MINERALS AND WASTE LOCAL PLAN: EVIDENCE BASE

Cumbria Waste Needs Assessment

Waste Arisings and Capacity Requirements

Final Report

December 2014

Date	Details	Prepared by	Reviewed and approved by
03/Dec/2014	Interim Draft Report	Paul Knott	
19/Dec/2014	Draft Final Report	Paul Knott	Carolyn Williams

CONTENTS

1 INTRODUCTION

1.1 Background

1.1.1 Cumbria County Council is currently preparing a Waste Local Plan ('the Plan') which will replace the Core Strategy and Development Management Policies DPD that was adopted in April 2009. Subsequent work on a Site Allocations Document was suspended in 2012 as a result of new legislative and planning structures following passage of the Localism Act and the introduction of the National Planning Policy Framework (NPPF) in 2011/12. The current document will realign county policies on sustainable strategic waste management with this new structure, including the new National Planning Policy for Waste which was published as this report was being prepared.

1.1.2 This report provides an important component of the evidence base supporting the Waste Local Plan. It presents the results of:

- an analysis of the quantities of the principal controlled wastes that are created in Cumbria;
- an assessment of how these quantities will change over the period that the Plan will cover (2016-2031);
- a further analysis of how these wastes are currently being managed (ie. % recycled; % recovered; % disposed to landfill);
- projection of how the mix of management methods will change in the future in order to meet statutory and non-statutory targets and local aspirations; and
- estimating the amount of operational waste management capacity that exists in the county at present.

1.1.3 This process is referred to as the Needs Assessment and its purpose is to identify whether there are any gaps in the amount of capacity needed to manage locally-arising controlled wastes both now and over the Plan period taking account of how management priorities will evolve over time. The Needs Assessment identifies future capacity requirements but the responsibility for determining the optimal approach for dealing with the lies with Council Officers and is being addressed in preparing the Waste Local Plan.

1.2 Context

1.2.1 It is important to stress that the Needs Assessment reflects the Council's intention of planning for "net self-sufficiency" in future waste management. At present some locally created wastes leave the county to be managed in other authorities while other arrive to be managed locally. These movements are expected to continue as waste originators and management companies seek the most cost-effective solutions for managing these materials. Economic and logistical constraints mean that it is impractical to expect the county to provide enough capacity to manage all locally created wastes without relying on external facilities to some extent. A 'net self-sufficient' Plan aims to provide enough capacity to manage a quantity of waste equivalent to what is produced within the county even though continuing movement of materials between authorities is likely to continue,

1.2.2 The new planning system referred to above introduced the "Duty to Cooperate" on matters relating to coordinating the supply and use of strategic infrastructure which involves actions by two or more planning authorities. The current structure of the waste management industry in this country means that substantial quantities of waste move between authorities and the "Duty to Cooperate" requires an authority where waste is being generated to establish whether any external management capacity which is relied on at present will be available in the future,

and to make alternative provision through the Plan where this is not the case. This report also includes an analysis of the pattern of such movements out of the county to allow the Council to identify which other authorities will need to be contacted in order to discharge this obligation.

1.2.3 This report provides an overview of the Needs Assessment undertaken by Urban Vision Partnership on behalf of the Council and with the support of various officers who advised on appropriate assumptions and has provided some of the data that it draws upon. Chapter 8 provides a summary of cross-border movement of waste which also summarises the results of work undertaken already by the Council in discharging its obligations under the Duty to Cooperate (DtC) with regard to waste imports and exports.

1.2.4 The report addresses the following waste streams:

- Local Authority Collected Waste (LACW);
- Commercial and Industrial (C&I);
- Construction, Demolition and Excavation Waste (CD&E);
- Hazardous Waste;
- Agricultural waste; and
- Water Waste/Sewage Sludge.

1.2.5 The report does not address radioactive wastes created by the nuclear industry locally, and given the role of facilities in the county in managing these wastes from elsewhere in the UK. The original intention was to also address Low-Level Non-Nuclear Radioactive Wastes created, for example, in medical and research facilities. However there have been difficulties in collecting relevant information particularly about the fate of these materials which is significant in the context of the ‘Duty to Cooperate’ referred to above. Evaluation of this waste stream will therefore be undertaken and reported separately.

2 LOCAL AUTHORITY COLLECTED WASTE

2.1 Overview

2.1.1 Local Authority Collected Waste (LACW) has been previously referred to as Municipal Solid Waste. It has three components:

- Household waste – all waste generated on residential properties and which may be collected from the kerbside (residual and recyclables), or taken to Household Waste Recycling Centres (HWRCs) or 'bring sites' (eg. bottle banks);
- Trade waste – this is waste generated on (usually) very small business premises which is collected by the Council or its appointed contractors. A small amount of trade waste is also taken to HWRCs by traders under Council permitting schemes;
- Other non-household waste – this are diverse wastes including street and gutter sweepings, wastes from street litter bins, sweepings from parks, gardens and beach cleansing, etc.

2.1.2 Household waste typically comprises at least 90% of these materials.

2.2 Data Sources

2.2.1 All arisings data that inform the Needs Assessment have been provided by the Council's Waste Services division who report the same information to Defra's WasteDataFlow system. This data is then incorporated into government statistics on waste arisings and management and it therefore the most authoritative source of this information.

2.2.2 The Environment Agency Waste Data Interrogator (WDI) database has been used in additional analysis of the fate of certain treatment materials.

2.3 Arisings & Management

2.3.1 Table 2.1 summarises the size of the LACW stream in Cumbria in the base year for the Needs Assessment (2013) and the fate of the materials.

Table 2.1: LACW Arisings & Management in Cumbria in 2013[1]

	ARISINGS	MANAGEMENT					TOTALS
		Recycled	Composted	Treated RDF produced	Treated Moisture loss	To landfill	
Household waste to MBT plants	102,826	11,306		37,612	36,341	17,566	102,825
Household waste to other locations	136,368	58,293	43,022			35,053	136,368
Total household wastes		69,599	43,022	37,612	36,341	52,619	239,193
Proportion		29%	18%	16%	15%	22%	
C&D rubble managed at HWRCs	13,372	13,372					13,372
Non-household waste to MBT plants	4,726	521		1,704	1,704	796	4,725
Non-household waste to other locations	2,343	856		- 129		1,616	2,343
Total non-household wastes		1,377	-	1,575	1,704	2,412	7,068
LACW waste to MBT plants	107,552	11,827		39,316	38,045	18,362	107,550
C&D rubble	13,372	13,372					13,372
LACW waste to other locations	138,711	59,149	43,022	- 129		36,669	138,711
Total LACW		84,348	43,022	39,187	38,045	55,031	259,633
Proportion		32%	17%	15%	15%	21%	

[Source: CCC Waste Services – all figures in tonnes]

[1] Note that the C&D waste shown in this table is not counted as LACW in the subsequent analysis because it will not be managed in other municipal waste recycling or recovery facilities (MRFs, MBT plants, etc.). Instead it is added to C&D arisings so that it can be compared against the appropriate type of management capacity in the gap analysis.

2.3.2 Table 2.1 indicates that 49% of all LACW and 47% of household wastes only were recycled or composted[2]. The latter compares favourably with the national average of 43% for the corresponding period and suggests that the 2020 target should be achievable (possibly before then) although achieving the current Municipal Waste Strategy aspiration of 55% by the same date might be more demanding.

2.3.3 Table 2.1 also incorporates details of how materials from MBT were managed subsequently, showing that treatment produced over 39,000 tonnes of RDF/SRF, while almost 12,000 tonnes of residue was suitable for recycling and is included in the performance referred to in the preceding paragraph.

2.3.4 Overall, 21% of LACW was deposited in landfill sites, indicating a recovery rate of 79%, although it is acknowledged this includes a sizeable quantity of moisture lost during treatment in the MBT plants. If moisture losses are excluded the recovery performance is still over 64%. One of the MBT plants was affected by operational problems during 2013 reducing the amount of material it could process. Once operating fully, and together with further potential increase in recycling/composting rates, the current level of value recovery – even without moisture losses – suggests the 2020 national target of 75% should be achievable.

2.3.5 As there are no energy recovery facilities in Cumbria at present all the RDF/SRF leaves the county. However, in order to achieve a net self-sufficient outcome, the Needs Assessment assumes the Waste Local Plan will need to provide sufficient capacity to treat this fuel stock locally, to recycle the recovered metals and to dispose of the other residues[3].

2.4 Stream Composition

2.4.1 In order to accurately assess recycling capacity it is necessary to estimate the relative proportions of ordinary mixed wastes and those requiring specialised management facilities. In this case 'recycling' refers to activities of bulking and separating mixed wastes into separate streams of recyclable materials (paper/card, glass, plastics, etc.) which is normally undertaken at a Materials Recycling Facility (MRF) or a transfer station performing the same function. Other materials such as metals and Waste Electronic & Electrical Equipment will be handled at specialised facilities that handle only these materials. Capacity assessment therefore needs to make this distinction as Needs Assessment shows that plan areas typically have a surplus of specialised recycling capacity and it would be inaccurate to assume these facilities are capable of managing mixed household (and Commercial and Industrial) wastes.

2.4.2 Table 2.2 summarises the quantities of materials collected from the kerbside in each authority with the quantities and range of materials collected varying according to each authority's recycling contracts. It implies that most of the collected materials would be suitable for processing in mixed recycling capacity such as a MRF and that as little as 6.5% would be taken to a specialised recycler. A separate analysis (not shown here) of materials taken to HWRCs in the county suggest that just under 5% of materials would need to be handled at a specialised recycling facility, and the Needs Assessment uses a figure of 5.75% reflecting the difference in quantities of recyclables collected from the kerbside and that taken to HWRCs.

[2] The needs assessment uses the lower of these figures as the higher one includes trade waste which was is taken into account in assessing the C&I waste stream.

[3] The analysis suggests most of the residual material goes to landfill, with a small quantity going to energy recovery. Leachate is sent to a treatment plant.

Table 2.2: Composition of kerbside-collected recyclable materials

Materials	Allerdale	Barrow	Carlisle	Copeland	Eden	S. Lakes	Total	Share
Mixed	8,464	3,401			1,245		13,110	20.9%
Green	6,786	3,731	8,916	4,897	4,344		28,674	45.7%
Paper/card	4,637	1,104	3,833	993	1,406	1,361	13,334	21.2%
Glass			1,972	793		711	3,476	5.5%
Metals			529	161		62	753	1.2%
Plastic			2,938			429	3,367	5.4%
WEEE	22		26	12			60	0.1%
							62,773	100%

[Source: CCC Waste Services – all figures in tonnes]

2.4.3 Finally, the Needs Assessment ignores the quantity of LACW identified as trade waste. This material originates in businesses and is already included in the assessment of the C&I waste stream which follows in the next section, therefore it is excluded to prevent double-counting. Similarly, the analysis of locally produced hazardous wastes has identified the very small quantity that is produced by households (just under 1% of LACW arisings) and the quantity of LACW assumed by the Needs Assessment is reduced proportionately to prevent further double-counting. As a result the size of the LACW stream assumed for the analysis is 253,608 tonnes, which includes a very small amount of non-household waste.

3 COMMERCIAL & INDUSTRIAL WASTE

3.1 Overview

3.1.1 In urbanised planning authorities Commercial & Industrial (C&I) wastes are second only to CD&E wastes in size and usually a little larger than the LACW stream. Typically they account for around 25%-30% of all controlled wastes. Distinction is made between:

- Wastes from retailing and wholesaling; a wide range of service sub-sectors including leisure, business and domestic services, etc.; and all parts of the public sector = **Commercial**.
- Wastes from all other sectors of manufacturing; publishing; food production; and the utilities sector = **Industrial**.

3.1.2 It is important to assess the two components separately at the outset because restructuring of the UK economy over the last two decades has seen significant reductions in the scale and range of industrial activity and a corresponding broadening and increase in the service sectors in particular.

3.2 Data Sources

3.2.1 Information about C&I wastes at national, regional and more local levels is poor and a 2012 report prepared for the Chartered Institute of Waste Management has brought these problems to light for a wider audience. The main problems are the lack of regular monitoring and because the stream has only been assessed at the national level. The latter requires interpolation to derive estimates at sub-regional level which can introduce errors adding to those that may be introduced by the survey approach.

3.2.2 The sub-regional waste authorities in the North West, in conjunction with the Environment Agency, commissioned two regional surveys in 2006/7 and 2008/9 which were structured to provide sub-regional results. The latter survey was adapted to take account of lessons learned from the former though it may have under-estimated levels of waste produced under ‘normal’ economic activity as it was undertaken when the economy was entering deep recession. Notwithstanding, it is a bespoke survey undertaken for evidence gathering purposes to support waste planning in the region and represents the best information available.

3.2.3 The results of the North West survey were incorporated into a 2009/10 national survey undertaken by Defra, although comparison of the regional totals shows that the latter includes an adjustment that alters the estimate of total arisings. The North West survey estimates a higher level of arisings and it would be prudent to use these results as the basis of this needs assessment because this is more conservative (ie. it implies more wastes will have to be managed) and because it may offset the indirect effect of recession on the results of both surveys, albeit to an unknown extent.

