



Waste Action
Scotland

Reduce → Reuse → Recycle

National Waste Strategy: Scotland

Forth Valley



Area Waste Plan



SCOTTISH EXECUTIVE





Forth Valley Area Waste Plan

Prepared by SEPA in partnership with:

Clackmannanshire Council
Falkirk Council
Stirling Council
Scottish Enterprise Forth Valley
Scottish Water
Scottish Waste Awareness Group

Prepared by SEPA

February 2003

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Foreword by Forth Valley Area Waste Group Chair

It is with great pleasure that I present to you the Forth Valley Area Waste Plan. The Forth Valley Waste Strategy Area Group (WSAG) has been working hard since early 2000 to prepare a long-term and integrated plan for wastes in the area.

Waste management in Scotland is on the verge of major change, driven by legislative changes, public expectation and economic drivers. The Forth Valley Area is well placed to be at the forefront of these changes and to lead others by example. Once implementation commences, everyone within the area will have an opportunity to make a real impact. The generation of waste is everyone's problem and it is our duty as human beings to live within our environment and to act in a responsible manner for the benefit of ourselves and for future generations.

The production of this Area Plan has been built on a consultative and consensual approach that will continue to characterise the work of the Waste Strategy Area Group in future. Feedback from stakeholders, including the commercial sector, business organisations, politicians, campaigning groups and local people has been important in shaping the thinking behind this plan.

The plan itself proposes a radical shift in the amount of municipal solid waste recycling over the next eight 8 years, and sets a key target to recycle or compost 38% of municipal waste by 2010. This aspirational target is soundly based upon a rigorous assessment of the options available for the area having regard to economic, social, environmental and political realities.

However, we are honest enough to admit that there is much more to be done, including giving waste prevention and education and promotion much higher profiles; filling data gaps and improving understanding and dealing with the implications of new legislation. In addition we have to ensure that we work in an effective and proactive manner towards the long-term vision of the plan.

The next step is of course to implement the actions detailed in the plan. Effective implementation is imperative if we are to succeed. Nevertheless, we cannot allow ourselves to become complacent. We have some tough targets to meet and will need to work particularly hard on attempting to change the very attitudes and behaviours that currently contribute towards the throwaway society that we have become.

Time is not on our side and waste production levels are currently growing at an unsustainable rate. There is no doubt that attention will need to be focused on closing the resource use loop and preventing waste from being generated in the first place.

On a positive note, the consultation process used to produce this plan demonstrated a high level of commitment and this is a fundamental cornerstone on which to build success.

Good luck.

Gordon Jackson

Falkirk Environment Regulation and Improvement Team Leader, SEPA
Chair, Forth Valley Area Waste Group

Foreword by Scottish Executive

Currently almost all of Scotland's household waste goes to landfill sites. This has been a cheap and – for most of us – convenient way of putting waste out of sight and out of mind. But disposing of unsorted refuse in this way is, quite literally, a waste of the world's resources. It is also a potent source of greenhouse gases and other emissions to the environment with waste management (mainly from landfills) contributing almost a quarter of the total amount of methane emitted in Scotland each year.

Moving to a position where we produce less waste, reuse and recycle more and recover value from as much as possible of what is left is at the heart of the Scottish Executive's approach to sustainable development. Nationally we have set a target of recycling or composting 25% of Scotland's waste by 2006, but we aim to move beyond that to achieve higher levels of recycling and composting and minimise our use of landfill. These are goals that are wholeheartedly supported by the Scottish people. In the recent Executive survey of public attitudes on the environment over two-thirds of people indicated that they were worried or very worried about waste management issues. Many already support recycling and composting initiatives by local authorities and the community sector. Opinion surveys show that more than 80% of people would participate in kerbside recycling if the necessary facilities were in place.

The change cannot be achieved overnight. It will need investment in new services and new facilities and in the development of markets for recycled materials. The Executive has allocated more than £230m over the next three years for these purposes. The change also needs a change of culture so that sorting our waste becomes a part of daily life for all of us. And crucially it must be based on thorough planning taking full account of local circumstances.

The preparation of this Area Waste Plan for the Forth Valley, along with 10 other area plans and the National Waste Plan, has been the essential first step on the path to change. The Plan is the product of intensive work by Clackmannanshire, Falkirk and Stirling Councils, the Scottish Environment Protection Agency and Scottish Enterprise Forth Valley, Scottish Water and Scottish Waste Awareness Group to identify the best practicable environmental option for waste management in Forth Valley. Its completion is a testament to the potential of partnership working across local authority, organisational and sectoral boundaries and all participants deserve credit for the parts they have played. The exercise has also generated extremely high interest amongst the general public in waste issues, partly as a result of the area groups organising many local meetings, exhibitions, leaflets and consultations.

The programme of change set out in this plan and its counterparts is a challenging one. But it is one, which by building on the partnerships that have been established at national and local level by the waste planning process, we can and must achieve.

Ross Finnie

Minister for Environment and Rural Development

Executive Summary

This Forth Valley Area Waste Plan (AWP) has been developed by the Waste Strategy Area Group to establish a framework for improved waste- management practices across the three local authority areas of Clackmannanshire, Falkirk and Stirling.

The key aim of the Area Waste Plan is to:

'Contribute to the sustainable development of the Forth Valley by developing waste management systems that will control waste generation, reduce the environmental impacts of waste production, improve resource efficiency, stimulate investment and maximise the economic opportunities arising from waste.'

The principle of sustainable development is now fully embedded at all levels of government thinking and policy-making. The Scottish Executive recognises that effective resource use is a crucial element of sustainable development and therefore set the following objective within their Spending Proposals for 2003-6:

'Ensure progress towards sustainable management of Scotland's waste and achievement of EU landfill reduction targets by 2010, 2013 and 2020.'

The Executive therefore set an overall national target to increase the amount of waste collected by local authorities that is recycled or composted to 25% by 2006.

The Forth Valley Area Waste Plan forms part of the overall National Waste Strategy for Scotland and should be read in conjunction with relevant development documents listed in Annex 4. The plan has five main parts:

- Chapter 1** → Sets out the background to the Area Waste Plan in the context of the Forth Valley area and details current waste management practices and infrastructure.
- Chapter 2** → Summarises the strategic framework and key drivers behind the development of the Area Waste Plan and presents a summary of the Best Practicable Environmental Option (BPEO) development process for Municipal Solid Waste (MSW) in the Forth Valley.
- Chapter 3** → Details the plan for implementing the BPEO for municipal solid waste in Forth Valley, managed by the three local councils. The plan seeks to build on the existing range of waste management facilities and to significantly increase the amount of waste materials that are reused, recycled and composted.
- Chapter 4** → Presents a national and local framework for developing the BPEO for non-municipal solid wastes, managed by the private waste industry.
- Chapter 5** → Summarises essential elements required for implementing the Forth Valley Area Waste Plan, including the future role and membership of the Waste Strategy Area Group and local forums.

The plan primarily focuses on Municipal Solid Waste (MSW), that is, the waste produced by households and some commercial premises that is collected and managed by the local authority. It sets out the strategy for implementing the best practicable environmental option (BPEO), as identified by the group in April 2001, and reported in the Forth Valley Draft Area Waste Plan, July 2001.

A schematic of the area waste plan development process and public consultation exercises is presented at the end of this summary.

Information and data on non-MSW, from other commercial, industrial, clinical, construction and demolition sources, are currently insufficient to conduct a through analysis of management options and identify the BPEO. The framework for developing the Best Practicable Environmental Option for these other waste streams is set out in Chapter 4 and focuses on developing sufficient data on content and quantity for future management.

BPEO Action Plan for Municipal Solid Waste in the Forth Valley, 2002 - 2020

The Best Practicable Environmental Option (BPEO) for the management of municipal solid waste within Forth Valley is presented in Chapter 3 of this plan, summarised in Annex 1 and composed of the following key elements:

A public awareness campaign to reduce the quantities of waste arising and increase public participation in the reuse and recycling of materials through improved infrastructure provision.

Recycling of source separated materials through the provision of household multi-material dry recycle collection and improved local bring sites.

Compost source separated garden waste and support the development of home and community composting activities.

Review area waste plan implementation in 2006 and investigate the performance, practicability and costs of advanced waste treatment technologies.

Reduce the quantity of waste landfilled, particularly biodegradable waste in line with the Landfill Directive targets.

In summary

Figure 3.3 - Forth Valley Municipal Solid Waste Targets



	2000	2006	By 2010	By 2013	By 2020
% Recycling	4	18	19	27	28
% Composting	2	18	19	26	25
% Other recovery	-	-	-	17	17
% Landfill	94	64	62	30	30

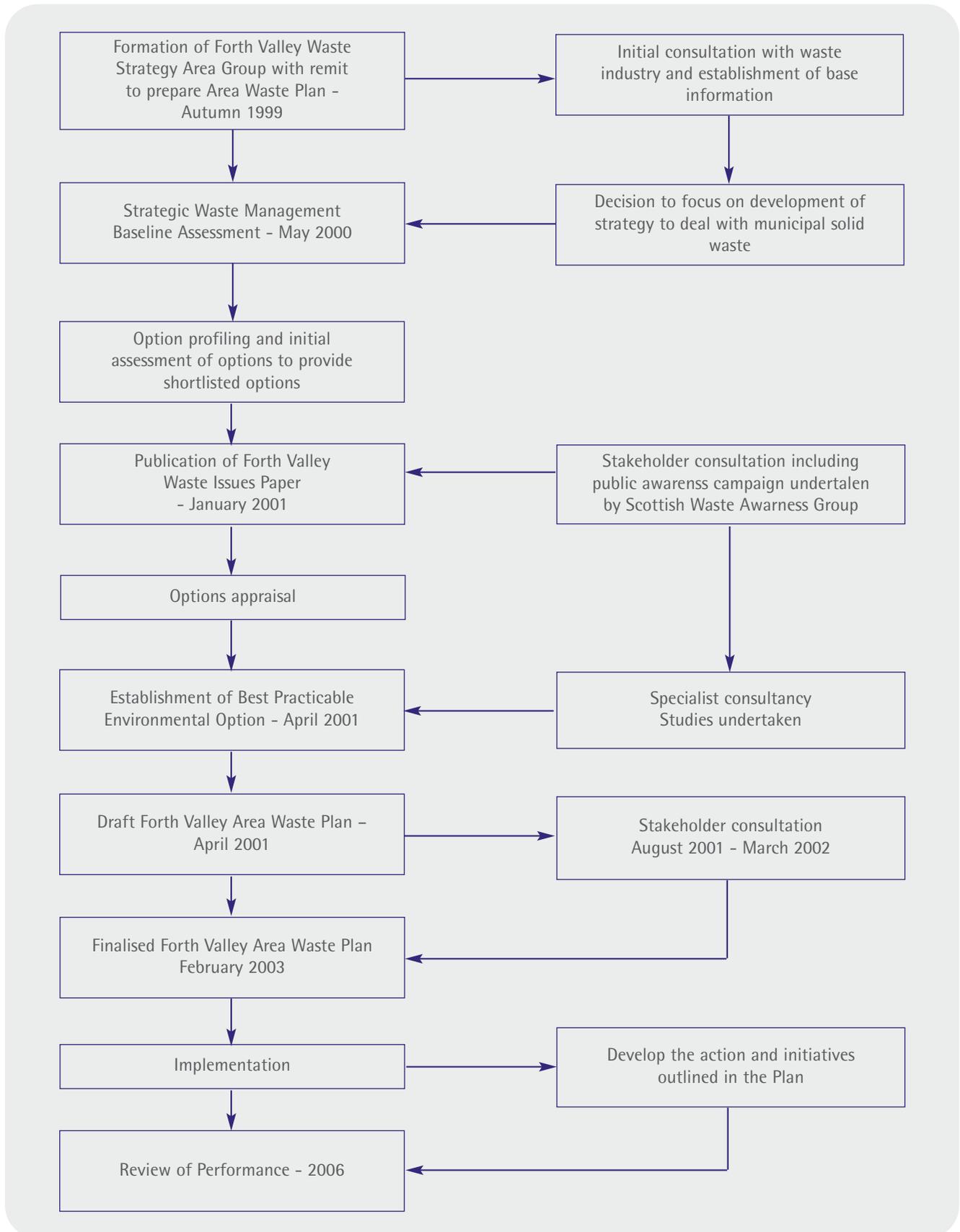
The BPEO requires increased levels of public awareness and participation in waste prevention and in source separating materials for kerbside collection. It also encourages communities to get involved in developing local projects that have added social or environmental value.

Improved collection systems aim to capture a high-quality material and make recycling accessible to householders across the Forth Valley. Initiatives to increase diversion of biodegradable municipal waste (BMW) from landfill include kerbside collection of garden wastes and development of centralised and local community composting sites.

Advanced waste treatment infrastructure will be considered for incorporation to the Forth Valley integrated waste management system as the Area Waste Plan develops, post 2006. This will allow assessment of technological performance, public participation, recycle abstraction and waste growth rates to inform infrastructure capacity requirements to effectively manage MSW up to 2020.

Taking forward the Forth Valley Area Waste Plan will require partnership working at a range of levels and with a number of stakeholders. Consequently, it is essential that commitment is given by all sectors of the community, to both the principles behind the plan and the range of actions summarised in Annex 1. Education and awareness raising is a vital element in achieving widespread attitude and behaviour change towards improving household and commercial waste management.

Area Waste Plan Development Process



Key Acronyms (terms and abbreviations most frequently used)

AWP – Area Waste Plan

The National Waste Strategy: Scotland 1999 established 11 Waste Strategy Area Groups. Each Group was charged with producing an AWP presenting the strategic plan for the waste arising in that area based on National Waste Strategy: Scotland principles.

BMW – Biodegradable Municipal Waste

Waste collected by local authorities that is capable of undergoing anaerobic or aerobic decomposition, such as food or garden waste and paper and cardboard, i.e. waste that rots. This is generally accepted to be 60% of MSW.

BPEO – Best Practicable Environmental Option

The National Waste Strategy: Scotland 1999 defined the BPEO as the outcome of a systematic and consultative decision-making procedure, which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits or the least damage to the environment as a whole, at acceptable cost, in the long term as well as in the short term.

MSW – Municipal Solid Waste

Household waste and any other wastes collected by the local authority, or on behalf of the local authority.

SWMBA – Strategic Waste Management Baseline Assessment

An assessment and description of the existing waste management within an area. Details waste arising, waste management facilities and capacities, imports and exports of waste, existing contract arrangements and demographics, such as population and household numbers.

Forth Valley WSAG – Forth Valley Waste Strategy Area Group

A key component of the National Waste Strategy Scotland was the establishment of 11 Waste Strategy Area Groups across Scotland. The groups are charged with making the national strategy a reality at a local level, developing local solutions in response to local needs. The Forth Valley Waste Strategy Area Group consists of the following partners:

- Clackmannanshire Council
- Falkirk Council
- Stirling Council
- Scottish Enterprise Forth Valley
- Scottish Environment Protection Agency
- Scottish Water
- Scottish Waste Awareness Group.

SWAG – Scottish Waste Awareness Group

This group has been tasked with planning and delivering public awareness campaigns on domestic waste management throughout Scotland.

A full glossary of terms is presented in Annex 2

1 Introduction and context

1.1 Background

Waste management in Scotland is facing a period of rapid and radical change. Driven by the need for improved environmental protection, public expectation and European legislation, we must find ways of reducing our current dependence on landfill and move towards more sustainable methods of managing waste. We must also act to reduce the growth in waste arising within homes, businesses and industry across Scotland if we are to manage waste effectively. This will require a fundamental change in society's current attitude to waste and an acceptance that each of us has a responsibility to reduce waste production and participate in reuse, recycling and composting initiatives.

SEPA developed the National Waste Strategy: Scotland, in 1999, which set out the process of Area Waste Planning and formation of 11 Waste Strategy Area Groups (WSAGs) across Scotland. This strategy was adopted by the Scottish Executive as the principal mechanism to develop sustainable waste management across Scotland. The Forth Valley WSAG was formed in the autumn of 1999 and is a partnership of the following organisations:

- Clackmannanshire Council
- Falkirk Council
- Stirling Council
- Scottish Enterprise Forth Valley
- Scottish Environment Protection Agency
- Scottish Water
- Scottish Waste Awareness Group.

In addition, Action Recycle, Alloa Community Enterprise and Grangemouth Enterprise have assisted in the development of the plan and articulated the views of the not for profit sector locally.

This Area Waste Plan primarily deals with the management of Municipal Solid Waste (MSW), and sets out a strategy that will meet the Landfill Directive diversion targets for biodegradable municipal waste (BMW), in Chapter 3. A framework for developing the BPEO for non-MSW is set out in Chapter 4.

1.2 Area Waste Plan: Key Aims and Objectives

The key aim of the Area Waste Planning process, adopted by the Forth Valley Waste Strategy Area Group (WSAG), is to:

'Contribute to the sustainable development of the Forth Valley by developing waste management systems that will control waste generation, reduce the environmental impacts of waste production, improve resource efficiency, stimulate investment and maximise the economic opportunities arising from waste.'

This aim is supported by the following objectives:

1. Examine existing waste management infrastructure and plan for progress in waste management in the medium and long term to meet current and future legislative requirements and objectives of the National Waste Strategy: Scotland.
2. Ensure that the waste management system developed is in accordance with the Best Practicable Environmental Option (BPEO) and the principles of sustainable development, making the maximum possible contribution to reducing society's impact at an acceptable economic cost.
3. Provide a clear framework for stakeholders to judge the future development of waste management services in the Forth Valley, and guide both local authority Integrated Waste Management Plans and private investment decisions.
4. Encourage local development planning policy to be consistent with the overall aims of the National Waste Strategy and the Forth Valley Area Waste Plan.
5. Present opportunities for Forth Valley businesses arising from sustainable waste management, including the not-for-profit sector.

6. Enable all key stakeholders the opportunity to input to the Area Waste Planning process.
7. Present an ongoing Area Waste Planning process that offers a clear, transparent and informative approach to local stakeholders.
8. Raise public awareness of the future challenges in implementing the AWP and promote active participation by all stakeholders in meeting the objectives.
9. To maintain regular review of new waste management technologies to ensure the continued BPEO for the Forth Valley in the longer term.

1.3 Developing an Integrated Plan

The Area Waste Plan seeks to adopt an integrated approach that:

- takes advantage of opportunities to pursue cost-effective Best Practicable Environmental Option (BPEO) implementation across the Forth Valley by collaboration between neighbouring local authorities and other waste strategy areas – with particular regard to the capacity and timing of infrastructure development
- ensures all waste streams are considered together and the solutions chosen for individual waste streams are considered in the light of how they impact on the management of others
- considers waste reduction, reuse, recycling, energy recovery, disposal, promotion and education and local market development in a coherent and systematic manner
- ensures consistency with adjoining areas and national integration of the plan within the National Waste Strategy: Scotland.

The Forth Valley WSAG has identified the Best Practicable Environmental Option (BPEO) for the management MSW and developed an action plan for implementation of improved waste management across the area. (Summary Action Plan presented in Annex 1).

However, the poor quality of data on the quantity, source, and content of industrial, construction, clinical and other non-MSW wastes has hindered an appropriate analysis on the status and future management of these waste streams. Consultation with Forth Valley waste producers and the waste industry is required to develop a fully integrated plan encompassing non-MSW waste streams.

It is recognised that there is a need for a common approach to collecting waste data to meet the demands of effective waste management planning. Data is required for European reporting requirements, policy planning, reviewing performance, assessing the impacts of new legislation, effective regulation, aiding research and disseminating information to stakeholders.

Regular annual surveys of MSW and licensed waste management sites are being introduced by SEPA (2002/3), while work is ongoing to improve the quality of data on special waste, priority waste streams and general industrial wastes. Significant improvement will need to be made to the quality of data on waste arising if the shift to an efficient resource management culture in Scotland is to be achieved.

When completed and integrated across Scotland the 11 Area Waste Plans will require to collectively meet Landfill Directive diversion requirements. To achieve consistency of approach across the Waste Strategy Areas a broad methodology and guidance was established by SEPA through the key documents: 'Supporting Guidance for Area Waste Plans' and 'Best Practicable Environmental Option (BPEO) Decision Making Guidance'. An important element was to seek the involvement of key stakeholders, such as waste producers, local authorities, community business and the public at various stages of the process. Consistency between adjoining waste strategy areas is also important. Due to Forth Valley's central location this means possible co-operation with the Fife, Tayside, Lothian & Borders, Glasgow & Clyde Valley and Argyll & Bute Waste Strategy Areas.

The Area Waste Plan establishes an inclusive approach to waste management in the Forth Valley area and fits with improving public awareness and other sustainability policy objectives. The Forth Valley Area Waste Plan will therefore influence and, in turn, be influenced by other policy documents and initiatives. It has a key role in integrating investment programmes and other strategies developed by central and local government, partner agencies and the waste industry. A list of other relevant documents is outlined in Annex 3. The key drivers, partners and mechanisms for change are presented in Figure 2.1.

1.4 Area Description

The Forth Valley Waste Strategy Area comprises the administrative areas of Clackmannanshire, Falkirk and Stirling Councils.

Clackmannanshire is Scotland's smallest county, set against the backdrop of the Ochil Hills. The main town with the largest population is Alloa, famed for its historic textile industry, brewing and glass making. Clackmannanshire makes up almost 18% of the total population within the Forth Valley.

