Waste Aware Scotland

Reduce → Reuse → Recycle

National Waste Strategy: Scotland

Lothians and Borders

Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004

Strategic Environmental Assessment of

Lothian & Borders Area Waste Plan Review

ENVIRONMENTAL REPORT

July 2007

Area Waste Plan

SEPA
Scottish Environment Protection Agency

SEA ENVIRONMENTAL REPORT – COVER NOTE – SECTION 1

To SEA.gateway@scotland.gsi.gov.uk

SEA ENVIRONMENTAL TEMPLATE – COVER NOTE – SECTION 2

An Environmental Report is attached for

Lothian & Borders Area Waste Plan Review

The Responsible Authority is:

The Scottish Environment Protection Agency

SEA ENVIRONMENTAL REPORT TEMPLATE – COVER NOTE – SECTION 3

Contact Name	**For SEA:**	**For Area Waste Plan:**
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Note: Please respond to this consultation using the following email:

lothianandbordersAWP@sepa.org.uk

SEA ENVIRONMENTAL REPORT TEMPLATE – COVER NOTE – SECTION 5

Date	**4 July 2007**

LOTHIAN AND BORDERS AREA WASTE PLAN REVIEW

STRATEGIC ENVIRONMENTAL ASSESSMENT – ENVIRONMENTAL REPORT

List of Tables and Figures

LOTHIAN AND BORDERS AREA WASTE PLAN REVIEW

STRATEGIC ENVIRONMENTAL ASSESSMENT – ENVIRONMENTAL REPORT

SUMMARY

1. INTRODUCTION

1.1 In 2003, 11 Area Waste Plans covering the whole of Scotland were prepared by the Scottish Environment Protection Agency (SEPA), in partnership with the Scottish Executive, local authorities and other stakeholders. These set out a strategic framework for delivery of waste management facilities across Scotland in order to improve Scotland's rates of waste recycling and recovery and to reduce the amount of waste being disposed of in landfill sites.

1.2 The Lothian and Borders Area Waste Plan (LBAWP) covers the local authority areas of Edinburgh City, East, Mid and West Lothian and the Scottish Borders.

1.3 In 2003/4 555,201 tonnes of municipal (or household) waste was generated in the Lothian and Borders area. The amount of waste that was recycled in 2003/4 was 10.8% and this has risen to 22.3% in 2005/6. This represents a significant improvement and is the result of considerable effort by all the authorities involved and by the public. It remains the case that 77.75% is still disposed to landfill sites. This is not a sustainable or desirable approach to managing waste and Scotland has set itself challenging targets to divert waste away from landfill.

1.4 Landfill sites can have a number of environmental problems, including odour, noise, litter, potential to contaminate water through leaching of contaminants and also through emissions of methane, a powerful greenhouse gas that contributes to climate change. Moving away from landfill is therefore a key objective for the Area Waste Plan.

1.5 Since publication of the LBAWP in 2003, the Scottish Executive has invited proposals from the local authorities for funding for residual waste management facilities[1]. Local Authorities in the Lothian and Borders have identified a number of potential options. Some of these options are not in line with the Best Practicable Environmental Option (BPEO) for dealing with waste as identified in the 2003 LBAWP. Once finalised and, if approved by the Scottish Executive for funding, these options will have a key influence on how the LBAWP is implemented.

1.6 SEPA considers that it is important to review the LBAWP now to take account of the potential impacts of these options. SEPA wants to ensure that consideration of the options is supported by evidence about their potential environmental effects. To do this, a review of the LBAWP in association with a strategic environmental assessment (SEA) was considered necessary. This Environmental Report is the outcome of this assessment.

1.7 The LBAWP does not identify specific waste management technologies nor does it identify sites. Accordingly, the review has not identified areas where facilities should be sited and as a result, this SEA only considers the generic effects. SEPA anticipates that effects on specific areas will be identified through SEA of local authority development plans.

1.8 SEA of the LBAWP Review is a requirement under the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004. SEA is a systematic method for assessing the potential environmental effects of plans during their preparation in order to make sure the plan considers environmental matters and so that measures to address adverse effects can be identified and put into place early. This document reports on the findings of the SEA.

[1] ***Residual Waste:*** *This is the waste that remains after reduction, reuse, recycling and composting.*

2. THE ASSESSMENT METHOD

What Was Assessed ?

2.1 This Environmental Report has compared the environmental effects of the revised municipal waste proposals (options 1 - 6) profiled by local authorities in the Lothian and Borders as part of the development of the bids. It has compared these against current waste management practices in 2005/2006 (the baseline). Links to summaries of the different types of waste management facilities is provided in Appendix 5.

2.2 Option 1 reflects delivery of the existing Area Waste Plan indicative targets. Option 1 has been modelled to use residual treatment facilities that carry out Mechanical Biological Treatment (MBT), Anaerobic Digestion (AD) and Energy from Waste (EfW). Option 1 provides the following performance outcomes:

Components	**2020**
Source segregated Recycling and Composting	**26 %**
Source segregated recycling	21 %
Source segregated composting	5 %
Residual Waste Treatment	**57%**
Additional Recycling and Composting	16 %
Additional Diversion from Landfill	37 %
Landfill after treatment e.g. ash	4.4 %
Landfill	**17 %**

2.3 The additional recycling and composting includes metal recovery and the production of stabilised biowaste from the MBT facility and bottom ash recycling into a substitute aggregates material. The additional diversion from landfill covers the process loss e.g. evaporation of the moisture content within the biowaste and the production of Refuse Derived Fuel which then goes on to an energy recovery facility.

2.4 **Option 2** - Option 2 has been modelled to use Energy from Waste residual waste treatment facilities, whilst maintaining the recycling and composting levels in the existing Area Waste Plan.

Components	**2020**
Source segregated Recycling and Composting	**26 %**
Source segregated recycling	21 %
Source segregated composting	5 %
Residual Waste Treatment	**64%**
Additional Recycling and Composting	11%
Additional Diversion from Landfill	44%
Landfill after treatment e.g. ash left over after incineration	9%
Landfill	**10%**

2.5 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

2.6 **Option 3 -** Option 3 has been modelled to use Energy from Waste residual waste treatment facilities, whilst maintaining recycling and composting levels comparable to the progress that is currently being made and to the existing Area Waste Plan. Option 3 maximises diversion from landfill.

Components	**2020**
Source segregated Recycling and Composting	**33 %**
Source segregated recycling	21 %
Source segregated composting	12 %
Residual Waste Treatment	**66 %**
Additional Recycling and Composting	12%
Additional Diversion from Landfill	46%

Landfill after treatment e.g. ash left over after incineration	8%
Landfill	**1 %**

2.7 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

2.8 **Option 4** - Option 4 includes source segregated recycling and composting levels well beyond existing AWP targets. These recycling and composting levels are considered as aspirational as they depend on the availability of additional public funding as well as increased public participation. Option 4 has been modelled using Energy from Waste residual waste treatment technology and maximises diversion from landfill.

Components	**2020**
Source segregated Recycling and Composting	**43 %**
Source segregated recycling	29 %
Source segregated composting	14 %
Residual Waste Treatment	**56%**
Additional Recycling and Composting	10%
Additional Diversion from Landfill	39%
Landfill after treatment e.g. ash left over after incineration	7%
Landfill	**1 %**

2.9 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

2.10 **Option 5** – Option 5 includes improved recycling and composting levels far beyond existing AWP targets. These recycling and composting targets are considered as aspirational as they depend on the availability of substantial additional public funding as well as increased public participation. Option 5 has been modelled using Energy from Waste residual waste treatment technology and maximises diversion from landfill.

Components	2020
Source segregated Recycling and Composting	**48%**
Source segregated recycling	32 %
Source segregated composting	16 %
Residual Waste Treatment	**51 %**
Additional Recycling and Composting	9%
Additional Diversion from Landfill	36%
Landfill after treatment e.g. ash left over after incineration	6%
Landfill	**1 %**

2.11 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

2.12 **Option 6 –**Option 6 includes improved recycling and composting levels far beyond existing AWP targets. These recycling and composting targets are considered as aspirational as they depend on the availability of substantial additional public funding as well as increased public participation. Option 6 has been modelled using Energy from Waste residual waste treatment technology.

Components	**2020**
Source segregated Recycling and Composting	**48%**
Source segregated recycling	32 %
Source segregated composting	16 %
Residual Waste Treatment	**44%**
Additional Recycling and Composting	8%
Additional Diversion from Landfill	31%
Landfill after treatment e.g. ash left over after incineration	5%

Landfill	**8 %**

2.13 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

Assessment Method

2.6 An assessment of each of the options described above was undertaken. This assessment involved considering whether the options were working towards or away from a set of identified objectives. This is a typical approach to completing an Environmental Report and reflects guidance published by the Scottish Executive.

2.7 The environmental objectives used in this assessment were:

- To increase the rates of reuse, recycling and recovery in the area in accordance with the waste hierarchy;
- To reduce landfilling of MW waste in the area;
- To manage waste in a way that reduces emissions to air;
- To manage waste in a way that reduces emissions to land and soil;
- To manage waste in a way that reduces emissions to water;
- To manage waste in a way that protects and enhances biodiversity;
- To manage waste in a way that reduces greenhouse gas emissions;
- To reduce energy use and support the development of renewable energy supplies;
- To reduce the movement of waste;
- To manage waste in a way that protects communities and their local environment;
- To manage waste in a way that protects and enhances cultural heritage;
- To manage waste in a way that protects and enhances landscape.

2.8 Each option was considered in respect of these objectives and for each option a matrix completed which sets out:

- whether the option is working towards or away from each environmental objective;
- whether cumulative or other effects are likely; and
- whether effects will be short, medium or long term.
- a commentary which provides key information about the environmental effects identified and a justification for the scores given; and
- a summary of mitigation measures that should be undertaken to prevent or reduce adverse environmental effects that may occur.

All of this information is aimed at providing decision makers with information about the environmental effects in order that decisions can be made in an informed way.

2.9 To undertake the assessment, SEPA adopted a four stage approach:

1. *Scoping* – SEPA prepared a "Scoping Report" which set out the intended approach to the assessment and its scope and level of detail. Historic Scotland and Scottish Natural Heritage were consulted on the Scoping Report in line with the SEA Regulations.
2. *Preliminary Assessment* – A workshop was held with specialist SEPA staff to complete a preliminary assessment. This workshop involved experts in waste management, air, water, ecology, human health and contaminated land.
3. *Stakeholder Workshop* – After completing its preliminary assessment, SEPA then held a workshop with an external "expert group" involving representatives from the Lothian and Borders Waste Strategy Area Group and other invited stakeholders. This group were given the opportunity to comment on SEPA's preliminary assessment and make recommendation for changes or additions.
4. *External Validation* – External consultants (Envirocentre) were contracted to undertake an independent validation to report on the accuracy of the assessment and make recommendations accordingly.

3. ASSESSMENT FINDINGS – OVERVIEW

3.1 The table below summarises the identified effects across the four options. This table shows whether it is considered each option will move towards or away from the stated objective.

Environmental Objective	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Summary
1. Increase rates of Recycling and Recovery	↑?	↑	↑	↑	↑	↑	All options moving towards this objective.
2. Reduce landfilling of municipal waste	↑	↑	↑	↑	↑	↑	All options moving towards this objective.
3. Reduce emissions to air	↑↓?	↑↓?	↑↓?	↑↓?	↑↓?	↑↓?	All options have both positive and negative effects although the extent of these is uncertain. Emissions to air require mitigation.
4. Reduce emissions to land	↑↓?	↑↓	↑↓	↑↓	↑↓	↑↓	All options have both positive and negative effects. Emissions to land require mitigation.
5. Reduce emissions to water	↑?	↑	↑	↑	↑	↑	Option 1 has uncertain effects on water. Other options moving towards this objective.
6. Protect and enhance biodiversity	?	?	?	?	?	?	Uncertain as effects on biodiversity dependent upon where facilities are sited. Need to assess effects at land use planning stage.
7. Reduce GHG emissions	↑	↑	↑	↑	↑	↑	All options moving towards this objective.
8. Reduce energy use and support renewables	↑↓	↑	↑	↑	↑	↑	All options moving towards this objective, except option 1 which is more energy intensive.
9. Reduce movement of waste	?	?	?	?	?	?	Uncertain as movement of waste dependent upon where facilities are sited. Need to assess effects at land use planning stage.
10. Protect communities and the local environment	↓?	↓?	↓?	↓?	↓?	↓?	All options will have some negative effects on local environment and communities. These can be mitigated through good siting, design and effective regulation when sites are licenced.
11. Protect and enhance cultural heritage	?	?	?	?	?	?	Uncertain as effects on biodiversity dependent upon where facilities are sited. Need to assess effects at land use planning stage.
12. Protect and enhance landscape	?	?	?	?	?	?	Uncertain as effects on biodiversity dependent upon where facilities are sited. Need to assess effects at land use planning stage.

3.2 Overall, all six options could potentially have a combination of positive and negative significant environmental effects. When considered together, the options tend to present more potentially positive effects compared to the baseline, although it was difficult to identify the nature and extent of some effects due to the strategic nature of the LBAWP and due to the fact that it does not identify specific technologies or locations.

3.3 It is the case, however, that all waste management options have the potential to create adverse environmental effects that must be considered and where possible mitigated. The assessment

process found that these adverse environmental effects were likely to be most prevalent in relation to impacts on local communities and upon air quality. Land quality was also potentially likely to be affected depending on how waste derived compost and other outputs were used.

3.4 There are uncertainties for all six options as to their potential effects on biodiversity, cultural heritage and landscape. This is because the environmental effects will depend on the type of facilities and where they are located.

3.5 All six options should have a positive effect on reuse, recycling and recovery in the Lothian and Borders area. Options 4, 5 and 6 have the most ambitious rates of recycling and recovery. Option 3, 4 and 5 send only 1% direct to landfill through moving waste up the waste hierarchy and represents the best option in terms of reducing the amount of waste going to landfill.

3.6 Overall, while all 6 options may result in both positive and negative effects in respect of the environmental objectives, it is likely to be the case that all six options will deliver significantly better outcomes than the current situation where rates of landfill of waste remain very high. It is also important to note that negative effects can be addressed through effective mitigation. In particular, all options and waste management technologies that may emerge under them will require to be subject to rigorous regulatory processes including planning, Pollution Prevention and Control (PPC) regulations and Waste Management Licencing which are designed to protect the environment.

3.7 The findings of the Environmental Report in respect of the objectives are summarised below:

3.8 *Objective 1 - Increase reuse, recycling and recover* - All of the options are predicted to improve recycling and recovery rates and significantly reduce the amount of waste going to landfill.

3.9 *Objective 2 – Reduce landfill of municipal waste* - All of the options are predicted to reduce the amount of waste going to landfill and therefore all score positive in relation to this objective.

3.10 *Objective 3 – Reduce emissions to air* - All options have both positive and negative effects on air. On the positive side, in comparison to the current situation where 77% of waste is landfilled, there will likely be a reduction in emissions to air. There are limits for air emissions for waste technologies such as Energy from Waste which are all strictly regulated under Pollution Prevention and Control (PPC) Regulations. Greenhouse gas emissions are likely to reduce under all six options as landfilling rates will decline (Landfill is responsible for significant releases of methane, a powerful greenhouse gas). However, in all options there are air emissions which need to be properly managed and mitigated. There is a potential for cumulative effects on air quality with all six options if facilities are located in areas with existing air quality problems. These effects will require to be addressed through effective mitigation.

3.11 *Objective 4 – Reduce emissions to land and soil* - All six options are likely to have a positive effect on land because there is less waste going to landfill compared to the current waste management practice baseline. However, an uncertainty in option 1 is that there is the potential for outputs from waste management processes to be applied to land. Any composted or stabilised biowaste being applied to land needs to undergo a Risk Assessment. Waste being incorporated to land will also fall under the Waste Management Licensing Regulations in order to protect human health and the environment. Any energy from waste facility will also generate ash which will require to be treated as required and disposed to landfill.

3.12 *Objective 5 – Reduce emissions to water* – All six options are likely to have a positive effect on water because there is less waste going to landfill (landfill sites have the potential to cause harm to waterbodies and groundwater from leaching of contaminants). There will likely be considerably less going to landfill in option 3, 4 and 5 which makes these options best in terms of water. In option 1, there uncertainty about what happens to the outputs and if applied to land there is the potential for water pollution and a risk assessment will be required.

3.13 *Objective 6 – Protect and enhance biodiversity* - The AWP Review does not identify types of facilities or their locations. Accordingly, it is not possible to identify individual effects upon biodiversity from any of the options at this stage as this will be very dependent upon location. However, waste management facilities do have the potential to impact upon biodiversity – for

example, where facilities are sited on or close to protected habitats or where protected habitats and species may be disturbed by activities and noise. It is important that more detailed level assessment is undertaken as and when sites are considered in order that significant effects on biodiversity can be identified and appropriate mitigation measures put in place.

3.14 *Objective 7 – Reduce greenhouse gas emissions* - All the options considered recorded a likely marked improvement in release of greenhouse gases. All options are designed to reduce levels of waste going to landfill, which will in the long term significantly reduce emissions of methane, a powerful greenhouse gas.

3.15 *Objective 8 – Reduce energy use and support renewables* - Options considered had the potential to generate energy from combustion of waste. This energy can be classified as renewable energy under the *Renewables Obligation (Scotland) Order*[2] and can qualify for Renewables Obligation Certificates. Accordingly, this source of energy will contribute to meeting Scotland's target of generating 40% of its energy needs from renewable sources by 2020. Option 1 is more energy intensive in that the significant amounts of energy required to operate facilities offsets some of the benefits of generating energy through combustion.

3.16 *Objective 9 – Reduce the movement of waste* - The significance of the impact of transport from the movement of waste will depend on the location and number of facilities. The uncertainties surrounding the site location will need to be dealt with through land use planning. Planning will also seek to ensure that facilities are sited to make best use of existing transport networks and keep treatment facilities close to source of the waste, by applying the proximity principle.

3.17 *Objective 10 – Protect local communities and their local environment* - SEPA has used a 2004 study by the Department for Environment, Food and Rural Affairs (DEFRA) to guide its consideration of human health as it is not possible at this stage to consider potential effects on individual areas as specific facilities and sites are not identified in the LBAWP review. A summary of the generic effects of waste management facilities on human health is provided in Chapter 3 and in the box below.

Potential Health Effects of Waste Management Facilities

There is concern that waste management facilities can lead to health problems for those working in them or living nearby. In 2004 the Department for Environment, Food and Rural Affairs (DEFRA) published a comprehensive UK review of the environment and health effects of waste management. This report represents the most authoritative and comprehensive information currently available and SEPA has used this as the basis for its consideration of human health in this Environmental Report. The following summarises the findings for waste management technologies:

Landfill – Many studies have been carried out to investigate the health effects of landfill sites. One UK study identified a possible link between living close to a landfill site and occurrence of some birth defects although it was unable to say if the effects were causal or reflecting other factors. A more detailed study in Scotland on 61 sites did not find any significant risk. Other studies have found no evidence to suggest that living close to landfill sites increases the chance of cancer developing.

Composting - A few studies have shown that there may be an increased rate of certain health effects such as bronchitis, coughing and eye irritation as a result of particulates released from the process although there is no evidence of increased rates of asthma. A few studies have looked at emissions of volatile organic compounds (VOCs) and whether there is additional cancer risk due to emissions from composting sites. No additional risk of cancer in populations living close to composting facilities was found.

Materials Recycling Facilities - A few studies have been carried out in the workplace and these indicate that flu-like diseases, eye and skin problems, tiredness and sickness are higher in the workers than would be expected in other comparable groups. So far as we know, there are no studies of health effects in people living near MRFs. If there were any health effects, these would be expected to be similar in nature to those associated with composting facilities.

Energy From Waste – Dioxins – There has been concern about the release of dioxins from energy from waste plants. Exposure to dioxins has been linked to many human diseases including links to some cancers. Modern energy from waste facilities have reduced dioxin emissions by 99% over previous generation facilities and less than 1% of all UK dioxin emissions come from household waste incinerators (compared to 18% for domestic heating and cooking). This is due to the strict emission limits that are placed on all energy from waste facilities. The Government's independent expert advisory Committee on the Carcinogenicity of Chemicals in Food, Consumer Products and the Environment concluded that "*any potential risk of cancer due to residency near to the MSW incinerators was exceedingly low and probably not measurable by the most modern techniques*".

Energy from Waste - Particle matter and SO_2 - Other health concerns relate to respiratory disease associated with emissions of particle matter and SO_2 . The DEFRA review concluded that there is little evidence that emissions from energy from waste facilities make respiratory problems worse and that in most cases the facility contributes only a small proportion to the local level of pollutants. Such emissions can also be strictly controlled for example using filter systems.

[2] *For legislation, go to: www.opsi.gov.uk/legislation/scotland/ssi2007/20070267.htm#8*

All of the options assessed could have impacts upon local communities, but the extent and nature of effects will depend upon where facilities are located. Generic effects which have been identified include the potential for noise, odour, visual impacts and increased traffic generated by facilities. All of these effects can be effectively mitigated through good siting, good design and effective regulation and operation of facilities. The assessment identified the potential for cumulative effects on local communities if new facilities are located on or adjacent to existing waste management sites. This is especially important where local communities are already living with the effects of existing waste management facilities. These factors do, however, have to be balanced with the benefits (e.g. reduced transport) that may accrue from co-location of waste management facilities.

3.18 *Objective 11 – Protect and enhance cultural heritage* - The AWP Review does not identify types of facilities or their locations. Accordingly, it is not possible to identify individual environmental effects upon landscape from any of the options at this stage as this will be very dependent upon location. Therefore it is important that more detailed level assessment is undertaken as and when sites are considered in order that significant effects on cultural heritage can be identified and appropriate mitigation measures put in place.

3.19 *Objective 12 – Protect and enhance landscape* - The AWP Review does not identify types of facilities or their locations. Accordingly, it is not possible to identify individual environmental effects upon landscape from any of the options at this stage as this will be very dependent upon location. Therefore it is important that more detailed level assessment is undertaken as and when sites are considered in order that significant effects on landscape can be identified and appropriate mitigation measures put in place.

4. MITIGATION

4.1 The following mitigation measures are identified and which should be put into place as required following adoption of the revised LBAWP:

4.2 *Planning* - The land use planning system will need to ensure that facilities are sited and designed in a way that reduces impacts on local communities and the environment. Planning authorities are encouraged to provide a framework for delivery of waste management facilities by identifying suitable sites in Development Plans.

4.3 *Operation* – A range of regulatory controls exist to ensure that waste management facilities are designed and operated in a way that protects the environment and human health. As and when proposals for facilities come forward, these controls will be used to address potential effects identified in this assessment.

4.4 *Considering the Bids and Tendering for Proposals* – Further details about the environmental performance of some of the options should be sought as part of the decision making process on what bids should go forward. Tenders for facilities should also seek highest environmental performance from bidders.

4.5 *Waste Outputs* - Ensure market testing undertaken before facilities are developed to ensure that there is a viable and environmentally acceptable market for outputs. In addition, risk assessment criteria must be applied prior to the application of outputs from treatment processes with respect to their impact on the air, soil and water environment.

4.6 *Thermal Efficiency* – Ensure that any Energy from Waste facility has maximum thermal efficiency to maximise generation of heat and electricity in line with SEPA guidance[3].

4.7 *Engagement and Involvement* – Local communities potentially affected by waste management facilities should be given early and effective opportunities to involve themselves in decision making.

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[3] *SEPA has published Thermal Treatment Guidelines(www.sepa.org.uk/pdf/nws/guidance/thermal_treatment.pdf) and is also developing criteria for thermal treatment of waste which will be available later in the year.*

4.8 *Design* – Facilities should be designed to enhance the environment where possible.

4.9 *More Detailed Assessment in Other Plans and Programmes* – This assessment is a strategic assessment that is consistent with the scale and nature of the AWP Review. There will be a need for more detailed level assessment to take place as more detailed level plans and programmes are prepared. In particular, local authority Development Plans which identify locations or areas of search criteria for waste management facilities will need to consider the environmental implications of proposed locations.

5. CONSULTATION

5.1 SEPA welcomes your comments on this Environmental Report. Comments should be made in writing by **22 August 2007** to either:

FREEPOST
Lothian and Borders AWP Consultation
SEPA Edinburgh Office
Clearwater House
Heriot Watt Research Park
Riccarton
Edinburgh. EH14 4AP

Or by email to:

lothianandbordersAWP@sepa.org.uk

5.2 Throughout this Environmental Report a number of key questions have been posed to assist those wishing to respond. These are:

A. Do you think that SEPA has identified the relevant plans and programmes and environmental objectives which may influence the Lothian and Borders Area Waste Plan? (p5)

B. Do you think SEPA has identified the key environmental issues in, and baseline characteristics of, the Lothian and Borders Area Waste Plan area? (p19)

C. Do you have any comments on the evaluation of the environmental effects of the options and the findings derived from them? If not, please explain which parts of the evaluation you disagree with (p60)

D. Has the evaluation covered all of the environmental issues that you would like to see considered? If not, please tell us which environmental issues should also be included (p60)

E. Do you think SEPA has identified appropriate mitigation actions to prevent, reduce as fully as possible or offset and significant adverse environmental effects of the plan on the environment? (p63)

F. Are the proposed monitoring indicators suitable for monitoring the significant environmental effects that may arise from implementing the Area Waste Plan ? (p64)

G. Are there any other points in respect of this Environmental Report that you would wish to make? (p64)

LOTHIAN AND BORDERS AREA WASTE PLAN REVIEW

STRATEGIC ENVIRONMENTAL ASSESSMENT – ENVIRONMENTAL REPORT

CHAPTER 1

INTRODUCTION TO ENVIRONMENTAL REPORT

Introduction

1.1 In 2003, 11 Area Waste Plans covering the whole of Scotland were prepared by the Scottish Environment Protection Agency (SEPA), in partnership with local authorities and other stakeholders. These set out a strategic framework for delivery of waste management facilities across Scotland in order to improve Scotland's rates of waste recycling and recovery and to reduce the amount of waste being disposed of in landfill sites.

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1.4 SEPA considers that it is important to review the LBAWP now to take account of the potential impacts of these options. SEPA wants to ensure that consideration of the options is supported by evidence about their potential environmental effects. To do this, a review of the LBAWP in association with a strategic environmental assessment (SEA) was considered necessary. This Environmental Report is the outcome of this assessment.

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1.6 SEA of the AWP Review is a requirement under the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004. SEA is a systematic method for assessing the potential environmental effects of plans during their preparation in order to make sure the plan considers environmental matters and so that measures to address adverse effects can be identified and put into place early. This document reports on the findings of the SEA.

Purpose of this Report

1.7 The purpose of this Environmental Report is to:

- Introduce Strategic Environmental Assessment and its application to the LBAWP review;
- Set out the method adopted for assessing the significant environmental effects of implementing the LBAWP;
- Identify where mitigation measures are required to prevent, reduce or offset any adverse environmental effects;

[4] ***Residual Waste Treatment:*** *This is the treatment of waste that remains after reduction, reuse, recycling and composting.*

- Provide a framework for long term monitoring of any significant environmental effects arising from implementing the LBAWP;

- Provide an opportunity and framework for Consultation Authorities, other stakeholders and the public to comment on the assessment and its recommendations;

Strategic Environmental Assessment

1.8 SEA was introduced to Scotland under the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004 and was extended in scope under the Environmental Assessment (Scotland) Act 2005. SEA is a systematic method for assessing the environmental effects of plans and programmes during their preparation allowing for the mitigation of any adverse effects before the plan is implemented. SEA provides decision makers with environmental information that must be taken into account when preparing plans, programmes or strategies.

1.9 SEA takes place in an open and transparent way through reporting at key stages and through a wide consultation process. Accordingly, SEA extends the opportunities for public and stakeholder participation in decision making on plans and programmes being brought forward by the public sector.

The objectives of SEA

1.10 The objectives of SEA are to:

- Require that Responsible Authorities, (those responsible for preparing a plan), prepare an environmental report on likely significant environmental effects of their plan.

- Provide a systematic means of identifying, describing, evaluating and reporting on the environmental effects of strategies, plans and programmes.

- Ensure as far as possible the prevention, reduction and offsetting of negative environmental effects. The enhancement of positive effects can also be integral to the process.

- Ensure wide consultation and engagement with statutory Consultation Authorities; other stakeholders where relevant and the public at an early and effective stage of the plan preparation.

- Deliver a public statement demonstrating how the environmental report and opinions expressed during the SEA consultation process have been taken into account in a final adopted plan.

- Ensure that Responsible Authorities monitor for significant environmental effects of implementing their strategy, plan or programme, enabling them to identify unforeseen adverse effects at an early stage and to take appropriate remedial action where necessary.

1.11 The key stages of SEA and a summary of progress relative to the LBAWP review are briefly described in Table 1 below:

Table 1 - Summary of SEA steps

SEA Stage	Description	Progress in LBAWP
Screening	Determining whether the plan or programme is likely to have significant environmental effects and whether an SEA is required	Waste management plans automatically qualify for SEA and therefore this stage was not required for the LBAWP.
Scoping	Deciding on the scope and level of detail of the Environmental Report, and the consultation period for it - this is done in consultation with the Consultation Authorities (Historic Scotland, SNH and SEPA)	A scoping report was prepared and sent to the Consultation Authorities on 14 July 2006. As SEPA is acting as a Responsible Authority, it must not consult itself as a Consultation Authority and therefore the Scoping

		Report was sent only to Historic Scotland and SNH. A copy of the Scoping Report is available on request. A summary of the outcome of the Scoping process is provided in Chapter 4.
Environmental Report	Publishing and consulting upon a report which describes the significant environmental effects which may arise from implementing the plan, which identifies mitigation measures to address adverse effects and which compares alternatives that were considered during the plan's preparation	This report fulfils this stage. It sets out the significant environmental effects and evaluates the options considered. This report is out for consultation until 17 August 2007.
Adoption	Publishing an "SEA Statement" which explains how the Environmental Report and views expressed upon it have been taken into account for adopting the plan	This will be prepared following the consultation period. SEPA must take into account this report and any views expressed upon it during the consultation period.
Monitoring	Monitoring significant environmental effects after adopting the plan and taken remedial action where necessary	Chapter 6 of this report explains how we intend to monitor. Once the plan is adopted, these arrangements will be put into place.

1.12 This Environmental Report has been prepared to meet the requirements of Schedule 2 of the Environmental Assessment of Plans and programmes (Scotland) Regulations 2004. In addition, it has been prepared as far as possible using the Scottish Executive SEA toolkit[5].

1.13 Please note, as preparation of the waste management options, which instigated the AWP review, was commenced prior to 19th February 2006, the SEA is being undertaken under the 2004 Regulations and not under the Environmental Assessment (Scotland) Act 2005 which applies for all plans and programmes commenced after 20 February 2006.

[5] *Scottish Executive (2006) Strategic Environmental Assessment Toolkit*

CHAPTER 2

THE CONTENTS AND MAIN OBJECTIVES OF THE LBAWP AND ITS RELATIONSHIP WITH OTHER PLANS, PROGRAMMES AND STRATEGIES

2.1 This section of the Environmental Report is designed to meet the requirements of paragraphs 1 and 5 of Schedule 2 of the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004. Namely, an outline of the contents and main objectives of the Review and its relationship with other qualifying plans and programmes and a summary of those relevant environmental protection objectives set at international, community or member state level.

