



Llywodraeth Cynulliad Cymru  
Welsh Assembly Government



# North Wales Regional Waste Group

## Strategic Waste Management Options

### Strategic Environmental Assessment

#### Non Technical Summary



October 2007



## Introduction

Hyder Consulting Ltd. was appointed by Caerphilly County Council on behalf of the Co-ordinating Authorities of the three Regional Waste Groups (RWG) in Wales (Caerphilly County Borough Council, Neath Port Talbot County Borough Council and Denbighshire County Council) to carry out Strategic Environmental Assessment (SEA) as part of the North Wales Regional Waste Plan (RWP) 1<sup>st</sup> Review process. An SEA of the Strategic Waste Management Options, known as the Options, for the North Wales Region has been undertaken.

In accordance with the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004, an Environmental Report detailing the SEA process for the Options has been prepared as part of a series of documents which make up the Consultation Draft of the 1<sup>st</sup> Review of the North Wales RWP. This Non-Technical Summary provides a summary of information provided in the Environmental Report.

This NTS documents the key findings of the SEA undertaken for the Options only. The overarching objective of an SEA is “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation of plans and programmes with a view to promoting sustainable development” (European Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment).

SEA is a decision support tool, providing information on the environmental effects of the Plan. The output of the SEA process informs both the Plan makers and interested parties of possible significant environmental effects (both positive and negative) of the Plan and its reasonable alternatives. The full findings of the SEA for the Options are presented in the Environmental Report.

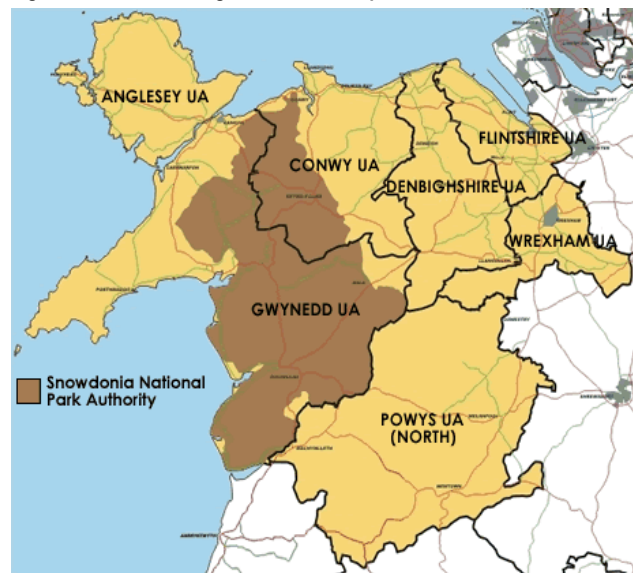
### SEA of the Options and the North Wales Regional Waste Plan 1<sup>st</sup> Review Process

Waste has become an issue of major importance in recent years and the specific objectives and targets set out in the Waste Framework Directive (2006/12/EEC as amended) and the Directive on the Landfill of Waste (1999/31/EC) require radical changes in the way that waste is managed in the UK.

In June 2002, the Welsh Assembly Government published *Wise about Waste: The National Strategy for Wales*<sup>1</sup>, which seeks to ensure compliance with the various European Directives on waste management. Within the context of this national strategy, planning policy contained in Technical Advice Note 21: Waste (2001) requires local authorities to work together to prepare RWPs.

The North Wales Regional Waste Plan November 2003 – 2013 was formally agreed by the Welsh Assembly Government in 2004. The principal purpose of the Plan was to provide a land use planning framework to assist in the provision of a network of new waste management facilities to deal with waste forecast to 2013 within the North Wales Region (see Figure 1).

**Figure1: North Wales Regional Waste Group Authorities**



In accordance with Technical Advice Note 21 (TAN 21): Waste (2001) and the contract with the Welsh Assembly Government, Local Authorities are required to undertake reviews of their RWP. The North Wales RWP 1<sup>st</sup> Review will be published in 2007/2008. The Welsh Assembly Government expect the RWP 1<sup>st</sup> Review to provide the framework for Local Development Plans by identifying Areas of Search for regional/sub-regional scale waste management facilities for all waste streams.