The main towns in the Falkirk Council area are Bo'ness, Bonnybridge, Denny, Falkirk, Grangemouth, Larbert, Polmont, and Stenhousemuir. The Falkirk area is the industrial and manufacturing centre of Forth Valley, supporting the petrochemical complex at Grangemouth, timber yards and sawmills. The Forth and Clyde canal dissects the area west to east and the Slammanan plateau borders the area to the south. Falkirk's population makes up almost 52% of the Forth Valley total.

Stirling comprises of an area of 2,200 square kilometres with an extensive rural sector stretching out from Tyndrum and Crianlrich in the Southern Highlands down to the Glasgow commuter villages of Killearn and Strathblane. The majority of the population live within the main urban area around Stirling, including the former mining villages of Plean, Cowie and Fallin. Stirling makes up 30% of the total Forth Valley population.

Population trends are an important indicator of household waste production. Table 1.1 presents Forth Valley population numbers for 1998 and projected percentage population trend up to 2010.

Table 1.1 - Population projections for Forth Valley from 1998 to 2010

Council	Population Council Reported (1998)	Population GRO Reported (1998)	Population trend (GRO) Percentage Change Between 1998 and 2010
Clackmannanshire	48,560	48,903	Slow increase of less than 1% and a subsequent decline after 2010
Falkirk	144,499	143,138	Decline of about 1.3%
Stirling	83,500	83,453	Increase of 5%
Forth Valley Total	276, 559	275,494	Overall increase of 1% in combined population

Data Source: General Register Office (GRO), Scotland, 1999.

More recent population projections from the General Register Office, published 2002, indicate that the Stirling Council's area population growth rate, from 2000 to 2010, may be as high as 7%. Falkirk's population is projected to remain fairly constant with a small increase of 0.2%, while the Clackmannanshire population is projected to decline by 0.2% over the same period. This gives an average increase of 1.9% across the Forth Valley given the population properties described above. Changing local circumstances necessitate continued close monitoring of population trends and associated waste arising.

The projected number of households (Table 1.2) is also a useful indicator of potential waste arising due to the recent trend towards an increasing proportion of single-person occupancy households, which tend to produce a disproportionately high level of waste for a given population size.

Table 1.2 - Household projections for Forth Valley to 2014

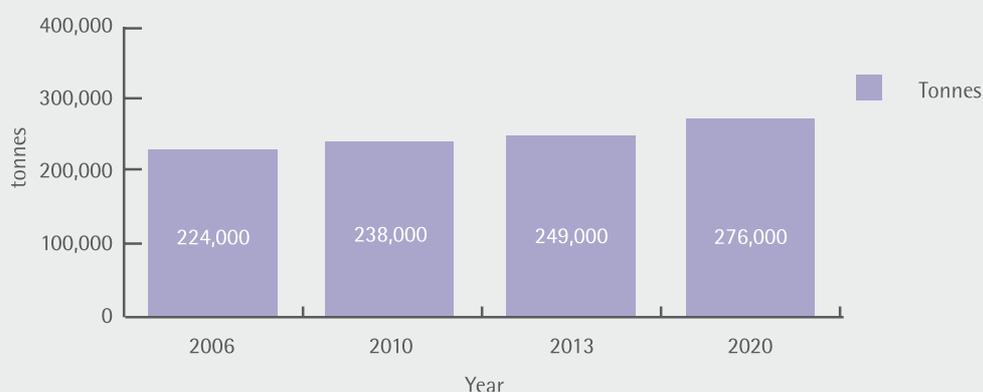
Council	Household Estimates for 2000	Household Projections for 2014		
		Number	Change	%
Clackmannanshire	20,630	22,850	2,200	10.8
Falkirk	61,840	69,300	7,460	12.1
Stirling	34,530	41,540	7,010	20.3
Forth Valley Total	117,000	133,690	16,690	14.3

Data Source: Scottish Executive Housing Statistics Bulletin HSG/2002/4 (August 2002).

The Forth Valley Waste Area comprises a mixture of rural, semi-rural and urban communities supporting a diverse range of housing types requiring a flexible waste management infrastructure. Population and housing forecasts have implications for both the strategy and management of waste across the area. Recent waste growth trends, population and household projections (as presented in the draft Area Waste Plan, July 2001) were used to develop an estimate of the future growth rate for MSW in the Forth Valley of 1.5%, which informed the Best Practical Environmental Option appraisal during April 2001 (summarised in Section 2.5.3).

Figure 1.1 projects future waste arising for MSW within the Forth Valley, based on a waste growth rate of 1.5%. Municipal solid waste has been defined in the development of this plan as 'household waste and any other waste collected by the local authorities or on behalf of the local authority'.

Figure 1.1 - Predicted Forth Valley MSW arising at 1.5% Growth Rate



Note: Growth rate of 1.5%, estimated by the Forth Valley waste strategy area group and based on Forth Valley local authority population ratio, recent waste arising trends and future population and household predictions

These forecasts, however, do not take account of the potential for waste prevention to have a significant impact on future levels of waste arising. It should also be noted that whilst the total quantities of MSW are well understood there is poor local data on the composition of the constituents of this waste stream and its variability across geographic, economic and social groups.

1.5 Current Waste Management Practice within the Forth Valley

Future plans for the management of waste must take account of the current waste management situation presented in the May 2000 Strategic Waste Management Baseline Assessment (SWMBA) report for the Forth Valley.

The SWMBA report presents data on waste management practices, waste flows, existing waste management infrastructure and services across Forth Valley. It demonstrates that the Forth Valley currently has a relatively self-contained system for the management of municipal solid waste and was used as a baseline for the development of the BPEO and this plan.

1.5.1 Current MSW Recycling and Compost Rates

Each Forth Valley local authority is currently engaged in recycling and composting some elements of their municipal waste stream through provision of bring facilities, collection at civic amenity sites and trial kerbside collection systems. Quantities recovered in 2000/1, per local authority, are presented in Table 1.3. In summary, the tonnage of material recycled or composted across the area accounted for less than 6% of the total MSW collected:

Total waste recycled in the Forth Valley, 2000/1	8551.6 tonnes	4.2%
Total waste composted in the Forth Valley, 2000/1	3,106.0 tonnes	1.5%
Total waste landfilled in the Forth Valley, 2000/1	193,310.0 tonnes	94.3%
Total MSW arising 2000/1 across the Forth Valley	204,967.6 tonnes	100%

Data Source: Local Authority Waste Arising Survey, 2000/1

Table 1.3 – Summary of Municipal Solid Waste Management across the Forth Valley, 2000/1

	Clackmannanshire	Falkirk	Stirling
Mini-Recycling Centres/Bring sites	8 Bring recycling sites for: Glass, aluminium & steel cans newspapers, junk mail and other paper products. Total collected – 1,076.6 tonnes	59 Bring recycling sites for Glass, aluminium & steel cans textiles, motor oil Total collected – 3,972 tonnes	42 Bring recycling sites for; Glass, aluminium & steel cans textiles, newspapers and other paper products etc. Total collected – 3,503 tonnes
Civic Amenity Sites	2 sites Forthbank & Glenochill	2 sites: Kinneil Kerse & Roughmute	5 sites: Lower Polmaise, Balfron, Callander, Aberfoyle & Killin to cover central Stirling, the rural west and south.
Central Composting	Central facility at Glenochill plant nursery where householders are encouraged to bring tree branches and other organic materials to be chipped and used as mulch material. Total for 2000/1 – 100 tonnes	Garden waste is accepted at civic amenity sites and centrally composted at Kinneil Kerse by open windrow system Total for 2000/1 – 2057 tonnes	The council encourages all waste producers to deliver their compostible wastes to Lower Polmaise civic amenity site. Here it is shredded and composted in open windrows. Total for 2000/1 – 949 tonnes
Home composting ¹	Promotion of subsidised recycled plastic compost bins, with information pack. A total of 328 composters were distributed to households	Promotion of home composting in partnership with Action Recycle, with information pack, support and advice service, Distribution of composters started 2001	Trial in Dunblane established in June 2000, in partnership with Stirling Landfill Tax Trust. Free telephone advice on home composting. Up to 1,500 composters were distributed from partnership outlets to householders.

	Clackmannanshire	Falkirk	Stirling
Community composting	No activity to date	No activity to date	Local sites where householders can take and deposit their compostibles. This reduces the need to transport long distances and that the finished composting material can be used by local producers. Current site: Kippen, (an estimated 35 – 40 tonnes of biodegradable waste diverted annually) Proposed sites: 1. Killin 2. Callander 3. Balquhidder 4. Aberfoyle 5. Killearn At least 6 other communities/ neighbourhoods have expressed an interest to date.
Kerbside scheme	Following a funding award from Scottish Executive the council has piloted a multi-material kerbside recycling scheme in partnership with Alloa Community Enterprise. The initial trial targeted 5000 households and proved so popular that it was extended to 20,000 homes during 2002. Materials collected: paper, cans, glass, textiles	Action Recycle – fortnightly collection of newspapers, magazines, catalogues, textiles, aluminium steel cans from 60,000 households	Following a funding award from Scottish Executive the council has piloted a multi-material kerbside recycling scheme. Trial targeted at 12,000 households of which approximately 50% are participating. Materials collected: paper, cans, glass, textiles
Landfill	Residual MSW collected by Clackmannanshire Council currently consigned to Black Devon landfill site. Total for 2000/1 – 30,779 tonnes	Residual MSW collected by Falkirk Council currently consigned to landfill by Shanks Avondale. Total tonnage – 104,841 during 2000/1.	Residual MSW collected by Stirling Council currently consigned to Lower Polmaise landfill site Total tonnage –57,690 during 2000/1.

Note: 'Home composting figures have not been added to figures for recycling or to the total waste arising as there is no agreed methodology for estimating quantities of waste composted at home within a given local authority. Source: (Local Authority Waste Arising Survey) 2000/1.

1.5.2 Current Community Sector Service Provision

There are a number of community recyclers in addition to the national charity shop chains who collect for the purpose of reuse, recycling, refurbishment and renovation of household and commercial items. These are described below:

Action Recycle – a subsidiary of British Trust for Conservation Volunteers, operations were established in 1989. The project is currently the largest kerbside collection operation in Scotland covering approximately 170,000 homes within the central belt, including 60,000 in Falkirk and 12,000 in Stirling).

- Household waste materials collected include: newspaper & magazines, aluminium & steel cans and textiles.
- The materials are bulked up and sent on to a range of reprocessing companies
- Action Recycle also operates an Office Paper Collection Scheme within Stirling and Falkirk and a Cardboard Collection Scheme across Clackmannanshire and Falkirk. Commercial materials collected include cardboard and some plastics.
- Falkirk Council & Action Recycle together employ a Community Liaison Officer to deliver waste prevention message to schools, community groups and households.

Alloa Community Enterprises (ACE) – established glass recycling projects in 1991, and currently has bottle and can bank collection arrangements with Clackmannanshire, Falkirk and Stirling Councils.

- Current capacity to collect approximately 6,500 tonnes of glass for recycling annually.
- ACE are British Alcan's Scottish process centre and handle in excess of 30 million aluminium drinks cans per year and twice as many steel cans.
- Collect unwanted furniture and white goods from the general public which are then passed on to low income families.
- Administer trial kerbside collection of paper, glass, mixed cans and textiles in partnership with Clackmannanshire Council
- Collect textiles that are sold onto Nathans Wastesavers, Denny where they are graded and exported to developing countries.
- Operate a local Re-Paint scheme where left over paint is donated and distributed free to charities, social inclusion and voluntary groups.
- Operate two unique contracts with Jaeger Tailoring and Coats Viyella to sort and grade clothes hangers for re-distribution to factories for re-use.
- Materials Recycling Facility (MRF), with up to 50,000 tonnes capacity, for processing source separated recycled materials.

Grangemouth Enterprises – were established in 1982 with the aim of providing employment and protecting the environment. They collect unwanted furniture, white goods and electrical equipment from the Falkirk and West Lothian areas. Operations include:

- Free Furniture Referral Scheme: 2000/1 – to provide furniture that is safe and functional. Local Authority and other local agencies refer people who require household items but cannot afford to purchase them. They provided 650 free furniture referrals and 3,500 low- cost furniture sales in 2000/1.
- A white goods recycling and reuse project was established in January 2000 with a total of 7,281 items uplifted from domestic properties and civic amenity sites in 2000 and 9,525 items in 2001.
- Computer Recycling and Training Project where PCs are refurbished for reuse or passed on to reprocessing companies for recycling. Trainees in their employment receive personal development and technical training. Refurbished PCs are donated to low-income families.

1.5.3 Local Reprocessing Capacity

There is sufficient capacity within the Forth Valley to reprocess significant quantities of glass, wood and some textiles extracted from the municipal solid waste stream and other sources. These include:

- Nexfor (formerly Caberboard), Cowie, Stirling – reprocesses waste wood to manufacture board products. Accepts waste from outwith the Forth Valley area. Recycled an estimated 150,000 tonnes in 2001.
- WoodWaste, Boness – accepts waste wood from Aberdeenshire, North Lanarkshire, Edinburgh and Fife, as well as the Forth Valley. Current annual capacity – 50,000 tonnes.
- United Glass, Alloa – accepts source separated glass cullet from most Scottish Council bottlebank schemes and some private glass collection operators. Cullet is recycled into new glass container products. Current rate of 50,000 to 60,000 tonnes per annum. Capacity of the plant is 150,000 tonnes per annum.
- Superglass Insulation, Stirling – processes approximately 33,000 tonnes per annum of glass cullet and recycles it into glassfibre insulation.
- Nathan Wastesavers, Denny – collection and grading of textiles for remanufacture as wipers, cloths and insulation. Collects graded textiles from bring banks and charity shop sales for export to developing countries overseas.

A number of collection agents and recyclers operate in the Forth Valley area servicing industry, commerce and the public sector with services such as, toner and ink cartridge refurbishment, mobile phone collection, scrap metal processing and the salvaging of building materials for reuse. However, the majority of other materials are currently exported outwith the area to be processed, representing a significant gap in service provision and opportunity to develop from this current baseline of reprocessing infrastructure and enterprise.

1.5.4 Landfill Disposal

In common with the rest of Scotland, the Forth Valley area has relied on landfill as the primary method of MSW treatment and disposal. Up to 193,310 tonnes, representing 94% of MSW was consigned to landfill in the financial year 2000/1. Traditionally each of the councils has managed its own landfill site, however, increasing cost, technical and legislative requirements to operate landfill disposal sites mean that the last of the council managed sites will cease to accept MSW in June 2004. Table 1.4 presents a summary of the current licensed landfill infrastructure across the Forth Valley.

Table 1.4 – Current MSW Licensed Landfill Infrastructure within the Forth Valley

Name and License Number of Site	Type of Waste Accepted	Licensed Annual Capacity (Tonnes)	Expected Date of Closure	Operator
Avondale WML/E/20	Household, Commercial and Et Industrial	385,000	2015 – although site filling up faster than expected	Shanks Avondale Ltd
Black Devon WML/E/20023	Household, Commercial Et Industrial	75,000	April 2004	Clackmannanshire Council
Lower Polmaise WML/E/20076	Household, Commercial Et Industrial	135,000	June 2004	Stirling Council
Kinneil Kerse WML/E/20012	Inert only	450,000	Current restoration phase of site	Falkirk Council

Current waste management costs for the Forth Valley, as presented by Audit Scotland Performance Indicators 2000/1, are set out below.

Table 1.5 – Gross Cost of Refuse Collection and Disposal per Premise, 2000/1

	Collection (£)	Disposal (£)	Total Collection and Disposal Cost (£)
Clackmannanshire	55.37	52.81	108.18
Falkirk	35.29	46.13	81.42
Stirling	62.56	42.20	104.76
Forth Valley Average	51.07	47.05	98.12
Scottish Average	45.63	44.63	90.26

Audit Scotland, Feb. 2002, Performance Indicators 2000/1

Stirling and Clackmannanshire areas are classified as mixed urban/rural councils by the Accounts Commission, while Falkirk is classified as urban reflecting reduced transport distances in lower waste management costs.

1.5.5 Contract Arrangements

The current contractual arrangements in place between local authorities and private contractors will influence future waste management arrangements. Currently only Falkirk Council has an existing contract with Shanks Avondale for the landfill disposal of municipal solid waste. This contract expires as the Stirling and Clackmannanshire in-house landfill sites are due for closure, with the option of four single year extensions. These arrangements allow a significant level of flexibility for converging Forth Valley waste management arrangements resulting in benefits from economies of scale in future.

1.5.6 Non-Municipal Solid Waste

At present, the data on commercial, industrial, construction and demolition wastes currently arising within the Forth Valley are poor. However an estimate may be gained from the total MSW tonnage reported in the local authority waste arising survey subtracted from the total active waste disposed of in landfill that was generated within the Forth Valley.

Forth Valley active waste total (from landfill site operators returns for 2000, SEPA source)	364,600 tonnes	100%
Forth Valley total MSW (from Local Authority Waste Arisings Survey, 2000 /1).	204,970 tonnes	56%
Estimated Commercial & Industrial waste arising across the Forth Valley (excluding inerts)	59,630 tonnes	44%

Data Source: SEPA waste management facility quarterly data returns.

In addition the Strategic Waste Management Baseline Assessment (SWMBA) reported that an estimated 8 -11,000 tonnes of Special Waste was generated within the area and largely exported for disposal during 1999.

An impression of likely sources and their possible scale of non-MSW can be gleaned from the economic outputs and projected growth trends by sector summarised in Table 1.6. Managing this waste is the next challenge for future waste strategy development across the Forth Valley and Scotland as a whole.

Table 1.6 - Percentage of Total Output (1998) by Economic Sector Within the Forth Valley

Sector	Clackmannanshire %	Falkirk %	Stirling %	Forth Valley Trend	Scottish Average %
Agriculture	2	1	3	increasing	2
Distribution, Hotel/Catering	16	14	17	increasing	15.6
Energy & Water supply	4	2	8	declining	4.6
Metals & Chemicals, Oil	9	30	5	declining	14.6
Engineering	1	5	1	variable	2.3
Other Manufacturing	19	5	5	declining	9.6
Construction	11	6	6	variable	7.6
Banking, Finance	8	9	15	variable	10.6
Transport & Communication	7	8	5	variable	6.6

Data Source - Forth Valley Strategic Waste Management Baseline Assessment, Envirospire, May 2000, p.16.

In summary:

- Agriculture accounts for an average of 2% of Forth Valley economic output but this may obscure significant quantities of agricultural waste arising throughout the rural regions.
- The Distribution, Hotels & Catering sector accounts for an average of 15.6% of the economic activity within the area and is projected to increase in line with the expanding tourism industry across the Forth Valley.
- The petro-engineering and metal industry sector located within the Grangemouth complex represents almost 15% of economic activity within the area, projected to decline. Special/hazardous wastes are currently exported from the Forth Valley for specialised treatment and disposal.
- Public sector administration accounts for around a quarter of the economic output of the Forth Valley and is set to increase. This sector has potential to lead by example by improving internal waste management systems, raising awareness among staff and developing sustainable procurement policies.
- Banking and Finance contributes up to one tenth of the Forth Valley economic activity. This sector produces mainly MSW type waste streams.
- The Construction, Transport and Communication sectors collectively account for about 14% of the Forth Valley economy and produce a diverse range of waste types.

A full survey of waste production and composition by economic sector will be conducted within the Forth Valley to fill present data gaps. The framework for the process is presented in Chapter 4 of this plan.

These wastes are primarily dealt with by the private sector. Significant quantities are currently landfilled, however, increasing quantities are being recovered and reused as landfill tax increases.