Background

2.2 The LBAWP was published in 2003 and sets out the framework for waste management facilities required in the area to 2013 in order to meet targets set by the National Waste Plan. Preparation of the LBAWP was led by SEPA, but was a joint plan involving local authorities and other stakeholders in the plan area. The key aim of the LBAWP (2003) is:

"*To contribute to the sustainable development of the Lothian and Borders area 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."*

Details of the 2003 LBAWP and it main objectives can be found on SEPA's website: www.sepa.org.uk/nws/areas/lothian_borders/awp/1.2.html

2.3 Since publication of the LBAWP in 2003, the Scottish Executive has invited proposals from the local authorities for funding for residual waste management facilities. Local Authorities in the Lothian and Borders have identified a number of potential options. Some of these options are not in line with the Municipal Waste Best Practicable Environmental Option (BPEO), identified in the 2003 LBAWP.

2.4 Decisions made on the funding bids will have a key influence on delivery of the LBAWP. SEPA considers it is not desirable to wait until a full AWP review as it is expected that funding decisions on the bids will have been taken by then and it will be too late to consider the environmental effects of them. SEPA considers it is important that an environmental assessment is completed to inform decision making on the options the Scottish Executive are assessing for funding. Accordingly, the LBAWP is being reviewed to consider the potential impacts of options being considered by the local authorities. As noted above, this review was determined to require SEA under the SEA Regulations. The review proposes amendments to section 3 of the LBAWP and is out for consultation until 17 August 2007 alongside this Environmental Report.

2.5 In time, the full LBAWP will be formally reviewed and subject to SEA. That work will incorporate this assessment and any revisions to Section 3 of the AWP which may result form this Review. Thus, this Environmental Report may be seen as stage 1 of a two stage approach to reviewing and assessing the LBAWP as a whole.

Outline of the Contents and Main Objectives of the LBAWP

2.6 Key facts about the LBAWP Review are set out in Table 2 below:

Table 2 – Key facts about the LBAWP Review

Responsible Authority	The Scottish Environment Protection Agency
Title of Plan	Lothian & Borders Area Waste Plan Review
Plan Subject	Waste management

Period	To 2020
What prompted the plan	Preparation of the LBAWP is a requirement of the National Waste Strategy 1999. The existing LBAWP was published in 2003. A limited scope review of the LBAWP is being progressed to take account of a range of waste management options that have been presented to the Scottish Executive for funding of waste management facilities in the area.
Frequency of Updates	This SEA relates to a review of the LBAWP brought about by potential impacts of options put forward by City of Edinburgh, East Lothian, Midlothian, Scottish Borders and West Lothian Councils for strategic waste management facilities in their area. Only Section 3 of the existing LBAWP is the subject of the review and therefore of the SEA. A full review of the whole AWP when conducted will be subject to SEA under the Environmental Assessment (Scotland) Act 2005.
Plan area	The LBAWP covers an area of 6471 km^2. A map of the area is shown in Appendix 2.
Summary of content /nature of plan	Section 3 of the LBAWP has been reviewed and revised text has been put forward for consultation. This section sets out local policies relating to waste prevention, reuse and refurbishment, recycling, composting, residual waste treatment and disposal. It also sets performance targets for delivering the best practicable environmental option (BPEO) for dealing with municipal solid waste in Lothian and Borders and identifies measures to support delivery of BPEO. The focus of the review is on the need to consider the options put forward by the local authorities and to subject them to assessment and consideration of whether they represent the Best Practical Environmental Option (BPEO). This is detailed in Chapter 4. The AWP sets the framework for waste management in line with the BPEO in the area. It is important to note that the LBAWP does not, however, identify specific waste management technologies nor does it identify sites – this is the job of development plans which provide the land use framework for delivery of the LBAWP. Accordingly, the review has not identified areas where facilities should be sited and as a result, the SEA only considers the generic effects. SEPA anticipates that these effects will be identified through SEA of local authority development plans.

Relationship with other Plans, Programmes & Objectives

2.7 Consideration of the relationship of the LBAWP with other plans and environmental objectives that it may influence or be influenced by is an important part of SEA. Understanding the relationship assists the identification of significant environmental effects and also allows understanding of which plans may be best placed to implement any mitigation measures required.

2.8 Appendix 2 sets out a list of plans and programmes considered to be relevant to the LBAWP. This sets out the relevant plans and provides brief commentary on their relevance to the LBAWP.

2.9 Appendix 2 also sets out those environmental objectives set at international, national or member state level which are considered to be relevant to the LBAWP.

CONSULTATION QUESTION A - Do you think SEPA has identified all relevant plans and programmes and environmental objectives which may influence the Lothian and Borders Area Waste Plan ?

CHAPTER 3

SUMMARY OF CURRENT ENVIRONMENT IN LOTHIAN AND BORDERS

3.1 This section of the Environmental Report is designed to meet the requirements of paragraphs 2, 3 and 4 of Schedule 2 of the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004. This requires SEPA to summarise the environmental characteristics of area likely and any existing environmental problems which are relevant to the Area Waste Plan.

Introduction

3.2 In order to be able to understand the significant environmental effects of the options and the resultant modification of the LBAWP, it is necessary to set out some basic information about the current environment. Due to the strategic geographic scale of the area covered by the LBAWP, it is not possible to describe every aspect of the environment. Rather this Environmental Report sets out in basic terms key environmental information relevant to municipal waste management in the area and its effect on the wider environment. Such an approach is consistent with Scottish Executive guidance which advises Responsible Authorities to keep assessment relevant to the nature of the plan and its geographic scale.

3.3 **Waste Data**

3.3.1 **Locations of waste facilities in AWP area**

Figure 1 below details all the main sites used for municipal waste management in the Lothian and Borders Waste Strategy Area. This includes landfills, transfer stations, composting sites, material reclamation facilities and civic amenity sites[6]. In addition to the infrastructure listed below, the Councils also provide an extensive network of Recycling Points (also known as Bring Sites) where the public can deposit a range of waste materials suitable for recycling, most commonly glass, cans and newspapers.

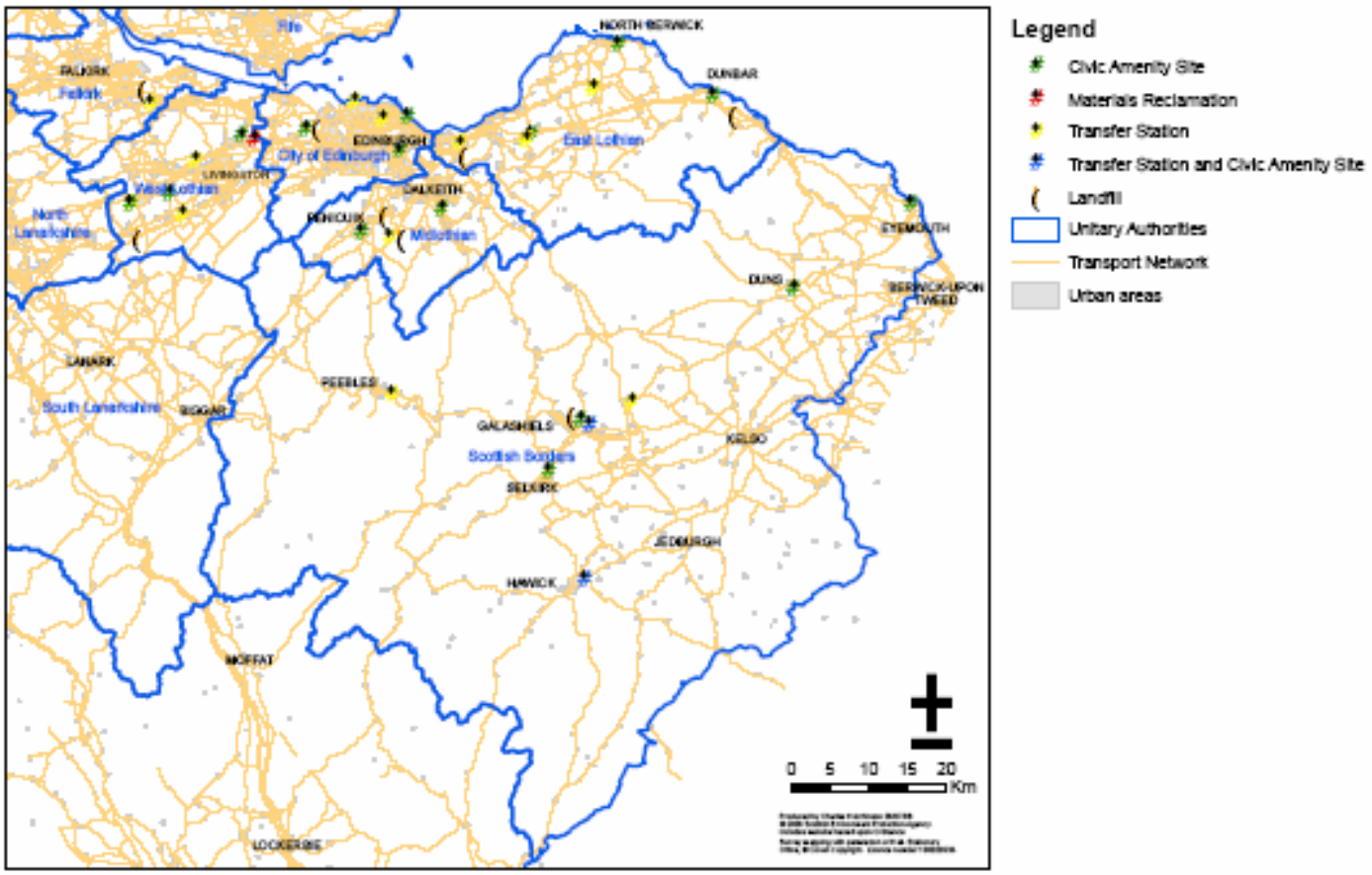
Scottish Borders is the only Council operating its own landfill site, all the others now being contracted with private sector landfill site operators. West Lothian Council exports the majority of its residual waste to Avondale landfill and a small proportion to Levenseat, both of which are outwith the Lothian and Borders Area Waste Plan area. There are likely to be only two privately owned and operated landfill sites within the Lothian and Borders area with sufficient void space to be of potential relevance to the LBAWP review. These are Drummond Moor, Midlothian and Dunbar, East Lothian.

Due to the large geographical area of the Scottish Borders, it also operates a number of Transfer Stations in order to bulk up locally collected waste for onward transport to landfill. Due to long haulage distances, City of Edinburgh, East Lothian, West Lothian Councils also operate one Transfer Station each. Midlothian is the only one of the five Councils to deliver all of its residual waste directly to a landfill site for disposal.

All the local authorities operate Community Recycling Sites (also known as Civic Amenity Sites) where the public can deliver items of waste and recyclables not collected by the normal refuse collection service. This provision is restricted to an extent by the availability of suitable land, particularly in urban locations.

[6] *A summary of the different types of waste facilities is provided Appendix 5*

Figure 1 – Waste Sites in LBAWP Area



3.3.2 Levels of municipal waste generated across Lothian and Borders

Table 3 below details the amount of municipal waste collected by each of the Local Authorities and within the Lothian and Borders area during the financial year 2003/04 but also shows the recycling and composting rates in 2003/04; 2004/05 and 2005/06. 77.75% of municipal waste was sent to landfill in 2005/6

Table 3 – Waste generated across LBAWP area (Tonnes)

Local Authority	MSW Arisings* 2003/04	Recycling & Composting Rate (%)		
		2003/04	2004/05	2005/06
City of Edinburgh	262,585	11.6	15.5	22
East Lothian	63,975	13.6	19.6	28
Midlothian	54,103	4.6	4.7	21.9
Scottish Borders	67,938	10.1	7.7	14.8
West Lothian	106,600	11.0	17.6	25
Totals	**555,201**	**10.8**	**14.58**	**22.25**

Source: Lothian & Borders Outline Business Case

The population and household numbers in each Council area largely dictate the quantity of household waste collected by local authorities. Table 4 demonstrates this relationship and provides an indication of the amount of waste produced per household. In 2003/04 Lothian & Borders contained approximately 18% of the total households in Scotland and the MSW arisings were approximately 17% of Scotland's total. This accords with the waste produced per household for Lothian & Borders

of 1.10 tonnes per annum being slightly less than the figure of 1.14 tonnes per annum calculated for all of Scotland.

Table 4 - Household Waste Produced Annually per Household 2004/05 (Tonnes)

Local Authority	Number of households	Total Waste Tonnage	Household Waste	H'hold Waste per Household
City of Edinburgh	223,203	267,129	216,804	0.97
East Lothian	41,117	65,638	53,737	1.31
Midlothian	33,563	54,955	51,456	1.53
Scottish Borders	55,085	80,022	59,096	1.07
West Lothian	70,368	118,944	83,694	1.19
TOTAL	423,336	586,688	464,787	1.21

Source: SEPA Waste Data Digest 6

3.3.3 Current management regime & Transport of waste in Lothian and Borders

Each local authority currently provides a collection service for residual mixed waste. The councils aim to provide householders with a fully containerised refuse collection service wherever possible, normally by the provision of wheeled bins. Exceptions are made for some tenement properties or flats and some rural dwellings where refuse collection continues to be by means of black sack. Collection systems for recyclable materials are described in the table below. The percentages shown in table 5 relate to the coverage of households to which each service is available in each local authority area. The figures are not constant over time since the services are still being rolled out in a phased manner over a period of several months or years, but the figures shown are reported by the Councils as representative of the position in 2006.

Table 5 - Recycling and Composting Collections from Kerbside

Local Authority	Dry Recyclables		Garden Waste	
City of Edinburgh	Box 1: Paper, glass, cans, textiles Box 2: Cardboard, card, drinks cartons	Fortnightly 55%	240 or 140 litre bins	Fortnightly 44%
East Lothian	Mix 1: Paper and card Mix 2: Glass, cans and plastic bottles	Fortnightly 85%	240 litre bins	Fortnightly 73%
Midlothian	Box 1: Glass and cans Box 2: Paper, card and plastic bottles	Weekly 95%	240 or 140 litre bins	Fortnightly 95%
Scottish Borders	Mix 1: Paper & Cardboard Mix 2: Cans and plastic bottles	Weekly 100%	190 litre bins	Weekly 70%
West Lothian	240 litre bins: Mix of cans, paper, card and plastic bottles	4 weekly 100%	240 litre bins	4 weekly 92%

Source: Lothian & Borders Draft Outline Business Case

3.3.4 Emissions recorded from Waste Management Facilities

The Scottish Pollutant Release Inventory is a register of site specific emissions to air and water for a range of specific pollutants. The emissions are reported annually as a total emission figure for each site, including waste management sites in Lothian & Borders. Information about the individual pollutants, the sites that returned data and background information is available on this site http://www.sepa.org.uk/spri/index.htm . The site currently provides access to data gathered under

the requirements of European Pollutant Emission Register (EPER) for the calendar year 2002 and under SPRI requirements for 2004.

The most significant emission recorded from waste management facilities in the LBAWP area is the release of methane, a powerful greenhouse gas, from existing landfill sites. For example, in 2004 the Drummond Moor landfill site near Penicuik emitted almost 6,000,000kg of methane (source: SPRI)

3.3.4 Problems associated with existing facilities

There have been no problems at any of the identified and operated Council facilities in the Lothian and Borders Waste Strategy Area that have resulted in prosecutions or enforcements over the past five years.

3.4 Environmental Baseline Overview

This section provides a brief overview of environmental conditions in the Lothian and Borders area. As the LBAWP does not identify types or locations of facilities, the environmental assessment will not go down to a detailed level. Accordingly, the Environmental Report provides only an overview of prevailing environmental conditions in the Lothian and Borders area as detailed information would not be appropriate in the absence of specific proposals for activities in specified locations.

From this overview – which is summarised below – it is assumed that across the area, environmental conditions are generally good.

3.5 Biodiversity, Flora and Fauna

3.5.1 Table 6 below shows the number of areas designated for their international, national or local conservation value, by local authority, in Lothian & Borders.

Table 6 – Natural Heritage Designations

Local Authority Area	SSSI	SAC	SPA	Ramsar
City of Edinburgh Council	6	0	2	0
East Lothian Council	15	0	0	1
Midlothian Council	15	1	2	2
Scottish Borders Council	90	8	5	3
West Lothian Council	16	2	0	0

Source: SNH website

3.5.2 Sites of Special Scientific Interest (SSSI) represent the best of Scotland's natural heritage. They are 'special' for their plants, animals or habitats, their rocks or landforms, or a combination of such natural features.

3.5.3 Special Areas of Conservation (SACs) are areas designated under the European Directive commonly known as the 'Habitats' Directive. Together with Special Protection Areas, which are designated under the Wild Birds Directive for wild birds and their habitats, SACs form the Natura 2000 network of sites.

3.5.4 Special Protection Areas (SPAs) are classified under the EC Directive on the Conservation of Wild Birds (79/409/EEC), commonly known as the Birds Directive. SPAs are intended to safeguard the habitats of the species for which they are selected and to protect the birds from significant disturbance.

3.5.5 Ramsar sites are designated under the Convention of Wetlands of International Importance.

3.5.6 In addition to these sites which are designated for their natural heritage importance, Local Biodiversity Action Plans (LBAPs) have been prepared across the AWP area. These set out priority species and habitats and set out actions for their protection and enhancement. It is not practical or

meaningful in a strategic plan like the AWP to identify all species and habitats covered, however these are set out in the links below. It will be expected that more local plans which implement the AWP will be able to use this information during SEA of these plans.

Edinburgh City - http://www.ukbap.org.uk/lbap.aspx?ID=381

West Lothian - http://www.ukbap.org.uk/lbap.aspx?ID=489

Mid Lothian - http://www.ukbap.org.uk/lbap.aspx?ID=422

East Lothian - http://www.ukbap.org.uk/lbap.aspx?ID=380

Scottish Borders - http://www.ukbap.org.uk/library/LBAPS/ScottishBorders.pdf

3.5.7 Further, local sites are also important considerations, a number of which are spread across the LBAWP area. There are 6 Country Parks, 1 Regional Park and 7 Local Nature Reserves.

3.6 Population and Human Health

3.6.1 The AWP does not identify facilities or sites. Accordingly, the Environmental Report is not able to assess potential health effects of waste management facilities in specific areas. In 2004, the Department for Environment, Food and Rural Affairs (DEFRA) published a comprehensive UK wide review of the environmental and health effects of waste management. This report represents the most authoritative information available about the nature and extent of effects upon environment and health from management of municipal solid waste. Accordingly, it has been used to inform this assessment. A summary of the key findings of this work, along with a summary of the key health issues associated with different types of waste management facility studied are set out below. The full DEFRA report can be found at:

http://www.defra.gov.uk/environment/waste/research/health/index.htm

DEFRA Study – Emissions and Environmental Effects from Waste Management Facilities

3.6.2 The most important environmental effect reported in research is the effect of emissions of greenhouse gases (most importantly, methane) from landfill of waste. Accordingly, methane generated at landfill sites is an important contributor to climate change. As a result, alternatives to landfilling of municipal waste are often viewed as having a positive effect in wider environmental terms. More locally, some waste management operations involve heating or burning municipal waste and these could have an effect on local air quality and potentially upon human health (see below). The DEFRA work investigated emissions to the environment from waste management facilities and the findings are summarised below:

3.6.3 *Emissions to air* - These can be disaggregated into those which are released because they are in the waste or produced during its decomposition and those resulting from burning waste or gases derived from waste. Some substances arise from both of these sources. Methane, a powerful greenhouse gas, is emitted from landfill sites as waste decomposes. Landfill has the greatest climate change impact of all waste management facilities as a result. Carbon dioxide is emitted when waste decomposes or is burnt. Oxides of nitrogen (NO_X) are produced when waste is burnt, which can have effects on local air quality. Particle matter can be emitted when handling waste, in transporting it and when waste is burnt. Fine particulate matter is a concern for local air quality and may have respiratory health effects. Filter systems can address particulate release. Dioxins and furans can be formed in very small quantities when organic chemicals are burnt. Municipal waste incineration used to be a significant source of these chemicals but has been reduced by 99% over the last decade with the introduction of much stricter controls.

3.6.4 *Emissions to water* – These mostly occur from a landfill site through the leaching of contaminants into rainwater or water already in the wastes. The resulting leachate is normally collected and treated on site or at a sewage treatment works before being released back into a waterbody. Some leachate can seep from the site into adjacent waterbodies and into groundwater. Control of leachate is an

important part of the operating licence for a site. Oxides of nitrogen are produced when waste is burnt, which can contribute to nutrient loading in waterbodies.

3.6.5 *Emissions to land* – With the exception of landfill, there are few direct emissions to land from waste management facilities. Landfill of waste causes significant local effects, including odour, litter and visual impacts.

3.6.6 *Other Effects* – In addition to emissions to air, water and land, waste management facilities have the potential to have other environmental effects, including noise, odour, dust, visual intrusion, impact on plants and animals and damage to buildings from acidic gas. The potential for different types of waste management facility to have effects on these is summarised in the figure below. These effects tend to be more local and linked to the siting, design and operation of individual facilities, which points to the need for effective planning and environmental consent decisions.

Figure 2 – Summary of environmental effects of waste management facilities

Summary of key environmental issues

Activity	Noise	Odour	Dust	Flora/ fauna	Soils	Water quality/ flow	Air quality	Climate	Building damage
Materials recycling facility	x	x	x	x	x	xx	xx	–	–
Composting	xx	xxx	xx	✓	x ✓	xx	xxx	x	–
Mechanical biological treatment	xx	xxx	xx	–	–	xx	xx	x	x
Anaerobic digestion	xx	xx	x	x ✓	x ✓	xx	xx	x	x
Gasification/ pyrolysis	xx	xx	xx	–	–	–	xx	x	x
Incineration with pre-sorting	xx	xx	xxx	xx	xx	xx	xxx	x	x
Incineration	xx	xx	xxx	xxx	xxx	xxx	xxx	x	x
Landfill	xxx	xxx	xx	xxx ✓	xxx	xxx	xxx	xxxx	x
Waste transfer stations	xx	xxx	x	–	–	xx	x	✓	–

Category	Meaning
✓	Direct or indirect benefit
–	No effect
x	Unlikely to be significant
xx	Potentially significant impact in some cases, but can be controlled
xxx	Impact can normally be controlled, but an issue at sites if design, engineering or operation falls below best practice
xxxx	An issue at all sites

3.6.7 Summary of Environmental Effects

- Landfill is the waste management option with the greatest greenhouse gas emissions
- Incineration produces the greatest emissions of NO_X.
- Composting produces the highest emissions of particulates per tonne of MSW, while incineration is also an important source.

- Transport of waste is unlikely to be important for many emissions – particulates, Oxides of Sulphur (SO_X) etc.
- SO_X emissions are similar for all processes which burn waste or gases derived from decomposed waste.
- Volatile Organic Compound (VOC)[7] emissions are likely to be greater from landfill, composting and MBT processes.
- Emissions of dioxins are higher from incineration than other options although this has dramatically reduced over the past 10 years.
- Landfill can be a significant source of emissions to waterbodies.

DEFRA Study – Summary of Research on Health Effects of Waste Management Facilities

3.6.8 *Landfill* – In the DEFRA Review, it states that many studies have been carried out to investigate the health effects of landfill sites. A UK study has identified a possible link between living close to a landfill site and the occurrence of some birth defects. However a specific study that was carried out in Scotland on population living within 2 km of 61 Scottish special landfill sites did not find any significant risk of birth defects in the population. The UK study was not able to say whether the associations are causal or whether they might be reflecting other factors. The observation is a small increase in the risk of a birth defect happening, although the increase is much smaller than other factors (diet, smoking, alcohol intake etc) which influence the likelihood of birth defects and the numerical results cannot at present be reliably used. Other studies have found no evidence that living close to landfill sites increases the chance of getting cancer to a level that can be measured.

3.6.9 *Composting* – A few studies have considered health effects of people living near to, or working in, a composting plant. These have shown that there may be an increased rate of certain health effects such as bronchitis, coughing and eye irritation as a result of particulates released from the process although there is no evidence of increased rates of asthma. A few studies have looked at emissions of volatile organic compounds and whether there is additional cancer risk due to emissions from composting sites. No additional risk of cancer in populations living close to composting facilities was found.

3.6.10 *Materials recycling facilities [MRFs]* - A few studies have been carried out in the workplace at materials recycling facilities. These indicate that flu-like diseases, eye and skin problems, tiredness and sickness are higher in the workers than would be expected in other comparable groups. So far as we know, there are no studies of health effects in people living near MRFs. If there were any health effects, these would be expected to be similar in nature to those associated with composting facilities, in view of the similarity between the health effects which have been observed in workers at MRFs and workers at composting facilities.

3.6.11 *Energy from Waste - Dioxins* - Incineration of waste has met with strong public objections in the past in particular in relation to emissions of dioxins/furans and heavy metals which were emitted by older generation incineration facilities. Exposure to dioxins has been linked to many human diseases, including developmental and reproductive effects, immune system problems and links to some cancers. Dioxins remain in the environment for a long time and can accumulate in fatty tissue. Emissions of dioxins from today's municipal waste incinerators have reduced by 99% from previous generation facilities. Today, less than 1% of UK dioxin emissions come from household waste incinerators (compared to 18% for domestic cooking and heating for example). This reduction is due to the strict emission limits that are imposed on all energy from waste facilities. The DEFRA review suggests that there is no consistent evidence of a link between exposure to emissions and an increased rate of cancer and the Government's independent expert advisory Committee on the Carcinogenicity of Chemicals in Food, Consumer Products and the Environment concluded that "*any*

[7] *The term VOC is used to describe a large group of organic compounds emitted into the atmosphere by a variety of industrial processes. VOCs come from a variety of chemical classes and they can have a variety of impacts on both man and the environment, including human health and ecosystem issues. However the impact of a VOC on the environment depends on the concentration and properties of the individual compounds. For further background, go to: www.sepa.org.uk/pdf/data/spri/voc_explanation.pdf*

potential risk of cancer due to residency near to the MSW incinerators was exceedingly low and probably not measurable by the most modern techniques".

3.6.12 *Energy from Waste - Particle matter and SO_2* - Other health concerns relate to respiratory disease associated with emissions of particle matter and SO_2. The DEFRA review concluded that there is little evidence that emissions from incinerators make respiratory problems worse and that in most cases the incinerator contributes only a small proportion to the local level of pollutants. Such emissions can be controlled using filter systems and total combustion of organic waste stream.

3.6.13 *Other Facilities* – DEFRA reports that studies looking at emissions from other types of facilities have not found evidence of health effects linked to the emissions.

3.7 Water

3.7.1 The data presented in tables 7, 8 and 9 (below), cover the water bodies in the Forth and Tweed sub basins (which are within the council areas of City of Edinburgh Council, East Lothian, Midlothian, Scottish Borders and West Lothian Council) where refuse disposal activities are assessed to be a primary risk to the water body not meeting good ecological status by 2015 as required under the Water Framework Directive. The assessed risk of failure can be high (1a), medium (1b) or low (2a). There are only 2 water bodies in each sub-basin where refuse disposal is a primary risk of failure for the water body. All of the waste disposal activities are assessed to be point source pollution pressures.

3.7.2 ***(a) West Lothian Council Area – Forth Sub Basin***

Table 7 details water bodies within the West Lothian Council Area which fall within the Forth Sub Basin for which refuse disposal activities are assessed to be a primary risk for the water body not meeting good ecological status by 2015.

Table 7 – Waterbodies at risk – West Lothian

Catchment Name	Site of Refuse Disposal Activity	Name of Water Body	Type of Water Body	Risk of Failure (1a, 1b or 2a)	Water Quality Status	Water Resource Status	Habitat Status	Priority Sub Status	Pressure Description (e.g. point source pollution)
River Almond	Muldron Quarry Tip	Kitchen Linn	River	1a	Fail	Pass	Pass	Pass	Point Source Pollution
River Almond	Seafield Tip Leachate	Lochshot Burn	River	1a	Fail	Pass	Fail	Pass	Point Source Pollution

Source: SEPA

3.7.3 ***(b) City of Edinburgh, East Lothian, Midlothian Council Areas – Forth Sub Basin***

Table 8 details water bodies in the City of Edinburgh & Midlothian Council areas, falling within the Forth Sub Basin for which refuse disposal activities are assessed to be a primary risk for the water body not meeting good ecological status by 2015.

It should also be noted that the Lothians is also at primary risk from the following:

- Other diffuse source pollution
- Abstraction (agriculture; mining and quarrying; recreational, cultural and sporting activities)
- Point source pollution (mining and quarrying, manufacturing)
- Diffuse source pollution (agriculture and forestry)

It should also be noted that Murray Burn is also at primary risk from the following:

- Diffuse source pollution (sewage disposal activities, urban development)
- Morphological alterations (urban development culverting)

Table 8 – Waterbodies at risk – Edinburgh, East and Midlothian

Catchment Name	Site of Refuse Disposal Activity	Name of Water Body	Type of Water Body	Risk of Failure (1a, 1b or 2a)	Water Quality Status	Water Resource Status	Habitat Status	Priority Sub Status	Pressure Description (e.g. point source pollution)
Missing Information	Oatslie Landfill Site, Roslin	Lothians	Ground water	1a	Fail	Fail	Pass	Fail	Point Source Pollution
Water of Leith	Hailes Tip Leachate	Murray Burn	River	1a	Fail	Pass	Fail	Pass	Point Source Pollution

Source: SEPA

3.7.4 ***(c) Scottish Borders – Tweed Sub Basin***

Table 9 details water bodies in the Scottish Borders Council area, falling within the Tweed Sub Basin for which refuse disposal activities are assessed to be a primary risk for the water body not meeting good ecological status by 2015.

It should also be noted that Blackadder Water is also at primary risk from the following:

- Morphological alterations (Farming of animals; agriculture and forestry
- Diffuse source pollution (growing of crops combined with farming of animals)

It should also be noted that Boonraw Burn is also at primary risk from the following:

- Diffuse pollution

Table 9 – Waterbodies at risk – Scottish Borders

Catchment Name	Site of Refuse Disposal Activity	Name of Water Body	Type of Water Body	Risk of Failure (1a, 1b or 2a)	Water Quality Status	Water Resource Status	Habitat Status	Priority Sub Status	Pressure Description (e.g. point source pollution)
Whiteadder Water	Duns, Waste water treatment works	Black - adder Water	River	1b	No entry	No entry	No entry	No entry	Point Source Pollution
River Tweed	No info on site in database	Boonraw Burn	River	2a	No entry	No entry	No entry	No entry	Point Source Pollution

Source: SEPA

3.8 Air and Climatic Factors

Air

3.8.1 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland currently sets air quality standards and objectives that have been introduced to protect the most sensitive members of society. Its main objective is to ensure that everyone is able to enjoy an acceptable level of air quality in public places. This level should pose no significant risk to human health or quality of life, and carry no unacceptable social or economic costs.

3.8.2 All the Lothian and Borders area currently meets these standards with the exception of 2 areas in Edinburgh – one in central Edinburgh and one in Corstorphine. Edinburgh meets all the standards except the annual average for nitrogen dioxide (NO_2) of 40 micrograms per metre cubed set for 2005.

