

MUNICIPAL WASTE MANAGEMENT STRATEGY

STRATEGY DOCUMENT



by

SLR CONSULTING LIMITED

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FOREWORD

Pembrokeshire County Council is committed to improving the quality of life of local communities and to achieving sustainable development. The Council has set out a number of strategic aims in the Joint Unitary Development Plan and this includes conserving and enhancing the environment.

The development of a Municipal Waste Management Strategy, in line with the requirements of the Welsh Assembly Government, provides the basis for establishing how the Council will meet the various waste reduction and recycling targets established in national policy documents.

This Municipal Waste Management Strategy for Pembrokeshire considers the current situation of waste management in the Authority. It outlines how much waste is being produced and how the Council intends to reduce and recycle it. The strategy provides details of the waste reduction and recycling targets and what measures will be taken to achieve them. The strategy also explains how the Council will combat litter and address other related environmental issues. Waste minimisation is central to reducing the amount of waste produced in Pembrokeshire, and this will be a priority for the Council over the next few years.

Importantly, the document also addresses how everyone can participate in developing and implementing the strategy as the Council cannot achieve the goals alone.

The thoughts and opinions of a range of consultees, and the wider community, will be sought as well as those of the private sector. It is important that the strategy is acceptable to businesses, voluntary organisations and individuals, so as to ensure that this integrated approach to managing waste proves to be a success.

CHAPTER 1 – EXECUTIVE SUMMARY

1.1 BACKGROUND

The management of municipal waste is one of the most important and challenging environmental issues facing Wales. The National Waste Strategy for Wales (*‘Wise about Waste’*), which was published in June 2002, sets a challenging programme of change over the next 10 years, which will alter fundamentally the way waste is managed throughout Wales. It is essential therefore that each local authority in Wales prepares its own detailed plans for managing municipal wastes in line with the national strategy.

It is the aspiration of both the Welsh Assembly Government (WAG) and the Welsh Local Government Association (WLGA), that in the future, municipal wastes in Wales will be managed in ways that not only protect the environment and human health but also provide economic and social benefits. This Municipal Waste Management Strategy for Pembrokeshire will contribute significantly to meeting this aspiration and ensure that municipal waste is managed in a truly sustainable manner.

In preparing this strategy for Pembrokeshire the focus has been on adopting the Waste Hierarchy (see Figure 1.1).

Figure 1.1 - The Waste Hierarchy



Waste reduction is at the top of the hierarchy. To date in Wales (and elsewhere in the UK) the principal focus has been on the recycling of waste. However, it is simply not sufficient merely to find different ways of dealing with the waste we produce. As a priority we must aim to produce less in the first place.

Second in the hierarchy is the reuse of waste, which essentially involves using a product over and over again. If the product regarded as waste is no longer suitable for reuse, it may still contain materials of value that can be recovered through recycling, composting or treatment with energy recovery.

Only when all of the other levels of the waste hierarchy have been maximised, should disposal of material be considered. Various European Union Directives limit the amount and type of residual material that is permitted for landfill. However, regardless of the method of waste management applied, there will always be a need for landfill for those elements of the waste stream that cannot be further re-used, recycled, composted or otherwise treated.

The **‘Best Practicable Environmental Option’** (BPEO) is widely accepted as the key concept for assessing waste management options and facilities. This strategy for Pembrokeshire has therefore been developed within the context of the following:

- The Waste Management Strategy for Pembrokeshire County Council which was completed by SLR Consulting Limited in March 2001, and which included a simplified BPEO analysis to determine the preferred way forward at that time.

- The recently (March 2004) completed Regional Waste Plan for South-West Wales which was derived using a modified version of the BPEO which incorporates social and economic factors in order to determine the Sustainable Waste Management Option (SWMO).

In summary, the BPEO is defined as:

The option that provides the best overall solution taking into account specific local circumstances, social and economic aspects, as well as impacts on the environment.

1.2 PREFERRED STRATEGY

The preferred strategy for Pembrokeshire, which is in line with the Best Practicable Environmental Option (BPEO) and Sustainable Waste Management Option (SWMO) identified for the South-West Region of Wales, is as follows:

Expansion of recycling and reuse schemes for municipal waste such that the waste strategy targets for each of the target years of 2006/07 and 2009/10 are met and in fact exceeded. All residual waste would be sent to a Mechanical Biological Treatment (MBT) plant (it is considered necessary that a degree of flexibility in the management of the residual waste stream is required and options should remain for any of Mechanical Biological Treatment, energy from waste or landfilling). Continued landfill of waste residues will be required.

The strategy focuses on meeting specific targets set over the next 15 years or so but, realistically, cannot look in detail anywhere near this far ahead. Changes in legislation, taxation and attitudes to waste, dictate that a regular review of detail will therefore be necessary every 3 years.

The strategy for Pembrokeshire will comprise a number of key elements, as follows:

- **Waste minimisation** is central to reducing the amount of waste produced in Pembrokeshire, and this will be a priority for the Council over the next few years. A key initiative is the planned introduction of home composting units to 30,000 households across the County, with the intention of using this as a means of raising the public's awareness of other waste minimisation initiatives. This will be a national home composting pilot scheme aimed at evaluating the potential for waste minimisation and to provide a basis for inclusion of home composting in recycling/composting targets
- Introduction and development of **kerbside collection schemes** for dry recyclable materials (initially, from March 2004, as a pilot scheme for dry recyclables serving 3000 households, to be reviewed after 12 months). It will be necessary to develop these schemes on a progressive basis over the period up to 2009/10 (and beyond) in order to achieve the level of diversion required to meet the various targets. The kerbside collection of organic wastes will also be considered, along with the development of an in-vessel composting plant.
- Improvements to the **Civic Amenity and Recycling Centre** provision across the County to facilitate better access to the principal population centres and increased diversion of materials for recycling and reuse.

- Enhancement of the existing network of **‘Bring Sites’**, to include the provision of a number of strategically located community based recycling centres, particularly in the more rural areas of the County.
- Seeking to maintain and, where appropriate, expand existing **partnerships with community groups** which have proved to be very effective to date.
- Development of **in-County composting facilities for green waste**.
- Developing infrastructure for the **in-vessel composting of kerbside collected kitchen derived organic wastes** in line with the Animal By Products Regulations.
- Development of **Materials Recycling Facility (MRF) infrastructure and services** to deal with recyclable materials diverted at the kerbside and at Civic Amenity and Recycling Centres and ‘Bring Sites’. Procurement of a MRF within the County is currently actively being pursued by the Council, with the intention that a facility will be operational during 2005.
- Identifying appropriate **markets for reuse and reprocessing of materials** segregated from the municipal waste stream (where possible and practicable these should be locally based).
- Identifying appropriate **waste handling and treatment infrastructure for residual waste** (i.e. materials that are not segregated for recycling and composting). Further treatment of residual waste will be required by 2010, or soon thereafter in order to meet the European Union Landfill Directive biodegradable municipal waste (BMW) diversion targets.

It should be noted that there will be a need for the disposal to landfill of some residual wastes over the full duration of the strategy. The quantity of waste sent to landfill will reduce significantly up to 2010 and beyond. Ongoing access to landfill capacity will therefore need to be secured in the long term (currently the Council has access to Withy hedge Landfill site, just north of Haverfordwest, operated by Resources Management (UK) Limited).

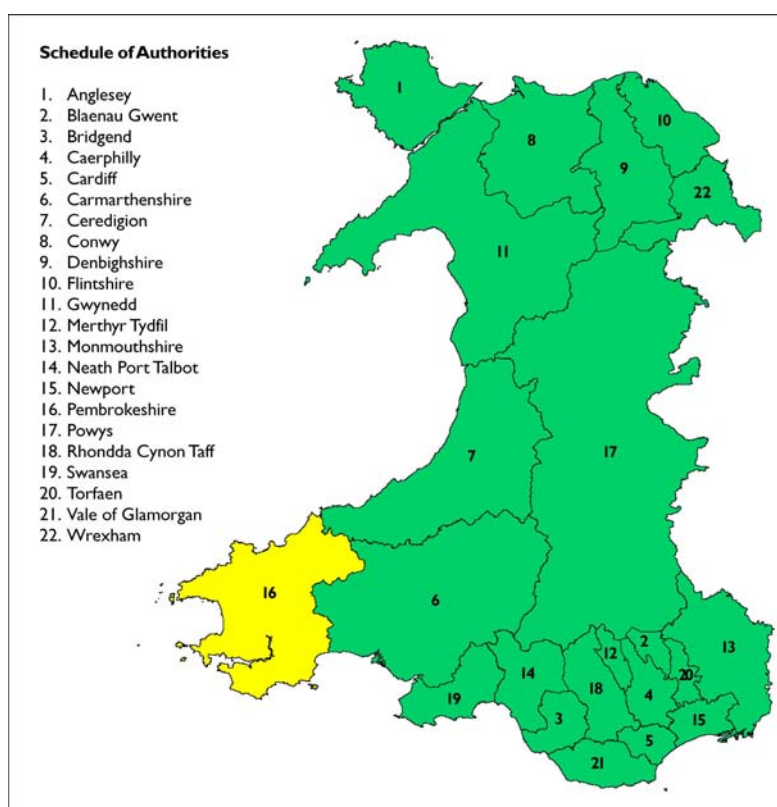
CHAPTER 2 – PEMBROKESHIRE IN CONTEXT

2.1 GEOGRAPHICAL MAKE UP

The County of Pembrokeshire (see Figure 2.1) covers a total land area of 165,018 hectares, which includes the Pembrokeshire Coast National Park. The area is largely rural in nature, with the most significant upland areas (Mynydd Preseli) in the north-eastern part of the County, where the mountains rise to over 1,500 feet above sea level.

The road network within the County is limited, with the principal trunk roads into the County being the A40 and A477 (from Carmarthen and South Wales beyond) and the A487 (from Cardigan and Mid-Wales beyond). All roads within the County are single carriageway. There is a main line railway connection from South Wales with links to Fishguard, Milford Haven and Pembroke Dock.

Figure 2.1: Map of Wales



2.2 POPULATION

Published population figures and projections (December 1998 data for input to the JUDP) are summarised overleaf in Table 2.1. It can be seen from these data that over the next 20 years the overall population is predicted to increase by approximately 5,000 (equivalent to a 4.4% increase above the current population). It should be noted that these projections do not take into account the increases in population that resulted from boundary changes introduced in April 2003.

The 2001 Census of Population indicated that the overall population of the County was 112,900, which is approximately 2.0% below the projected figure for 2001, but it is assumed that the general trend is for an increase in population of around 5,000 (4.4%) over the period of the strategy, part of this increase being taken up by population increases caused by the County boundary changes referred to above.

Town and Community Council populations vary significantly, from 13,129 (2001 Census) in Milford to under 158 in Castlemartin. Of the 80 current Town and Community Council areas 53 have a population less than 1,000. With the exception of more urban Town Council areas the more densely populated Community Councils tend to be located in the south of the County.

Tourism data indicate some 1.187 million tourist trips to the County in total, of which some 94% were UK tourists. This equates to around 5.2 million overnight stays in Pembrokeshire, broken down as follows:

- 38% staying in caravans/camp sites
- 16% in hotels and other serviced accommodation
- 23% in self-catering cottages
- 19% in the homes of friends and relatives
- 4% other

The data indicate that over 76% of the trips were made over the 7 month period from April through to October, with the Peak months being May, July and August.

Table 2.1: Population Projections for Pembrokeshire

Year	Population Projection
1996	113,598
2001	115,246
2006	116,249
2011	117,362
2016	118,820

(Ref: UDP Working Paper Trend Based Population and Household Projections, Dec 1998)

2.3 PLANNING CONTEXT

2.3.1 Local Planning Framework - Unitary Development Plan

The overall planning context for future development within Pembrokeshire is provided by the emerging Joint Unitary Development Plan (JUDP), as deposited between 24th May 2002 and 5th July 2002. The local public inquiry commenced in January 2004. The Plan is approved for development control purposes and will continue to be used in the determination of planning applications and appeals. In its current form the policies relating to waste are limited to the following:

- Policy 121 Hazardous Waste
- Policy 122 Disposal of Inert Waste
- Policy 123 Recycling
- Policy 124 Waste Recovery Facilities

At a local level there will be a need to ensure that any future development associated with implementation of the Municipal Waste Management Strategy is consistent with policies set out in the Joint Unitary Development Plan. Any waste related development will be required to satisfy a number of key criteria, most of them related to environmental impact and sustainability. Depending on the nature and scale of the development any new waste related development may need to be subject to the rigours of Environmental Impact Assessment (as part of the planning process) and Pollution Prevention and Control (PPC) permitting or waste management licensing.

When assessing the suitability of potential sites for waste treatment/disposal use the main issues to consider will be as follows:

- Possible conflict with planning policy(ies)
- Visual intrusion
- Conservation (protection of habitats, SSSIs, etc)
- Impact on historical and archaeological sites
- Pollution
- Traffic impact
- Access and accessibility
- Nuisance (noise, smell, litter, dust, etc.)
- Need for restoration and aftercare
- Preference for the use of derelict land

2.3.2 Regional Waste Plan

The Regional context for the management of waste within South-West Wales is provided through the Regional Waste Plan, prepared in line with the requirements of Planning Policy Wales Technical Advice Note 21: Waste (TAN 21), and which provides a regional framework for the management of waste into the future. The Plan was agreed by the Regional Member Forum on Friday 28th November 2003 and was recommended to each of the eight local planning authorities across the region for endorsement. All eight planning authorities have now endorsed the Regional Waste Plan and the Member Forum formally accepted the Plan at a meeting on Friday 27th February 2004. The Plan has now been formally submitted to the Welsh Assembly Government.

The Plan addresses a number of waste streams, of which municipal waste is but one. The intention is that the Plan will inform decisions at local authority level and allow further development of Unitary Development Plans so as to include specific allocation of potential sites for provision of the infrastructure that will be required to manage waste over the period to 2020.