3.2.4 There are two specific problems with the regional survey data:

- The data are now five years old and do not necessarily represent the current position. This issue has been addressed by projecting forward sectoral employment growth using Experience econometric forecasts that inform other Council plans and strategies over the period 2009-2013

- 'Micro-businesses' (companies with <5 employees) were not surveyed. However the 2009 report estimated that these businesses generated waste equivalent to an extra 7.8% of the material created by the other sectors and the estimated arisings in 2013 have been adjusted accordingly.

3.2.5 In principle the Environment Agency's Waste Data Interrogator could be used to as a cross-check on the size of this stream. It reports a combined total for arisings of Household, Industrial and Commercial (HIC) waste which is problematic. As a result the quantity of C&I waste has to be identified by deducting the estimated quantity of household (and non-household material such as street sweepings) from the HIC arisings, However some C&I wastes are not reported accurately in terms of their origin and as a result a quantity of waste that may have arisen in Cumbria is reported as "origin not coded" or only identified as originating in the North West region. Consequently the Needs Assessment uses arisings estimated from extrapolating the results of the 2009 sub-regional survey.

3.3 Arisings and Management

3.3.1 Table 3.1 summarises the results of the 2009 survey showing the quantity of wastes produced in Cumbria and how it was managed. Total arisings were estimated to be 683,788 tonnes, comprising 325,171 tonnes of commercial waste and 358,617 tonnes of industrial waste. The 'headline' observation is that 51% of these materials were being recycled or composted, which was only marginally below the national average of 52% estimated by the Defra survey referred to above.

Table 3.1 C&I Waste Creation & Management in Cumbria (2009 estimate)

Industry (SIC group)	Recycling	Composting	Treatment (non-thermal)	Thermal treatment (with recovery)	Thermal treatment (no recovery)	Landfill (non-hazardous)	Waste water treatment	Transfer station	Don't know
Food, drink and tobacco	41,237	18,848	3,513	248	294	20,619	-	-	1,032
Textiles/wood/paper/publishing	19,209	16	259	13	218	12,929	-	893	451
Power & Utilities	1,675	175	1	13	-	667	-	7	6
Chemical/non-metallic minerals mfg	17,382	2,168	4,797	113	2,295	11,426	-	815	1,070
Metal manufacturing	23,093	-	261	95	17	132,190	-	15	589
Machinery & equipment (other mfg)	32,992	-	251	27	27	5,300	415	700	256
Retail & wholesale	98,080	186	502	455	292	25,651	-	1,412	8,238
Other services	54,006	104	329	446	198	23,954	924	588	11,009
Public sector	17,648	53	1,922	957	4,331	16,148	-	3,789	4,473
Micro businesses	23,815	1,681	923	185	598	19,413	104	641	2,116
TOTAL (all C&I waste)	329,137	23,231	12,758	2,552	8,270	268,297	1,443	8,860	29,240
TOTAL (C waste only)	193,549	2,024	3,676	2,043	5,419	85,166	1,028	6,430	25,836
TOTAL (I waste only)	135,588	21,207	9,082	509	2,851	183,131	415	2,430	3,404
% (all C&I waste)	48%	3%	2%	0%	1%	39%	0%	1%	4%
% (C waste only)	60%	1%	1%	1%	2%	26%	0%	2%	8%
% (I waste only)	38%	6%	3%	0%	1%	51%	0%	1%	1%

3.3.2 Table 3.1 shows that the fate over 38,000 tonnes of waste could be not be determined, comprising material taken to transfer stations for bulking and onward despatch, and where the management method could not be established. Using information from the 2009 Waste Data Interrogator it has been possible to estimate that 28% of C&I wastes removed from waste transfer stations in the county in 2009 was sent for recycling, reprocessing or treatment, though it is not possible to distinguish the specific management method used. The remaining material was disposed to landfill or by land spreading, or taken to another transfer station where (it is assumed) it was eventually sent for disposal.

3.3.3 The details in Table 3.1 have been adjusted to reflect this correction and have also been adjusted to provide an estimate of arisings and management in 2013. The latter has been based on projecting estimated waste per employee forwards over the period 2009-2013 using econometric forecasts produced by Experian which inform other Council plans and strategies. This approach allows the impact of structural changes in the county economy – as reflected in employment levels – to be taken into account when assessing how the quantities of waste generated by different industry sectors will have changed, as well as taking account of the corresponding change in the proportions that are recycled and recovered. Table 3.2 shows the resulting estimate of the size of the stream.

Table 3.2 C&I Waste Creation & Management in Cumbria (2013 estimate)

	Recycling	Composting	Treatment (non-thermal)	Treatment (thermal recovery)	Treatment (thermal non-recovery)	Landfilled	Total tonnes
Food, drink and tobacco	44,068	20,002	3,728	263	312	22,670	91,042
Textiles/wood/paper/publishing	20,506	17	271	14	228	14,550	35,585
Power & Utilities	1,677	175	1	13	-	676	2,541
Chemical/non-metallic minerals mfg	16,405	1,986	4,394	104	2,102	11,709	36,700
Metal manufacturing	22,742	-	255	93	17	129,661	152,768
Machinery & equipment (other mfg)	29,845	-	225	24	24	5,373	35,492
Retail & wholesale	105,604	195	526	477	306	34,159	141,267
Other services	59,390	108	341	463	205	33,509	94,016
Public sector	18,801	50	1,810	901	4,079	20,812	46,453
Micro-businesses	24,885	1,757	901	183	567	21,303	49,597
TOTAL (all C&I wastes)	343,922	24,289	12,453	2,535	7,841	294,422	
TOTAL (C waste only)	208,679	2,110	3,579	2,024	5,158	109,783	331,334
TOTAL (I waste only)	135,243	22,179	8,875	510	2,683	184,639	354,129
TOTAL (all C&I wastes)	50%	4%	2%	0%	1%	43%	
TOTAL (C waste only)	63%	1%	1%	1%	2%	33%	
TOTAL (I waste only)	38%	6%	3%	0%	1%	52%	

3.3.4 Comparison of Tables 3.1 and 3.2 projects a slight increase in Commercial waste arisings from around 325,000 tonnes to 3over 30,000 tonnes while Industrial waste arisings are estimated to have fallen from almost 359,000 tonnes to a little over 352,000 tonnes. Consequently the overall size of the combined stream is estimated to be 686,000 tonnes. Table 3.3 summarises the overall management mix estimated for the 2013 base year.

Table 3.3 Summary Management Mix for C&I Wastes Originating in Cumbria (2013)

Management route	Commercial	Industrial	All wastes
Recycled / composted	63.6%	44.5%	53.7%
Recovered - thermal	2.2%	0.9%	1.5%
- non-thermal	1.1%	2.5%	1.8%
Disposed	33.1%	52.1%	43.0%

3.3.5 The Defra national survey estimates C&I arisings of 632,580 tonnes in Cumbria in 2009, a difference of around -7% compared to the figures above. However, if the wastes attributed to micro-businesses are excluded the North West survey forecast arisings of 633,908 tonnes – a difference of less than 0.5%.

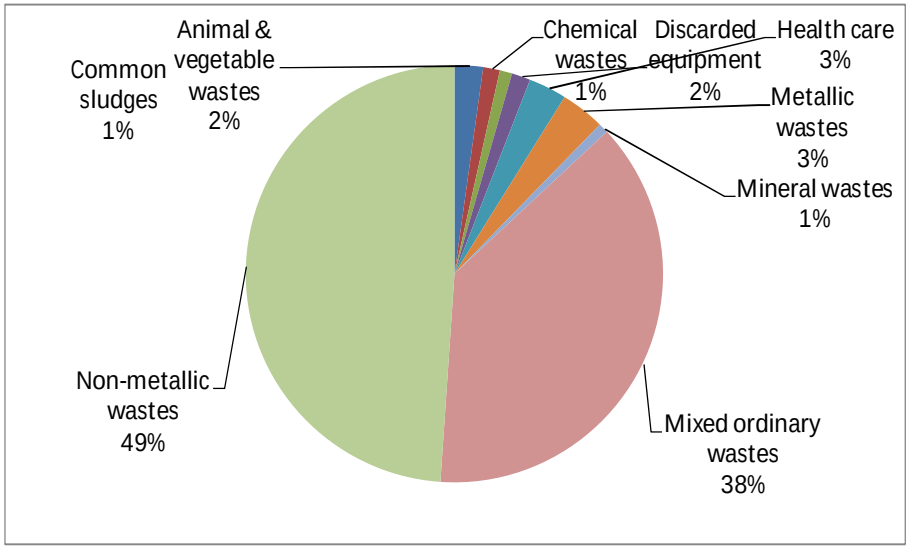
3.3.6 The Defra report claims to have incorporated the results from the North West survey but quotes total estimated arisings in the region of 7.53 million tonnes, whereas the original survey estimated arisings of 7.63 million tonnes. This is only a difference of less than 2% and therefore does not explain this discrepancy, however the North West survey results are considered to be the more reliable and as therefore used as the basis of this assessment.

3.3.7 The preceding sub-section refers to using the Waste Data Interrogator to estimate the size of this stream and the problems involved in this approach. As a comparison, the 2013 Interrogator identifies total HIC arisings of 866,000 tonnes. If the arisings of LACW (excluding trade waste) of 259,000 tonnes are this estimates the size of the C&I stream to be 608,000 tonnes. As a result there is a difference of a little over 70,000 tonnes (11%) between the two estimates. However, as noted previously, some waste arising in Cumbria may not have been recorded as arising in the county and this may explain some of the difference. Moreover the higher estimate derived from the 2009 regional survey is used as it is a more pragmatic estimate of arisings and the Needs Assessment should not lead the Plan to under-estimate capacity and land requirements.

3.4 Stream composition

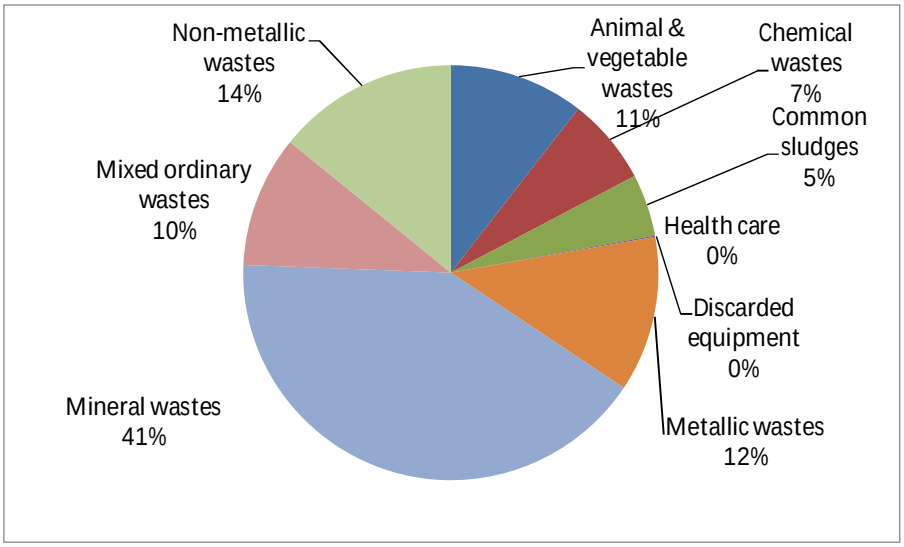
3.4.1 The 2009 regional survey identified the composition of the two streams as shown in Figures 3.1 and 3.2 below. While the Waste Data Interrogator can be used to estimate total arisings the same approach cannot be used to evaluate the stream composition because of the limited detail about the composition of the LACW stream. Analysis is therefore based on the results of the 2009 regional C&I survey.

Figure 3.1: Indicative Composition of the Commercial Waste Stream



[Source; 2009 Regional C&I survey]

Figure 3.2: Indicative Composition of the Industrial Waste Stream



[Source; 2009 Regional C&I survey]

3.4.2 Figure 3.1 indicates that 87% of commercial wastes comprise ordinary or non-metallic wastes. In practice the two sub-streams are very similar to one another and to LACW in that they comprise mixtures of paper/card, plastic, glass, etc. As only 2% of the stream are animal and vegetable wastes it is likely that the mixed ordinary waste also include a proportion of food wastes. Metallic wastes comprise only 5% of the stream though again there may be some of this material in the mixed ordinary component.

3.4.3 The distribution given by Figure 3.2 is likely to be unrepresentative of the composition of the stream as it appears that the survey sample included businesses that sent substantial quantities of mineral wastes to landfill in 2008/9, Once this information was grossed up from the sample to the county-wide estimate it exaggerated the amount of the arisings managed this way. Detail from the Waste Data Interrogator indicates that quantities of mineral wastes landfilled at that time were not on the scale indicated by the survey results. However the results of the earlier 2006 regional survey show an even more skewed distribution with this part of the stream accounting for almost 45% of the total.

3.4.4 However it is not possible to determine what would be the effect if the quantity of these materials was lower as it would be necessary to make an unsubstantiated assumption about the resulting corrected mix of management methods. Moreover, if the quantity of mineral wastes sent to landfill was reduced to reflect the quantity recorded in the WDI then the total amount of C&I wastes generated would be substantially lower than other sources. As a result the assessment has used the combined management mix (see right-hand column in Table 3.3) to limit the extent to which this issue skews the baseline data.

