
North East	36,600	36,935	37,269	37,603	37,937	38,272	38,603	38,934	39,265	39,596	39,927	40,256	40,584	40,913	41,241	41,570	625,504
Bolsover	31,200	31,559	31,918	32,278	32,637	32,996	33,353	33,710	34,067	34,424	34,781	35,140	35,499	35,859	36,218	36,577	542,213
Amber Valley	51,200	51,724	52,248	52,773	53,297	53,821	54,306	54,791	55,277	55,763	56,248	56,717	57,185	57,654	58,122	58,591	879,714
Derby	102,700	103,637	104,574	105,511	106,449	107,386	108,317	109,249	110,182	111,114	112,045	113,041	114,037	115,031	116,027	117,023	1,756,324
Erewash	41,100	41,493	41,886	42,278	42,672	43,064	43,414	43,763	44,113	44,462	44,811	45,154	45,497	45,841	46,184	46,527	702,260
South	32,300	32,745	33,189	33,633	34,078	34,523	34,966	35,411	35,855	36,299	36,743	37,183	37,624	38,065	38,506	38,946	570,067
TOTAL	411,500	415,661	419,823	423,983	428,146	432,307	436,359	440,413	444,470	448,524	452,577	456,669	460,758	464,852	468,941	473,033	7,078,016

DERBYSHIRE - Sub-Areas

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	TOTAL
Western	73,400	74,173	74,947	75,719	76,493	77,266	78,025	78,786	79,546	80,307	81,066	81,826	82,585	83,346	84,105	84,865	1,266,455
North Eastern	110,800	111,889	112,979	114,068	115,158	116,247	117,331	118,413	119,497	120,580	121,663	122,747	123,830	124,914	125,997	127,081	1,903,197
South Eastern	227,300	229,598	231,898	234,196	236,495	238,793	241,003	243,214	245,427	247,638	249,847	252,096	254,343	256,592	258,839	261,087	3,908,364
TOTAL	411,500	415,661	419,823	423,983	428,146	432,307	436,359	440,413	444,470	448,524	452,577	456,669	460,758	464,852	468,941	473,033	7,078,016

APPENDIX C

Household Waste Analysis

The profile of waste found in the average household bin varies considerably between different parts of the Country and also between the three sub-areas identified in Derbyshire. It is important to establish the type and quantity of material generated per household because this will influence the choice and success of recycling schemes.

Waste profiles have been compiled for the three waste strategy sub areas in Derbyshire based on information quoted in District Council Recycling Plans as shown in the table below. Figures based on a national survey, as quoted in the Audit Commission's Report 1997, are also shown for comparison.

Household Waste Analysis % by Weight

%	North Eastern Sub Area	South Eastern Sub Area	Western Sub Area	Audit Commission Report
Paper	17	32	27	33
Glass	6	10	10	10
Metal	7	8	8	7
Textiles	2	4	4	2
Plastics	5	7	8	11
Organic	25	20	30	20
Ash/Dust	17	5	-	-
Unclassified	23	15	15	17

On average the dominant component of waste is paper suggesting that recycling schemes should focus on this material. Of particular note is the presence of ash/dust in the north eastern and south eastern sub areas reflecting the legacy of concessionary coal and hence coal fires. This could also be the reason for the low paper content found in the north eastern sub area.

Organic material is also present in large quantities, this can be composted via bring/kerbside or home composting schemes.

APPENDIX D

Waste Arising Per Household

The amount of waste generated per household varies considerably between different parts of the Country and also between the three sub-areas identified in Derbyshire. The Audit Commission Report 1997 quotes research that suggests wealthier households can generate up to 50% more waste than less affluent households. Waste arisings per household have been calculated for the three waste strategy sub-areas for the year 1996/97, as shown in the table below.

Waste Arisings Per Household by Sub Area (1996/97)

North Eastern	South Eastern	Western
0.98	1.04	1.15

Figures in Tonnes

The figures support the theory that the most affluent areas produce the most waste. Waste minimisation schemes could most appropriately be targeted at the western sub area. Equally this area has the potential to recycle the largest quantities of material. Most affluent areas also tend to have more garden space, making home composting a more viable option.

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Taken from H:\H2\FP642.WPD (Converted May 2001)

PF/BS/12LN/AB

28 April 1999