Further consideration of the conclusions of the Regional Waste Plan, and in particular the approach to waste management that has been identified as the 'Best Practicable Environmental Option' and 'Sustainable Waste Management Option' for the Region and how this influences the future management of municipal waste in Pembrokeshire, is given in later chapters of this document. The Plan itself can be viewed on line by accessing the following web page:

http://www.walesregionalwasteplans.gov.uk/swales/sw_regional_waste_plan.html.

In summary, the preferred option for dealing with waste in the Region has been identified as:

Option 6: 'Do More' (MBT led strategy). This option attempts to achieve the 2020 Landfill Directive target in 2013 principally through maximising recycling and composting levels with all remaining residual wastes being sent to MBT. The additional diversion of residual wastes through MBT ensures the 2020 BMW Landfill Directive target is met and in fact exceeded.

CHAPTER 3 – WASTE MANAGEMENT TODAY

3.1 DESCRIPTION OF EXISTING SERVICE DELIVERY

3.1.1 Household Waste Collection

The Council has a statutory duty as a Waste Collection Authority to collect household waste, as required by the Environmental Protection Act 1990. No charge can be made for this service except in prescribed cases (such as bulky household waste collections).

Waste collection is currently undertaken throughout Pembrokeshire by the Council's Municipal Services Section. The following are the key features of the service:

- Waste is collected weekly from approximately 55,000 households
- Waste is collected in black bags which are supplied by the Council; each household is supplied with 75 bags each year
- A green bag collection for garden waste is also provided on a chargeable basis for those householders not able to take green waste to a Civic Amenity and Recycling Centre (bags can be purchased from local Council offices). Green bags are collected along with the normal black bag collection and the charges are levied on a cost recovery basis.
- There are two principal depots – the main one in Milford Haven, and a second at Feidr Castell in Fishguard
- The majority of waste collected from households is undertaken using refuse collection vehicles (RCVs), and delivered direct to Withy hedge Landfill. A small proportion (estimated at just under 1400 tonnes per year) is collected from the more rural parts in the north of the County using caged vehicles and delivered to the Civic Amenity and Recycling Centres at Hermon, Manorowen and St. Davids. Here the collected waste is deposited into the compactor units at each of the sites for onward transfer to Withy hedge Landfill.

3.1.2 Commercial Waste Collection

The Council's Municipal Services Section, under the current arrangements, also provides a commercial waste collection service, where the Council has been requested to provide that service. Collections are provided on a weekly or twice weekly basis, and currently some 1630 premises are served (using blue bags, 660 litre or 1100 litre blue Euro bins). There are also a number of private sector operators who offer a service to commercial customers in the Council's area.

The charging mechanism for the collection of commercial waste is on a cost recovery basis. The charges for 2004 (excluding VAT) are as follows:

- | | |
|------------------------------------|--------|
| • Blue sacks (packs of 50) | £14.96 |
| • 660 litre bin hire, charge/week | £0.75 |
| • 660 litre bin emptying charge | £5.80 |
| • 1100 litre bin hire, charge/week | £0.94 |
| • 1100 litre bin emptying charge | £7.16 |

3.1.3 Kerbside Collection Schemes

Pembrokeshire County Council is committed to increasing recycling and in March 2004 a 12 month pilot kerbside collection scheme commenced. This scheme collects dry recyclable materials, in translucent orange bags, from just over 3000 households in Pembrokeshire. At the end of the twelve month period, and based upon the success of the scheme, a decision will be made on the preferred method or methods for introduction of a kerbside collection scheme across the Authority area.

The pilot is taking place in the following areas:

- **Urban Areas:** Hakin, Milford Haven
- **Rural Areas:** Freystrop Cross, Hook, Pill Road, Furzy Hill, Nash Road, Llangwm, Blacktar, Guildford, Ashdale Lane, Sardis, Troopers Inn Road, Johnston Road, Rosemarket, Waterston, Coombes Road, Black Bridge, Barnlake, Burton, Houghton, Hill Mountain.

The orange bag collection scheme currently accepts:

- Newspaper and magazines
- Office paper
- Junk mail (e.g. flyers, brochures)
- Plastics (Bottles, tubs, pots and carrier bags)
- Steel and aluminium cans and tins (e.g. drinks cans, food tins and pet food tins, empty aerosols)
- Cardboard (e.g. cereal, detergent and other similar boxes)
- Directories (Telephone Directories and Yellow Pages)
- Catalogues

The orange bags are collected on the same day as the black bag waste in separate vehicles and delivered to Carmarthenshire Recycling's Material Recycling Facility at Johnstown, Carmarthen.

3.1.4 Waste Handling and Disposal

The Council has a duty as a Waste Disposal Authority to arrange for the disposal of all municipal waste arising within Pembrokeshire that isn't separated for recycling or composting.

There is a Contract in place with Resources Management (UK) Limited (RML) for the disposal to landfill of residual (i.e. non-recycled) wastes collected by Pembrokeshire's Municipal Services Section. The Contract, dated 6th June 1997, is for a 10 year period (with a commencement date of 1st June 1997). The operational landfill is located at Withyhedge to the North of Haverfordwest.

The Contract is on an exclusive basis for all wastes handled by the County Council, but with the following exclusions:

- Recyclable materials extracted by the Council prior to delivery for disposal at the landfill.
- Inert waste arising from construction, demolition and excavation works.

3.1.5 Civic Amenity and Recycling Centre Provision

The Council currently has in place a network of six Civic Amenity and Recycling Centres. Four of these sites, in the northern part of the County, are operated by Pembrokeshire County Council, with operation of the two in the south of the County currently under Contract to Shanks Waste Solutions. The Contract with Shanks Waste Solutions was originally for a 7 year period up to 2002, but has since been extended. In the medium term the Council intend to find replacements for these two Civic Amenity and Recycling Centres, and for these to be operated by the Council.

The six site locations are as follows (See Figure 3.1, at the end of this document, for locations):

South of County

- Salterns, Tenby
- Waterloo, Pembroke Dock

North of County

- Winsel, Haverfordwest
- Manorowen, Fishguard
- Hermon
- St. Davids

Facilities at each site vary but typically include recycling bins for a range of materials, bulk storage bins (for waste to be deposited to landfill), bulk storage compactors (at the four PCC operated sites, for waste delivered to landfill) and green waste receipt and storage (with some sites having shredding and mulching on site or on adjacent land).

The sites serve two key functions:

- they provide residents of Pembrokeshire with facilities for the disposal of household waste that is too large to be disposed of through the normal refuse collection service; and
- they provide residents with facilities for the deposit of recyclable and compostable materials (green waste).

3.1.6 Community ‘Bring’ Sites

A network of community based recycling centres has been developed across the County. There are currently 66 individual centres with facilities ranging from a single glass, paper or can bank to a full range of multiple banks (glass, paper and magazines, cans and textiles).

A schedule of recycling centre locations, together with details of the provision at each location, is included in the accompanying technical appendices document (Appendix 1).

3.1.7 Bulky Household Waste Collection

The Council provides a collection service for bulky household items from domestic properties. Such items might include fridges, freezers, cookers, washing machines, three piece suites and other items of furniture. A charge is levied depending on the type and number of items to be collected.

Any fridges that are collected, or that are delivered to Civic Amenity and Recycling Centres, are transferred to Evans Logistics, where they are safely dismantled and recycled.

In May 2003 the County Council signed a Memorandum of Understanding with FRAME, a charity which provides training opportunities for people with, or recovering from mental ill health. Within the terms of the Memorandum, FRAME have undertaken a pilot scheme for the collection and refurbishment of bulky household items on behalf of the Council. An appraisal of the pilot scheme has been undertaken during the summer of 2004 and, subject to a satisfactory outcome of the review, it is hoped that the work undertaken as part of the pilot scheme will form the basis of a partnership between the two organisations.

3.1.8 Clinical Waste Collection Service

Clinical waste is currently collected from 31 customers by Sterile Technologies, formerly Eurocare, on behalf of Pembrokeshire County Council. All customers are referred to Pembrokeshire County Council by Swansea NHS Trust - Morriston Hospital. Each customer is provided with yellow bags and/or sharps boxes as required and receives a collection on a weekly basis from the doorstep.

3.1.9 Green Waste

Pembrokeshire County Council actively encourages the home composting of garden waste by making composting units available to the public at reduced cost. A total of 5275 bins have been sold to the public for use at home, this reflects some 9.6% of all households within the County.

Green waste can also be deposited at any of the six Civic Amenity and Recycling Centres within Pembrokeshire.

Pembrokeshire County Council, in conjunction with the Centre for Alternative Technology (CAT) and various community organisation based within Pembrokeshire, is to distribute 30,000 compost bins to householders in the County as part of a County-wide evaluation of the potential for waste minimisation.

Green waste collected at Civic Amenity and Recycling Centres is shredded prior to delivery to a central point in the County where it is composted. Currently this operation is undertaken by Resources Management Limited who are under contract to the Council to provide this service.

Kerbside collection of small quantities of green waste is undertaken on a charged-for basis. All materials collected under this scheme are currently landfilled.

3.1.10 Street Cleansing Waste

Cleansing services are currently provided by the Council's Municipal Services Section.

Pembrokeshire County Council is committed to supporting the 'Pride in our Communities' project which is a joint initiative with Keep Wales Tidy and the Environment Agency.

The Authority made a financial contribution of £20k in 2003-04 and further equivalent funding commitments in the subsequent two years. The money will partially fund the appointment of a Community Project Officer, to be employed by Keep Wales Tidy, in the County.

3.1.11 Fly-tipped Waste

In accordance with the provisions of The Environmental Protection Act 1990 and Refuse Disposal (Amenity) Act 1979 the Council exercises its powers to remove fly-tipped waste. Fly-tipped waste is currently dealt with by the Council's Municipal Services Section. Where evidence is found relating to ownership either the Environment Agency Wales is involved or the Council's Environmental Health Officers with the aim of identifying the offenders for prosecution.

3.1.12 Abandoned Vehicles

The Council has a duty under Sections 3-5 of the Refuse Disposal (Amenity) Act 1978, to remove abandoned vehicles within their area from the public highway. Abandoned vehicles are currently collected by Waterloo Metals Limited, a local company under Contract to the Authority.

Following a significant increase in vehicle numbers during the last decade the situation seems to have stabilised and numbers now appear to be in decline. Some 643 vehicles were collected for disposal during the year 2003/04.

A new Contract is currently being produced and this will require contractors to comply fully with the End-of-Life Vehicles Regulations 2003 when arranging for the disposal of vehicles. Within the specification for the service will be the requirement for the Contractor to provide a surrender facility where residents may safely dispose of vehicles that have reached the end of their life.

3.1.13 Hazardous Household Waste

The Council is currently arranging with a local specialist waste contractor for the provision of facilities at its principal Civic Amenity and Recycling Centre (located at Winsel) where residents may safely dispose of hazardous household materials including asbestos, paints, and other materials such as batteries, oils and fluorescent tubes etc. The provision at Winsel is an interim arrangement until the Authority is in a position to introduce similar facilities at other Civic Amenity and Recycling Centres.

3.1.14 Street and Beach Cleansing Service

The Council has a statutory duty under the Environmental Protection Act to provide a cleansing service. The Council provides a street cleansing service that is compliant with the Code of Practice on Litter and Refuse.

The cleansing of highways, streets, beaches and other public areas is provided under the current arrangements with the Council's Municipal Services Section. All waste arising from the cleansing service is delivered to landfill for disposal.

3.2 EXISTING MINIMISATION, REUSE, RECOVERY AND RECYCLING ACTIVITY

3.2.1 Waste Minimisation Activities

Waste minimisation is key to reducing the amount of waste produced in Pembrokeshire. Encouraging householders to consider waste as a cost to them and the environment will need to be an important element of the Waste Strategy. Current and planned public awareness campaigns include:

- Junk mail elimination
- Home Composting – a major initiative is proposed by the Council in partnership with the Centre for Alternative Technology (CAT) aimed at providing composting units to 30,000 households across the County
- Real Nappy Campaign
- ‘Say no to Unnecessary Bags’ (SNUB) campaign
- Christmas Card Campaign (reduce waste by sending e-cards)

The Council recognises that promoting waste minimisation and changing public attitudes cannot be undertaken in isolation. The Council will therefore work with local business support providers to promote waste minimisation, and will encourage all local businesses to give careful consideration to the amount of waste they produce.

Internally, within the Council itself, waste minimisation is promoted throughout the organisation through the implementation of a formal procurement policy aimed at minimising waste. A detailed Council waste audit was undertaken in spring 2004. The report is currently in the review stage, and this will provide the basis for identification of further waste reduction and minimisation measures.

3.2.2 Waste Reuse

The Council is seeking to support the reuse of waste produced in Pembrokeshire by working in partnership with locally based charities and voluntary organisations.

Opportunities exist to work with organisations such as FRAME to offer community collection services for redundant goods and equipment, including furniture and white goods.

Once checked, repaired, serviced or recycled, such goods can be sold at FRAME’s retail outlets or passed back into the community to support individuals, families, and local community/voluntary groups that suffer deprivation or poverty.

3.2.3 Materials Recovery and Recycling

Pembrokeshire County Council currently has in place a number of key services or initiatives which make provision for materials recovery and recycling including kerbside collection of recyclable materials, a network of community based bring sites and recycling at Civic Amenities and Recycling Centres. Further details on these services have been provided in Section 3.1 above.

3.2.4 Council Offices Recycling Initiative

Collection boxes are provided in Council offices for recyclable materials. Materials collected vary at each location but include paper, newspapers and magazines, telephone directories, catalogues, Christmas cards, cans, glass, toner cartridges, mobile phones and office equipment. Following the recent (Spring 2004) audit of Council properties it is anticipated that further recycling initiatives will be introduced in due course.