4 CONSTRUCTION, DEMOLITION & EXCAVATION WASTE

4.1 Overview

4.1.1 In urbanised planning authorities Construction, Demolition & Excavation (CD&E) wastes are often the largest waste stream, sometimes comprising as much as 50% of all the principal controlled wastes (ie. excluding waste water and radioactive wastes). However in less urbanised and relatively rural authorities they may be similar in size to the other streams.

4.1.2 It is appropriate to split the stream into two components because the types of wastes produced and the options for managing them are very different:

- C&D wastes fall into two further sub-categories:
  - Fittings and fixtures: wood, plastic, glass, uPVC, ceramics/pottery, roofing and insulation materials – some of this material is suitable for recycling (eg. glass and certain plastics, waste wood reprocessed into chipboard) or re-use (roofing tiles) but the rest is likely to be disposed of either to landfill or to an energy from waste facility (waste wood);
  - Asphalt, bricks and concrete: some brickwork might be recovered for re-use, but much of this material is crushed and re-used as a secondary aggregate as sub-base for roads, parking areas, etc.
- E (Excavation) wastes comprise soil and stones excavated during development of a site and will typically be re-used at source as fill or for landscaping, though some material may be removed from where it arises and stored temporarily prior to re-use for similar purposes elsewhere.

4.1.3 Both categories contain some hazardous wastes including demolished materials containing asbestos or soil and stones that have been contaminated by previous land uses.

4.2 Data Sources

4.2.1 Information about CD&E waste is poor and the problem is compounded by inconsistencies in the way waste management companies record arisings and movements. Defra conducted two national surveys (with some reporting of results at regional level) early in the last decade. Identifying results requires use of assumptions that can introduce significant error or distortion and therefore these sources cannot be used to derive meaningful information at planning authority level. A further national survey was undertaken by the Waste Resources Action Programme (WRAP) in 2010, using data for 2008, but this provides indicative rates of recycling, re-use and landfilling of the materials again at a national level only.

4.2.2 The principal source of information is the quantity of materials reported in the Environment Agency's Waste Data Interrogator. However it cannot be used to estimate the quantity of waste arisings accurately because the current permitting regulations do not require all wastes to be reported. The Interrogator does not include those CD&E wastes:

- that are re-used at source and never leave the location where they arose; or
- that are taken off-site in relatively small quantities and spread on land for environmental improvement or restoration purposes. These activities can be performed under exemptions from the permitting process and the wastes are therefore unrecorded.

4.2.3 However this situation is not as problematic as it appears. On-site re-use makes use of mobile plant only, not merchant or municipal waste capacity that the Plan provides for; and the

quantity of material taken to exempt sites is relatively small and only requires lorries and plant for offloading and spreading it at its destination. The Plan does not make provision for this infrastructure either.

4.2.4 One further complication is that significant quantities of wastes removed from source are taken to transfer stations for storage, sorting or re-processing. This creates two further problems:

- Some materials are taken to other waste management sites creating the risk of double-counting;
- Some materials are re-processed at the transfer station into secondary aggregates at which point they become 'not waste' and disappear from the reporting systems.

4.2.5 The analysis below has been undertaken at a level of detail to allow these discrepancies to be identified as far as possible and taken into account when estimating CD&E waste arisings and the fate of these materials.

4.2.6 As a result the Waste Data Interrogator only provides data on some of the wastes created and the quantities referred to below should be regarded as an indication of the minimum level of arisings for these streams.

4.3 Arisings & Management

4.3.1 Table 4.1 summarises how and where these materials were managed and shows total estimated arisings of 148,875 tonnes (the sum of the bold figures).

Table 4.1 Arisings and Management of C&D Wastes Originating in Cumbria in 2013

Reported arisings	**205,285**		
Management location		In Cumbria	Outside Cumbria
Waste received		189,116	16,169
Management fate	Landfilled or used in restoration	18,037	3,980
	Recycled (metals)	1,621	1,802
	Treated/reprocessed	114,086	5,120
	Taken to transfer station	(see below)	5,267
	Total	**124,405**	**16,169**
Material taken to local transfer stations		64,711	-
Management fate	Removed to other facility	22,842	7,781
	Fate not identified	**33,320**	-

[Source: Environment Agency Waste Data Interrogator 2013 – all figures in tonnes]

4.3.2 Almost 96% of reported arisings were managed in Cumbria with very little leaving the county. This is unsurprising as C&D wastes are bulky and of generally low value and in most cases this makes it uneconomical to move them over long distances whether for recycling or disposal. Table 4.1 implies local C&D waste management is fairly sustainable with only around 22,000 tonnes of material (approx. 15%) going to landfill, although this may be slightly higher if some of the material leaving transfer stations for unidentified fate is also used as fill on exempt sites.

4.3.3 As noted above there is a risk of double-counting wastes which are taken to local transfer stations and then stored, bulked or reprocessed and then sent to other waste sites where their receipt is recorded a second time. The lower part of Table 4.1 shows that almost 65,000

tonnes of local waste was handled in transfer stations in Cumbria with 37% being removed to another waste facility in the county and being removed to facilities in other authorities. The fate of the remaining 33,300 tonnes cannot be established with any certainty from the records in the Waste Data Interrogator. It is most likely to have been reprocessed into secondary aggregate which is no longer a waste and therefore its subsequent removal is not reported to the Environment Agency. However that implies this material is not being double-counted and therefore the total arisings are estimated to be the sum of the three underlined figures in Table 4.1.

4.3.4 Table 4.2 provides the corresponding analysis for Excavation wastes.

Table 4.2 Arisings and Management of Excavation Wastes Originating in Cumbria in 2013

Reported arisings	**356,492**		
Management location		In Cumbria	Outside Cumbria
Waste received		334,972	21,521
Management fate	Landfilled / land spread	118,501	16,696
	Used in restoration	84,817	-
	Treated/reprocessed	98,319	1,037
	Taken to transfer station	(see below)	3,788
	Total	**301,638**	**21,521**
Material taken to local transfer stations		**33,333**	-

[Source: Environment Agency Waste Data Interrogator 2013 – all figures in tonnes]

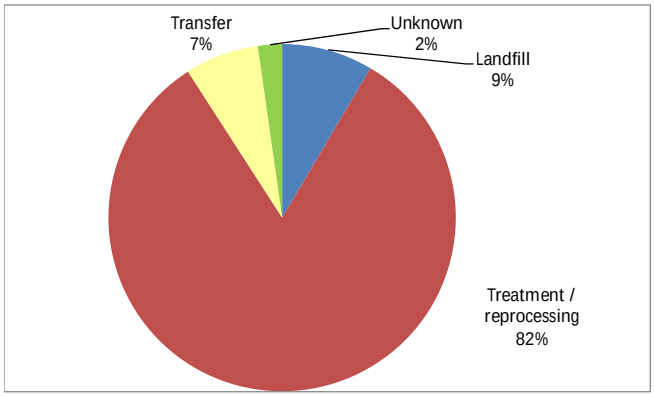
4.3.5 Identifying the fate of Excavation wastes passing through transfer stations has proved more problematic. The analysis of wastes originating locally shows a little over 33,000 tonnes deposited in transfer stations in the county. A separate analysis of wastes received at transfer stations in Cumbria shows reasonable correspondence (35,400 tonnes) however only 29,000 tonnes originated locally and the rest arrived from other authorities. A further complication arises in the analysis of wastes removed from these facilities which shows almost 39,000 tonnes was sent to other sites in Cumbria and a further 15,750 tonnes was sent to sites outside the county giving a total of almost 55,000 tonnes. It has not been possible to identify or suggest where the additional 22,000 tonnes of material has come from as the analysis summarised above has already taken account of material imported to the county.

4.3.6 Although the Excavation wastes taken to transfer stations in the county may be re-recorded when it is moved to another location it has not been possible to establish the level of double-counting that has occurred. It appears prudent to over-estimate arisings to ensure that sufficient capacity will be available and therefore the quantity of Excavation waste arisings has been estimated to be the sum of the three underlined figures above: 356,492 tonnes.

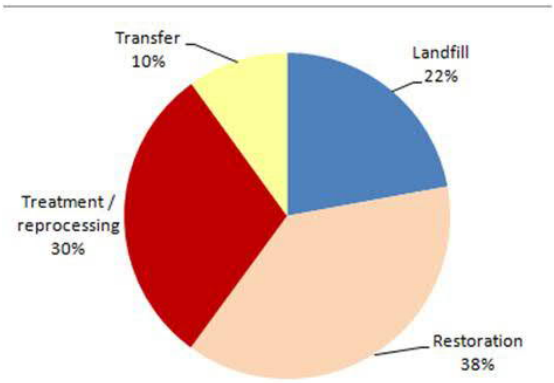
4.3.7 Figure 4.1 (overleaf) summarises the overall fate of these materials irrespective of where they were managed. This analysis suggests the management of Excavation wastes is less sustainable insofar as more material is managed as the bottom of the Waste Hierarchy but at least two-thirds is recovered, re-processed or used beneficially for engineering purposes (ie. for restoration). However opportunities to re-use these wastes for this purpose will depend on the number and scale of development projects under way in a particular year and therefore may fluctuate over time.

Figure 4.1 Fate of All CD&E Wastes Originating in Cumbria in 2013

C&D Waste



Excavation Waste



[Source: Environment Agency Waste Data Interrogator 2013 – all figures in tonnes]

4.3.8 Separate analysis documented in Section 8.3 of this report estimated 96% of CD wastes and 94% of E wastes were managed locally. The fate of exported materials is summarised in Table 4.3 in that their eventual fate might indicate where there are possible shortages of capacity in the county though any analysis is again limited by the substantial proportion that was moved to a transfer station.

Table 4.3 Fate of C&D and Excavation Waste Materials Arising in Cumbria But Managed Outside the County in 2013

	C&D	Excavation
Disposal to landfill	**25%**	**78%**
Metal recycler	**11%**	
Treated / reprocessed	**32%**	**5%**
To transfer station	**33%**	**18%**

4.3.9 These findings are generally consistent with the expectation that these materials are bulky and of low value and therefore waste contractors have no incentive to move large quantities over substantial distances to use marginally cheaper management facilities outside the county. Nevertheless over 13,000 tonnes of excavation waste was exported to Blaydon Quarry at Gateshead which is a non-inert landfill site and the reason for this movement is unclear.

4.4 Stream Composition

4.4.1 For the purposes of the Needs Assessment it is unnecessary to analyse the materials involved in detail other than distinguishing between C&D and E wastes. However an additional shows the following composition of the two streams as shown in Table 4.4 overleaf. Note that for reasons explained previously it will contain some double-counted material as is it not possible to isolate this from the analysis and the proportions should be regarded as indicative.

4.4.2 Virtually all C&D wastes have been reported as mixed materials though this is likely to be because contractors have not bothered to record the quantities of individual components, which are likely to be bricks, crushed or blocks of concrete and asphalt, as well as quantities of glass, plastics and wood, when they are received at transfer stations and other recycling or treatment facilities. Unsurprisingly the excavation wastes are almost entirely soils (possibly containing some stones). In both cases further detail of the quantities of individual materials can be provided if required.

Table 4.4 Indicative Composition of the C&D and Excavation Waste Materials Arising in Cumbria in 2013

C&D wastes			Excavation wastes		
Glass wastes	5,457	3%	Dredging spoil	634	<1%
Plastic wastes	111	<1%	Soil and stones	348,644	98%
Wood wastes	4,705	2%	Quarrying wastes	6,539	<2%
Metal wastes	4547	2%	Other mineral wastes	675	<1%
Mixed wastes	190.405	93%			

[Source: Environment Agency Waste Data Interrogator 2013 – all figures in tonnes]

5 HAZARDOUS WASTE

5.1 Overview

5.1.1 As most hazardous wastes arise in relatively small quantities and require specialised handling they are managed across a network of facilities each of which has a regional or even national catchment. This situation means that no authority has a set of hazardous facilities to deal with all the wastes it produces and as a result the movement of these wastes between authorities – as a proportion of total arisings – is higher than for other streams.

5.1.2 The analysis has identified:

- The quantities of wastes produced locally and those imported and exported between Cumbria and other authorities. The analysis of historical trends shows Cumbria is a net exporter of hazardous wastes. If the Plan is to provide for a net self-sufficient outcome then the required capacity is taken to be equivalent to local arisings irrespective of where they are eventually managed.
- The type of materials arising. All hazardous wastes are a subset of the other principal streams and this analysis identifies, for example, how much of the material originates from households. This enables estimation of the proportion of household (or LACW) waste that is hazardous so that the quantity of arisings can be reduced to prevent double-counting.
- The fate of the materials insofar as this indicates how well hazardous waste management is performing with respect to the Waste Hierarchy.
- The destination of exported hazardous wastes. The scale of inter-authority movements means this is a particularly important issue with respect to the Council's obligations under the Duty to Cooperate.

5.1.3 In order to provide a clear focus, this chapter addresses the first three points above, and a more detailed analysis of the destination of hazardous wastes leaving Cumbria is provided in Chapter 8.

