



**Development of Waste Treatment Facility,
comprising Reception and Recycling Hall;
Mechanical Biological Treatment (MBT) Facility;
Advanced Conversion Technology (ACT) Facility;
Power Generation and Export Facility; Education
and Office Accommodation; Landscaping and,
Access.**

Sinfin Lane, Derby

Resource Recovery Solutions (Derbyshire) Ltd

Environmental Statement

Chapter 5:

Need and Alternatives

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5 Need and Alternatives

5.1 Introduction

- 5.1.1 This chapter identifies, describes and evaluates the process and decisions underpinning the choice of location, waste management technology and design, which define the proposal. Need and Alternatives have been considered in detail in the preparation of this Environmental Statement (ES) and the formulation of the proposals.
- 5.1.2 The proposal forms part of the Joint Municipal Waste Management Strategy ‘ Looking After Derbyshire’s Waste’ developed by Derbyshire County Council, Derby City Council and the eight Derbyshire Borough/ District Councils (The Councils).
- 5.1.3 The proposals will enable the integration of additional waste management capacity within the Council’s area. The New Waste Treatment Facility, together with the existing and proposed waste handling facilities will provide the means to sustainably manage biodegradable and combustible waste arisings within the City of Derby and Derbyshire County. The New Waste Treatment Facility will provide the means to meet the requirements of the Council’s municipal waste management contract.
- 5.1.4 The focus of the Strategy is to deliver a waste solution which provides for the long term management of municipal waste in Derbyshire involving a recycling/ composting rate for between 45% and 55%.

5.2 Need for the Development

- 5.2.1 Whilst Planning Policy Statement 23: Planning and Pollution Control, at Annex 1 paragraph 1.54, states:
- “applicants do not normally have to prove a need for their proposed development, or discuss the merits of alternative sites,”* Paragraph 1.54 provides that the nature of polluting or potentially polluting developments and the national or regional need for them, or the location of a proposal in an environmentally designated or sensitive area may make the availability, or lack of availability, of suitable alternative sites material to the planning decision.
- 5.2.2 Paragraph 1.55 provides:
- “Environmental Statements, which must accompany applications where EIA is considered necessary, should identify matters that will be relevant to the determination of the application. Where alternatives are considered, they must include an outline of the main options examined by the applicant and an indication of the most important reasons for the choice, taking into account the respective environmental effects and other relevant matters”.*

- 5.2.3 Planning Policy Statement 10: Delivering Sustainable Waste Management, in respect to the demonstration of need states: (paragraph 22), *“Development plans form the framework within which decisions on proposals for development are taken. It is important that plans are kept up to date and properly reflect national policy. When proposals are consistent with an up to date development plan, waste planning authorities should not require applicants for new or enhanced waste management facilities to demonstrate a quantitative or market need for their proposal”*.

Waste Framework Directive (75/442/EEC, amended by Directives 91/156, 91/692 and 96/350)

- 5.2.4 This EU Directive establishes the principle that the essential objective of all provisions relating to waste disposal must be the protection of human health and the environment against harmful effects. It states that the recovery of waste and the re-use of recovered materials should be encouraged in order to conserve natural resources. It also introduces measures designed to implement these principles.

5.3 Waste Strategy

- 5.3.1 Waste policy in the UK sits within a wider policy and legislative framework agreed with the European Union (EU) and internationally. This collaborative approach will help to deliver global environmental benefits associated with waste, whilst the policy instruments supporting the EU internal market objectives and recognise the global nature of international trade. Waste Strategy is addressed at a number of levels, Internationally this is through the Waste Framework Directive then nationally through the Waste Strategy for England 2007 (WS2007).

Waste Strategy for England 2007

- 5.3.2 The National Waste Strategy is part of the implementation for England of the requirements within the Framework Directive on Waste, and associated Directives to produce waste management plans. The European Landfill Directive (Council Directive 1999/31/EC) sets targets for the reduction of biodegradable municipal waste sent to landfill. These targets were incorporated into the National Waste Strategy (Waste Strategy 2000). Since that time the National Waste Strategy has been taken forwards to the Waste Strategy for England 2007 issued in June 2007 (WS2007).
- 5.3.3 WS2007 highlights: *‘There is a particular requirement in the Waste Framework Directive for the waste management plan to identify suitable waste disposal sites or installations. PPS10 (Planning for Sustainable Waste Management) sets out relevant national policies for waste management facilities, including location criteria to inform local planning policy and planning decisions. Local planning authorities in England are reminded of their obligation under the*

Waste Management Licensing Regulations 1994 (now the Environmental Permitting (England and Wales) Regulations 2007) to produce detailed policies in respect of suitable disposal sites or installations for waste management purposes when producing local development documents, and also their obligation to have regard to national policies in this strategy. PPS10 provides that local planning authorities should, among other things, identify in development plan documents sites and areas suitable for new or enhanced waste management facilities for the waste management needs of their areas, and, in particular, allocated sites to support the pattern of waste management facilities set out in the RSS (in accordance with the broad locations identified in the RSS)'.

5.3.4 WS2007 sets out the Government's key objectives:

- Decouple waste growth (in all sectors) from economic growth and put more emphasis on waste prevention and re use;
- Meet and exceed the Landfill Directive diversion targets for biodegradable municipal waste in 2010, 2013 and 2020;
- Increase diversion from landfill of non municipal waste and secure better integration of treatment for municipal and non municipal waste;
- Secure the investment in infrastructure needed to divert waste from landfill and for the management of hazardous waste; and,
- Get the most environmental benefit from that investment through increased recycling of resources and energy recovery from residual waste using a mix of technologies.

5.3.5 The WS2007 reinforces the importance of the waste hierarchy whereby landfill is treated as the option of last resort, with an emphasis upon reduction in waste generation followed by reuse and recycling and recovery of value. Despite the hierarchy, the majority of UK waste is still being disposed of through landfill. The waste hierarchy has taken many forms over the past decade, but the basic concept has remained the cornerstone of most waste minimisation strategies. The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of waste.

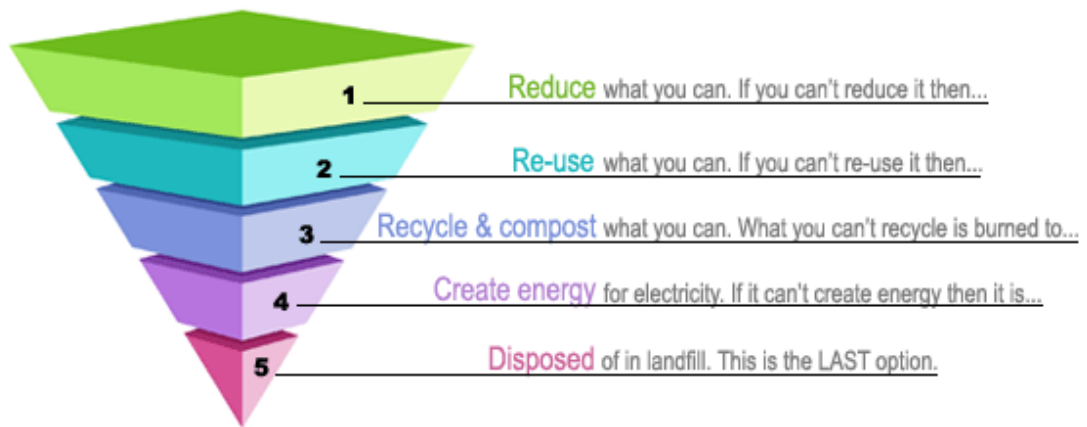


Fig.5.1: Waste Hierarchy

5.3.6 The key landfill targets in WS2007 are:

- To reduce the amount of industrial and commercial waste land filled to 85% of 1998 levels by 2005,
- To reduce the amount of biodegradable municipal waste that is land filled to 75%, 50% and 35% of 1995 levels by 2010, 2013 and 2020 respectively.

5.3.7 A key lever is the Landfill Allowance Trading Scheme (LATS). Introduced as part of the Waste and Emissions Trading Act in 2003, a statutory limit on the amount of Biodegradable Municipal Waste (BMW) that can be sent to landfill by waste authorities in each year between 2005 and 2020 has now been imposed. The Landfill Allowances Trading Scheme (LATS) requires all Waste Disposal Authorities to either reduce the materials sent to landfill, trade permits with other better performing authorities or risk a fine of £150 per tonne for any biodegradable municipal waste sent to landfill over the set limit.