3.2.5 Schools Recycling Initiative and Sustainable Schools Programme

FRAME provides a paper recycling service to 28 schools in the County. In 2003/04, 11 tonnes of paper was recycled from participating Pembrokeshire Schools. FRAME is currently exploring

opportunities to partner with another voluntary organisation in order to extend this service to all schools in the County.

Pembrokeshire County Council has a Sustainable Schools Programme. Of the 39 registered schools, 19 are focusing on the subject of waste and litter. It is understood that these schools are recycling all or some of the following materials: drinks cans, paper, printer cartridges, plastic, glass bottles, cardboard, and carrying out composting of garden and kitchen waste.

3.2.6 Commercial Waste Recycling Service

In line with a requirement to consider all municipal waste, opportunities for recycling of commercial waste are now being considered by the Council.

A consultation exercise with all businesses in Pembrokeshire has been undertaken to help identify ways of developing recycling services that will reduce the amount of waste going to landfill and subsequently reduce disposal costs. A pilot project for the recycling of glass bottles and jars will be launched early in 2005 with the provision of mixed glass igloos to 30 commercial premises.

3.2.7 Educational Awareness Initiatives

Initiatives in place in Pembrokeshire include the following:

Attendance at special events:

- County Show - information and recycling point
- Crucial Crew – awareness raising event for all year 6 children in the County
- Motorised bin day – SNUB (with ‘Waste Awareness Wales’ support)

Educational Visits:

- Schools
- Community Groups – Beaver Scouts, environmental groups, composting groups, Mothers Union, Women’s Institute, etc.

Education Packs:

- Education materials are distributed to schools and other educational organisations on request. Links have been made with Waste Watch for the distribution of their education packs.

Kerbside Education and Awareness: The Education and Awareness campaign that takes place in kerbside participation areas includes:

- The issue of a postcard one month before commencement
- Press releases
- Meetings: in local communities, for Members, for refuse operatives and kerbside collection operatives
- Visits to local schools
- Information guides for Members and refuse operatives
- Information on the Intranet for access by all staff

- Broadcasts on Radio Pembrokeshire
- The issue of orange bags and information packs to all households in the participation area with staff knocking on doors to spread the message and deal with queries

Web Site Development

- A Waste and Recycling web site was launched in November 2004. The site includes core information and will continue to be developed during 2005.

The Waste and Recycling web site can be viewed by accessing the following web site:

www.pembrokeshire.gov.uk/wasteandrecycling

National, Regional and Local Initiatives:

- Participation in National and Regional Recycling Initiatives such as junk mail campaigns, Christmas tree and Christmas card recycling initiatives, Waste Awareness Wales led campaigns etc.
- Pembrokeshire County Council is supporting the National Media Campaign to promote the 3R's of waste management (reduce, reuse and recycle) and will ensure that any awareness activities undertaken at a local level support the national campaign, and will actively seek to promote the national awareness initiatives.
- Local initiatives such as promotion of home composting and joint waste reduction initiatives with businesses promoting the use of locally grown/produced food and products.
- These initiatives all use local press and radio to raise awareness and a range of promotional items such as cotton bags.

Leaflet and Directory Distribution:

- Distribution of a Waste and Recycling Services booklet to all households.
- Production and distribution of a Guide to Home Composting.

Promotional Items:

- A range of promotional items such as pens, pencils, rulers, rubbers, pencil sharpeners, note pads, cotton bags and wine carriers made from recycled materials or materials from a sustainable source have been purchased and used in all promotional activities to leave the public with a message that lasts after the day of the event.
- The County Council are in the process of purchasing an exhibition pod that will be used as a tool when visiting schools and events. It will be used as an education resource that can be left with schools that are working on sustainability, waste and recycling projects.

3.2.8 Partnerships with Community and Voluntary Groups

The Council meets regularly with the Pembrokeshire Community Recycling and Energy Partnership, organised by Cylch, which seeks to establish a co-ordinated approach to waste and recycling initiatives undertaken by the voluntary sector and the County Council. This ensures all interested parties are kept apprised of waste and recycling activities, encourages joint/partnership

working and ensures that voluntary schemes are in keeping with Pembrokeshire's Municipal Waste Strategy.

Pembrokeshire County Council has actively sought to involve and work with community and voluntary groups and recognises the important role that such organisations have to play in achieving increased recycling activity. Examples where this has been, and continues to be effective are as follows:

- **FRAME:** FRAME has been established (since 1993) with the aim of providing therapeutic work and training opportunities for individuals with mental health problems and learning difficulties (currently over 100 placements are offered each week) and also providing some 2000 hours of supervision to the probation service. The work activity involves the recovery and recycling of unwanted household goods (including furniture, white goods, etc.) and onward sale, with particular emphasis to those on low incomes or supplementary benefits.
- **Fishguard Community Composting Group:** The County Council has provided Fishguard Community Composting Group with 19 compost bins with which to run a trial in their community. This has been supported with the provision of the Council's Guide to Home Composting, other waste reduction promotional items and attendance at meetings to answer questions and share information.
- **Centre for Alternative Technology (CAT):** The County Council is working in partnership with CAT on a project which will involve the introduction of 30,000 compost bins to households in the County. The project will be a Research and Development Project which will serve as a national home composting pilot. The project will seek funding from the Strategic Recycling Scheme Fund (SRS.) and will include partnering with local voluntary and community groups.

3.3 ORGANISATIONAL STRUCTURE

Figure 3.2 shows the organisational structure of Pembrokeshire County Council Municipal Services, with Figure 3.3 highlighting the cleansing and waste management service in particular. Table 3.1 outlines the main roles and functions of the Waste Strategy team.

Figure 3.2: Organisational Structure for Municipal Services in Pembrokeshire

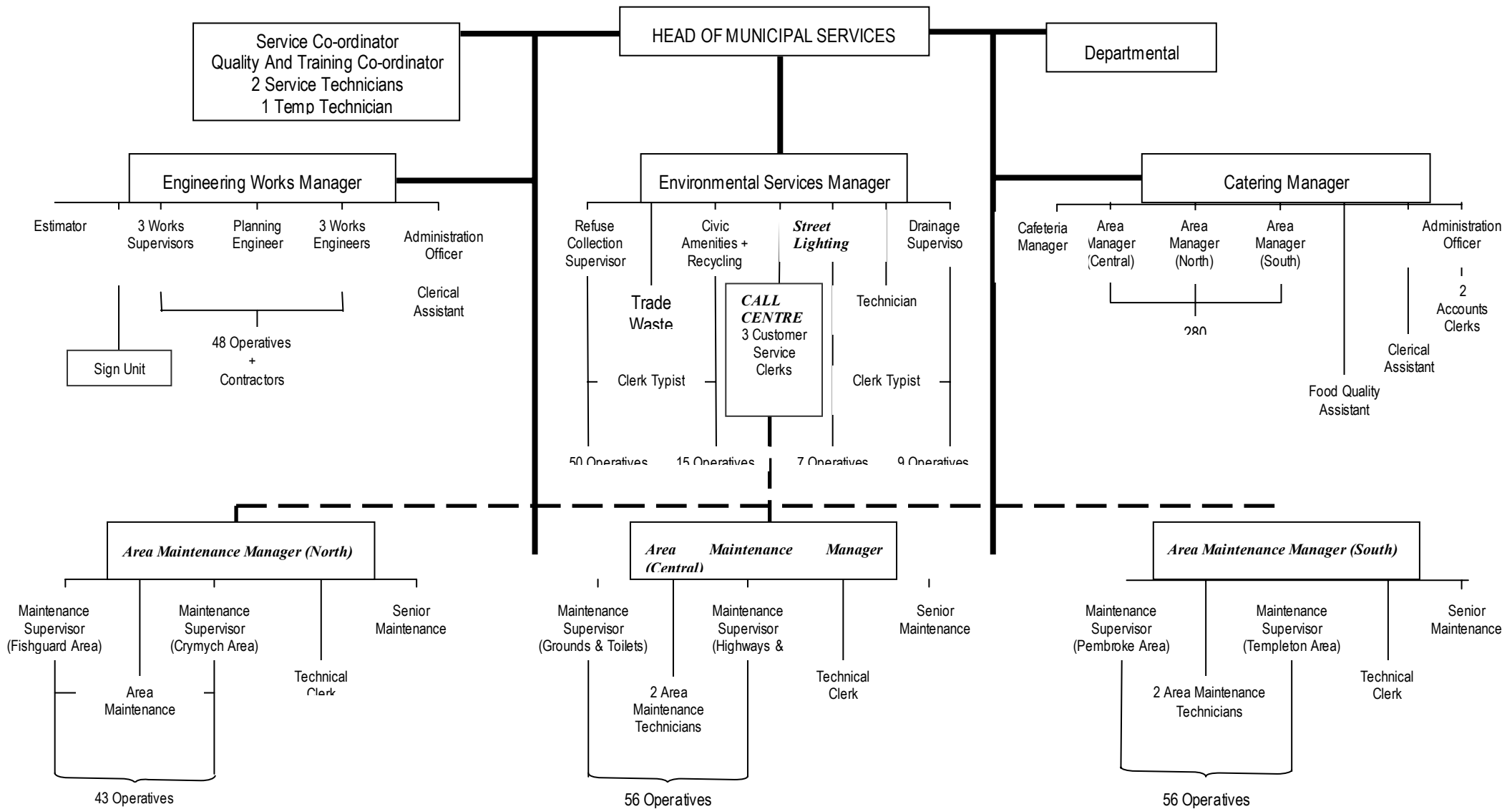


Figure 3.3: Organisational Structure for Waste Management in Pembrokeshire

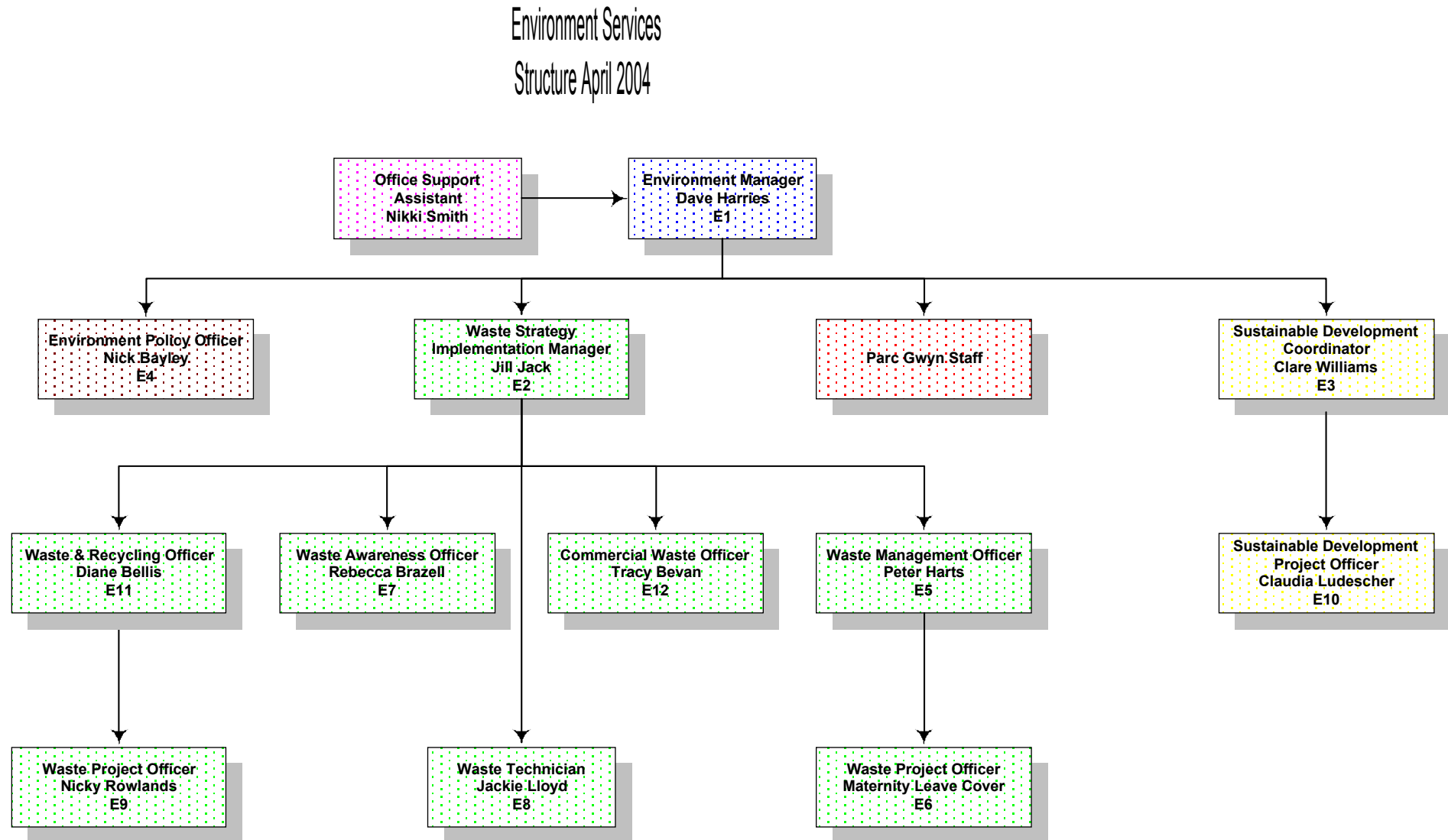


Table 3.1: Outline of the Waste Strategy Team's Key Functions

WASTE STRATEGY TEAM				
<p style="text-align: center;">WASTE STRATEGY OFFICER</p> <p>The post holder is responsible for integrated waste management within Pembrokeshire and is responsible for determining policies, and implementing and maintaining appropriate service strategies.</p>				
Commercial Waste Officer	Waste and Recycling Officer & Waste Project Officer	Waste Management Officer & Waste Project Officer	Waste Awareness Officer	Waste and Recycling Technician
<p>The main purpose of this post is the development and implementation of commercial recycling initiatives throughout Pembrokeshire.</p> <p>The post holder is also responsible for developing the in-house recycling strategy.</p>	<p>The post holder has responsibility for managing another team member.</p> <p>The main purpose of this post is the development of new initiatives as derived from the waste strategy and associated documents.</p> <p>There is also responsibility for assisting in the implementation of new initiatives.</p> <p>The post holder is responsible for ensuring that data is gathered and collated to aid in assessing performance and for use in developing strategies for handling of waste.</p>	<p>The post holder has responsibility for managing another team member.</p> <p>The main purpose of this post is in the management of current initiatives, including third party contracts, ensuring that the service level delivered achieves the aims as laid down in the waste strategy and associated documents.</p> <p>There is also responsibility for assisting in the implementation of new initiatives.</p> <p>The post holders is responsible for co-ordinating recycling activity across the Council</p>	<p>The main purpose of this post is to initiate, develop and manage the Authority's programme for waste education and awareness raising.</p> <p>There is also responsibility for assisting in the implementation of new initiatives</p>	<p>The main purpose of this post is to provide administrative and technical support to the Waste Strategy Section.</p>

3.4 CURRENT PERFORMANCE

3.4.1 Waste Arisings

Table 3.2 provides details of municipal waste arisings for the years 1997/98 to 2003/04, which confirms a total of 75,726 tonnes for 2003/04. The total municipal waste tonnage has risen by just over 18,000 tonnes in this seven year period. There do appear to be some fluctuations over this period. The reasons for this are unclear, although it may be related to changes in definition of municipal waste.