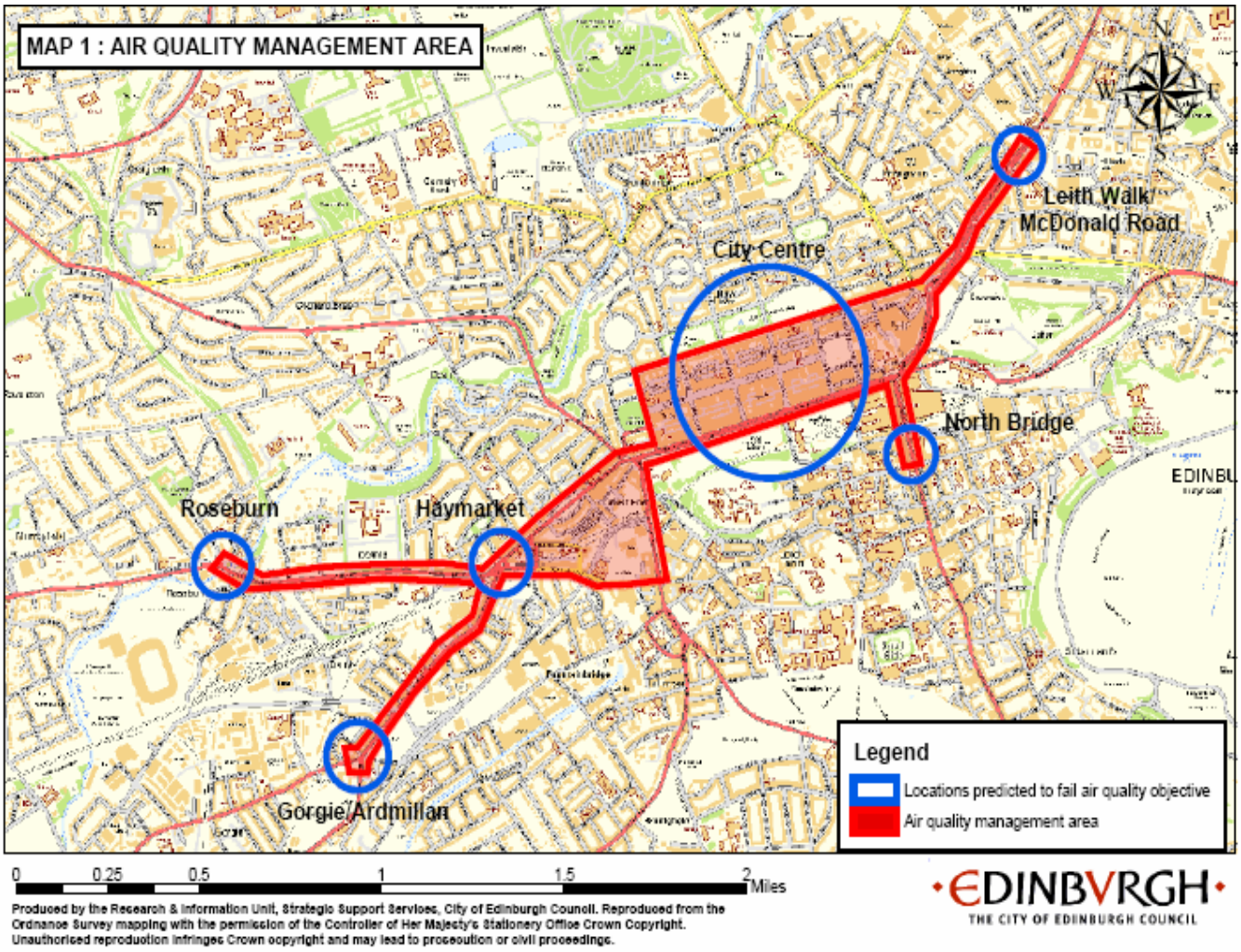
Studies in Edinburgh have shown that 88 percent of nitrogen oxides (NO_x) come from road transport, with the remaining 12 percent coming from domestic heating and Edinburgh International Airport.

3.8.3 Edinburgh's Air Quality Management Areas (AQMA) include all the places where the annual average concentrations of nitrogen dioxide are exceeding the annual mean air quality standard for nitrogen dioxide. Recent monitoring data has shown that the concentrations of nitrogen dioxide are increasing in some areas within the AQMA. Figure 3 below shows the location of the Air Quality Management Areas in Edinburgh.

3.8.4 There are no other Air Quality Management Areas in the Lothian & Borders Waste Strategy Area, however, sensitive areas have been identified at Leith Docks in the City of Edinburgh Council area; Musselburgh in the East Lothian Council area and Galashiels in the Scottish Borders area.

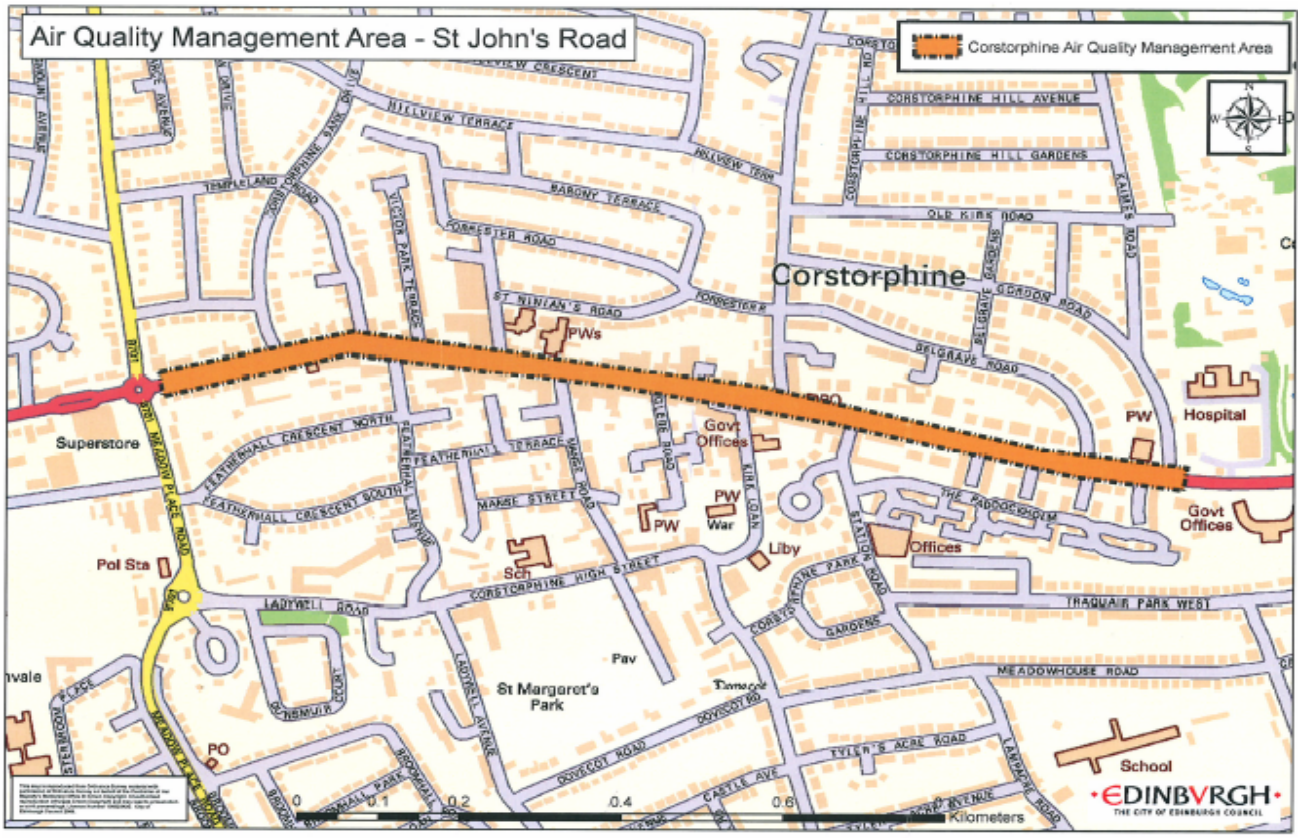
3.8.5 Existing waste management facilities are not considered to have significant environmental effects on air quality in the AWP area.

Figure 3 – Air Quality Management Area – Central Edinburgh



(Source for Figs 3 and 4: City of Edinburgh Council.

Figure 4 – Air Quality Management Area – St John's Road, Corstorphine



Climatic Factors

3.8.6 Existing landfills in Lothian and Borders emit methane, a powerful greenhouse gas. In Scotland as a whole, greenhouse gas emissions from waste management sources have declined by over 50% since 1990. Currently the waste management sector contributes around 1% of all greenhouse gas emissions in Scotland. After agriculture, waste management is the largest source of methane emissions in Scotland, contributing around 13% to Scotland's methane emissions in 2003. The source of methane is predominately waste disposal on land (landfill). By 2003 methane emissions from this source had fallen to around 40% of 1990 levels due to an increase in the use of methane recovery systems in landfill sites and an increase in recycling. Reducing emissions of methane will be a key part of implementing the targets set in Scotland's Climate Change Programme.

3.8.8 Certain types of waste treatment have the ability to capture energy. In certain cases, this can qualify as "renewable energy". The biomass fraction of energy from waste is recognised as a "renewable resource" by the EU Renewable Energy Directive. It is also considered by the Department for Trade and Industry as a renewable energy.

3.8.9 The Scottish Executive has set a target of generating 40 per cent of Scotland's electricity from renewable sources by 2020. Scotland is currently on track to meet an interim target of 18% by 2010. The Renewables Obligation (Scotland) Order[8] (ROS) is the key driver for promoting the development of renewable energy across Scotland. This places an obligation on energy suppliers to provide more of their electricity from renewable sources. Renewables Obligation Certificates (ROCs) place an obligation on all licensed electricity suppliers to produce evidence that they have sourced a specified proportion of their electricity supplies from renewable energy sources.

3.8.10 The effect of the Order is that electricity from combined heat and power (CHP) plants fuelled by waste are eligible to apply for ROCs if the waste is biomass or the electricity has been produced

[8] *For legislation, go to: www.opsi.gov.uk/legislation/scotland/ssi2007/20070267.htm#8*

using one of the "advanced conversion technologies". Advanced conversion technologies mean gasification, pyrolysis or anaerobic digestion, or any combination thereof[9].

3.8.11 Any plant powered wholly or partly by waste and accredited under the DEFRA's Combined Heat and Power Quality Assurance Standard (CHPQA) will be eligible.

3.9 Soil

3.9.1 The Scottish Vacant and Derelict Land Survey (SVDLS) covers vacant land in, or close to, urban areas and derelict land in both urban and rural areas. Derelict land is that which has been so damaged by development or use that it is incapable of being developed for beneficial use without rehabilitation. Vacant land is that which is unused or unsightly or which would benefit from development or improvement. The survey provides an indication of the contamination of vacant and derelict land. The term 'contamination' refers simply to suspected or known presence of potential contaminants and therefore differs from the statutory Part IIA definition. Table 10 shows vacant and derelict land within each local authority in the Lothian & Borders Waste Strategy Area and shows that the percentage of total vacant and derelict land by area is low.

Table 10 – Rates of derelict and vacant land in LBAWP area

Local Authority	Derelict Land			Urban Vacant Land			Total Derelict and Urban Vacant Land		
	Area (ha)	% of Derelict Land (by Area)*	No. of Sites	Area (ha)	% of Urban Vacant Land (by Area)*	No. of Sites	Area (ha)	% of Total V&D Land (by Area)*	No. of Sites
City of Edinburgh	83	1	21	96	3	43	179	2	64
East Lothian	75	1	36	9	-	15	84	1	51
Midlothian	284	4	89	33	1	19	317	3	108
Scottish Borders**	40	1	34	25	1	41	65	1	79
West Lothian	595	8	50	58	2	17	653	6	67

Source: ***http://www.scotland.gov.uk/Publications/2006/01/30155550/2*** *Table 1: Derelict and urban vacant land [1] by local authority area, 2005*

**As a percentage of the total vacant/derelict land recorded in Scotland*

***2002 data have been used for the Scottish Borders council area.*

3.9.2 The Scottish Executive has introduced a set of performance indicators to enable an assessment of the overall progress by local authorities and SEPA in carrying out their statutory responsibilities under Contaminated Land Part IIA. Amongst other things Local Authorities are asked to indicate number and total area of sites warranting inspection under Contaminated Land Part IIA, number and total area of sites having been investigated under Contaminated Land Part IIA and also numbers of sites which have undergone or are undergoing remediation both through the part Contaminated Land Part IIA route and also under planning and redevelopment or voluntary remediation. These performance indicators will give an idea of the extent of land contamination in each local authority area and could be used as an indicator.

3.9.3 Existing waste management facilities are not considered to have significant environmental effects on land quality in the AWP area, although local effects from landfill sites are possible.

3.9.4 Certain waste management processes may result in materials which can be used on land to improve or restore soil. For example this may be applied as a soil restorer for contaminated sites, or may be used to enhance poor soil quality. Any application of such outputs to land does have the

[9] *A summary of the different types of waste facilities is provided Appendix 5*

potential to have effects on the environment and as such is carefully regulated and a risk assessment undertaken.

3.9.1 Cultural Heritage

3.10.1 The area has a rich cultural heritage which is demonstrated by the number of buildings and sites which have been afforded protection. Table 11 below shows the number of listed buildings and Scheduled Ancient Monuments in the area. Listed buildings are those which have special architectural or historic interest worthy of protection and which receive special treatment under the planning system. Ancient monuments include sites of national importance which retain direct evidence of past human activity.

3.10.2 Edinburgh Old and New towns have also been designated since 1995 a World Heritage Site due to its very high quality urban form and architecture, its impressive landscape setting and its history and heritage. Further information available at http://www.ewht.org.uk/Edinburgh.aspx

Table 11 – Protected buildings and monuments in LBAWP area

Local Authority	Listed Buildings	Scheduled Ancient Monuments
City of Edinburgh	4889	64
West Lothian	431	50
Midlothian	714	79
East Lothian	1817	293
Scottish Borders	2998	723
Total in L & B AWP	10849	1209

Source: www.historicscotland.gov.uk (search for LBs and SAMs)

3.10.3 As the AWP does not identify facilities or locations it has not been possible in the assessment to identify specific effects on the cultural heritage. This can only be achieved in any detail when sites for facilities are chosen. Accordingly, this assessment provides generic consideration of cultural heritage issues. It is possible that waste management facilities as they come forward will have effects upon cultural heritage assets such as listed buildings and scheduled ancient monuments, however these effects will need be assessed as and when other plans which set out a locational framework for waste management facilities (e.g. development plans) are prepared and when Environmental Impact Assessment is undertaken.

3.11 Landscape

3.11.1 The area has a high landscape value with numerous local and national landscape designations, including 2 National Scenic Areas (NSAs) at Eildon and Leaderfoot (3600 hectares) and Upper Tweeddale (10500 hectares). National Scenic Areas are those areas of land considered of national significance on the basis of their outstanding scenic interest which must be conserved as part of the country's natural heritage.

3.11.2 In addition, the area also contains 5 green belts which are in place to:

- direct planned growth to the most appropriate locations and support regeneration;
- protect and enhance the character, landscape setting and identity of towns and cities; and
- protect and give access to open space within and around towns and cities, as part of the wider structure of green space. (SPP21)

3.11.3 Other local landscape designations include Gardens and Designed Landscapes. The locations and further details about these can be found at: **www.snh.org.uk/pdfs/publications/corporate/factsandfigures/0304/map07.pdf** .

3.11.4 As the AWP does not identify facilities or locations it has not been possible in the assessment to identify specific effects on landscape. This can only be achieved in any detail when sites for facilities are chosen. Accordingly, this assessment provides generic consideration of landscape issues and identifies effects where possible. It is possible that waste management facilities as they come forward will have effects upon landscape assets however these effects will need be assessed as and when other plans which set out a locational framework for waste management facilities (e.g. development plans) are prepared and when Environmental Impact Assessment is undertaken.

3.11.1 Environmental Problems

3.12.1 Table 12 sets out those environmental problems being faced in the area and which the AWP modification may have some influence over.

Table 12 – Summary of waste related environmental problems in the LBAWP area

Env Problem	Relevance to Plan
Increased amount of waste being generated	The current LBAWP review does not address waste prevention and reduction. This will feature in the wider review and this will contain measures to help address the increase in municipal waste arisings being generated.
Lack of sustainable waste management facilities	Scotland is in a period of significant change in the way it manages waste. Historically, Scotland has relied upon very high rates of landfilling of waste. This is not sustainable nor desirable and challenging targets have been set to significantly increase recycling, reuse and recovery of waste and to reduce the amount of waste going to landfill. This change relies upon the bringing forward of new facilities to manage waste in a more sustainable way and this process is currently ongoing. The AWP Review will assist decision making on what facilities a may be required, but it will be for other plans – for example development plans – to identify specific facilities and locations.
Transportation of Waste	Transport of waste from its source to its disposal point has important environmental effects, including: emissions from vehicles transporting waste; fuel use; local effects on communities where waste traffic uses residential areas and waste traffic can also contribute to local congestion. The LBAWP will not be able to resolve these issues as transport of waste depends upon where facilities are located and what mode of transport is used. As the AWP review will not identify facilities or locations, assessment of these impacts in detail has not been possible.
Greenhouse gas emissions from landfill	Landfill of waste results in significant emissions of greenhouse gases, particularly methane, that contribute to climate change.
Impacts of waste management facilities on local communities	Existing waste management facilities can cause disturbance to local communities through issues such as odour, traffic and noise. There have been no specific problems with any Council facilities in Lothian and Borders that have resulted in prosecutions or enforcements over the past five years, however, waste facilities do have the potential for local effects on communities. These can be addressed through effective planning, regulation and operation of sites.

CONSULTATION QUESTION B - Do you think SEPA has identified the key environmental issues in, and baseline characteristics of, the Lothian and Borders Area Waste Plan area ?

CHAPTER 4.

ASSESSMENT OF ENVIRONMENTAL EFFECTS OF THE AWP REVIEW, INCLUDING REASONABLE ALTERNATIVES

4.1 This section of the Environmental Report is designed to meet the requirements of paragraphs 6 and 8 of Schedule 2 of the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004. Namely, an assessment of the environmental effects of the LBAWP Review, including reasonable alternatives.

PART 1 - ASSESSMENT METHOD

4.2 Scope of Assessment

4.2.1 Scoping is a statutory stage of SEA and requires SEPA to consult with the Consultation Authorities (Scottish Natural Heritage and Historic Scotland) on the proposed scope and level of detail of the SEA and on its proposed approach to the assessment. On completion, this process confirms the scope and level of detail intended for inclusion in the Environmental Report and set out SEPA's intended method for undertaking the assessment.

4.2.2 A scoping report was submitted on 14 July 2006. The scoping stage confirmed which environmental receptors listed in Schedule 2 of the Regulations will be considered in the assessment. In the Scoping Report, SEPA proposed that cultural heritage and landscape should not be assessed as the LBAWP does not identify facilities or locations it is unlikely that assessment would will be able to identify significant effects on these receptors.

4.2.3 In its response to the Scoping Report consultation, Historic Scotland and SNH respectively stated that they would wish to see cultural heritage and landscape included in the scope of the assessment on the basis that generic effects may be able to be identified and that the AWP assessment would be able to identify where more detailed level assessment would need to be carried out by lower tier plans. Accordingly, these receptors have been incorporated into the assessment, although SEPA has only been able to undertake a generic assessment of potential effects on these receptors and it will be for plans that provide the locational framework for delivering the AWP that will need to undertake more detailed level assessment. A full summary of Consultation Authority comments is provided in 4.4 below.

4.3 SEA Objectives & Assessment Matrix

4.3.1 The use of SEA objectives is not a requirement of the Regulations, however their use is widely adopted as a tool for helping assessment of the significant environmental effects of a plan. In this assessment, the SEA objectives describe a set of desired outcomes and are designed to test whether the options evaluated are likely to move towards or away from that objective. These objectives have been derived from the requirement to cover a range of environmental issues which are set out in the SEA Regulations. The SEA objectives used in this assessment are summarised in table 13 below.

4.3.2 To assist the application of these objectives in the assessment, they were supported by a series of questions. The aims of these supporting questions are to secure consistency in approach to the assessment, to ensure that all potentially significant issues have been covered, and to assist with the consultation process. The questions are there to provide a framework and are summarised in table 13.

4.3.4 A matrix approach to the assessment was adopted. A full description of the how the matrix was used and copies of all completed matrices are set out in Part 2 of this Chapter.

Table 13 – Summary of SEA objectives

SEA Objective	Supporting Questions*	Sch2 Receptors Covered
To increase the rates of reuse, recycling and recovery in the area in accordance with the waste hierarchy	*a. Will the AWP option reduce the overall amount of Municipal Waste generated* *b. Will the AWP option likely improve recycling & composting rates in the area ?* *c. Will the AWP option improve waste recovery (incl energy recovery) in the area ?*	Material Assets
To reduce landfilling of MSW waste in the area	*a. Will the AWP option likely result in reduction in MSW sent to landfill?* *b. Will the AWP option ensure that biodegradeable Municipal Waste landfill allowances are met ?*	Material Assets, Soil,
To manage waste in a way that reduces emissions to air	*a. How much pollution will be released to air?* *b. Will the AWP option significantly affect air quality standards due to emissions from waste facilities?* *c. Will the AWP option significantly affect dust levels from waste management facilities ?* *d. Will the AWP option result in increased odour issues ?*	Air, Climatic Factors, Human Health
To manage waste in a way that reduces emissions to land and soil	*a. Will the AWP option significantly change the quality and quantity of soils as a result of waste management activities?* *b. Will the AWP option significantly increase/reduce rates of derelict, vacant or contaminated land ?*	Soil, Human Health
To manage waste in a way that reduces emissions to water	*a. How much pollution will be released to water?* *b. Will the AWP option significantly affect the ecological status of waterbodies in the area?* *c. Will the AWP option significantly increase/reduce flood risk in the area ?* *d. Will the AWP option affect the status of groundwater ?*	Water, Human Health
To manage waste in a way that protects and enhances biodiversity	*a. Will the AWP option have significant effects upon sites or species protected for their nature conservation value?* *b. Will the AWP option safeguard the ecological processes on which protected sites/species depend ?*	Biodiversity, Flora, Fauna
To manage waste in a way that reduces greenhouse gas emissions	*a. Will the AWP option significantly reduce GHG emissions from MSW management ?* *b. What is the net release of greenhouse gases such as carbon dioxide and methane under each option?*	All
To reduce energy use and support the development of renewable energy supplies	*a. Will the AWP option support or inhibit renewable energy development ?*	Climatic Factors
To reduce the movement of waste	*a. Will the AWP option significantly effect the volume of waste transported ?* *b. Will the AWP option significantly affect the distance waste is transported ?*	Air, Climatic Factors, Population, Human Health
To manage waste in a way that protects communities and their local environment	*a. Will the AWP option significantly affect traffic levels in local communities ?* *b. Will the AWP option significantly affect ambient noise levels ?* *c. Will the AWP option significantly affect levels of litter in local communities ?* *d. Will the AWP option increase risk of accident ?* *e. Will the AWP option have significant effects on human health ?*	Population, Human Health
To manage waste in a way that protects and enhances cultural heritage	*a. Will the AWP option significantly affect protected heritage assets such as Ancient Monuments, Listed Buildings and archaeological sites?* *b. Will the AWP option significantly affect historic gardens and designed landscapes?*	Cultural Heritage
To manage waste in a way that protects and enhances landscape	*a. Will the AWP option significantly affect overall landscape quality?* *b. Will the AWP option significantly affect protected landscapes?*	Landscape

4.4 What was Assessed?

4.4.1 The SEA has compared the environmental impact of the waste proposals (options 1 - 6) prepared by the Local Authorities against the baseline (current waste management practices in 2005/2006). All performance percentages are for the Waste Strategy Area as a whole, and not local authority

specific. Details of the different types of facilities are provided in the consultation pack accompanying this report and links to a summary are provided in Appendix 5.

Option summary

4.4.2 Options 1 and 2 look at two different technologies to meet the existing Area Waste Plan performance targets for recycling and composting. The potential Residual Waste Treatment technologies along with the levels of recycling, compost, residual treatment and landfill are assessed. Options 3, 4, 5 and 6 assess different levels of recycling, composting, residual treatment and landfill. They are modelled using the same residual waste treatment technology as Option 2.

4.4.3 The AWP is neither site or technology specific. The number of sites and the residual waste treatment technology depends on what comes forward from the private sector. The Area Waste Plan focuses on output specification and the technology that comes forward from the private sector will have to take the recycling, composting, residual waste treatment and landfill levels in the AWP into account.

Options 1 to 6

Component	Baseline 2005 / 2006	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Source segregated Recycling and Composting	**23%**	**26 %**	**26 %**	**33 %**	**43 %**	**48%**	**48%**
Source segregated recycling		21 %	21 %	21 %	29 %	32 %	32 %
Source segregated composting		5 %	5 %	12 %	14 %	16 %	16 %
Residual Waste Treatment		**57%**	**64%**	**66 %**	**56%**	**51%**	**44%**
Additional Recycling and Composting e.g. metal, ash		16 %	12%	12%	10%	9%	8%
Additional Diversion from Landfill e.g. through reduction by incineration		37 %	44%	46%	39%	36%	31%
Landfill after treatment e.g. ash		4 %	8%	8%	7%	6%	5%
Landfill	**77%**	**17 %**	**10%**	**1 %**	**1 %**	**1 %**	**8 %**

4.4.4 Option 1 reflects delivery of the existing Area Waste Plan indicative targets. Option 1 has been modelled to use residual treatment facilities that carry out Mechanical Biological Treatment (MBT), Anaerobic Digestion (AD) and Energy from Waste (EfW). Option 1 provides the following performance outcomes:

Components	2020
Source segregated Recycling and Composting	**26 %**
Source segregated recycling	21 %
Source segregated composting	5 %
Residual Waste Treatment	**57%**
Additional Recycling and Composting	16 %
Additional Diversion from Landfill	37 %
Landfill after treatment e.g. ash	4.4 %
Landfill	**17 %**

4.4.5 The additional recycling and composting includes metal recovery and the production of stabilised biowaste from the MBT facility and bottom ash recycling into a substitute aggregates material. The additional diversion from landfill covers the process loss e.g. evaporation of the moisture content

within the biowaste and the production of Refuse Derived Fuel which then goes on to an energy recovery facility.

4.4.6 **Option 2** - Option 2 has been modelled to use Energy from Waste residual waste treatment facilities, whilst maintaining the recycling and composting levels in the existing Area Waste Plan.

Components	**2020**
Source segregated Recycling and Composting	**26 %**
Source segregated recycling	21 %
Source segregated composting	5 %
Residual Waste Treatment	**64%**
Additional Recycling and Composting	11%
Additional Diversion from Landfill	44%
Landfill after treatment e.g. ash	9%
Landfill	**10%**

4.4.7 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

4.4.8 **Option 3 -** Option 3 has been modelled to use Energy from Waste residual waste treatment facilities, whilst maintaining recycling and composting levels comparable to the progress that is currently being made and to the existing Area Waste Plan. Option 3 maximises diversion from landfill.

Components	**2020**
Source segregated Recycling and Composting	**33 %**
Source segregated recycling	21 %
Source segregated composting	12 %
Residual Waste Treatment	**66 %**
Additional Recycling and Composting	12%
Additional Diversion from Landfill	46%
Landfill after treatment e.g. ash	8%
Landfill	**1 %**

4.4.9 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

4.4.10 **Option 4** - Option 4 includes source segregated recycling and composting levels well beyond existing AWP targets. These recycling and composting levels are considered as aspirational as they depend on the availability of additional public funding as well as increased public participation. Option 4 has been modelled using Energy from Waste residual waste treatment technology and maximises diversion from landfill.

Components	**2020**
Source segregated Recycling and Composting	**43 %**
Source segregated recycling	29 %
Source segregated composting	14 %
Residual Waste Treatment	**56%**
Additional Recycling and Composting	10%
Additional Diversion from Landfill	39%
Landfill after treatment e.g. ash	7%
Landfill	**1 %**

4.4.11 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

4.4.12 **Option 5** –Option 5 includes improved recycling and composting levels far beyond existing AWP targets. These recycling and composting targets are considered as aspirational as they depend on the availability of substantial additional public funding as well as increased public participation. Option 5 has been modelled using Energy from Waste residual waste treatment technology and maximises diversion from landfill.

Components	2020
Source segregated Recycling and Composting	**48%**
Source segregated recycling	32 %
Source segregated composting	16 %
Residual Waste Treatment	**51**
Additional Recycling and Composting	9%
Additional Diversion from Landfill	36%
Landfill after treatment e.g. ash	6%
Landfill	**1 %**

4.4.13 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

4.4.14 **Option 6 –**Option 6 includes improved recycling and composting levels far beyond existing AWP targets. These recycling and composting targets are considered as aspirational as they depend on the availability of substantial additional public funding as well as increased public participation. Option 6 has been modelled using Energy from Waste residual waste treatment technology.

Components	**2020**
Source segregated Recycling and Composting	**48%**
Source segregated recycling	32 %
Source segregated composting	16 %
Residual Waste Treatment	**44%**
Additional Recycling and Composting	8%
Additional Diversion from Landfill	31%
Landfill after treatment e.g. ash	5%
Landfill	**8 %**

4.4.15 The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

4.5 Outcome of Scoping

4.5.1 A Scoping Report was prepared and submitted to the Consultation Authorities on 14 July 2006. A copy of the Scoping Report is available on request. SEPA received comments from the Consultation Authorities and table 14 below sets out how these have been taken into account.

Table 14 – Summary of scoping

Consultation Authority Comment	***How it has been taken into account in the ER***
Scottish Natural Heritage	
Suggested that the Scottish Borders Woodland Strategy be included in the list of other relevant plans and programmes.	This has been included in Appendix 2.

A number of minor inaccuracies in the environmental baseline.	These are noted and have been addressed in the Environmental Report.
Expect other sites of natural heritage importance to be included – e.g. country and regional parks, designed landscapes and regionally important geological sites.	The environmental baseline has been widened to include reference to these, although it has not been possible in the assessment to assess individual effects on them as the AWP does not identify locations for facilities.
They wish to see more work on the potential effects on soils and not just focused on vacant and derelict land.	The assessment covers wider issues such as the application of waste outputs to land and the effect this may have on soils quality. This is explained in the matrices.
Landscape should be scoped into the assessment and a suitable assessment objective added.	Landscape has been included in the assessment and an objective added. It was difficult to record specific effects upon landscape due to the fact that the AWP review is not site specific and in most cases, more detailed level assessment will be required when sites and facilities are identified.
No comment made regarding proposed 7 week consultation period.	SEPA assumes SNH is content with the 7 week period and SEPA has confirmed with the Scottish Ministers that a 7 week consultation period will be provided.
Historic Scotland	
Cultural heritage should be scoped into the assessment and a suitable objective added.	Cultural heritage has been included in the assessment and an objective added. It was difficult to record specific effects upon cultural heritage assets due to the fact that the AWP review is not site specific and in most cases, more detailed level assessment will be required when sites and facilities are identified.
Content with 7 week consultation period.	SEPA has confirmed with the Scottish Ministers that a 7 week consultation period will be provided.
Additional plans and programmes relevant to cultural heritage were suggested for inclusion in the Environmental Report.	These have been included in Appendix 1.
Baseline information should include reference to gardens and designed landscapes.	This information has been included Chapter 3.
The Environmental Report should recognise that there are cultural heritage sites of local importance which should be considered when locations are identified for waste management facilities.	The Environmental Report makes reference in the assessment findings (Chapter 4) to the need for more detailed level assessments to include cultural heritage effects.
Does the assessment of sites in the bid include criteria or guidelines to ensure that adverse effects on the historic environment are avoided in the selection of sites?	The bid process does not allocate sites. This will be achieved through the land use planning process. The bid does identify a wide range of potential sites, but at this stage, no assessment has been made as decisions will be made through the land use planning process.
Need to ensure that where more detailed level assessment is required that this is clearly set out as a requirement in the Environmental Report.	This is provided in the matrices, identified as mitigation actions and summarised in Chapter 5.