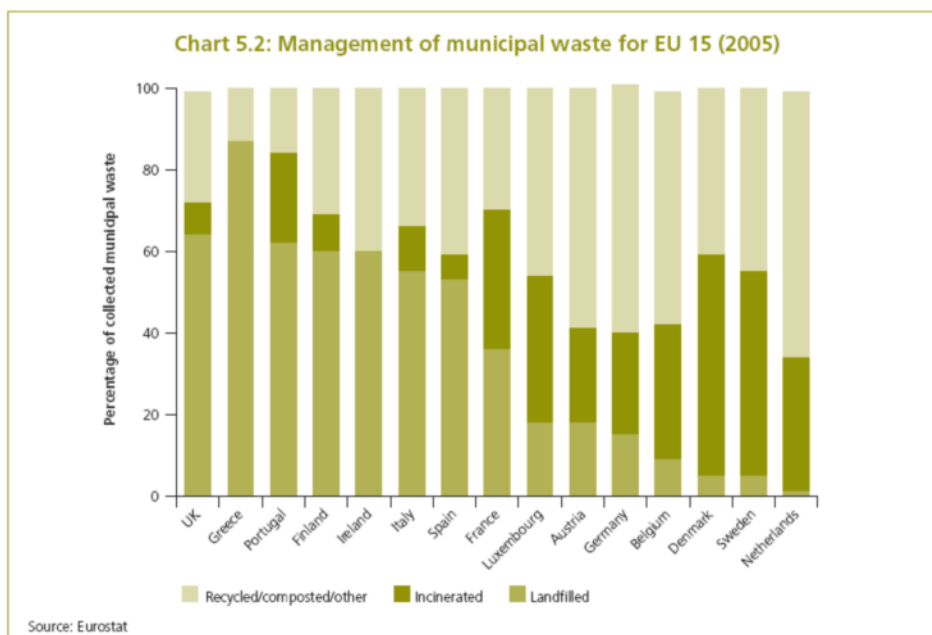
5.3.8 Increased national targets were set in WS2007, (compared to that of the Waste Strategy 2000):

- To recover value from 53% of municipal waste by 2010, 67% by 2015, and 75% by 2020;
- To recycle or compost at least 40% of household waste by 2010, 45% by 2015, and 50% by 2020.

5.3.9 In respect to investment in infrastructure WS2007 confirms that the Government is [Executive Summary xxiv] '*ensuring that Regional Spatial Strategies and local development plans conform to national planning guidance on waste so that waste infrastructure projects needed to deliver this strategy receive planning approval*'. Also '*using PFI, and, where appropriate, Enhanced Capital Allowances, and/or Renewable Obligation Certificates (ROC's) to encourage a variety of energy recovery technologies (including anaerobic digestion) so that*

unavoidable residual waste is treated in the way which provides the greatest benefits to energy policy. Recovering energy from waste (EFW), which cannot sensibly be recycled, is an essential component of a well-balanced energy policy. Energy from waste is expected to account for 25% of municipal waste by 2020 compared with 10% today'.

5.3.10 The Strategy further emphasises: ' [Chapter 5 paragraphs 5, 17] *'recovering energy from waste which cannot sensibly be reused or recycled is an essential component of a well balanced energy policy, and [Chapter 5 paragraph 21]. 'the recovery of energy from waste has been held back by public fears over alleged health effects, and fears that the development of suitable infrastructure would lock in wastes which could otherwise be minimised or recycled'.* It is important that energy recovery does not crowd out recycling and the Government points out [Chapter 5 paragraph 23] *'evidence from neighbouring countries, where very high rates of recycling and energy from waste are able to coexist, demonstrates that a vigorous energy from waste policy is compatible with high recycling rates'.*(see chart below)



5.3.11 WS2007 also highlights trends in waste growth, recycling and composting. *'In April 2007 the government set performance standards on recycling and composting for all local authorities for the year 2007/2008, setting a minimum performance standard of 20% across the country.'*

East Midlands Regional Waste Strategy (January 2006)

- 5.3.12 The East Midlands Regional Waste Strategy was published in January 2006. The Strategy is identified as a key element of Regional Policy. The strategy has an important role to identify the current capacity of the Region to manage waste and to set out the waste management infrastructure needed to be developed to meet future needs. The Strategy sets out the pressing need to develop waste treatment and disposal capacity - to provide alternatives to burying waste in landfill sites and to ensure the region has sufficient infrastructure in place to cope with future growth in the amount of waste arising.
- 5.3.13 The key principles and priorities for the strategy were established in the Regional Spatial Strategy for the East Midlands. A technical report was produced which provided an assessment of the various options available to ensure that the Best Practicable Environmental Option for strategic waste management across the region is adopted. BPEO as a tool has now been superseded by the provisions of PPS 10: Sustainable Waste Management.
- 5.3.14 The Companion Guide to PPS 10 at paragraph 3.12 the guide states: *'The SA process is founded on the same general principles as BPEO, those of:*
- *systematic testing of options against criteria;*
 - *incorporation of stakeholder and community engagement; and*
 - *seeking an optimal outcome taking account of a range of different impacts.'*
- 5.3.15 Whilst the concept of BPEO has now been taken forwards by Government policy through the concept of Sustainability Appraisals by incorporating the requirements of the Strategic Environmental Assessment Directive, the principle may still be robustly applied to development plans and decision making in those circumstances where waste strategies have been developed within the transitional timeframe.
- 5.3.16 The Strategy (pp17) notes that in total, the East Midlands generated around 20.6 million tonnes of controlled waste in 2003. Municipal waste (MSW) make up only 12% of the total of controlled wastes generated. In 2003 some 521,392 tonnes of MSW were generated within Derbyshire/ Derby City from a regional total of 2,370,347 tonnes.
- 5.3.17 The Strategy (pp36) notes that *'the adoption of a flexible approach to the treatment and disposal of residual wastes allows both the waste management industry and planning authorities the ability to develop infrastructure which best meets the overall needs of a particular waste stream in any particular geographical area. It is expected that the mix of residual technologies to be employed will include an ongoing proportion of landfill but also the development of energy from waste, anaerobic digestion, mechanical bio treatment and advanced thermal treatment solutions.*

Looking After Derbyshire's Waste, Strategy Document (July 2006)

- 5.3.18 The Joint Municipal Waste Management Strategy document sets out 6 options which have been developed for future waste management, each comprising a mixture of bring and kerbside recycling, household waste recycling centres, waste facilities for treatment of residual waste and landfill disposal. A detailed options appraisal process assessed each option against a set of 21 environmental, economic and social indicators.
- 5.3.19 The best performing options for long term management of municipal waste in Derbyshire involved a recycling/ composting rate between 45 and 55% with the residual waste being treated at an Energy from Waste facility, or by anaerobic digestion or by autoclaving (steam sterilisation) technology. All three options are considered by the Strategy to offer a sustainable solution for the future management of Derbyshire's and Derby City's municipal waste and allows the councils to meet if not exceed the Landfill Directive targets in 2020.
- 5.3.20 The options appraisal identified options 1, 5 and 6 as being the highest scoring options.
- Option 6 (High Source Segregation with the Residual Waste being processed in an Energy from Waste plant maximising Diversion from Landfill) assumes an expansion of recycling schemes to achieve a 55% performance resulting in a high performing option. To achieve, and exceed in the longer term landfill Directive targets all remaining municipal waste would be sent to an energy from waste facility.
 - Option 5 (High Source Segregation with the Residual Waste being processed in an Aerobic Digestion Plant) The basis of this option is achieve a 55% source segregated recycling and composting effort, with residual waste being treated via an anaerobic digestion plant.
 - Option 1 (Moderate source segregation with the residual waste being processed in an autoclave Mechanical Treatment plant). The basis of this option is to achieve 45% source segregated recycling and composting effort, with residual waste processed through an autoclave MBT process. The autoclave MBT plant is based on steam sterilisation of waste followed by recovery of recyclable materials, production of a refuse derived fuel (RDF), for offsite combustion, and disposal of a non recoverable fraction to landfill.

5.3.21 The proposed waste solution most closely accords with Option 6. Delivery of the Waste Strategy for 2020 is highlighted within Table 5.1 – predicted waste treatment capacity for options 1, 5 and 6 reproduced below.