5.2 Data Sources

5.2.1 The nature of these materials requires care and special facilities for transporting, managing and disposing of them. As a result tight regulatory controls and reporting mean that information about the quantities, movement and fates of these wastes is well documented. Data presented here are taken from the Environment Agency's Hazardous Waste Data Interrogator (HWDI) which is published annually and which provides comprehensive and definitive database information about this stream. The current analysis includes data for 2013 which were released in October 2014.

5.3 Arisings & Management

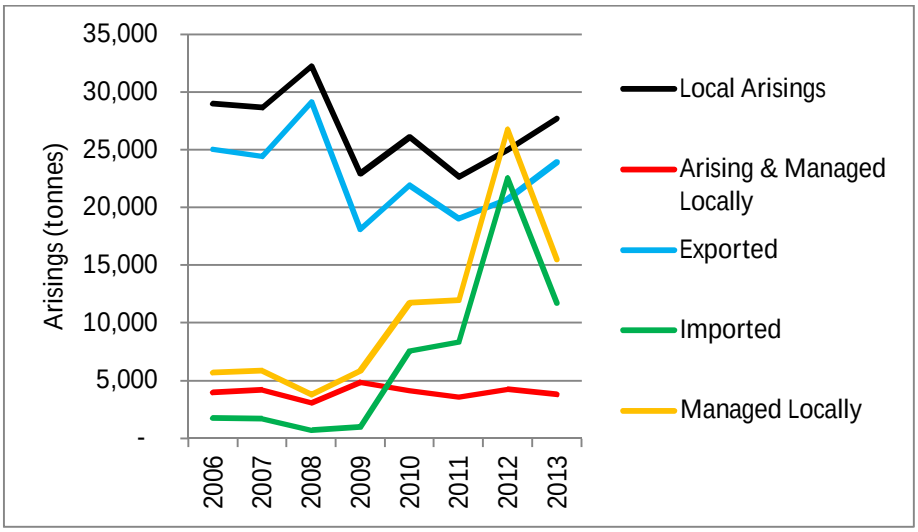
5.3.1 Table 5.1 summarises the recent trends in arisings, imports and exports and these trends are shown graphically in Figure 5.1. The final row in Table 5.1 comprises the local arisings that remained within the county plus imported material.

Table 5.1: Hazardous Waste Management in Cumbria – Recent History

	2006	2007	2008	2009	2010	2011	2012	2013
Local Arisings	29,036	28,659	32,301	22,992	26,103	22,668	25,002	27,762
Arising & Managed Locally	3,978	4,179	3,109	4,886	4,133	3,578	4,242	3,787
Exported	25,058	24,480	29,192	18,106	21,970	19,090	20,760	23,975
Imported	1,736	1,670	671	997	7,590	8,386	22,551	11,753
Managed Locally	5,714	5,849	3,779	5,883	11,723	11,964	26,793	15,540

[Source: EA Hazardous Waste Data Interrogators]

Figure 5.1: Hazardous Waste Management in Cumbria – Recent History



[Source: EA Hazardous Waste Data Interrogators]

5.3.2 Local arisings show a similar trend to many other authorities, with a gradual decline in quantity, the amount remaining in the county and that exported though there are noticeable differences from one year to the next. In both cases the total quantities involved have fallen at a rate of about 0.65% annually.

5.3.3 The quantity of imported waste has changed significantly over the last eight years, remaining at around 5000 tonnes per year until 2009 after which the quantity has more than doubled. Figures for 2012 show an anomaly which represents two large movements of waste oils and solvents from Teesside and central Scotland. These materials were handled at transfer stations in the county prior to being sent for recovery but it has not been possible to identify where they were eventually managed4. However, the fact that these extra quantities were handled with no indication of permissions for new or expanded facilities implies considerable spare capacity exists in this type of waste management facility in the county.

5.3.4 This apparent anomaly was also the only time when the county – briefly – became a net importer of hazardous waste. For more of the preceding period, and now again in 2014, it has been heavily dependent on external capacity.

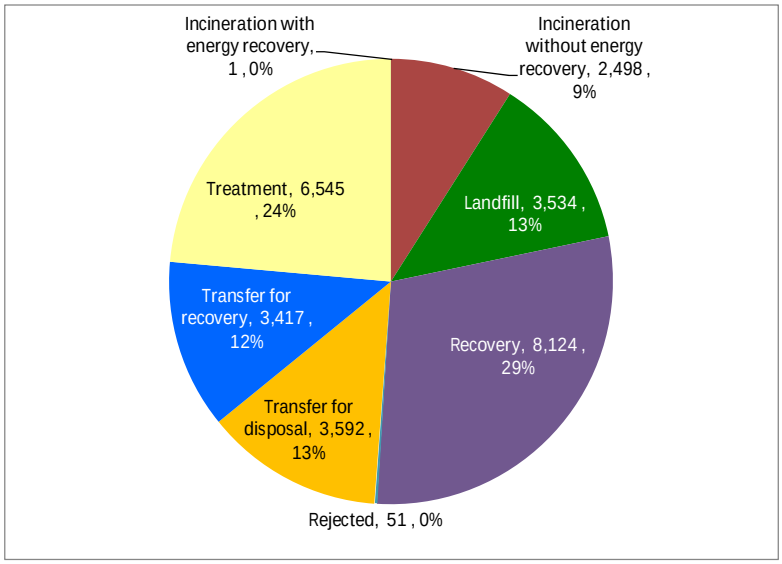
5.3.5 The hazardous nature of these wastes ought to imply there is limited scope for recycling and recovery compared to the other principal streams, but this is not the case. Typically much of the hazardous wastes that are landfilled are C&D wastes containing asbestos as there are

[4] These movements were identified from the Hazardous Waste Data Interrogator which does not provide details of the facility sending or receiving the wastes. These details can be obtained from the Waste Data Interrogator (though it is regarded as less authoritative than the Hazardous equivalent) but there is no record of any movement of these materials on this scale.

currently no technically or economically feasible processes that would enable them to be recycled.

5.3.6 Figure 5.2 shows the fate of all local waste arisings in 2013 irrespective of where they were eventually managed.

Figure 5.2; Fate of Hazardous Wastes Arising in Cumbria in 2013



[Source: EA Hazardous Waste Data Interrogator – figures in tonnes]

5.3.7 Both 'treatment' and 'recovery' will involve processing wastes to remove hazardous contaminants (such as certain minerals in waste oils and solvents; or oil mixtures that may have contaminated soil) so that the material can be re-processed or re-used. Figure 5.2 suggests that about two-thirds of the locally arising wastes are recycled to some extent. Materials sent to "Transfer for disposal" are most likely to be landfilled which accounts for a quarter of local wastes, with the remainder going to high temperature incineration.

5.3.8 Table 5.2 summarises the fate of exported arisings over the last 8 years in that this gives an indication of the type of management capacity that is lacking locally.

Table 5.2: Recent Trends in Managing Hazardous Wastes Exported from Cumbria

	Total	Incineration with energy recovery	Incineration without energy	Landfill	Recycling / reuse / recovery	Rejected	Transfer (D)	Transfer (R)	Treatment
2006	25,058	78	7042	5464	5463	1	1508	2662	2841
2007	24,480	61	6731	2984	7339	0	1271	3006	3088
2008	29,192	78	5345	7941	5822	0	2843	3742	3421
2009	18,106	52	2903	1789	5431	10	955	4156	2810
2010	21,970	59	3050	2179	7849	0	703	3361	4769
2011	19,090	5	2988	2384	6061	25	778	3081	3767
2012	20,760	4	4259	1783	6914	0	932	2621	4246
2013	23,974	1	2498	2766	8091	51	1518	2504	6545
2013 only		0.0%	10.4%	11.5%	33.7%	0.2%	6.3%	10.4%	27.3%
4 year averge		0.1%	14.9%	10.6%	33.7%	0.1%	4.6%	13.5%	22.5%
8 year averge		0.2%	19.1%	14.9%	29.0%	0.0%	5.8%	13.8%	17.2%

[Source: EA Hazardous Waste Data Interrogators – figures in the main table are in tonnes]

5.3.9 Table 5.2 illustrates that over 70% of material was treated or recovered (in some cases via external transfer stations). The analysis shows that the proportion being treated or recovered has increased while that being disposed to landfill or incineration has fallen. While the county is still very dependent on external capacity, and while the Waste Plan has limited scope to influence the pattern or scale of waste movements, the current industry-led outcome is moving more of these materials up the Waste Hierarchy.

5.3.10 Table 5.3 provides the corresponding analysis of what has happened to hazardous wastes imported to the county since 2005. It shows virtually the material is being brought to transfer stations for onward despatch to recovery facilities. However the small quantity of material going directly to recovery or recycling facilities identifies a lack of local capacity that the Waste Plan might seek to address. This apparent lack of capacity appears consistent with the patterns of waste movements and fates shown in Table 5.2.

Table 5.3: Recent Trends in Managing Hazardous Wastes Imported to Cumbria

	Total	Incineration with energy recovery	Landfill	Recycling / reuse / recovery	Transfer (D)	Transfer (R)	Treatment
2006	1,736	1	14	146	1,383	8	183
2007	1,670	25	89	237	1,289	30	-
2008	671	-	10	42	513	105	-
2009	997	-	165	2	210	621	-
2010	7,590	-	-	608	377	6,605	-
2011	8,386	-	518	8	205	7,655	-
2012	22,551	-	49	59	454	21,988	-
2013	11,753	-	5	-	166	11,582	
2013 only		0.0%	0.0%	0.0%	1.4%	98.5%	0.0%
4 year averge		0.0%	1.0%	1.2%	2.2%	86.4%	0.0%
8 year averge		0.0%	1.5%	2.0%	8.3%	87.8%	0.3%

[Source: EA Hazardous Waste Data Interrogators – figures in the main table are in tonnes]

5.3.11 Leaving aside movements through transfer stations, Table 5.3 implies local hazardous waste management has moved an increasing proportion of material up the Waste Hierarchy, though not on the same scale as the material that is exported. It also implies that hazardous waste management facilities in the county have closed in the last eight years due to the lack of incineration or treatment after 2006/7.

5.3.12 Table 5.4 provides the further analysis of how local arisings which remained in the county were managed.

Table 5.4: Recent Trends in Managing Hazardous Wastes That Remained in the County

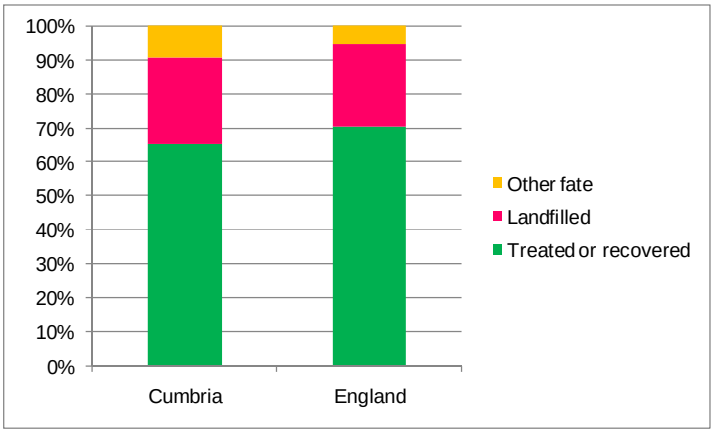
	Total	Incineration with energy recovery	Incineration without energy recovery	Landfill	Other Fate	Long term storage	Recycling / reuse / recovery	Rejected	Transfer (D)	Transfer (R)	Treatment
2006	3,978	2	0	1380	12		241	18	1,493	828	6
2007	4,179	0	0	648			1339		1,880	311	0
2008	3,109			485		1	276		1,915	433	
2009	4,886			442			299		2,152	1992	
2010	4,133			0			210		2,348	1575	
2011	3,573			1019			65		1,376	1114	
2012	4,242			1375	0		46		1,474	1347	
2013	3,787			768			32		2,074	913	0

5.3.13 This analysis shows the limited scale of local hazardous waste management. Landfill disposal facilities are restricted to those capable of accepting C&D wastes with high levels of asbestos and gypsum and the fall in inputs over the period 2007-2010 appears likely to reflect the impact of recession on the number of regeneration projects that might have created these

waste materials. The reason for the decline in recycling/re-use/recovery is a potential cause for concern as the levels managed locally are much lower than the amount that is exported (see Table 5.2) though the fact that material is being managed suggests local capacity is still operating. Similarly quantities of material passing through local transfer stations is modest compared to the imported materials (see Table 5.3) especially in the last two years, and suggests these businesses may be increasingly dependent on these movements.

5.3.14 Figure 5.3 shows how well the county fares compared to England in terms of the sustainable management of hazardous wastes. This comparison suggests management of local arisings – irrespective of where this occurs – is marginally less sustainable than the national average with slightly more waste sent to disposal, storage of another fate which does not recover value from the material. However it is not possible to judge whether this difference is just because more of the waste produced local is only suitable for disposal. Also, Table X.3 shows only limited quantities of local wastes are exported for disposal and even if the Plan provides for additional treatment or recovery capacity in Cumbria there may be limited scope to directly influence the quantity of wastes meeting these fates.