Table 1.7 - Current non-MSW Licensed Landfill Infrastructure within the Forth Valley

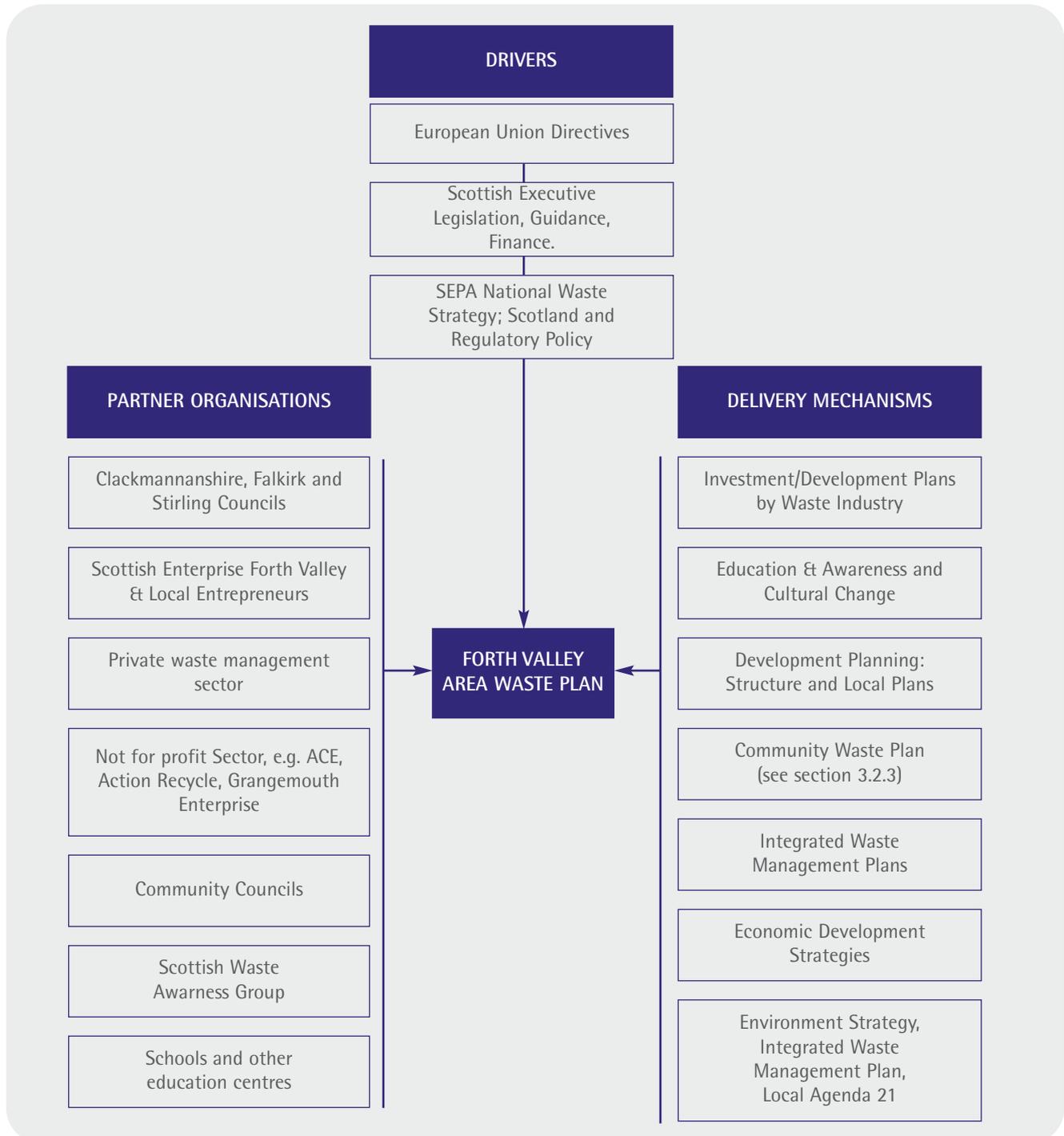
Name and License Number of Site	Type of Waste Accepted	Licensed Annual Capacity (Tonnes)	Operator
Avondale WML/E/20	Household, Commercial & Industrial	385,000	Shanks Avondale Ltd
West Thomaston Farm WML/E/18	Commercial & Industrial	24,999	Seamus McAllister
Broadside Reservoir, Denny, WML/E/25	Industrial/sludge	75,000	Scottish Water
West Carron WML/E/15	Commercial & Industrial	74,999	GR Service Co, Falkirk
Muirton Park Cottage WML/E/326	Inert only	45,000	Mr George Adam
Lower Whitestone Farm WML/E/323	Inert only	75,000	Mr A.P. Anderson

2 Strategic framework and drivers for change

2.1 Introduction

The purpose of this chapter is to summarise a number of key drivers and influences that set the context for the Area Waste Plan and which will impact on future waste planning and management within the Forth Valley. Figure 2.1 presents the most significant partner organisations, drivers and mechanisms by which to deliver change.

Figure 2.1 - Key Drivers, Partner Organisations and Mechanisms to deliver the Forth Valley Area Waste Plan objectives



Some of the drivers are described in the following text while partner organisations and mechanisms are discussed in relevant sections of the plan and Annex 3.

2.2 Sustainable Waste Management

It is Scottish Executive policy to move towards more sustainable waste management systems with increased emphasis on recycling and composting (up to 25% of MSW by 2006) and less reliance on landfill disposal. The Strategic Waste Fund has been established to assist local authorities with the additional costs of implementing the National Waste Strategy through the Area Waste Plans. (see section 3.6)

2.3 The EU Landfill Directive (99/31/EC)

The Landfill Directive is one of the key drivers behind the National Waste Strategy: Scotland. The Directive imposes environmental and engineering standards for landfills across Europe and will ban the landfilling of many substances that are disposed of in this way at present. The Directive also requires a progressive reduction in the landfilling of Biodegradable Municipal Waste (BMW) and the pre-treatment of wastes before landfilling, to both reduce waste volume and minimise the environmental impact of disposal. This will assist in the reduction of landfill gases, such as methane, which are significant contributors to global warming.

2.3.1 Diversion of Biodegradable Municipal Waste (BMW)

The Directive establishes targets and a timescale for the reduction of BMW to landfill. Where member states are particularly dependent on landfill, they will be allowed to defer the implementation of the Directive target dates by up to four years. It is expected that the UK will take advantage of this derogation. The UK must report to the European Commission by July 2003 giving details of how the targets will be met and a decision on whether to extend the target dates will be taken then.

From a baseline of 1995, the amount of BMW allowed to landfill will be (assuming the four year delay is used) as follows:

- 75% of 1995 levels by 2010
- 50% of 1995 levels by 2013
- 35% of 1995 levels by 2020

Using the 1995 baseline figures for the Forth Valley Area, and calculating 1.5% growth rate for waste arising since 1999, Table 2.1 presents the BMW diversion from landfill that will be required by each of the target years.

Table 2.1 - BMW Diversion Required with 1.5% Growth in Waste Arising Across the Forth Valley

	By 2010 (Tonnes)	By 2013 (Tonnes)	By 2020 (Tonnes)
MSW arisings ¹	238,000	249,000	276,000
BMW arisings ²	142,800	149,400	165,600
Max. BMW to landfill disposal ³	86,700	57,800	40,500
Required BMW diversion	56,100	91,600	125,100

Notes:

1 - assumed annual growth of 1.5%

2 - assumes BMW = 60% MSW

3 - allocation of landfill directive targets as calculated from Forth Valley proportion of the 1995 total of 2.8million tonnes, in proportion to its arisings in 1998.

The landfill diversion targets that the Forth Valley councils must meet are sensitive to the growth rate of municipal waste. If waste production continues to increase the quantity of waste requiring diversion from landfill and consequential costs will also rise. Section 3.4 presents MSW landfill diversion targets through implementation of best practical environmental option, the mechanism which will deliver compliance with the Landfill Directive diversion targets.

2.3.2 Landfill Permits

A key mechanism in controlling the amount of Biodegradable Municipal Waste (BMW) each local authority will be allowed to landfill in future will be a system of Landfill Permits. The Scottish Executive will decide if local authorities will be able to trade their allowances, although it will be the responsibility of each local authority in the Waste Strategy Area Group to determine how to use the permits allocated to them. The overall allocation of allowances will be set to reduce the amount of BMW sent to landfill and will be set through the forthcoming Waste Emissions Trading Bill

2.3.3 Other Technical Requirements

The Landfill Directive also has a number of other requirements, which will have an impact on the ability of landfill sites to accept certain waste types, the cost of landfill and could potentially shorten the life of some sites. The main requirements of the Directive are as follows:

- Classification of sites to certain standards or acceptance of certain hazardous waste types.
- Specific wastes banned from landfill, including liquids and tyres.
- Increased technical and engineering standards.
- Waste requires to be treated prior to acceptance into landfill in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery.

2.4 Landfill Tax

The Landfill tax encourages efforts to minimise the amount of waste generated and to develop more sustainable waste management techniques by making landfill a less economically attractive option.

The current landfill tax escalator, introduced in 1999, commits the government to raise the standard rate of tax for active waste by £1 per tonne each year until 2004/5, by which time it will have reached a rate of £15 per tonne. There is a strong case for increasing the tax significantly in future years to provide incentives for diversion of waste from landfill towards recovery treatments. The UK government announced in the November 2002 pre-budget statement their intention to consult on a revenue neutral proposal to increase the tax escalator to £3 per tonne from 2005/6 on the way to a medium to long-term rate of £35 per tonne.

As an integral part of Landfill Taxation a Landfill Tax Credit Scheme (LTCS) has been returning some of the revenue from Landfill Tax to the community to improve environmental quality and local participation in waste projects.

The government has announced a reform the LTCS from 1 April 2003. The level of funding for the replacement schemes will be capped at the value of the tax that would have been forgone in 2002/3 if all the available tax credits had been claimed by landfill operators. Approximately one-third of the funding will continue to be made available through a reformed tax credit scheme for spending on local community environmental projects, ensuring that the current level of support for these types of projects is maintained. The remainder will be allocated to public spending to encourage sustainable waste management.

2.5 National Waste Strategy: Scotland Principles

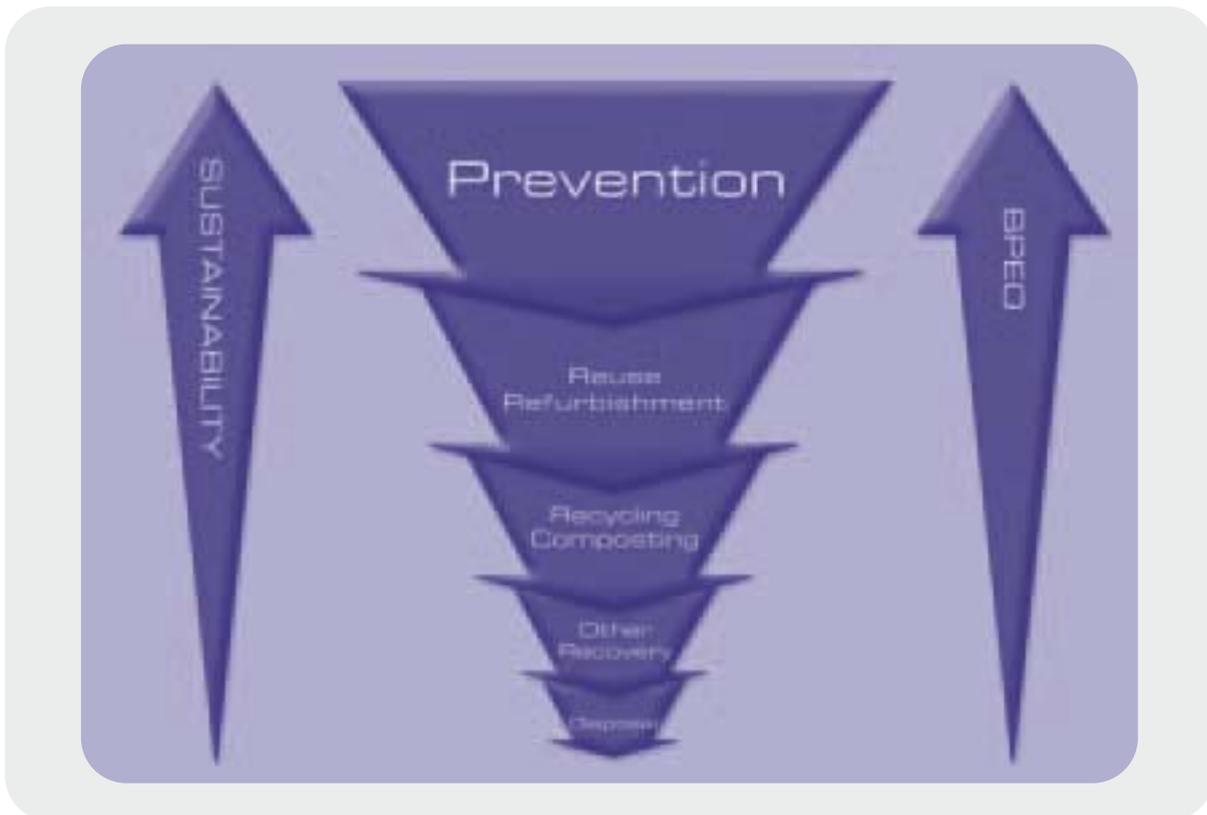
The National Waste Strategy: Scotland (NWSS) established key principles that need to be considered when establishing a sustainable future for waste management. The following have influenced the development of the Forth Valley Area Waste Plan:

- The Waste Hierarchy
- The Proximity Principle and Self Sufficiency
- Best Practicable Environmental Option

Application of these principles will affect the development of Forth Valley waste management systems by improving their sustainability in line with the waste hierarchy.

2.5.1 The Waste Hierarchy

The waste hierarchy provides a framework within which the most desirable waste management options are presented. Within the Forth Valley, in common with the majority of Scotland, existing waste management practices are currently situated at the bottom of the hierarchy at the least sustainable level. The objectives of sustainable waste management are to prevent waste being produced at source and thereafter increase the percentage of waste that can be reused, recycled and recovered. Consequently, the percentage of waste being disposed of to landfill should continue to reduce as materials are removed from the residual waste stream.



Waste Prevention

Is defined by the Organisation for Economic Co-operation and Development (OECD) as including:

- **Strict avoidance** – the complete prevention of waste generation by virtual elimination of hazardous substances or by reducing material intensity in production, consumption and distribution.
- **Reduction at source** – minimising use of toxic or harmful substances and/or minimising material consumption.
- **Product reuse** – multiple use of a product in its original form, for its original purpose or for an alternative, with or without reconditioning.

Unless we control the amount of waste arising, management systems and costs will increase in response. Waste prevention therefore forms a key element of the National Waste Strategy: Scotland. Waste prevention initiatives must address household, commercial and industrial waste production at source.

Household waste is by far the greatest proportion of Municipal Solid Waste (MSW). By reducing the growth of household waste, the diversion required to meet the landfill directive targets can be significantly reduced. Prevention of household waste will be facilitated by local education and awareness initiatives and action taken by householders to reduce purchases of materials that will become waste, such as packaging and to divert biodegradable waste from MSW by home composting, reuse, and refurbishment of products and materials.

Commercial and industrial waste prevention can be achieved at a number of stages including pre-product design, clean technologies and staff training. Continuous improvement throughout manufacturing processes can provide a financial benefit to the company as well as maintaining segregation of materials for reuse or collection.

Reuse and Refurbishment

In recent years, there has been a decline in the reuse and refurbishment of consumer durables as the cost of replacing them has fallen in relation to the cost of repair. As well as removing items from the waste stream, reuse and refurbishment activities can be used to stimulate social inclusion, provide training, employment and personal development opportunities. There are already such schemes established within the Forth Valley ranging from the reuse of clothing through to the refurbishment of furniture and computers.

Recycling

Recycling is the separation of a waste material for processing, followed by preparation and sale onto a market to displace virgin material. The most commonly recycled materials include newspaper, cardboard and glass. There are numerous environmental benefits, such as reduced air emissions and polluting discharges water, reduced impacts of raw material extraction and transport, energy savings, lower disposal impacts on the environment and more efficient use of raw materials to be gained from recycling.

Composting

Composting is the aerobic decomposition of organic material to produce a stable material containing organic matter and plant nutrients. There are often benefits in applying this material to land, including nutrient addition, improved soil structure and improved water retention. These benefits are often only realised through the use of source segregated uncontaminated compostable wastes.

Other Recovery

Recovering part of the energy value from waste may be achieved in a number of ways once adequate pre-treatment has been achieved.

- Direct incineration of mixed waste residue to produce electricity.
- Burning a fuel derived from part of the waste stream, either as refuse derived fuel or as landfill gas produced by the methanogenic decomposition of organic waste.
- Pyrolysis or gasification systems can produce a gaseous or liquid carbonaceous fuel.

SEPA guidelines to thermal treatment plants specifically states that the development of energy from waste plants should only be considered as part of an integrated waste management strategy and ensure that waste materials suited to reuse, recycling or composting should be separated out before any material is burnt.

'Guidelines and approach to thermal treatment and energy from waste' available from www.sepa.org.uk/nws

Disposal

Landfill disposal sits at the base of the waste hierarchy for the following reasons:

- its potential to pollute
- it is a waste of resources and considered unsustainable
- in many areas, especially close to large urban populations, suitable sites are increasingly scarce.

However, landfill will continue to form part of a balanced portfolio of treatment and disposal options into the foreseeable future.

2.5.2 The Proximity Principle and Self-Sufficiency

This means that waste should be disposed of as near as possible to the point at which it is produced. Most of the waste originating in the Forth Valley is currently consigned to landfill while glass, for example, is treated by local reprocessors within the area. Wastes requiring specialist treatment, such as hazardous wastes and those being sent for recycling, such as paper, are exported often long distances. Although this is likely to continue to be the case for some time, as greater quantities of material for recycling are collected there will be more enterprise opportunities for local collection agents and reprocessing facilities.

2.5.3 Best Practicable Environmental Option (BPEO)

BPEO is the outcome of a systematic and consultative decision-making procedure, which encompasses practicability, cost, environmental, social and national policy objectives for sustainable waste management. It is a stakeholder driven approach where key decisions have been taken by the Waste Strategy Area Group during a series of workshops in order to be inclusive and publicly accountable. The methodology and process within the Forth Valley is presented in the Executive Summary Area Waste Planning process flow diagram and fully described in the Draft Area Waste Plan, published in July 2001.

In summary:

The Forth Valley Waste Strategy Area Group produced a range of 5 options that were felt to be realistic packages of technologies to deliver a solution in line with the requirement to meet the landfill diversion targets. The group placed particular importance on:

- environmental performance
- no increase in particulate or dioxin emissions
- encouraging producers to take responsibility for their waste
- overall cost and affordability of each option
- public acceptability
- flexibility (as legislation, financing and technology may change over the 20 year life of the targets)
- technical feasibility and practical deliverability making maximum use of current infrastructure.

On this basis the group undertook detailed option appraisal in April 2001, using environmental, economic and social decision criteria, following SEPA's BPEO Decision-Making Guidance, published in Sept 2000.

The appraisal process rejected the 'mass composting Option 1' due to technical risks and poor performance against social and environmental criteria. The 'basic recycling Option 2' was felt to be a stepping-stone towards further recycling but did not meet BMW diversion requirements beyond the first target date (2010).

The 'mass burn incineration of Option 3' was also rejected due to inflexibility of large, up-front, capital expenditure and was felt to be unpopular with the Forth Valley public. The incineration option also failed to encourage public responsibility for waste.

Option 4 'recycling and thermal treatment' (pyrolysis or gasification – defined in glossary, Annex 2) performed well, especially against air, land and water emissions and greenhouse gases, but was a highly expensive option.

Option 5 represented 'widespread source separated recycling' and scored highest in most respects. It was deemed publicly acceptable, environmentally friendly, to promote the efficient use of resources, contain added social value and did not involve as many perceived or actual risks. The fundamental drawback, however, was that even with optimistic recycling participation rates – the residue to landfill is such that it may not fulfil the requirements of the Landfill Directive third diversion target in 2020. Therefore, additional measures to Option 5 would eventually be required. These considerations pointed to a combination of Options 4 and 5 by 2020.

Thus, the group felt that a two-stage process was most appropriate:

1. Implement a large-scale multi-material dry recyclable collection and source separated green waste collection over the next 5 years.
2. Investigate the performance, practicability and costs of advanced waste treatment technologies and review the Plan in 2006, with a view to incorporating additional treatment technologies to ensure compliance with all landfill diversion targets.

Full BPEO development process is reported in the Forth Valley Draft Area Waste Plan, published July 2001. Available at: www.sepa.org.uk/nws

3 Best Practicable Environmental Option (BPEO) for Municipal Solid Waste in the Forth Valley – Action Plan for Change

3.1 BPEO Summary

This Chapter sets out the Best Practical Environmental Option (BPEO) for municipal solid waste (MSW) across the Forth Valley as proposed by the local Waste Strategy Area Group. This waste stream consists of household and some commercial waste collected by the three Forth Valley local authorities.

The Forth Valley Waste Action Plan consists of the following elements:

A public awareness campaign to reduce the quantities of waste arising and increase public participation in the reuse and recycling of materials through improved infrastructure provision.

Recycling of source separated materials through the provision of household multi-material dry recycle collection and improved local bring and civic amenity sites.

Compost source separated garden waste and support the development of home and community composting activities.

Review area waste plan implementation in 2006 and investigate the performance, practicability and costs of advanced waste treatment technologies.

Reduce the quantity of waste landfilled, particularly biodegradable waste in line with the Landfill Directive targets.

The BPEO requires increased levels of public awareness and participation in waste prevention and in source separating materials for kerbside collection. It also encourages communities to get involved in developing local projects that have added social or environmental value.

Improved waste collection systems aim to capture a high quality material and make recycling accessible to householders across the Forth Valley. Initiatives to increase diversion of Biodegradable Municipal Waste (BMW) from landfill include kerbside collection of garden wastes and development of centralised and local community composting sites.

Alternative processes such as mechanical biological treatment, thermal and other appropriate treatment processes will be considered for incorporation in the Forth Valley integrated waste management system as it develops post 2006. This will allow assessment of public participation in recycling schemes, abstraction and waste growth rates to inform infrastructure capacity requirements to effectively manage MSW to 2020.

Figure 3.2 presents a schematic representation of the proposed waste management system in 2020 (Figure 3.2) and a baseline of current waste management practices as of 2000 (Figure 3.1) for comparison.

Section 3.2 describes the key elements of the Best Practical Environmental Option (BPEO) proposed for the management of municipal solid waste in the Forth Valley.

An implementation Action Plan is presented in Annex 1, detailing individual actions identified in order to achieve the targets set within this BPEO chapter. Further information on some of the partner organisations and delivery mechanisms are presented in Annex 3.