Table 5.1 Predicted Waste Treatment Capacity for Options 1, 5 and 6
Taken from Table 9.3 of 'Looking after Derbyshire's Waste')

	Option 1	Option 5	Option 6
MSW Arisings	630,478	630,478	630,478
Recycling	129,811	169,780	169,780
Composting	153,904	176,983	176,983
Treatment	346,763	283,715	283,715
Landfill (Primary)	0	0	0
Waste Handling (primary)	630,478	630,478	630,478
Landfill (secondary)	133,330	59,580	70,929
Total Waste Handling	763,809	690,059	701,407
Total Recycled/Composted %	45%	55%	55%
Treatment%	55%	45%	45%

5.3.22 In summary, 'Looking after Derbyshire's Waste ' at paragraph 9.9 summarises the preferred strategy is as follows:

- *'Expansion of recycling and composting schemes to achieve up to 55% recycling level*
- *All residual waste, in the absence of a suitable regional facility will be treated at in – county treatment facilities.*
- *The combination of recycling and recovery will ensure that the landfill Directive targets for each of the key years are met and in fact exceeded.'*

5.4 Planning Policy

5.4.1 The Government's approach to planning and for sustainable waste management is enshrined within Planning Policy Statement 10: Planning for Sustainable Waste Management. Paragraph 1 of the policy statement provides: "*The overall objective of Government policy on waste, as set out in the strategy for sustainable development, is to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Through more sustainable waste management, moving the management of waste up the 'waste hierarchy' of reduction, reuse, recycling and composting, using waste as a source of energy and only disposing as a last resort.*"

- 5.4.2 Further *'This means a step change in the way waste is handled and significant new investment in waste management facilities. The planning system is pivotal to the adequate and timely provision of the new facilities that will be needed'*.
- 5.4.3 In addition paragraph 2 of the policy statement provides: *"Positive planning has an important role in delivering sustainable waste management:*
- *through the development of appropriate strategies for growth, regeneration and the prudent use of resources; and ,*
 - *by providing sufficient opportunities for new waste management facilities of the right type, in the right place and at the right time"*
- 5.4.4 The Planning Policy Statement at paragraph 7 identifies some of the factors which should be taken into account by Regional planning bodies in developing a responsible approach to future waste management. These include the latest Government advice on forecasts of waste arisings and the proportion of waste that can be recycled; waste arisings across the region; municipal waste management strategies, and, opportunities to accommodate new or expanded waste management facilities including for disposal of the residues from treated wastes.
- 5.4.5 In identifying land for waste management facilities, paragraph 17 of the policy statement identifies that Waste Planning Authorities should identify in development plan documents, sites and areas suitable for new or enhanced waste management facilities for waste management needs of their areas by the allocation of sites and areas for new and enhanced waste management facilities. In so doing (paragraph 18) Waste Planning Authorities should be able to demonstrate how capacity equivalent to at least 10 years of the annual rates set out within the RSS could be provided, and identify the type or types of waste management facility that would be appropriately located on the allocated site or in the allocated area.
- 5.4.6 In identifying suitable sites and areas for new enhanced waste management facilities, waste planning authorities are advised (paragraph 20) to consider:
- "opportunities for on-site management of waste where it arises, and, a broad range of locations including industrial sites, looking for opportunities to co locate facilities together and with complementary activities (reflecting the concept of resource recovery parks)."*
- 5.4.7 Under the Planning and Compulsory Purchase Act 2004, local plans are being replaced by local development frameworks. Where in the interim where development plans are not yet updated to reflect policies of the planning policy statement (PPS10).

The East Midlands Regional Plan

- 5.4.8 The East Midlands Regional Plan (RSS8) was adopted in March 2009 and covers the period until 2026. In accordance with the Planning and Compulsory Purchase Act 2004, it replaces the RPG8 and the Derby & Derbyshire Structure Plan as part of the statutory development plan. The document provides both a Core Strategy as well as topic based priorities and more detailed policies for each of the four Sub-Regional Centres identified. The site being located within Derby is located within the Three Cities Sub-Regional Centre comprising the three largest cities of the Region and is made up of the Principal Urban Areas of Derby, Leicester and Nottingham.
- 5.4.9 East Midlands Regional Plan issued in March 2009 notes that *the overall regional context for waste policy is set by the Regional Waste Strategy which is based on*
- *Working towards zero growth in waste at the regional level by 2016;*
 - *Reducing the amount of waste sent to landfill in accordance with the EU Landfill Directive;*
 - *Exceeding Government targets for recycling and composting, with the objective to bring all parts of the region up to the levels of current best practice; and,*
 - *Taking a flexible approach to other forms of waste recovery, on the basis that technology in this area is developing very quickly and is difficult to predict over a 20 year period.*
- 5.4.10 The Plan identifies that the East Midlands produced around 20.6 million tonnes of controlled waste in 2003 of which 12% was municipal solid waste. The Plan forecasts that controlled wastes generation will increase to around 22.2 million tonnes assuming achievement of known Government and regional targets and success of proposed waste minimisation initiatives. The Plan (Appendix 4) identifies that the estimated Municipal Solid Waste Capacity landfill diversion required within Derby and Derbyshire to be 187,000 tonnes by 2020.
- 5.4.11 Policy 38 Regional Priorities for Waste Management provides key guidance to local authorities within the region. In respect to waste collection and disposal all Authorities should achieve a minimum targets for the recycling and composting of municipal solid waste of 30% by 2010 and 50% by 2015. Further, the policy advises that Waste planning authorities should make provision for waste management capacity equal to the amount of waste generated and requiring management in their areas as provided for by the regional apportionment. In the Three Cities sub–area (including Derby) a centralised pattern of large facilities should be developed.

- 5.4.12 The Plan at paragraph 3.3.62 acknowledges that Waste Planning Authorities will need to *'reflect the need for additional waste management facilities in Waste Local Development Frameworks. These will include 'materials recycling facilities (MRF's), composting operations, inert processing plants and waste transfer facilities. Some additional waste recovery capacity will also be needed, which may include energy from waste, or other technologies such as anaerobic digestion.'*
- 5.4.13 The Estimated Municipal Solid Waste shortfall in Derbyshire and Derby City is identified within Figure 5 of the Plan. The table explains that there is a shortfall of 241,000 tonnes of recycling and composting capacity and 187,000 tonnes of landfill diversion capacity.
- 5.4.14 The Plan at paragraph 3.3.73 notes that within the Three Cities area generally studies undertaken to inform the Plan that the major urban areas of Leicester, Derby and Nottingham are currently deficient in recycling and recovery capacity. Further, the counties of Derbyshire, Leicestershire and Nottinghamshire are together predicted to produce *"over 70% of all the regions waste, the vast majority of which will be generated within the three cities themselves. The three cities themselves should therefore provide the focus for the future provision for waste management infrastructure in the sub area. A centralised pattern of larger facilities should be developed"*.

Local Planning Policy Context

- 5.4.15 The Derby & Derbyshire Waste Local Plan (DDWLP) was adopted in March 2005 . It is now due for replacement in the form of new-style Waste Development Framework. In December 2008, prior to the preparation of draft submission documents the Councils abandoned the preparation of its Waste Development Document following a review by the Planning Officers Society Enterprises and legal advice, primarily, that in the absence of a suitably adopted Waste Core Strategy. Accordingly, in January 2009 preparation of a Waste Core Strategy DPD was commenced. In September 2007, the Secretary of State issued a Direction to 'save' certain policies of the Derby& Derbyshire Waste Local Plan 2005. The Direction did not 'save' policy W1a as it is superseded by the policy of the PPS10. The DDWLP policies that were 'saved' and are considered relevant to the proposed development are set out in the following paragraphs.

5.4.16 Policy W1b relates to the Need for Development. It states:

“Waste development will be permitted if the development would help to cater for the needs of the local area, in terms of quantity, variety and quality, as part of an integrated approach to waste management.

Waste development catering primarily for the needs of other areas will be permitted only if:

- the development would satisfy a need which could not realistically be met closer to the source of the waste; and*
- the development would contribute to an integrated system of waste management”.*

5.4.17 Policy W2 relates to Transport Facilities. It states:

“Waste development which would be likely to result in an overall significant increase in the number or distance of waste-related journeys for people, materials or waste or would not provide or utilise a choice of transport modes for people, materials or waste will not be permitted if there is a practicable, environmentally better alternative.”

Derby & Derbyshire Waste Development Framework

Waste Core Strategy DPD

5.4.18 In March 2009 preparation of the Derby & Derbyshire Waste Core Strategy DPD commenced. The Waste Core Strategy (WCS) will establish a spatial vision and objectives for waste planning until 2030 and a strategy for delivering the objectives, including core policies and the identification of strategic sites.

Waste Implementation SPD

5.4.19 In July 2009 preparation of the Derby & Derbyshire Waste Implementation SPD will commence. The Waste Implementation SPD will provide greater detail on how the policies in the WCS will be implemented. It will consider to what extent the existing development control policies of the Derby City Council need elaboration to ensure that they relate clearly to waste development. It will provide more site specific detail than the WCS and will provide advice to potential applicants for planning permission, particularly with regard to the strategic sites identified in the WCS, but will not identify any new sites. The Minerals and Waste Development Scheme (Feb 2009) programmes the Waste Implementation SPD to be adopted in September 2012.

5.5 Current Performance

5.5.1 Section 35 of the Planning and Compulsory Purchase Act 2004 requires every local planning authority to submit an Annual Monitoring Report (AMR) to the Secretary of State in respect to its Local Development Framework. The East Midlands Regional Plan Annual Monitoring Report 2007/2008 confirmed (*Table 6.8*) that a total of 131,418 tonnes of MSW in the City of Derby and 400,355 tonnes of MSW in Derbyshire were generated in the year 2007/2008. This is confirmed by the Derbyshire Minerals and Waste Development Framework Annual Monitoring report for the same period.