4.6 Description of Assessment Matrix

4.6.1 Schedule 2 of the Regulations requires that the likely significant environmental effects of implementing proposals in the AWP review are identified and assessed. This extends to include

short, medium and long term effects, permanent and temporary effects, positive and negative effects and secondary, cumulative and synergistic effects.

4.6.2 To undertake this assessment, a matrix was used which assesses each of the options put forward by the local authorities against the environmental objectives. The completed matrices are set out in Part 2 of this chapter. The matrix is comprised of the following elements:

A. SEA objectives – the objectives were used to assess all options considered.

B. Assessment – this box considers the contribution each option may make towards achieving each environmental objective. The assessment was simple and high level and sets out whether each option may contribute to achieving the objective. The symbols used in the matrices are described below:

↑	is making a positive contribution to the objective	↓	is moving away from the desired objective
O	has no significant relationship with the objective	?	may have an effect on the objective, but its nature and extent are unknown

C. Short, Medium and Long Term Effects – This box records whether the effects are likely to be short, medium or long term. The following definitions and abbreviations were used: **Short Term (S)** – up to 3 years from adoption of proposals resulting from the AWP review; **Medium Term (M)** – 4 to 7 years from adoption of proposals resulting from the AWP review; and **Long Term (L)** – 8 or more years from adoption of proposals resulting from the AWP review. Due to the long lead in time for the planning, licencing and construction of new waste management facilities, no short term effects were identified.

D. Cumulative and Other Effects – If cumulative effects or other types of effects may be likely, then this is identified with a tick in box D and a description of the potential effects in the comments box (F).

E. Comments and Supporting Information – This box is used to:

- record supporting information as required;
- justify the score given for box B;
- identify the nature of any cumulative or other effects in box D; and
- set out mitigation measures to address effects identified in the assessment.

Summary – This column summarises the overall effects of each option.

4.6.3 One matrix has been completed for each option.

4.7 Method for Undertaking Assessment

4.7.1 The assessment and the preparation of the Environmental Report were conducted in three stages following the Scoping Report consultation. These stages are described below:

4.7.2 **Stage 1 – Preliminary SEPA Assessment** – When engaged in its role as a Responsible Authority, SEPA does not act in its duties as a Consultation Authority – i.e. SEPA is not required to "consult itself" on either the Scoping Report or the Environmental Report. There is a need, however, to ensure that the experts in SEPA areas of competence are brought into the process of assessment. An initial assessment of the AWP Review and its alternatives was undertaken internally by SEPA. This was achieved through a day workshop held on 16th August 2006, which included environmental experts from across the Agency, including water, ecology, air, waste, human health, soil and also included regulatory staff involved in the licencing of waste management facilities.

The workshop tested each option through the application of the assessment matrix and resulted in a preliminary assessment of the potential significant environmental effects of implementing the plan. This preliminary assessment was then presented to an external "expert group" comprising representatives from the Waste Strategy Area Group and an invited group of external stakeholders (see Stage 2 below).

4.7.3 **Stage 2 – External Input** – A workshop was held on 13 September 2006 with an external "expert group" comprising of an invited group of external stakeholders to consider SEPA's preliminary assessment. Workshop attendees were given the opportunity to comment on any part of the preliminary assessment and invited to make recommendations for changes or additions. The findings of this workshop were then considered by SEPA as Responsible Authority and, where appropriate, the preliminary assessment was changed.

4.7.4 **Stage 3 – External Validation** - To ensure robustness of the assessment and to secure an "independent" review of the findings, SEPA contracted external consultants (Envirocentre) to undertake an independent validation process of the assessment and the findings derived from it. Envirocentre were provided with the "final draft" assessment matrices following stages 1 and 2 above. Envirocentre then provided SEPA with a report of its findings which is available on SEPA's website as part of the consultation documents. These findings were then considered by SEPA and, where appropriate, the assessment was changed.

4.7.5 **Best Practical Environmental Option (BPEO) Assessment -** This SEA has been carried out in parallel with a process called BPEO assessment. BPEO is a decision making process developed for SEPA specifically for use when developing or reviewing the Area Waste Plans.

It brings together the complex array of social, economic and environmental factors that have to be considered when selecting the future waste management options. The process follows waste through its life cycle, from generation, collection, reprocessing to final disposal, and is designed to allow both local and national priorities to be reflected in the process.

The environmental assessment element of BPEO is very similar to SEA, using almost identical criteria and assessment methods, and including stakeholder consultation. Consequently the environmental assessments carried out for SEA were combined with the environmental components of the BPEO assessment. The BPEO assessment is not a formal part of this environmental report, but can be viewed as part of the consultation documents.

4.8 Assumptions and General Principles of the Assessment

4.8.1 A number of general principles and assumptions were adopted in undertaking this assessment. A summary of these is provided below:

1. Environmental Baseline – All of the options considered have been scored in comparison with the current baseline conditions. A summary of the baseline environmental conditions is described in Chapter 3

2. Life Cycle Assessment (LCA) - This was used to assess the some of the potential environmental impacts of the options considered. LCA provides a way of assessing the environmental burdens associated with the whole life cycle of a product or service, from its cradle to its grave. In the context of waste management this includes not only the treatment and final disposal of the waste but all of the associated infrastructure as well. This helps the identification of significant potential environmental impacts and allows for remedial measures to be identified and built in from the outset. Accordingly, LCA data where appropriate have been used to help compile the assessment matrices. Life cycle models can only be considered indicative at this stage as no locations for the required infrastructure have been identified, and within any waste management technology there are a vast range of variations, each with there own advantages and problems. So LCA has been used in this assessment primarily to give a quantitative indication of the relative differences between the waste management options being assessed. These are described in the matrices and summarised in Part 3 of this Chapter. A full summary of the LCA findings are provided in Appendix A of the BPEO assessment forming part of the Consultation Pack.

3. Weighting – No weighting has been applied to the scores set out in box B. Rather, a simple indication of whether each option moves towards or away from an environmental objective is given.

4. Assumptions – It has been assumed that waste management facilities that may emerge from the options considered will:

(a) be designed and constructed to modern, efficient standards;
(b) that site specific environmental effects will be able to be managed through effective siting and design through statutory land use planning;
(c) that site specific environmental effects arising from the operation of a facility will be able to be managed through effective Pollution Prevention & Control (PPC) regulation;
(d) that any facility will be operated efficiently and in accordance with any planning or licence conditions applied.

PART 2 - ASSESSMENT FINDINGS – COMPLETED ASSESSMENT MATRICES

Option 1

This option reflects delivery of the existing Area Waste Plan indicative targets. Option 1 has been modelled to use residual treatment facilities that carry out Mechanical Biological Treatment (MBT), Anaerobic Digestion (AD) and Energy from Waste (EfW). These provide the following performance outcomes:

Components	2020
Source segregated Recycling and Composting	**26 %**
Source segregated recycling	21 %
Source segregated composting	5 %
Residual Waste Treatment	**57 %**
Additional Recycling and Composting	16 %
Additional Diversion from Landfill	37 %
Landfill after treatment e.g. ash	4%
Landfill	**17 %**

The additional recycling and composting includes metal recovery, bottom ash and stabilised biowaste. The additional diversion from landfill covers the process loss e.g. evaporation and the production of Refuse Derived Fuel (RDF) which then goes on to an energy recovery facility.

1. A. SEA OBJECTIVE 1 – To increase the rates of reuse, recycling and recovery in the area in accordance with the waste hierarchy

B. Is this part of AWP moving towards/away from objective	↑?	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting Information

- Compared to the baseline of current waste management practices in 2005 / 2006, option 1 would increase source recycling/composting compared to the current performance. Option 1 further increases the amount of waste diverted from landfill through additional recycling and composting.
- AD outputs include organic material and a liquor. Organic material is nutrient rich and can potentially be used as a soil conditioner, though the quality of this product and the certainty of end use depends heavily on the waste input and extent of refining. The liquor can potentially be used as a liquid fertiliser, though as with fibre, the quality of this product and the certainty of end use depends heavily on the waste input and extent of refining.
- Organic output from an MBT can be used as a compost, though the quality of this product and the certainty of end use depends heavily on the waste input. MBT also produces RDF.
- Bottom ash is considered inert once stabilised and recycling as aggregate is technically feasible but is not guaranteed.

Reasons for Score in Boxes B - D:

Option 1 scored **positively** against objective 1 because it increases recycling, composting and recovery rates when compared to the baseline (current waste management practices being carried out in 2005/06). However, it is a modest increase in source segregated recycling and composting rate. This is, offset positively, by the increased diversion of waste from landfill following residual treatment.

Option 1 scored a **question mark** against objective 1 because whilst option 1 is diverting additional waste from landfill following residual waste treatment, there are uncertainties about the quality of the output from MBT and AD. It is questionable as to whether or not there would be markets for the biowaste & RDF created. Therefore it should be noted that the landfill diversion rates may not be achievable as there may not be markets available for these outputs products.

2. A. SEA OBJECTIVE 2 – To reduce landfilling of MSW waste in the area

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting Information :

In 2005/06, 77.75% of total municipal waste arising was sent to landfill. Option 1 proposes to reduce waste to landfill to 21%

Reasons for score in Boxes B - E:

Option 1 scored **positively** against objective 2 because waste disposed to landfill can potentially reduce from 77.75% of all municipal waste to 21%

3. A. SEA OBJECTIVE 3 – To manage waste in a way that reduces emissions to air

B. Is this part of AWP moving towards/away from objective	↑↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information :

- Based on Life Cycle Analysis (LCA) evidence, modelled around option 1 for air emissions, there is a comparable net reduction of sulphur dioxide equivalent to the baseline.

Reasons for Score in Boxes B - D:

Option 1 scored **positively** against objective 3 because:

- In comparison to the current baseline where the majority of waste is landfilled, there will be a reduction in emissions to air.

▪ The level of impact of bio-aerosols will depend on where a facility is located; and future developments in proximity of the plant. ▪ It was noted that Air Quality Management Areas in Scotland are largely based on traffic movements and therefore, there is potential for local effects. ▪ Likely to be dust/odour issues associated with storage and handling of waste. ▪ Strict controls/specific limits for the use RDF are applied under the Waste Incineration Directive (WID). ▪ AD, MBT and EfW all fall under the PPC Regulations and therefore air emissions from these facilities are regulated. ▪ Concern about air emissions from EfW facilities, particularly dioxin release and effects on human health (see objective 10).	▪ There are limits for air emissions for EfW, MBT and AD which are set under PPC Regulations and a PPC permit application will also take local air quality into account. Also, there are recognised benchmarks for waste incineration so SEPA are confident that air emissions can be quantified and are reduced when compared to landfill for EfW. ▪ Processes are assumed to be "in vessel" (closed) and therefore releases of emissions and odour to local air environment are limited. Option 1 scored **negatively** against objective 3 because: ▪ There are air emissions (odour, dust, bioaerosols etc) which need to be effectively managed. Option 1 scored a **question mark** against objective 3 because emissions will vary depending on facility and location. Option 1 scored as having potential for **other effects (cumulative)** if facilities are sited in areas with existing air quality problems.

4. A. SEA OBJECTIVE 4 - To manage waste in a way that reduces emissions to land and soil

B. Is this part of AWP moving towards/away from objective	C. Short, medium or long term effects ?	D. Any other types of effects ?
↑↓?	M	✓

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
▪ Quality of the composted material from source segregated green compost and output from MBT and its application for land improvement is questionable due to the potential for metals content. However, this is dependent on the quality of input material to the composting process. Additionally, the application of these outputs to land is risk assessed on a case by case basis. Currently mixed waste composting is used for landfill restoration/daily cover. ▪ The majority of waste in the baseline is landfilled which creates a long term pollution legacy. The long term effects cannot be judged for a municipal waste landfill site as no site has been stabilised and no licence has been surrendered under Waste Management Licensing regime. There is a risk of accidental pollution due to failure of a landfill liner particularly over a long period. So, Option 1 offers more control compared to the baseline. ▪ Fly ash from EfW can be hazardous. Bottom ash is inert once stabilised. Fly Ash must be treated to prevent leaching of hazardous materials. ▪ Physical space required for the facilities will be smaller than for landfill.	Option 1 scored **positively** against objective 4 because: ▪ There is less waste to landfill than in 2005/06 ▪ Smaller footprint compared to new landfill facilities Option 1 scored **negatively** against objective 4 because: ▪ There is a potential to generate hazardous fly ash although extent is unknown. ▪ There is a potential hazard if the outputs are applied to land and have a high metals content. Option 1 scored as a **question mark** against objective 4 because there is a dependency on the capacity of the market to absorb MBT and AD outputs of compost and biowaste. Option 1 scored as having potential for **other effects (cumulative)** if the application of these outputs to land is in areas where there are already pressures on that land.

5. A. SEA OBJECTIVE 5 – To manage waste in a way that reduces emissions to water

B. Is this part of AWP moving towards/away from objective	C. Short, medium or long term effects ?	D. Any other types of effects ?
↑?	M/L	✓

E. Comments and Supporting Information :

Supporting information:	Reasons for Score in Boxes B - D:
▪ Based on LCA evidence, for emissions to water; option 1 performs better than the baseline for eutrophication and freshwater aquatic ecotoxicity. ▪ Assumed for SEA purposes that process takes place "in vessel" (inside a building) therefore emissions to water environment controlled. ▪ Effluent assumed to go into sewerage system and treated as required. ▪ Reduced waste going into landfill from this option and therefore reduced potential for leachate pollution of local water courses from this source.	Option 1 scored **positively** against objective 5 because: ▪ There is less biodegradable waste to landfill in than in 2005/06 which means less potential for leachate pollution of water courses. ▪ It performs better than the baseline for eutrophication and freshwater aquatic ecotoxicity. Option 1 scored a **question mark** due to uncertainty about what happens to outputs e.g. potential emissions to water when outputs are applied to land/landfill. Option 1 scored as having potential for **cumulative effects** if there is potential for cumulative effects of application of these outputs to land if there are other pressures on water bodies adjacent to the land.

6. A. SEA OBJECTIVE 6 - To manage waste in a way that protects biodiversity

B. Is this part of AWP moving towards/away from objective	C. Short, medium or long term effects ?	D. Any other types of effects ?
?	?	

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
No relevant biodiversity data was considered because sites for facilities are not identified and therefore it is impossible to predict specific effects.	Option 1 scored as a **question mark** against objective 6 because: ▪ Impacts on biodiversity will depend on where facility is located and on where/how the outputs will be used ▪ Impacts of the different outputs from the treatment processes in

Biodiversity duty under the Nature Conservation (Scotland) Act will apply.	Option 1 may have effects on biodiversity due to their potential impact on air, soil and water environments.

7. A. SEA OBJECTIVE 7 – To manage waste in a way that reduces greenhouse gas emissions

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
Based on LCA evidence; option 1 performs better than the baseline as it not only significantly reduces but also mitigates all greenhouse gas emissions, particularly methane.	Option 1 scored **positively** against objective 7 because greenhouse gas emissions are likely to reduce.

8. A. SEA OBJECTIVE 8 - To reduce energy use and support the development of alternative, renewable, energy supplies

B. Is this part of AWP moving towards/away from objective	↑↓	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information:	Reasons for score in Boxes B - D:
▪ MBT and AD processes are energy intensive. Energy from burning waste could be used to power the MBT/AD. ▪ Qualification for ROCs depends on the input to the plant and the type of technology. See Section 3.8 ▪ There is potential for EfW to produce heat which could be used as part of a Combined Heat and Power (CHP) system. Depending on location there could be opportunities to provide heat to industrial, commercial or residential properties. ▪ According to LCA Option 1, reduces the loss of non-renewable resources compared to the baseline.	Option 1 scored **positively** against objective 8 because: ▪ Ability to offset energy use against production of energy from MBT and AD ▪ Potential for ROCs to apply ▪ Potential for facility to generate electricity and heat. Option 1 scored **negatively** against objective 8 because MBT and AD processes are energy intensive.

9. A. SEA OBJECTIVE 9 – To reduce the movement of waste

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information:	Reasons for Score in Boxes B - D:
It is difficult to assess this objective because there is no information on where facilities will be located; or where markets for outputs from source segregated collections or residual treatment processes will be. The location and number of facilities will impact on the amount of waste transportation required. LCA indicates in terms of transport that multiple waste treatment sites are favourable compared to a single site.	Option 1 scored as a **question mark** against objective 9 because it is dependent on location and number of facilities. Option 1 scored as having **other types of effect** because of the potential secondary effects of through route traffic on communities.

10. A. SEA OBJECTIVE 10 - To manage waste in a way that protects communities and their local environment

B. Is this part of AWP moving towards/away from objective	↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information

Supporting information:	Reasons for score in Boxes B - D:
▪ **Odour/dust**: Potential odour/dust nuisance from all processes in this option. The large number of processes in option 1 means that waste will have to be handled/transported more which can increase the amount of odour released. ▪ **Noise**: More equipment, more noise (can be mitigated, but dependent on operator), level of impact dependent on location of facilities. ▪ **Litter**: Less landfill over long term may result in less litter from municipal waste sources, but all sites would need to be effectively operated. ▪ **Local Traffic**: Some effects on local communities from vehicle movements in local area. See objective 9. ▪ **Risk of Accident**: Potential increase risk of accidents from more processing equipment, waste being processed, but this will be need to be managed through risk assessment /regulation. ▪ **Health**: See assessment of health effects in environmental report. See Section 3.6 ▪ **Environmental Justice**: Potential environmental justice issues if new facilities are located on same sites as existing landfills or other facilities.	Option 1 scored **negatively** against objective 10 to reflect the fact that there is potential for impacts on local communities. Option 1 scored as a **question mark** against objective 10 because facilities in this option have potential for local effects on local communities and the extent of this impact will depend on where the facilities are located. Option 1 scored as having potential for **cumulative effects** on communities if new facilities are located on same sites as existing facilities.

▪ **Local Energy Source:** The option could potentially provide a local heat source (if CHP technology used), and this may have a positive impact for the community.	

11 **A. SEA OBJECTIVE 11 – To manage waste in a way that reduces impacts on cultural heritage**

▪

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	**Reasons for Score in Boxes B - D**:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the land use planning system.	Option 1 scored as a **question mark** against objective 11 because the impact on cultural heritage is dependent on location of facilities. Potential for traffic levels & emissions to affect cultural heritage, but effects judged by group as likely to be relatively minor.

12 **A. SEA OBJECTIVE 12 – To manage waste in a way that reduces impacts on landscape**

▪

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	**Reasons for Score in Boxes B - D**:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the Land Use Planning System.	Option 1 scored as a **question mark** against objective 11 because it is dependent upon location of facilities. Potential for waste management facilities to intrude on landscape, particularly where stacks form part of facility, but impacts likely to be minor as long as sited sensitively.

Summary of Overall Effect of this Option:

The performance of option 1 against each objective can be summarised as follows:

Uncertainties

- A question mark was put next to a number of the criteria being assessed because the impact on the criteria depends on the site location. This includes impact on: local communities, cultural heritage, landscape and biodiversity. However, these criteria will be covered in more detail in site specific studies e.g. EIA and the site locations will be largely under the control of Land Use Planning.
- The significance of air emissions from transport will also be largely dependent on the location and number of facilities.
- There is an uncertainty about the quality of the output from MBT and AD causing them to question if there would be markets for all the stabilised biowaste and RDF created; or for the bottom ash recovered. There is also a dependency on the capacity of the market to absorb outputs of compost and stabilised biowaste in relation to land application. It was noted that the diversion rates may not be achievable as there may not be markets available for these outputs/products.
- Additionally, there is uncertainty as to the cumulative effects of application of these outputs to land if there are other pressures on water bodies adjacent to the land.

Negative

- MBT and AD technologies are energy intensive technologies.
- It was also highlighted that the proposed technologies in Option 1 would produce air emissions and could impact watercourses. AD, MBT and EfW are all managed under PPC permits and therefore have limits for air emissions and also take into account the local air quality.
- There are air emissions (odour, dust, bioaerosols etc) which need to be properly managed.
- There is a potential to generate small quantities of fly ash through the EfW element of this option although the extent of this is unknown. The markets for bottom ash are not well developed at the moment, with the risks and opportunities needing to be better understood.
- There will be impacts on local communities, however, the extent and location is uncertain.

Positive

- Increases recycling, composting and recovery rates when compared to the baseline (current waste management practices being carried out in 2005/06).
- Option 1 diverts more from landfill than the baseline which will result in less uncontrolled emissions (e.g. leachate to land and water and methane to air).
- The processes in option 1 are assumed to be “in vessel” closed and therefore escapes of emissions and odour to local air environment are limited.
- Greenhouse gas emissions are likely to reduce compared to the current waste management practices.
- Potentially, there is the ability to offset energy use of the energy intensive MBT and AD against the energy production by AD and MBT.
- Potential to qualify for ROCs and to generate electricity and heat for local communities.
- Smaller physical footprint compared to new landfill facilities.

OVERALL THIS OPTION PERFORMS BETTER THAN THE BASELINE TO WHICH IT IS COMPARED

Mitigation Actions – Option 1

Mitigation actions applicable to all objectives with this option	
▪ Land use planning system will take into account local issues – air quality, effects on communities, landscape, cultural heritage, transport of waste etc – to ensure protection of the environment through sensitive location of facilities. ▪ Environmental regulation of facilities will ensure that sites will be regulated to high environmental standards and will consider in detail emissions to air, emissions to water and land, emissions of greenhouse gases, noise, odour, dust and effects on human health. Suitable abatement technologies will be required as part of regulation of facilities to address these effects. ▪ PPC regulation will require use of Best Available Technology (BAT) for waste management processes	
Specific mitigation actions relevant to specific SEA objectives	
Obj	**Action**
1	▪ Ensure market testing undertaken before facilities are developed to ensure a product can be recovered and used as a useful product. ▪ Improve source segregated waste recycling and composting rates beyond proposed where affordable and practical.
4	▪ At tender stage and review of bids, check proposed application of outputs. ▪ There must be no application of composted/stabilised biowaste material to land without risk assessment. Waste being incorporated with the land also falls under the Waste Management Regime. ▪ Renewable Energy Association (REA) standards are currently being developed for AD which will apply to the input, process and output. ▪ EfW facility will be regulated in respect of handling and managing ash residues under PPC permits for the protection of the environment and human health. ▪ Some of the bottom ash could be recycled for use as a road base material. However, there is a need to ensure that any bottom ash is stabilised before use as a road base/building material.
5	▪ At tender stage and review of bids, check proposed application of outputs. ▪ Risk assessment criteria must be applied for the application of compost and stabilised biowaste, treated liquor from AD when considering application to land which will include consideration of local watercourses. ▪ The Water Environment (Controlled Activities) (Scotland) Regulations 2005 will apply to protect the water environment.
6	▪ Design of facility to enhance local biodiversity. ▪ Risk assessment criteria must be applied for the application of outputs from treatment processes in option 1 with respect to their impact on the air, soil and water environment and therefore biodiversity. ▪ Need to take account of local biodiversity action plans.
7	▪ At tender stage and review of bids, check proposed greenhouse gas emissions
8	▪ At tender stage and review of bids, check proposed process and thermal efficiency of proposed facilities. ▪ Potential application of ROCs ▪ Seek to use less energy intensive MBT/AD technologies. ▪ Application of SEPA's Thermal Treatment Guidelines ▪ Active engagement should take place to locate future plant close to premises where there would be a demand for heat
9	▪ The Land Use Planning System will seek to ensure that facilities are sited to make best use of existing transport facilities (particularly rail) and keep facilities close to source of waste (proximity principle) and also consider co-location of facilities. ▪ Planning and environmental controls may also be able to control routing.
10	▪ There needs to be a communication plan to explain SEPA's regulatory responsibilities to protect the environment & human health as well as regulatory powers used to enforce these responsibilities in an effort to engender trust within local communities. ▪ Local communities potentially affected should be given opportunities to engage planning and PPC permit application stage. These should be widely publicised, and the public engaged at the earliest possible opportunity. ▪ Movement of waste may have impact on communities on route - planning conditions and environmental licensing conditions can set conditions surrounding vehicle movements on site

Option 2

Option 2 has been modelled to use Energy from Waste residual waste treatment facilities, whilst maintaining the recycling and composting levels in the existing Area Waste Plan.

Components	2020
Source segregated Recycling and Composting	**26 %**
Source segregated recycling	21%
Source segregated composting	5 %
Residual Waste Treatment	**64%**
Additional Recycling and Composting	11%
Additional Diversion from Landfill	44%
Landfill after treatment e.g. ash	9%
Landfill	**10%**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

1. A. SEA OBJECTIVE 1 – To increase the rates of reuse, recycling and recovery in the area in accordance with the waste hierarchy

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information:

- Option 2 would increase source recycling/composting compared to the current performance. Option 2 further increases the amount of waste diverted from landfill through additional recycling and composting e.g. ash recovery. See summary of Option 2 above.
- Bottom ash is considered inert once stabilised and recycling as aggregate is technically feasible, but is not guaranteed.
- No biowaste or RDF is produced under this option

Reasons for Score in Boxes B - D:

Option 2 scored **positively** against objective 1 because:

- It increases in recycling, composting and recovery rates when compared to the baseline (current waste management practices being carried out in 2005/06). However, the modest rate of increase in source segregated recycling and composting rate was negative. This was, offset positively, by the increased diversion of waste from landfill following residual treatment.
- Option 2 is diverting additional waste from landfill following residual waste treatment via EfW.
- Bottom ash could be used as building material once stabilised and there is potential for fly ash to be used in future advanced technologies.

2. A. SEA OBJECTIVE 2 – To reduce landfilling of MSW waste in the area

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting Information :

In 2005/06, 77.75% of total municipal waste arising was sent to landfill. Option 2 proposes to reduce waste to landfill to 18%

Reasons for score in Boxes B - E:

Option 2 scored **positively** against objective 2 because waste disposed to landfill can potentially reduce from 77.75% to 18%

3. A. SEA OBJECTIVE 3 – To manage waste in a way that reduces emissions to air

B. Is this part of AWP moving towards/away from objective	↑↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information :

- Based on LCA evidence, modelled around option 2 for air emissions, there is potential for an impact from sulphur dioxide equivalent into the atmosphere compared to the baseline.
- It is noted that Air Quality Management Areas in Scotland are largely based on traffic movement and therefore, there is the potential for local effects.
- Public concern about air emissions from EfW facilities, particularly dioxin release and effects on human health (see objective 10)

Reasons for Score in Boxes B - D:

Option 2 scored **positively** against objective 3 because:

- In comparison to the current waste management practice in 2005/06 where the majority of waste is landfilled; there will be a reduction in methane emissions to air
- There are limits for air emissions for EfW which are set under WID and included in the PPC Permit for the plant and these permits also take local air quality into account.
- There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified and are reduced when compared to landfill.
- Less handling of waste in EfW stage therefore less issue of bioaerosols and odour/dust. EfW is in an enclosed section of facility and odour and dust are burned at the combustion phase.

	Option 2 scored **negatively** against objective 3 because it is recognised that there will be emissions, however, mitigation and strict regulatory measures that will ensure that air emissions are kept to certain levels to prevent harm to human health and the environment. Option 2 scored a **question mark** against objective 3 because emissions will vary depending on facility and location. Option 2 scored as having potential for **cumulative effects** if facilities are sited in areas with existing air quality problems

4. A. SEA OBJECTIVE 4 - To manage waste in a way that reduces emissions to land and soil

B. Is this part of AWP moving towards/away from objective	↑↓	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
▪ The majority of waste in the baseline is landfilled which creates a pollution legacy which will last up to 25 years or more. The long term effects cannot be judged for a municipal waste landfill site as no site has been stabilised and no licence has been surrendered under Waste Management Licensing regime. There is a risk of accidental pollution due to failure of landfill liner particularly over a long period. So, Option 2 offers more control and considerably reduces the pollution of soils than the baseline. ▪ Fly ash from EfW can be hazardous. Bottom ash is inert once stabilised. Bottom ash must be treated to prevent leaching of hazardous materials. ▪ Physical space required for the facility will be smaller than landfill.	Option 2 scored **positively** against objective 4 because: ▪ There is significantly less waste to landfill than in 2005/06 ▪ Smaller footprint compared to new landfill facilities Option 2 scored **negatively** against objective 4 because there is a potential to generate hazardous fly ash although extent is unknown

5. A. SEA OBJECTIVE 5 – To manage waste in a way that reduces emissions to water

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
▪ According to LCA results, option 2 performs better than the baseline for impact on water from eutrophication. ▪ SEPA advise that a dry scrubber (BAT) and not a wet scrubber system would be used. ▪ There is a risk of accidental pollution and long term effects, due to failure of landfill liner. Option 2 offers more control and therefore considerably reduces the potential to pollute the water environment. However, there is potential leaching from fly ash which could be landfilled.	Option 2 scored as a **positive** against objective 5 because: ▪ There is less biodegradable waste going to landfill, therefore generation of leachate will be reduced and less impact on water. ▪ It performs better than the baseline for impact on water from eutrophication.

6. A. SEA OBJECTIVE 6 - To manage waste in a way that protects biodiversity

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
No relevant biodiversity data was considered because sites for facilities are not identified and therefore it is impossible to predict specific effects. Biodiversity duty under the Nature Conservation (Scotland) Act will apply.	Option 2 scored as a **question mark** against objective 6 because: ▪ Impacts on biodiversity will depend on where facility is located and on where/how the outputs will be used ▪ Impacts of the different outputs from the treatment processes in Option 2 may have effects on biodiversity due to their potential impact on air, soil and water environments.

7. A. SEA OBJECTIVE 7 – To manage waste in a way that reduces greenhouse gas emissions

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
Based on LCA evidence; option 2 performs better than the baseline as it significantly reduces all greenhouse gas emissions, particularly methane.	Option 2 scored **positively** against objective 7 because greenhouse gas emissions are likely to reduce.

8.	**A. SEA OBJECTIVE 8 - To reduce energy use and support the development of alternative, renewable, energy supplies**				
B. Is this part of AWP moving towards/away from objective	↑	**C. Short, medium or long term effects ?**	**L**	**D. Any other types of effects ?**	

E. Comments and Supporting Information

Supporting information:	**Reasons for score in Boxes B - D:**
▪ There is a potential for EfW to produce heat which can be used for industrial, commercial or residential use. ▪ Qualification for ROCs depends on the input and type of technology. See Section 3.8 ▪ According to LCA Option 2, reduces the loss of non-renewable resources compared to the baseline.	Option 2 scored **positively** against objective 8 because: ▪ It is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency. ▪ Potential for ROCs to apply. Qualification will depend on the type of technology and input to the plant.