Figure 5.3; National Comparison of Hazardous Waste Management

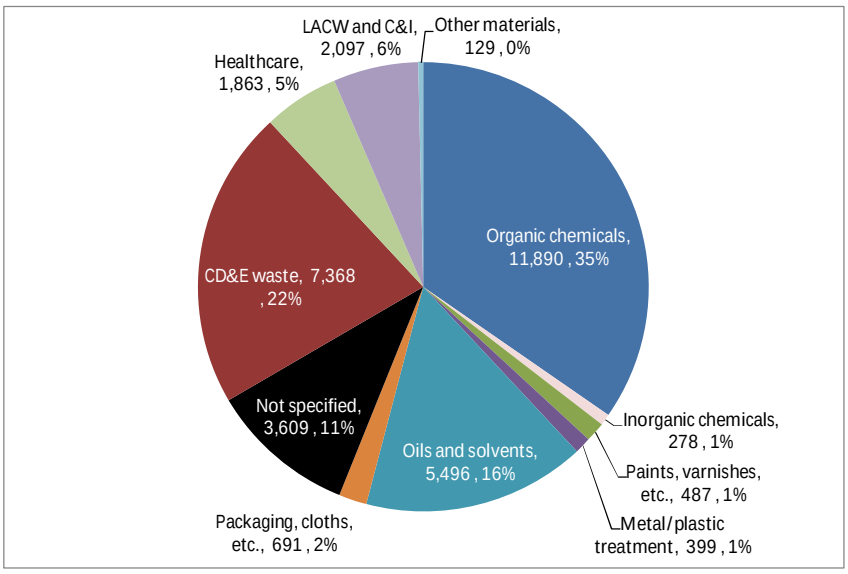


[Source: EA Hazardous Waste Data Interrogator]

5.4 Stream Composition

5.4.1 Figure 5.4 shows the composition of local arisings in 2013. Several categories of material have been combined into “other materials”. This analysis indicates that three categories – organic chemicals, oils and solvents, and CD&E wastes - represent almost three-quarters of local arisings. Separate analysis (not shown here) indicates the increase over the period 2011 to 2013 (see Table 5.1) is largely the result of increased arisings in wastes from organic chemical production, CD&E wastes which are primarily asbestos-containing materials, and materials that are (unhelpfully) “not otherwise specified”.

Figure 5.4: Composition & Quantities of Locally Arising Hazardous Wastes in 2013



[Source: EA Hazardous Waste Data Interrogator – figures in tonnes]

5.4.2 As stated above, hazardous wastes are a subset of the principal streams. The type of material involved can, in most cases, be used to determine whether it is likely to be LACW, C&I or CD&E waste. In the case of the LACW and C&I, oil/solvents, packaging and not specified categories a more detailed analysis of the materials has been undertaken to identify the quantities in each of the main streams. The results are summarised in Table 5.5 and in each case the tonnage shown in the second column is deducted from the total waste stream to prevent double-counting in capacity assessment.

Table 5.5: Estimated Hazardous Components of the Principal Waste Streams

	Hazardous arisings	Share of hazardous arisings	Proportion of main stream
LACW	2,372	9%	0.94%
Commercial	4,052	15%	1.25%
Industrial	16,331	60%	4.70%
C&D	3,172	12%	0.84%
Excavation	1,107	4%	0.31%

[Source: EA Hazardous Waste Data Interrogator; Urban Vision analysis]

6 AGRICULTURAL WASTE

6.1 Overview

6.1.1 Data from the 2010 have been used to identify the proportion of farm holdings in the North West region that were in Cumbria in 1988. Data from the 2001 report have been used to estimate total arisings in the region and the relative proportions of various materials (plastic packaging, cardboard/paper packaging, organic by-products, etc.). As there is no other information to draw on it has been necessary to assume that the mix of materials regionally is the same as that produced by Cumbrian farms. The data show that virtually all agricultural waste consists of organic by-products (see below), most of which are silage and slurries. These wastes are likely to be produced in far greater quantities by pastoral agriculture which is the predominant land use in the county. In that respect the assumption referred to above may be more representative for Cumbria than for the more urbanised southern sub-regions where horticulture or arable cultivation will predominate.

6.1.2 The historical data from the 2010 survey have then been used to project the change in the number of farm holdings over the period 1998-2010. It has been necessary to make further simplifying assumptions that:

- There has been no change in the scale, mix or intensity of farming over the period that might also affect the mix of wastes and how they are managed;
- As a result it is also consistent to assume that the quantity of waste generated per agricultural holding has remained roughly same.

6.2 Data Sources

6.2.1 Agricultural waste is another stream where accurate assessment is limited by the quality of the data, the problem in this case being the lack of up-to-date information. The only available data sources are:

- The 2001 Environment Agency report *Towards Sustainable Agricultural Waste Management* which estimates total arisings in each English region in 1998*;*
- The 2003 Defra survey *Agricultural Waste Survey 2003* which identifies how a wide range of agricultural waste was managed at the time;
- The 2010 Defra survey of the number, scale and type of agricultural holdings with data reported at county or local authority level at 5 year intervals back to 1995.

6.2.2 Collectively these sources provide a mixture of information at regional and county level from which it is possible to extrapolate an estimate of the quantity of agricultural wastes arising in Cumbria provided that the limitations of this approach are recognised both in terms of the age of the data and the range of assumptions used. The source data for this assessment (see below) were compiled at a time when the UK farming industry was recovering from the BSE and foot-and-mouth epidemics of the 1990s and it must be assumed that they had a significant but unquantifiable impact on the results.

6.3 Arisings, Stream Composition & Management

6.3.1 Table 6.1 summarises the results of the 1998 survey for the North West region and, as stated above, this is assumed to be representative of the mix in Cumbria.

Table 6.1: Agricultural Waste Arisings in the North West of England, 1998[5]

Waste materials	Tonnage	% of stream	Waste type (generic)
Packaging materials			
Packaging - plastics	2,079		C&I
Packaging – cardboard or paper	681		C&I
Packaging – metal/glass/wood/rubber	131		C&I
Packaging materials	**2,891**	**0.03%**	
Non-packaging plastics			
Film plastic	2,727		C&I
Other non-packaging plastic	1,687		C&I
Contaminants attached to plastic	3,678		C&I
Non-packaging plastics	**8,092**	**0.10%**	
Machinery, equipment, etc.			
Oils	1,609		C&I and hazardous
Batteries	225		C&I
Tyres	2,135		C&I
Machinery	2,115		C&I
Equipment containing CFCs	2		Hazardous
Machinery, etc.	**6,086**	**0.07%**	
Organic & animal by-products			
Slurry and farmyard manure			Sector-specific
Silage effluent	211,189		Sector-specific
Waste milk	3,437		C&I
Waste vegetables and cereals	57,550		C&I
Straw	230,647		Sector-specific
Animal carcasses and tissue	28,201		Hazardous
Organic by-products	**8,289,668**	**99.6%**	
Other wastes			
Non-packaging cardboard	106	<0.01%	C&I
Agrochemicals	3,084	0.04%	C&I and hazardous
Animal health products	11,215	0.13%	C&I and hazardous
Asbestos roof sheeting	1,768	0.02%	Hazardous
TOTAL	**8,319,232**		

[Source: Environment Agency, 2001; Defra 2003 and 2010]

6.3.2 The 2003 survey identifies the following principal management methods for organic by-products:

- Slurry, farmyard manure and silage effluent – spread on land for biological improvement;
- Waste milk, vegetables, etc. – composted or buried (these are wastes and therefore there is no commercial rationale for taking them off-site for disposal at extra cost);
- Straw – spread on land or re-used as animal bedding where feasible;
- Animal carcasses, etc. – high-temperature incineration at specialised facilities to comply with Animal By-Products legislation.

6.3.3 Interpolating the results of Defra's censuses of farm holdings there were estimated to be 6,872 holdings in Cumbria, representing 35% of all agricultural holdings in the North West in 1998. As there is no way of estimating how varying mixes of agricultural use affect arisings in different sub-regions it has been necessary to use a simplifying assumption that a

[5] The source statistics exclude quantities of unused pesticides, veterinary medicines, etc. due to a lack of reliable data, but analysis of the results of the 2003 report suggests that the total quantity is inconsequential. Other wastes such as building rubble are usually re-used on the holding to fill in potholes or minor landscaping.

corresponding proportion of the regional total arose in Cumbria – ie. 2,953,815 tonnes, giving total arisings of 430 tonnes per holding.

6.3.4 The most recent survey data show the number of holdings have fallen by 31% since 1998 to 4,768 by 2010 although other sub-regions of the North West have seen greater declines. Further simplifying assumptions have been made that the quantity of local wastes has fallen in the same ratio and that the distribution across the various material categories has not changed. Table 6.2 summarises the estimated quantities.

Table 6.2: Estimated Annual Agricultural Waste Arisings in Cumbria, 2010

Waste material	Tonnage
Packaging materials	712
Non-packaging plastics	1,993
Machinery, etc.	1,499
Organic by-products (excluding animal by-products)	2,034,374
Animal by-products	6,944
Non-packaging cardboard	26
Agrichemicals	760
Animal health products	2,762
Asbestos roof-sheeting	435
Total	**2,049,505**

[Source: Environment Agency, 2001; Defra 2003 and 2010]

6.3.5 The 2003 survey referred to above suggests that there are multiple management routes for several of these materials. The principal exception is the largest stream which has previously been managed at source and therefore makes no demands of the off-site waste facilities which the MWLP must provide for. It is likely that this situation has changed since the 2001 and 2003 studies were undertaken and that a proportion of slurry, manure and effluent is processed in Anaerobic Digestion (AD) facilities. There is no evidence of merchant sites providing this service to third parties on a significant scale in Cumbria but the technology is scalable. However there are a number of small-scale facilities dealing with arisings from the immediate holding only and which are operating under exemptions from the Environmental Permitting regime. A further 1MW plant also accepts a mixture of bio crop or similar non-waste feedstocks as well as slurry from a number of nearby farms . A further plant dealing with waste from two holdings has commenced operations in 2014.

6.3.6 Table 6.3 (overleaf) summarises the assumed / estimated quantities managed in different ways. The estimated mix demonstrates the dominance of on-site management. The largest quantity of material managed off-site is straw which has been baled. Taking the material off-site incurs cost and therefore it is reasonable to expect it is sold for re-use elsewhere and not landfilled or burned as this could occur at source without incurring cost.

6.3.7 Lack of detailed up-to-date information about how these wastes are managed mean it is difficult to estimate future waste management needs6. Again it is necessary to make a simplifying assumption that wastes are already being managed as far up the Waste Hierarchy as is technically or economically feasible. Even slurry, etc. that is treated in AD plants to

[6] Defra's 2012 Farm Practices Survey (https://www.gov.uk/government/statistics/farm-practices-survey-october-2012-current-farming-issues) provides an update on management methods that suggests many materials that were previously being burned or buried at source are now being recycled. It is difficult to judge what change in farming practices has occurred to create a need to re-use various discarded plastic films and packaging materials where none apparently existed previously. The scope for direct comparison is also limited because the latest survey only covers some of those reviewed by the earlier survey and the current survey does not indicate whether organic by-products continue to dominate the agricultural waste stream.

provide a local source of power (and possibly heat) is being managed at the second-bottom level in the Waste Hierarchy and it is debatable whether this is an environmentally optimal use of the material compared to composting it into mulch or spreading it on farmland as a fertiliser or soil improver.

Table 6.3: Estimated Management Mix of Agricultural Wastes in Cumbria, 2010

Waste material	Tonnage
Management on site	
Land recovery, composting or other treatment	1,963,367
Burned	2,144
Tipped or buried	14,623
Stored or stockpiled	1,255
Sub-total	1,981,420 (96.7%)
Management off site	
Taken back by supplier	2,206
Taken by waste contractor	875
Recycled or re-used off-site	56,796
Taken to HWRC for probable disposal	114
Domestic residual (black bag) disposal	860
Landfilled (largely hazardous)	283
Specialised incineration (ABP regulations compliant)	6,944
Sub-total	68,079 (3.3%)
Total	**2,049,505**

[Source: Environment Agency, 2001; Defra 2003 and 2010; Urban Vision analysis]

6.3.8 Leaving aside the need for specialised incineration of certain material, there are around 4,000 tonnes of material that is currently managed through third party waste sites. The level of re-use or recycling of these materials cannot be substantiated and therefore it would be prudent for the MWLP to assume they are all currently being disposed as residual waste and that the Plan should provide for some new capacity to enable them to be recycled. However it should also be recognised that most of the material will be similar to C&I waste and therefore this capacity might be provided at facilities handling those waste streams.

7 OTHER WASTES

7.1 Waste Water Treatment

7.1.1 United Utilities (UU), the statutory undertaker for wastewater in Cumbria, confirms that their latest 5-year Asset Management Programme (AMP6)7 identifies the need for a new wastewater treatment works (WwTW) as part of a major capital scheme to upgrade the West Cumbria water supply network. The proposed WwTW at Bridekirk would connect a new clean water transfer main from Thirlmere and a new treated water transfer main to an existing service reservoir. However, there will be associated decommissioning of a number of WwTWs and pumping stations, so the amount of wastewater needing treatment will not increase significantly. Progress should be kept under review.