Table 3.2: Municipal Waste Arisings (1997/98 to 2003/04) in Tonnes

	1997/98	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04
Household Waste, Sweepings and Council (Landfill)	37,415	38,407	39,391	39,274	39,440	41,731	39,549
Trade Waste (Landfill)				5,090	5,400	5,887	6,278
Civic Amenity (Landfill)	16,550	15,064	16,991	18,193	19,248	18,303	18,873
Hazardous Waste (Landfill)	39	10	0	2	6	9	2
Recycled Waste	3,626	3,637	4,423	6,919	11,094	11,307	11,025
Total Household Waste (MSW less Trade)	57,629	57,118	60,804	64,387	69,788	71,351	69,449
Total MSW Waste	57,629	57,118	60,804	69,477	75,188	77,238	75,726

Source: Pembrokeshire County Council

3.4.2 Recycling and Composting Performance

Table 3.3 provides a summary of overall recycling and composting performance for the years 1997/98 to 2003/04. The proportion of waste being recycled has nearly doubled between 1997 and 2004, with figures increasing from 3,026 tonnes to 5,861 tonnes. The growth in composting has been much more dramatic, with 5,165 tonnes being processed in 2003/04 compared to only 600 tonnes back in 1997/98. Pembrokeshire performed well in 2003/04 achieving a recycling rate of 8.24% and a composting rate of 7.26%.

Table 3.3 confirms a total of just under 6,000 tonnes of material was segregated for recycling during 2003/04. A detailed breakdown of the recycling data for 2001/02, 2002/03 and 2003/04 is provided in the accompanying technical appendices document (Appendix 2). The data does not indicate the precise source of the recycled materials.

Table 3.3: Recycling and Composting Performance (1997/98 to 2003/04)

	1997/98	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04
Recycling	3,026	2,977	3,704	4,578	5,469	5,956	5,861
Composting	600	660	719	2,341	5,625	5,352	5,165
Total	3,626	3,637	4,423	6,919	11,094	11,307	11,025
Recycling as % of MSW	5.3%	5.2%	6.1%	6.6%	7.3%	7.7%	8.2%
Composting as % of MSW	1.0%	1.2%	1.2%	3.4%	7.5%	6.9%	7.3%

Figure 3.4 provides a visual breakdown of municipal waste for Pembrokeshire based on data for 2003/04 from Tables 3.2 and 3.3.

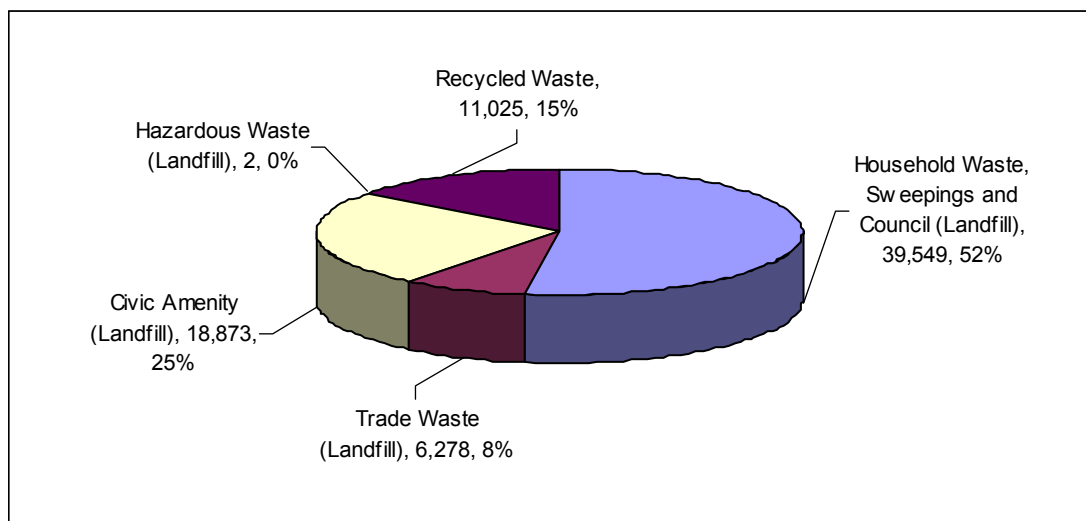
Figure 3.4 Breakdown of Municipal Waste Arisings (2003/04 data)

Table 3.4 outlines the tonnages and proportions of materials collected for the first 3 months of the kerbside recyclable pilot scheme. During this period a total of 118.00 tonnes of material was collected through the orange bag scheme (see paragraph 3.1.3 above). Further data from the pilot scheme can be found in Appendix 2.

Table 3.4 Results of the Pilot Kerbside Scheme (12th April 2004 to 18th July 2004).

Material	Foil	Cardboard	Junk Mail	Mixed Cans	News & Mags	Office Paper	Plastic	Directories	Landfilled	Total
Tonnes	0.10	16.78	0.62	5.20	56.40	0.62	9.51	1.81	26.96	118.00
Wt %	0.1%	14.2%	0.5%	4.4%	47.8%	0.5%	8.1%	1.5%	22.8%	100.0%

3.4.3 Waste Compositional Data

Since 2001 the Welsh Assembly Government has been funding a national survey to determine the composition of municipal waste in Wales. The principal focus of the survey work has been to determine the proportion of the waste stream that can be recycled or composted. The results of the study were published in February 2004 and include data from nine local authorities across Wales.

The key conclusions arising from the study were as follows:

- 36% of the municipal waste stream in Wales is potentially recyclable
- 28% of the municipal waste stream in Wales is potentially compostable (garden and kitchen derived wastes)
- A further 5% of the municipal waste stream in Wales is construction and demolition waste which could also be recycled
- There is a strong seasonal influence on the percentage of garden waste (highest in spring and summer)
- There is strong evidence of variations in the amounts of some components according to age profile of the household: for example households in the 45-64 age band produce more

newspapers and magazines: households in the 65 and over age band produce less waste and less packaging waste than households in other age bands

- There is no evidence of variations between the different types of waste collection and the amounts of household collected waste or the waste taken to waste recycling sites
- There is no evidence of differences between urban, rural and valley authorities in either the amounts of household collected waste or average amount of waste per visitor to Civic Amenity and Recycling Centres
- There is very strong evidence of variations between areas within an authority in terms of both total weights and weights of specific components, for example newspapers, magazines and kitchen waste
- There appears to be no significant relationship between the amount of waste generated and either the collection method or the socio-economic profile of the area

A summary of the compositional data is provided in the accompanying technical appendices document (Appendix 3).

3.4.4 Budgetary Information

A summary of the waste management budgetary information for Pembrokeshire County Council is provided in the accompanying technical appendices document (Appendix 4).

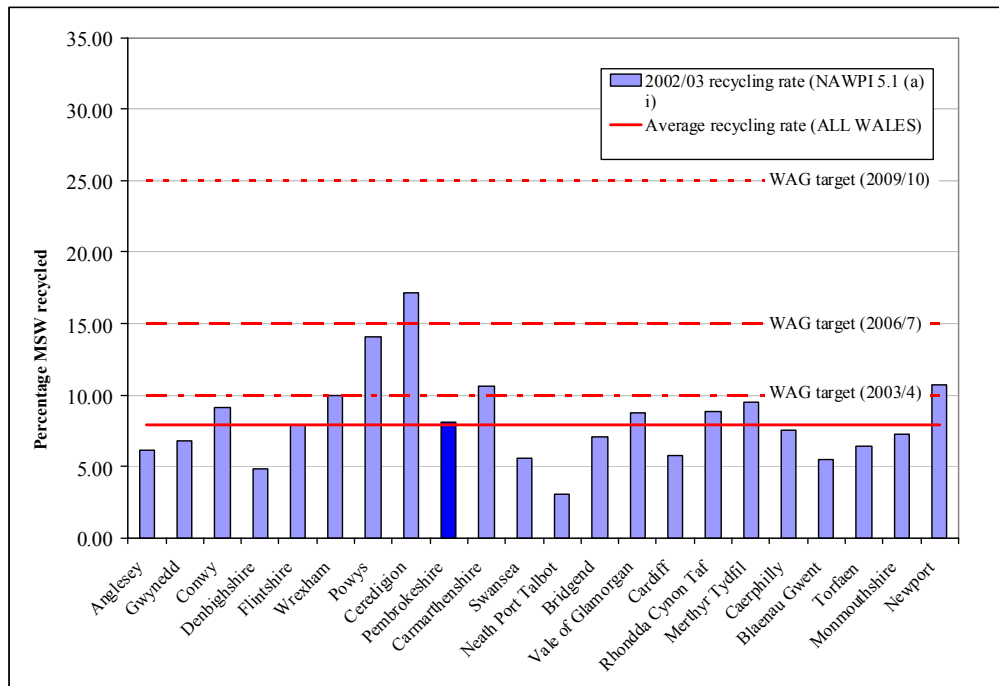
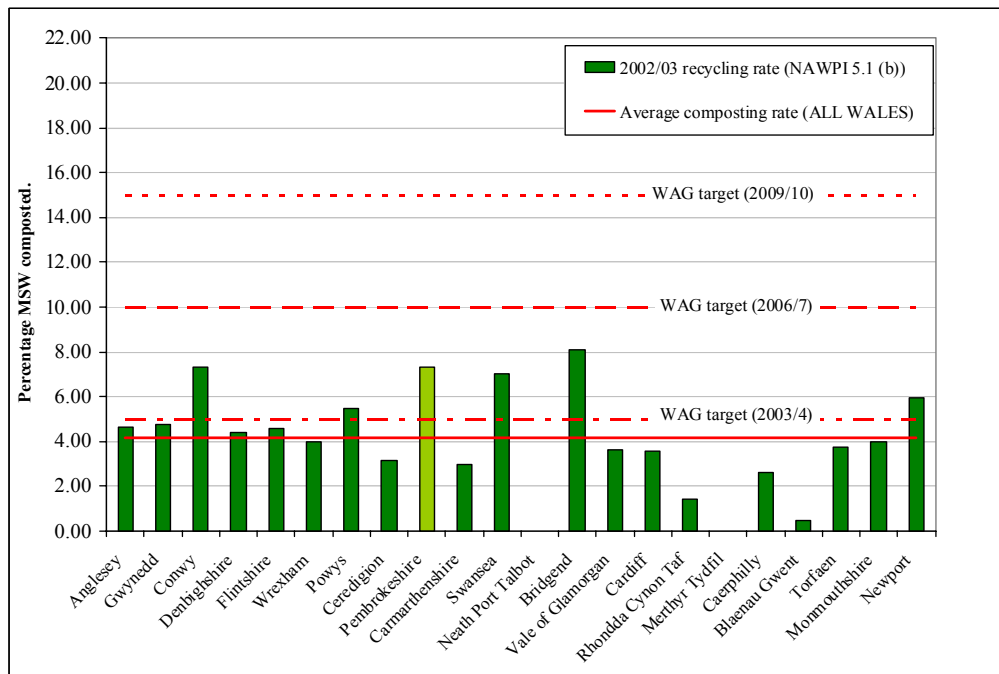
3.5 COMPARISON WITH OTHER WELSH AUTHORITIES

Using Performance Indicators (NAWPIs) collated by the Local Government Data Unit it is possible to compare the performance of Pembrokeshire County Council against all other authorities in Wales. The following 7 NAWPIs relate to waste and recycling:

NAWPI 5.1a(i) - Percentage MSW recycled
 NAWPI 5.1b – Percentage MSW composted
 NAWPI 5.1c - Percentage MSW used to recover heat, power and other energy sources
 NAWPI 5.1d – Percentage MSW landfilled
 NAWPI 5.5 - Percentage of highways and relevant land inspected of a high or acceptable standard of cleanliness
 NAWPI 5.6 - Number of collections missed per 100,000 collections of household waste
 NAWPI 5.7 - Percentage of population served by a kerbside collection of recyclables

A more detailed description of each of the indicators is provided in the accompanying technical appendices document (Appendix 5).

A visual comparison of performance for all 22 Unitary Authorities in Wales is provided in Figures 3.5 and 3.6, which illustrate recycling and composting performance, respectively. The 2002/03 data show that Pembrokeshire performed well, coming 10th out of 22 for recycling and 3rd out of 22 for composting.