The RWP 1<sup>st</sup> Review process comprises of a number of studies including:

- The identification of Strategic Waste Management Options (known as the Options);
- Sustainability Assessment and Lifecycle Assessment of the Options;
- Strategic Environmental Assessment (SEA) of the Options and also separately, of the Areas of Search (broad areas of search for suitable sites for regional/sub-regional scale waste management facilities);
- Health Impact Assessment (HIA) of the Options.

These studies together with a consultation exercise will result in the production of the RWP 1<sup>st</sup> Review.

This NTS documents the key findings of the SEA undertaken (and reported in the Environmental Report) for the Options only. The

<sup>1</sup> Wise about Waste: The National Strategy for Wales, June 2002

SEA has been undertaken to provide information to the North Wales Regional Waste Planning Group on the environmental issues related to the Options. This will assist them in the preparation of the North Wales RWP 1st Review.

A similar process is being undertaken for RWP covering the South East and South West Regions of Wales which will result in a co-ordinated waste management strategy for the whole of Wales.

### The Strategic Waste Management Options

In practice, strategic waste management options comprise a combination of technologies according to the type of waste, its source and composition, the viability of treatment methods and the local context. The option development process was approached on an all-Wales basis with the aim of producing waste management plans for all of Wales that are based on comparable principles and techniques.

To undertake the study, it was decided that all Options should include the same high levels of recycling and composting (for municipal waste this is over 50% of the expected waste arising). The principal differences between the Options are due to the selected waste treatment technology used to manage the residual waste. The Options incorporate a range of waste treatment technologies including new and emerging facilities such as:

- Mechanical Biological Treatment/Biological Mechanical Treatment<sup>2</sup> (MBT/BMT). This describes a number of different approaches to managing residual waste. The main difference between the approaches is the stage at which the biological part of the waste (garden and kitchen waste) is treated – either before or after the mechanical separation of the waste;
- Pyrolysis - an Advanced Thermal Treatment (ATT) technology that uses heat to treat household rubbish. This technology has previously been used in the UK to produce fuels such as charcoal, coke and town/coal gas. Pyrolysis occurs with no oxygen;

<sup>2</sup> There are a number of different ways that the waste can be separated (the mechanical stage)

Screens to remove the larger pieces of waste;

Magnetic separation - for removal of ferrous metals (cans made of steel),

Eddy current separation - for removal of non-ferrous metals (cans made of aluminium),

Optical separation - separation of certain types of plastics

Air classification can help to separate light and heavy materials (paper/plastic film for example).

Treatment options for the biological part of the waste, include:

Biostabilisation - where air is forced through the waste to 'dry' it.

In Vessel Composting.

Anaerobic Digestion.

- Gasification – an ATT technology as with Pyrolysis, used to produce the same fuels but the process occurs with a limited amount of oxygen;
- Anaerobic Digestion - the breaking down of garden and kitchen wastes (organic waste) by bacteria in the absence of air; and
- Autoclave/Mechanical Heat Treatment (MHT)

as well as more established methods such as mass burn (incineration) with energy recovery and landfill. The nineteen Options developed as part of the North Wales RWP 1<sup>st</sup> Review and assessed within the SEA are presented in Table 1.