The targets presented in Section 3.4 are strategic targets for the waste strategy area. Local implementation plans will set out the detail of localised delivery systems based on each local authority's ability to achieve a proportion of the overall targets.

Figure 3.1 – Schematic of Baseline Waste Flow Percentage and Tonnage for MSW in the Forth Valley, 2000

(all tonnage rounded to nearest '000)

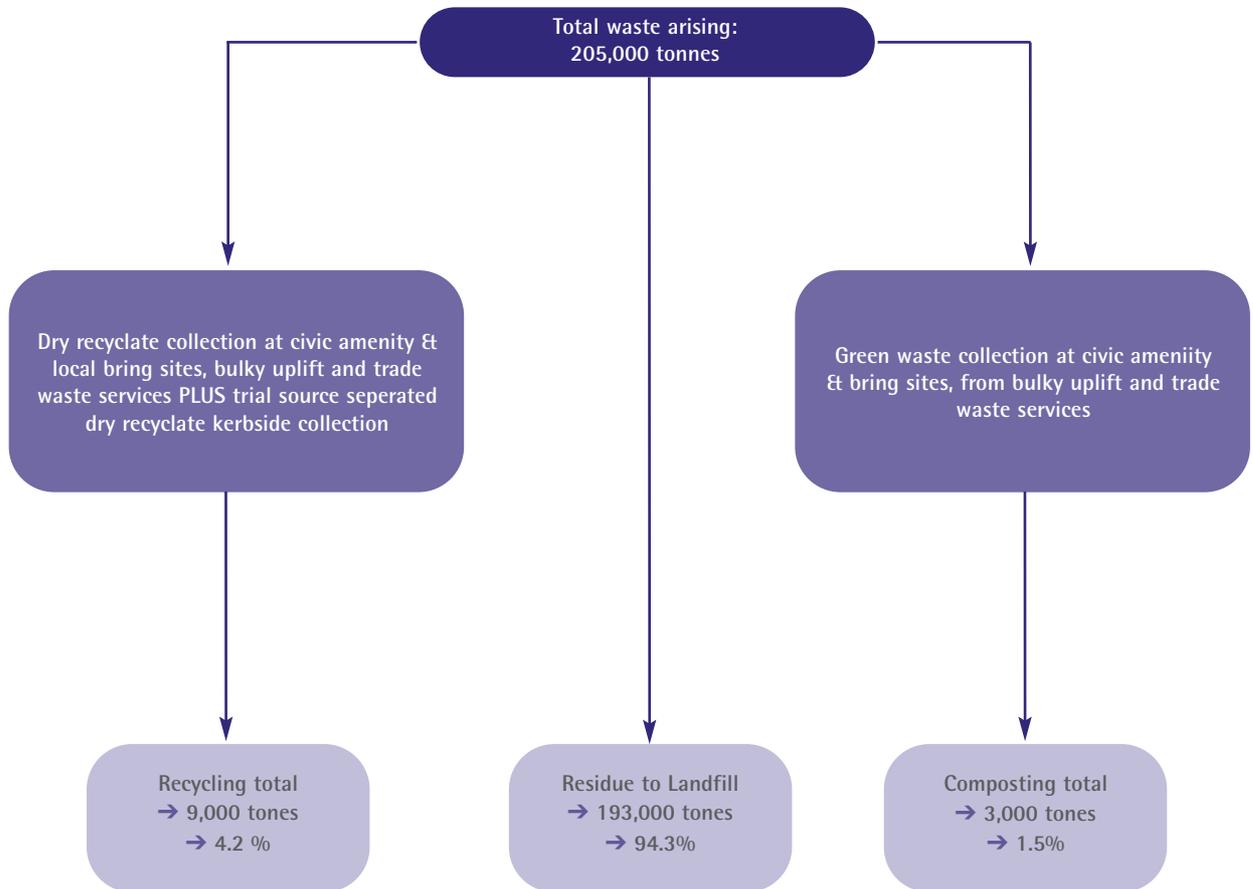
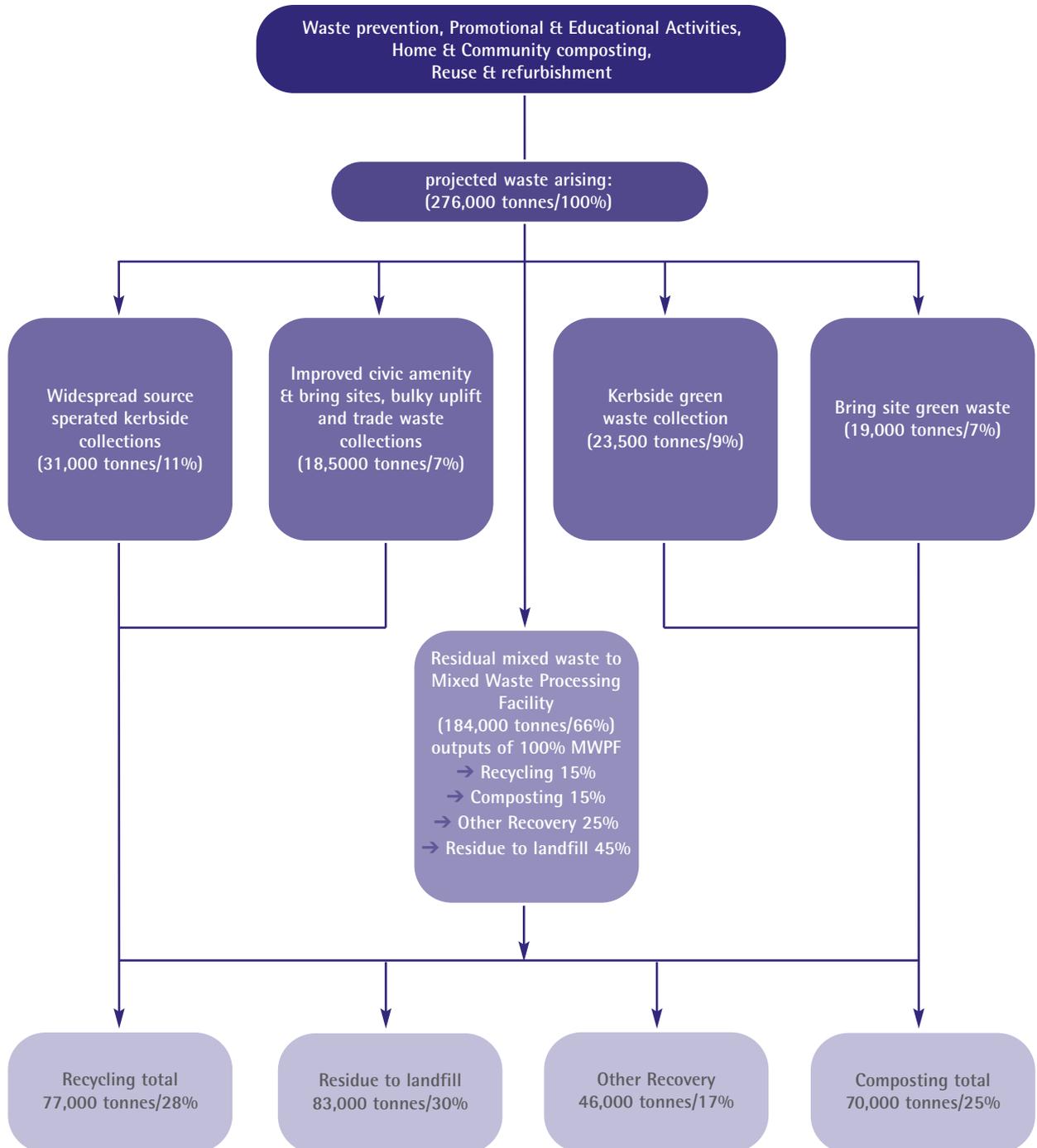


Figure 3.2 - Schematic of Proposed BPEO for MSW in the Forth Valley, 2020

(all tonnages rounded to nearest '000)



3.2 Elements of the BPEO

3.2.1 Waste Prevention

In working with the National Resource and Waste Forum (NRWF), SEPA is developing a national framework to guide the work of the Forth Valley waste strategy group and other key players on municipal solid waste prevention. This will include research into best practice in waste prevention, both within the UK and abroad. The outputs from this research will be twofold:

- Practical guidance to Waste Strategy Area Groups on how to develop a local waste prevention plan, and information on the various tools and techniques available in partnership with the local authorities and the Scottish Waste Awareness Group (SWAG).
- National recommendations to policy makers and others on instruments which have been demonstrated as successful in preventing waste.

The Forth Valley Waste Strategy Area Group will then draw together a local stakeholder group with the remit to identify existing waste prevention initiatives in partnership with local organisations and develop a Forth Valley Area Waste Prevention plan. This plan will set targets, identify actions to be undertaken locally and will tie in to national initiatives on education, promotion and emerging local policy instruments.

The Forth Valley Waste Strategy Area Group has estimated that MSW may grow at a rate of 1.5%. Effective action to reduce the amount of waste being produced in domestic and commercial sectors is key to achieving long-term sustainable waste management systems. Unless we tackle waste issues at source and divert materials from entering the waste stream, management facilities will require increased capacity and investment.

Action Target 1

Stabilise and then reduce growth of municipal solid waste arising within the Forth Valley.

Action Plan Summary presented in Annex 1

Each of the three councils within the Forth Valley has a pivotal role in promoting waste prevention through all service sectors. The public sector (local government, education, health, etc.) is one of the largest employers in the area, and through its diverse activities generates large quantities of waste. A range of actions, from procurement activities through proper separation of wastes and promoting waste minimisation in staff training can all make a contribution. Member organisations within the Forth Valley waste strategy area group have agreed to take a lead in examining their own activities and taking action through improved waste management systems.

Action Target 2

Waste strategy area group members to minimise the environmental impact of their own organisations, with particular regard to waste management.

Waste prevention is notoriously difficult to promote and the concept will be new to the majority of householders. A consistent and effective awareness raising campaign will be necessary to effect a change in attitude and behaviour towards improved household waste management.

3.2.2 Public Awareness Campaign

The Scottish Waste Awareness Group (SWAG) will plan and facilitate a public awareness campaign on household waste management, within the Forth Valley linked to infrastructure developments, such as, kerbside recycle collection and other service provision. SWAG will deliver the campaign in partnership with key stakeholders, including the three local authorities, SEPA, private waste industry and community organisations.

Action Target 3

Facilitate improved awareness and responsibility for waste produced by householders and communities across the Forth Valley.

The 'Waste Aware Forth Valley' programme will work towards changing public attitudes and behaviour towards domestic waste management. A baseline survey was conducted during autumn 2001, when a total of 1250 householders were interviewed on their current waste practices and attitudes across the Forth Valley. Surveys of this kind will be essential in developing promotional materials, inform project development and tailor services to local needs.

Each campaign will focus on a specific waste management issue and run concurrently with the provision of services and infrastructure.

The campaign will comprise of three basic stages:

1. **Before survey** – to assess baseline attitudes and behaviour towards the identified waste management issue (e.g. kerbside recycle collection service) prior to the intervention strategy.
2. **Campaign** – intensive localised intervention strategy run initially for a six-month period working in partnership with the WSAG, each local authority, retailers, the private waste industry, local communities and voluntary groups.
3. **After survey** – to assess attitudes and behaviour towards the identified waste minimisation issue after the intervention strategy and to appraise the effectiveness of the different campaign methods employed.

This format will allow SWAG to monitor progress towards more sustainable public waste management behaviour, and to develop models of good practice for changing public attitudes to reduction, reuse and recycling. A rolling programme of Waste Aware Campaigns in conjunction with all waste strategy area groups will be implemented across Scotland.

Campaigns will provide stakeholders with an understanding of the problem, an opportunity to develop local solutions and provide a means for taking action. One of the key components will be to match the campaigns with 'real' infrastructure, encouraging householders to make informed domestic waste management decisions. Public perception values and needs will be considered to ensure stakeholder participation towards making decisions regarding local needs and opportunities.

It is essential that there is continuity of approach and terminology in the delivery mechanism to change public attitudes towards domestic waste throughout Scotland. The development of the 'Waste Aware Scotland' campaigning programme provides a framework to allow an integrated partnership approach, providing a national campaign identity that is deliverable at the local level via Forth Valley waste strategy partnerships and plans.

Each of the three councils within the Forth Valley presently deliver a range of local public information services with the aim of increasing environmental awareness, sustainable development, lifelong learning, improved health and citizenship. There is potential for the Forth Valley area waste group to link up with these initiatives and promote the understanding of waste issues through activity and participation in local projects.

Action Target 4

Integrate the aspirations of the AWP into local Community Planning, Sustainability, Lifelong Learning, Improved Health & Citizenship and other relevant policy implementation programmes.

3.2.3 Community Waste Planning

Community Waste Planning is a method developed by Stirling Council by which a community (or neighbourhood) and council waste services can collaboratively plan how to reduce the amount of waste being sent to landfill from that community area.

The current lack of public waste awareness is a major issue to address if we are to successfully achieve targets set out in this plan. Locally it is the intention of Forth Valley local authorities to improve waste awareness at the community level. Community Waste Planning methodology invites intensive focus on the waste arising from within individual communities by the community, facilitated by the local authority or community organisation. Waste management is intrinsic to modern life and can be incorporated into any social or environmental community project to reinforce the producer responsibility message. This process establishes ground level advice and support so that current waste prevention methods and services can be maximised and new methods introduced as appropriate.

Community Waste Planning develops partnerships to implement the most effective local methods for reducing waste from individual communities and neighbourhoods.

The primary objectives are:

- To meet the waste diversion objectives of the Landfill Directive
- To raise awareness of a communities responsibility for their own waste
- To promote a spirit of community pride and achievement that will increase community capacity to carry out projects in the future.

This method has been developed independently of the Community Planning duties contained in the Local Government Bill, although the process of stakeholder participation is common to both. These objectives are actively linked with the three Forth Valley local authorities strategic aims of Sustainability, Local Democracy, Social Inclusion, Quality of Life and Best Value. These related policies are further discussed in Annex 3.

Any area undertaking development of a community waste plan first has to define boundaries and scope in consultation with individual community councils and other representative groups taking geographical and other practical considerations into account.

Target setting encourages all parties to carefully consider both the aspirational and mechanical aspects of waste generation, prevention, recycling and composting. It is imperative that community waste reduction targets are set at an achievable level. Targets must consider the current waste arising and projected trends. They can be set in accordance to the relative infrastructure available to the community, maximise participation in current service provision and consider the scope available to expand facilities and integrate with other local initiatives.

The physical and mechanical aspects of Community Waste Planning go hand in hand with waste awareness raising and education. As people become more willing to participate in waste management activities, they must have the infrastructure available to allow them to do so as simply as possible. Waste related decisions for community input on physical and mechanical aspects can be roughly broken down into seven specific options:

1. Home composting (with possible demonstration sites)
2. Community composting
3. Bring sites for green waste
4. Kerbside collections for green waste
5. Bring systems/mini recycling centres
6. Kerbside collections for recycling
7. Litter/fly tipping issues.

The Community Waste Planning format is inherently flexible and adaptive to community and Council needs and therefore leaves great scope for future development in emerging priority areas.

Action Target 5

Facilitate community led sustainable waste management projects through the Community Waste Planning model.

3.2.4 Reuse and Refurbishment

The reuse and refurbishment of waste is implicit in the Forth Valley Area Waste Plan. Value is retained while reuse and refurbishment activities can be used to stimulate social inclusion by providing employment, personal development training and a range of affordable goods and services to the wider society. Each of the Forth Valley local authorities will examine and establish further opportunities for recycling, reuse and refurbishment, particularly of waste collected at civic amenity sites and from bulky household collections.

Action Target 6

Maximise the reuse and refurbishment of household items in partnership with local organisations.

3.2.5 Recycling Collection Systems

The Forth Valley Area Waste Plan requires a significant increase in the quantities of materials collected and forwarded to reprocessors for recycling. This will involve significantly increasing the segregated kerbside collections of paper, plastic, textiles, and ferrous and non-ferrous metals. It is possible that glass will also be collected in this way, however any collection system that produces a mixed (colour) glass fraction will limit reprocessing options.

The Scottish Waste Awareness Group reported in autumn 2001, that 90% of respondents who were participating in Forth Valley trial kerbside collection systems, were satisfied with the system, stating that it was regular, convenient and easy to use. Source-segregated waste collection is seen as the way forward by the Forth Valley Waste Strategy Area Group, where all waste producers are encouraged to treat materials appropriately for future uplift and reprocessing.

Kerbside collection systems will be progressively introduced across the three local authorities comprising the Forth Valley. In practice, it will be necessary to maintain flexibility of collection system in order to maximise public participation, improve the quality of material collected, reduce the possibility of exclusion and fill the current gaps in provision. High-density accommodation and remote, rural dwellings will require more specialised collection methods. Projected numbers of households across the Forth Valley that will be serviced by kerbside collection methods are presented in Table 3.1.

Table 3.1 – Projected Number and Percentage of Current Number of Households within the Forth Valley that will be Serviced by Kerbside Collection for Dry Recyclate Materials

	2003	2004	2005	2006	2007
Number of households provided with bins/boxes across the Forth Valley	78,000	96,000	107,000	108,000	109,000
Other collection systems from high flats, rural communities, neighbourhood sites, etc.	2,500	3,000	4,000	5,000	6,000
Percentage of households with kerbside provision across the Forth Valley	67%	85%	95%	97%	98%

The Forth Valley waste strategy area group estimated projected participation rates at 85–95% from evaluation of trial schemes in each of the three council areas and comparable studies within the UK. This assumes a high degree of increased public awareness and confidence in using recycling services as an integral part of household waste management.

The three authorities will also provide a seasonal garden green waste uplift to appropriate households through a separate brown bin integrated into the residual waste collection system by way of substitution. This substitution of service encourages householders to participate and not opt out of collection systems.

Table 3.2 – Projected Number and Percentage of Current Number of Households within the Forth Valley that will be Serviced by Kerbside Collection of Garden Green Waste

	2003	2004	2005	2006	2007
Number of households provided with bins/boxes across the Forth Valley	33,000	58,000	60,000	60,000	61,000
Percentage of households with kerbside provision across the Forth Valley	28%	50%	51%	51%	52%

All kerbside collection systems will be accompanied by a comprehensive householder education programme prior to and during establishment of each service. It will also be important to maintain communication with householders in order to monitor participation rates and gain feedback on how to improve efficiency of local collection systems.

Action Target 7

Improve household recycling rates in alignment with targets set in this plan for 2006, 2010, 2013 & 2020 – as presented in Figure 3.3.

It is important that alternative facilities are made available to those where it is impractical to offer kerbside collection services or householders who have bulky or difficult materials to be disposed of. For this reason, an improved network of mini recycling centres and facilities at civic amenity sites will be phased in. These facilities will also capture separated materials in order to maintain the quality of recycled material and remove hazardous elements from the waste stream.

A current analysis of the constituent elements of household waste and MSW will be required to maintain an efficient and cost effective collection system.

Action Target 8

Improve understanding of the content of local household and MSW arising using waste analysis across the Forth Valley.

Community sector involvement in recycling will be important in filling local gaps in service provision and awareness raising. There is a significant history of community recycling projects within the Forth Valley, with several organisations experienced in delivering a range of services and public waste aware initiatives (as presented in section 1.5.4). The Community Recycling Network (Scotland) was established in early 2002, to facilitate the exchange of information, share best practice and resources between active community organisations across Scotland, engaged in recycling activities. It aims to provide advice on legislative requirements for waste handling and treatment, funding and training opportunities as well as improve operational standards within the sector.

3.2.6 Composting

The Forth Valley local authorities aim to significantly increase the quantity of separately collected compostible garden wastes through provision of a brown bin to households with a garden. Collection of segregated green waste will also be encouraged at recycling centres and civic amenity sites provided with separate skips.

Home and community composting can also provide a viable method for diverting garden green waste from entering the MSW stream, particularly in rural communities, which comprise a significant sector of the Forth Valley population. The Dunblane home composting trial and Kippen community composting project are examples of good practice that may be replicated where appropriate across the Forth Valley.

Action Target 9

Establish local composting systems to provide access to composting to householders across the Forth Valley.

The existing composting facilities at Kinneil Kerse (Falkirk) and Lower Polmaise (Stirling) will be expanded to accommodate increased quantities of source-separated material collected and processed in open windrow systems, which has the advantage of being low technology and low cost. It is proposed that these sites will be supplemented in the medium term by a new in-vessel composting facility at the proposed new Materials Recycling Facility, which will meet requirements under the Animal By-products Order. The Scottish Agricultural College and ReMade Scotland have assisted the Forth Valley in the development of appropriate composting systems and will continue to advise as composting technologies and markets develop. This expertise will support a local forum that will be established to assess the treatment options and potential utilisation of organic waste.

Action Target 10

Divert organic waste from landfill disposal.

3.2.7 Advanced Waste Treatments to Enhance Recovery

It is recognised by the Forth Valley area waste group that even with optimistic rates of public participation in recycling and composting, the residue to landfill is such that the Forth Valley may not fulfil the requirements of the Landfill Directive's third target by 2020 by recycling and composting alone. Additional measures may be required, especially if the growth of waste arising is not effectively curtailed. Therefore the Forth Valley waste strategy area group will conduct a comprehensive review of implementation of the Area Waste Plan in 2006 to assess progress on reducing waste growth, development of a robust data set, recycling & composting participation rates and make recommendations for additional infrastructure from then until 2020.