9.	**A. SEA OBJECTIVE 9 – To reduce the movement of waste**				
B. Is this part of AWP moving towards/away from objective	**?**	**C. Short, medium or long term effects ?**	**?**	**D. Any other types of effects ?**	✓

E. Comments and Supporting Information :

Supporting information:	**Reasons for Score in Boxes B - D**:
It is difficult to assess this objective because there is no information on where facilities will be located; or where markets for outputs from source segregated collections or residual treatment processes will be. The location and number of facilities will impact on the amount of waste transportation required. LCA indicates in terms of transport that multiple waste treatment sites are favourable compared to a single site.	Option 2 scored as a **question mark** against objective 9 because it is dependent on location and number of facilities. Option 2 scored as having **other types of effect** because of the potential secondary effects of through route traffic on communities.

10.	**A. SEA OBJECTIVE 10 - To manage waste in a way that protects communities and their local environment**				
B. Is this part of AWP moving towards/away from objective	↓?	**C. Short, medium or long term effects ?**	**M/L**	**D. Any other types of effects ?**	✓

E. Comments and Supporting Information

Supporting information :	**Reasons for score in Boxes B - D:**
▪ **Odour/dust**: Potential odour/dust nuisance from all processes in this option via storage and mixing of wastes prior to combustion. ▪ **Noise**: More equipment, more noise (can be mitigated, but dependent on operator), level of impact dependent on location of facilities. ▪ **Litter**: Less landfill over long term may result in less litter from MSW sources, but all sites would need to be effectively operated. ▪ **Local Traffic**: Some effects on local communities from vehicle movements in local area. See objective 9. ▪ **Risk of Accident**: Potential increase risk of accidents from more processing equipment, waste being processed, but this will be need to be managed through risk assessment /regulation. ▪ **Health:** See assessment of health effects in environmental report. See Section 3.6 ▪ **Environmental Justice**: Potential environmental justice issues if new facilities are located on same sites as existing landfills or other facilities. ▪ **Local Energy Source:** It is potential the option can provide a local heat source (if CHP technology used), and this may have a positive impact for the community.	Option 2 scored **negatively** against objective 10 to reflect the fact that there will be impacts on local communities Option 2 scored as a **question mark** against objective 10 because facilities in this option will have local effects on local communities and the extent of this impact will depend on where the facilities are located. Option 2 scored as having **potential for cumulative effects** on local communities if new facilities are located on same sites as existing facilities.

11.	**A. SEA OBJECTIVE 11 – To manage waste in a way that reduces impacts on cultural heritage**				
B. Is this part of AWP moving towards/away from objective	**?**	**C. Short, medium or long term effects ?**	**M/L**	**D. Any other types of effects ?**	

E. Comments and Supporting Information :

Supporting information :	**Reasons for Score in Boxes B - D**:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the land use planning system.	Option 2 scored as a **question mark** against objective 11 because the impact on cultural heritage is dependent on location of facilities. Potential for traffic levels & emissions to affect cultural heritage, but effects judged by group as likely to be relatively minor.

12.	A. SEA OBJECTIVE 12 – To manage waste in a way that reduces impacts on landscape				
B. Is this part of AWP moving towards/away from objective	**?**	**C. Short, medium or long term effects ?**	**M/L**	**D. Any other types of effects ?**	

E. Comments and Supporting Information :

Supporting information :	**Reasons for Score in Boxes B - D**:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the Land Use Planning System.	Option 2 scored as a **question mark** against objective 12 because it is dependent upon location of facilities. Potential for waste management facilities to intrude on landscape, particularly where stacks form part of facility, but impacts likely to be minor as long as sited sensitively.

Summary of Overall Effect of this Option:

The performance of option 2 against each objective can be summarised as follows:

Uncertainties

- A question mark was put next to a number of the criteria being assessed because the impact on the criteria depends on the site location. This includes impact on: local communities, cultural heritage, landscape and biodiversity. However, these criteria will be covered in more detail in site specific studies e.g. EIA and the site locations will be largely under the control of Land Use Planning.
- Impact from air emissions is dependent on facility, location and licence conditions.
- The significance of the impact of transport from the movement of waste will also depend on the location and number of facilities.
- It is difficult to identify the extent of water effects as this will depend upon where facilities are located and operational process. However, both abstraction from and discharges to water courses are regulated by SEPA in order to protect the water environment.

Negative

- There is a potential to generate quantities of fly ash which will be required to be landfilled and/or recovered once stabilised.
- It is recognised that there will be emissions but it is noted that strict regulatory measures will ensure that air emissions are kept to level which will not harm human health or the environment.
- There will be impacts on local communities due to siting of the facility; however, the extent is uncertain.

Positive

- Increases recycling, composting and recovery rates when compared to the baseline.
- Smaller footprint compared to a new landfill.
- Option 2 diverts more from landfill than the baseline which will result in less uncontrolled emissions (e.g. leachate to land and water and methane to air).
- There are limits for air emissions for EfW which are set under WID and included in the PPC permit for the plant taking into account the ambient air quality in the area. There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified.
- Greenhouse Gas emissions are likely to reduce from the proposed technology in Option 2.
- Option 2 is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency and whether or not is will be classed as producing renewable energy.
- Potential for ROCs depends on the input to the plant and the type of technology.

OVERALL THIS OPTION PERFORMS BETTER THAN THE BASELINE TO WHICH IT IS COMPARED.

Mitigation Actions – Option 2, 3, 4, 5 and 6

Mitigation actions applicable to all objectives with this option	
▪ Land use planning system will take into account local issues – air quality, effects on communities, landscape, cultural heritage, transport of waste etc – to ensure protection of the environment through sensitive location of facilities. ▪ Environmental regulation of facilities will ensure that sites will be regulated to high environmental standards and will consider in detail emissions to air, emissions to water and land, emissions of greenhouse gases, noise, odour, dust and effects on human health. Suitable abatement technologies will be required as part of regulation of facilities to address these effects. ▪ PPC regulation will require use of Best Available Technology (BAT) for waste management processes	
Specific mitigation actions relevant to specific SEA objectives	
Obj	**Action**
1	▪ Ensure market testing undertaken before facilities are developed to ensure that ash product can be recovered and used as a useful product. ▪ Improve source segregated waste recycling and composting rates beyond proposed where affordable and practical.
3	▪ Air quality issues to be resolved via good siting of facilities, operating conditions, design of technology, noise/odour/dust abatement techniques and minimised movement and handling. ▪ Regulate emissions to highest standards in line with WID ▪ Modern EfW facilities are much better at reducing emissions, for example, Nitrous Oxides (NOx) and Sulphur Oxides (SOx) compared to the perceived emissions from combustion plants.
4	▪ Ash could be recycled for use as a road base material. However, there is a need to ensure that any bottom ash is stabilised before use as a road base/building material.
5	▪ All emissions to water from EfW will need to comply with stringent WID limits. ▪ The Water Environment (Controlled Activities) (Scotland) Regulations 2005 will apply to protect the water environment. ▪ Process should recover as much heat as possible through identified heat sink to avoid need for cooling.
6	▪ Design of facility to enhance local biodiversity. ▪ Risk assessment criteria must be applied for the application of outputs from treatment processes in option 1 with respect to their impact on the air, soil and water environment and therefore biodiversity. ▪ Need to take account of local biodiversity action plans.
7	▪ All plants will be regulated to reduce emissions of greenhouse gases. ▪ At tender stage and review of bids, check proposed greenhouse gas emissions.
8	▪ At tender stage and review of bids, check proposed process and thermal efficiency of proposed facilities. ▪ Potential application of ROCs ▪ Application of SEPA's Thermal Treatment Guidelines ▪ Active engagement should take place to locate future plant close to premises where there would be a demand for heat
9	▪ Planning and environmental controls may be able to control routing.
10	▪ Ensure adequate abatement technologies in place. New facilities should be designed and operated correctly to minimise noise/odour/dust issues. ▪ There needs to be a communication plan to explain SEPA's regulatory responsibilities to protect the environment & human health as well as regulatory powers used to enforce these responsibilities in an effort to engender trust within local communities. ▪ Local communities potentially affected should be given opportunities to engage planning and PPC permit application stage. These should be widely publicised, and the public engaged at the earliest possible opportunity. ▪ Movement of waste may have impact on communities on route - planning conditions and environmental licensing conditions can set conditions surrounding vehicle movements on site. ▪ Potential local energy source (e.g. CHP).

Option 3

Option 3 has been modelled to use Energy from Waste residual waste treatment facilities, whilst maintaining recycling and composting levels comparable to the progress that is currently being made and to the existing Area Waste Plan. Option 3 maximises diversion from landfill.

Components	2020
Source segregated Recycling and Composting	**33 %**
Source segregated recycling	21 %
Source segregated composting	12 %
Residual Waste Treatment	**66 %**
Additional Recycling and Composting	12%
Additional Diversion from Landfill	46%
Landfill after treatment e.g. ash	8%
Landfill	**1 %**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

1. A. SEA OBJECTIVE 1 – To increase the rates of reuse, recycling and recovery in the area in accordance with the waste hierarchy

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information:

- Option 3 would increase source recycling/composting compared to the current performance. Option 3 further increases the amount of waste diverted from landfill through additional recycling and composting e.g. ash recovery. See summary of Option 3 above.
- Option 3 also moves waste further up the hierarchy by sending very little waste directly to landfill. 8% comes from residual waste treatment and 1% goes direct to landfill. Bottom ash is considered inert once stabilised and recycling as aggregate is technically feasible, but is not guaranteed.
- No biowaste or RDF is produced under this option

Reasons for Score in Boxes B - D:

Option 3 scored **positively** against objective 1 because:

- It increases in recycling, composting and recovery rates when compared to the baseline (current waste management practices being carried out in 2005/06). However, the modest rate of increase in source segregated recycling and composting rate was negative. This was, offset positively, by the increased diversion of waste from landfill following residual treatment.
- Option 3 is diverting additional waste from landfill following residual waste treatment via EfW.
- Option 3 is also sending most waste for recovery before landfill.
- Bottom ash could be used as building material once stabilised and there is potential for fly ash to be used in future advanced technologies.

2. A. SEA OBJECTIVE 2 – To reduce landfilling of MSW waste in the area

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting Information :

In 2005/06, 77.75% of total municipal waste arising was sent to landfill. Option 3 proposes to reduce waste to landfill to 9%. 8% is from residual waste treatment e.g. ash and 1% is waste going direct to landfill.

Reasons for score in Boxes B - E:

Option 3 scored **positively** against objective 2 because waste disposed to landfill can potentially reduce from 77.75% to 9%. Landfill is being reduced as much as possible with waste principally going for treatment before landfill.

3. A. SEA OBJECTIVE 3 – To manage waste in a way that reduces emissions to air

B. Is this part of AWP moving towards/away from objective	↑↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information :

- Based on LCA evidence, modelled around option 3 for air emissions, there is less net reduction of sulphur dioxide equivalent into the atmosphere compared to the baseline.
- It is noted that Air Quality Management Areas in Scotland are largely based on traffic movement and therefore, there is the potential for local effects.
- Public concern about air emissions from EfW facilities, particularly dioxin release and effects on human health (see objective10)

Reasons for Score in Boxes B - D:

Option 3 scored **positively** against objective 3 because:

- In comparison to the current waste management practice in 2005/06 where the majority of waste is landfilled; there will be a reduction in methane emissions to air
- There are limits for air emissions for EfW which are set under WID and included in the PPC Permit for the plant and these permits also take local air quality in the local area into account.
- Less handling of waste in EfW stage therefore less issue of bioaerosols and odour/dust. EfW is in an enclosed section of facility and odour and dust are

▪ Likely to be dust/odour issues associated with storage and handling of waste.	burned at the combustion phase. Option 3 scored **negatively** against objective 3 because it is recognised that there will be emissions, however, mitigation and strict regulatory measures that will ensure that air emissions are kept to levels to prevent harm to human health and the environment. Option 3 scored a **question mark** against objective 3 because emissions will vary depending on facility and location. Option 3 scored as having potential for **cumulative effects** if facilities are sited in areas with existing air quality problems

4. A. SEA OBJECTIVE 4 - To manage waste in a way that reduces emissions to land and soil

B. Is this part of AWP moving towards/away from objective	↑↓	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
▪ The majority of waste in the baseline is landfilled which creates a pollution legacy which will last up to 25 years or more. The long term effects cannot be judged for a municipal waste landfill site as no site has been stabilised and no licence has been surrendered under Waste Management Licensing regime. There is a risk of accidental pollution due to failure of landfill liner particularly over a long period. So, Option 3 offers more control and considerably reduces the pollution of soils than the baseline. ▪ Fly ash from EfW can be hazardous. Bottom ash is inert once stabilised. Bottom ash must be treated to prevent leaching of hazardous materials. ▪ Physical space required for the facility will be smaller than landfill.	Option 3 scored **positively** against objective 4 because: ▪ There is significantly less waste to landfill than in 2005/06 ▪ Smaller footprint compared to new landfill facilities Option 3 scored **negatively** against objective 4 because there is a potential to generate hazardous fly ash although extent is unknown

5. A. SEA OBJECTIVE 5 – To manage waste in a way that reduces emissions to water

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
▪ According to LCA results, option 3 performs better than the baseline for impact on water from eutrophication. ▪ SEPA advise that a dry scrubber (BAT) and not a wet scrubber system would be used. ▪ There is a risk of accidental pollution and long term effects, due to failure of landfill liner. Option 3 offers more control and therefore considerably reduces the potential to pollute the water environment. However, there is potential leaching from fly ash which could be landfilled.	Option 3 scored as a **positive** against objective 5 because: ▪ There is less biodegradable waste going to landfill, therefore generation of leachate will be reduced and less impact on water. ▪ It performs better than the baseline for impact on water from eutrophication.

6. A. SEA OBJECTIVE 6 - To manage waste in a way that protects biodiversity

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
No relevant biodiversity data was considered because sites for facilities are not identified and therefore it is impossible to predict specific effects. Biodiversity duty under the Nature Conservation (Scotland) Act will apply.	Option 3 scored as a **question mark** against objective 6 because: ▪ Impacts on biodiversity will depend on where facility is located and on where/how the outputs will be used ▪ Impacts of the different outputs from the treatment processes in Option 3 may have effects on biodiversity due to their potential impact on air, soil and water environments.

7. A. SEA OBJECTIVE 7 – To manage waste in a way that reduces greenhouse gas emissions

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
Based on LCA evidence; option 3 performs better than the	Option 3 scored **positively** against objective 7 because greenhouse gas

baseline as it significantly reduces and mitigates against greenhouse gas emissions, particularly methane.	emissions are likely to reduce.

8. **A. SEA OBJECTIVE 8 - To reduce energy use and support the development of alternative, renewable, energy supplies**

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	L	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information:	Reasons for score in Boxes B - D:
▪ There is a potential for EfW to produce heat which can be used for industrial, commercial or residential use. ▪ Qualification for ROCs depends on the input and type of technology. See Section 3.8 ▪ According to LCA Option 3, reduces the loss of non-renewable resources compared to the baseline.	Option 3 scored **positively** against objective 8 because: ▪ It is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency. ▪ Potential for ROCs to apply. Qualification will depend on the type of technology and input to the plant.

9. **A. SEA OBJECTIVE 9 – To reduce the movement of waste**

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information:	Reasons for Score in Boxes B - D:
It is difficult to assess this objective because there is no information on where facilities will be located; or where markets for outputs from source segregated collections or residual treatment processes will be. The location and number of facilities will impact on the amount of waste transportation required. LCA indicates in terms of transport that multiple waste treatment sites are favourable compared to a single site.	Option 3 scored as a **question mark** against objective 9 because it is dependent on location and number of facilities. Option 3 scored as having **other types of effect** because of the potential secondary effects of through route traffic on communities.

10. **A. SEA OBJECTIVE 10 - To manage waste in a way that protects communities and their local environment**

B. Is this part of AWP moving towards/away from objective	↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
▪ **Odour/dust**: Potential odour/dust nuisance from all processes in this option via storage and mixing of wastes prior to combustion. ▪ **Noise**: More equipment, more noise (can be mitigated, but dependent on operator), level of impact dependent on location of facilities. ▪ **Litter**: Less landfill over long term may result in less litter from MSW sources, but all sites would need to be effectively operated. ▪ **Local Traffic**: Some effects on local communities from vehicle movements in local area. See objective 9. ▪ **Risk of Accident**: Potential increase risk of accidents from more processing equipment, waste being processed, but this will be need to be managed through risk assessment /regulation. ▪ **Health:** See assessment of health effects in environmental report. See Section 3.6 ▪ **Environmental Justice**: Potential environmental justice issues if new facilities are located on same sites as existing landfills or other facilities. ▪ **Local Energy Source:** It is potential the option can provide a local heat source (if CHP technology used), and this may have a positive impact for the community.	Option 3 scored **negatively** against objective 10 to reflect the fact that there will be impacts on local communities Option 3 scored as a **question mark** against objective 10 because facilities in this option will have local effects on local communities and the extent of this impact will depend on where the facilities are located. Option 3 scored as having **potential for cumulative effects** on local communities if new facilities are located on same sites as existing facilities.

11. **A. SEA OBJECTIVE 11 – To manage waste in a way that reduces impacts on cultural heritage**

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the land use planning system.	Option 3 scored as a **question mark** against objective 11 because the impact on cultural heritage is dependent on location of facilities. Potential for traffic levels & emissions to affect cultural heritage, but effects judged by group as

	likely to be relatively minor.

12. A. SEA OBJECTIVE 12 – To manage waste in a way that reduces impacts on landscape

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the Land Use Planning System.	Option 3 scored as a **question mark** against objective 12 because it is dependent upon location of facilities. Potential for waste management facilities to intrude on landscape, particularly where stacks form part of facility, but impacts likely to be minor as long as sited sensitively.

Summary of Overall Effect of this Option:

The performance of option 3 against each objective can be summarised as follows:

Uncertainties

- A question mark was put next to a number of the criteria being assessed because the impact on the criteria depends on the site location. This includes impact on: local communities, cultural heritage, landscape and biodiversity. However, these criteria will be covered in more detail in site specific studies e.g. EIA and the site locations will be largely under the control of Land Use Planning.
- Impact from air emissions is dependent on facility, location and licence conditions.
- The significance of the impact of transport from the movement of waste will also depend on the location and number of facilities.
- It is difficult to identify the extent of water effects as this will depend upon where facilities are located and operational process. However, both abstraction from and discharges to water courses are regulated by SEPA in order to protect the water environment.

Negative

- There is a potential to generate quantities of fly ash which will be required to be landfilled and/or recovered once stabilised.
- It is recognised that there will be emissions but it is noted that strict regulatory measures will ensure that air emissions are kept to level which will not harm human health or the environment.
- There will be impacts on local communities due to siting of the facility; however, the extent is uncertain.

Positive

- Increases recycling, composting and recovery rates when compared to the baseline.
- Smaller footprint compared to a new landfill.
- Option 3 diverts more from landfill than the baseline which will result in less uncontrolled emissions (e.g. leachate to land and water and methane to air).
- There are limits for air emissions for EfW which are set under WID and included in the PPC permit for the plant taking into account the ambient air quality in the area. There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified.
- Greenhouse Gas emissions are likely to reduce from the proposed technology in Option 3.
- Option 3 is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency and whether or not is will be classed as producing renewable energy.
- Potential for ROCs depends on the input to the plant and the type of technology.

OVERALL THIS OPTION PERFORMS BETTER THAN THE BASELINE TO WHICH IT IS COMPARED.

Mitigation

Mitigation measures for this option are described on page 38

Option 4

Option 4 includes source segregated recycling and composting levels well beyond existing AWP targets. These recycling and composting levels are considered as aspirational as they depend on the availability of additional public funding as well as increased public participation. Option 4 has been modelled using Energy from Waste residual waste treatment technology and maximises diversion from landfill.

Components	2020
Source segregated Recycling and Composting	**43 %**
Source segregated recycling	29 %
Source segregated composting	14 %
Residual Waste Treatment	**56%**
Additional Recycling and Composting	10%
Additional Diversion from Landfill	39%
Landfill after treatment e.g. ash	7%
Landfill	**1 %**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

1. A. SEA OBJECTIVE 1 – To increase the rates of reuse, recycling and recovery in the area in accordance with the waste hierarchy

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information:

- Option 4 would increase source recycling/composting compared to the current performance. Option 4 further increases the amount of waste diverted from landfill through additional recycling and composting e.g. ash recovery. See summary of Option 4 above.
- Option 4 also moves waste further up the hierarchy by sending very little waste directly to landfill. 7% comes from residual waste treatment and 1% goes direct to landfill. Bottom ash is considered inert once stabilised and recycling as aggregate is technically feasible, but is not guaranteed.
- No biowaste or RDF is produced under this option

Reasons for Score in Boxes B - D:

Option 4 scored **positively** against objective 1 because:

- It increases in recycling, composting and recovery rates when compared to the baseline (current waste management practices being carried out in 2005/06). However, the aspirational targets will depend on public participation and public funding.
- Option 4 is diverting additional waste from landfill following residual waste treatment via EfW.
- Option 4 is also sending most waste for recovery before landfill.
- Bottom ash could be used as building material once stabilised and there is potential for fly ash to be used in future advanced technologies.

2. A. SEA OBJECTIVE 2 – To reduce landfilling of MSW waste in the area

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting Information :

In 2005/06, 77.75% of total municipal waste arising was sent to landfill. Option 4 proposes to reduce waste to landfill to 8%. 7% is from residual waste treatment e.g. ash and 1% is waste going direct to landfill.

Reasons for score in Boxes B - E:

Option 4 scored **positively** against objective 2 because waste disposed to landfill can potentially reduce from 77.75% to 8%.Further to this, Landfill is being reduced as much as possible with waste principally going for treatment before landfill.

3. A. SEA OBJECTIVE 3 – To manage waste in a way that reduces emissions to air

B. Is this part of AWP moving towards/away from objective	↑↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information :

- Based on LCA evidence, modelled around option 4 for air emissions, there is a net reduction of sulphur dioxide equivalent into the atmosphere compared to the baseline.
- It is noted that Air Quality Management Areas in Scotland are largely based on traffic movement and therefore, there is the potential for local effects.
- Public concern about air emissions from EfW facilities, particularly dioxin release and effects on human health (see objective10)
- Likely to be dust/odour issues associated with storage and handling of waste.

Reasons for Score in Boxes B - D:

Option 4 scored **positively** against objective 3 because:

- In comparison to the current waste management practice in 2005/06 where the majority of waste is landfilled; there will be a reduction in methane emissions to air
- There are limits for air emissions for EfW which are set under WID and included in the PPC Permit for the plant and these permits also take local air quality in the local area into account.
- There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified and are reduced when compared to landfill.
- Less handling of waste in EfW stage therefore less issue of bioaerosols and odour/dust. EfW is in an enclosed section of facility and odour and dust are

	burned at the combustion phase. Option 4 scored **negatively** against objective 3 because it is recognised that there will be emissions, however, mitigation and strict regulatory measures that will ensure that air emissions are kept to levels to prevent harm to human health and the environment. Option 4 scored a **question mark** against objective 3 because emissions will vary depending on facility and location. Option 4 scored as having potential for **cumulative effects** if facilities are sited in areas with existing air quality problems

4. **A. SEA OBJECTIVE 4 - To manage waste in a way that reduces emissions to land and soil**

B. Is this part of AWP moving towards/away from objective	↑↓	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
▪ The majority of waste in the baseline is landfilled which creates a pollution legacy which will last up to 25 years or more. The long term effects cannot be judged for a municipal waste landfill site as no site has been stabilised and no licence has been surrendered under Waste Management Licensing regime. There is a risk of accidental pollution due to failure of landfill liner particularly over a long period. So, Option 4 offers more control and considerably reduces the pollution of soils than the baseline. ▪ Fly ash from EfW can be hazardous. Bottom ash is inert once stabilised. Bottom ash must be treated to prevent leaching of hazardous materials. ▪ Physical space required for the facility will be smaller than landfill.	Option 4 scored **positively** against objective 4 because: ▪ There is significantly less waste to landfill than in 2005/06 ▪ Smaller footprint compared to new landfill facilities Option 4 scored **negatively** against objective 4 because there is a potential to generate hazardous fly ash although extent is unknown

5. **A. SEA OBJECTIVE 5 – To manage waste in a way that reduces emissions to water**

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
▪ Based on LCA evidence, for emissions to water; option 4 performs better than the baseline for eutrophication and freshwater aquatic ecotoxicity. ▪ SEPA advise that a dry scrubber (BAT) and not a wet scrubber system would be used. ▪ There is a risk of accidental pollution and long term effects, due to failure of landfill liner. Option 4 offers more control and therefore considerably reduces the potential to pollute the water environment. However, there is potential leaching from fly ash which could be landfilled.	Option 4 scored as a **positive** against objective 5 because: ▪ There is less biodegradable waste going to landfill, therefore generation of leachate will be reduced and less impact on water. ▪ It performs better than the baseline for eutrophication and freshwater aquatic ecotoxicity.

6. **A. SEA OBJECTIVE 6 - To manage waste in a way that protects biodiversity**

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
No relevant biodiversity data was considered because sites for facilities are not identified and therefore it is impossible to predict specific effects. Biodiversity duty under the Nature Conservation (Scotland) Act will apply.	Option 4 scored as a **question mark** against objective 6 because: ▪ Impacts on biodiversity will depend on where facility is located and on where/how the outputs will be used ▪ Impacts of the different outputs from the treatment processes in Option 4 may have effects on biodiversity due to their potential impact on air, soil and water environments.

7. **A. SEA OBJECTIVE 7 – To manage waste in a way that reduces greenhouse gas emissions**

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:

Based on LCA evidence; option 4 performs better than the baseline as it significantly reduces and mitigates against greenhouse gas emissions, particularly methane.	Option 4 scored **positively** against objective 7 because greenhouse gas emissions are likely to reduce.

8. A. SEA OBJECTIVE 8 - To reduce energy use and support the development of alternative, renewable, energy supplies

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	L	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information:	Reasons for score in Boxes B - D:
▪ There is a potential for EfW to produce heat which can be used for industrial, commercial or residential use. ▪ Qualification for ROCs depends on the input and type of technology. See Section 3.8 ▪ According to LCA Option 4, reduces the loss of non-renewable resources compared to the baseline.	Option 4 scored **positively** against objective 8 because: ▪ It is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency. ▪ Potential for ROCs to apply. Qualification will depend on the type of technology and input to the plant.

9. A. SEA OBJECTIVE 9 – To reduce the movement of waste

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information:	Reasons for Score in Boxes B - D:
It is difficult to assess this objective because there is no information on where facilities will be located; or where markets for outputs from source segregated collections or residual treatment processes will be. The location and number of facilities will impact on the amount of waste transportation required. LCA indicates in terms of transport that multiple waste treatment sites are favourable compared to a single site.	Option 4 scored as a **question mark** against objective 9 because it is dependent on location and number of facilities. Option 4 scored as having **other types of effect** because of the potential secondary effects of through route traffic on communities.

10. A. SEA OBJECTIVE 10 - To manage waste in a way that protects communities and their local environment

B. Is this part of AWP moving towards/away from objective	↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
▪ **Odour/dust**: Potential odour/dust nuisance from all processes in this option via storage and mixing of wastes prior to combustion. ▪ **Noise**: More equipment, more noise (can be mitigated, but dependent on operator), level of impact dependent on location of facilities. ▪ **Litter**: Less landfill over long term may result in less litter from MSW sources, but all sites would need to be effectively operated. ▪ **Local Traffic**: Some effects on local communities from vehicle movements in local area. See objective 9. ▪ **Risk of Accident**: Potential increase risk of accidents from more processing equipment, waste being processed, but this will be need to be managed through risk assessment /regulation. ▪ **Health:** See assessment of health effects in environmental report. See Section 3.6 ▪ **Environmental Justice**: Potential environmental justice issues if new facilities are located on same sites as existing landfills or other facilities. ▪ **Local Energy Source:** It is potential the option can provide a local heat source (if CHP technology used), and this may have a positive impact for the community.	Option 4 scored **negatively** against objective 10 to reflect the fact that there will be impacts on local communities Option 4 scored as a **question mark** against objective 10 because facilities in this option will have local effects on local communities and the extent of this impact will depend on where the facilities are located. Option 4 scored as having **potential for cumulative effects** on local communities if new facilities are located on same sites as existing facilities.

11. A. SEA OBJECTIVE 11 – To manage waste in a way that reduces impacts on cultural heritage

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered	Option 4 scored as a **question mark** against objective 11 because the impact on cultural heritage is dependent on location of facilities. Potential for traffic

through the land use planning system.	levels & emissions to affect cultural heritage, but effects judged by group as likely to be relatively minor.

12.	**A. SEA OBJECTIVE 12 – To manage waste in a way that reduces impacts on landscape**				
B. Is this part of AWP moving towards/away from objective	**?**	**C. Short, medium or long term effects ?**	**M/L**	**D. Any other types of effects ?**	

E. Comments and Supporting Information :	
Supporting information :	**Reasons for Score in Boxes B - D**:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the Land Use Planning System.	Option 4 scored as a **question mark** against objective 12 because it is dependent upon location of facilities. Potential for waste management facilities to intrude on landscape, particularly where stacks form part of facility, but impacts likely to be minor as long as sited sensitively.

Summary of Overall Effect of this Option:

The performance of option 4 against each objective can be summarised as follows:

Uncertainties

- A question mark was put next to a number of the criteria being assessed because the impact on the criteria depends on the site location. This includes impact on: local communities, cultural heritage, landscape and biodiversity. However, these criteria will be covered in more detail in site specific studies e.g. EIA and the site locations will be largely under the control of Land Use Planning.
- Impact from air emissions is dependent on facility, location and licence conditions.
- The significance of the impact of transport from the movement of waste will also depend on the location and number of facilities.
- It is difficult to identify the extent of water effects as this will depend upon where facilities are located and operational process. However, both abstraction from and discharges to water courses are regulated by SEPA in order to protect the water environment.

Negative

- There is a potential to generate quantities of fly ash which will be required to be landfilled and/or recovered once stabilised.
- It is recognised that there will be emissions but it is noted that strict regulatory measures will ensure that air emissions are kept to level which will not harm human health or the environment.
- There will be impacts on local communities due to siting of the facility; however, the extent is uncertain.

Positive

- Increases recycling, composting and recovery rates when compared to the baseline.
- Smaller footprint compared to a new landfill.
- Option 4 diverts more from landfill than the baseline which will result in less uncontrolled emissions (e.g. leachate to land and water and methane to air).
- There are limits for air emissions for EfW which are set under WID and included in the PPC permit for the plant taking into account the ambient air quality in the area. There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified.
- Greenhouse Gas emissions are likely to reduce from the proposed technology in Option 4.
- Option 4 is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency and whether or not is will be classed as producing renewable energy.
- Potential for ROCs depends on the input to the plant and the type of technology.

OVERALL THIS OPTION PERFORMS BETTER THAN THE BASELINE TO WHICH IT IS COMPARED.

Mitigation

Mitigation measures for this option are described on page 38

Option 5

Option 5 includes improved recycling and composting levels far beyond existing AWP targets. These recycling and composting targets are considered as aspirational as they depend on the availability of substantial additional public funding as well as increased public participation. Option 5 has been modelled using Energy from Waste residual waste treatment technology and maximises diversion from landfill.