Figure 3.5: Comparison of Recycling Performance for Welsh Authorities (2002/03)**Figure 3.6: Comparison of Composting Performance for Welsh Authorities (2002/03)**

The 2003/04 NAWPIs are currently out to consultation, however the estimates indicate that Pembrokeshire recycled or re-used 8.24% of the total municipal waste arisings and composted 7.26%. Therefore Pembrokeshire exceeded the 2003/04 WAG target of 15% with an estimated overall recycling and composting rate of 15.5%.

3.6 IMPROVEMENT PLANS

3.6.1 Policy Agreements and Improvement Plans

The Welsh Assembly Government, through its Sustainable Waste Management Grants, has allocated significant sums to Pembrokeshire County Council, and all other authorities in Wales, to assist in the process of meeting the sustainable waste management targets set out in 'Wise about Waste'. The grant allocation for Pembrokeshire for the year 2003/04 was set at just over £964,000 and over that period the key focus has been on funding the following:

- Pilot of kerbside dry recyclable collection scheme
- Centralised composting including improvement of green waste shredding points
- Inert waste recycling
- Pilot project with FRAME for bulky household waste collections – increasing recycling and re-use of items retrieved
- Improve recycling 'bring' facilities
- Extend number of recycling 'bring' facilities
- Increase and improve paper recycling 'bring' facilities
- Increase education and awareness through promotional activities facilitated by the purchase of an exhibition pod
- Home composting

For 2004/05, 2005/06 and 2006/07 the grant is expected to be in the order of £920,000 per annum, with spending allocated principally to further development of the kerbside collection schemes, composting facilities, material recycling facility and improving both Civic Amenity and Recycling Centres and recycling 'Bring' facilities.

In a Best Value Review completed in March 2003 Pembrokeshire County Council was scored as good with Promising Prospects for Improvement. A Waste Services Improvement Programme identifying areas for action up to 2010 was developed as an outcome of the review. The outcomes can be found in Appendix 12 of the accompanying Technical Appendices.

3.7 WASTE MANAGEMENT IN ADJOINING AUTHORITIES

The Welsh Assembly Government has, in 'Wise about Waste', stressed the importance of exploring opportunities for joint working between local authorities in Wales. It is important therefore, to understand how those authorities adjoining Pembrokeshire are proposing to manage their municipal waste in the future. A brief overview of the approach being taken by the two adjoining authorities is provided in Table 3.5 below.

Table 3.5: Waste Management in Adjoining Authorities

<p>Carmarthenshire County Council:</p> <p>A waste management strategy was prepared by Babbie on behalf of the County in 1999. This has been updated by SLR Consulting and was issued as a final document in June 2004.</p> <p>The strategy is based on recycling and composting, utilising staged introduction of kerbside collection schemes. The Council is currently introducing kerbside collection schemes on a trial basis. A new MRF has recently been developed in Carmarthen, and there are plans for a new 'in-vessel' composting plant.</p> <p>There is one major landfill site located within the County at Nantycaws, a few kilometres to the east of Carmarthen.</p>
<p>Ceredigion County Council:</p> <p>A waste management strategy was prepared by SLR Consulting on behalf of the County in 2002; this has since been updated by SLR in line with the new guidance.</p> <p>The strategy will be based on recycling and composting, utilising staged introduction of kerbside collection schemes; initially on a trial basis as part of the 'Exemplar' initiative. The Council is seeking to maintain and develop its strong relationship with community based organisations. The Council is also exploring options for development of a new Materials Recycling Facility (MRF) within the County to handle dry recyclable materials and infrastructure for composting of green waste and in-vessel facilities to handle kerbside collected kitchen organic derived waste.</p> <p>The County will require some element of landfill throughout the duration of the strategy, and as such the Council is seeking to secure capacity with an operator located in one of the adjoining authorities.</p>

CHAPTER 4 – DRIVERS FOR CHANGE

4.1 LEGISLATIVE REQUIREMENTS

4.1.1 Environmental Protection Act 1990

The Environmental Protection Act 1990 Part II sets out the duties of Waste Collection Authorities and Waste Disposal Authorities. Under this Act, Waste Collection Authorities (WCAs) have a duty to collect waste from all households and commercial properties if requested to do so in receptacles specified by the WCA. The WCA may make a charge for the receptacles. Waste Disposal Authorities (WDAs) have a duty to dispose of waste collected by the Waste Collection Authorities and to provide facilities at which persons resident in its area may deposit waste. A WCA may charge for the collection of commercial and industrial waste and, under the Controlled Waste Regulations 1992, may charge for the collection of certain types of household waste. Unitary Authorities assume the responsibility of both the WCA and WDA.

Under this Act, Local Authorities have a statutory duty to keep roads, land, open highways, etc. free of litter and to ensure roads and highways are kept clean in accordance with the *Code of Practice on Litter and Refuse*.

4.1.2 Controlled Waste Regulations 1992

These Regulations provide legal definitions of controlled wastes (household, commercial and industrial wastes). The Regulations also state that certain types of litter and refuse are to be treated as Controlled Waste.

Under these Regulations, Local Authorities may charge for the collection of certain types of household waste. Examples of when a charge may be made include: garden waste, bulky waste, clinical waste and asbestos.

4.1.3 Environment Act 1995

Apart from the requirement to produce a National Waste Strategy, this Act was largely concerned with changes to the legal and institutional arrangements for waste management.

4.1.4 Directive on Packaging and Packaging Waste 94/62/EC

The Directive on Packaging and Packaging Waste came into force in 1994. The Directive aims to harmonise the management of packaging waste in two ways. Firstly, recovery and recycling targets have been established to prevent the environmental impact of packaging. Secondly, the Directive ensures secure functioning of the internal market so obstacles to trade are avoided and competition is preserved within the European Community.

The Packaging Directive is implemented in England and Wales by the Producer Responsibility Obligations (Packaging Waste) Regulations 1997 (as amended) and the Packaging (Essential Requirements) Regulations 1998. Any business handling more than 50 tonnes of packaging and with a financial turnover of more than £2 million is obligated under the Packaging Regulations if it is involved in manufacturing raw materials for packaging; converting materials into packaging; filling packaging; selling packaging to the final user or importing packaging or packaging materials into the UK.

4.1.5 Landfill Directive (99/31/EC)

The Landfill Directive was brought into force in the UK on the 15th June 2002 as the Landfill (England and Wales) Regulations 2002 and since then has been introduced progressively to give UK industry time to adapt. The Landfill Directive is seen as providing the principal legal framework influencing municipal solid waste management and strategy development in the UK. The Directive seeks to prevent or reduce negative environmental effects from the landfilling of waste by introducing uniform standards throughout the European Union. The main regulatory provisions of the Directive stipulate:

- Classes of landfill;
- Requirements for obtaining a permit for operating a landfill;
- Waste acceptance procedures;
- Control and monitoring procedures for operating a landfill; and
- Closure procedures.

The first requirement of the Regulations was for all landfill operators to submit a conditioning plan by July 26th 2002, which reclassified the site as inert, hazardous or non-hazardous. This is one of the key provisions of the Directive as previously UK landfills had either been inert or practiced co-disposal of hazardous and non-hazardous material. Now, non-hazardous sites can accept only non-hazardous waste.

The most significant part of the Directive is Article 5 which proposes a strict timetable for reductions in landfilling Biodegradable Municipal Waste (BMW). These are onerous requirements and have been the principal influence on the formulation of '*Waste Strategy 2000*' and '*Wise about Waste*'. The EC Landfill Directive sets mandatory targets which, for the UK, require the following:

- *By 2010 to reduce BMW landfilled to 75% (by weight) of that produced in 1995*
- *By 2013 to reduce BMW landfilled to 50% (by weight) of that produced in 1995*
- *By 2020 to reduce BMW landfilled to 35% (by weight) of that produced in 1995.*

Local Authorities are also required to ensure that residual MSW is treated prior to landfill (Article 6). In Autumn 2003 the Welsh Assembly Government carried out consultation on implementation of the Waste and Emissions Trading Bill (including the Municipal Waste Management (Wales) Regulations). The consultation document outlined a proposed landfill allowance scheme that will limit the amount of BMW sent to landfill, in accordance with the requirements of Article 5 of the Landfill Directive.

The consultation resulted in the adoption of the Waste and Emissions Trading Act (2003) which implements Articles 5(1) and 5(2) of the EC Landfill Directive in the UK. This has been implemented in Wales through the introduction of the Landfill Allowance Scheme (Wales) Regulations 2004.

Outlined below are the mechanisms which are included in the landfill allowance scheme for Wales:

- The Welsh Assembly Government allocated each Waste Disposal Authority a maximum quantity that it may landfill in each scheme year from 2004 to 2009 (Letter to all Local Authority Chief Executives dated 18th August 2004).

- Landfill allowances for the first scheme year (2004/05) is based on the amount of waste landfilled in Wales in 2001/02
- The allocation of allowances in the first target year of 2010 is based on the proportion of municipal waste that the authority produced in 2001/02 in relation to the total waste arisings of Wales. A linear reduction in allowances between 2004 and 2010 is assumed.
- There will be a review of the landfill allocations in 2006/07 to take into consideration any demographic or other changes.
- A financial penalty of £200/tonne for each tonne of BMW landfilled in excess of the landfill allowance limit.
- A financial penalty of £1000 per offence for failure to maintain adequate records.

4.1.6 Best Value – Wales Programme for Improvement

Best Value is a key component of the Welsh Assembly Government's programme to modernise local government in Wales, and places authorities under a duty to seek continuous improvement in the way in which they exercise their functions. The Local Government Act 1999 sets out the principal framework of Best Value.

Best Value in Wales has evolved into the Wales Programme for Improvement, the main principles of which are continuous improvement, effective management of performance, a whole authority approach and targeted action.

4.1.7 Waste Minimisation Act 1998

This Act enabled Waste Collection Authorities or Waste Disposal Authorities to make arrangements to minimise the generation of Controlled Waste in their area (i.e. household, commercial or industrial waste). The Act also authorised the relevant Authority to contribute towards the expense.

4.1.8 Waste Incineration Directive 2000/76/EC

The Waste Incineration Directive 2000/76/EC has introduced stringent operating conditions and sets minimum technical requirements for waste incineration and co-incineration. It consolidates new and existing incineration controls into a single piece of European legislation. The requirements of the Directive have been developed to reflect the ability of incineration plants to more cost effectively achieve high standards of emission control in comparison to the late 1980's. Previous waste incineration Directives only applied to municipal and hazardous waste. The current Directive updates the requirements of the 1989 municipal waste incineration (MWI) Directives (89/429/EEC) and, merging them into the 1994 Hazardous Waste Incineration Directive (94/67/EC), consolidates new and existing incineration controls into a single piece of European legislation.

The Directive is being implemented through the Pollution Prevention and Control regime. The Directive will eventually cover some 2,600 incinerators, around 70% of which are waste oil burners in vehicle service garages.

4.2 EMERGING LEGISLATION

4.2.1 Biowaste Directive

The European Commissions mandate reads: “By the end of 2004 a directive on compost and other biowaste will be prepared with the aim to control potential contamination and to encourage the use of certified compost.” In its current draft form the Biowaste Directive encourages the recycling of food waste to agricultural land to improve the agricultural quality of the soil and its macro and micro nutrients. If this Directive is implemented local authorities will be forced to adopt separate collection systems for food waste.

The proposed Directive will provide further drivers to increase the use of composting (both aerobic and anaerobic) and the quality of compost products. The new Directive should provide much needed support to the requirements of the Landfill Directive.

4.2.2 Animal By-Products Regulations 2003

Under the earlier Animal By-Products Order 1999 (as amended) it was an offence to allow livestock or wild birds access to catering waste containing meat or products of animal origin, or which originated from premises handling meat or products of animal origin. This order effectively banned composting and biogas digestion as treatment and recovery methods for catering waste.

The new EU Animal By-Products Regulations (enforced in the UK since 1 July 2003) affects all those who deal with animal by-products, including the waste disposal industry, the animal feed industry, slaughterhouse operators, farmers, food manufacturing premises, catering outlets, zoos and hunt kennels. The main aim of the Animal By-Products Regulations is to reduce the risk of the transmission of disease to humans and animals. This aim is achieved by new rules for the collection, transport, storage, handling, processing and use or disposal of animal by products. Under the new regulations, landfill of catering waste is permitted as a low risk waste. The Regulations also permits the use of composting and biogas treatments for catering waste and other low risk (category 3) animal by-products in approved composting and biogas premises. Approval of schemes requires the sanction of the Government Veterinary Service.

4.2.3 Waste Electrical and Electronic Equipment (WEEE) Directive

This Directive will affect those organisations involved in manufacturing, selling, distributing, recycling or treating electrical and electronic equipment (including household appliances, IT and telecommunications equipment, audiovisual equipment, lighting equipment, electrical and electronic tools, toys, leisure and sports equipment, medical devices and automatic dispensers).

The Directive aims to reduce the waste arising from electrical and electronic equipment; and improve the environmental performance of all those involved in the life cycle of electrical and electronic equipment. The Directive covers WEEE used by consumers and for professional purposes.

The Directive outlines that by August 13th 2005:

- Private householders will be able to return their WEEE to collection facilities free of charge.

- Producers (manufacturers, sellers, distributors) will be responsible for financing the collection, treatment, recovery and disposal of WEEE from private households deposited at these collection facilities.
- Producers will be responsible for financing the collection, treatment, recovery and disposal of WEEE from products placed on the market after 13th August 2005. However, it may be possible for all or part of these costs to be recovered from users other than private householders.

By December 2006, producers will be required to achieve a series of demanding recycling and recovery targets for different categories of appliance and the UK must have reached an average WEEE collection rate of four kilograms for each private householder annually.

The Directive was due to be brought into force in the UK by 13th August 2004.