7.2 Low-level Non-nuclear Industry Radioactive Waste

7.2.1 These wastes are typically produced by hospitals, and academic and medical research establishments and arise in very small quantities. They can include used x-ray plates and similar materials and often include non-radioactive hazardous materials such as medical sharps. Materials are disposed not recycled and the potential options include:

- Disposal of some liquid wastes as waste water;
- Use of the UK Low Level Radioactive Waste Repository within Cumbria;
- Controlled burial at a very limited number of permitted landfill sites, including Lillyhall in Cumbria;
- High temperature incineration at one of a similarly restricted number of specialised facilities, the nearest of which is at Ellesmere Port, Cheshire.

7.2.2 Producers of these wastes are not required by law to record the weight of materials, and scale is usually expressed in the radioactive emission of the material. The Environment Agency provides limited details of the fate of these wastes, and some wastes have such limited hazardous qualities that they can be disposed in the same way as non-hazardous materials, eg. to foul sewer.

7.2.3 The Council has received information of this nature from the Environment Agency but at the time of completion of this report it lacked sufficient detail to provide a report on the materials involved and where they were managed. As a result details of local management requirements for these wastes will be reported separately.

8 CROSS-BORDER MOVEMENT OF WASTE

8.1 Introduction

8.1.1 Cross-border movements complicate the Needs Assessment because they cannot be taken into account readily and because the pattern and quantities involved will change from year to year. However local planning authorities are required7 to have regard to the principles of self-sufficiency and the "proximity principle" as set out in Article 6 of the Waste Framework Directive, when exercising their planning functions relating to waste management. In order to assess performance against this requirement, Planning Practice Guidance[8] makes it clear that the evidence base for the Local Plan must involve understanding waste arisings from within the authority area, including imports and exports.

8.1.2 The normal commercial operation of the waste management sector results in a situation in which most types of waste will move between waste planning authorities. In some cases this occurs because of a lack of a particular type of local capacity; potentially because the specific waste types are produced in small quantities for which it would be uneconomic to have a facility in each local authority. In other cases it occurs because of commercial decisions or the organisation of a waste management company which may move wastes from various authorities to a single location within the region.

8.1.3 Waste exports and imports for 2013 are summarised in Table 8.1 and both sets of figures include movements that are not precisely reported by the waste operators but which are allocated to a specific waste planning authority or region[9]. These figures may overestimate Cumbria movements in both directions as they include the NW region of which Cumbria is only a part. More accurate hazardous waste figures, derived from the separate Hazardous WDI, are reported elsewhere in this report.

Table 8.1: Comparison of Controlled Waste Exports and Imports to Cumbria, 2013

2013	Household and C&I	Inert and CD&E	Hazardous	TOTAL (tonnes)
EXPORTS	204,586	30,495	10,967	246,048
IMPORTS	88,098	205,112	4,120	297,330

[Source: Environment Agency Data Interrogators, 2013]

8.1.4 Table 8.1 indicates that there is some equivalence in the net movements of waste in and out of Cumbria (excluding radioactive waste, imports of which are highly significant but are not addressed in this report). Cross-border movements are particularly significant in the light of the Duty to Cooperate (DtC) which was introduced by the Localism Act, especially in terms of the extent to which the county will depend on external capacity. The majority of this chapter therefore focuses on the export of wastes as this informs the scale of dialogue the Council needs to undertake with other authorities that receive locally created wastes.

8.1.5 Waste exports to England and Wales from 2006 to 2012 are summarised in Table 8.2. These totals are lower than those in Table 8.1 because this WDI report does not include waste movements that were not adequately recorded, and does not include exports to Scotland. However, the time series data demonstrates that the quantity of waste being exported from Cumbria has fluctuated but is currently less that at its peak in 2011.

7 The Waste (England and Wales) Regulations, 2011.

8 DCLG, Planning Practice Guidance – Waste, para.6.

9 Drawn from document LD268 Waste Exports from Cumbria _EA WDI 2013 Cumbria CC Dec 2014 and LD269 Waste Imports to Cumbria EA WDI 2013 Cumbria CC Dec 2014

Table 8.2: Comparison of Controlled Waste Exports and Imports to Cumbria, 2013[10]

2006	2007	2008	2009	2010	2011	2012	2013
40,696	41,422	65,527	141,178	249,248	260,742	175,041	178,936

[Source: Environment Agency Data Interrogators, 2013]

8.1.6 The Council has used the export data from 2006 to 2012 to identify 51 authorities that were consulted in December 2013 about cross border movements, details of any new facilities or potential closures, and asking whether they had any concerns about the receipt of waste from Cumbria. The consultation included four Scottish WPAs, receiving in total 26,651 tonnes of waste from Cumbria in 2012. No concerns were raised about waste exports from Cumbria, and the impact on waste planning in the recipient authorities' areas, although some information about the future of landfill sites in two areas has been taken into consideration in Chapter 11.

8.1.7 The rest of this Chapter contains a more detailed analysis conducted as part of the Waste Needs Assessment which addresses movements in 2013 only. The concluding section assesses to what extent the requirements highlighted in paragraph 8.1.1 above has been, or can be, achieved.

8.2 Household, industrial & Commercial Waste

8.2.1 Due to the difficulties involved in separating the LACW and C&I streams in the Waste Data Interrogator the analysis addresses the movement of all non-inert, non-hazardous wastes.

8.2.2 Table 8.3 summarises the destination of these wastes arising in Cumbria in 2013 and the type of waste management facility that received them. It shows that 85% of these materials were initially handled at facilities within the county. This figure should be viewed with some caution as material taken to transfer stations may have been bulked into larger loads and then moved out of the county.

8.2.3 The main observations from the analysis in Table 8.3 are as follows:

- Exports to other authorities in the North West totalled 33,500 tonnes, equivalent to just under 4% of estimated arisings;
- Exports to other English regions totalled 92,500 tonnes, equivalent to almost 11% of estimated arisings, and there was no material exported directly to other parts of the UK or outside it;

8.2.4 A threshold of 1000 tonnes for defining a strategic movement of waste, would require the Council to contact 13 waste planning authorities with regard to its DtC obligations with regard to these waste streams (see orange cells). Of these authorities only Bromley was omitted from consultation in 2013. However the waste sent there went to a single producing RDF which was closed in 2014 as a result of enforcement activity. A recent appeal to re-open the site has been refused and it appears very unlikely that waste exports to Bromley will resume.

[10] The quantities in this table exclude movements of waste to or from Scottish WPAs.

Table 8.3: Destination of HIC Wastes Arising in Cumbria in 2013 and the Type of Facility Where They Were Managed

LOCAL	
Cumbria WPA	740,187
OTHER NORTH WEST	
Cheshire West and Chester WPA	14
Bolton WPA	1
Manchester WPA	13
Rochdale WPA	1
Salford WPA	17
Trafford WPA	2,000
Wigan WPA	75
Blackburn with Darwen WPA	10
Lancashire WPA	27,336
Halton WPA	120
Knowsley WPA	22
Liverpool WPA	2,652
St Helens WPA	1,250
Warrington WPA	4
NORTH EAST	
County Durham WPA	3
Gateshead WPA	6,523
Hartlepool WPA	68,199
Newcastle Upon Tyne WPA	1,010
North Tyneside WPA	4,277
Northumberland WPA	285
Stockton-on-Tees WPA	234
Sunderland WPA	851

YORKS & HUMBER	
Bradford City WPA	1
Calderdale WPA	92
East Riding of Yorkshire WPA	1,874
Kingston Upon Hull City WPA	1,414
Kirklees WPA	479
Leeds WPA	35
North Yorkshire WPA	650
Redcar and Cleveland WPA	569
Rotherham WPA	1,000
Sheffield WPA	336
Wakefield WPA	44
EAST MIDLANDS	
Derbyshire WPA	49
Leicestershire WPA	175
Lincolnshire WPA	309
North Lincolnshire WPA	953
Northamptonshire WPA	17
Nottingham City WPA	121
Nottinghamshire WPA	2
WEST MIDLANDS	
Birmingham City WPA	0
Dudley WPA	1
Sandwell WPA	24
Staffordshire WPA	15
Stoke-on-Trent City WPA	294
Warwickshire WPA	0

EAST ENGLAND	
Bedford WPA	21
Essex WPA	41
Peterborough WPA	6
LONDON	
Barking and Dagenham WPA	22
Greenwich WPA	52
SOUTH EAST	
Bromley WPA	2,378
Hampshire WPA	0
Hertfordshire WPA	2
Southampton City WPA	0
SOUTH WEST	
Bristol City WPA	54
Devon WPA	67
Dorset WPA	0
Somerset WPA	2
Swindon WPA	1

[Source: Environment Agency Waste Data Interrogator, 2013 – all figures in tonnes (rounded) and zeros identify movements of less than 0.5 tonnes]

8.3 Construction, Demolition & Excavation Waste

8.3.1 Tables 8.4 and 8.5 summarise the movement of C&D and Excavation wastes originating in Cumbria, showing where they were managed and the type of facility involved. Note that these figures will include the double-counted material moving through transfer stations which will slightly over-state the proportion of material managed in Cumbria.

Table 8.4: Location & Type of Capacity Involved in Managing C&D Wastes Originating in Cumbria in 2013

	Waste received	Receiving authorities	Landfill	MRS	On/In Land	Transfer	Treatment	Use of Waste	Authority total
			12,319	1,833		62,734	121,505	360	
Cumbria	182,582	Cumbria	8,338	32		57,467	116,385	360	182,582
North West	2,752	Cheshire West and Chester WPA				141			141
		Bury WPA	3						3
		Trafford WPA		42					42
		Wigan WPA				3			3
		Lancashire WPA		4		2,008	218		2,230
		Halton WPA				0			0
		Knowsley WPA				0			0
		Liverpool WPA		333			0		333
East England	0	Hertfordshire WPA		0					0
East Midlands	31	Northamptonshire WPA					31		31
North East	10,885	County Durham WPA					3,932		3,932
		Gateshead WPA	3,800						3,800
		Hartlepool WPA				2,954			2,954
		Stockton-on-Tees WPA	177						177
		Sunderland WPA				11	11		22
West Midlands	0	Staffordshire WPA		0					0
Yorks & Humber	2,500	Doncaster WPA					69		69
		East Riding of Yorkshire WPA		0					0
		Rotherham WPA		1,422		149			1,571
		Wakefield WPA					859		859

[Source: Environment Agency Waste Data Interrogator 2013 – all figures in tonnes]

Table 8.5: Location & Type of Capacity Involved in Managing Excavation Wastes Originating in Cumbria in 2013

	Waste received	Receiving authorities	Landfill	MRS	On/In Land	Transfer	Treatment	Use of Waste	Authority total
			103,836		40,009	32,674	100,321	77,922	354,763
Cumbria	333,242	Cumbria	87,141		40,009	28,886	99,284	77,922	333,242
North West	4,046	Bolton WPA	99						99
		Manchester WPA					249		249
		Warrington WPA	53						53
		Lancashire WPA				3,645			3,645
North East	16,857	County Durham WPA	1						1
		Gateshead WPA	13,118						13,118
		Hartlepool WPA	3,423			143			3,566
		Stockton-on-Tees WPA	1				51		52
		Sunderland WPA					120		120
Yorks & Humber	618	Sheffield WPA					618		618

[Source: Environment Agency Waste Data Interrogator 2013 – all figures in tonnes]

8.3.2 Both tables show that most of the authorities receiving more than 1000 tonnes of C&D waste are already receiving more than 1000 tonnes of HIC wastes. However the purpose of the DtC dialogue is to check that facilities receiving waste from Cumbria will be available in the future, and those taking inert wastes may not be taking HIC wastes. Therefore any dialogue with regard to inert wastes would require contact with 5 operators, one of which (County Durham) would be contacted for inert wastes only. It may be prudent to include Wakefield also as the non-hazardous wastes (ie. both HIC and CD&E wastes) received were more than 900 tonnes.

8.3.3 All of these waste planning authorities were contacted in 2013 and the Council has advised that no concerns were raised[11].

8.3.4 Both analyses show the county is virtually self-sufficient in managing locally-produced C&D and excavation wastes. The principal external movements of C&D waste were to:

- County Durham – Hill Top Farm (treatment)
- Teesside – Niramax transfer station (co-located with RDF production facility)
- Tyneside – Blaydon Quarry (landfill)

The principal external movements of Excavation waste were to:

- Lancashire – Harcross Yard, Preston (appears to be a land restoration project or similar)
- Teesside – Longhill (landfill but may also be short-lived restoration project)
- Tyneside – Blaydon Quarry (landfill).

8.4 Hazardous Waste

8.4.1 Table 8.6 overleaf summarises the movement of hazardous wastes showing where they were managed and their eventual fate. As with the other principal streams some degree of double-counting may occur if wastes are moved to local transfer stations for bulking into larger loads which then leave the county.

8.4.2 Authorities appear to differ in their view of an appropriate threshold that represents a 'significant' movement of hazardous wastes and which would need to be addressed through DtC dialogue, with figures ranging from 100 to 500 tonnes. Given the relative scale of arisings, if a threshold of 1000 tonnes is used for non-hazardous wastes then it would be appropriate to use 100 tonnes for hazardous materials. If this level is used Table 8.6 suggests 34 planning authorities should be contacted (see orange cells). If a threshold of 500 tonnes is used it would be necessary to contact only 12 authorities.