Components	**2020**
Source segregated Recycling and Composting	**48 %**
Source segregated recycling	32 %
Source segregated composting	16 %
Residual Waste Treatment	**51%**
Additional Recycling and Composting	9%
Additional Diversion from Landfill	36%
Landfill after treatment e.g. ash	6%
Landfill	**1 %**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

1. A. SEA OBJECTIVE 1 – To increase the rates of reuse, recycling and recovery in the area in accordance with the waste hierarchy

B. Is this part of AWP moving towards/away from objective	↑	**C. Short, medium or long term effects ?**	**M**	**D. Any other types of effects ?**	

E. Comments and Supporting Information :

Supporting information:

- Option 5 would increase source recycling/composting compared to the current performance. Option 5 further increases the amount of waste diverted from landfill through additional recycling and composting e.g. ash recovery. See summary of Option 5 above.
- Option 5 also moves waste further up the hierarchy by sending very little waste direct to landfill. 6% comes from residual waste treatment and 1% goes direct to landfill. Bottom ash is considered inert once stabilised and recycling as aggregate is technically feasible, but is not guaranteed.
- No biowaste or RDF is produced under this option

Reasons for Score in Boxes B - D:

Option 5 scored **positively** against objective 1 because:

- It increases in recycling, composting and recovery rates when compared to the baseline (current waste management practices being carried out in 2005/06). However, the aspirational targets will depend on public participation and public funding.
- Option 5 is diverting additional waste from landfill following residual waste management via EfW.
- Option 5 is also sending most waste for recovery before landfill.
- Bottom ash could be used as building material once stabilised and there is potential for fly ash to be used in future advanced technologies.

2. A. SEA OBJECTIVE 2 – To reduce landfilling of MSW waste in the area

B. Is this part of AWP moving towards/away from objective	↑	**C. Short, medium or long term effects ?**	**M**	**D. Any other types of effects ?**	

E. Comments and Supporting Information

Supporting Information :

In 2005/06, 77.75% of total municipal waste arising was sent to landfill. Option 5 proposes to reduce waste to landfill to 7 %. 6% is from residual waste treatment e.g. ash and 1% is waste going direct to landfill.

Reasons for score in Boxes B - E:

Option 5 scored **positively** against objective 2 because waste disposed to landfill can potentially reduce from 77.75% to 7%. Further to this, landfill is being reduced as much as possible with waste principally going for treatment before landfill.

3. A. SEA OBJECTIVE 3 – To manage waste in a way that reduces emissions to air

B. Is this part of AWP moving towards/away from objective	↑↓?	**C. Short, medium or long term effects ?**	**M/L**	**D. Any other types of effects ?**	✓

E. Comments and Supporting Information :

Supporting information :

- Based on LCA evidence, modelled around option 5 for air emissions, there is a net reduction of sulphur dioxide equivalent into the atmosphere compared to the baseline.
- It is noted that Air Quality Management Areas in Scotland are largely based on traffic movement and therefore, there is the potential for local effects.
- Public concern about air emissions from EfW facilities, particularly dioxin release and effects on human health (see objective10)
- Likely to be dust/odour issues associated with storage and handling of waste.

Reasons for Score in Boxes B - D:

Option 5 scored **positively** against objective 3 because:

- In comparison to the current waste management practice in 2005/06 where the majority of waste is landfilled; there will be a reduction in methane emissions to air
- There are limits for air emissions for EfW which are set under WID and included in the PPC Permit for the plant and these permits also take local air quality in the local area into account.
- There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified and are reduced when compared to landfill.
- Less handling of waste in EfW stage therefore less issue of bioaerosols and

	odour/dust. EfW is in an enclosed section of facility and odour and dust are burned at the combustion phase. Option 5 scored **negatively** against objective 3 because it is recognised that there will be emissions, however, mitigation and strict regulatory measures that will ensure that air emissions are kept to levels to prevent harm to human health and the environment. Option 5 scored a **question mark** against objective 3 because emissions will vary depending on facility and location. Option 5 scored as having potential for **cumulative effects** if facilities are sited in areas with existing air quality problems

4. A. SEA OBJECTIVE 4 - To manage waste in a way that reduces emissions to land and soil

B. Is this part of AWP moving towards/away from objective	↑↓	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information	
Supporting information :	**Reasons for score in Boxes B - D:**
▪ The majority of waste in the baseline is landfilled which creates a pollution legacy which will last up to 25 years or more. The long term effects cannot be judged for a municipal waste landfill site as no site has been stabilised and no licence has been surrendered under Waste Management Licensing regime. There is a risk of accidental pollution due to failure of landfill liner particularly over a long period. So, Option 5 offers more control and considerably reduces the pollution of soils than the baseline. ▪ Fly ash from EfW can be hazardous. Bottom ash is inert once stabilised. Bottom ash must be treated to prevent leaching of hazardous materials. ▪ Physical space required for the facility will be smaller than landfill.	Option 5 scored **positively** against objective 4 because: ▪ There is significantly less waste to landfill than in 2005/06 ▪ Smaller footprint compared to new landfill facilities Option 5 scored **negatively** against objective 4 because there is a potential to generate hazardous fly ash although extent is unknown

5. A. SEA OBJECTIVE 5 – To manage waste in a way that reduces emissions to water

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :	
Supporting information :	**Reasons for Score in Boxes B - D**:
▪ Based on LCA evidence, for emissions to water; option 5 performs better than the baseline for eutrophication and freshwater aquatic ecotoxicity. ▪ SEPA advise that a dry scrubber (BAT) and not a wet scrubber system would be used. ▪ There is a risk of accidental pollution and long term effects, due to failure of landfill liner. Option 5 offers more control and therefore considerably reduces the potential to pollute the water environment. However, there is potential leaching from fly ash which could be landfilled.	Option 5 scored as a **positive** against objective 5 because: ▪ There is less biodegradable waste going to landfill, therefore generation of leachate will be reduced and less impact on water. ▪ It performs better than the baseline for eutrophication and freshwater aquatic ecotoxicity.

6. A. SEA OBJECTIVE 6 - To manage waste in a way that protects biodiversity

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	

E. Comments and Supporting Information	
Supporting information :	**Reasons for score in Boxes B - D:**
No relevant biodiversity data was considered because sites for facilities are not identified and therefore it is impossible to predict specific effects. Biodiversity duty under the Nature Conservation (Scotland) Act will apply.	Option 5 scored as a **question mark** against objective 6 because: ▪ Impacts on biodiversity will depend on where facility is located and on where/how the outputs will be used ▪ Impacts of the different outputs from the treatment processes in Option 5 may have effects on biodiversity due to their potential impact on air, soil and water environments.

7. A. SEA OBJECTIVE 7 – To manage waste in a way that reduces greenhouse gas emissions

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :	
Supporting information :	**Reasons for Score in Boxes B - D**:

Based on LCA evidence; option 3 performs better than the baseline as it significantly reduces and mitigates against greenhouse gas emissions, particularly methane.	Option 5 scored **positively** against objective 7 because greenhouse gas emissions are likely to reduce.

8. A. SEA OBJECTIVE 8 - To reduce energy use and support the development of alternative, renewable, energy supplies

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	L	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting information:	Reasons for score in Boxes B - D:
▪ There is a potential for EfW to produce heat which can be used for industrial, commercial or residential use. ▪ Qualification for ROCs depends on the input and type of technology. See Section 3.8 ▪ According to LCA Option 2, reduces the loss of non-renewable resources compared to the baseline.	Option 5 scored **positively** against objective 8 because: ▪ It is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency. ▪ Potential for ROCs to apply. Qualification will depend on the type of technology and input to the plant.

9. A. SEA OBJECTIVE 9 – To reduce the movement of waste

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	?	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information:	Reasons for Score in Boxes B - D:
It is difficult to assess this objective because there is no information on where facilities will be located; or where markets for outputs from source segregated collections or residual treatment processes will be. The location and number of facilities will impact on the amount of waste transportation required. LCA indicates in terms of transport that multiple waste treatment sites are favourable compared to a single site.	Option 5 scored as a **question mark** against objective 9 because it is dependent on location and number of facilities. Option 5 scored as having **other types of effect** because of the potential secondary effects of through route traffic on communities.

10. A. SEA OBJECTIVE 10 - To manage waste in a way that protects communities and their local environment

B. Is this part of AWP moving towards/away from objective	↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information

Supporting information :	Reasons for score in Boxes B - D:
▪ **Odour/dust**: Potential odour/dust nuisance from all processes in this option via storage and mixing of wastes prior to combustion. ▪ **Noise**: More equipment, more noise (can be mitigated, but dependent on operator), level of impact dependent on location of facilities. ▪ **Litter**: Less landfill over long term may result in less litter from MSW sources, but all sites would need to be effectively operated. ▪ **Local Traffic**: Some effects on local communities from vehicle movements in local area. See objective 9. ▪ **Risk of Accident**: Potential increase risk of accidents from more processing equipment, waste being processed, but this will be need to be managed through risk assessment /regulation. ▪ **Health:** See assessment of health effects in environmental report. See Section 3.6 ▪ **Environmental Justice**: Potential environmental justice issues if new facilities are located on same sites as existing landfills or other facilities. ▪ **Local Energy Source:** It is potential the option can provide a local heat source (if CHP technology used), and this may have a positive impact for the community.	Option 5 scored **negatively** against objective 10 to reflect the fact that there will be impacts on local communities Option 5 scored as a **question mark** against objective 10 because facilities in this option will have local effects on local communities and the extent of this impact will depend on where the facilities are located. Option 5 scored as having **potential for cumulative effects** on local communities if new facilities are located on same sites as existing facilities.

11. A. SEA OBJECTIVE 11 – To manage waste in a way that reduces impacts on cultural heritage

B. Is this part of AWP moving towards/away from objective	?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information :	Reasons for Score in Boxes B - D:
Difficult to assess this objective because there is no information	Option 5 scored as a **question mark** against objective 11 because the impact

as to where facilities will be located. This will be considered through the land use planning system.	on cultural heritage is dependent on location of facilities. Potential for traffic levels & emissions to affect cultural heritage, but effects judged by group as likely to be relatively minor.

12. A. SEA OBJECTIVE 12 – To manage waste in a way that reduces impacts on landscape

B. Is this part of AWP moving towards/away from objective	**?**	**C. Short, medium or long term effects ?**	**M/L**	**D. Any other types of effects ?**	

E. Comments and Supporting Information :

Supporting information :	**Reasons for Score in Boxes B - D**:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the Land Use Planning System.	Option 5 scored as a **question mark** against objective 12 because it is dependent upon location of facilities. Potential for waste management facilities to intrude on landscape, particularly where stacks form part of facility, but impacts likely to be minor as long as sited sensitively.

Summary of Overall Effect of this Option:

The performance of option 5 against each objective can be summarised as follows:

Uncertainties

- A question mark was put next to a number of the criteria being assessed because the impact on the criteria depends on the site location. This includes impact on: local communities, cultural heritage, landscape and biodiversity. However, these criteria will be covered in more detail in site specific studies e.g. EIA and the site locations will be largely under the control of Land Use Planning.
- Impact from air emissions is dependent on facility, location and licence conditions.
- The significance of the impact of transport from the movement of waste will also depend on the location and number of facilities.
- It is difficult to identify the extent of water effects as this will depend upon where facilities are located and operational process. However, both abstraction from and discharges to water courses are regulated by SEPA in order to protect the water environment.

Negative

- There is a potential to generate quantities of fly ash which will be required to be landfilled and/or recovered once stabilised.
- It is recognised that there will be emissions but it is noted that strict regulatory measures will ensure that air emissions are kept to level which will not harm human health or the environment.
- There will be impacts on local communities due to siting of the facility; however, the extent is uncertain.

Positive

- Increases recycling, composting and recovery rates when compared to the baseline.
- Smaller footprint compared to a new landfill.
- Option 5 diverts more from landfill than the baseline which will result in less uncontrolled emissions (e.g. leachate to land and water and methane to air).
- There are limits for air emissions for EfW which are set under WID and included in the PPC permit for the plant taking into account the ambient air quality in the area. There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified.
- Greenhouse Gas emissions are likely to reduce from the proposed technology in Option 5.
- Option 5 is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency and whether or not is will be classed as producing renewable energy.
- Potential for ROCs depends on the input to the plant and the type of technology.

OVERALL THIS OPTION PERFORMS BETTER THAN THE BASELINE TO WHICH IT IS COMPARED.

Mitigation

Mitigation measures for this option are described on page 38

Option 6

Option 6 includes improved recycling and composting levels far beyond existing AWP targets. These recycling and composting targets are considered as aspirational as they depend on the availability of substantial additional public funding as well as increased public participation. Option 6 has been modelled using Energy from Waste residual waste treatment technology.

Components	2020
Source segregated Recycling and Composting	**48%**
Source segregated recycling	31 %
Source segregated composting	16 %
Residual Waste Treatment	**44%**
Additional Recycling and Composting	8%
Additional Diversion from Landfill	31%
Landfill after treatment e.g. ash	5%
Landfill	**8 %**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

1. A. SEA OBJECTIVE 1 – To increase the rates of reuse, recycling and recovery in the area in accordance with the waste hierarchy

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information :

Supporting information:

- Option 6 would increase source recycling/composting compared to the current performance. Option 6 further increases the amount of waste diverted from landfill through additional recycling and composting e.g. ash recovery. See summary of Option 6 above.
- Bottom ash is considered inert once stabilised and recycling as aggregate is technically feasible, but is not guaranteed.
- No biowaste or RDF is produced under this option

Reasons for Score in Boxes B - D:

Option 6 scored **positively** against objective 1 because:

- It increases in recycling, composting and recovery rates when compared to the baseline (current waste management practices being carried out in 2005/06). However, the aspirational targets will depend on public participation and public funding.
- Option 6 is diverting additional waste from landfill following residual waste treatment via EfW.
- Option 6 is also sending most waste for recovery before landfill.
- Bottom ash could be used as building material once stabilised and there is potential for fly ash to be used in future advanced technologies.

2. A. SEA OBJECTIVE 2 – To reduce landfilling of MSW waste in the area

B. Is this part of AWP moving towards/away from objective	↑	C. Short, medium or long term effects ?	M	D. Any other types of effects ?	

E. Comments and Supporting Information

Supporting Information :

In 2005/06, 77.75% of total municipal waste arising was sent to landfill. Option 6 proposes to reduce waste to landfill to 13 %. 5% is from residual waste treatment e.g. ash and 8% is waste going direct to landfill.

Reasons for score in Boxes B - E:

Option 6 scored **positively** against objective 2 because waste disposed to landfill can potentially reduce from 77.75% to 13%.

3. A. SEA OBJECTIVE 3 – To manage waste in a way that reduces emissions to air

B. Is this part of AWP moving towards/away from objective	↑↓?	C. Short, medium or long term effects ?	M/L	D. Any other types of effects ?	✓

E. Comments and Supporting Information :

Supporting information :

- Based on LCA evidence, modelled around option 6 for air emissions, there is a net reduction of sulphur dioxide equivalent into the atmosphere compared to the baseline.
- It is noted that Air Quality Management Areas in Scotland are largely based on traffic movement and therefore, there is the potential for local effects.
- Public concern about air emissions from EfW facilities, particularly dioxin release and effects on human health (see objective10)
- Likely to be dust/odour issues associated with storage and handling of waste.

Reasons for Score in Boxes B - D:

Option 6 scored **positively** against objective 3 because:

- In comparison to the current waste management practice in 2005/06 where the majority of waste is landfilled; there will be a reduction in methane emissions to air
- There are limits for air emissions for EfW which are set under WID and included in the PPC Permit for the plant and these permits also take local air quality in the local area into account.
- There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified and are reduced when compared to landfill.
- Less handling of waste in EfW stage therefore less issue of bioaerosols and odour/dust. EfW is in an enclosed section of facility and odour and dust are burned at the combustion phase.

	Option 6 scored **negatively** against objective 3 because it is recognised that there will be emissions, however, mitigation and strict regulatory measures that will ensure that air emissions are kept to levels to prevent harm to human health and the environment. Option 6 scored a **question mark** against objective 3 because emissions will vary depending on facility and location. Option 6 scored as having potential for **cumulative effects** if facilities are sited in areas with existing air quality problems

4.	**A. SEA OBJECTIVE 4 - To manage waste in a way that reduces emissions to land and soil**				
B. Is this part of AWP moving towards/away from objective	↑↓	**C. Short, medium or long term effects ?**	**M**	**D. Any other types of effects ?**	

E. Comments and Supporting Information	
Supporting information :	**Reasons for score in Boxes B - D:**
▪ The majority of waste in the baseline is landfilled which creates a pollution legacy which will last up to 25 years or more. The long term effects cannot be judged for a municipal waste landfill site as no site has been stabilised and no licence has been surrendered under Waste Management Licensing regime. There is a risk of accidental pollution due to failure of landfill liner particularly over a long period. So, Option 6 offers more control and considerably reduces the pollution of soils than the baseline. ▪ Fly ash from EfW can be hazardous. Bottom ash is inert once stabilised. Bottom ash must be treated to prevent leaching of hazardous materials. ▪ Physical space required for the facility will be smaller than landfill.	Option 6 scored **positively** against objective 4 because: ▪ There is significantly less waste to landfill than in 2005/06 ▪ Smaller footprint compared to new landfill facilities Option 6 scored **negatively** against objective 4 because there is a potential to generate hazardous fly ash although extent is unknown

5.	**A. SEA OBJECTIVE 5 – To manage waste in a way that reduces emissions to water**				
B. Is this part of AWP moving towards/away from objective	↑	**C. Short, medium or long term effects ?**	**M**	**D. Any other types of effects ?**	

E. Comments and Supporting Information :	
Supporting information :	**Reasons for Score in Boxes B - D**:
▪ Based on LCA evidence, for emissions to water; option 6 performs better than the baseline for eutrophication and freshwater aquatic ecotoxicity. ▪ SEPA advise that a dry scrubber (BAT) and not a wet scrubber system would be used. ▪ There is a risk of accidental pollution and long term effects, due to failure of landfill liner. Option 6 offers more control and therefore considerably reduces the potential to pollute the water environment. However, there is potential leaching from fly ash which could be landfilled.	Option 6 scored as a **positive** against objective 5 because: ▪ There is less biodegradable waste going to landfill, therefore generation of leachate will be reduced and less impact on water. ▪ It performs better than the baseline for eutrophication and freshwater aquatic ecotoxicity.

6.	**A. SEA OBJECTIVE 6 - To manage waste in a way that protects biodiversity**				
B. Is this part of AWP moving towards/away from objective	**?**	**C. Short, medium or long term effects ?**	**?**	**D. Any other types of effects ?**	

E. Comments and Supporting Information	
Supporting information :	**Reasons for score in Boxes B - D:**
No relevant biodiversity data was considered because sites for facilities are not identified and therefore it is impossible to predict specific effects. Biodiversity duty under the Nature Conservation (Scotland) Act will apply.	Option 6 scored as a **question mark** against objective 6 because: ▪ Impacts on biodiversity will depend on where facility is located and on where/how the outputs will be used ▪ Impacts of the different outputs from the treatment processes in Option 6 may have effects on biodiversity due to their potential impact on air, soil and water environments.

7.	**A. SEA OBJECTIVE 7 – To manage waste in a way that reduces greenhouse gas emissions**				
B. Is this part of AWP moving towards/away from objective	↑	**C. Short, medium or long term effects ?**	**M**	**D. Any other types of effects ?**	

E. Comments and Supporting Information :	
Supporting information :	**Reasons for Score in Boxes B - D**:
Based on LCA evidence; option 6 performs better than the baseline as it significantly reduces and mitigates against	Option 6 scored **positively** against objective 7 because greenhouse gas emissions are likely to reduce.

greenhouse gas emissions, particularly methane.

8. A. SEA OBJECTIVE 8 - To reduce energy use and support the development of alternative, renewable, energy supplies

B. Is this part of AWP moving towards/away from objective	C. Short, medium or long term effects ?	D. Any other types of effects ?
↑	L	

E. Comments and Supporting Information

Supporting information:

- There is a potential for EfW to produce heat which can be used for industrial, commercial or residential use.
- Qualification for ROCs depends on the input and type of technology. See Section 3.8
- According to LCA Option 2, reduces the loss of non-renewable resources compared to the baseline.

Reasons for score in Boxes B - D:

Option 6 scored **positively** against objective 8 because:

- It is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency.
- Potential for ROCs to apply. Qualification will depend on the type of technology and input to the plant.

9. A. SEA OBJECTIVE 9 – To reduce the movement of waste

B. Is this part of AWP moving towards/away from objective	C. Short, medium or long term effects ?	D. Any other types of effects ?
?	?	✓

E. Comments and Supporting Information :

Supporting information:

It is difficult to assess this objective because there is no information on where facilities will be located; or where markets for outputs from source segregated collections or residual treatment processes will be. The location and number of facilities will impact on the amount of waste transportation required.
LCA indicates in terms of transport that multiple waste treatment sites are favourable compared to a single site.

Reasons for Score in Boxes B - D:

Option 6 scored as a **question mark** against objective 9 because it is dependent on location and number of facilities.

Option 6 scored as having **other types of effect** because of the potential secondary effects of through route traffic on communities.

10. A. SEA OBJECTIVE 10 - To manage waste in a way that protects communities and their local environment

B. Is this part of AWP moving towards/away from objective	C. Short, medium or long term effects ?	D. Any other types of effects ?
↓?	M/L	✓

E. Comments and Supporting Information

Supporting information :

- **Odour/dust**: Potential odour/dust nuisance from all processes in this option via storage and mixing of wastes prior to combustion.
- **Noise**: More equipment, more noise (can be mitigated, but dependent on operator), level of impact dependent on location of facilities.
- **Litter**: Less landfill over long term may result in less litter from MSW sources, but all sites would need to be effectively operated.
- **Local Traffic**: Some effects on local communities from vehicle movements in local area. See objective 9.
- **Risk of Accident**: Potential increase risk of accidents from more processing equipment, waste being processed, but this will be need to be managed through risk assessment /regulation.
- **Health:** See assessment of health effects in environmental report. See Section 3.6
- **Environmental Justice**: Potential environmental justice issues if new facilities are located on same sites as existing landfills or other facilities.
- **Local Energy Source:** It is potential the option can provide a local heat source (if CHP technology used), and this may have a positive impact for the community.

Reasons for score in Boxes B - D:

Option 6 scored **negatively** against objective 10 to reflect the fact that there will be impacts on local communities

Option 6 scored as a **question mark** against objective 10 because facilities in this option will have local effects on local communities and the extent of this impact will depend on where the facilities are located.

Option 6 scored as having **potential for cumulative effects** on local communities if new facilities are located on same sites as existing facilities.

11. A. SEA OBJECTIVE 11 – To manage waste in a way that reduces impacts on cultural heritage

B. Is this part of AWP moving towards/away from objective	C. Short, medium or long term effects ?	D. Any other types of effects ?
?	M/L	

E. Comments and Supporting Information :

Supporting information :

Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the land use planning system.

Reasons for Score in Boxes B - D:

Option 6 scored as a **question mark** against objective 11 because the impact on cultural heritage is dependent on location of facilities. Potential for traffic levels & emissions to affect cultural heritage, but effects judged by group as likely to be relatively minor.

12.	A. SEA OBJECTIVE 12 – To manage waste in a way that reduces impacts on landscape				
B. Is this part of AWP moving towards/away from objective	**?**	**C. Short, medium or long term effects ?**	**M/L**	**D. Any other types of effects ?**	

E. Comments and Supporting Information :

Supporting information :	**Reasons for Score in Boxes B - D**:
Difficult to assess this objective because there is no information as to where facilities will be located. This will be considered through the Land Use Planning System.	Option 6 scored as a **question mark** against objective 12 because it is dependent upon location of facilities. Potential for waste management facilities to intrude on landscape, particularly where stacks form part of facility, but impacts likely to be minor as long as sited sensitively.

Summary of Overall Effect of this Option:

The performance of option 6 against each objective can be summarised as follows:

Uncertainties

- A question mark was put next to a number of the criteria being assessed because the impact on the criteria depends on the site location. This includes impact on: local communities, cultural heritage, landscape and biodiversity. However, these criteria will be covered in more detail in site specific studies e.g. EIA and the site locations will be largely under the control of Land Use Planning.
- Impact from air emissions is dependent on facility, location and licence conditions.
- The significance of the impact of transport from the movement of waste will also depend on the location and number of facilities.
- It is difficult to identify the extent of water effects as this will depend upon where facilities are located and operational process. However, both abstraction from and discharges to water courses are regulated by SEPA in order to protect the water environment.

Negative

- There is a potential to generate quantities of fly ash which will be required to be landfilled and/or recovered once stabilised.
- It is recognised that there will be emissions but it is noted that strict regulatory measures will ensure that air emissions are kept to level which will not harm human health or the environment.
- There will be impacts on local communities due to siting of the facility; however, the extent is uncertain.

Positive

- Increases recycling, composting and recovery rates when compared to the baseline.
- Smaller footprint compared to a new landfill.
- Option 6 diverts more from landfill than the baseline which will result in less uncontrolled emissions (e.g. leachate to land and water and methane to air).
- There are limits for air emissions for EfW which are set under WID and included in the PPC permit for the plant taking into account the ambient air quality in the area. There are recognised emission benchmarks for waste incinerators so SEPA are confident that air emissions can be quantified.
- Greenhouse Gas emissions are likely to reduce from the proposed technology in Option 6.
- Option 6 is energy efficient (compared to baseline) and will produce electricity and / or heat. However, it is not known what type of facility will be used and therefore the extent of thermal efficiency and whether or not is will be classed as producing renewable energy.
- Potential for ROCs depends on the input to the plant and the type of technology.

OVERALL THIS OPTION PERFORMS BETTER THAN THE BASELINE TO WHICH IT IS COMPARED.

Mitigation

Mitigation measures for this option are described on page 38

PART 3 – ASSESSMENT FINDINGS - CONCLUSIONS

4.9 Introduction

4.9.1 This part summarises the key findings from the assessment about the potential environmental effects of the options. It brings together the key points from the assessment matrices set out in Part 2 and sets the framework for mitigation actions that are described in Chapter 5. This section summarises the effects firstly by option and then by environmental objective. For detailed information about the assessment please refer to matrices in Part 2.

4.9.2 Table 15 on the following page summarises the identified effects across the six options. For each environmental objective, the top row shows the score given and the second row highlights where cumulative and other effects are possible.

4.10 Assessment Summary – Overview

4.10.1 Overall, all six options could potentially have a combination of positive and negative significant environmental effects. When considered together, the options tend to present more potentially positive effects, although it was difficult to identify the nature and extent of some effects due to the strategic nature of the AWP and due to the fact that it does not identify specific technologies or locations. This positive score is not surprising as all options were designed to improve the environmental performance of waste management in the AWP area.

4.10.2 It is the case, however, that all waste management options have the potential to create adverse environmental effects that must be considered and where possible mitigated. The assessment process found that these adverse environmental effects were likely to be most prevalent in relation to impacts on local communities and upon air quality. Land quality was also potentially likely to be affected depending on how waste derived compost and other outputs were used.

4.10.3 There are uncertainties for all six options as to their potential effects on biodiversity, cultural heritage and landscape. This is because the environmental effects will depend on the type of facilities and where they are located. The potential effects on biodiversity will also depend on where or how the outputs of the processes will be used. Regulations are in place to protect the environment and local Biodiversity Action Plans should be taken into account.

4.10.4 All six options should have a positive effect on reuse, recycling and recovery in the Lothian and Borders area. However, there are concerns about the quality of the likely output from Mechanical Biological Treatment and Anaerobic Digestion in option 1 causing questions to arise as to whether or not there will be markets for all the stabilised biowaste created and the Refuse Derived Fuel (RDF). This could be mitigated through market testing. Also, one of the key differences between option 2 and option 3 compared to option 4, option 5 and option 6 is that options 4, 5 and 6 are far more ambitious in terms of up front source segregated recycling and composting.

4.10.5 There is a predicted reduction in waste being disposed to landfill compared to baseline waste management practices 2005/2006 in all six options. Option 1 is predicted to send 21% to landfill, option 2 is predicted to send 19 % to landfill, option 3 is predicted to send 9% to landfill, option 4 is predicted to send 8% to landfill, option 5 is predicted to send 7% and option 6 is predicted to send 13% to landfill. options 3,4 and 5 only send 1% direct to landfill and the rest is after residual waste treatment and therefore these options maximise the diversion from landfill.

4.10.6 The significance of the potential environmental effects of transport from the movement of waste will also depend on the location and number of the facilities. The uncertainties surrounding the site location will be dealt with through Land Use Planning and site specific assessments such as Environmental Impact Assessments. Land Use Planning will seek to ensure that facilities are sited to make best use of existing transport facilities and keep facilities close to source of waste, by applying the proximity principle.

Table 15 – Summary of Assessment Findings Table 19 – Summary of Assessment Findings

SEA Objective	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Summary
1. Increase rates of Recycling and Recovery	↑?	↑	↑	↑	↑	↑	All options moving towards this objective.
2. Reduce landfilling of municipal waste	↑	↑	↑	↑	↑	↑	All options moving towards this objective.
3. Reduce emissions to air	↑↓?	↑↓?	↑↓?	↑↓?	↑↓?	↑↓?	All options have both positive and negative effects although the extent of these is uncertain. Emissions to air require mitigation.
	✓	✓	✓	✓	✓	✓	
4. Reduce emissions to land	↑↓?	↑↓	↑↓	↑↓	↑↓	↑↓	All options have both positive and negative effects. Emissions to land require mitigation.
	✓						
5. Reduce emissions to water	↑?	↑	↑	↑	↑	↑	Option 1 has potential to have negative effects on water. Other options moving towards this objective.
	✓						
6. Protect and enhance biodiversity	?	?	?	?	?	?	Uncertain as effects on biodiversity dependent upon where facilities are sited. Need to assess effects at land use planning stage.
7. Reduce GHG emissions	↑	↑	↑	↑	↑	↑	All options moving towards this objective.
8. Reduce energy use and support renewables	↑↓	↑	↑	↑	↑	↑	All options moving towards this objective, except option 1 which is more energy intensive.
9. Reduce movement of waste	?	?	?	?	?	?	Uncertain as movement of waste dependent upon where facilities are sited. Need to assess effects at land use planning stage.
	✓	✓	✓	✓			
10. Protect communities and the local environment	↓?	↓?	↓?	↓?	↓?	↓?	All options will have some negative effects on local environment and communities. These can be mitigated through good siting, design and effective regulation once sites are licenced.
	✓	✓	✓	✓	✓	✓	
11. Protect and enhance cultural heritage	?	?	?	?	?	?	Uncertain as effects on biodiversity dependent upon where facilities are sited. Need to assess effects at land use planning stage.
12. Protect and enhance landscape	?	?	?	?	?	?	Uncertain as effects on biodiversity dependent upon where facilities are sited. Need to assess effects at land use planning stage.

4.10.7 Overall, while all six options may result in both positive and negative effects in respect of the environmental objectives, it is very likely to be the case that all six will deliver significantly better outcomes than the current situation where rates of landfill of waste remain very high. The aim of a long term move from a reliance on landfill to much higher rates of reuse, recycling and recovery in association with use of new technologies for management of residual waste will likely result in overall environmental improvements. It is also important to note that negative effects can be addressed through effective mitigation – details of proposed mitigation can be found in the matrices and are summarised in Chapter 5. In particular, all options and waste management technologies that may emerge under them will require to be subject to rigorous regulatory processes including planning, PPC and Waste Management Licencing which are designed to protect the environment.

SEPA expects these to be a key part of the mitigation measures implemented to prevent, reduce and offset adverse effects.