4.2.4 End of Life Vehicles (ELV) Directive

The End of Life Vehicles (ELVs) Directive (2000/53/EC) passed into European law in October 2000. It is concerned with cars, vans and certain three-wheeled vehicles. The main requirements are for Member States to ensure that producers limit the use of certain hazardous substances in the manufacture of new vehicles and automotive components whilst promoting the recyclability of their vehicles. It must also be ensured that ELVs are subject to de-pollution prior to dismantling, recycling or disposal. The Directive also covers treatment facilities and requires that they operate at higher environmental standards and have permits if they want to deal with non de-polluted ELVs.

The Directive also sets certain recovery and recycling targets, namely:

- by 2006, 85% recovery and 80% recycling by weight, and
- by 2015, 95% recovery and 85% recycling by weight.

The Directive contains a provision that by 2007, producers pay ‘all or a significant part’ of the costs of treating negative or nil value ELVs at treatment facilities.

4.2.5 Landfill Directive – Used Tyres

Restrictions set out in the Landfill Directive stipulate the following targets:

- By August 2003, no whole tyres to be disposed of to landfill
- By 2006, no shredded tyres to be disposed of to landfill

4.2.6 Landfill Directive - Article 6

Article 6 of the Landfill Directive requires that only waste that has been subject to treatment is landfilled. This requirement will have implications on municipal waste which will be required to go through some degree of treatment prior to landfilling. At present it is unclear what ‘treatment’ actually infers although where kerbside collection of recyclable and compostable materials is in place this is likely to constitute ‘treatment’.

4.2.7 Hazardous Household Waste

The EU Commission published a discussion paper in February 1997 regarding a proposed Directive on hazardous municipal waste. At present there are no plans to introduce legislation specific to

hazardous municipal waste in the near future. However, implementation of the proposed Bio-waste Directive may necessitate development and implementation of a Hazardous Household Waste Directive in order to reduce contamination of biodegradable waste destined for composting.

It should be noted that where hazardous household waste material is collected separately, this will need to be managed as hazardous waste. *'Wise about Waste'* sets the following target for safer handling of hazardous household waste:

- By 2003/04 all civic amenity sites should have facilities to receive and store, prior to proper disposal, bonded asbestos sheets, and facilities for receiving and storing, prior to recycling, oils, paints, solvents and fluorescent light bulbs.

4.2.8 Household Waste Recycling Act

The Household Waste Recycling Act 2003 was the result of a private member's bill introduced to Parliament by Joan Ruddock, the MP for Lewisham and Deptford, in December 2002.

Backed by pressure group Friends of the Earth, and originally known as the "doorstep recycling bill" and later the "municipal waste recycling bill", the bill was toned down slightly from its initial aim of 50% recycling by 2010 after discussion with then environment minister Michael Meacher. The UK Government has set a lower target of 30% recycling by 2010 in 'Waste Strategy 2000'.

The Act requires all English local authorities to provide kerbside collections for all householders for a minimum of two materials by 2010. The Bill gives the Welsh Assembly Government the power to require similar schemes in Wales.

4.2.9 Batteries Directive

On 24th November 2003 the European Commission adopted a proposal for a new Directive on batteries and accumulators and spent batteries and accumulators. The proposed directive will, unlike existing community legislation on batteries, apply to all types of batteries regardless of their chemical composition. The previous Directives only applied to an estimated 7% of all portable batteries placed on the EU market annually with certain Mercury, Lead and Cadmium content, and the legislation failed to provide a framework for battery collection and recycling. The scope of the draft directive covers all batteries irrespective of their shape, weight, composition or use. However batteries and accumulators used for military applications and for the protection of EU Member States are exempted.

The requirements of the draft directive include:

- A collection target of 160 grams per inhabitant for spent portable batteries within four years of the Directive being transposed into national legislation (equivalent at current sales levels to a 43% collection rate in the UK)
- A collection rate of 80% for spent portable nickel cadmium within four years of the Directive being transposed.
- Free of charge collection schemes for spent portable batteries to be established within one year of the Directive being transposed with at least 90% recycling. Within three years of the Directive being transposed, 55% by average weight of the materials contained in portable batteries must be recycled (except for nickel cadmium batteries where 100% of the cadmium and 75% of the other materials must be recycled).
- Prohibition by Member States of the disposal of industrial and automotive batteries in landfill or by incineration.

On 13th May 2004 the Government published a consultation paper seeking the views of stakeholder on the proposal for a new Batteries Directive to inform its negotiating position. The consultation period closed on the 5th August 2004.

CHAPTER 5 – FUTURE WASTE ARISING AND TARGETS

5.1 WASTE ARISING AND PREDICTED GROWTH

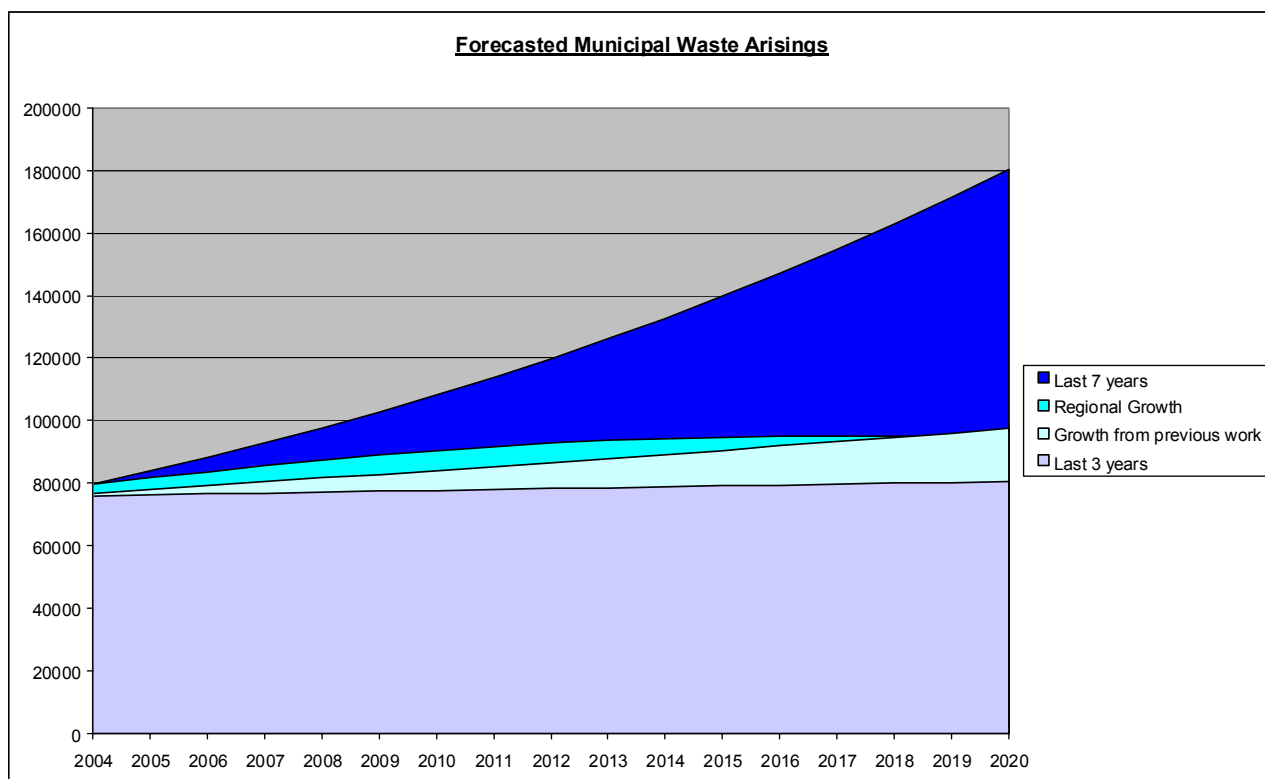
There is considerable uncertainty regarding the likely future growth in municipal solid waste in Pembrokeshire, and indeed elsewhere in Wales and the rest of the UK. The range of factors affecting waste growth includes:

- Population changes;
- Changes to the number and size of households;
- Consumer behaviour;
- Effectiveness of waste minimisation strategies; and
- Changes in the economic prosperity of a region

It is recognised that municipal waste arisings throughout the UK are increasing year by year, with current annual growth for the UK as a whole put at 2.7% per annum. Figure 5.1 depicts predicted growth in municipal solid waste generation in Pembrokeshire up to the year 2020 for a number of growth rate scenarios, as follows:

- Growth in MSW for Pembrokeshire over the last 7 years (5.23%);
- Medium growth rate as used in the TAN 21 Regional Waste Plan (2.37% increase up to 2007 then declining to zero by 2016);
- Growth rate from the previous, March 2001 strategy (1.5%);
- Growth in MSW for Pembrokeshire over the last 3 years (0.36%).

Figure 5.1: Forecasted Municipal Waste Arisings



For consistency with the waste strategy produced in March 2001, the 1.5% growth per annum rate has been used. Overall, the 1.5% growth is also comparable with the medium declining growth rate used in the Regional TAN 21 work, which has a higher (2.37%) growth in the early years of the strategy, and which later declines to zero growth from 2016 onwards.

5.2 TARGETS

5.2.1 Recycling & Composting Targets

‘Wise about Waste’ – the National Waste Strategy for Wales (Welsh Assembly Government, 2002) sets out minimum recycling and composting targets for each local authority to deliver:

- *By 2003/04 achieve at least 15% recycling/composting, with a minimum of 5% composting (with only compost derived from source segregated materials counting) and 5% recycling*
- *By 2006/07 achieve at least 25% recycling/composting, with a minimum of 10% composting (with only compost derived from source segregated materials counting) and 10% recycling*
- *By 2009/10 achieve at least 40% recycling/composting, with a minimum of 15% composting (with only compost derived from source segregated materials counting) and 15% recycling*

Recycling and composting requirements for the target years are identified in Table 5.1 below. These requirements have been used in determining the waste management service and infrastructure requirements for Pembrokeshire.

Table 5.1: Recycling and Composting Requirements for Target Years

Year	Target	Total Tonnage (recycling & composting)	Minimum tonnage of:	
			Recycling	Composting
2006/07	To achieve at least 25% recycling/composting of MSW with a minimum of 10% composting (with only compost derived from source segregated materials counting) and 10% recycling.	19,796	7,919	7,919
2009/10	To achieve at least 40% recycling/composting of MSW with a minimum of 15% composting (with only compost derived from source segregated materials counting) and 15% recycling.	33,121	12,420	12,420

A more detailed review of recycling and composting requirements for the strategy period is presented in the accompanying technical appendices document (Appendix 6).

5.2.2 Landfill Directive Targets

The EC Landfill Directive sets mandatory targets which, for the UK, require the following:

- *By 2010 to reduce BMW landfilled to 75% (by weight) of that produced in 1995*
- *By 2013 to reduce BMW landfilled to 50% (by weight) of that produced in 1995*
- *By 2020 to reduce BMW landfilled to 35% (by weight) of that produced in 1995*

Based on the Guidance from WAG (letter dated 18th August 2004 to all Local Authority Chief Executives) on implementation of the Landfill Allowances Scheme (Wales) Regulations 2004 (which recognises that data for 1995 is not easily available for local authorities in Wales), the allowable tonnages of Biodegradable Municipal Waste (BMW) that can be sent to landfill have

been defined for each Authority in Wales; the figures for Pembrokeshire are summarised in Table 5.2.

Table 5.2: Landfill Directive Targets for BMW to Landfill

Year	Target	BMW Landfill Allowance
2010	No more than 75% of the BMW produced in 1995 can be landfilled ¹	29,481
2013	No more than 50% of the BMW produced in 1995 can be landfilled ²	19,516
2020	No more than 35% of the BMW produced in 1995 can be landfilled ²	13,702

BMW: Biodegradable Municipal Waste

1. Derived from letter to all Local Authority Chief Executives dated 18th August 2004 : "The Landfill Allowance Scheme : Allocation of Allowances". Letter published in the internet at www.wales.gov.uk

2. Derived from the decrease in the allowance for all of Wales, from "Consultation on implementation of the Waste and Emissions Trading Bill including the Municipal Waste Management (Wales) Regulations" July 2003, WAG.

5.2.3 Waste Reduction

‘Wise about Waste’ identifies targets relating to waste reduction for household waste and also for waste produced by local authorities. The targets are as follows:

- *By 2005 achieve a reduction in waste produced (by the authority) equivalent to at least 5% of the 1998 arisings figure*
- *By 2010 achieve a reduction in waste produced (by the authority) equivalent to at least 10% of 1998 arisings figure*
- *By 2009/10 (and to apply beyond) waste arisings per household should be no greater than those (for Wales) in 1997/98*
- *By 2020 waste arising per person should be less than 300kg per annum*

5.2.4 Hazardous Household Waste

‘Wise about Waste’ establishes a target for all civic amenity sites to have facilities to receive and store, prior to proper disposal, bonded asbestos sheets, and facilities for receiving and storing, prior to recycling, oils, paints, solvents and fluorescent light bulbs. In addition, the Welsh Assembly Government has set a target to reduce the amount of hazardous waste generated by at least 20% by 2010 compared with that produced in 2000.

CHAPTER 6 – OPTIONS FOR MANAGING WASTE AND EFFECTING CHANGE

6.1 GENERAL PRINCIPLES

6.1.1 The Integrated Waste Management System

The term integrated waste management (IWM) is most commonly used when addressing national or regional waste strategies. IWM means the use of a range of different waste management techniques as opposed to a single approach. Key aspects of an effective IWM include:

- embracing the concepts of the waste hierarchy (see below);
- recognising each step in the waste management process as part of a whole;
- involvement of all key players or stakeholders;
- adopting a mixture of waste management options; and
- incorporating flexibility in order to meet social, economic and environmental conditions.

Experience has shown that adopting an integrated approach results in the most effective waste management decisions.

6.1.2 The Waste Hierarchy

The ‘Waste Hierarchy’ is broadly accepted as the guiding principle for securing a more sustainable waste management system. The hierarchy suggests that the most effective environmental solution is to minimise the generation of waste. Where further reduction is not practicable, products and materials can sometimes be used again, either for the same or for a different purpose (re-use). Failing that, value should be recovered from waste through recycling or composting, or through energy recovery. Only if none of these offers an appropriate solution should waste be incinerated without energy recovery, or disposed to landfill.