8.4.3 Only two of the 34 authorities identified in the 2013 data analysis were not contacted in December 2013 by the Council on the basis of the 2012 data. The tonnages identified were 109 tonnes to Wolverhampton and 94 tonnes to Warwickshire. Both quantities are close to the recommended threshold and the Council did not consider this omission was not of a sufficiently significant scale to require urgent further consultation.

8.4.4 Figure 5.1 in Chapter 5 of this waste needs assessment shows the changing relationship between imports, exports, local arisings and local management since 2006, and demonstrates that both local management and hazardous waste imports increased significantly in 2012, fell back in 2013, but show a generally rising trend. Local arisings have fluctuated significantly, but in 2013 almost returned to 2006 tonnages, probably reflecting changes in economic activity over the period.

8.4.5 The County's consultation exercise[12] in December 2013 also demonstrated that the waste planning authorities who are recipients of hazardous waste exported from Cumbria had no concerns about current exports, and no future shortages or closures of recipient facilities raised issues during the Plan period. Cheshire West and Chester, which received 2,713 tonnes in 2013 acknowledged that they hosted several facilities of regional and even national significance and stated that:

> *"The waste volumes are not considered significant enough to require specific attention under the duty to cooperate"*

[11] LD270 Waste Export Consultation Exercise_Cumbria CC_December 2013 .
[12] ibid.

Table 8.6: Location & Type of Capacity Involved in Managing Hazardous Wastes Originating in Cumbria in 2013

	Regional totals	Receiving WPA	Incineration with energy recovery	Incineration without energy recovery	Landfill	Recovery	Transfer prior to disposal	Transfer prior to recovery	Treatment	Received by WPA
			1	2,498	3,534	8,124	3,592	3,417	6,545	
Cumbria	3,787	Cumbria			768	32	2,074	913	0	3,787
North West	10,323	Cheshire East				122	4	41		167
		Cheshire West and Chester		1,848		477	225	162		2,713
		Bolton		4		4	6	14		29
		Bury			69					69
		Manchester					2			2
		Rochdale					0	0		0
		Salford		0		204	21	80	236	542
		Stockport				7	6	5		19
		Tameside				4				4
		Trafford				4		5		9
		Wigan	1			4	7	45		57
		Halton			0	3	1	82		87
		Knowsley				216	60	79	26	381
		Liverpool				1,796	41	26	443	2,305
		Sefton				260				260
		St Helens				199	23			221
		Wirral						2		2
		Blackburn with Darwen					3	3		7
		Lancashire			672	779	224	1,297		2,971
		Warrington				5	0	5	470	479
East England	95	Cambridgeshire				37				37
		Essex				0	0	0		0
		Hertfordshire					43			43
		Norfolk						1		1
		Suffolk				13				13
East Midlands	516	Derbyshire			0	238				239
		Leicestershire				0	0	0		0
		Lincolnshire				68				68
		North East Lincolnshire					0	0		0
		North Lincolnshire			16			0		16
		Northamptonshire				1		1		1
		Nottinghamshire				164	8	19		191
North East	5,377	County Durham		0	419		0			419
		Darlington					1	21		21
		Gateshead				39	248	39	62	388
		Hartlepool			358			14		372
		Middlesbrough				70		36		106
		Newcastle Upon Tyne					96		692	787
		Northumberland				48	150	2		200
		Stockton-on-Tees			822	934	1	24	1,253	3,033
		Sunderland					4	46		50
South East	1,281	East Sussex				630				630
		Hampshire		645						645
		Oxfordshire						0		0
		Southampton City						1		1
		Surrey						4		4
South West	215	Bristol City				13				13
		Devon				177				177
		Kent			4				1	5
		North Somerset				0				0
		Plymouth				19				19
		Somerset						0		0
West Midlands	1,064	Birmingham City					1	5	227	233
		Dudley				29				29
		Sandwell					30	0		30
		Staffordshire				1	2	3	1	8
		Stoke-on-Trent City				205	0	36	78	319
		Walsall					0	225		225
		Warwickshire			6	88				94
		Wolverhampton				109				109
		Worcestershire				16	0	0		17
Yorks & Humber	5,054	Barnsley				112	3	1		116
		Bradford City				8		3		11
		Doncaster				3	2			5
		East Riding of Yorkshire					0			0
		Kingston Upon Hull City				0	0			0
		Kirklees			401	14	258	7		679
		Leeds		0		55	13	27	113	209
		North Yorkshire	0			5	0	0		6
		Redcar and Cleveland					15		2,756	2,771
		Rotherham				35	0	95	1	131
		Sheffield				1	11	33	54	99
		Wakefield				873	7	12	125	1,017
		York, City of							9	9

[Source: Environment Agency Hazardous Waste Data Interrogator 2013 – all figures in tonnes]

8.4.6 Redcar and Cleveland which received 2,771 tonnes of hazardous waste in 2013 commented:

> *"While we would welcome an aim of self-sufficiency, we recognise the need for some export of waste due to market forces and the need for specialist waste management, including to Redcar & Cleveland."*

8.4.7 The responses from authorities receiving hazardous waste exports supports the conclusions of Chapter 5.

8.5 Meeting the Requirements of the Proximity Principle

8.5.1 The analysis of cross border movements above indicates firstly that the volumes of waste imported to Cumbria and exported from Cumbria are not disproportionate, even when radioactive waste is excluded from the discussion. Secondly the County is virtually self-sufficient in management facilities for CD & E wastes. This is not surprising as these wastes are heavy and costly to transport long distances, and relatively simple facilities are required to recycle such wastes and to dispose of residual waste. In fact the County receives and treats a significant amount of CD & E waste from other areas, although a significant part of this is the import of rail ballast for treatment in Carlisle. The ballast is then redistributed around the UK for reuse.

8.5.2 Treatment of hazardous waste, by contrast, can be complex and the tonnages to be treated are small. Specialised treatment and disposal facilities are required, and will be developed where it is economic to do so. Given the limited ability of a waste local plan to influence such market-led provision, it appears that planning for locally managed, rather than locally arising, hazardous wastes would help ensure existing capacity is used effectively and efficiently, and to maintain recycling without resulting in local over-capacity. However this situation should be kept under review.

8.5.3 The majority of exported material is HIC waste. This includes a proportion of household waste managed at waste facilities under contracts[13] – this is sorted waste from HWRCs and waste transfer stations, or from the county's MBT plants. RDF from the MBT plants also forms part of these exports as has been noted in Chapter 2, and is further discussed in Chapter 11.

8.5.4 The decisions about where to manage all of these wastes is a commercial decision based on a number of factors and not directly influenced by the planning system. While the fate of these wastes is not always recorded on the WDI, it is however clear that the vast majority of the exported waste is sent to facilities that recycle or recover the materials, and, as has been noted with hazardous waste, the outcome of the market-led decisions probably enables efficient use of capacity and a shift in management up the waste hierarchy.

8.5.5 Planning policy makes it clear that it is not expected that each waste planning authority should deal solely with its own waste in order to meet the proximity principle, although managing all its own waste should be the aim. The analysis in this chapter indicates that Cumbria is close to net-self-sufficiency, although the final recovery of RDF needs to be considered further. However, waste exports from Cumbria are not currently causing concerns to the waste planning authorities that receive the waste, including the relevant Scottish WPAs. The Council intends to keep this situation under review.

[13] LD 268 Exports from Cumbria _EA WDI 2013_Cumbria CC Dec 2014

9 ESTIMATING CAPACITY

9.1 Overview of Data Collection

9.1.1 The Needs Assessment also requires an accurate assessment of the quantity of waste management capacity available in the county (expressed as tonnes of built capacity of m^3 of landfill void). The capacity must also be categorised as accurately as possible in terms of the waste management function it performs (recycling, treatment, transfer, etc.) and the waste stream(s) it handles.

9.1.2 The Needs Assessment draws on a database of permitted waste management facilities provided by the Council derived from Environment Agency records. Key data provided for each site was:

- Operator name
- Site identity & address
- Local planning authority
- Environmental Permit type
- Permitted capacity (based on planning permission)
- Details of recent throughput
- Opening and closure dates

(a) Permit type

The type of Permit has been used to make judgements about the waste management functions performed and the waste stream(s) each site handles.

Sites have been categorised according to whether they provide transfer, recycling, composting, treatment (thermal or non-thermal) or landfill capacity. Recycling capacity distinguishes between sites handling mixed wastes (typically MRFs or transfer stations that also provide recycling capacity) and those handling specific wastes (eg. metal recyclers, vehicle dismantlers, WEEE recycling/re-use facilities). This is necessary because there are invariably large numbers of the latter offering more capacity than is needed locally and it is essential that any surplus capacity is not assumed to be available to treat mixed wastes because the plant on these sites is unsuitable.

Each site is also ‘allocated’ to a specific waste stream. In most cases the site is likely to handle a single stream only, but where more than one is handled the capacity is divided between the streams, usually on a 50:50 basis. This approach applies primarily to transfer stations and recycling facilities which handle a mixture of C&I and CD&E wastes the proportions of which will change from one year to the next. All sites covered by municipal waste management contracts are assumed to handle LACW only.

The only exceptions to the above assumptions are open windrow composting sites, non-inert landfills and specialised recycling facilities (ie. those handling materials such as tyres, metals, plastics, etc.) which will handle material from the LACW and C&I streams.

(b) Permitted capacity and details of recent throughput

This is the key parameter for the assessment and in most cases it reflects that specified on the planning permission as this provides the most reliable indication of what a facility can realistically provide. Standard Environmental Permits often provide for a much greater capacity than the site can actually handle and are not used for this reason. Where detail from the planning permission is missing, data on annual throughput at the facility over the period 2007-2013 has been used and the maximum rate has been assumed to be the most reliable available indicator of the capacity it provides. The approach adopted is therefore regarded as the best available estimate of the operational capacity available at present.

(d) Opening and closure dates

Most facilities were operating at the start of the forecasting period (2013) but some recent permissions were not operational and planning applications and the knowledge of Council officers has informed a view of when the facility is likely to come into service. The Council also provided details of known closure dates (ie. when an existing planning permission is known to expire) although in most cases the sites have open-ended permissions. Where the closure date is known the Needs Assessment assumes it results in the permanent loss of capacity which may increase an existing gap or create a new one. The gap analysis in Chapter 11 of this report identifies where this occurs and indicates the effect of possible future permissions for time extensions on any capacity shortages, recognising that there is no certainty that such permissions would be granted.

9.1.3 In addition to the above research the Council contacted operators of waste sites asking them to confirm details were correct and to provide additional information about expansion plans, expected closure data and, in those cases where there was no recent throughput information, to advise whether the site was still operational, temporarily or permanently closed. This process generated a response rate of around 20% and while it did not identify any extra detail about expansion or closure plans it helped to validate the details in the site capacity database for those operators who responded.

9.2 Capacity Summary

9.2.1 Table 9.1 summarises the estimated capacity illustrating how it has been aggregated into 29 categories distinguished by waste management function and waste(s) handled. The table includes a number of facility types that are not available in Cumbria at present, but this format allows them to be added to the database and capacity included in due course.

Table 9.1: Summary of Operational & Planned Waste Management Capacity in Cumbria

	OPEN DATE					
Facility type	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Clinical waste incinerator						
Composting (closed)	10,000			13,000		
Composting (open - LACW)	50,000					
Composting (open)	75,000					
EfW (mixed)						
EfW (wood & biomass)						
Household Waste Recycling Site	321,654		11,000			
Land Raise / Restoration						
Recycling (C&D)	505,811					
Recycling (ELVs)	292,197					
Recycling (Metals)	92,996					
Recycling (MRF - LACW)	92,999		50,000			
Recycling (MRF)	261,119					
Recycling (reprocessors)						
Recycling (tyres)	19,999					
Recycling (WEEE)	74,999					
Transfer stations (C&D)	205,998		75,000			
Transfer stations (clinical waste)						
Transfer stations (hazardous)	427,326					
Transfer stations (non-hazardous - LACW)	77,949					
Transfer stations (non-hazardous)	67,499					
Treatment (C&D)	150,000					
Treatment (hazardous)	55,000					
Treatment (non-hazardous - LACW)	210,000					
Treatment (non-hazardous)	414,987					
Treatment (waste water)						

[Source: Environment Agency; Cumbria County Council sources; Urban Vision analysis – all figures in tonnes]

9.2.2 Table 9.1 also shows that sites that have recently received planning permission have been included in the assessment. This approach assumes the sites will eventually come forward (though this will need to be checked during the annual monitoring process) and professional judgement has been used to estimate when this capacity might be available.

9.2.3 Landfill capacity is evaluated separately because it is finite and reduces over time. Table 9.2 summarises the estimated capacities in 2013 based on data for voidspace in 2012 adjusted to reflect recorded deposits in 2013. An additional 240,000 m^3 of inert capacity at Silver Fields, Flusco has planning permission but will not be available until limestone extraction at the site has progressed further.