Recovering materials from mixed waste may be achieved by the mechanical and biological processes described below, while recovering energy from waste may be achieved by thermally treating waste directly (during incineration or other controlled heat technology) or by burning a refuse derived fuel (RDF) produced by a waste treatment process. While the waste strategy area group specifically rejected mass-burn incineration during the option appraisal process, April 2001, a viable alternative may include the following:

- i. **Mixed Waste Processing takes place in two main stages** - firstly, the mechanical stage, in which problematic substances, bulky objects and remaining recyclables are removed by mechanical or personnel sorting. Secondly, the biological stage, in which the degradable organic content of the mechanically treated waste is treated to form an extensively mineralised product fit for further use as a compacted fuel or stabilised for disposal. The extent of the organic-fraction reduction and end-product quality will depend primarily on the original composition of the waste, the applied method and duration of treatment, all of which have increasing cost implications but are offset by production of a more versatile, valuable and clean product.

ii. **Thermal Treatments** – the future of thermal treatments for the recovery of energy from waste may lie with emerging technologies such as pyrolysis or gasification which have been proven in a range of applications such as coal gasification, energy recovery from tyres or biofuels. However, these technologies are not yet proven in the UK for the treatment of a mixed household and commercial waste stream. It is expected that they will require careful waste pre-treatment and sorting to gain maximum energy output and minimum pollution impact.

- **Pyrolysis** – is carried out at high temperature without oxygen to produce a carbonaceous char and oils and gases that can be used to generate electricity.
- **Gasification** – differs from pyrolysis in that oxygen in the form of air, steam or pure oxygen is reacted at high temperatures with the available carbon in the waste to produce a gas product, ash and tar.

SEPA guidelines on thermal treatment plants specifically state that the development of energy from waste plants should only be considered as part of an integrated waste management strategy and should ensure that waste materials suited to reuse, recycling or composting are separated out before any material is treated.

Action Target 11

Reach an informed decision on the performance of advanced waste treatment technologies and their potential application in the Forth Valley by 2006.

3.2.8 Disposal to Landfill

Waste not recycled, composted or recovered in any other way, will be disposed of to landfill until alternative treatments are established. In addition reject material from additional processes will also be disposed of in this way. Over the 20 year time frame of this plan there will be a significant reduction in the amount of waste going to landfill and in particular the biodegradable element in accordance with Landfill Directive targets (see Tables 2.1 and 3.3).

In the short-term residual wastes from segregated collection and residues from treatment processes will continue to be landfilled under current arrangements until a joint Forth Valley waste management arrangement is secured. It is proposed that any negotiated contract will seek an integrated waste management delivery mechanism that maximises economic, social and environmental opportunities within the Forth Valley in compliance with Landfill Directive requirements.

It will be necessary to assess current and predicted future landfill capacity requirements for all wastes arising within the Forth Valley in order to ensure adequate supply in future.

Action Target 12

Seek to maintain a 10-year landfill capacity for municipal solid waste, with planning permission across the Forth Valley area, in line with Landfill Directive diversion targets.

There is a need for a clear and robust methodology to allow a consistent calculation of the regional landfill supply for the Forth Valley. Annex 6 presents a suggested methodology to assess remaining capacity across the three categories of landfill, classified under the Landfill Directive.

3.3 Household Hazardous Waste

Household hazardous wastes such as batteries, pesticides, solvents, etc., contain chemicals and have the potential to harm the environment or human health. They pose a particular problem within MSW as the Landfill Directive comes into force and waste managers will be under increasing pressure to remove hazardous elements before waste treatment and disposal.

A national partnership project is being delivered to investigate the options available to local authorities in Scotland for collecting household hazardous waste separately from the domestic waste stream. Once an initial study has taken place to review the current situation on household hazardous waste recovery in the UK and Europe and what future legislation will mean for local authorities, pilot collection trials will be implemented to accurately determine the logistical and economic realities of separate household hazardous waste collections. The project will also investigate current public awareness of the issues to develop effective education campaigns.

Action Target 13

Assess the feasibility in conducting a trial collection scheme for Household Hazardous Waste within the Forth Valley.

3.4 Monitoring Progress and Performance

The Landfill Directive requirement to divert biodegradable municipal waste (BMW) from landfill must be met – a requirement implicit in this area waste plan for the Forth Valley. Figure 3.3 shows the target proportions of MSW arising in the Forth Valley, which will be recycled, composted and/or treated in some other way in order to meet the biodegradable waste diversion targets and contribute to the national 25% recycling and composting national target by 2006.

Figures are given for each of the derogated Landfill Directive target years (2010, 2013 and 2020) with an interim target for 2006. It should be noted that waste management infrastructure will be brought in line as soon as practically possible before derogated dates to facilitate increased recycling, composting and recovery of waste materials.

Figure 3.3 – Forth Valley Municipal Solid Waste Indicative Targets



	2006	By 2010	By 2013	By 2020
% Recycling	18	19	27	28
% Composting	18	19	26	25
% Other recovery	-	-	17	17
% Landfill	64	62	30	30

Through provision of source separated kerbside collection systems for recycle materials and green waste, recycling and composting levels are projected to significantly increase from their 2000 levels of 6% and 2%, respectively, to 18% each, by 2006.

Post 2010, an alternative waste treatment technology is projected to come on line and increase diversion from landfill disposal by a further 17% by 2013, ensuring compliance with the landfill diversion target. It is expected that this facility will improve abstraction of recycle materials, produce a Refuse Derived Fuel or compost biodegradable waste for some other secondary use. At present, it is not possible to predict the performance of the mixed waste processing facility and a flat rate presented in Figure 3.1, has been assumed post 2013. Improved performance is expected after the 2006 review when decisions will be taken upon what additional type of infrastructure will be commissioned.

Section 2.2.1 presents Landfill Directive biodegradable waste diversion for the derogated dates of 2010, 2013 and 2020. Table 3.3 sets out the projected BMW diversion rates through implementation of the Forth Valley BPEO, as presented throughout Section 3.2.

Table 3.3 – Projected Diversion of BMW from Landfill (tonnes)

	By 2010	By 2013	By 2020
Biodegradable recycling	27,194	49,558	56,426
Total composted	46,279	65,001	70,136
Other Recovery	0	41,699	46,041
Projected total BMW diversion	73,473	156,258	172,603
Required BMW Diversion from Table 2.1	56,100	91,600	125,100

By implementing the Forth Valley Area Waste Plan, the Forth Valley local authorities are projected to comfortably comply with the BMW diversion targets. However, there is no room for complacency, it will require significant attitude and behavioural change to achieve required participation rates and improved investment in infrastructure developments. It will be necessary to regularly monitor, review and report progress.

Action Target 14

Annual review and report progress on implementation of the Forth Valley Area Waste Plan.

3.5 Proposed BPEO Infrastructure

Implementation of the BPEO will require an ongoing partnership approach between the Forth Valley local authorities and stakeholders to achieve the targets presented in Figure 3.3. The Forth Valley Area Waste Plan also seeks to achieve best value from the existing infrastructure, investment and experience that is already in place.

The BPEO requires a significant increase in the amount of materials collected for reprocessing and in the volume of organic material collected for composting. Clackmannanshire and Stirling Council's will bulk recycled material in a centrally located transfer station, in the short term, while a clean Materials Recycling Facility and appropriate in-vessel composting technology will have to be developed as quantity and type of material processed increases over time.

It is also recognised that, in taking forward this BPEO, there will be a need for significant linkage with the land use planning system to secure approval for sites and projects. In recognition of this, Forth Valley local authority planners have been active members of the waste strategy area group throughout the Area Waste Plan development process. Table 3.4 sets out an indication of the key collection systems and facilities identified at this stage that are required to deliver landfill reduction targets.

The collected non-biodegradable recyclable waste (such as metal cans, glass, etc.) will in the short term be handled by interim bulk waste transport arrangements until appropriate waste transfer and Material Recycling Facility provision is developed. Recyclate collected close to reprocessing facilities or national bulking agents, such as glass and aluminium cans in Clackmannanshire will be delivered direct to these facilities.

Action Target 15

Ensure strategic waste management facility provision across the Forth Valley.

Table 3.4 - Indicative Infrastructure Development for the Forth Valley BPEO for MSW (2002–2020)

Proposed facility	Timescale	Input Capacity'	Projected NPV Capital Cost ²	Notes
Kerbside Collection System recycle provision to 98% of Forth Valley households by 2008.	Phased from 2003 to 2008	Projected collection of 25,000 tonnes of dry recyclates.	Bins/boxes £ 122,000	It is assumed that kerbside collection systems will remove 33% of the estimated 1.15 tonne of household waste per annum. Of this 40% is collected via the dry recycle collection – composed of 60% biodegradable materials and 40% non-biodegradable materials.
Kerbside collection of biodegradable material and green garden waste – provision to appropriate housing stock with gardens, i.e. over 48% of projected housing stock.	Phased from 2003 to 2008	Projected collection of 23,000 tonnes of garden green waste in 2008.	Bins/boxes £ 41,000	It is assumed that the green waste kerbside collection system will capture 60% of the total 33% of materials abstracted from the household waste stream.
Upgrade Civic Amenity Sites	Phased from 2003 to 2010	Projected collection of 25,000 tonnes of dry recyclates green waste in 2010.	£180,000	Development of improved facilities to allow separated waste streams to be collected and provide information & advice on household hazardous waste management.
Composting facilities – open windrow and some in-vessel provision.	Phased from 2003 onwards	20,000 tonnes (x 2)	£6,480,000 (x 2)	Large centralised sites and small-scale community composting sites to be locally developed. In-vessel composting facility required for composting of kitchen catering putrescible wastes
Materials Recovery Facility (MRF) / Advanced Mixed Waste Processing Facility (MWWPF)	MRF from 2005/ MWWPF post 2006 Review	200,000 tonnes	£48,930,000	Modular development of MRF to process source separated recyclates. 2006 Review of advanced treatment technologies to identify appropriate residual mixed waste stream processing facility.
Landfill capable of taking nonhazardous and inert wastes	2020	Annual tonnage of MSW projected for landfill disposal in 2020 is 83,000 tonnes	No capital expenditure	Significant reduction in tonnage of material consigned to landfill over timescale of the plan.

Note 1 – Capacity required will be dependant on several variables including waste composition, waste growth, participation in recycling schemes, and success of waste prevention schemes. Capacities are only for MSW, these capacities will increase if other wastes are managed at these facilities. Facilities, which accept wastes other than MSW, will require larger capacity.

Note 2 – Projected capital costs calculated using Net Present Value (NPV) using a 6% discount rate, with annual waste growth at 1.5% by ERM consultants as part of national cost analysis. These costs are indicative only.

3.6 Cost of the Best Practical Environmental Option

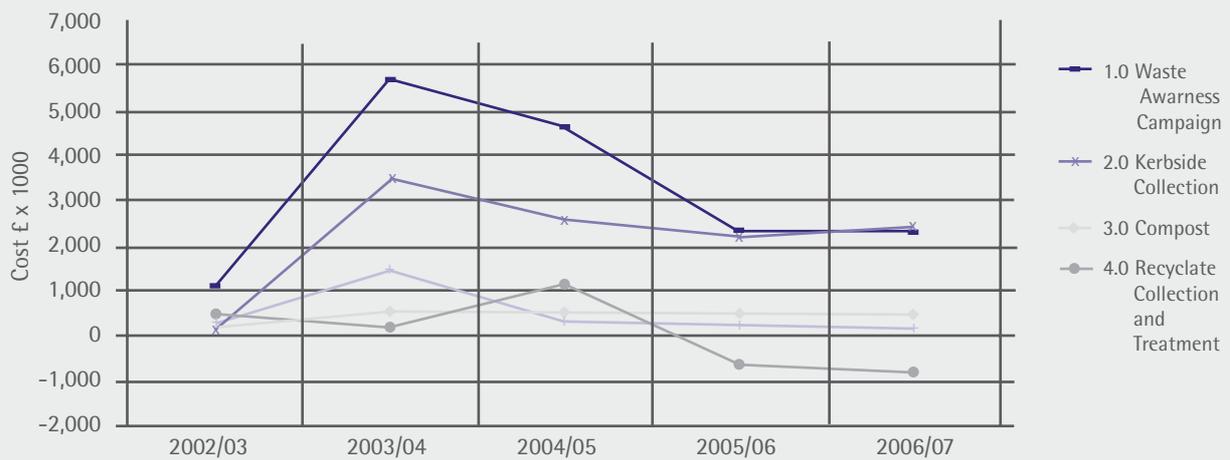
Detailed implementation cost projections have been determined as part of a joint Strategic Waste Fund bid submitted to the Scottish Executive from the three Forth Valley local authorities, October 2002. A summary of these projected costs to 2007 is presented in Table 3.5.

Table 3.5 - Projected Additional Cost Above Present Expenditure of Forth Valley implementation plan to 2007

Cost of implementation (£x100)	2002/03	2003/04	2004/05	2005/06	2006/07
1. Waste Awareness Campaign	156	546	537	502	502
2. Kerbside Collection	151	3,485	2,579	2,227	2,439
3. Compost	472	201	1,158	-624	-773
4. Recyclate Collection and Treatment	303	1,464	366	235	154
Total	1,082	5,695	4,640	2,340	2,322

Note: negative costs reflect avoided landfill costs; data source: Forth Valley Strategic Waste Fund bid, Oct 2002.

Figure 3.4 - Graph Showing Projected Additional Cost of Forth Valley Waste-management System from 2002–2007



The main focus of the implementation plan between 2002 and 2007 is to roll out kerbside recycling provision to householders across the Forth Valley, with appropriate infrastructure to collect segregated materials and bulk recyclate before transport to reprocessors. Central composting facilities will be upgraded to process increasing quantities of source separated green waste, while home and community composting activities will be supported through the Community Waste Planning initiative.

All waste management infrastructure and service improvements will be linked to public waste aware campaigns delivered by local stakeholders and integrated, where possible, with other relevant policy implementation.

Cost projections after 2007 will form part of the 2006 review when the Forth Valley Waste Area Strategy Group (WSAG) will make recommendations for the development of a fully integrated waste management system for the Forth Valley and assess the impact of waste prevention, recycling and composting on the amount of municipal waste arising.

A nationally consistent costing model for the implementation of all 11 area waste plans from 2002 to 2020 has been developed through discussions with the Scottish Executive and is presented in the National Waste Plan, (published February 2003). From these data it is projected that the annualised cost per tonne for Forth Valley is projected to increase from current average of £98 to an average of £111 by 2020.

The following Net Present Value (NPV) annual operating costs for the proposed Forth Valley integrated waste management system have been projected from the national integration study conducted in May 2002.

Table 3.6 – Indicative Costs Calculated Using Net Present Value, (NPV), With Annual Waste Growth at 1.5% by ERM Consultants as Part of National Cost Analysis

	2010 (x'000)	2013 (x'000)	2020 (x'000)
Waste reduction/ bring site operation	£1,000	£1,100	£1,300
Collection costs	£13,000	£14,000	£15,000
Transport costs	£1,500	£1,500	£1,700
Recyclate handling	£1,000	£1,200	£1,300
Centralised composting	£950	£1,000	£1,200
MixedWaste Processing Facility	£0	£5,500	£6,000
Landfill operating costs	£9,000	£4,200	£4,600
Total operating costs (NPV)	£26,500	£28,500	£31,100
Revenues (-ve = income)	-£1,500	-£1,600	-£1,900
Indicative Total Operating Costs (NPV)	£25,000	£26,900	£29,200

Note: Projected costs calculated using NPV, using a 6% discount rate, with annual waste growth at 1.5% by ERM consultants as part of national cost analysis. These costs are indicative only of likely cost implications.

The process to establish the BPEO was to find the optimum methods of waste treatment that should as a minimum meet the three landfill reduction targets set by the Landfill Directive. In the light of the 11 Draft AWP's previously published, the Scottish Executive has calculated that an interim overall national target of 25% recycling and composting of MSW is achievable by 2006 by collective implementation of the AWP's. The Executive has allocated £230 million for the financial years 2003/04, 2004/05, 2005/06 through the Strategic Waste Fund to assist with the additional costs of implementing the AWP's. It is expected that the delivery of the plans will contribute to the 2006 target by early implementation of recycling and composting systems.

Action Target 16

Build and maintain best value within implementation of the Forth Valley BPEO.

It is recognised by the three councils within the Forth Valley that an effective integrated waste management system requires close partnership working between the local authorities and joint procurement of goods and services to maximise economies of scale. Clackmannanshire, Falkirk and Stirling councils intend to formalise their current working arrangement as the area waste plan implementation phase commences.

Action Target 17

Establish the best means of securing formal joint working arrangements between the local authorities within Forth Valley for the implementation of the AWP.

3.7 Recycling Market Development

If Scotland is to make better progress in recycling, significant effort must be made to develop both national and local markets using recycled materials. Progress can also be made in improving the logistics of supply to markets outside Scotland. Two major initiatives have been established to promote sustainable waste management through the creation of stable markets for recycled materials and products and by removing barriers to waste prevention, reuse and recycling.

The ReMade Scotland (Recycling Market Development www.remade.org.uk) programme was established in 1999 to identify potential markets and uses for recovered materials in Scotland. It is a key focal point for recycling market development in Scotland and is seeking to increase recovery of waste, create jobs, support the Area Waste Planning process and local recycling businesses through encouraging investment, supporting local partnerships and engaging wider awareness in uses of recovered materials.

WRAP (Waste and Resource Action Programme www.wrap.org.uk) is a £40m UK wide programme funded for 3 years (established 2001) to change attitudes to waste minimisation and recycling through the creation of stable and efficient markets for recycled materials and products. The programme is looking at material specific research and development projects, compost standards, delivering training programmes, and government procurement. WRAP is working closely with ReMade and other organisations, addressing barriers to recycling including market development, supply chain issues, investment packages to reduce business risk in new technologies and processes, and supporting the development of recycling infrastructure.

The Forth Valley Waste Strategy Area Group in partnership with ReMaDe and WRAP will identify and develop opportunities for local market development. Scottish Enterprise Forth Valley also have a role in supporting local entrepreneurs initiate local reprocessing of collected recycled materials.

Action Target 18

Increase recycled material reprocessing capacity and enterprise across the Forth Valley.

3.8 Risks to Implementation

There are a variety of risks which if realised could compromise the successful and timely implementation of the area waste plan. It is important these risks are identified and managed. Examples of such risks include failure to identify sustainable markets for recyclate, poor public participation or inadequate resource allocation. The Forth Valley waste strategy area group will identify risks and develop appropriate strategies to manage them as an intrinsic element of all actions within this plan

3.9 Future Developments and Proposals

The BPEO for MSW in the Forth Valley has been chosen with regard to a given set of assumptions based on currently available methods and technologies. It is accepted that changes in legislation, technology or knowledge may mean the chosen BPEO could be superseded. To allow for future developments or proposals not included in the plan, BPEO will be kept under review and may be superseded by valid proposals that can be shown to provide a better BPEO. The Waste Strategy Area Group will consider evaluating relevant waste management proposals for an improved BPEO as they arise.

These could include regional or national-scale waste facilities proposed by developers at a scale designed to attract waste from outside the Waste Strategy Area in which they are located. As part of the planning application process, the developer will be required to demonstrate that the proposals satisfy or exceed the BPEO of the Waste Strategy Areas from which the waste will be obtained. The results of this BPEO evaluation will be a material consideration in the planning process for such developments.

Where existing or proposed regional or national scale facilities will result in waste movement between Waste Strategy Areas, then consideration of the proposed waste exports and imports must be included in the BPEO process. The 'Export or Import' of waste should be considered as part of the BPEO process, for both the importing and exporting areas, where it is proposed as an original or developing option. Any subsequent review of the BPEOs should also take this into consideration. Approval of the proposed waste management facilities in the importing area is a matter for consideration by the planning and licensing authorities.

4 Managing Non-Municipal Solid Wastes

4.1 Introduction

This chapter focuses on all other non-municipal solid wastes, which include industrial, clinical wastes, non-natural agricultural wastes, mine & quarry wastes and all commercial wastes not collected by the local authorities.

The volume of these wastes is much greater and content more complex than municipal solid wastes (MSW). Whilst the Best Practical Environmental Option (BPEO) process, facilitated by the Forth Valley Waste Strategy Area Group, has been successfully applied to MSW, it is become apparent through the development process that significant data gaps exist and the process requires refinement in order to effectively deal with the quantity and diversity of non-MSW.

The key issues for the non-municipal solid waste management are:

1. Data Gaps – the current lack of requirement to record and report data on many types of waste has contributed to the absence of sufficient data required to make an informed BPEO decision.
2. A Framework to Manage all Non-MSW has been developed in partnership between SEPA, the Scottish Executive, the Enterprise community and the waste management industry. Non-MSW will be a major focus for the future development of the National Waste Strategy: Scotland and the regular review of the Forth Valley Area Waste Plan.
3. Producer Behaviour – it must be practical and economically attractive for waste producers to adopt more sustainable waste practices. Consumer and supply chain pressures, as well as producer responsibility and other regulatory tools may be applied to influence the behaviour of commercial and industrial waste producers to ensure the adoption of BPEO for any particular waste stream.