5.5.2 The Derby City Council Annual Monitoring Report December 2008 provides the current position but also sets out the future waste management capacity required:

“Indicator W1 CORE – Capacity of new waste management facilities

By 2020 to have approximately 626,000 tonnes of waste handled by new or expanded non landfill treatment facilities in Derby and Derbyshire”.

“Indicator W2 CORE – Amount of municipal waste arising, and managed by management type

Target 33% recycled/composted by 2015

Progress

(i) Landfill 67,270 tonnes (57%)

(ii) Recycle 25,661 tonnes (22%)

(iii) Composted 21,982 tonnes (18%)

(iv) Heat/Power 4,109 tonnes (3%)

All figures are for 2007/08 monitoring year”

5.6 Waste Management Requirements

5.6.1 The following sub section identifies the projected waste flows associated with the proposal and seeks to highlight the dynamics of municipal waste generation over the period of 25 years in terms of points of arising, feedstock and management of wastes and requirements. The Waste Strategy for England 2007, the East Midlands Regional Plan and the Derbyshire Waste Strategy highlight the need for improvement in performance in recycling. National recycling targets have been set for every local authority including City of Derby and Derbyshire County. This section provides analysis of the management of the overall waste stream by reference to the waste hierarchy.

Proposed Capacity

5.6.2 The selection of the New waste treatment facility size is dependent upon a number of factors which include:

- The identification of the catchment area for the proposed site.
- Identification of the residual waste suitable treatment.
- Prediction of future waste flows.

The identification of the catchment area for the site.

5.6.3 The Councils have the responsibility for collecting and disposing of the municipal waste stream. It is mainly composed of:

- Waste produced by householders
- Wastes produced by trade premises and collected on behalf of the Councils.

5.6.4 The waste collected from the district's households will form a portion of the wastes being used as a feedstock for the proposed New Waste Treatment facility. The complete residual MSW waste stream to be managed at the proposed facility will be generated within the Derbyshire County and City of Derby administrative areas and will be sourced from administrative areas of:

- High Peak,
- Chesterfield,
- South Derbyshire,
- North East Derbyshire,
- Bolsover,
- Amber Valley,
- Derbyshire Dales
- Erewash and
- City of Derby.

5.6.5 Municipal Solid Wastes will be collected from non-householder sources including school and community premises and street cleansing. Bulky waste items can also be collected directly from school, community and householder premises. Quantities of commercial wastes are also collected from business premises including local authority and associated buildings.

Household Waste Recycling Centres are significant recipients of waste generated throughout the Council's area.

Identification of the residual waste suitable for Thermal Treatment.

5.6.6 Only residual waste suitable for management within the new Waste Treatment Facility is relevant to the selection of plant size. For it to be suitable it must:

- be compatible with the likely requirements of an Environmental Permit;
- be combustible; and,
- of a physical nature to allow handling and feeding into the plant.

5.6.7 Table 5.2 shows estimates of suitability of waste feedstock for a New Waste Treatment Plant of the waste streams generated within the catchment area.

Table 5.2 Suitability of Waste Streams in Catchment Area

Waste Stream	
Household collected waste	Suitable subject to removal of non combustibles
Civic Amenity residues	Waste deposited in skips is often bulky or inert making it unsuitable for Thermal Treatment. Further segregation at a Civic Amenity Site could yield wastes suitable for Thermal Treatment
Street waste	Generally neither suitable or combustible
Bulky waste	Sizes above 1m across or inert items are not suitable.
Rejects	Residues likely to be small in size and combustible

Waste Management Facility Provision

5.6.8 The Derbyshire Joint Municipal Waste Management Strategy at *Table 9.3* reproduced below as *Table 5.1* predicted tonnage requirements and facility capacities for option 6, 5 and 1 for 2020. It should be noted that there will be a need for disposal to landfill of some wastes over the full duration of the strategy. The quantity of waste sent to landfill will reduce significantly up to 2010 and beyond.

In respect to the number and type of facility required the Derbyshire waste strategy confirmed that 'Each option will necessitate the need for various types of facility across the county at various locations. These facilities will vary in size. The table below gives indicative numbers for these facilities depending on whether they are small, medium or large. For example, the total

number of facilities for option 1 may be 39 small, 25 medium or 20 large facilities. In reality it will be a combination with the likelihood of there being 20 – 30 facilities needed across the whole county.'

Prediction of future waste flows.

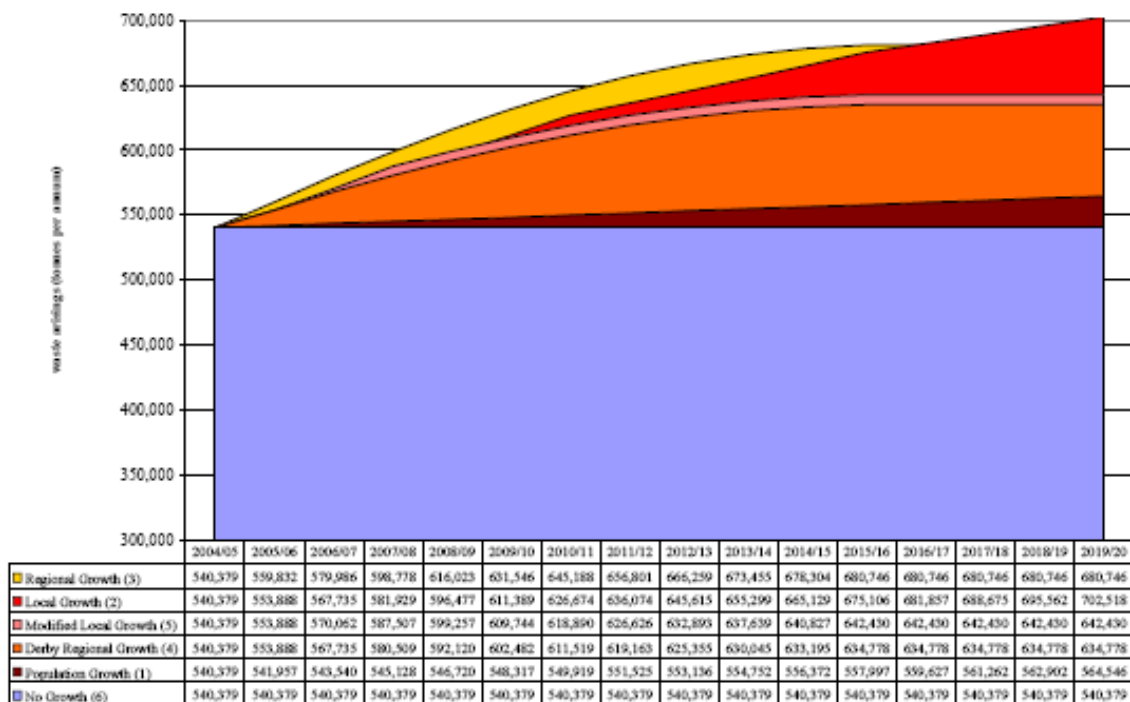
5.6.9 The Derbyshire Waste Strategy document identified the basis for and assumptions relating to waste growth for the range of wastes for which the County and City Council, as Waste Disposal Authorities, and District Councils, as Waste Collection Authorities, have a responsibility to collect under the Environmental Protection Act (1990).

5.6.10 The Strategy states: 'Forecasting of waste growth over the next 20 years is required to assess the magnitude of the task facing the Derbyshire Councils in meeting current and future Government targets. There are three main factors that may affect the quantities of municipal waste arising in the future:-

- changes in the number of households
- the behavior patterns of the public that cause a growth in the quantity of waste generated per household
- the effect of minimisation and recycling initiatives.

5.6.11 Further 'In the past, population forecasts have been used to estimate future household waste arisings. However, the significant reductions in average household sizes in recent years have revealed that the quantity of municipal waste produced is more closely related to household numbers than population size'. Six growth scenarios were considered as follows:

Figure 5.2 Waste Strategy Growth Scenarios (After Figure 6.1 Derbyshire Waste Strategy)



5.6.12 The Strategy at paragraph 6.4 states:

'Following presentation of the growth predictions to Officers, it has been agreed that the modified local growth scenario (5)(salmon pink on the graph) most closely matches the Regional RTAB growth scenario and should therefore form the basis of future waste predictions. Growth scenario 5 has been used to develop future potential options'.