6.1.3 Waste Minimisation and Reuse

Fundamental to any waste management strategy is the incorporation of waste minimisation and re-use initiatives. Details of waste minimisation schemes to be implemented by Pembrokeshire County Council are summarised in Chapter 7 of this strategy.

6.1.4 Waste Collection and Segregation Options

In order to facilitate increased recycling there are three principal methods of collection/segregating municipal waste. The decision on which method to employ is influenced by the final waste management solution selected. The options are as follows:

- Collecting the whole unsorted waste and delivering it to a so-called ‘**dirty**’ **Materials Recycling Facility (MRF)**. Experience has shown that whilst this minimises the collection costs the ability to segregate individual components of the waste stream, and to produce clean, high quality recyclate for reprocessing and organic waste for composting is normally highly compromised. There are a number of examples in the UK where a ‘dirty’ MRF has been constructed and later converted to a ‘clean’ MRF after a period of poor performance. Increasing pressure from reprocessors, and more demanding quality standards for waste

derived products such as compost are further factors which are unlikely to see the ‘dirty’ MRF as a realistic option in the future.

- Collecting source-segregated materials from each household and delivering it to a **‘clean’ MRF or simple bulking facility** (either as individual materials or in a co-mingled form) where the materials can be further separated as necessary and then bulked up prior to onward delivery for reuse and/or reprocessing; and
- Encouraging the public to segregate dry recyclable materials (and compostable materials) at source and to then utilise an existing and/or improved network of **community based ‘bring’ recycling sites and Civic Amenity and Recycling Centres**.

Each of these methods has their own advantages and disadvantages, however it is the ‘at source’ segregation approach that appears to be favoured by the Welsh Assembly Government, and which has been shown from experience in the UK and elsewhere in Europe to result in high recycling rates. The use of ‘bring’ sites and Civic Amenity and Recycling Centres also has an important role to play in encouraging recycling.

It is important to recognise that the collection and segregation of waste cannot be considered in isolation but within the context of the preferred way forward for treatment and disposal.

6.1.5 Waste Treatment and Disposal

Municipal solid waste is a complex and heterogeneous material with a composition that varies on a day-to-day basis and sometimes more significantly on a seasonal basis. The principal processes for handling, treatment and disposal of waste are:

- **Materials Recycling Facilities**, either ‘clean’ or ‘dirty’, for the separation of reusable and recyclable materials
- **Composting** for the treatment of biodegradable materials (this includes open windrow techniques for parks and garden waste – so-called ‘green’ waste – and ‘in-vessel’ techniques for kitchen derived organic wastes)
- **Anaerobic/Aerobic Digestion** for the treatment of the biodegradable fraction of municipal waste
- For the further treatment of the ‘residual’ fraction (i.e. the waste that has not been separated for recycling or composting) the following principal options are available:
 - **Thermal sterilisation and mechanical treatment (TSMT)**
 - **Incineration with energy recovery**
 - **Advanced thermal treatment processes** (Gasification and Pyrolysis)
 - **Mechanical Biological Treatment (MBT)**
 - **Landfill**

It should be noted that some of these residual treatment technologies are not a complete solution in their own right but may form part of an overall waste management system. For example, thermal sterilisation (autoclave technology) and Mechanical Biological Treatment are normally used to treat residual waste so as to remove some materials for recycling and/or composting, leaving the bulk of the remainder as a Refuse Derived Fuel (with a small proportion of rejects going to landfill). Technologies of these types vary from one manufacturer to another, and can also come in varying configurations depending on market conditions for the product(s).

It is also important to note that some of these technologies are not yet fully proven in the UK for the full-scale treatment of municipal solid waste, although there is considerable interest in their development, with several planning permissions having been granted in recent months for MBT and TSMT plants. They are therefore better referred to as ‘emerging’ technologies, although the next 2-3 years will see a wealth of operational information which will inform future decisions on residual waste treatment technology selection.

These processes are discussed in more detail in the accompanying technical appendices document (Appendix 7).

It is important to recognise that there will always be a need for landfill to form part of a fully integrated system to receive final residues that cannot be reused or recycled and that remain after completion of a residual waste treatment process.

6.2 OPTIONS DEVELOPMENT

6.2.1 Introduction

The Welsh Assembly Government’s recycling and composting targets (and other waste reduction targets), together with the Landfill Directive, provide the framework for identifying a future waste management strategy for Pembrokeshire.

The preferred option should incorporate:

- a reduction in growth of municipal waste;
- high rates of recycling and composting;
- greatly reduced reliance on landfill;
- facilities for treating and disposing of waste as an alternative to landfill;
- the ‘Proximity Principle’;
- principles of affordability and deliverability; and
- the Best Practicable Environmental Option (BPEO).

It is important to recognise that there is a need to consider the overall strategy in two principal phases, as follows:

- As a matter of priority it is important for Pembrokeshire County Council to have a short to medium term strategy that will achieve the recycling and composting targets established by the Welsh Assembly Government for 2006/07 and 2009/10. The Council has already been very successful in introducing measures that have resulted in the 2003/04 target being achieved. The key focus should therefore be on implementing further change that will ensure that the more challenging targets for 2006/07 and 2009/10 are also met.
- The second phase of strategy development requires the introduction of measures that will assist the Council in meeting the Biodegradable Municipal Waste (BMW) diversion targets set out in the Landfill Directive, and in particular the specific requirements for Pembrokeshire established in the Waste and Emissions Trading Bill (including the Landfill Allowance Scheme (Wales) Regulations).

Selecting the preferred broad strategic approach to the future management of municipal waste in Pembrokeshire is heavily influenced by the outcome of previous assessments, including:

- The Waste Management Strategy for Pembrokeshire County Council which was completed by SLR Consulting Limited in March 2001, and which included a simplified BPEO analysis to determine the preferred way forward at that time.
- The recently (March 2004) completed Regional Waste Plan for South-West Wales which was derived using a modified version of the BPEO which incorporates social and economic factors in order to determine the Sustainable Waste Management Option (SWMO).

A brief overview of the outcomes of each of these two assessments is provided below.

6.2.2 Options Assessment from the March 2001 Waste Management Strategy

The March 2001 Waste Management Strategy includes a detailed assessment of the following principal options:

- Option 1 – An integrated materials reclamation facility. This option involved developing a new building for FRAME to house bulky waste recycling, a clean MRF with the capacity to manage recyclate from a kerbside collection scheme to serve 80% of households by 2010, and an in-vessel composting facility for kitchen derived organic wastes.
- Option 2 – Development of a Solid Waste and Energy Recovery Facility (SWERF). This option would incorporate a new building for FRAME and construction of a ‘dirty MRF’ and gasification/pyrolysis plant to handle all non-recycled waste.
- Option 3 – Integrated approach with Carmarthenshire. This option involved developing a new building for FRAME, a transfer/bulking station for materials before being sent to facilities in Carmarthenshire, and an in-vessel composting facility for kitchen derived organic wastes.

Details of the assessment and analyses undertaken for these options are provided in the March 2001 Waste Management Strategy document, which included a simplified BPEO analysis. The analysis undertaken at the time confirmed that Option 1 was the preferred way forward for Pembrokeshire. The assessment undertaken at the time has to a degree been superseded by the more recent work undertaken for development of the Regional Waste Plan for South West Wales.

6.2.3 Options Assessment for the Regional Waste Plan (TAN 21)

The process of option development and assessment undertaken for South West Wales is described in detail within the Plan itself and involved the identification of 6 principal options. In summary, the preferred option for the Region was identified as being as follows:

Option 6: ‘Do More’ (MBT led strategy). This option attempts to achieve the 2020 Landfill Directive target in 2013 principally through maximising recycling and composting levels with all remaining residual wastes being sent to MBT. The additional diversion of residual wastes through MBT ensures the 2020 BMW Landfill Directive target is met and in fact exceeded.

The Regional Waste Plan included further clarification on the preferred options by adding the following statement:

'It is considered necessary that a degree of flexibility in the management of the residual waste stream is required and options should remain for any of mechanical biological treatment, energy from waste or landfilling.'

It is clear therefore, that the BPEO defined by the Regional Waste Plan, as applied to Pembrokeshire, provides the Council with a degree of flexibility in terms of deciding which residual treatment technology to select.

The remaining chapter of this strategy provides a framework and overall plan for implementation of the municipal waste management strategy for Pembrokeshire within the context outlined above.

CHAPTER 7 – IMPLEMENTATION PLAN

7.1 INTRODUCTION

This final chapter of the municipal waste management strategy for Pembrokeshire provides a summary of the measures that will need to be taken to meet the various Welsh Assembly Government and Landfill Directive derived targets identified in previous Chapters. The guidance provided by the Welsh Assembly Government (WAG) and the Welsh Local Government Association (WLGA) on the preparation of municipal waste management strategies identifies the need to prepare a number of specific plans and to address several key issues. These are summarised within this Chapter, although much of the supporting detail is provided in the accompanying technical appendices document.

7.2 DELIVERY OF THE STRATEGY

The preferred strategy, established within the context of the BPEO/SWMO identified within the South-West Wales Regional Waste Plan, is as follows:

Expansion of recycling and reuse schemes for municipal waste such that the waste strategy targets for each of the target years of 2006/07 and 2009/10 are met and in fact exceeded. All residual waste would be sent to a Mechanical Biological Treatment plant (it is considered necessary that a degree of flexibility in the management of the residual waste stream is required and options should remain for any of mechanical biological treatment, energy from waste or landfilling). Continued landfill of waste residues will be required.

Table 7.1 provides a summary of the tonnages of materials that will need to be segregated in order to meet the various Welsh Assembly Government (WAG) and Landfill Directive (LFD) targets. The strategy for Pembrokeshire has been developed on the basis of meeting, and indeed exceeding, these targets.

A detailed ‘mass balance’ analysis has been undertaken in order to determine appropriate contributions from the various elements of the waste management service (kerbside collection, ‘bring bank’ and Civic Amenity and Recycling Centre operation and infrastructure provision) that will be required in order to achieve the targets. The full mass balance analysis is provided in the accompanying technical appendices document (Appendix 8). The mass balance is developed from the following:

- The waste composition confirmed from the recent Welsh Assembly Government funded all-Wales municipal waste compositional study and in particular the proportions of recyclable and compostable materials.
- An assumed split of municipal waste arising from household and commercial waste collections, from kerbside collections, from civic amenity and recycling centres and from ‘Bring’ sites. The data provided for Pembrokeshire is non-specific in terms some elements of the waste stream, and in particular the historic and current contribution to the overall recycling figures from the various available sources (civic amenity sites, community ‘bring’ sites and kerbside collection schemes), the following assumptions have therefore been built into the modelling:
 - For historic and current data, recyclable materials (namely paper, cans, glass and textiles) are split approximately 60:40 between Civic Amenity and Recycling Centres and ‘bring’ sites. All other recyclable material is assumed to be collected at civic amenity sites.

- Mechanical/Street Sweepings totalled 3300.47 tonnes in 2003/04. Of this, 1356.27 tonnes were sent to landfill with the remaining 1944.20 tonnes composted. Pembrokeshire County Council has been liaising with the Environment Agency in order to maximise the composting of street sweepings. The total amount of street sweepings is assumed to increase in line with the growth rate, with the compostable proportion contributing towards the WAG composting target.
 - Diversion rates through Civic Amenity and Recycling Centres are assumed to reach 55% in 2006/07, rising to 60% by 2009/10. The diversion rate includes all materials diverted from landfill, including inert wastes. It should however be noted that inert waste does not contribute towards the WAG recycling and composting targets. The estimated composting and recycling rate from Civic Amenity and Recycling Centres is currently 30-40%. The modelling assumes recycling and composting rates of approximately 40% in 2006/07 and 45% in 2009/10.
 - Kerbside collection coverage across the County is assumed to reach 40% by 2005/06 and 80% by 2009/10.
 - The maximum diversion rate for green waste at CA sites is 80%. This assumes that 20% of the green waste entering the civic amenity site will end up in the residual skips.
 - Cardboard from Civic Amenity and Recycling Centres is combined with the green waste for composting.
- The proportion of households served by kerbside collection schemes, the assumed participation rate (proportion of households actually using the schemes) and the capture rate for each material targeted (the proportion of each material that is actually diverted for recycling or for composting). These 'variables' can be altered in the mass balance model derived for this strategy so as to plan the kerbside scheme(s) to ensure that overall tonnages of recyclable and compostable materials are diverted in order to match the target requirements.

Table 7.1: Summary of Tonnages from Collection Schemes, Civic Amenity and Recycling Centres and 'Bring' Sites to meet Targets¹

Tonnages for 2006/07 (25% recycling/composting)

Origin	Tonnes
Recyclate collected from CA site	7,469
Compostables collected from CA site	4,002
Recyclate collected from Brings	2,400
Recyclate collected from households	1,131
Compostables from households	1,884
Recyclate from commercial premises	1,076
Compostables from commercial premises	0
Street Sweepings	2,033

Tonnages for 2009/10 (40% recycling/composting)

Origin	Tonnes
Recyclate collected from CA site	8,452
Compostables collected from CA site	4,684
Recyclate collected from Brings	2,510
Recyclate collected from households	7,849
Compostables from households	5,641
Recyclate from commercial premises	1,897
Compostables from commercial premises	0
Street Sweepings	2,126

Tonnages for 2010/2011 (40% recycling/composting)

Origin	Tonnes
Recyclate collected from CA site	8,579
Compostables collected from CA site	4,754
Recyclate collected from Brings	2,548
Recyclate collected from households	7,967
Compostables from households	5,875
Recyclate from commercial premises	2,054
Compostables from commercial premises	0
Street Sweepings	2,158

¹ The figures presented in Table 7.1 represent tonnages required to meet the WAG targets. Indications from the pilot kerbside recycling scheme suggest tonnages could be in excess of those modelled in 2006/07; therefore Pembrokeshire would exceed their WAG target, or could divert less material from Civic Amenity and Recycling Centres, Bring Sites or Commercial premises.