**Table 1: Strategic Waste Management Options for the Regional Waste Plan 1st Review**

Option for RWP Review	Description
<b>Option 0</b> 'Do Nothing' strategy	(This Option is included for assessment purposes only – as a baseline to compare the other Options against.) Front end levels of recycling and composting identical to other options with no further treatment, projected on waste tonnages arising in 2013.
<b>Option 1</b> A landfill-led strategy for residual waste	<i>High</i> recycling and composting levels followed by <i>low</i> levels of thermal treatment of residual waste using either: Pyrolysis (Option 1A), or Gasification (Option 1B), or Mass burn with energy recovery (Option 1C) All remaining residual waste would then be sent to landfill. (Recycling/treatment levels are those required to achieve the 2020 BMW Landfill Directive Target in 2013.)
<b>Option 2</b> An Energy from Waste - led strategy for residual waste	<i>High</i> recycling and composting levels with all residual wastes, where possible, being treated by <i>high</i> levels of Energy from Waste using either: Pyrolysis (Option 2A), or Gasification (Option 2B), or Mass burn with energy recovery (Option 2C), or Anaerobic digestion (Option 2D) Any remaining residual waste would then be sent to landfill. (Recycling/treatment levels are those required to achieve the 2020 BMW Landfill Directive Target in 2013. Energy from Waste levels aim to minimise waste to landfill.)
<b>Option 3</b> An MBT/BMT-led strategy for residual waste	<i>High</i> recycling and composting levels, all remaining residual wastes being sent to MBT/BMT with the output recovered/disposed of using either: Pyrolysis (Option 3A), or Gasification (Option 3B), or Mass burn with energy recovery (Option 3C), or Fuel to off-site energy use (Option 3D), or On-site anaerobic digestion (Option 3E), or Landfill (Option 3F) For Options 3A – 3E, any remaining residual waste would then be sent to landfill.

Option for RWP Review	Description
	(Recycling levels are the maximum possible – may exceed those required to achieve the 2020 BMW Landfill Directive target in 2013.)
<b>Option 4</b> An autoclave-led strategy for residual waste	<p>High recycling and composting levels, all remaining residual wastes being sent to autoclave with the output recovered/disposed of using either:  Pyrolysis (Option 4A), or  Gasification (Option 4B), or  Mass burn with energy recovery (Option 4C), or  Fuel to off-site energy use (Option 4D), or  Landfill (Option 4E)</p> <p>For Options 4A to 4D, any remaining residual waste would then be sent to landfill.</p> <p>(Recycling levels are the maximum possible – may exceed those required to achieve the 2020 BMW Landfill Directive target in 2013.)</p>

### Summary of the SEA Assessment Methodology

The SEA assesses the “likely significant effects” on the environment of the Options for the North Wales RWP 1<sup>st</sup> Review. The assessment has followed the general guidance for the completion of SEAs as set out in ‘A Practical Guide to the Strategic Environmental Assessment Directive’<sup>3</sup> and the “SEA Good Practice Guidelines”<sup>4</sup>. Various stages for SEA are set out as follows:

- Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope
- Stage B: Developing and refining alternatives and assessing effects
- Stage C: Preparing the Environmental Report
- Stage D: Consulting on the draft plan or programme and the Environmental Report
- Stage E: Monitoring implementation of the plan or programme.

A Scoping Report was produced for consultation in May 2007<sup>5</sup> in order to define the scope of the SEA. Consultation responses received were incorporated as appropriate within the SEA assessment documented in the Environmental Report.

The SEA Framework is the fundamental component of the assessment methodology. A series of SEA Objectives and

<sup>3</sup> Scottish Executive, Office of the Deputy Prime Minister, the Welsh Assembly Government, Department of the Environment for Northern Ireland (2005)

<sup>4</sup> Environment Agency (2004)

<sup>5</sup> Hyder Consulting (UK) Ltd. (May 2007) Wales Regional Waste Plan 1<sup>st</sup> Review, Strategic Environmental Assessment, North Region – Scoping Document

indicators were developed, based on the SEA Directive topic areas, to use as methodological yardsticks against which the Options have been assessed. Each of the Options were tested against the SEA Objectives and indicators to determine their positive and negative effects. Uncertainties about the nature and/or significance of the effects were also identified.

Following from the assessment of the Options, mitigation measures were identified. Residual environmental effects of the Options after mitigation were also evaluated. Finally, the Environmental Report presents the conclusions and recommendations which identify key areas that should be considered within the North Wales RWP 1<sup>st</sup> Review Process.

### The Findings of the SEA

As part of the assessment, a summary table was drawn up to identify impacts likely from each of the technologies, assuming implementation of current good practice techniques is applied to each technology. This assumed compliance with all the appropriate environmental laws and requirements of regulators such as the Environment Agency, together with what is currently regarded as good working practice to identify what, if any effects would be left. Without specific information on the type of waste facility proposed and where it will be, it is not possible to assess exactly how good or bad the effects will be. A further assessment would therefore be needed once this information becomes available.