4.11 Summary of Life Cycle Analysis Results

As noted in 4.8.1, a Life Cycle Analysis of the options has been undertaken using a modelling process known as "WRATE". This has been used to inform the completion of the matrices in Part 2. The following summarises the 'default impacts' (Global Warming, Abiotic Depletion, Freshwater Aquatic Ecotoxicity, Eutrophication, Acidification and Human Toxicity as defined by WRATE) results for the 6 options and a baseline. The key points are:

- All options show an offset against impact for all indicators with the following exceptions: All options under potential for eutrophication and the baseline and option 2 for global warming potential.

- Options 5 & 6 perform best against all indicators. Option 4 performs best against all options except the baseline under human toxicity potential.

- On the basis of this, options 4,5 & 6 should be regarded as roughly equivalent in terms of environmental performance.

- The key sensitivity is the distance of bulk haulage of recyclate and residual wastes, but as this affects principally the magnitude of the results, the relative performance of the different options is not significantly affected.

- Collection vessel type, collection vehicle mileage and urban/rural split has no significant effect on the results.

- For all options, multiple waste treatment sites are favourable compared to a single site in terms of transport.

A full summary of the LCA results is provided in Appendix A of the BPEO Review which accompanies this consultation.

4.12 Assessment Summary by Environmental Objective

4.12.1 Objective 1 - Increase reuse, recycling and recovery

All of the options will potentially improve recycling and recovery rates and significantly reduce the amount of waste going to landfill. This represents a more positive use of waste as a material asset. All options also support the use of waste as a fuel, which is significantly better than disposal to landfill.

4.12.2 Objective 2 – Reduce landfill of municipal waste

All of the options are predicted to reduce the amount of waste going to landfill and therefore all score positive in relation to this objective. Option 1 is predicted to send 21% to landfill, Option 2 is predicted to send 19 % to landfill, Option 3 is predicted to send 9% to landfill, Option 4 is predicted to send 8% to landfill, Option 5 is predicted to send 7% and Option 6 is predicted to send 13% to landfill. Option 3,4 and 5 only send 1% direct to landfill and the rest is after residual waste treatment and therefore maximising the diversion from landfill.

4.12.3 Objective 3 – Reduce emissions to air

All six options have both positive and negative effects on air. On the positive side, in comparison to current waste management practice where the majority of waste is landfilled, there will likely be a reduction in emissions to air. There are limits for air emissions for EfW, MBT and AD which are all strictly regulated under PPC Regulations and will require PPC permits. The process of issuing PPC permits should also ensure the use of Best Available Techniques (BAT). Greenhouse gas emissions are likely to reduce in application of all four process options compared to the current waste

management practice baseline. However, in option 1 there are air emissions (odour, dust, bio-aerosols etc) which need to be properly managed. The design of technology could also include odour abatement techniques. There is a potential for cumulative effects on air quality with all six options if facilities are located in areas with existing air quality problems. These effects will require to be addressed through effective mitigation.

Local air quality can be mitigated through good siting of facilities through the Land Use Planning System. The full range of proposed mitigation measures for dealing with emissions to air are summarised in Chapter 5.

4.12.4 **Objective 4 – Reduce emissions to land and soil**

All six options are likely to have a positive effect on land because there is less waste going to landfill compared to the current waste management practice baseline. However, an uncertainty in option 1 is that there is a dependency on the capacity of the market to absorb the outputs of compost and stabilised biowaste in relation to land application. Any composted or stabilised biowaste being applied to land needs to undergo a risk assessment. Waste being incorporated to land will also fall under the Waste Management Licensing Regulations in order to protect human health and the environment. It was highlighted that in all six options there would be a negative effect because there is a potential to generate hazardous ash although the extent of this is unknown. However, the EfW facility will be regulated in respect of handling and managing ash residues under PPC permits to protect human health and the environment.

The full range of proposed mitigation measures for dealing with emissions to land are summarised in Chapter 5.

4.12.5 **Objective 5 – Reduce emissions to water**

All six options are likely to have a positive effect on water because there is less waste going to landfill (as landfill sites have the potential to cause harm to waterbodies and groundwater from leaching of contaminants). It was also noted that there will likely be considerably less going to landfill in option 3, 4 and 5. In option 1, there is a need to contain and manage emissions from the processes and manage the application of outputs on the water environment. There is also uncertainty about what happens to the outputs. For example, will they be applied to land or go to landfill? Additionally, there is uncertainty as to the cumulative effects of application of these outputs to land from option 1 if there are other pressures on water bodies adjacent to the land. The land use planning system will need to ensure that facilities are well sited and that water quality is protected from adverse effects. Also, The Water Environment (Controlled Activities) (Scotland) Regulations have been brought in to protect Scotland's water environment. The full range of proposed mitigation measures for dealing with emissions to water are summarised in Chapter 5.

4.12.6 **Objective 6 – Protect and enhance biodiversity**

The AWP review does not identify types of facilities or their locations. Accordingly, it is not possible to identify individual effects upon biodiversity from any of the options at this stage as this will be very dependent upon location. However, waste management facilities do have the potential to impact upon biodiversity – for example, where facilities are sited on or close to protected habitats or where protected habitats and species may be disturbed by activities and noise from a facility. There may be some limited opportunities to enhance biodiversity through the design and layout of a site. The reduction in waste going to landfill will reduce the footprint of land required for waste management facilities, which may have some biodiversity benefits. It is important that more detailed level assessment is undertaken as and when sites are considered in order that significant effects on biodiversity can be identified and appropriate mitigation measures put in place.

The full range of proposed mitigation measures for dealing with impacts on biodiversity are summarised in Chapter 5.

4.12.7 **Objective 7 – Reduce greenhouse gas emissions**

All the options considered recorded a likely marked improvement in release of greenhouse gases. All options are designed to move away from the currently high levels of disposal of MW to landfill, which will in the long term significantly reduce emissions of methane, a powerful greenhouse gas.

4.12.8 **Objective 8 – Reduce energy use and support renewables**

Many of the options considered had the potential to generate energy from combustion of waste. This energy is classified as renewable energy under the Renewables Obligation (Scotland) Order and can qualify for Renewables Obligation Certificates (ROCs). Accordingly, this source of energy will contribute to meeting Scotland's target of generating 40% of its energy needs from renewable sources by 2020.

Option 1 is more energy intensive in that the significant amounts of energy required to operate MBT facilities offsets some of the benefits of generating energy through combustion. There is the potential for such facilities to generate energy to power themselves.

Option 1 has positive and negative effects on energy use and the development of alternative renewable energy supplies. The MBT and AD processes in option 1 are energy intensive. However, there is the ability to offset this energy use against the production of energy from MBT and AD. All four options have the potential for ROCs to apply. Options 2, 3 4, 5 and 6 are energy efficient compared to the baseline of current waste management practice 2005/06 and will produce electricity and / or heat. The Planning System could support the location of the EfW facility being located in proximity to heat users.

4.12.9 **Objective 9 – Reduce the movement of waste**

The significance of the impact of transport from the movement of waste will depend on the location and number of facilities. It is very likely that there will be impacts from transport of waste, including emissions from waste vehicles and impacts on local communities living near waste facilities and those living on "through routes". There is also the potential for waste transport movements to have negative effects on local air quality. The uncertainties surrounding the site location mean though that none of these effects can be quantified at this stage. Accordingly, it is important that these will be dealt with through land use planning and through site specific assessments such as Environmental Impact Assessments. Land use planning will also seek to ensure that facilities are sited to make best use of existing transport networks and keep treatment facilities close to source of the waste, by applying the proximity principle.

4.12.10 **Objective 10 – Protect local communities and their local environment**

As noted above, SEPA has used the DEFRA study to guide its consideration of human health as it is not possible at this stage to consider potential effects on individual areas as specific facilities and sites are not identified in the AWP review. A summary of the generic effects of waste management facilities on human health is provided in Chapter 3.

All of the options assessed will likely have some adverse effects impacts upon local communities, but the extent and nature of effects will depend upon where facilities are located. Generic effects which have been identified include the potential for noise, odour, visual impacts and increased traffic generated by facilities. There is also the potential for local air quality to be affected. All of these effects can be effectively mitigated through good siting, good design and effective operation of facilities if and when they come forward. This will need to be secured through land use planning decisions and through SEPA's regulatory controls. It is important that potential impacts on local communities are more fully considered as proposals for facilities are considered in land use Development Plans. Of primary importance is the need to ensure that local communities have an early and effective opportunity to present their views regarding and proposals that do come forward.

The assessment identified the potential for cumulative effects on local communities if new facilities are located on or adjacent to existing waste management sites. This is especially important where local communities are already living with the effects of existing waste management facilities. These factors do, however, have to be balanced however with the benefits (e.g. reduced transport) that

may accrue from co-location of waste management facilities. This will need to be addressed again as part of land use planning and in SEA of Development Plans as they are brought forward.

The full range of proposed mitigation measures for dealing with impacts on population and local communities are summarised in Chapter 5.

4.12.11 **Objective 11 – Protect and enhance cultural heritage**

The AWP review does not identify types of facilities or their locations. Accordingly, it is not possible to identify individual environmental effects upon landscape from any of the options at this stage as this will be very dependent upon location. However, waste management facilities do have the potential to impact upon cultural heritage. Potential effects may arise if waste management facilities are sited where they may affect a protected building or its setting or where the setting of a wider area (e.g. Conservation Area or World Heritage Site) may be affected. Therefore it is important that more detailed level assessment is undertaken as and when sites are considered in order that significant effects on cultural heritage can be identified and appropriate mitigation measures put in place.

The full range of proposed mitigation measures for dealing with impacts on cultural heritage are summarised in Chapter 5.

4.12.12 **Objective 12 – Protect and enhance landscape**

The AWP review does not identify types of facilities or their locations. Accordingly, it is not possible to identify individual environmental effects upon landscape from any of the options at this stage as this will be very dependent upon location. However, waste management facilities do have the potential to impact upon landscape. Therefore it is important that more detailed level assessment is undertaken as and when sites are considered in order that significant effects on landscape can be identified and appropriate mitigation measures put in place.

The full range of proposed mitigation measures for dealing with effects on landscape are summarised in Chapter 5.

CONSULTATION QUESTION C - Do you have any comments on the evaluation of the environmental effects of the options and the findings derived from them ? If not, please explain which parts of the evaluation you disagree with.

CONSULTATION QUESTION D - Has the evaluation covered all of the environmental issues that you would like to see considered ? If not, please tell us which environmental issues should also be included.

CHAPTER 5

SUMMARY OF MITIGATION MEASURES REQUIRED

5.1 This section of the Environmental Report is designed to meet the requirements of paragraph 7 of Schedule 2 of the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004. Namely, a summary of proposed mitigation measures to prevent, reduce or as far as possible offset any adverse environmental effects. All mitigation actions identified have been recorded in the matrices set out in Part 2 of Chapter 4.

5.2 The following mitigation actions are identified in Table 16 below. Please note, these have been grouped for brevity and clarity. Detailed mitigation actions are set out in the assessment matrices in Chapter 4. It is important that these mitigation measures are taken into account by other plan makers when preparing other plans to take forward the AWP review.

Table 16 – Summary of Mitigation Actions

Mitigation Identified	Why	By Whom and When
Planning - The land use planning system will need to ensure that facilities are sited and designed in a way that reduces impacts on the environment. In particular, planning can: • Consider visual impact and landscape effects • Protect amenity of local communities • Consider transport routes • Site facilities using the proximity principle to reduce transport and provide source for heat and electricity generated • Consider cultural heritage effects • Protecting quality of the environment, particularly sensitive receptors such as protected sites, AQMAs, downgraded waterbodies etc • Consider LBAPs when making decisions As part of the development for proposals for residual waste management facilities, SEPA and the Scottish Executive are encouraging Local Authorities to provide details of the site selection strategy which includes: evidence that robust and transparent land-use planning criteria and processes were adopted; evidence that all sites selected are compatible with the relevant land-use Development Plans and have taken cognisance of other material considerations, such as national policy, and suitable for the technology envisaged; and evidence that the site(s) selected for the funding bid have been consulted upon and approved by the relevant local authority.	It is not possible to assess specific effects in the AWP as it is not a land use document, therefore more specific assessment is required when these decisions are made.	Planning Authorities during preparation of Development Plans and in Development Management decisions. SEPA must be consulted on these and will provide its view when detailed proposals emerge.
Operation – A range of regulatory controls exist to ensure that waste management facilities are designed and operated in a way that protects the environment and human health. As and when proposals for facilities come forward, these should be used to address potential effects identified in this assessment. In particular, the	It is not possible to assess specific effects in the AWP as no facilities are being put forward at this time,	SEPA during its regulatory activities once proposals are identified and applications

controls can: • Ensure effective odour abatement equipment is installed • Apply BAT (Best Available Techniques) to ensure facilities meet high standards and reduce emissions to air and water • Protect quality of the environment, particularly sensitive receptors such as protected sites, AQMAs, downgraded waterbodies • Consider human health effects	therefore more specific assessment is required.	submitted.
Considering Bids and Tendering for Proposals– Further details about the performance of some of the bids to the Scottish Executive could be sought as part of the decision making process on what bids should go forward. For example, good environmental performance of facilities in terms of energy efficiency, reduced GHG emissions, high recycling rates and use of BAT should be factored into decision making. Tenders for facilities should also seek highest environmental performance from bidders.	This assessment has not considered specific proposals. There is an opportunity though to ensure that those proposals that do come forward for funding represent the best available technology and environmental performance.	Scottish Executive in its review of the bids. Also Councils in tendering for facilities.
Waste Outputs - Undertake market testing undertaken before facilities are developed to ensure that there is a viable and environmentally acceptable market for outputs – e.g. reuse of ash as a building material, composted material etc In addition, risk assessment criteria must be applied for the application of outputs from treatment processes with respect to their impact on the air, soil and water environment and therefore biodiversity.	Viable markets are required for outputs to reduce risk of these having to be landfilled. Risk assessment required to fully consider impacts upon receiving environment.	Scottish Executive as part of consideration of bids.
Thermal Efficiency – Ensure that any Energy from Waste facility has maximum thermal efficiency to maximise generation of heat and electricity. These should be in line with SEPA's Thermal Treatment Guidelines[10]	To maximise potential for electricity and heat generation.	SEPA, during PPC regulation.
Engagement and Involvement – Local communities potentially affected by waste management facilities should be given early and effective opportunities to involve themselves in decision making. This means putting into place effective consultation and participation processes, making the process understandable for lay audiences and providing communities which may be affected with a full and proper opportunity to express its view. SEPA will use its communication plan to explain its regulatory responsibilities to protect the environment &	To ensure that there is effective opportunity for local people to engage in decision making processes. To promote an understanding of how environmental and human health effects of waste	Planning Authorities during Development Plan process. SEPA through PPC and other regulatory processes. SEPA will use its communication plan.

[10] *SEPA has published Thermal Treatment Guidelines(www.sepa.org.uk/pdf/nws/guidance/thermal_treatment.pdf) and is also developing criteria for thermal treatment of waste which will be available later in the year.*

human health in respect of waste management facilities as well as regulatory powers used to enforce these responsibilities.	management facilities can be controlled.	
Design – Facilities should be designed to enhance the environment where possible. For example, through remediation and re-use of derelict sites, through habitat enhancement on site.	To promote enhancement through development	Planners when making development management decisions.
Other Plans and Programmes – This assessment is a strategic assessment that is consistent with the scale and nature of the AWP Review. There will be a need for more detailed level assessment to take place as more detailed level plans and programmes are prepared. In particular, Development Plans which identify locations or areas of search criteria for waste management facilities will need to consider the environmental implications of proposed locations. This is particularly the case for those issues which SEPA has not been able to evaluate in this SEA as they are location dependent: biodiversity, landscape and cultural heritage.	To ensure that appropriate consideration is given to environmental effects as more detailed plans which implement the AWP are developed.	Other Responsible Authorities as they take forward SEA of other relevant plans and programmes.

It is expected that these actions will be taken forward as further details about the types of facilities being proposed and their locations are available. Many of these measures can be taken further through SEA of lower level plans and programmes that will deliver the AWP when it is adopted.

CONSULTATION QUESTION E - **Do you think SEPA has identified appropriate mitigation actions to prevent, reduce and as fully as possible offset any significant adverse effects of the plan on the environment ?**

CHAPTER 6

MONITORING

6.1 SEPA conducts an annual review of progress in respect of delivering the actions set out in the AWP. These annual reports report on waste arisings and composition in the AWP area and rates of recycling. The most recent Annual Report can be viewed on SEPA's website at: **www.sepa.org.uk/nws/guidance/annual_reports0506/lothian/index.html** .

6.2 These annual reports will continue to monitor waste related indicators in the Lothian and Borders area and this will be used as a key part of the monitoring programme.

6.3 In addition, the following monitoring indicators are proposed in Table 17. Please note that these are for consultation and will be finalised when the AWP is adopted.

Table 17 – Draft monitoring Indicators

Indicator	Target	Source
Municipal waste arisings in LBAWP area	Reduce	SEPA Waste Digest
Recycling Rates in LBAWP Area	Increase	SEPA AWP Monitoring
Municipal Waste disposed to landfill in LBAWP area	Reduce	SEPA AWP Monitoring
Transport of municipal waste in LBAWP area	Reduce	SEPA / Councils
Greenhouse gas emissions from waste facilities in AWP Area	Reduce	SPRI
Pollution incidents at waste management facilities in LBAWP area resulting in enforcement action from SEPA	None	SEPA
Amount of renewable energy generated	Increase	Waste operators
Number of Air Quality Management Areas in AWP which waste facilities contribute to	None	Local Authority AQMA designations

CONSULTATION QUESTION F - Are these monitoring indicators suitable for monitoring the significant environmental effects that may arise from implementing the Area Waste Plan ?

CONSULTATION QUESTION G - Are there any other points in respect of this Environmental Report that you would wish to make ?

CHAPTER 7

NEXT STEPS

7.1 This Environmental Report will be placed on consultation, with the AWP Review for a period of seven weeks closing on 22 August 2007.

7.2 Comments on this Environmental Report, or on the proposals in the AWP Review should be sent, **before 22 August 2007** to:

FREEPOST
Lothian and Borders AWP Consultation
SEPA Edinburgh Office
Clearwater House
Heriot Watt Research Park
Riccarton
Edinburgh. EH14 4AP

Or by email to:

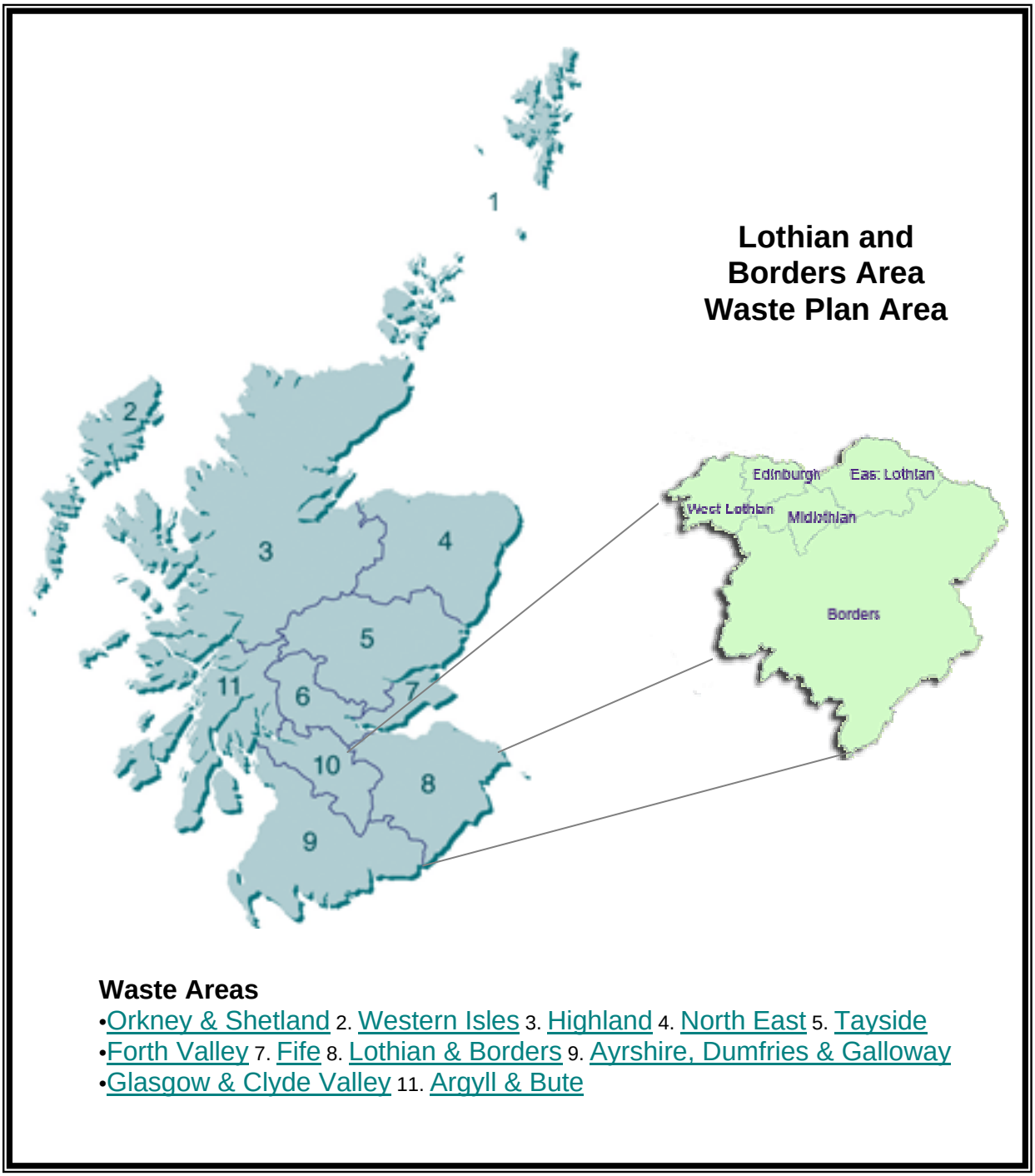
lothianandbordersAWP@sepa.org.uk

7.3 SEPA must take account of the Environmental Report and of any views expressed upon it during the consultation period prior to adopting the revised AWP. How this has occurred will be set out in an SEA Statement which will be published when the revised AWP is adopted.

7.4 The next steps in the SEA process following consultation on the Environmental Report are proposed as follows:

Stage	Proposed Time (Indicative)
Consultation Period on Environmental Report	Commences 4 July 2007
Consultation Closes	22 August 2007
SEPA must take account of Environmental Report and views expressed upon it when finalising AWP	Aug – Nov 2007
SEPA publishes revised AWP	Nov 2007
SEPA publishes SEA Statement	Nov 2007
Scottish Executive to take account of revised AWP and Environmental Report findings in its decisions on Strategic Waste Funding bids	After AWP adoption
Monitoring of environmental effects	After plan implementation

Appendix 1 – Map Showing Area Covered by Lothian & Borders Area Waste Plan



Waste Areas

•Orkney & Shetland 2. Western Isles 3. Highland 4. North East 5. Tayside
•Forth Valley 7. Fife 8. Lothian & Borders 9. Ayrshire, Dumfries & Galloway
•Glasgow & Clyde Valley 11. Argyll & Bute

Appendix 2 – Summary of Other Relevant Plans, Programmes and Environmental Objectives

NATIONAL AND INTERNATIONAL LEVEL PLANS		
Landfill Directive 99/31/EC	**Authority: European Commission**	**Date: 1999**

The Directive aims to reduce the amount of their biodegradable municipal waste sent to landfill. The main requirements of the Directive are that:

- All landfill sties are to classifies as either hazardous, non hazardous or inert.
- Full costs to be met by the gate price
- Only treated waste may by landfilled
- Once a landfill site is classified, the Directive dictates the types of wastes it can accept
- Certain wastes will be banned from landfills over a number of years - liquids, explosives, infectious clinical wastes and tyres

The Directive sets out successive targets for reducing municipal waste. Municipal waste must be reduced to 75% of the 1995 baseline by 2010, 50% by 2013 and 35% by 2020. The Directive also requires Member States to set up a national strategy for the implementation of these targets.

The Directive has been transposed in Scotland by the Landfill (Scotland) Regulations 2003

Plan: National Waste Strategy	**Authority: SEPA/Scottish Executive**	**Date: 1999**

The National Waste Strategy: Scotland sets out a framework for sustainable waste management in Scotland and marks a fundamental change in the way waste is managed.

Link - www.sepa.org.uk/pdf/publications/nws/nationalwastestrategy.pdf

The objectives of the National Waste Strategy are set out in Schedule 12 of the Environment Act 1995. These are:

1. Ensuring that waste is recovered or disposed of without endangering human health and without using processes or methods which could harm the environment and, in particular, without -
   (a) risk to water, air, soil, plants or animals
   (b) causing nuisance through noise or odours; or
   (c) adversely affecting the countryside or places of special interest.

2. Establishing an integrated and adequate network of waste disposal installations, taking account of the best available technology not involving excessive costs.

3. Ensuring that the network referred to in paragraph 2 above enables -
   (a) the European Community as a whole to become self-sufficient in waste disposal, and the Member States individually to move towards that aim, taking into account geographical circumstances or the need for specialised installations for certain types of waste; and
   (b) waste to be disposed of in one of the nearest appropriate installations, by means of the most appropriate methods and technologies in order to ensure a high level of protection for the environment and public health.

4. Encouraging the prevention or reduction of waste production and its harmfulness, in particular by -
   (a) the development of clean technologies more sparing in their use of natural resources;
   (b) the technical development and marketing of products designed so as to make no contribution or to make the smallest possible contribution, by the nature of their manufacture, use or final disposal, to increasing the amount or harmfulness of waste and pollution hazards;
   (c) the development of appropriate techniques for the final disposal of dangerous substances contained in waste destined for recovery.

5. Encouraging -
   (a) the recovery of waste by means of recycling, re-use or reclamation or any other process with a view to extracting secondary raw materials; and
   (b) the use of waste as a source of energy.

Plan: National Waste Plan	**Authority: SEPA**	**Date: 2003**

The National Waste Plan establishes the direction of the Scottish Executive's policies for sustainable waste management. It is build around a major commitment of funding by the Executive to transform Scotland's record on waste reduction, recycling, composting and recovery.

The plan sets out:

- an integrated summary of the 11 Area Waste Plan proposals for the Best Practicable Environmental Option, showing the way forward for municipal waste in Scotland;
- how other wastes will be tackled;
- an action plan to implement the changes required; and
- how the Executive and SEPA will continue to work in partnership with other stakeholders to focus on wider resource use issues in the future.

Link - www.sepa.org.uk/nws/guidance/nwp.htm

The National Waste Plan sets out a series of principles which should direct waste management decision making, including:

- Application of the waste hierarchy which encourages the adoption of options for managing waste in the following order of priority:
  - Waste should be prevented or reduced at source as far as possible;
  - Where waste cannot be prevented, waste materials or products should be reused directly, or refurbished then reused;
  - Waste materials should then be recycled or reprocessed into a form that allows them to be reclaimed as a secondary raw material;
  - Where useful secondary materials cannot be reclaimed, the energy content of waste should be recovered and used as a substitute for non-renewable energy resources;
  - Only if waste cannot be prevented, reclaimed or recovered, should it be disposed of into the environment by landfilling, and this should only be undertaken in a controlled manner.
- Application of the proximity principle which requires waste to be dealt with as close as possible to where it is produced.
- Application of the polluter pays principle which requires producers of waste to bear the costs imposed by those wastes.
- Application of the Best Practical Environmental Option which requires choices on waste management to be made in accordance with the BPEO.

Plan: National Planning Framework	**Authority: Scottish Executive**	**Date: 2004**

The NPF sets the spatial framework for strategic development in Scotland. It includes a framework for delivery of strategic waste management facilities as required by the 11 AWP's. The NPF is a material consideration in decision making on specific proposals for facilities and influences the content of Development Plans.

Plan: Scottish Planning Policy 10	**Authority: Scottish Executive**	**Date: 2006**

SPP10 sets out the Executive's planning policy for waste management. It has recently been subject to consultation and has not been formally published in its final form. The policy provides both detailed and strategic policy direction on how to plan for new waste management facilities. Key features of the policy are:

Promotion of a sustainable approach to waste management
Supports for site identification in land use Development Plans for a range of waste management technologies
Promotion of a model Development Plan policy for waste
Encouragement of new development design that enables waste separation and collection of recyclates
Decisions to be made in context of national guidance including SEPA's thermal treatment guidance

Plan: Other Scottish Planning Policies	**Authority: Scottish Executive**	**Date: Various**

In addition to NPPG10, other planning policies may influence the AWP. This may include SPP17 on transport as well as sectoral policy on natural heritage, flooding, coastal planning etc depending upon the proposed location of facilities.

Plan: Scottish Climate Change Programme	**Authority: Scottish Executive**	**Date: 2006**

The Scottish Climate Change Programme sets out the policies in devolved areas that will deliver the Executive's commitment to make an equitable contribution to the UK Kyoto obligation.

The Programme supplements the UK Climate Change Programme which is designed to deliver the UKs Kyoto commitment to reduce the 6-gas basket of greenhouse gas emissions by 12.5% below 1990 levels in the period 2008-2012, and to move towards the domestic goal of a 20% reduction in carbon dioxide emissions by 2010.

Link - www.scotland.gov.uk/Publications/2006/03/30091039/0

The Executive has committed to make an equitable contribution to this UK commitment, which has been calculated as a reduction of 1.7 million tonnes of carbon in annual savings by 2010. In addition to this commitment, the Executive has set also an ambitious target to do even more by exceeding this share by 1 million tonnes of carbon savings.

The SCCP also provides specific reference to waste management activities, which can be found at: www.scotland.gov.uk/Publications/2006/03/30091039/15. This recognises that greenhouse gas emissions have declined by over 50% since 1990 and that the waste management sector contributes around 1% of greenhouse gas emissions in Scotland. After agriculture, waste management is the largest source of methane emissions in Scotland, contributing around 13% to Scotland's methane emissions in 2003. The source of methane is predominately waste disposal on land. By 2003 methane emissions from this source had fallen to around 40% of 1990 levels due to an increase in the use of methane recovery systems in landfill sites.

Plan: Guidelines for Thermal Treatment of Municipal Waste	**Authority: SEPA**	**Date: 2004**

SEPA's Guidelines for Thermal Treatment of Municipal Waste set out SEPA's views on the role of thermal treatment in dealing with municipal waste within the context of the National Waste Strategy: Scotland. This document covers the strategic role of thermal treatment: it does not provide technical guidance on site specific issues.
Link - www.sepa.org.uk/pdf/nws/guidance/thermal_treatment.pdf

Plan: National Waste Data Strategy	**Authority: SEPA**	**Date:**

SEPA's Waste Data Strategy aims to collate and publish data on waste arisings and waste management (disposal, recycling and recovery) activities. This will be used to inform decision making on waste management issues throughout Scotland.