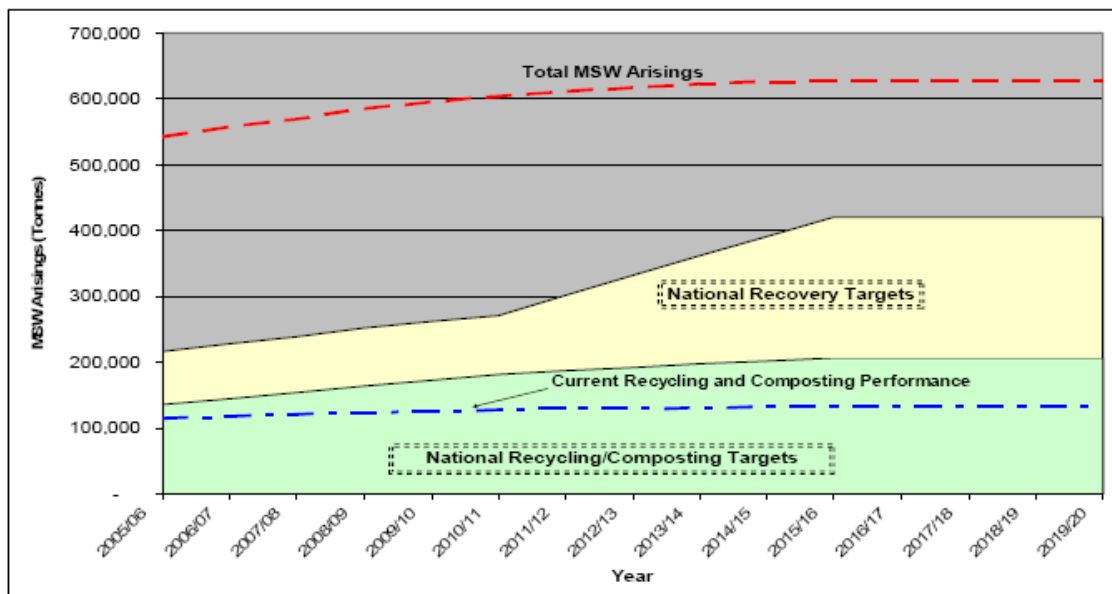
Table 5.3 Growth in MSW Arisings (modified local growth scenario 5)

Growth in MSW Arisings. (Modified Local Growth (5))					
Year	2006/07	2010/11	2013/14	2016/17	2019/20
Tonnage	570,062	618,890	637,639	642,430	642,430

Modified Local Growth Option 5 from Derbyshire Joint Waste Management Strategy 2006

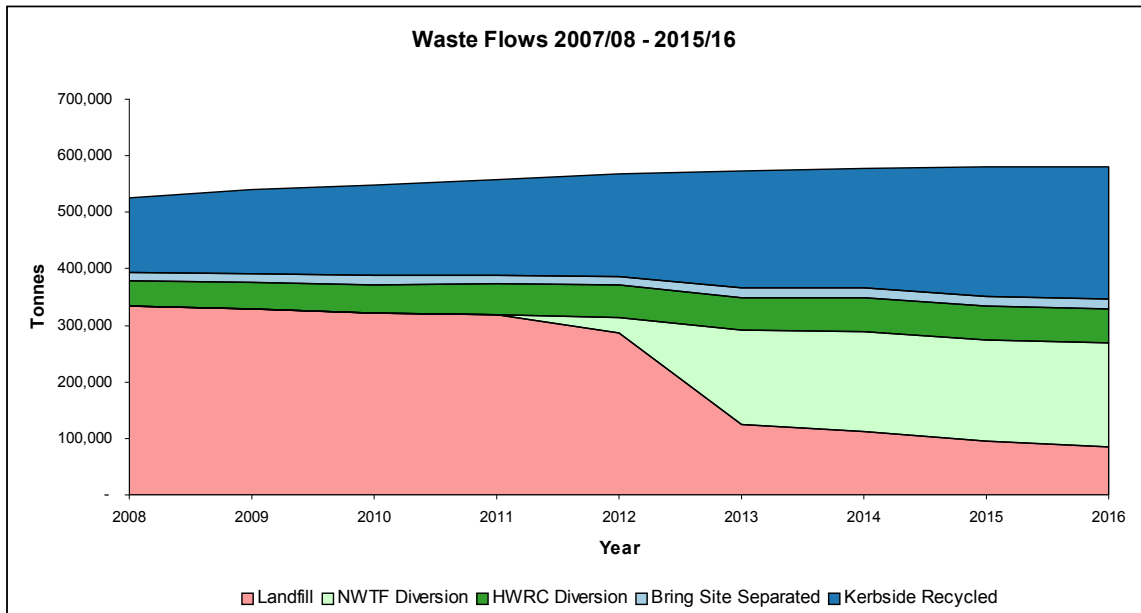
5.6.13 The Derbyshire Municipal Waste Management Strategy document having identified the targets for waste management applied these to the predicted MSW growth figures for Derbyshire and the results are summarised in Figures 5.3 and 5.4. Figure 5.3 shows the amount of Biodegradable Municipal Waste (BMW) that is required to be diverted in accordance with the targets set by the Landfill Directive. Figure 5.4 shows the amount of municipal waste to be diverted from landfill to achieve the Waste Strategy recovery targets.

Figure 5.3 Diversion of Biodegradable MSW to achieve Landfill Directive Targets (After Figure 6.2 of Derbyshire Municipal Waste Management Strategy 2006)



5.6.14 The impact the proposed new waste treatment facility will have on the Municipal Solid Waste flows arising with the Councils' administrative area is highlighted within Figure 5.3 below.

Figure 5.4 Effect of Municipal Solid waste flows with commissioning of new Waste Treatment Facility



5.6.15 Figure 5.3 illustrates that on the basis of predictions which flow from the Derbyshire Municipal Waste Management Strategy document, recycling is not crowded out by the use of the facility. Recycling continues to grow where the new Waste Treatment Facility displaces the majority of the residual landfill waste stream, however, there is a continuing need for landfill provision.

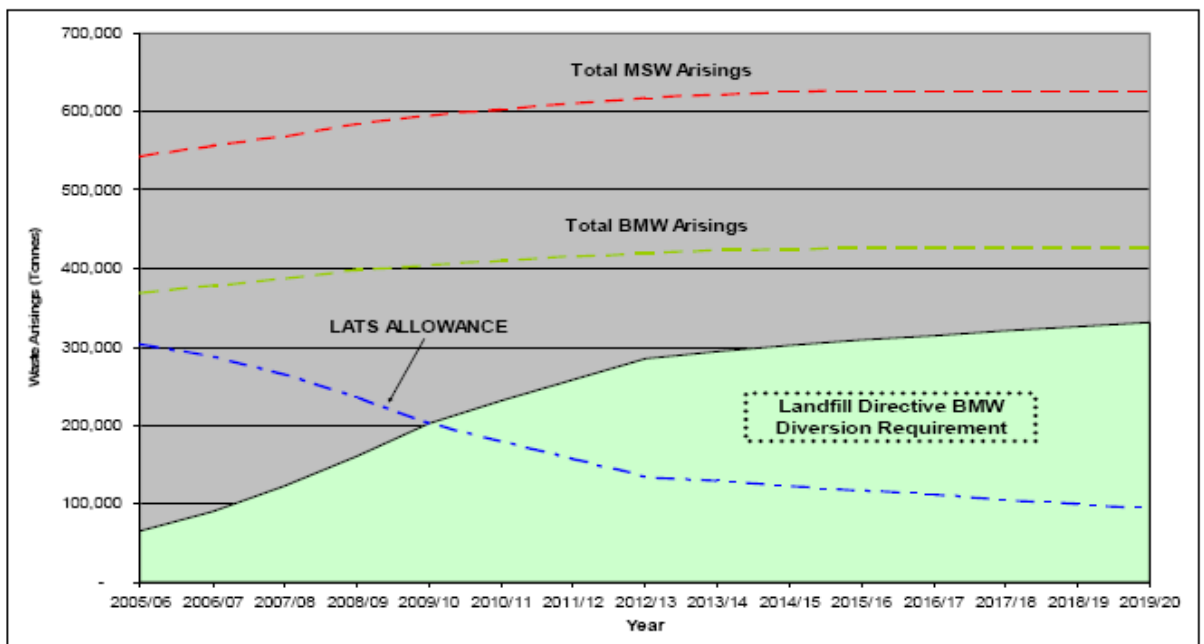
5.7 Landfill Allowance Trading Scheme (LATS)

5.7.1 The Landfill Allowance Trading Scheme (LATS) was introduced on 1st April 2005. LATS introduces significant and innovative changes in waste policy and practice for the diversion of biodegradable municipal waste from landfill. It is intended to provide a cost effective way of enabling England to meet its targets for reducing the landfilling of biodegradable municipal waste under Article 5(2) of the EC Landfill Directive. Allowances were allocated to each waste disposal authority at a level that will enable England to meet its targets as a contribution to the UK targets in accordance with the Landfill Directive. The allowance is in the form of the total tonnes of Biodegradable Municipal Waste (BMW) that would be allowed to go to landfill during each year (April to April).