In order to meet the Welsh Assembly Government and Landfill Directive targets delivery of the strategy can be considered in three elements:

A. Services and infrastructure required to segregate materials for recycling and composting:

To ensure the targets can be met it will be necessary to have in place a range of services and improved infrastructure to segregate materials from the municipal waste stream for recycling and composting. For Pembrokeshire this can be achieved as follows:

- Introduction and development of the kerbside collection scheme(s) for dry recyclable and, more importantly, organic (compostable) materials. It will be necessary to extend the scheme(s) progressively over the period up to 2009/10 in order to achieve the level of diversion required to meet the targets.

The recycling performance to date has been excellent, even without any significant contribution from kerbside collection initiatives. In order to meet the 2006/07 targets the mass balance model indicates that it will be necessary to introduce kerbside collection for dry recyclable materials to around 40% of households within the County prior to the end of 2005/06. An average participation rate of 50% will be required and individual capture rates achieved of around 50% for paper, card, cans and plastics. Also commercial customers will be included in a variety of recycling initiatives, targeting principally glass, paper, cardboard and cans. In order to meet the 2006/07 WAG composting targets, compostable waste from Civic Amenity and Recycling Centres will need to be supplemented (an additional 1,800 tonnes). This material will be derived from households principally through green waste home composting (WAG are currently considering allowing material composted at home to contribute towards composting targets, although the mechanism to be used to confirm tonnages has yet to be confirmed). By 2009/10, assuming the kerbside collection scheme is serving 80% of all households within Pembrokeshire, an average participation rate of 75% will need to be achieved, with a capture rate for individual materials of around 75%. By 2009/10 it will also be necessary to broaden the range of materials included in the scheme (to include glass and textiles) and to widen the commercial collection scheme to include other materials. In addition to any green waste composted (through home composting or kerbside collection), there will also be a need to target kitchen waste. To gain the required diversion, an estimated 80% of the properties will need to be served with participation and capture rates of 60% and 65% respectively, resulting in approximately 3,500 tonnes of material.

It is clear that the performance of the kerbside collection scheme(s) will be key if Pembrokeshire is to meet the targets for 2006/07 and 2009/10. The full cooperation of the residents of Pembrokeshire, with support from various community organisations in the County, will therefore be essential

Development of the kerbside collection scheme(s) will result in a significant reduction in the quantities of residual waste (i.e. waste that is not segregated for recycling or composting) for collection.

These planned changes to the collection services will, in certain areas, require some rationalisation in order to reduce any inconvenience to the public. Ideally the Council would like to see all recycling collections in a particular area being carried out on the same day, with residual waste collected on the same day too.

- Enhancement of the Civic Amenity and Recycling Centre provision across the Authority to facilitate improved access to the principal population centres and increased diversion of materials for recycling and reuse. The two sites in the south of the County are restricted in area, and the Council is endeavouring to find more suitable new locations. At all sites measures will be required to further encourage users to segregate materials for recycling and composting.

Improved operation of the Civic Amenity and Recycling Centres will be required such that by 2006/07 a diversion rate in excess of 55% is being achieved at all six sites.

- The network of 'Bring' Sites has come about in a somewhat haphazard manner over the past 15 years. A full and comprehensive review is underway, with the number of locations increasing to bring the point of recycling closer to the population and with a full range of recycling banks, for cans, glass, newspaper and magazines and textiles, at each location. A site refurbishment programme is also underway to enhance existing facilities with a hard-standing, screening, lighting, litter bin provision and an information board. Further work is to be progressed to ensure that all sites are appropriately and adequately serviced and maintained.

B. Infrastructure required to handle and/or treat materials segregated for recycling and composting

There will be a need to provide new and improved infrastructure to handle and/or treat the materials that are segregated for recycling and composting. Table 7.2 provides a summary of the overall infrastructure requirements for handling the materials that are segregated for recycling and composting on the assumption that the Welsh Assembly Government targets for 2006/07 and 2009/10 and Landfill Directive targets for 2010, 2013 and 2020 are met.

Table 7.2: Summary of Infrastructure Requirements²

	Capacity Requirements to Achieve Targets			
	MRF	Compost	Additional BMW Diversion from Landfill Required	Residual (Treatment/Landfill)
2006/07	11,878	7,919		59,389
2009/10	20,701	12,420		49,682
2010	21,011	12,607		50,427
2013	21,971	13,183	10,135	42,595
2020	24,384	14,631	19,299	39,223

² Capacity for composting is based on kerbside collections of green and kitchen waste. If home composting could contribute to WAG targets then capacity requirements for composting would substantially decrease. For example, in 2009/10, Green waste from Civic Amenity and Recycling Centres could be composted on farm, green waste from households could be home composted, the only infrastructure requirements would be approximately 3,500 tonnes of in-vessel capacity.

Table 7.2 confirms that the requirements will be as follows:

- Provision of Materials Recycling Facility (MRF) capacity to receive, handle and bulk up recyclable materials diverted at the kerbside and received at Civic Amenity and Recycling Centres and 'Bring Sites'. By 2006/07 the dry recyclables total will be just under 11,900 tonnes, rising to just over 20,700 tonnes by 2009/10. The Council is currently tendering for the provision and operation of a Materials Recycling Facility. Tenders were returned on 1st November 2004 with a start date, albeit with interim arrangements pending construction of a MRF, of 1st January 2005 in order to meet the 2006/07 targets.
- Development of an 'in-vessel' composting facility for the treatment of kerbside segregated organic materials.

It is anticipated that the 2006/07 composting target will in part be met through the introduction of a mechanism by the Welsh Assembly Government to calculate the rate of home composting activity. If home composting cannot contribute to WAG targets then a green waste kerbside collection scheme or increased diversion from Civic Amenity and Recycling Centres would be required.

Suitable technology is available in West Wales for dealing with organic materials which, subject to the appropriate procurement process, may be able to take small amounts of kitchen derived organics from Pembrokeshire. The Council is unaware of any other such facility in the vicinity at the present time. However, additional capacity will be required to be in place to meet the 2009/10 composting target of 15%. By 2009/10 the overall composting capacity will need to be in excess of 10,000 tonnes per annum. If green waste is composted on farm based open windrow facilities, and if the contribution from home composting is accepted by WAG, then the in-vessel composting capacity required by 2009/10 would be in the order of 3,500 tonnes per annum.

Pembrokeshire County Council and the Pembrokeshire Coast National Park Authority are jointly sponsoring research into anaerobic digestion by ADAS Wales. ADAS will carry out an evaluation of existing technology as a potential option for the management of kitchen derived organic wastes and farm wastes including slurry.

There has also been some interest shown by local farmers in setting up in-vessel composting facilities. These potential opportunities will be explored further.

C. Infrastructure required to treat residual waste to meet the Landfill Directive targets

In Table 7.2 it should be noted that the 'Residual (Treatment/Landfill)' figure is the tonnage of waste that will still need to be sent to landfill up to 2010, at which stage additional residual treatment will be required to reduce the amount of biodegradable municipal waste landfilled in line with the Landfill Directive targets.

The Regional Waste Plan BPEO incorporates the use of Mechanical Biological Treatment (MBT) technology for treating residual waste, although it does provide some degree of flexibility in terms of the actual technology utilised. Use of a residual treatment plant will not be required until 2010 at the earliest, and therefore the final decision on preferred technology does not need to be made for a year or two. Over this period it will be possible for Pembrokeshire County Council to monitor the performance of MBT plants and other treatment technologies across Wales and the rest of the UK so that an appropriate decision is made. It should be noted however, that at least 3-4 years should be allowed for completing the process of securing planning permission for a treatment plant and for procuring a contract for development and operation of the plant. A decision has yet to be made as to the preferred procurement route for providing residual treatment capacity, and whether this would comprise a new facility within the Authority, or use of a facility outside of the Authority. The Council will continue to monitor this situation going forward.

It is important to note that whilst the quantity of waste sent to landfill will reduce significantly up to 2010 and beyond it will be necessary for Pembrokeshire to secure additional landfill capacity in the future. Table 7.2 indicates that even if all of the targets are met by 2010 there will still be a need to dispose of around 50,000 tonnes of residual waste to landfill during that year alone.

7.3 BMW DIVERSION PLAN

The BMW (Biodegradable Municipal Waste) Diversion Plan indicates how the Council proposes to meet the EU Landfill Directive targets for reducing the amount of biodegradable waste being sent to landfill. The Welsh Assembly Government has set targets for each Council in Wales to achieve for each year between 2004 and 2010. BMW diversion plans are quite similar to recycling plans, however they also include information on the method for dealing with biodegradable waste that is not segregated for recycling or composting. The Council aims to meet the targets for diversion of biodegradable municipal waste in a number of ways:

- Provision for the segregation of green waste at Civic Amenity and Recycling Centres for composting and timber for recycling
- Collection of separated kitchen organic waste from households with subsequent treatment via 'in-vessel' composting
- Contribution from home based composting (subject to WAG acceptance)
- Collection of paper at 'Bring Banks' and Civic Amenity and Recycling Centres and kerbside collections from households and businesses
- In the longer term (beyond 2010) delivery of residual waste to a residual treatment facility

The Council's BMW Diversion Plan is presented in the accompanying technical appendices document (Appendix 9).

7.4 WASTE MINIMISATION AND EDUCATION

Waste Minimisation is at the top of the Waste Hierarchy. The Council fully supports the need for waste reduction and minimisation and is keen to promote suitable waste minimisation initiatives.

The impact of increased waste minimisation would be beneficial to Pembrokeshire in the following ways:

- reduced cost of waste collection and disposal;
- reduced use of fuel and emission of pollutants in transporting waste;
- reduced landfill with its attendant potential for pollution risk; and
- increased awareness of residents on waste related issues.

Education and the promotion of awareness about waste management issues are particularly important if waste producers, including the public, are to adopt more sustainable waste management practices.

By specifying environmentally friendly materials and processes to be used in the performance of contracts and procurement of consumables, the Council will be helping to stimulate the market for recycled materials. Examples of potential actions that the Council can take are:

- requiring the use of recycled paper;
- requiring construction and demolition contracts to specify the use of recycled and secondary aggregates; and
- requiring the use of waste derived composts and soil conditioners in landscaping.

The Council plans to undertake an audit of its facilities and services to identify opportunities for maximising the specification of green services and materials.

Pembrokeshire County Council are planning to produce a draft Waste Minimisation Plan in the near future. Once prepared, the Waste Minimisation plan will be presented in the accompanying technical appendices document (Appendix 10)

7.5 LITTER PLAN

The Welsh Assembly Government has given priority to improving the management of litter in Wales. To this end Pembrokeshire County Council is developing a draft Litter Plan as part of this strategy and this will in due course be included in the accompanying technical appendices document (Appendix 11). The draft Plan will include details of cleansing policies, strategies and services currently provided by the Council to address the problem of litter within Pembrokeshire. The draft Plan will also set out proposals for future improvement.

7.6 WASTES OF SPECIAL IMPORTANCE

Municipal wastes include a number of wastes for which there is specific legislation. There are current or proposed European Community (EC) Directives or Regulations for a range of wastes. Furthermore, the National Waste Strategy for Wales promotes measures for the separate collection of household hazardous wastes, to improve the management of resources and reduce the hazardous nature of residual municipal waste. The strategy advocates the improvement of household hazardous waste collection facilities, particularly at civic amenity sites. Further detail on how wastes of special importance will be managed is provided in the accompanying technical appendices document (Appendix 13).

7.7 FINANCIAL ASSESSMENT AND PROCUREMENT

Implementation of the strategy will require substantial capital investment in new recycling and treatment facilities such as improved Civic Amenity and Recycling Centres and ‘bring’ sites, and new material recycling, composting and residual treatment infrastructure. It is unlikely that the Council will be able to afford this significant investment alone and will need to consider contractual arrangements or partnerships with private sector organisations.

Additional costs will be incurred through compliance with specific legislation e.g.:

- Landfill Directive
- Ozone Depleting Substances Regulations
- End of Life Vehicles Directive
- Waste Electrical and Electronic Equipment Directive

A financial assessment, along with the contractual framework options that could be considered by Pembrokeshire County Council for delivering the required waste management infrastructure and service(s) are discussed in Appendix 14 of the accompanying technical appendices document.

7.8 COMMUNITY INVOLVEMENT

The Voluntary and Community sector play a significant role in recycling and bring an extensive range of skills and experience that are not always available in the private sector. Details of how the Council will involve the community sector in municipal waste management are given in the accompanying technical appendices document (Appendix 15).

7.9 CONSULTATION

The Authority will devote considerable effort towards informing and educating the public about sustainable waste management in Pembrokeshire. The Authority recognises that a successful waste management strategy will only be achieved with the full support of the public. From the public a change in attitudes and habits is required. This is something that will not occur overnight, but the Council is confident that any changes will be implemented in conjunction with sufficient publicity to ensure that they are fully adopted by the community.

The responsibility for the generation of waste lies with all members of society – not just the Council. Therefore all members of the public need to have the ability to be involved in this Strategy, be they a consumer, customer, provider or a regulator (including Waste Planning Authorities and the Environment Agency).

The purpose of the public consultation stage should be seen as:

- Communicating the reason for change
- Raising awareness
- Educating to increase understanding
- Achieving consensus
- Identifying issues which need addressing
- Gaining ownership of the final decision

Pembrokeshire County Council will ensure that all stakeholders are actively involved in the development of the strategy in their area. Consultation has been fully integrated into every stage of the Municipal Waste Management Strategy development so far, and will continue to play an important role in the strategy development in the future.