Other EU, UK and National Plans, Programmes and Objectives Relevant to the Area Waste Plan

Kyoto Protocol (1998)
EU Air Quality Directive (1996)
EU Habitats Directive (1992)
EU Wild Birds Directive (1979)
EU Biofuels Directive (2003)
EU Water Framework Directive (2000)

UK Energy White Paper (2003)
UK Energy Review – The Energy Challenge (2006)
Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2000)

Choosing our future: Scotland's Sustainable Development Strategy (2005)
Scotland's Biodiversity: Its in your hands – Scotland's Biodiversity Strategy (2004)
Scotland's National Transport Strategy (2006)
NPPG5 Archaeology and Planning
NPPG18 – Planning and the Historic Environment
SPP6 – Renewable Energy
Framework for Economic Development in Scotland (2004)
Passed to the Future: Historic Scotland's Policy for the Sustainable Management of the Historic Environment (2002)
Improving Health in Scotland – The Challenge (2003)

LOCAL / REGIONAL PLANS

Plan: West Edinburgh Planning Framework	**Authority: Scottish Executive**	**Date: 2003**

The Scottish Executive considers West Edinburgh to be nationally important in economic, transport, and environmental terms. The nature and scale of development, both existing and committed, is significant to the regional and Scottish economy. Established land uses such as Edinburgh Airport and the Royal Highland Showground play a national or regional role, and have aspirations for long-term growth. The existence of the Airport, and the road and rail routes that connect West Edinburgh to the rest of the country place it in a strategically important location. To manage these pressures, a planning framework for the area has been prepared which sets out the long term strategic vision for the area.

Link - www.scotland.gov.uk/Resource/Doc/47034/0026420.pdf

Plan: Structure Plans	Authority: Local Authorities	Date: Various

There are two Structure Plans covering the LBAWP area: The Edinburgh and Lothians Structure Plan (2004) and the Scottish Borders Structure Plan (2002). Structure plans are statutory documents that set out the long term vision and framework for the land use development of an area. The structure plan, together with local plans form the development plan for an area. The development plan is the principal tool used by the planning authority to assess planning applications. The following policies are promoted in the Structure Plans:

Edinburgh and Lothians Structure Plan:

ENV 11: Waste Management
Proposals meeting Lothians and Borders AWP's Best Practicable Environmental Option and capacity and infrastructure requirements will, in principle, be supported. Local plans identifying existing and proposed sites or containing policies to meet the AWP capacity and infrastructure requirements should follow the principles of sustainable waste management and accord with policies ENV1, ENV2 and ENV3.

Scottish Borders Structure Plan

POLICY I17: Waste Management
Local Plans will make provision for waste management facilities. In identifying sites and assessing applications for new waste management facilities, the Council will have regard to the following:
(i) the provisions of the 'National Waste Strategy: Scotland',
(ii) the provisions of the Area Waste Plan and the Scottish Borders Waste Management Strategy,
(iii) the objectives of sustainable waste management and the need to move waste up the waste hierarchy,
(iv) the need to safeguard both the natural and built environment, and,
(v) the need to safeguard the amenity and environmental quality of existing and future developments from significant adverse impact from waste management facilities.

Plan: Local Plans	Authority: Local Authorities	Date: Various

Local plans must accord with Structure Plans and they set out more detailed policies and proposals to guide development. Unlike Structure Plans, Local Plans identify sites for specific types of development and are encouraged to identify sites for future waste management facilities. Councils must consult widely on the content of a local plan. After considering all views and objections and making suitable changes, councils will adopt the local plan as the basis for their decision making in the area. The Councils in the Lothian and Borders area are working on a range of local plans which are at various stages of progress.

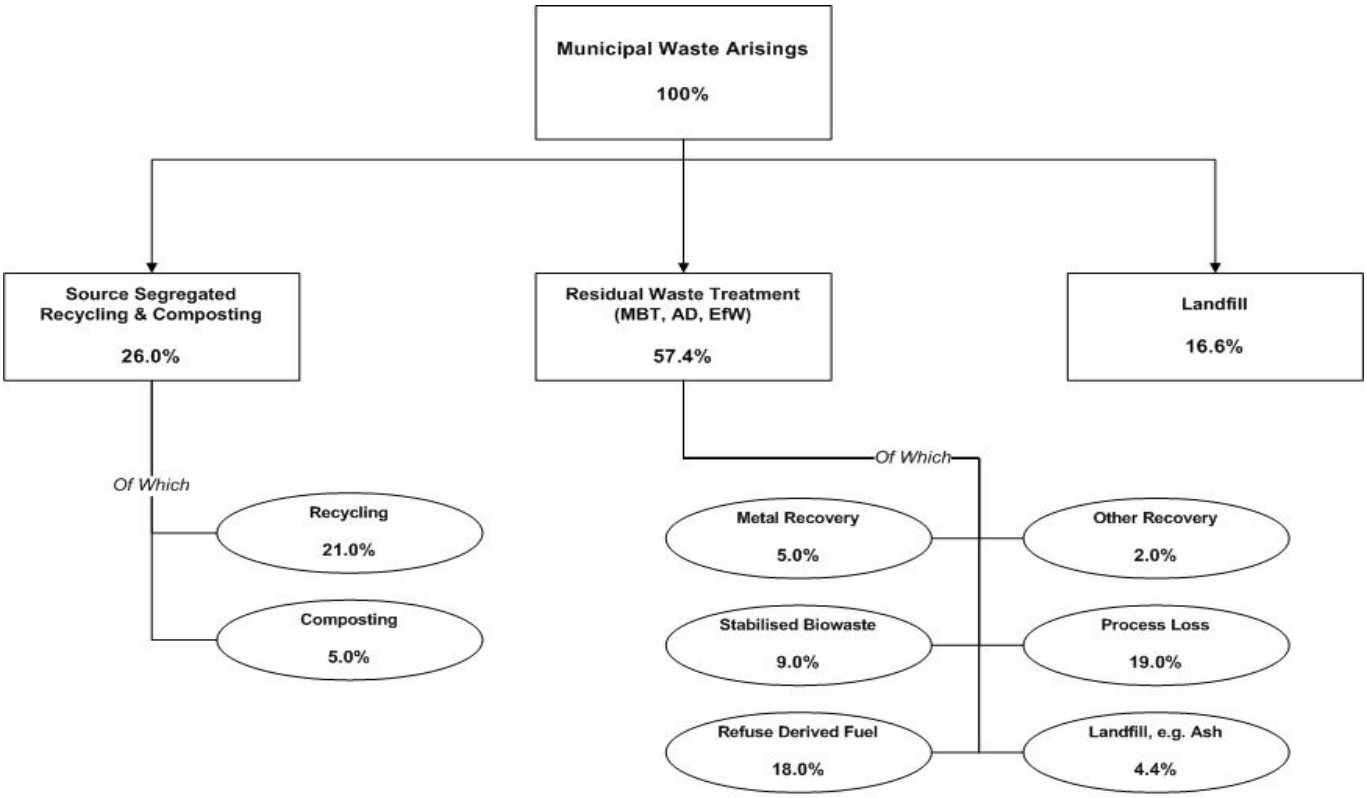
Plan: Scottish Borders Woodland Strategy	Authority: Scottish Borders Council	Date: 2005

The Scottish Borders Woodland Strategy sets out policies and proposals for the future of trees, woodlands and forests in the Scottish Borders. The purpose of the strategy is to:

- Provide a planning tool and policy guidance
- Provide a framework policy document for the development of forestry
- Provide a regional expression of the Scottish Forestry Strategy

Link - www.scotborders.gov.uk/pdf/7682.pdf

Appendix 3 – Summary of the Options



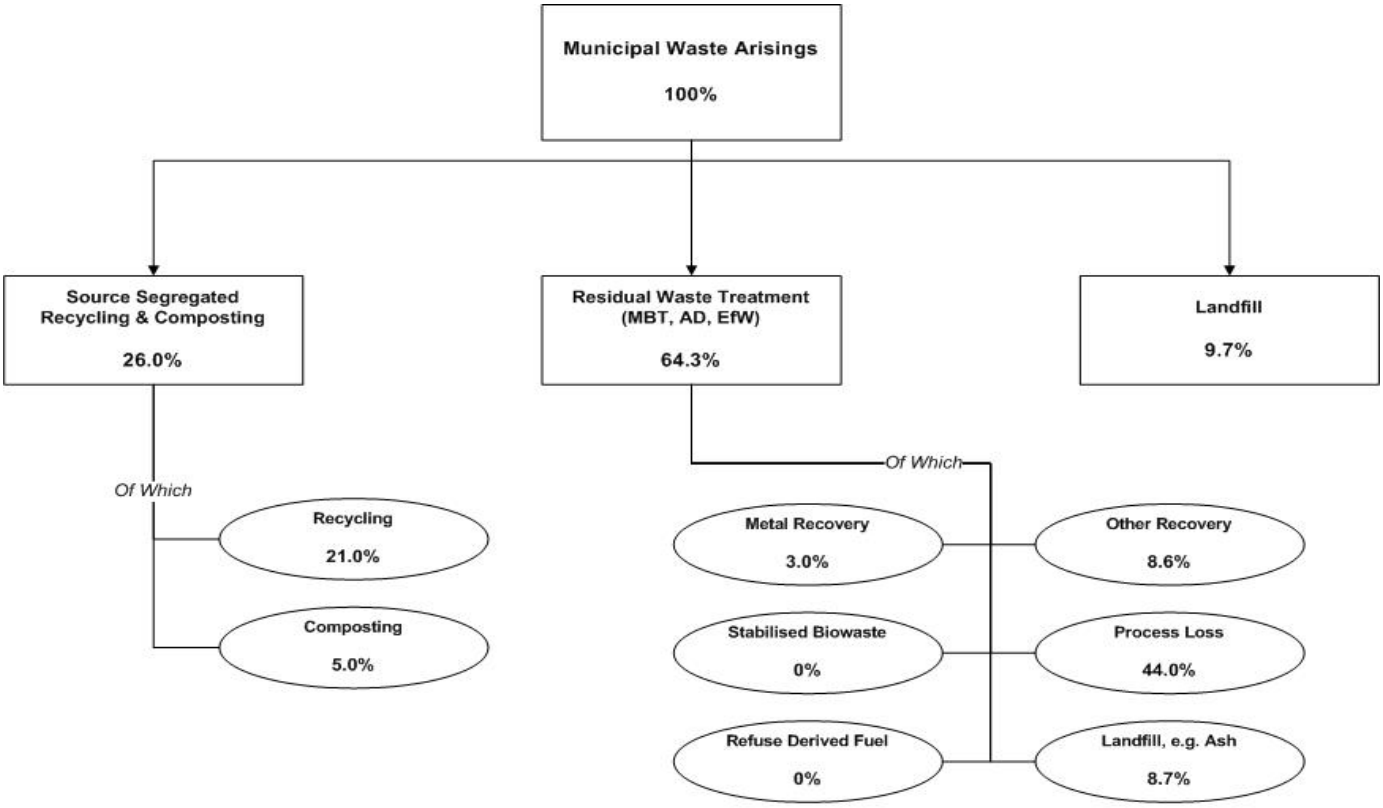
Lothian & Borders

Option 1

Option 1 reflects delivery of the existing Area Waste Plan indicative targets. Option 1 has been modelled to use residual treatment facilities that carry out Mechanical Biological Treatment (MBT), Anaerobic Digestion (AD) and Energy from Waste (EfW). Option 1 provides the following performance outcomes:

Components	**2020**
Source segregated Recycling and Composting	**26 %**
Source segregated recycling	21 %
Source segregated composting	5 %
Residual Waste Treatment	**57%**
Additional Recycling and Composting	16 %
Additional Diversion from Landfill	37 %
Landfill after treatment e.g. ash	4.4 %
Landfill	**17 %**

The additional recycling and composting includes metal recovery and the production of stabilised biowaste from the MBT facility and bottom ash recycling into a substitute aggregates material. The additional diversion from landfill covers the process loss e.g. evaporation of the moisture content within the biowaste and the production of Refuse Derived Fuel which then goes on to an energy recovery facility.



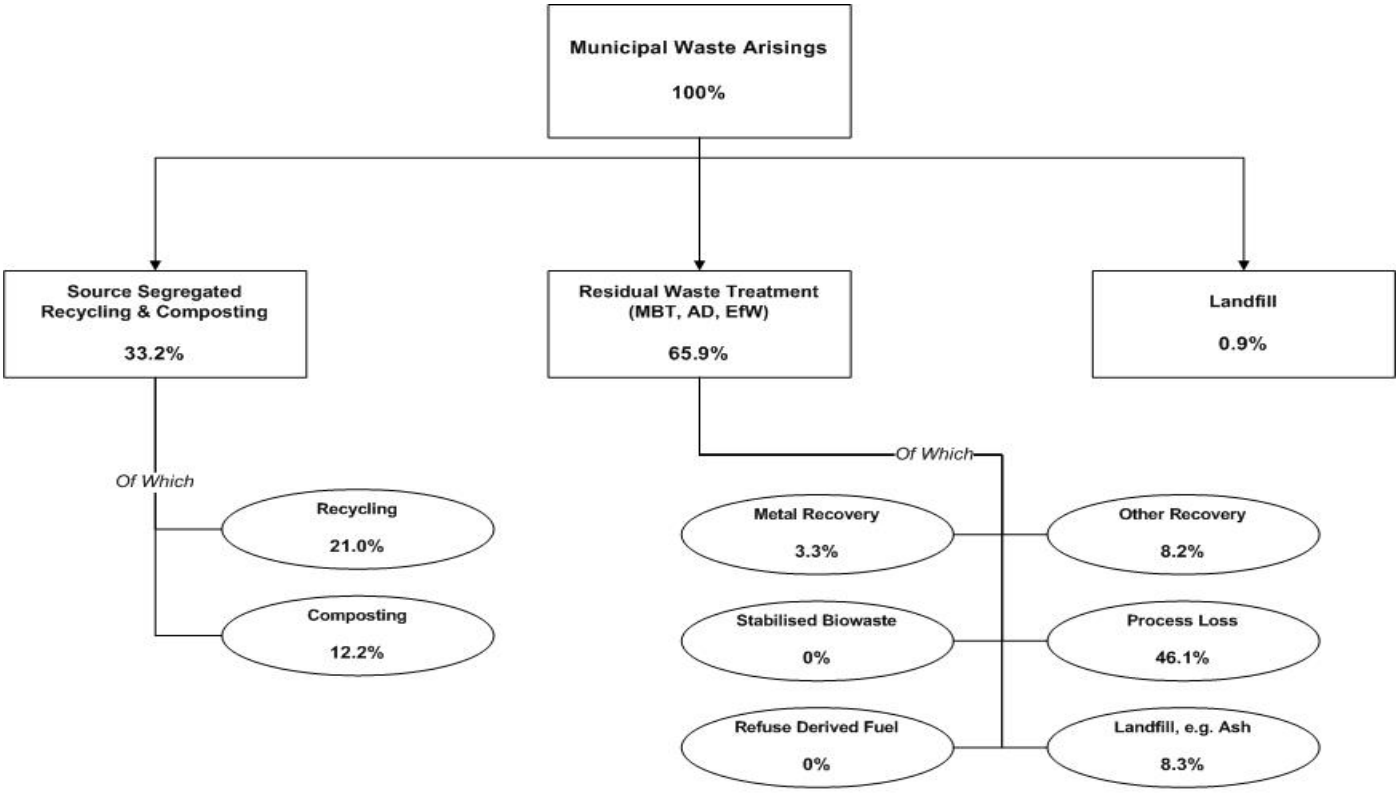
Lothian & Borders

Option 2

This option has been modelled to use Energy from Waste residual waste treatment facilities, whilst maintaining the recycling and composting levels in the existing Area Waste Plan.

Components	**2020**
Source segregated Recycling and Composting	**26 %**
Source segregated recycling	21 %
Source segregated composting	5 %
Residual Waste Treatment	**64%**
Additional Recycling and Composting	11%
Additional Diversion from Landfill	44%
Landfill after treatment e.g. ash	9%
Landfill	**10%**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.



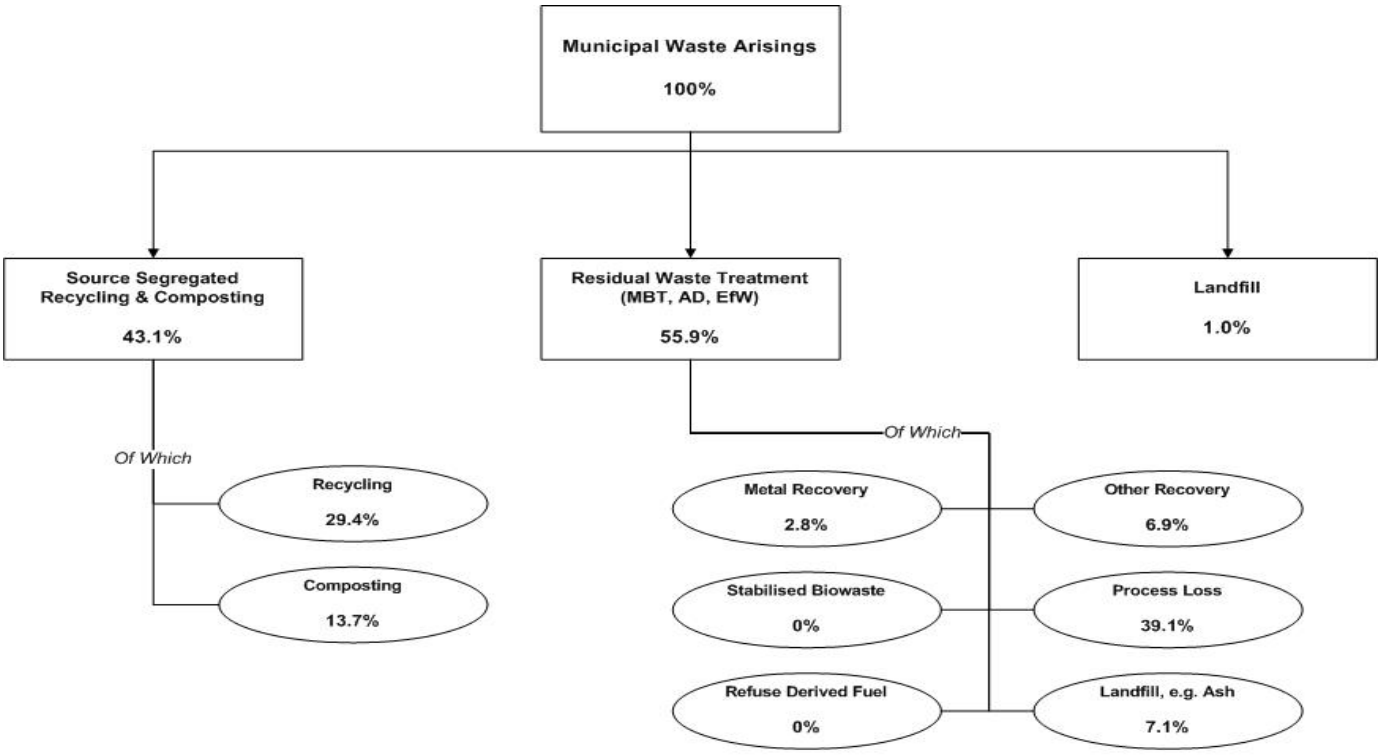
Lothian & Borders

Option 3

This option has been modelled to use Energy from Waste residual waste treatment facilities, whilst maintaining recycling and composting levels comparable to the progress that is currently being made and to the existing Area Waste Plan. Option 3 maximises diversion from landfill.

Components	**2020**
Source segregated Recycling and Composting	**33 %**
Source segregated recycling	21 %
Source segregated composting	12 %
Residual Waste Treatment	**66 %**
Additional Recycling and Composting	12%
Additional Diversion from Landfill	46%
Landfill after treatment e.g. ash	8%
Landfill	**1 %**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.



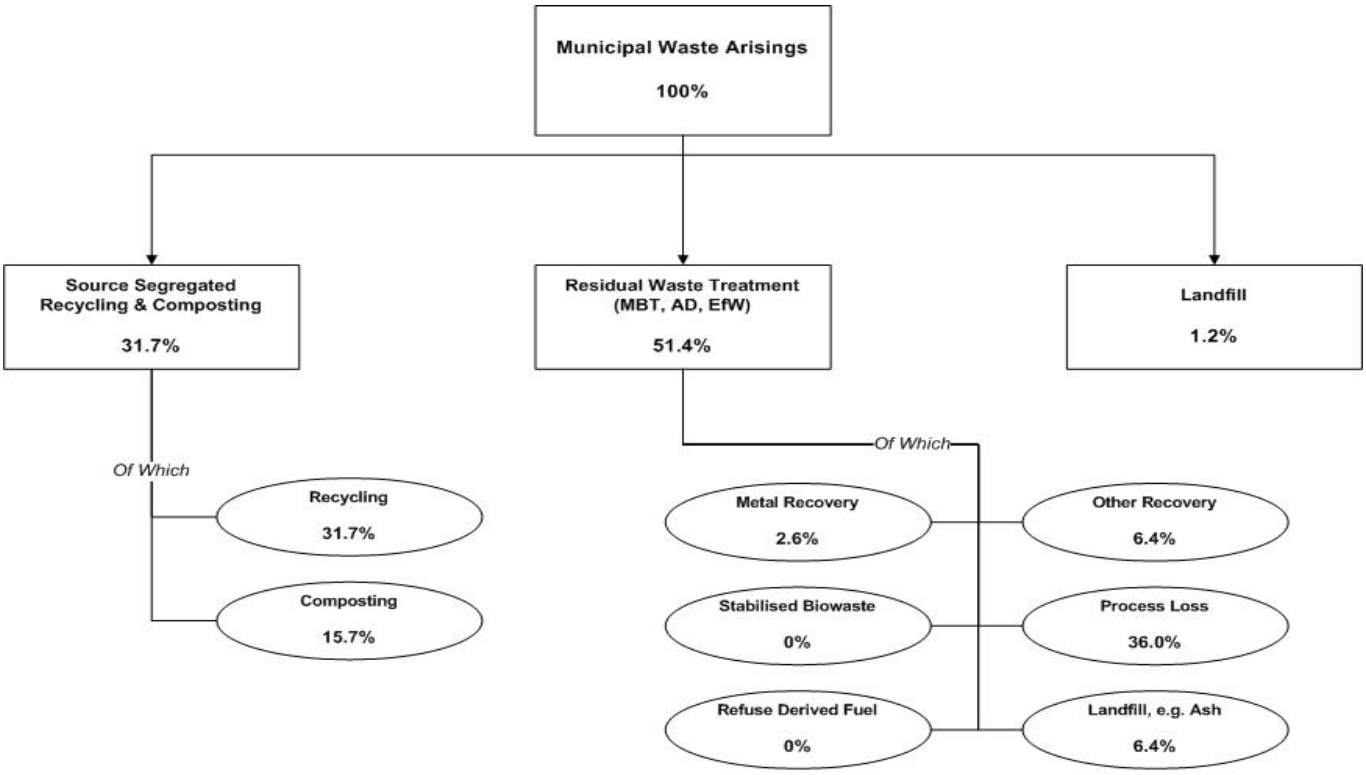
Lothian & Borders

Option 4

This option includes source segregated recycling and composting levels well beyond existing AWP targets. These recycling and composting levels are considered as aspirational as they depend on the availability of additional public funding as well as increased public participation. Option 4 has been modelled using Energy from Waste residual waste treatment technology and maximises diversion from landfill.

Components	**2020**
Source segregated Recycling and Composting	**43 %**
Source segregated recycling	29 %
Source segregated composting	14 %
Residual Waste Treatment	**56%**
Additional Recycling and Composting	10%
Additional Diversion from Landfill	39%
Landfill after treatment e.g. ash	7%
Landfill	**1 %**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.



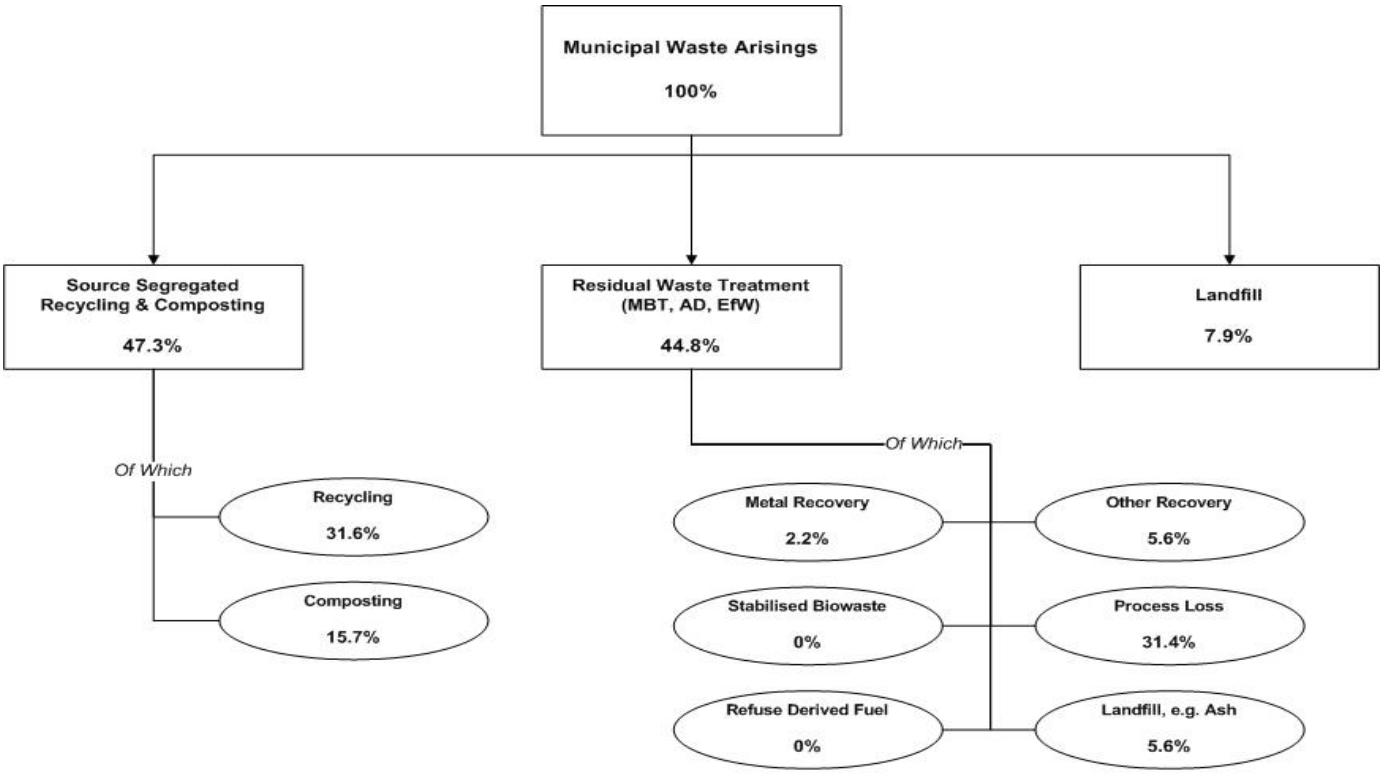
Lothian & Borders

Option 5

This option includes improved recycling and composting levels far beyond existing AWP targets. These recycling and composting targets are considered as aspirational as they depend on the availability of substantial additional public funding as well as increased public participation. Option 5 has been modelled using Energy from Waste residual waste treatment technology and maximises diversion from landfill.

Components	2020
Source segregated Recycling and Composting	**48%**
Source segregated recycling	32 %
Source segregated composting	16 %
Residual Waste Treatment	**51**
Additional Recycling and Composting	9%
Additional Diversion from Landfill	36%
Landfill after treatment e.g. ash	6%
Landfill	**1 %**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.



Lothian & Borders

Option 6

This option includes improved recycling and composting levels far beyond existing AWP targets. These recycling and composting targets are considered as aspirational as they depend on the availability of substantial additional public funding as well as increased public participation. Option 6 has been modelled using Energy from Waste residual waste treatment technology.

Components	**2020**
Source segregated Recycling and Composting	**48%**
Source segregated recycling	32 %
Source segregated composting	16 %
Residual Waste Treatment	**44%**
Additional Recycling and Composting	8%
Additional Diversion from Landfill	31%
Landfill after treatment e.g. ash	5%
Landfill	**8 %**

The additional recycling and composting includes metal recovery and bottom ash. The additional diversion from landfill covers the process loss e.g. evaporation and reduction by Energy from Waste.

APPENDIX 4 – GLOSSARY AND ABBREVIATIONS

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 fibre fraction (digestate) and a liquid fraction (liquor).

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.

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.

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.

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.

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.

Residual Waste This is the treatment of waste that remains after reduction, reuse, recycling and composting.

Source segregation 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 – eg a household. 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.

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 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.

Please Note: Definitions and details of the different waste technologies are provided in the links in Appendix 5.

AD	Anaerobic Digestion
AWP	Area Waste Plan
BPEO	Best Practical Environmental Option
DEFRA	Department for Environment Food and Rural Affairs
EfW	Energy from Waste
LBAWP	Lothian and Borders Area Waste Plan
LCA	Life Cycle Analysis
MW	Municipal Waste
MBT	Mechanical/Biological Treatment
NWP	National Waste Plan
NWSS	National Waste Strategy Scotland
PPC	Pollution Prevention and Control
RDF	Refuse Derived Fuel
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SWAG	Scottish Waste Awareness Group
WID	Waste Incineration (Scotland) Regulations (2003)
WSA	Waste Strategy Area
WSAG	Waste Strategy Area Group

APPENDIX 5 – SUMMARY OF WASTE TECHNOLOGIES

SEPA has prepared a summary of key information about different types of waste technologies. These can be accessed via the links below. Each technology is described in terms of its process, the inputs and outputs, summarises some of the potential impacts and summarises how they are regulated. This information is correct at time of publication (December 2006). Click on the links below to access these information sheets.

- Anaerobic Digestion (39k pdf) - www.sepa.org.uk/pdf/nws/promotion/Anaerobic_Digestion.pdf
- Gasification (58k pdf) - www.sepa.org.uk/pdf/nws/promotion/Gasification.pdf
- In-Vessel Composting (51k pdf) - www.sepa.org.uk/pdf/nws/promotion/Gasification.pdf
- Incineration (37k pdf) - www.sepa.org.uk/pdf/nws/promotion/Incineration.pdf
- Landfill (57k pdf) - www.sepa.org.uk/pdf/nws/promotion/Landfill.pdf
- Material Recycling Facility (MRF) (35k pdf) - www.sepa.org.uk/pdf/nws/promotion/MaterialsRecyclingFacility.pdf
- Mechanical Biological Treatment (MBT) (52k pdf) - www.sepa.org.uk/pdf/nws/promotion/MechanicalBiologicalTreatment.pdf
- Mechanical Heat Treatment (MHT) (28k pdf) - www.sepa.org.uk/pdf/nws/promotion/MechanicalHeatTreatment.pdf
- Open Windrow Composting (33k pdf) - www.sepa.org.uk/pdf/nws/promotion/OpenWindrowComposting.pdf
- Pyrolysis (129k pdf) - www.sepa.org.uk/pdf/nws/promotion/Pyrolysis.pdf

Other Fact Sheets are available about other topics related to this consultation:

- National Waste Strategy: Scotland (140k pdf) - www.sepa.org.uk/pdf/nws/promotion/nationalwastestrategy.pdf
- Waste Hierarchy (142k pdf) - www.sepa.org.uk/pdf/nws/promotion/wastehierarchy.pdf
- Waste Minimisation (160k pdf) - www.sepa.org.uk/pdf/nws/promotion/wasteminimisation.pdf
- Landfills (147k pdf) - www.sepa.org.uk/pdf/nws/promotion/landfills.pdf
- Composting (143k pdf) - www.sepa.org.uk/pdf/nws/promotion/composting.pdf

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, Clackmanannanshire 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