5.7.2 The Councils, as disposal authorities were given a LATS allocation. The proposal would reduce the potential liability of the Councils under Landfill Avoidance Trading Scheme (LATS) penalties by approximately £ £1,120 million over the 25 year term of the contract. This is based on a £150 fine for every tonne of BMW land filled above the LATS target.

5.7.3 The Councils, as disposal authorities were given a LATS allocation. The proposal would reduce the potential liability of the Councils under Landfill Allowance Trading Scheme (LATS) penalties by approximately £1,120 million over the 25 year term of the contract. This is based on a £150 fine for every tonne of BMW land filled above the LATS target. The LATS allocation for each authority reduces year on year. For the Councils the allocation is 179,402 tonnes in 2011 and reduces to 94,086 tonnes by the year 2020. The Councils need to divert approximately 244,052 tonnes of BMW from landfill by 2012/13, 289,171 tonnes by 2019/20 and potentially 289,171 tonnes by 2035/36. These tonnages are based on waste growth forecasts, and are subject to vary depending on unpredictable future changes in waste growth

Figure 5.5 MSW Landfill Diversion required to meet LATS targets (After Figure 6.3 of Derbyshire Municipal Waste Management Strategy 2006)



5.7.4 Thermal treatment using ATT will deliver the achievement of LATS targets. In the City of Derby and Derbyshire County, for every 1,000 tonnes of residual waste sent to the new Waste Treatment Facility there will be a reduction of 1,000 tonnes going to landfill. The ash from the new Waste Treatment Facility is not biodegradable and so can be landfilled without affecting the LATS target.

- 5.7.5 With a waste management strategy which seeks the introduction of schemes which ultimately reduce waste arisings to zero, continued support to and promotion of the benefits of home composting and other waste minimisation schemes, support to local and regional schemes that encourage and develop local recycling, composting and reprocessing capacity, continued introduction/ expansion of the kerbside collection of dry recyclable and organic compostable materials, enhancement of the household waste and recycling centre provision, provision of materials recycling facilities to deal with recyclable materials required, develop a number of in vessel composting facilities, continued use of open windrow composting for green waste, provision of sufficient residual waste handling capacity to treat residual waste and provision of sufficient landfill capacity to receive treatment residues and other non recyclable waste.
- 5.7.6 In order to meet its Landfill Allowance Trading Scheme (LATS) allowances in 2020 the Councils will need to divert over 330,000 tonnes of biodegradable municipal waste away from landfill through a combination of recycling, composting and residual waste treatment. If it fails to develop the necessary facilities to enable waste to be diverted from landfill sites it will have to pay significant fines (currently set at £150 per tonne). In addition to current level of landfill tax is set at £48 per tonne.

5.8 Waste Hierarchy

- 5.8.1 The proposal forms part of a larger network of waste management installations which will collectively manage the target waste arisings within City of Derby and the County of Derbyshire. The proposed new Waste Treatment Facility will manage those residual combustible wastes that are not recycled following kerbside collection or management within the mix of civic amenity sites and household waste recycling centres located within the catchment area.
- 5.8.2 Taken in isolation, the new Waste Treatment Facility in the context of the waste hierarchy is more favourable than disposal, but less favourable than recycling and composting. The option of doing nothing is very reliant on management of the residual biodegradable waste by landfill, which in terms of the waste hierarchy is the least favoured option. In practice, this option is becoming more constrained by the fast diminishing available permitted landfill capacity within the County area.
- 5.8.3 The proposal is an essential component of the overall strategy to move the management of waste up the waste hierarchy and should not be viewed in isolation. The proposed new Waste Treatment Facility will form part of a network of waste management sites which include those which will receive and manage recycle, civic amenity sites, and landfill. It will form part of a network of other facilities within the County and the City of Derby The proposal therefore sits in combination with those existing permitted uses at a higher level with reference to the waste hierarchy.

5.9 Alternatives

5.9.1 The requirement to consider alternatives stems primarily from requirements under the EIA Regulations. The Regulations identify the information for inclusion within the Environmental Statement. Part 1(2) and 2(4) include:

“An outline of the main alternatives studied and an indication of the main reasons for this choice taking into account the environmental effects”.

5.9.2 Paragraph 83 of Circular 2/99 which accompanies the Regulations note that:

“Although the Directive and the Regulations do not expressly require the developer to study alternatives the nature of certain developments and their location may make the consideration of alternatives a material consideration...”

5.9.3 The following sections addresses the consideration of alternative sites and alternative technology.

Alternative Sites

5.9.4 Although not mandatory, the consideration of alternative sites is advisable. An Alternative Site appraisal has been undertaken and this is set out within Appendix 5.1. The following section, based upon the reporting sets out the methodology and conclusions of the assessment of alternative sites.

Site Selection Criteria

5.9.5 RPS Planning and Development alternative site assessments methodology, has been applied for similar proposed developments undertaken across the UK for a range of clients in the waste industry. This methodology reflects recent national planning guidance on site identification contained within Planning Policy Statement 10 (PPS10) and its Companion Guide.

5.9.6 An initial site identification process was undertaken to provide a list of sites which form the basis for an alternative site appraisal. Those sites were identified from a review of a variety of sources, including, adopted and emerging development plan documents, local authority publications and supplementary planning documents, Ordnance Survey mapping and personal knowledge.

5.9.7 The alternative site study aims to identify all potential development sites within a search area which is based upon districts within the administrative area of Derbyshire County. The districts within Derbyshire in which the study is based upon are High Peak, Chesterfield, South Derbyshire, North East Derbyshire, Bolsover, Amber Valley, Derbyshire Dales, Erewash and the City of Derby.

5.9.8 In identifying the proposal site, the factors taken into account by the applicant achieve the best balance between;

- Acceptability in planning, environment, local impact and traffic terms.
- Availability; and,
- Deliverability.

5.9.10 Following RRS Ltd's choice of site, a further study (set out within Appendix 5.1) has now been undertaken to provide an up to date comparative analysis of option sites within Derbyshire. The report focuses on the suitability of the site for development as a new Waste Treatment Facility.

5.9.11 The analysis has been undertaken in three stages.

- Stage 1 desk based analysis of sites by filtering out those which do not meet locational, site size / shape requirements, and employment/previously developed land requirements. Existing waste management sites, such as licensed landfill sites, and power stations are included in the long list.
- Stage 2 desk based analysis of retained sites by filtering out those, which did not meet criteria relating to: availability through development, compatibility with objectives of the adopted development plan and other material considerations; neighbouring land uses and access.
- Stage 3 provides a comparative analysis based on key planning considerations of the final list of retained sites by carrying out site visits.

Stage 1

5.9.12 Stage 1 of the analysis identified a potential 438 sites within the seven constituent authorities of the County of Derbyshire and the City of Derby unitary authority area. Of the 438 sites identified, 353 were discounted from the next stage of the process on the basis of size, shape of the site allocated and previously developed land status, and the site location.

Stage 2

5.9.13 Of the 85 short listed sites, a further 73 sites were discounted on the basis of their relative merits having regards to: Availability, Allocations and objectives of the Development Plan, Existing and Proposed Neighbouring Land Uses and Accessibility.

Stage 3

5.9.14 The remaining 12 sites were subject to a more detailed appraisal which involved site visits. The appraisal used a non numeric system of scoring based upon: Potential positive impact/consideration (✓), Neutral (=), Potential negative impact/consideration (x) and

Unknown/uncertain (?), having regard to Planning vision, Sensitive human receptors, Landscape and Visual consideration, potential impacts on natural environment, potential Impact on historic environment and built heritage, road access, rail and water transport, energy utilisation, flood risk and ground water vulnerability, Aerodrome Safeguarding Zones, Air Quality management Areas and Green Belt.

- 5.9.15 The assessment using the non numeric system of scoring showed that the Sinfin Lane site (Site157) tested favourably against the criteria adopted for the study. A number of other sites shortlisted also tested favourably against the criteria. No site was identified as having more positive attributes than the Sinfin Lane site.

Alternative Technology

- 5.9.16 The scoping response of Derby City Council (Appendix 1.1) requires the consideration of Alternative technology.
- 5.9.17 A detailed description of the gasification system has been provided in Chapter 4. This section provides an outline of the key features of the thermal alternatives and assesses their relative performance against the gasification technology. These options can also be considered against the current practice of landfill, which is the current disposal option at the bottom of the waste hierarchy.
- 5.9.18 The Joint Municipal Waste Management Strategy document identified three best performing options for long term management of municipal waste in Derbyshire involved a recycling/ composting rate between 45 and 55% with the residual waste being treated at an Energy from Waste facility, or by anaerobic digestion or by autoclaving (steam sterilisation) technology
- 5.9.19 Option 6 (High Source Segregation with the Residual Waste being processed in an Energy from Waste plant maximising Diversion from Landfill) assumes an expansion of recycling schemes to achieve a 55% performance resulting in a high performing option. To achieve, and exceed in the longer term landfill Directive targets all remaining municipal waste would be sent to an energy from waste facility.
- 5.9.20 In view of the choice that has been made which relies upon a thermal treatment technology other than EfW, the following analysis sets out a comparative overview of alternative thermal treatment technologies available.
- 5.9.21 Whilst the proposal includes the provision of a gasification facility, which is the preferred technology option, there are a number of alternative thermal treatment technologies, which include:
- Moving Grate;
 - Fluidised bed and;
 - Pyrolysis.