Table 2 shows the residual effects identified and the Options they apply to.

**Table 2: Summary of Likely Significant Residual Effects**

SEA Topic	Residual effects (after mitigation)	Applies to:
<b>Biodiversity</b>	Habitat loss/disturbance resulting from land take of currently programmed landfill extensions and requisite expansion and development for new facilities.	<b>all Options</b>
	Potential for cumulative and secondary effect upon habitats and some species resulting from deposition of air emissions/controlled discharges to water.	<b>all Options</b>
<b>Population &amp; Human Health</b>	There is a greater risk of odour /litter/ dust/ other nuisance associated with any open facilities.	<b>all Options</b>
	Vehicular emissions affecting populations along key roads to the facilities	<b>all Options</b>
	Some employment opportunities will be generated through recycling & composting facilities	<b>all Options</b>
	Potential further job opportunities through additional treatment facilities	<b>Options 1, 2, 3 &amp; 4</b>
	Potential for cumulative and secondary	

SEA Topic	Residual effects (after mitigation)	Applies to:
	effects upon human health resulting from deposition of air emissions.	<b>Options 1, 2, 3, 4</b>
<b>Soil</b>	Use of voids such as quarries etc (which may be designated as RIGS or SSSI) for landfill results in a reduction in the availability of this resource.	<b>Options 0 &amp; 1</b>
	Reduction in the requirement for landfill may potentially help conserve existing voids designated at RIGS/SSSI from future use as landfill.	<b>Options 2, 3, 4</b>
	Use of land for construction of thermal treatment plants etc. in addition to land take of currently programmed landfill extensions.	<b>Options 1, 2, 3, 4</b>
	Potential for cumulative and secondary effect upon soil resulting from deposition of air emissions.	<b>all Options</b>
<b>Water</b>	Potential for cumulative and secondary effect upon water resulting from licensed discharges and deposition of air emissions.	<b>all Options</b>
<b>Air</b>	Emissions of carbon dioxide and methane from landfill contribute significantly to overall greenhouse gas emissions.	<b>all Options</b>
	Potential for cumulative and secondary effect upon soil resulting from deposition of air emissions.	<b>Options 1, 2, 3, 4</b>
<b>Climatic Factors</b>	Emissions of carbon dioxide and methane from landfill contribute significantly to overall greenhouse gas emissions	<b>all Options</b>
	Greater burning of methane resulting in less methane being released directly to the atmosphere.	<b>Options 1, 2, 3, 4</b>
	Less carbon dioxide being produced from combustion of unsustainable sources (i.e. fossil fuel).	<b>Options 1, 2, 3, 4</b>
<b>Material Assets</b>	Use of resources in construction of new facilities.	<b>All Options</b>
	Less carbon dioxide being produced from combustion of unsustainable sources (i.e. fossil fuel).	<b>Options 1, 2, 3, 4</b>
	Generation of a greater proportion of recovered/recycled material for use instead of virgin materials e.g. aggregate substitute, glass products etc.	<b>Options 1, 2, 3, 4</b>
<b>Cultural Heritage</b>	Minimised impact on historic environment through site selection and design.	<b>all Options</b>
	Potential residual impacts might include reduction in amenity and the potential loss	<b>Options 1, 2, 3, 4</b>

SEA Topic	Residual effects (after mitigation)	Applies to:
	of an historic resource/historic landscape.  Cumulative effects across an area associated with the siting of new waste facilities and also in conjunction with the siting of other new development within an area.	<b>Options 1, 2, 3, 4</b>
<b>Landscape</b>	Minimised impact on landscape through site selection and design.	<b>all Options</b>
	Potential residual impacts might include reduction in visual amenity.	<b>all Options</b>
	Cumulative effects across an area associated with the siting of new waste facilities and also in conjunction with the siting of other new development within an area.	<b>Options 1, 2, 3, 4</b>

## Conclusions

Generally speaking, there is no clear leader amongst the Options, however, given the landfill emphasis associated with Options 0, 1 and parts of Option 4, on the whole Options 2 and 3 are more likely to ensure that the Landfill Directive and RWG targets will be met by 2013 and potentially beyond.