4.2 Data Collection

In order to plan effectively for the management of non-MSW waste streams, the immediate priority is to develop a comprehensive data set. The SEPA waste data team has recently introduced a quarterly survey system of all licensed waste management facilities. In time, this will deliver data on all waste managed at licensed sites throughout Scotland. The Forth Valley WSAG aims to fill this data gap locally by engaging in consultation with key local industry sectors and undertaking surveys to quantify the range of non-Municipal Solid Waste produced in the area.

A review of the current capacity and type of existing facilities will also be conducted, while the forward capacity required to maintain an adequate network of facilities will be identified on the basis of the current management systems for particular wastes. It is expected that this ongoing data gathering and consultation process will also help to identify local markets for recycled materials.

Action Target 19

Establish a comprehensive data set for the type, quantity and current management systems for non-MSW arising within the Forth Valley and plan for adequate provision of appropriate facilities.

4.3 Significant Local Non-municipal Solid Waste Streams

Significant local non-municipal waste streams within the Forth Valley identified in Table 1.3, Chapter 1, include the following:

- Food processing waste associated with the expanding tourism industry across the Forth Valley.
- Complex wastes generated by the petro-engineering and metal industries clustered within the Grangemouth area.
- Public sector, banking and administrative functions account for over a third of the Forth Valley economic output. Wastes generated within these industries may be largely compatible with the BPEO established for municipal solid waste.
- Other significant waste streams will be identified from data collection process.

4.3.1 Priority Waste Stream Projects

The National Waste Strategy identified the following priority waste streams in 1999:

1. Construction and demolition
2. Newsprint
3. Tyres
4. Chlorofluorocarbons and other ozone depleters
5. Waste electrical and electronic equipment
6. Special waste
7. Household hazardous waste
8. Packaging waste
9. Batteries
10. Waste oils
11. Agricultural waste
12. Clinical waste
13. End of Life Vehicles

Of these, construction & demolition wastes, tyres, newsprint, and end of life vehicles have reported results of initial data collection. Report conclusions relating to the Forth valley are summarised below.

4.3.2 Construction & Demolition Waste

It has been estimated that, in 2000, there were 6.28 million tonnes of construction & demolition waste arising within Scotland. Of this, approximately 331,000 tonnes was generated within the Forth Valley. According to the figures presented by Envirocentre, 2000, around 30% of this was recovered through crushing and screening, road planning and hand picking, while almost 3% was deposited at exempt waste facilities and approximately 67% was disposed to landfill. Overall, the secondary utilisation of construction & demolition waste is rapidly increasing due to increasing costs of landfill disposal and introduction of the aggregates tax.

The study identified that nationally around 37% of the landfilled C&D Waste could be recycled. Realising this potential locally could provide significant secondary aggregate to replace virgin materials used for construction within the Forth Valley. A full set of recommendations is detailed in the Construction and Demolition Waste Stream Project Report – Data, Best Practice and Recommendations.

4.3.3 Tyres

Nationally, it is estimated that around 3% of tyres are reused, 13 % recycled (via retreading and silage clamps/landfill engineering), and 49% landfilled, leaving 45% presently unaccounted for. This data was calculated using a predictive model using information from companies making up the tyre industry in Scotland and reported in May 2002. The estimated tonnage of tyres arising in the Forth Valley is reported as 2310 tonnes, equating to 248,000 tyres, primarily from cars and discarded by replacement.

Since 1999 fewer tyres are being landfilled as significant markets are becoming available for reuse or energy recovery, such as Lafarge Cement UK (formerly Blue Circle Cement Kiln in Dunbar) using tyres as a coal substitute. Those tyres that are consigned to landfill are primarily being used for engineering purposes, e.g. leachate drainage layer.

Implementation of the Landfill Directive will see a ban on whole tyres to landfill by July 2003 and shredded tyres by 2006.

4.3.4 Newsprint

Newsprint is a significant biodegradable component of municipal and commercial waste streams. The total newsprint waste arising in Scotland during 1999 was estimated to have been approximately 240,000 tonnes, comprised of: 6% Printers Waste, 11% Over Issue to sales outlets and 83% Post Consumer (based on sales data). The extent of post consumer newsprint waste arising in Forth Valley in 1999 was estimated at 10,538 tonnes. Within the Forth Valley recycled newspaper is collected by Action Recycle for bulking and transport to reprocessing.

Recovery of newsprint is estimated at 75% printers waste, 100% of over issues and 14% of post consumer newsprint arising for the whole of Scotland.

It is estimated that the requirements of the Landfill Directive targets to divert Biodegradable Municipal Waste from landfill will require the recovery of between 150,000 and 230,000 tonnes per year of newsprint waste by 2016, requiring a five to eight fold increase in recovery above current levels. As well as recycling into new paper, a number of other potential outlets have been identified:

- Cellulose insulation materials
- Manufacture of waste newspaper briquettes for use as fuel
- Animal Bedding
- Compost

These outlets have potential to develop as new reprocessing opportunities within the Forth Valley but will require a stable, quality and guaranteed supply of materials from collection agents.

4.3.5 End of Life Vehicles (ELVs)

There are two different categories of this waste stream:

- **Premature ELVs** - processed by insurance companies, end of life determined by damage as a result of an accident, fire, flood or theft.
- **Old ELVs** - processed by local authorities and private owners / vehicle retailers, determined when a vehicle comes naturally to the end of its life, when it is between 10 -14 years old.

A national study, undertaken by SEPA, estimated that in 1999, a total of 7251 vehicles (cars and Light Goods Vehicles), equating to 7106 tonnes (at 0.98 tonnes average weight of an ELV) were scraped.

Current infrastructure indicates that there are 15 Dismantlers/Scrap Yards/Metal Recyclers currently operating within the Forth Valley. It is likely the higher standards required by the End of Life Vehicles Directive will result in opportunities for diversification and recycling component vehicle parts in future years.

The report identifies Best Practice under the requirements of the End of Life Vehicle Directive that includes:

- Design of vehicles
- Recycling/recovering component parts before shredding
- Recycling/recovering material from shredder residue.

4.4 Proposed National Framework for Specific Waste Stream Project Development

Development of BPEO for non-MSW will follow the same process for identifying BPEO for MSW, i.e. comprehensive baseline data collection, stakeholder development of BPEO through the appraisal of different options, adoption of BPEO practice within industrial sector and regular monitor and review of BPEO implementation to inform future waste management.

Using the Consolidated European Waste Catalogue (August 2002) all listed wastes have been grouped into compatible industry sectors (Table 4.1). These groupings will form the basis of future work on other waste streams. Links with SEPA's Priority Waste Stream programme and existing Technical Guidance, Best Practice standards, etc, have been made along with potential links to current BPEO technology options for MSW as previously set out in the Area Waste Plan.

The waste groupings are presented in Table 4.1

Table 4.1 Consolidated European Waste Catalogue Waste Groupings

Waste Grouping	
A	Exploration, Mining, Quarrying and Physical /Chemical Treatment of Minerals
B	Animal/Fish wastes (Agriculture, Aquaculture, Hunting, Fishing, Food Preparation/Processing)
C	Plant wastes (Agriculture, Aquaculture, Forestry, Hunting, Fishing, Food Preparation/Processing)
D	Leather, Fur and Textile Industries
E	Petroleum Refining, Natural Gas Purification and Coal Pyrolysis
F	Wastes from Inorganic Chemical Processes
G	Wastes from Organic Chemical Processes
H	Wastes from Thermal Processes
I	Wastes from Surface Treatments/Coatings (Metals and Other Materials)
J	Waste Organic Solvents, Refrigerants and Propellants
K	Waste Packaging (Absorbents, Wiping Cloths, Filter Materials and Protective Clothing)
L	Wastes not otherwise specified
M	Construction & Demolition Wastes (Soil from Contaminated Sites)
N	Human and Animal Healthcare Wastes (Research Wastes/Excluding Kitchen Wastes)
O	Water Industry Wastes (Water/Sewage Treatment Wastes)
P	Other Waste Industry Wastes

Each of the waste groupings identified in Table 4.1 will form the basis of a particular project aimed at compiling baseline data, identify current waste treatment and disposal practices and to investigate future management options for that particular waste type.

A decision matrix has been developed to classify the wastes into high, medium and low priority projects, based on the following considerations:

- Links to Municipal Solid Waste BPEO
- Hazardous Content
- Recovery/Recycling Value
- Sector Importance (to the Scottish Economy)
- Infrastructure Shortfall in Scotland
- Quantity
- Finite resource use
- Legislative/regulatory priority

These projects will be managed at either the local or the national level depending on the geographical distribution and relative quantities of waste arising. It is envisaged that the Waste Strategy Area Groups will integrate activities to find waste stream specific solutions to particular waste problems.

Technical groups consisting of the key waste producers, waste managers and other stakeholders specific to each sector grouping will be formed to drive the projects forward. The groups will undertake and commission work that will seek to provide the following recommended outputs:

Recommended Outputs from Specific Waste Stream Projects

1. Establish reliable baseline data and identify existing regulatory controls
2. Report on current practices that deal with specific waste streams
3. List current facilities and technologies
4. Identify emerging technologies and processes
5. Recommend good practice and links to existing Best Practice guidance
6. Identify problematic wastes that may require further research
7. Identify waste minimisation tools
8. Identify skill gaps and training opportunities
9. Provide guidance on identifying local BPEO and the use of Life Cycle Analysis
10. Produce user guides
11. Identify barriers to achieving BPEO and recommendations to overcome
12. Describe benefits and opportunities to implementing BPEO
13. Identify necessary regulatory controls and other drivers
14. Identify any necessary economic and regulatory impact assessments for the sector
15. Identify enterprise opportunities and social benefits

4.5 Self Assessment Guidance for BPEO Decision Making

Not all wastes can be addressed as a high priority and the timetabling of stream specific BPEO projects will be over the medium to long term. Meanwhile, there are opportunities to encourage the widespread use of the BPEO decision-making processes that consider environmental, economic and social aspects when dealing with any particular waste stream. Development of a generic Self-Assessment BPEO Guidance for Industry and Commerce' will provide a consistent process for waste producers, the waste industry and waste regulators to identify the best practical option for particular waste arising locally. In order to achieve widespread industry ownership and acceptability of the guidance, it shall be facilitated by SEPA in an inclusive manner with consultation involving key stakeholders and undertaken at a national level.

Action target 20

Establish waste stream specific BPEO for moving the management of non-MSW up the waste hierarchy within the Forth Valley.

The waste industry will need to be involved in the development and implementation of the BPEO Self Assessment Guidance as they will, in many cases, be the major providers of investment in new infrastructure and hold considerable expertise in the management of different waste streams. Local businesses and industry must have their waste management needs addressed to ensure that the Scottish Economy is supported by the national waste strategy and that good practice is promoted to all waste producers. To ensure the effective input of the waste management industry and waste producers local forums will be established to identify local needs, utilise and share local knowledge and expertise.

4.6 Application of the Waste Hierarchy to Non-MSW in the Forth Valley

Waste minimisation programmes for the commercial and industrial sectors have historically included air emissions, waste water and energy efficiency, as well as, solid waste. Minimisation in this context includes solid waste prevention as part of the overall process.

4.6.1 Waste Prevention

In order to realise a significant level of commercial and industrial solid-waste prevention a co-ordinated effort is required between national and local government, a range of government agencies and the waste producers themselves. There may be a requirement for further regulatory and economic instruments to promote reduction of waste at source, as well as increased waste awareness through staff training.

Innovation in pre-product design and production processes holds the key to the development of clean or waste-less manufacturing and technology.

Waste minimisation initiatives are already well established within the Forth Valley through an active network of organisations. For example:

Business Gateway is a partnership between the three local authorities within the Forth Valley, Scottish Enterprise Forth Valley (SEFV) and the Tourist Board. It aims to encourage all types and sizes of business to work towards improving their current performance, including taking steps to minimise waste. The Forth Valley Waste Strategy Area Group will progress many of the non-MSW actions through this Business Gateway forum.

To assist the uptake of existing initiatives and improve local business performance, Business Gateway, have engaged an Environmental Advisor whose role will include:

- Raising awareness of the benefits of waste prevention.
- Providing information and targeted support to local companies.
- Develop competence of appropriate individuals in local small, medium and large enterprises.
- Help improve the take up of government funded support

There are at present a number of government funded programmes and incentives available to businesses throughout the Forth Valley. These include:

- Free energy and waste audits
- Access to environmental consultants
- Interest free loans
- Information and guidance.

In the main, these are delivered through the Scottish Energy Efficiency Office and its support for the UK waste minimisation programmes, Envirowise, and through Scottish Energy Efficiency Office (SEEO) schemes of financial support such as its interest free loan scheme 'Loan Action Scotland'. However, there has been a limited take up of this support indicating the need for Business Gateway to actively promote these services

Other local service providers include:

- **Falkirk and Stirling Councils** - have both been involved in supporting companies undertake waste and energy and environmental audits to improve efficiencies since 1996.
- **The Resource Efficiency Action Programme (REAP)** – aims to help around 40 companies per year. It is project managed by Scottish Water with additional funding from Scottish Enterprise, Forward Scotland, the Royal Bank of Scotland and SEPA. Companies that participate can achieve substantial savings through the implementation of low cost – no cost improvements.
- **Grangemouth Development Group** – has provided funding and REAP to run waste minimisation workshops for its members.

Action target 21

Improve waste management and promote minimisation within the commercial and industrial sectors within the Forth Valley.

4.6.2 Reuse and Refurbishment

As landfill tax is making it increasingly expensive to dispose of waste produced it is recognised that businesses need to find alternative routes for materials that can be reused or recycled. A waste exchange network would help to put companies who produce waste materials in contact with companies who have the capability of using those materials. Schemes of this type make connections between waste producers and potential users of the waste. While there are examples of waste exchanges operating in the UK, there is no current provision in the Forth Valley area at present. It may be possible to establish a local service or link into a nationally developed service.

Community business, such as Grangemouth Enterprises, illustrates how refurbishment and recycling activities can be integrated with social inclusion and community enterprise initiatives. The Forth Valley waste strategy group will seek to expand provision of such integrated services.

4.6.3 Recycling and Composting

The development of commercial recycling services has the potential to maximise the overall benefits and feasibility of MSW recycling services, and will be encouraged wherever possible. Examples of integrated recycling schemes include:

- Office paper and cardboard recycling
- Glass recycling from pubs and clubs
- Composting of canteen, food processing, landscape gardening, agricultural wastes
- Plastic, steel and aluminium container recycling
- Reprocessing of oils, solvents and batteries
- Ferrous and non-ferrous metal recycling

The collection of waste materials significantly impacts on the recycling options available as source separate collection methods by material type significantly increases available recycling opportunities.

Action Target 22

Improve commercial and industrial waste reuse, recycling and exchange within the Forth Valley.

The waste screening process carried out as part of the national non-Municipal Solid waste framework has identified shortfalls in current reprocessing infrastructure for some waste groupings. This highlights potential local and national business opportunities to develop and provide services to collect and reprocess commercial and industrial waste materials.

4.6.4 Other Recovery

The recovery of energy from non-Municipal Solid Waste may be appropriate for a range of wastes. These include:

- Clinical waste
- Special waste
- Oily waste
- Tyres
- Sewage sludge
- Shredder residues
- Agricultural waste
- Industrial sludges

Energy recovery through combustion has the advantage that it can effectively treat certain hazardous wastes. Biomass derived wastes may be combusted to provide energy generated from a renewable source. It should be noted that the actual wastes treated would depend on their compositional nature, the technology of the plant chosen and the economics of managing any particular waste stream.

4.6.5 Disposal

Significant quantities of non-Municipal Solid Waste are landfilled in the Forth Valley area. A significant proportion of this is construction and demolition waste that can be diverted from landfill for further use. The Landfill Directive obligation to end co-disposal will involve identifying waste according to content and this will determine what type of landfill it can be sent to. Some wastes will be banned from landfill disposal altogether.

It is expected that cost effective measures such as material segregation, reuse and recycling will divert significant quantities from landfill, requiring a more diverse waste management infrastructure in future. Action 19 details action for planning adequate provision of waste management facilities as identified through comprehensive data collection and collation.

5 Developing and Implementing The Forth Valley Area Waste Plan

5.1 Introduction

This Area Waste Plan provides a framework for taking forward waste management within the Forth Valley. However, it is recognised that to implement the various short- and long-term actions will involve partnership between public agencies, the waste industry, private and voluntary organisations, and our communities. The Area Waste Plan also provides a framework for investment, project development and innovation with partner agencies and organisations. Key future actions include:

- Defining the future role and membership of the Waste Strategy Area Group and local fora
- Implementing the Area Waste Plan
- Funding the Area Waste Plan
- Monitoring and review of the Area Waste Plan
- Linking the Area Waste Plan to the development planning system, other policy and delivery mechanisms
- Supporting and responding to national initiatives as set out in the National Waste Plan.

5.2 Future Role and Membership of Waste Strategy Group and Local Fora

The Forth Valley Waste Strategy Area Group and associated local fora will be maintained as the focal point for stakeholder participation in implementation of the plan. The partnerships developed in this group and associated fora provide a long term development resource and a way of embedding expertise on a wide range of issues relating to the development of the National Waste Strategy: Scotland.

A Forth Valley Waste Strategy Area Co-ordinator will be maintained by SEPA to provide ongoing facilitation and co-ordination and to ensure that the range of national projects identified in the National Waste Plan are integrated into the Area Waste Plans. Waste Strategy Area Co-ordinators will be responsible for facilitating implementation of the area waste plan and for reporting on the annual progress in partnership with key stakeholders.

5.3 Action Plan

The Action targets stated throughout the text in Chapters 3-5 of this Area Waste Plan are presented in a format that provides further detail on timescales and objectives of each action and how they will be delivered and measured. This framework will provide a consistent and transparent format for monitoring and reporting on progress. Resources will be identified and reported on in annual reviews. The summarised action plan is presented in Annex 1.

5.4 Funding the Area Waste Plan

Funding of the necessary investment for new waste management infrastructure and operations may be obtained in a number of different ways, including private finance, through a PPP or PFI arrangement (refer to Annex 3), or traditional direct funding by the local authority. The Scottish Executive has established the Strategic Waste Fund (SWF) to allow specific grants to be paid to local authorities to assist with additional costs to meet the requirements of the Area Waste Plan (refer to SWF Guidance available from the Scottish Executive, contact details in Annex 5). Additional funding may also be available in some cases from other sources, e.g. landfill tax credits, New Opportunities Fund 'Transforming Waste', EU structural funds and the sale of packaging waste recovery notes (PRNs).

Further information is available on the web site: <http://www.sepa.org.uk/nws/funding/index.htm>

5.5 Monitoring Progress and Performance

Monitoring and review of the Area Waste Plan performance is an important element in measuring the influence and progress the plan will have in improving waste management across the Forth Valley and in meeting the various targets established by the plan. This will ensure that the plan continues to be effective and deliver the improvement in waste management at both the Forth Valley and National level.

An annual Area Waste Plan progress report will be provided to the Scottish Executive, and made available on the web site, with a summary of the annual forward development plans. This will ensure that the area plan can remain current, highlight progress in implementing the Area Waste Plan and flag up key issues that need to be addressed by future review of the Plan.

Given that development of the MSW BPEO was a rigorous and consensual process, involving all local authorities and a range of other key stakeholder bodies, it is proposed that the aggregated figures from the Area Waste Plans should form the basis for national recycling and recovery MSW targets. It is also proposed that the targets post 2010 should be reviewed in line with revised area waste plans. This would take into account the progress made in achieving the 2010 target and issues such as the future adoption of new technologies and application of legislation.

5.5.2 Indicators

The Forth Valley Area Waste Plan is setting out the forward direction in taking the first steps towards making the significant changes that are required to change our 'throw away' culture to a more waste aware, resource efficient society. The magnitude of this change is substantial and to ensure that the plan becomes a reality, adequate monitoring and reporting of its implementation is essential.

A wide range of stakeholders will have a key role to play, not only in the implementation of actions but in the monitoring and communication of progress made continuing the partnership approach that has been at the heart of the development process to date.

Local indicators have been identified for measuring progress towards individual actions presented in the Summary Action Plan, Annex 1.

5.6 Positive Land Use Planning

It is clear that in planning to meet the landfill diversion targets, new infrastructure will be required in the coming years. Development planning, through the Clackmannanshire & Stirling and Falkirk Structure Plans, as well as respective local plans has a key role to play in this by planning positively for provision of adequate waste management infrastructure.

Action Target 23

An integrated and effective approach to land-use planning for proposed new infrastructure to deliver the BPEO for in the Forth Valley.

Planning authorities when considering development proposals will ensure they are fully assessed against the AWP and accord with the chosen strategy. The planning system will also assist in ensuring that protection is given to the natural, built and historic environment and assist in moving towards a more sustainable form of development.

Action Target 24

Encourage new housing and commercial developments to incorporate construction and design features that maximise waste reduction and material separation at source.

The following publications will be used to assist in the development of structure and local plan policies and when considering planning applications for waste management or treatment facilities in the Forth Valley.

- NPPG 10, Planning and Waste Management sets out the role and responsibility of planning authorities in developing policy and identifying sites for waste management facilities. 'Planning authorities have a duty to provide policies for suitable waste disposal sites or installations in order to supply the land necessary for waste treatment and disposal to take place.' (page 6, para 2).