Conventional Thermal Treatment Technologies

5.9.22 Conventional thermal treatment technologies are based upon the complete combustion of the residual waste feedstock producing a hot combustion gas, which is used to produce steam that in turn is used to generate power and which will require a facility to comply with the Waste Incineration Directive (WID). Fundamental requirements of the WID include the requirement to achieve a combustion temperature of $>850^{\circ}\text{C}$ with a residence time of at least 2 seconds after the last injection of combustion air. A number of variations exist based on the type of combustion plant, including moving grate and fluidised bed systems, both of which are considered here.

Moving Grate

5.9.23 Moving grate systems are the most widely adopted conventional thermal treatment technology for MSW applications and are well proven. The moving grate system is capable of burning MSW as received, thereby potentially reducing the amount of recyclate extracted from the residual waste as this type of facility generally has little or no pre-treatment. A variety of designs are available, but typically the grate system will include a mechanism for distributing the waste feed across the grate and for transporting the waste forward, providing mixing as it traverses the length of the grate.

5.9.24 The waste is burned with an excess of air that is generally drawn from above the waste bunker, providing a source of odour control. Primary air is normally fed through the grate with a secondary air supply above the grate to create turbulence. Moving grate systems will produce two major waste streams, bottom ash and Air Pollution Control (APC) residues (including flyash). Whereas the bottom ash is likely to go to recycling, the APC residue will need to be disposed of at a hazardous waste landfill.

Fluidised Bed Furnace

5.9.25 Fluidised Bed (FB) technology operates by feeding waste onto a bed of 'fluidised' sand particles where combustion is more efficient than traditional technologies such as moving grate. For MSW applications the feedstock will require pre-treatment, which will generally include crushing or shredding as a minimum and could be increased to include some recyclate separation. Failure of the pre-treatment processes can cause operational problems and increase maintenance costs.

5.9.26 Fluid Bed technology is capable of achieving lower NO_x concentrations in the raw gas through the lower bed temperatures (which reduce thermal NO_x formation), than is typically achievable in moving grate systems. However, NO_x abatement is still generally required to guarantee WID compliance. Solid waste streams from the process typically include bottom ash, cyclone ash (usually mixed with the bottom ash), and APC residues (including fly ash) to be treated

as described above. Generally one would expect a higher ash carry over and residual output from a fluidised bed system in comparison to moving grate combustion.

Advanced Thermal Treatment Technologies

5.9.27 Advanced thermal treatment technologies can be split into 2 basic categories - gasification and pyrolysis or combinations thereof. Gasification is partial combustion of the incoming waste stream in sub-stoichiometric conditions to create a syngas. Pyrolysis is the treatment of waste at temperature in the absence of oxygen to produce a syngas, char and pyrolysis oil. These processes have a history of application to fossil fuels and certain homogeneous waste streams, but their application to MSW is relatively new in the UK.

Gasification

5.9.28 Gasification is the partial thermal degradation of a substance in the presence of oxygen but with insufficient oxygen to oxidise the fuel completely. This process produces a gaseous fraction known as 'synthesis gas' or 'syngas', whose energy components are primarily a combination of carbon monoxide, hydrogen and methane. The syngas offers the potential to be utilised in a number of ways, subject to market constraints and technical feasibility, including combustion in engines, steam raising boilers or other energy conversion processes, although this is subject to gas quality and legislative requirements.

5.9.29 The beneficial use of syngas depends upon the availability of a market for its utilisation. It is reasonable to assume that the syngas would need to be combusted on site, as is proposed. Where syngas is combusted in a reciprocating gas engine or gas turbine to generate electricity, efficiency improvements could be seen compared to a conventional steam cycle incineration plant.

5.9.30 To obtain consistent gas quality a less heterogeneous incoming waste stream is required and some pre-treatment of MSW is therefore necessary, this presents the opportunity to remove recyclate. Typical temperatures for gasification would be above 750°C. Ash and char are also produced from the gasification process.

Pyrolysis

5.9.31 Pyrolysis is the thermal degradation of a substance in the absence of added oxygen. Pyrolysis also offers the potential for innovative uses of the pyrolysis syngas other than immediate combustion to produce heat. However, unlike gasification or traditional combustion technologies pyrolysis requires energy input from a combination of waste heat from the process and supplementary combustion, likely to be using either natural gas or low sulphur oil, to achieve the temperature required for thermal treatment. As with gasification a less heterogeneous incoming waste stream is required and some pre-treatment of MSW is therefore necessary, this presents the opportunity to remove recyclate. Typical temperatures

for pyrolysis are between 300-800°C. Similar to gasification, pyrolysis also produces fuel which could be sold as a product. However, for the reasons detailed previously this comparison assumes combustion on-site to generate energy as currently other gas utilisation technologies and markets are not developed to a commercial level.

Assessment of Technology Options

5.9.32 The discussion above provides an overview of the moving grate, fluidised bed, pyrolysis and gasification systems. Table 5.4 below summarises the relative performance of each option with respect to key environmental considerations.

Table 5.4: Comparison of Alternative Thermal Treatment Technologies

Criteria	Moving Grate	Fluidised Bed	Gasification	Pyrolysis
Emissions	Abated emissions meet WID.	Lower NO _x levels than moving grate are achievable, but abatement will still be required to guarantee WID.	Lower emissions of metals as the non volatile metals are transferred to solid residues. The combustion of syngas may result in simplified flue gas treatment system compared with conventional thermal treatment.	Lower emissions of metals as the non volatile metals are transferred to solid residues. The combustion of syngas may result in simplified flue gas treatment system compared with conventional thermal treatment.
Residue Generation	Produces bottom ash (<3% carbon) and APC residues.	Pre-treatment may produce a residue for disposal. Will produce bottom ash & APC residue, there is potential for the APC residue to	Pre-treatment may produce a residue for disposal. This will be offset against the reduced ash and APC residue from the	Pre-treatment may produce a residue for disposal. This will be offset against the reduced ash and APC residue from the

Criteria	Moving Grate	Fluidised Bed	Gasification	Pyrolysis
		be higher than in a moving grate due to ash carryover into the APC.	process.	process.
Odour	Odour management typically avoids nuisance.	Pre-treatment means more air movement is required for odour management.	Pre-treatment means more air movement is required for odour management.	Pre-treatment means more air movement is required for odour management.
Raw Materials	In addition to the incoming wastes there is a requirement for flue gas treatment reagents, boiler water treatment chemicals and maintenance and lubricating oils and greases.	Similar to moving grate. It can be higher due to fluidisation sand requirements, but this is dependant on the waste burnt and the systems ability to recycle bed material.	Variable, depends on flue gas treatment selected.	Variable, depends on flue gas treatment selected.
Noise	With appropriate abatement noise can be successfully be controlled.	Similar to MG, although pre-treatment plant may require additional abatement.	Similar to MG, although pre-treatment plant may require additional abatement.	Similar to MG, although pre-treatment plant may require additional abatement.
Renewable	The power generated from waste is not considered renewable unless accepted as Good Quality	The power generated from waste is not considered renewable unless accepted as Good Quality	If accredited as advanced thermal technology the power generated from the biomass	If accredited as advanced thermal technology the power generated from the biomass

Criteria	Moving Grate	Fluidised Bed	Gasification	Pyrolysis
Visual Impact	CHP plant, then the biomass fraction becomes eligible.	CHP plant, then the biomass fraction becomes eligible.	fraction of the waste is eligible for support under the Renewables Obligation.	fraction of the waste is eligible for support under the Renewables Obligation.
Construction	Exhaust gases are emitted through a stack the height of which is largely independent of the selected technology. Typical building structures in the order of 40 m are required, determined primarily by the boiler height	Similar to moving grate, although the main building will need to be larger (in foot print) if waste pre treatment is included onsite.	Similar, although if gas engines are used for combustion of the syngas then the building height can be lower (around 15m high) and could therefore have a slight reduction in the required stack height.	Similar, although if gas engines are used for combustion of the syngas then the building height can be lower (around 15m high) and could therefore have a slight reduction in the required stack height.
Other	Construction impacts can be managed to avoid significant impacts	Construction impacts can be managed to avoid significant impacts	Construction impacts can be managed to avoid significant impacts	Construction impacts can be managed to avoid significant impacts
Other	Proven technology with a large number of operational facilities.	Some operational experience, with mixed performance.	The proposed gasification process is proven at commercial scale within Europe. ⁽¹⁾ The syngas has potential to be put to alternative uses as	Pilot scale UK operational plants. The syngas has potential to be put to alternative uses as technologies develop and this becomes more economical.