Of all the Options (as modelled), only the following met the RWG Target of meeting the Landfill Directive 2020 target in 2013. These are:

### Landfill-led Strategy

- Option 1a – Pyrolysis
- Option 1c – Mass burn with energy recovery

### Energy from Waste-led Strategy

- Option 2a – Pyrolysis
- Option 2c - Mass burn with energy recovery

### MBT/BMT-led Strategy

- Option 3a – Pyrolysis
- Option 3b – Gasification
- Option 3c - Mass burn with energy recovery
- Option 3d – Fuel to off-site energy use

### Autoclave/MHT-led Strategy

- Option 4c - Mass burn with energy recovery
- Option 4d - Fuel to off-site energy use

It will be important that each Option is considered on its own merit and within the context of the receiving environment and available land when it comes to allocating Options to locations.

Many of the direct effects that could be anticipated from the technologies could not be fully assessed within the context of this study, e.g. loss of habitat. This is because the extent of the effects are most likely to be determined by the specific qualities of

the receiving environment and cannot be identified in isolation of the spatial element. Impacts identified that could not be assessed include:

- Effects on sites designated for biodiversity or ecological reasons;
- Effects on specific local communities;
- Effects of specific water courses;
- Effects on the historic environment (including townscapes and the wider historic landscape);
- Effects on the landscape in general.
- The secondary and cumulative effects likely upon the above.

Effects that could be considered in greater detail relate primarily to the land and resource requirements, and the emissions associated with the processes. Even then, only generalisations were possible given the potential for variation between operators of facilities.

Many impacts are already heavily regulated, e.g. all technologies which release atmospheric emissions are regulated to comply with common UK and European Standards, meaning that they will all, as a minimum, meet regulatory compliance requirements.

Further assessment will be required as the plan develops – it is important that this assessment looks at/brings together the spatial element and the technologies in greater detail, regardless of which Option is promoted. This may include Habitats Directive Appropriate Assessment.

**Monitoring framework**

Monitoring the significant environmental effects of implementing the RWP is an important ongoing element of the SEA process. The monitoring process can be used to:

- Determine the performance of a plan and its contribution to objectives and targets
- Identify the performance of mitigation measures
- Complete data gaps identified earlier in the SEA process
- Identify any undesirable effects and implement remedial action as appropriate
- Confirm whether predictions in the SEA process are correct.

The recommendations are that the framework should be based on existing monitoring programmes (or proposed monitoring programmes) undertaken centrally by the Welsh Assembly Government, and other organisations (Countryside Council for Wales and the Environment Agency for example). These include monitoring under the “Environment Strategy for Wales”, National Assembly for Wales Statistics Programme and WasteDataFlow. In addition, information published each year in the RWP Annual Report will be utilised where appropriate. The annual report collates and presents all available data to enable the effective monitoring of both the region’s waste arisings and waste

management facilities, to assess the region’s performance against the waste strategy targets

To examine the information gathered from the various monitoring programmes, a number of indicators have been proposed for each of the SEA topic areas.

The monitoring strategy recommendations within the Environmental Report should be reviewed and used as a guide for the development of a comprehensive strategy, which covers all the aspects considered within the RWP 1<sup>st</sup> Review process. It should also be refined when the preferred Option and the location of regional facilities are determined.

**How the SEA has informed the RWP 1<sup>st</sup> Review**

The experience of undertaking the SEA of the Strategic Waste Management Options has shown that, whilst there are benefits from identifying the potential environmental effects of the Options in isolation at this stage, the greatest benefit will be derived from when this work is tied-in with that of the Areas of Search and Health Impact Assessment. i.e. When the preferred Strategy Options are considered for specific sites to implement the new Regional Waste Plan.

**Commenting on the Environmental Report**

The Environmental Report is a consultation document that should be read in conjunction with the other reports produced as part of the North Wales RMP 1<sup>st</sup> Review process. Comments are invited on the content of the Environmental Report.

The consultation period will run from 1 October to 10 December 2007. Any comments relating to this Environmental Report should be addressed, by the 10 December 2007, to:

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