- PAN 63 Waste Management Planning provides best practice on a range of issues associated with waste management facilities and encourages a more proactive approach to waste management policy in development plans.

The Forth Valley Area Waste Plan is a material consideration for the land use planning system. As far as is practicable the AWP provides a clear framework for the development of waste management facilities to meet landfill diversion targets together with indicative infrastructure requirements to be incorporated into development plan policy as soon as is practicable.

For further information refer to Annex 3

SEPA has agreed subject to available resources, that it will provide expert technical assistance to Planning Authorities in defining the technologies that accord with the MSW BPEO decision (and future BPEO decisions). This could include commenting on the degree to which planning applications accord with the AWP, reviewing life-cycle assessment models where necessary and offering to appear as expert witnesses at public inquiries as required. Further assistance in the interpretation of the Landfill Directive and calculation of remaining landfill capacities, including the provision of waste data will also be provided where required. SEPA will also provide technical assistance in identifying and assessing the suitability of sites or areas of search for landfill.

5.6.1 Establishment of Loch Lomond and the Trossachs National Park -

This incorporates a significant area of the rural west within the Stirling area. The National Park Authority (NPA) will take over responsibility for planning from the local authorities in relation to determining planning applications and preparing a Local Plan. The NPA is also required to prepare a National Park Plan, which will deal with a broad range of park management issues, including waste.

The National Park has the following four aims for the area:

- To conserve and enhance the natural and cultural heritage of the area.
- To promote sustainable use of natural resources of the area.
- To promote understanding and enjoyment of the special qualities of the area by the public.
- To promote sustainable economic and social development of the area's communities.

These aims fit with the principles behind the Forth Valley Area Waste Plan and will offer a new opportunity to develop innovative partnership arrangements and local waste projects within the park boundary.

5.7 Linking to the National Plan

Each Area Waste Plan describes the activities, key infrastructure needs and targets for the eleven Waste Strategy Areas in Scotland. The National Waste Plan for Scotland (NWP) presents the aggregation of these eleven Area Waste Plans and describes the necessary activities to ensure that waste arising in Scotland is managed in a sustainable manner. The National Waste Plan also sets out how Scotland will achieve the objectives of the Landfill Directive. The future development of both the National Waste Plan and Area Waste Plans are linked by action. Together they provide the development programme to take forward the National Waste Strategy: Scotland at both a national and an area level.

Annex 1 – SMART Action Plan

Key:

AWP – Area Waste Plan; LA – Local Authority; SEFV – Scottish Enterprise Forth Valley;
SEPA – Scottish Environment Protection Agency; SWAG – Scottish Waste Aware Group;
WSAG – Waste Strategy Area Group

Action Number	Target	Action	Timescale	Indicator/measure	Responsibility	Objectives (Section 1.2)
1	Stabilise or reduce growth of MSW arising within the Forth Valley	SEPA steering group to research international good practice in waste prevention and produce Guidance to Waste Strategy Area Groups in development of local waste prevention plans. Production of a Forth Valley waste prevention plan to be developed in line with national guidance & recommendations from SEPA steering group. Implementation of Forth Valley waste prevention plan	Sept 2003 Jan 2004	Production of national guidance & recommendations for development of local waste prevention plans. Completion of Forth Valley waste prevention plan.	SEPA SEPA	2, 4, 8
2	WSAG members to minimise the environmental impact of their own organisations, with particular regard to waste management.	Examine and report baseline procurement system Conduct an internal waste audit & report Develop waste prevention plan for each WSAG member organisation. Implement plan	Dec 2003 Dec 2003 March 2004 From April 2004, annual review of plan Dec 2004	Monitor MSW growth rates across the Forth Valley Report on baseline procurement system. Report on waste audit for 2003 Report based upon waste audit & procurement baseline detailing plan for continuous in-house improvement Plan will identify appropriate indicators & measures	LA partners Each WSAG member organisation.	7, 8

Action Number	Target	Action	Timescale	Indicator/measure	Responsibility	Objectives (Section 1.2)
3	Facilitate improved awareness and responsibility for waste produced by householders and communities across the Forth Valley.	Deliver an integrated 3-year waste awareness campaign to promote waste prevention to householders and communities within the Forth Valley. Commence	Apr 2003, annual report March 2004 – 2007	SWAG annual report Monitor participation in KSC schemes and other local initiatives.	SWAG	2, 3, 6, 7, 8.
4	Integrate the aspirations of the AWP into local Community Planning, Sustainability, Lifelong Learning, Improved Health & Citizenship and other relevant policy implementation programmes.	Engage in necessary process for each local authority to integrate sustainable waste management within local Community Planning and other relevant projects.	Commence April 2003, annual report from Dec 2003	Number of community and Local Agenda 21 initiatives containing an element of sustainable waste management.	LA partners	3, 5, 6, 7, 8.
5	Facilitate community led sustainable waste management projects through the Community Waste Planning model.	Establish appropriate partnership projects with community organisations incorporating added value and sustainable waste management across the Forth Valley.	Annual report from Dec 2004	Number and activity of local partnership projects.	LA partners	2, 3, 7, 8.
6	Maximise the reuse and refurbishment of household items in partnership with local organisations	Support relevant organisations to effectively divert household items from landfill disposal by refurbishment and reuse within the community. Examine and establish further opportunities for recycling, re-use and refurbishment, particularly of waste collected at civic amenity sites and from bulky household collections.	Annual report from Dec 2004	Number and output of local initiatives engaged in refurbishment of household items.	LA partners	2, 5, 6.
7	Improve household recycling rates in alignment with targets set in this plan for 2006, 2010, 2013 & 2020.	A range of kerbside collection systems will be introduced, fitted to local circumstances.	Annual report from Dec 2003	Number of households participating in local schemes. Abstraction rates	LA partners	2, 4, 8.

Action Number	Target	Action	Timescale	Indicator/measure	Responsibility	Objectives (Section 1.2)
8	Improve understanding of the content of local household and MSW arising using waste analysis across the Forth Valley.	Conduct local household waste analysis project.	To be completed by June 2004	Production of local waste analysis report.	LA partners	2, 8
9	Establish local composting systems to provide access to composting to householders across the Forth Valley.	In urban areas, a green waste uplift service will be provided and central composting facilities developed either as an expansion of existing facilities or as new developments Develop local authority in-house composting activities in association with local communities with the long-term aim of the participating communities having access to the final compost product.	Annual review & report from Dec 2004	Number of participating households Tonnage of green waste diverted from landfill by central composting	LA partners	1, 2, 3, 8.
10	Divert organic waste from landfill disposal.	Establish a local forum to assess treatment options and potential utilisation of organic waste Implementation of forum recommendations with range of appropriate partners.	Annual report from Dec 2003 Commence April 2004, annual report from Dec 2004	Number of local community composting initiatives Tonnage of green waste diverted by community composting.	SEPA SEPA	1, 2, 3, 4, 5, 6.
11	Reach an informed decision on the performance of advanced waste treatment technologies and their potential application in the Forth Valley.	Investigate the performance of a range of waste treatment processes. Integrate investigation with neighbouring waste strategy area infrastructure requirements.	Dec 2006	Report recommendations for sustainable treatments and utilisation of organic waste produced within the Forth Valley. Annual review and report on diversion of organic wastes from landfill disposal. Report recommendations for advanced waste treatment technologies applicable to the Forth Valley. Meetings minutes with other on potential infrastructure performance.	WSAG	9

Action Number	Target	Action	Timescale	Indicator/measure	Responsibility	Objectives (Section 1.2)
12	Maintain a 10-year landfill capacity for all wastes with planning permission across the Forth Valley area.	Assess current and predicted future landfill capacity requirements for all wastes arising within the Forth Valley.	Assessment by Sept 2003 with annual report from Dec 20	Annual Report on MSW landfill rates and remaining capacity within the Forth Valley.	LA partners	1, 2, 4, 5.
13	Conduct a trial collection scheme for Household Hazardous Waste (HHW).	Assess the feasibility of a trial collection scheme for HHW	Commence June 2004, report Dec 2004.	Report on resource requirement and feasibility of a HHW trial collection scheme.	Stirling Council	1, 2
14	Annual review and report progress with implementation of the Forth Valley Area Waste Plan.	Develop a framework for monitoring and reporting progress once national guidelines are developed	Develop framework by Feb 2004 with annual report from Dec 2004	Annual review and report	SEPA	4, 7, 8.
15	Ensure strategic waste management facility provision across the Forth Valley.	Coordinate policies on waste within Structure and Local plans so that the provision of waste facilities is considered on a Forth Valley basis	Dec 2004	Incorporation within Structure and Local Plan's and appropriate land management decisions	LA partners	1, 2, 4,5.
16	Build and maintain best value within implementation of the Forth Valley BPEO.	Benchmark best practice to inform ongoing development & implementation of the Forth Valley AWP	Dec 2005	Annual report on benchmarking comparison with other waste strategy areas.	WSAG	9
17	Establish the best means of securing formal joint working arrangements between the local authorities within Forth Valley for the implementation of the AWP.	Develop mechanism to deliver strategic infrastructure requirements and other joint waste management activities.	Report Sept 2003	Formal agreement and procedures between local authority partners.	LA partners	2, 5, 9.
18	Increase recycled material reprocessing capacity and enterprise across the Forth valley.	Identify and quantify local recycle reprocessing capacity within the Forth Valley and encourage local entrepreneurs to fill gaps in provision.	Establish baseline by Sept 2003 & report capacity annually from Dec 2003	Baseline report detailing reprocessing capacity with annual update of info.	SEPA & SEFV	4, 6,

Action Number	Target	Action	Timescale	Indicator/measure	Responsibility	Objectives (Section 1.2)
19	Establish a comprehensive data set for the type, quantity and current management systems for non-MSW arising within the Forth Valley and plan for adequate provision of appropriate facilities.	Develop and implement a data collection system, in line with national waste data collection methods, to quantify non-MSW waste streams. Review current capacity & type of facilities utilised for the management of non-MSW Assess future capacity of landfill requirement and other waste management facilities for non-MSW.	Dec 2005 Report Dec 2005 Dec 2005	Production of accurate data on non-MSW waste streams. Production of accurate data set on the management systems applied to non-MSW across the Forth Valley. Production of accurate capacity projections for non-MSW management facilities, including landfill.	SEPA	1, 2.
20	Establish waste stream specific BPEO for moving the management of non-MSW up the waste hierarchy within the Forth Valley.	Establish a local non-MSW stakeholder group to assess viability of alternative waste management solutions that adhere to the principles of the waste hierarchy.	April 2004	Recommendations from the stakeholder group for improved non-MSW management options.	SEFV & SEPA	1, 2, 6.
21	Improve waste management and promote minimisation within the commercial and industrial sectors within the Forth Valley.	Facilitate commercial and industrial sectors to achieve waste minimisation and resource efficiency.	Annual report from Dec 2003	Number of Forth Valley businesses participating in commercial waste minimisation projects. £'s saved as a result of waste minimisation initiatives implemented.	SEFV	1, 2, 3, 6, 8.
22	Improve commercial and industrial waste reuse, recycling and exchange within the Forth Valley.	Develop forum for local waste producers to identify and report on sustainable options for the management of sector specific waste streams. Implement recommendations for specific waste streams.	Sept 2003 Annual report from Dec 2004	Production of recommendations for the management of sector specific waste streams. £'s saved as result of waste reuse recycling and exchange Action by commercial enterprises to reduce waste disposed of to landfill.	SEFV SEFV SEFV	2, 3, 6, 7, 8.

Action Number	Target	Action	Timescale	Indicator/measure	Responsibility	Objectives (Section 1.2)
23	An integrated and effective approach to land-use planning for proposed new infrastructure to deliver the BPEO for municipal solid waste in the Forth Valley.	Assess the land use implications of the infrastructure set out in Table 3.6 and the need to review current development plan policies or prepare supplementary planning guidance. Promote planning policies that encourage new developments to incorporate appropriate waste management facilities (e.g. recycling points) for large-scale housing and commercial developments.	Assessment carried out by Dec 2003 with annual report from Dec 2004	Agreed common approach across the Forth Valley and land use planning decisions made in accordance with the BPEO	LA partners	2, 4
24	Encourage new housing and commercial developments to incorporate construction and design features that maximise waste reduction and material separation at source.		Annual review & report from Dec 2003	Number of new developments that incorporate sustainable waste management infrastructure. Incorporation of appropriate waste management features within new development projects.	LA partners	2, 5, 8

Key:

AWP – Area Waste Plan;

LA – Local Authority;

SEFV – Scottish Enterprise Forth Valley;

SEPA – Scottish Environment Protection Agency;

SWAG – Scottish Waste Aware Group;

WSAG – Waste Strategy Area Group

Annex 2 – Glossary

Aerobic A process taking place in the presence of air.

Anaerobic A process taking place in the absence of air.

Anaerobic digestion The anaerobic decomposition of biodegradable waste, by the action of micro-organisms under controlled conditions, in order to produce methane in the form of biogas and, as residue, a fiber fraction (digestate) and a liquid fraction (liquor).

Avoidance Strict Avoidance involves the complete prevention of waste generation by virtual elimination of hazardous substances or by reducing material or energy intensity in production, consumption and distribution, as defined by Organisation for Economic Co-operation and Development – Strategic Waste Prevention 2000. See Waste Prevention

Best Value Places a duty on local authorities to deliver services (including waste collection and waste disposal management) to clear standards – covering both cost and quality – by the most effective, economic and efficient means available.

Biological treatment The stabilisation of residual municipal waste, unsorted waste or any other biodegradable waste in order to reduce the fermentability and volume of the waste.

Central composting Large-scale schemes that process biodegradable material from the surrounding area in a centralised location.

Commercial waste Waste arising from premises which are used wholly or mainly for trade, business, sport, recreation or entertainment, excluding household and industrial waste. (As defined in Environmental Protection Act 1990 Section 75)

Community sector Including charities, campaign organisations and not-for-profit companies.

Composting The controlled biological decomposition and stabilisation of biodegradable materials (such as organic garden and kitchen wastes) under predominantly aerobic (oxygen-rich) conditions to produce a humus rich, sanitised and stabilised product that can be beneficial to soil.

Controlled waste Household, industrial and commercial waste or any such wastes that require a waste management licence for treatment, transfer or disposal (as defined by Environmental Protection Act 1990 Section 75).

EC Directive A European Community legal instruction which is binding on all Member States and must be implemented through the legislation of Member State governments within a prescribed timescale.

Energy from waste The recovery of energy value from waste by burning the waste directly, or by burning a fuel produced from the waste, such as refuse-derived fuel (gaseous or solid) or landfill gas.

Gasification Heating waste in a low-oxygen atmosphere at temperatures typically of 800 - 1400 oC to give off a fuel gas. This technology was used to produce gas from coal, although it is relatively new process in its application to waste treatment

Green Waste 'Green and wood waste' means vegetable waste from gardens and parks, tree cuttings, branches, grass, leaves (with the exception of street sweepings), sawdust, woodchips and other wood waste not treated with heavy metals or organic compounds.

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

Household waste Waste from domestic properties including waste from caravans, residential homes and premises forming part of an educational establishment and part of a hospital or nursing home.

Incineration A combustion treatment process involving waste. This includes the incineration by thermal oxidation of wastes. The EU Directive on Incineration defines other processes such as gasification and pyrolysis as incineration in as far as the substances resulting from the treatment are subsequently incinerated.

Industrial Waste Waste from a factory (within the meaning of the Factories Act 1961) or from any premises used for or in connection with:

- Provision of public transport
- Public supply of gas, water, electricity or sewerage services
- Provision to the public of postal or communication services

Inert waste 'Waste that does not undergo any significant physical, chemical or biological transformations' as defined by the EU Landfill Directive (99/31/EEC).

Integrated waste management Involves a number of key elements, including: recognising each step in the waste management process as part of a whole; involving all key players in the decision-making process; and utilising a mixture of waste management options within the locally determined sustainable waste management system.

In-Vessel composting The composting of biodegradable material in a closed reactor where the composting process is accelerated by optimising air exchange, water content and temperature control.

Kerbside segregated collection Any regular collection of recyclables or compostable materials from premises. Excludes collection services delivered on demand.

Land use planning The Town and Country Planning system regulates development and use of land in the public interest and has an important role to play in achieving sustainable waste management.

Landfill Directive A key European Directive, agreed in April 1999, aims to prevent or reduce as far as possible the negative effects of landfilling on the environment and human health. The main requirements of the directive include treatment of most wastes before landfilling; banning the co-disposal of hazardous and non-hazardous waste; banning certain wastes from landfill completely; and targets for the reduction of biodegradable municipal waste to landfill.

Landfill sites Areas of land in or on which waste is deposited.

Materials recovery facility (MRF) A facility to process wastes for the purpose of recovering useful materials using a variety of processes to separate out different materials, ranging from manual sorting to advanced mechanical separation techniques.

Mixed waste processing facility Any facility using one or more mechanical, biological or thermal processes to extract more than one useful product (recyclables and/or compost and/or fuel or energy and/or other recovered materials) from a mixed wastes stream. This covers a range of existing and emerging technologies, many of which are capable of treating either mixed waste (before or after source separation) or source segregated materials, thus offering flexibility.

Packaging waste Comprises waste arising from "all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer...."

Pyrolysis In this treatment, organic waste is heated in the absence of air at temperatures typically of 400 – 800 oC. This produces a predominantly gaseous fuel product, occasionally some liquid fuel and a solid inert residue (mainly carbon). Pyrolysis can take different waste streams but generally requires a consistent feedstock. Pyrolysis does enable energy to be recovered from the waste.

Recovery Generating value from wastes from a wide variety of activities such as recycling, composting and energy recovery.

Recyclables Materials that are capable of being recycled.

Recycling Using waste materials in manufacturing other products of an identical or similar nature, as defined by Organisation for Economic Co-operation and Development – Strategic Waste Prevention 2000.

Reduction at Source Minimising use of toxic or harmful substances and/or minimising material or energy consumption, as defined by Organisation for Economic Co-operation and Development – Strategic Waste Prevention 2000. See Waste Prevention.

Refuse Derived Fuel A solid, liquid or gaseous fuel derived from waste which typically will be used as a fuel product on site or by a third party user.

Re-use Involves the multiple use of a product in its original form, for its original purpose or for an alternative, with or without reconditioning, as defined by Organisation for Economic Co-operation and Development – Strategic Waste Prevention 2000. See Waste Prevention.

Source separation Separation of materials for recycling or composting (e.g. paper, cans, glass, textiles, garden waste, household organics, plastic, steel, etc.) at the point of origin. The separation either takes place within the household (or business/institution) through the use of different containers, or parts of containers, for individual materials, or at street level when materials are sorted into the collection vehicle.

Sustainable development Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition can be extended to address waste and resources, i.e. development that recognises the need to limit the use of resources and production of waste to levels which do not damage the ability of natural ecosystems to remain stable and healthy. This will involve efficient use of resources including the re-use and recovery of wastes and a move from resources whose supply is finite to renewable.

Thermal treatment A broad generic term covering processes that involve the use of heat to treat waste. Incineration is the most common thermal treatment process. Pyrolysis and gasification are other high temperature processes but there are also low temperature processes used, for example, in technologies producing refuse derived fuel.

Waste Any substance or object in the categories set out in Annex 1 of the Waste Framework directive (91/156/EEC), which the holder discards or intends or is required to discard.

Waste arisings The amount of waste generated in a given locality over a given period of time.

Waste hierarchy Seeks to capture the desirability of different waste management options in descending order of preference, from Avoidance, Reduction and re-using waste, through recycling and composting, energy recovery and finally disposal. The concept is meant as a guide to thinking rather than a rigid rulebook.

Waste minimisation Preventing and/or reducing the generation of waste at the source: improving the quality of waste generated, such as reducing the hazard, and encouraging re-use, recycling and recovery, as defined by Organisation for Economic Co-operation and Development – Strategic Waste Prevention 2000.

Waste prevention Includes in descending order of preference: Strict Avoidance, Reduction at Source and Product Re-use, as defined by Organisation for Economic Co-operation and Development – Strategic Waste Prevention 2000. These terms are defined under the relevant headings.

Waste transfer station A site to which waste is delivered for sorting and/or bulking prior to transfer to another place for recycling, treatment or disposal.

Windrow composting An open-air method of composting in which biodegradable materials are placed in long piles, which are turned periodically to aid the composting process. The term originates from the farming practice of piling hay in rows so that it will dry out in the wind.

Annex 3 – Links to Other Policies, Legislation and Initiatives

The Area Waste Plans are being developed in an environment where other areas of policy development, legislation and initiatives are likely to influence, or be influenced by, the National Waste Plan. During its implementation the National Waste Strategy seeks to integrate its activities with the policies, legislation and initiatives described in the following sections. These fall under three categories, namely:

1. Waste Management related Policies, Legislation and Initiatives;
2. General Policies, Legislation and Initiatives – of direct relevance to waste management; and
3. Other Policies, Legislation and Initiatives – of indirect relevance to waste management.

1 Waste Management Related Policies, Legislation and Initiatives Awareness, Education and Cultural Change Programme

The Waste Aware Scotland Team (WAST) was established by SEPA to create a more positive waste culture in Scotland, using a waste education and awareness programme based on best practice from Scotland and around the world. Its specific aims are to establish a strategic framework for education and awareness initiatives in support of the National Waste Strategy: Scotland and where appropriate to support, facilitate and assist in the implementation of these education and awareness initiatives. The team is chaired by a representative from SEPA and draws its members from local authorities, commerce and industry, the waste management industry and consumer interests.