Criteria	Moving Grate	Fluidised Bed	Gasification	Pyrolysis
			technologies develop and this becomes more economical.	

⁽¹⁾Advanced Thermal Treatment of Municipal Solid Waste, DEFRA, 2007

- 5.9.33 The various options for thermal treatment of MSW have relative benefits and disadvantages. All four options are capable, subject to appropriate abatement measures being taken, of performing within WID emissions limits.
- 5.9.34 Both moving grate and fluidized bed systems require flue gas treatment to control NO_x emissions, which may give rise to emissions of nitrous oxide, a powerful global warming agent, as a by-product of the SNCR reaction. The nitrous oxide emissions are less a function of the thermal treatment option itself, than the selected abatement for NO_x. The performance of the various options in terms of carbon dioxide releases is fundamentally dependant on the carbon within the fuel and is not a direct function of the thermal treatment technology.
- 5.9.35 For the waste stream accepted at the facility carbon dioxide releases associated with treatment of the waste will be limited by the plant capacity, but will be lower than the carbon dioxide equivalent emissions from the waste being sent to landfill, because methane emitted from biodegradable MSW in landfill is a more powerful greenhouse gas than carbon dioxide.
- 5.9.36 Table 5.4 above indicates that, compared with the conventional thermal treatment, the chosen gasification process can provide additional recycling, potential for simplified gas cleaning systems, reduced APC residues, renewable power generation and potentially shorter construction periods. Compared to pyrolysis the chosen gasification technology is more proven at commercial scale at multiple plants within Europe.
- 5.9.37 In this context and alongside, in particular, the fact that its operation at a commercial scale is proven and that it provides a cost effective option, meeting all the requirements of the WID, and helping to achieve landfill diversion targets, taking account of increased recycling, gasification advanced thermal treatment technology forms the basis for the proposed facility.

Alternative Design

- 5.9.38 National planning policy highlights the importance of good design as a key contributor to providing sustainable solution to new development and working practice. The design of the facility has drawn upon a number of considerations including the surrounding landscape context, topography,

proposed facility requirements and layout but also the views and aspirations of local community interest groups and governmental organisations.

5.9.39 The process has necessarily been iterative in nature, responding to technical and environmental impact considerations. The key design aims are summarised as:

- Implementation of high quality and innovative sustainable design;
- Optimisation of the existing ground conditions, topography of the site and surroundings;
- Incorporation of landscape features;
- Provision of new landscape treatment;
- Minimisation of the impacts of the proposed development;
- Achievement of significant environmental improvements.

5.9.40 The design has been guided from the outset by the landscape context, the site configuration, topography and operational needs of the facility rather than by the requirements to satisfy a specific design envelope or criteria.

5.9.41 In particular, the design has evolved through an understanding and appraisal of the landscape context of the site. The subsequent architectural design evolved through an iterative process guided by this, together with consultations with key stakeholders and outputs from the Environmental Impact Assessment work related to the project.

5.9.42 Input from the following key stakeholders has taken place at various stages throughout the evolution of the project and has influenced and shaped the design of the proposals:

- Process Engineers: The architect has worked closely with Interserve, (the process engineers for the facility) and RRS to ensure that the emerging design would meet technical and operational requirements of the facility.
- Environmental Impact Assessment: Key outputs and findings from the Environmental Impact Assessment work have been fed back to the architect and landscape architect to enable the design to be responsive to the findings of the assessments and to incorporate recommended mitigation measures into the design proposals where appropriate.
- The land available within the site has determined the orientation of the proposed facility and the positioning of the associated education and visitors centre, areas of roadway, bunding and landscape treatment.

5.9.43 The facility infrastructure comprises distinct activities, the MBT and ACT and the Education & Visitors building, each having separate and different functions and requirements in terms of space, environment, layout and built-form. The education building will incorporate an extensive green roof.

- 5.9.44 The Education and Visitors centre has been designed to deliberately contrast with the adjacent new waste treatment facility building its location.
- 5.9.45 Various access and plant configurations for the site have been considered to accommodate a fully enclosed operation. Design iterations have been undertaken to arrive at the preferred layout. The proposed layout allows for safe access, rapid turnaround and egress from the site for all vehicles and a redesigned access to the site.
- 5.9.46 Buildings have been sited and entrance/ egress routes positioned to maximize the beneficial use of space across the full depth and width of the site. A limiting factor in the general arrangement for the site is its slightly triangular nature, however the general arrangement is orientated to maximize the efficient use of the site in relation to scale, topography and access points.
- 5.9.47 The choice of colouration has preferred neutral, non reflective colour 'goosewing grey'. This has been used in the surface treatment of the building and discrete night lighting to minimise potential visual impact. Non neutral reflective colours were not considered to minimise visual impacts.
- 5.9.48 The finishes have been selected to give variation of texture to reduce the visual impact of the overall mass of the structure. All building materials have been chosen having regard to sustainability considerations. The materials chosen are of modern, but classic, appearance and will not date.
- 5.9.49 Sustainability has been integral to the design approach and key elements of the development such as lighting, energy usage, water management, materials and access have been chosen having regard to environmental best practice.

5.10 Summary and Conclusions

- 5.10.1 The review of need objectives is based upon the broad principles of sustainable waste management outlined in government guidance and policies set out within those documents which comprise the Development Plan.
- 5.10.2 The review demonstrates that with respect to need, the proposal conforms to Government Policy, Waste Strategy for England 2007 and the Development Plan.
- 5.10.3 The proposal would make a positive contribution to sustainability objectives in that it forms part of an integrated network of proposals identified within the adopted Joint Municipal Waste Management Strategy. The size of the facility has been designed so as to meet those objectives but also to manage the residual combustible wastes generated within the Councils' administrative area. The Municipal Solid Waste (MSW) arisings are predicted to increase from over 530,000 tonnes of municipal waste per annum to approximately 626,000 tonnes by

2020. Reducing, reusing and recycling is an important part of managing Derby and Derbyshire's waste sustainably, but not all waste can be managed this way.

- 5.10.4 The only sustainable and viable option is to find alternative technologies and resources to manage the residual municipal waste. The proposed new Waste Treatment Facility located at Sinfin Lane will have sufficient annual throughput to adequately manage 190,000 tonnes per annum of the residual municipal solid waste stream in a manner higher up the waste hierarchy in accordance with the Government's philosophy for sustainable waste management.
- 5.10.5 The assessment of alternative sites has shown that a staged sequential approach was adopted in analysing potential site for siting of the new Waste Treatment Facility. .
- 5.10.6 The alternative site appraisal has considered 438 sites from which and taking account of national, County and Local Plan policy it is concluded that no other site is better placed to serve the Councils' area than the Sinfin Lane.
- 5.10.7 The options appraisal provides a high-level comparison of different generic options. It illustrates the variability in the performance of different options against different sustainability objectives and highlights that it is not possible to identify a clear preferred option, which provides a high level of benefits against all objectives.
- 5.10.8 The appraisal shows that the proposal is sustainable in terms of the waste streams involved and for the site itself, in that:
- It treats the residual waste stream at the appropriate level in the waste hierarchy;
 - The proposed new waste treatment facility will enable significant diversion of Bio-degradable Municipal Waste (BMW) away from landfill. This will enable the Councils to meet its responsibilities in terms of minimising the need for biodegradable waste disposal as a means of waste management.
 - The reduction in biodegradable waste to landfill will be lower than the provision that has been made for City of Derby and Derbyshire in terms of Landfill Directive Allowances.
 - The proposal complies with the principles of regional self-sufficiency as well as being of the right size and capacity for the catchment area it is intended to serve.
- 5.10.9 It is evident from within the region that there is a need to reduce dependency upon non-hazardous landfill void. Therefore this proposal for an new Waste Treatment Facility will become an essential device in being able to achieve, and sustain, government targets for reducing waste to landfill within the City of Derby and Derbyshire administrative area.

5.10.10 The alternative technology review has highlighted other technologies and their relative merits when compared with ATT gasification technology.

5.10.11 The iterations of the Layout and Design of the proposals have been highlighted.

5.11 References

- Planning Policy Statement 10: Sustainable Waste Management
- Planning Policy Statement 23: Plannign and Pollution Control
- Waste Strategy for England 2007
- East Midlands Regional Plan 2009
- 'Looking after Derbyshire's Waste' Derbyshire's Joint Municipal Waste Management Strategy
- Derbyshire County Council Annual Monitoring Reports
- Derby City Council Annual Monitoring Reports
- The East Midlands Regional Waste Strategy published January 2006
- East Midlands Regional Plan Annual Monitoring Report 2007/2008