The process focus of the team will be on formal education, informal learning, professional education and training, public campaigns and information or advice services. The strategic behavioural and cultural change objectives of WAST will be achieved through a number of initiatives which will address all wastes including household, commercial and industrial. Initiatives already underway include the Scottish Waste Awareness Group (SWAG), which will plan and deliver a series of public awareness campaigns across Scotland as part of their Waste Aware Scotland programme to change public attitudes towards reduction, reuse and recycling.

Working closely with SEPA and WAST, SWAG is a resource for local authorities and the National Waste Strategy: Scotland to deliver local and national campaigns to the public through the Waste Strategy Area groups. SWAG has cross-sector support from SEPA, local authorities, NGOs, recycling groups, consumer interests, private waste industry, Keep Scotland Beautiful, the media and the Scottish Executive, in particular their 'Do a Little Change a Lot' campaign.

SEPA's Regulatory Policy

SEPA's Regulatory Policy is aimed at meeting Objective 1 of Schedule 12 of the Environment Act 1995 and ensuring that waste is recovered or disposed of without endangering human health and without using processes or methods that could harm the environment. SEPA's Regulatory Policy, therefore, recognises the importance of ensuring that its regulatory functions are in line with the objectives of the National Waste Strategy process, and equally, that the Area Waste Plans are realistic concerning the contribution that regulation can make. There is also a need to ensure that each plan addresses forthcoming regulatory issues sufficiently. A full statement of SEPA's Regulatory Policies will be prepared for inclusion in the National Plan.

SEPA Waste Minimisation Programme

SEPA's Waste Minimisation Programme was launched in 1998 and became a permanent function in 2001. The overall aim is to demonstrate the benefits of waste minimisation to SEPA staff, commerce and industry. The programme works in partnership with external organisations to increase the amount of waste minimisation activity in Scotland by developing sector-based or geographical projects and links to SEPA's own internal environmental policy and the National Waste Strategy Scotland. It also contributes to the promotion of domestic waste minimisation to householders through working alongside the Scottish Waste Awareness Group,

To date SEPA has helped over 500 companies to reduce their waste through low cost measures through the external partnership network. This now equates to an across-the-board cost saving amongst Scottish Businesses of at least £6 million through reductions in water use and emissions to land and air.

The programme seeks to provide a focal point for the dissemination of best practice in waste minimisation. A website (www.sepa.org.uk/wastemin) contains useful information on the benefits of waste minimisation, how to establish a waste minimisation programme, useful contacts and sources of help and listing of all the initiatives throughout Scotland. A practical video and leaflet is also available free of charge.

2 General Policies, Legislation and Initiatives (of direct relevance to waste management)

Best Value

A duty of Best Value has been introduced to Scottish local government through the Local Government in Scotland Bill (introduced on 16 May 2002). Best Value means that local authorities will have to secure continuous improvement in the performance of all their functions. This improvement should be achieved while maintaining an appropriate balance between the quality of service delivered and cost of delivering the service. The intention is to embed a culture of quality and improvement in local government service delivery. Best Value is intended to focus local authorities on outcomes as well as the process, which may force them to ask themselves difficult questions – how should a service be delivered? How well do we deliver it? How well could others do it? How do we compare to others? This process requires a commitment to ongoing review and that an effective dialogue between local authorities, their staff and service users be created and maintained.

Whilst Best Value is a principle that can be applied widely across public sector services there are specific objectives in its application to waste management. These include aspects of collection, treatment and disposal of waste. The final structure and the necessary legislation for its application in Scotland are awaited. The services developed by local authorities as a result of the Area Waste Plans will be developed and managed as part of the Best Value regime.

Contaminated Land Issues

Area Waste Plans will address the management of contaminated soil arisings as part of the strategy for the management of non-Municipal Solid wastes. The majority of contaminated land issues will be addressed either through the Planning and Development Control procedures, Part IIA of the EPA 1990 (local authorities), or the Control of Pollution Act 1974 (enforced by SEPA).

Development Planning

The planning system guides the future development and use of land in the long-term public interest. The aim is to ensure that development and changes in land-use occur in suitable locations and are sustainable. The statutory development plan for an area consists of the structure and local plan:

- The structure plan provides a long-term vision as part of an overview of an area's development requirements. It should identify the overall supply of land to meet the requirements of development and reflect and identify the priorities for the provision of infrastructure.
- Local plans set out the detailed policies and specific proposals for development and the use of land that guide day-to-day planning decisions.
- Additionally, where applicable, any development proposals or waste management proposals will need to take account of the planning framework prepared for each National Park, namely a National Park Plan and a local plan or plans, as required by the National Parks (Scotland) Act 2000. The National Park Plan will set the overall strategic vision and management context within which the local plans will set out detailed policies and proposals for the development and use of land within a National Park.

Local Agenda 21 and Environmental Strategies

Whilst these plans are non-statutory, many local authorities will produce one or both. Local Agenda 21 strategies (LA21) arose out of the 1992 Rio Earth Summit and can be thought of as local plans for sustainable development. The Government challenged all authorities to produce such a statement by December 2000. Community plans and LA21s are very similar in nature. Thus many LA21 strategies have been combined with community plans or are seen as complementary processes. However LA21 plans tend to be longer term, more global-to-local in approach and more radical than community plans.

Since the World Summit on Sustainable Development (WSSD) fresh impetus has been given to the LA21 process, which is now been termed 'Local Action 21' with a renewed focus on action.

Environmental strategies simply draw together local authority actions on environmental issues, from transport to purchasing, from waste management to environmental education and subsequently the Area Waste Plans form a key component of the local authorities sustainable development strategy.

Local Government Bill

The forthcoming Local Government Bill aims to provide a framework for the delivery of better, more responsive public services, giving councils more flexibility and responsibility to act within a sensible framework and to work in partnership with communities and other agencies.

The proposals fall into three main areas:

- Giving councils a general power to promote and improve the well-being of their area.
- Providing a statutory underpinning for community planning through a duty on councils and key community planning partners.
- Introducing a statutory duty of best value for local authorities.

The new powers will enable councils to act more flexibly and innovatively in promoting and improving the well-being of their area in partnership with communities and other agencies.

councils will be required to facilitate a Community Planning process in their area and to consult and engage communities in that process. Other key public bodies, such as the NHS, local enterprise companies and police are under a statutory duty to participate in the community planning process. This is designed to promote more effective joint working between agencies in seeking to deliver the services people want. The emphasis should be on the needs of service users and the effective engagement of communities in the decisions that affect them.

A statutory duty of Best Value is to be placed on local authorities to pursue continuous improvement in performance in a way that maintains an appropriate balance between quality and cost.

The Bill will also be used as a vehicle for progressing a small number of miscellaneous provisions that relate to the role of local authorities, including a duty to prepare Integrated Waste Management plans to replace the current recycling plans. Integrated Waste Management Plans will include targets for individual local authorities to achieve as their contribution to their Area Waste Plan and the National Waste Plan.

Public Private Partnership (PPP)

One aim of government policy is to promote constructive working partnerships between the public and private sectors.

private capital and expertise in the provision of public infrastructure is not new. Joint working between the public and private sectors, in fields such as housing, economic development and regeneration, transport and municipal enterprises, has achieved a great deal over the years. The government is keen to build on this success, by extending successful approaches to delivering good value for money, and by developing new ones and PPP is one route by which local authorities may procure and fund the long-term integrated waste management required to meet the Area Waste Plan objectives.

Private Finance Initiative (PFI)

PPPs are about establishing arrangements, often using a legally binding contract that will bring benefits to both sectors. Such arrangements can include contractual relationships, management buy outs, externalisation of operational management and use of the Private Finance Initiative (PFI). The PFI is a mechanism for improving value for money in partnership with the private sector and is often applied to large capital projects such as roads, hospitals, schools and prisons. The PFI has also been applied to a range of waste management facilities.

The costs of the various waste management options for Municipal Solid Waste highlighted elsewhere in the plan indicate that there may be a need to explore PPPs to deliver certain aspects of the infrastructure and services required. It will be for individual councils to decide on the form that these arrangements take. The Scottish Executive have made clear that to secure any funding from the Strategic Waste Fund, all projects must accord with the local Area Waste Plan, irrespective of whether they are financed using PPP, PFI or other traditional methods of financing.

Renewables Obligation (Scotland)

The Scottish Executive has set out a policy on renewable energy, which aims to stimulate further the development of the renewable energy industry in Scotland. The Scottish Executive's objective is that by 2010 18% of electricity supplied in Scotland should be renewable energy, in other words generated from a renewable resource. The policy has five key aims:

- To assist the UK to meet national and international targets for the reduction of emissions, including greenhouse gases
- To help provide secure, diverse, sustainable and competitive energy supplies
- To stimulate development of new technologies needed for growth of the contribution from renewables in the longer term
- To assist the UK renewables industry to become competitive in home and export markets and in doing so to provide employment
- To make a contribution to rural development.

In line with the objective and aims, Renewables Obligation (Scotland) (ROS) obliges all licensed electricity suppliers in Scotland to demonstrate that they have supplied a specified proportion of electricity from renewable sources. This specified proportion will increase each year to help achieve the objective of 18% of electricity supplied from renewable sources by 2010.

The key renewable energy technologies include wind and wave power, solar energy, bio-mass production and energy from waste. The specific approach that the ROS takes on energy from waste as a renewable energy source is as follows:

Electricity generation from waste treatment is eligible under 2 categories, providing minimal content of fossil-fuel-derived waste.

(a) Generation from biomass

Electricity that is generated directly from treatment of biomass is eligible under the order. Biomass, defined as above, must be verified to be contaminant free to at least 98% of its energy content as measured by monthly sampling.

(b) Mixed-waste generation

Electricity generation from mixed waste treatment is not directly eligible under the 2002 order. However, electricity that is generated from the liquid or gaseous product/s of an advanced conversion technology, where it is applied to mixed waste, is eligible under the order. The order defines an advanced conversion technology as 'Gasification, pyrolysis or anaerobic digestion, or any combination thereof'.

Community Planning

This arose from the perception that public sector planning was fragmented and poorly co-ordinated at a local level, leading to duplication, waste and confusion. Hence since 1999, with councils taking a lead, organisations as diverse as Health Boards, LECs, Scottish Homes, SEPA, the police authority and Scottish Natural Heritage have come together to plan the future of the local area. These community plans are being finalised and should contain: a vision for the future of the area, an analysis of the main issues, an audit of current activities, an action plan for change, and a review mechanism. Community plans can cover strategic issues and also be subdivided to tackle very local issues such as traffic, noise, graffiti and green space. As such, community plans offer an important means to have policies endorsed by a very wide range of actors and stakeholders. The completed Area Waste Plans will provide useful input to local authority community plans.

Corporate Plans (Strategic Plans)

Most local authorities produce a corporate plan to cover either following year or three years. These are key documents as they translate the manifestos of the parties into policies and set out commitments on emerging government initiatives. Corporate plans usually present an analysis of the Council position (with respect to demographics, economy, social issues, environmental issues, etc.) and the key policies and actions it intends to undertake. It may also contain an explanation of the internal processes of the council that are intended to implement the corporate plan. It is likely that local authority Corporate Plans will make reference to the agreed Area Waste Plan.

Economic Development Strategies

Most local authorities have economic development teams and will therefore produce strategies and action plans setting out what these teams intend to achieve. This will often be in addition to any Local Enterprise Company (LEC) Economic Development Strategy they are supporting. Typical issues covered include company support, trade development, company development, training and New Deal programs, physical enhancement, infrastructure improvements, tourism, links to social inclusion work, and in some cases environmental issues. The completed Area Waste Plans, as agreed, may be used to inform the development of local authority economic development strategies.

Education Department Plans

A wide variety of plans are required in Education Departments, including curriculum development plans and school development plans. A recent innovation is the need to produce Community Learning Strategies and Community Learning plans to support the new Community Plans (see below). Community learning seeks to involve the Community Education function and other key learning institutions in meeting key learning needs arising from other strategies. For example, the economic development strategy might identify a need for greater IT skills, which the Community Learning Strategy might try to address. Some education departments may also have environmental education plans. Area Waste Plans typically have a significant public education and awareness component and the implementation of this may influence the development of local Community Learning Plans.

Housing Plans and Housing Management Plans

These are statements by Housing Department of the range and type of housing required for their area over a three or five year period, and the investment required to meet that need. Housing types cover both standard (council) housing and special needs housing. Housing Management Plans cover the service provided by the local authority: repairs and maintenance, estate management, tenant participation, etc. Housing Management Plans may influence the nature of any future changes to the current household waste collection systems, required by the Area Waste Plan.

Local Air Quality Plans

The Environment Act 1995 requires local authorities to review their area and determine possible breaches that may occur to the National Air Quality strategy objectives for key pollutants. Local authorities that identify areas likely to breach these standards must produce a strategy to return the area to compliance, using mechanisms such as controls on development, low emission zones, traffic restrictions, etc. Future waste management facilities and arrangements proposed by the completed Area Waste Plans may have an impact on local air quality and the Area Waste Plan proposals should be taken into account as part of the local air quality plans.

Local Biodiversity Action Plans

Another plan to arise from the 1992 Rio Earth Summit, these plans seek to implement at a local level the UK government's national Biodiversity Action Plans. Typically, a Local Biodiversity Action Plan (LBAP) will follow a defined process: an audit of existing flora, fauna and habitats, a prioritisation of these against key international, national and local criteria, followed by the development of action plans for the key species. Where they exist, LBAPs may inform the site location considerations for specific facilities required by the Area Waste Plan.

Local Transport Strategies

Local transport strategies are designed to bring together all the transport issues for the local authority area. They combine the statutory requirements of the Road Traffic Reduction Act and Road Safety Plans with analysis of the existing pattern of transport and traffic. They usually include plans for new roads and road improvements, bus, cycling, walking and rail projects and are a useful source of transport statistics. They may, and should, be linked to local air-quality and planning strategies. The completed Area Waste Plans may be used to inform the development of local transport strategies, particularly where new centralised waste processing facilities are planned.

Other Local Authority Corporate Policies

Local authority Chief Executives or Corporate Services Departments typically produce a wide range of other policies. These cover plans for both urban regeneration, closely linked to social inclusion, and rural regeneration, sometimes called Rural Development. Typically these plans use ring-fenced government money, together with Structural Funds, to promote community social and economic programmes such as training, community transport, credit unions, physical enhancements, etc. Elements of the agreed Area Waste Plans may be of relevance for inclusion in these Corporate Plans, where they impact regeneration and social inclusion.

Annex 4 – Associated Reports

The following publications are available from the Forth Valley Waste Strategy Area Coordinator at the address below:

1. Forth Valley Strategic waste management Baseline Assessment May 2000
2. Summary of Stakeholder Consultations and Responses, March / April 2001
3. WISARD assumptions & costing model assumptions, September / October 2001
4. Forth Valley Issues Paper, January 2001
5. Appraisal results & BPEO Decision meeting, April 2001
6. Forth Valley Draft Area Waste Plan, July 2001
7. Summary of Draft Area Waste Plan Consultation Responses, November 2002

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Email: eleanor.strain@sepa.org.uk

SEPA's Published guidance documents are also available online at: www.sepa.org.uk/nws

Forth Valley Issues Paper, Draft AWP and Consultation Responses

National Waste Strategy: Scotland (Dec 1999)

Best Practical Environmental Option – Decision Making Guidance (Sept 2000)

Supporting Guidance for Area Waste Plans (Sept 2000)

National Waste Plan (2003)

Annex 5 – Contact Organisations and Links

National Organisations

For enquiries and information on the National Waste Strategy: Scotland:

- visit: www.sepa.org.uk/nws
- email: nws@sepa.org.uk
- call the NWS information request line on: 0800 389 5270

Scottish Environment Protection Agency (SEPA)
Erskine Court
Castle Business Park
Stirling
FK9 4TR
Tel: 01786 457700
Fax: 01786 446885
www.sepa.org.uk

SEPA Waste Minimisation Project (WaMI)
Clearwater House
Heriot Watt Research Park
Avenue North
Riccarton
Edinburgh
EH14 4AP
Tel: 0131 449 7296
Fax: 0131 449 7277
www.sepa.org.uk/wastemin

Scottish Executive
Waste Strategy Team
SEPA Sponsorship and Waste Unit
Area 1- J (North) Victoria Quay
Edinburgh
EH6 6QQ
Tel: 0131 244 0243
Fax: 0131 244 0245
www.scotland.gov.uk

Convention of Scottish Local Authorities (CoSLA)
Rosebery House
9 Haymarket Terrace
Edinburgh
EH12 5XZ
Tel: 0131 474 9200
Fax: 0131 474 9292

Recycling Advisory Group Scotland (RAGS)
233 Cowgate
Edinburgh
EH1 1NQ
Tel: 0131 226 6666
Fax: 0131 220 2263
ragsdesk@rags.org.uk
events@rags.org.uk

ReMaDe Scotland
Caledonian Shanks Centre for Waste Management
Glasgow Caledonian University
3rd Floor Drummond House
1 Hill Street
Glasgow
G3 6RN
Tel: 0141 582 0450
Fax: 0141 582 0451
www.remade.org.uk

Scottish and Northern Ireland Forum for Environmental Research (SNIFFER)
11/13 Cumberland Street
Edinburgh
EH3 6RT
Tel: 0131 557 2140
Fax: 0131 652 3615

Scottish Environmental Services Association (SESA)
c/o Shanks
A8 Edinburgh Road
Coatbridge
Lanarkshire
ML5 4UG
Shanks Switchboard
Tel: 01236 433671
martin.king@shanks.co.uk

Scottish Institute of Sustainable Technology Ltd (SiSTech)
Heriot-Watt University
Riccarton
Edinburgh
EH14 4AS
Tel: 0131 4518162
Fax: 0131 4518150

Scottish Waste Awareness Group (SWAG)
7 Melville Terrace
Stirling
FK8 2ND
Tel: 01786 471333
www.wascot.org.uk

Waste and Resources Action Programme (WRAP)
The Old Academy
21 Horse Fair
Banbury
Oxon
OX16 0AH
Tel: 0800 100 2040
Fax: 01295 819911
www.wrap.org.uk
WRAP Scottish Liaison Officer
Tel: 0131 244 7953

Annex 6 – Suggested Methodology For Calculation Landfill Supply in Forth Valley

There is a need for a clear and robust methodology to allow a consistent calculation of the regional landfill supply for Forth Valley.

A basis for the calculation is the three fold separation of landfills by type that will be required under the Landfill Directive. The table shows the categories required and the equivalent waste category (as defined in the Controlled Waste Regulations 1992) that could be admitted to such a facility

Landfill Directive Landfill Type	Equivalent Wastes that Could be Deposited (using Controlled Waste Regulations 1992 categories)
Hazardous Landfill Sites	Special Waste
Non-Hazardous Landfill Sites	Household, commercial and general industrial waste, plus 20% of Construction and Demolition (C and D) wastes
Inert Landfill Sites	80% of Construction and Demolition Wastes

Calculations of landfill supply would then be split by landfill type, and calculated on the basis of local landfill capacity for each type, divided by local waste arising for the equivalent waste less mandatory and target diversions for waste (assumes AWP implemented in full) i.e.

Hazardous Landfill Supply = $\frac{\text{Capacity of Landfills in Forth Valley Classified as Hazardous}}{\text{Special Waste Arising in Forth Valley}}$

NB:- Due to the extremely specialised nature of the Hazardous Landfill Site as defined under the Landfill Directive, there are expected to be only a handful of such sites in the UK. Therefore, it is not expected that each individual area would be able to maintain a 10-year landfill supply for Hazardous Wastes.

Non-Hazardous Landfill Supply = $\frac{\text{Capacity in Forth Valley Classed as Non-Hazardous}}{\text{Household, Commercial \& Industrial Waste plus 20\% of C \& D waste arising in Forth Valley less mandatory and target diversions for waste}}$

Inert Landfill Supply = $\frac{\text{Capacity of Landfills in Forth Valley Classified as Inert Sites}}{80\% \text{ of C and D Waste Arising in Forth Valley}}$

Note – In calculating capacity it is assumed that landfill densities are:-

0.8 tonne/m³ for general wastes

1.5 tonnes/m³ for C and D wastes

Notes

Notes

- 1 Orkney and Shetland
- 2 Western Isles
- 3 Highland
- 4 Moray, City of Aberdeen and Aberdeenshire
- 5 City of Dundee, Angus and Perth and Kinross
- 6 City of Stirling, Clackmannanshire and Falkirk
- 7 Fife
- 8 City of Edinburgh, West Lothian, Midlothian
East Lothian and The Scottish Borders
- 9 North Ayrshire, East Ayrshire, South Ayrshire
and Dumfries and Galloway
- 10 Inverclyde, Renfrewshire, East Renfrewshire,
City of Glasgow, South Lanarkshire, North Lanarkshire,
East Dunbartonshire and West Dunbartonshire
- 11 Argyll and Bute



Printed on totally chlorine free (TCF) material containing a minimum of 75% recycled post-consumer waste.

Printed by: H Charlesworth & Co Ltd., AWPT006

ISBN 1 901 322 34 3