Table 9.2: Estimated Landfill Voidspace in Cumbria at the End of 2013[14]

Site	Type	Voidspace (m^3)	Closure
Bennett Bank	Non-inert	77,500	2017
Flusco	Non-inert	963,400	2032
Hespin Wood	Non-inert	1,027,000	2020
Lillyhall	Non-inert	1,302,400	2029
Derwent Howe	Inert	120,000	2016
Roan Edge	Inert	210,700	2016
Goldmire Quarry	Inert	1,173,000	2042
Lillyhall	Hazardous	17,500	2029

9.2.4 Deposits at land raise / restoration sites are not recorded because they normally occur over short periods and therefore do not provide a continual supply of capacity. The number and scale or projects is also unpredictable and therefore any capacity they offer cannot be estimated with any certainty. Mobile plant is used to crush C&D wastes at source and any material that is taken off-site should be recorded as throughput at one of the other facilities. Therefore this category can be excluded to prevent double-counting.

9.2.5 The approach above identified the following capacity losses due to expected closures:

- Recycling (LACW); 50,000 tonnes in 2016, 25,000 tonnes in 2017 and 2500 tonnes in 2019. These closures all affect HWRCs and reflect rationalisation of the network of facilities in the county. A further 75,000 tonnes is assumed to be lost in 2019 with the closure of a MRF;
- Open composting: 25,000 tonnes in 2019; 75,000 tonnes in 2021 (both due to expiry of existing permissions);
- Recycling (C&D): 75,000 tonnes in 2025 (due to expiry of existing permission).

9.3 Reference Capacities

9.3.1 Needs Assessment aims to identify how many additional waste management facilities will be needed over the life of the Plan, and the amount of land that will need to be allocated. In order to calculate land take it is necessary to make a range of assumptions about the typical area occupied by different types of waste facility.

9.3.2 The most definitive source of such information is a report published in 2004[15]. Some judgement is needed when considering whether the theoretical or case study examples in it are appropriate to the Plan area. For Cumbria a particular issue is whether certain types of large-scale facilities

[14] Capacity at Goldmire Quarry is linked to continuing extraction to create void and the site is not yet receiving waste.
[15] Department of Communities and Local Government, Planning for Waste Management Facilities, 2004.

referred to in the Plan would come forward and in some cases the reference size for facilities such as Energy from Waste plants are assumed to be limited in size.

9.3.3 Table 9.3 summarises the assumptions used in this assessment. Assumptions are not used for landfill sites as capacity will progressively reduce unless physical extensions are granted.

Table 9.3: Reference Annual Capacities and Land Take for Built Waste Facilities

	Average capacity (tonnes)	*Land take (ha.)*
Non-hazardous non-inert		
Transfer (non-municipal)	50,000	3
Recycling (mixed wastes)	75,000	2
Recycling (specific wastes)	25,000	0.5
Composting	25,000	2.5
Treatment (non-thermal)	75,000	2
Treatment (thermal)	50,000	2
Non-hazardous inert		
Transfer	5,000	0.5
Recycling	15,000	0.5
Incineration (biomass / wood)	50,000	2
Hazardous		
Transfer	5,000	1
Recycling, recovery & treatment	10,000	2
Incineration	25,000	2

9.4 Waste Exemptions

9.4.1 Information provided by the EA shows there were over 23,000 simple waste management exemptions issued in the County in 2014. Exemptions provide a simplified licensing structure for waste activities with limited environmental risk, occurring typically on a very small scale for specific purposes. Exemptions have to be renewed every 3 years, which also indicates they tend to occur on a one-off basis or over a limited period.

9.4.2 Table 9.4 identifies the principal types and activities involved.

Table 9.4: Overview of Principal Waste Exemptions Issued

Reported exempt activity	***Agricultural only***	***Agricultural and non-agricultural***	***Non-agricultural only***
Aerobic composting and associated pre-treatment	504	169	18
Burning waste as a fuel in a small appliance	513	230	16
Burning waste in the open	2388	662	66
Cleaning of spraying relevant waste	501	163	12
Deposit of plant tissue under a Plant Health notice	826		
Deposit of sludge from dredging inland waters	1870	497	30
Sorting and de-naturing of controlled drugs for disposal			120
Spreading of waste or plant matter	1808	750	39
Storage of sludge			268
Storage of waste	347	195	48
Storage of waste in a secure place	472	245	91
Treatment of sheep dip	222		
Treatment of waste wood by chipping, etc.	1066	418	30
Use of mulch	254	179	18
Use of waste for a specified purpose	1572	730	211
Use of waste in construction	1235	1289	419
Other activities	1502	970	316
Total exemptions	**15080**	**6497**	**1702**

9.4.3 The analysis identifies the principal activities (in terms of the number of exemptions issued) were burning waste in the open; use of waste in construction; use of waste for a specific purpose and spreading of waste for agricultural benefit. Collectively these four sets of exemptions represent almost half of those currently issued.

9.4.4 Infrastructure provided at sites that have been issued with exemptions makes some contribution to local waste management capacity but it is not practical to identify this accurately. The recently issued Planning Practice Guidance for Waste proposes that capacity might be estimated from details of the exemption and that it may be necessary to undertake a more detailed survey if it appears likely that these sites are making a potentially significant contribution to local management capacity.

9.4.5 It is not considered necessary to undertake this analysis in this case. First, almost two-thirds of the exemptions relate to agricultural activities only which allow storage or disposal of wastes on the holding where the wastes arose. As noted in Chapter 6, virtually all agricultural wastes are being managed at source, they make no demands of third party-provided capacity and therefore do not need to be taken into account in the needs assessment. This issue also applies to a large number of the Agricultural and Non-Agricultural exemptions.

9.4.6 A further issue is that the actual quantity of waste handled at each exempt site does not have to be reported to the EA and therefore there is no way of substantiating what actual contribution they make to meeting local management needs in the way that is possible for permitted sites. Multiplying the maximum permitted tonnage that can be handled by the number of exemptions risks significantly over-estimating the contribution they make[16].

9.4.7 One of the largest activities shown in Table 9.4 is 'Use of Waste in Construction'. Where this applies to agricultural-only exemptions it is expected to reflect the use of rubble to surface haul roads and similar across agricultural holdings, and this may apply to some of the other exemptions that include non-agricultural use. Some of this waste is undoubtedly used for landscaping or fill on non-agricultural premises but it is likely to be small in scale, occur over a short period, and it would be difficult to estimate how much waste is deposited with any degree of accuracy.

9.4.8 As a result a simplifying assumption has been made that all agricultural and most agricultural and non-agricultural exemptions refer to handling of wastes at source and do not need to be taken into account in the needs assessment. Similarly the remaining activities are likely to be so specialised and occur on such a small scale – and possibly intermittently – that their impact on capacity requirements cannot be taken into account accurately.

[16] The EA no longer provides details of the capacity of permitted waste sites because of concerns that it may not reflect the actual installed capability. This is a particularly issue for the large numbers of metal recycling (including ELV) sites and waste transfer stations where the actual annual throughput is usually substantially lower than permitted capacity. The approach adopted is therefore consistent with current EA policy.

10 FORECASTING CHANGE

10.1 Current Position

10.1.1 Based on the information presented in preceding chapters, Table 10.1 summarises the total waste arisings assumed in the base year of 2013 for each stream and the principal management methods.

Table 9.1 – Summary of Base Year Arisings and Management Mixes

Stream	Arisings (managed off-site)	Transferred (to transfer station)	Recycled / composted	Treated (non-thermal recovery)	Treated (thermal recovery)	Landfilled (or similar)
LACW						
• Household	**239,100**	-	126,000	77,200	*(37,600)*	52,600
• Non-h'hold	**20,400**	-	14,700	3,300	*(1,700)*	2,400
C&I						
• Commercial	**324,800**	-	360,800	12,100	10,100	288,900
• Industrial	**347,100**					
CD&E						
• C&D	**378,200**	-	359,300		-	18,900
• Excavation	**356,500**	-	99,800		-	256,700
Others						
• Hazardous	**15,600**	15,100	*[very small quantity]*		-	500
• Agricultural	**67,600**	-	67,600	-	-	-

[Sources: Cumbria County Council; Defra; Environment Agency; Urban Vision analysis – all figures in tonnes (rounded)]

10.1.2 The Needs Assessment takes account of capacity needed to recycle, recover or dispose of materials output from the MBT plants, which include recovered metals and Refuse-Derived Fuel (RDF). Note that figures for non-household LACW include both trade waste and other materials (eg. street sweepings) though the former are included in the C&I stream in the arisings forecasts. Recycled/composted household waste includes C&D waste taken to HWRCs as this material is recycled and not taken to landfill. LACW treatment residues are taken to energy recovery facilities outside the county and the quantities of material are shown below in brackets but the rows should not be summed as this material will be double-counted.

10.2 Approach to Forecasting Growth: LACW

10.2.1 Demographic series used in preparing other Council plans and strategies are used to project the growth in arisings of the three principal streams over the Plan period so that arisings forecasts should be consistent in principle with these other documents.

10.2.2 LACW growth is assumed to be linked to growth in dwelling numbers based on the Experian '*10-year Equal Weight Migration*' forecast as this series is used by the local planning authorities (and the National Park Authority) in preparing their housing / dwelling trajectories[17]. The 2012 base year figure has been adjusted to reflect completions in 2013 based on figures provided by the Council giving **a base year figure of 241,128 dwellings**.

10.2.3 Reflecting the Council's requirements, four growth scenarios are modelled:

- DG1: Achieving projected rates of completion over the Plan period with 100% occupancy;
- DG2: Achieving the same but with 96% occupancy[18];

[17] Source: http://www.cumbriaobservatory.org.uk/eLibrary/Content/Internet/536/673/1756/4170315336.xlsx.
[18] Source: Allerdale Borough Council Annual Monitoring Report estimate of dwelling vacancy rates across the county.

- DG3: Achieving the actual completion rate averaged across all the Districts over the period 2003-2013, representing a 29.1% under-performance, but with 100% occupancy;
- DG4: Achieving the same under-performance but with 96% occupancy.

10.2.4 Each scenario is modelled based on a projected growth in total dwellings by 2031 (based on figures supplied by the Council) with growth apportioned evenly over the intervening years.

10.2.5 The total number of dwellings in the base year is divided into the total household waste arisings to calculate the current quantity of waste produced by each dwelling in the base year. The Council's Waste Services division continues to promote waste reduction to householders and has advised that rates of between 1% and 2% per year could be achieved over the period to 2025. The above base year waste per dwelling figure is therefore reduced by this target rate through the appropriate part of the Plan period.

10.2.6 Table 10.2 summarises the data used by the model. Note that the two sets of dwellings refer to the total number of waste-generating households and therefore DG3 and DG4 reflect the effect of the reduced occupancy rates even though the same number of dwellings may have been added as in DG1 and DG2 respectively.

Table 10.2 – Summary of Growth Rates and Waste Reduction Assumptions – LACW

Scenario	*Dwellings added by 2032*	*Dwellings / year*	*Annual growth*
DG1	*40,780*	*2146*	*0.83%*
DG2	*28,913*	*1522*	*0.60%*
DG3	*39,149*	*2061*	*0.79%*
DG4	*27,757*	*1461*	*0.58%*

Waste reduction / year		
2013-2020	*2021-2025*	*2026-2031*
2%	1%	0%

[Source: CCC District housing forecasts; Cumbria WDA targets]

10.3 Approach to Forecasting Growth: C&I and CD&E Wastes

10.3.1 Growth in these streams is assumed to be linked to economic trends in the future and the model uses the forecast series output by the Experian econometric model which the Council uses in a range of strategic and planning activities. Two series have been modelled: employment (total positions) or output (£m).

10.3.2 Both series are forecast across 12 broad industry sectors as shown below which are aggregated from forecasts for 88 detailed sectors.

1. Agriculture, Forestry & Fishing
2. Extraction & Mining
3. Manufacturing
4. Utilities
5. Construction
6. Wholesale & Retail
7. Transport & Storage
8. Accommodation, Food Services & Recreation
9. Information & Communication
10. Finance & Insurance
11. Professional & Other Private Services
12. Public Services

10.3.3 Commercial wastes are assumed to be generated by sectors 6 and 8 to 12. Industrial wastes are assumed to be generated by sectors 3, and 4, recognising that the former includes a wide range of activities. Wastes generated by the Transport & Storage sector has been apportioned between the two streams according to the relative levels of employment in transport manufacturing (industrial) and transport services and logistics (commercial).

10.3.4 Current employment levels are divided into arisings in the base year to estimate a waste per employee (or waste per unit of output statistic).

10.3.5 Table 10.3 summarises the growth rates identified from the Experian forecasts.

Table 10.3 – Assumed Annual Growth Rates and Waste Reduction Rates – C&I and CD&E

	Employment-based			***Output-based***			***Waste reduction***		
	2013-2020	2021-2025	2026-2031	2013-2020	2021-2025	2026-2031	2013-2020	2021-2025	2026-2031
Commercial	+0.40%	+0.69%	+0.60%	+1.14%	+2.34%	+2.25%	2%	No further change	
Industrial	-0.25%	-1.47%	-1.17%	+1.97%	+1.22%	+1.48%			
CD&E	+0.63%	+0.03%	+0.38%	+2.44%	+2.00%	+2.12%			

[Source: Experian econometric forecasts; Urban Vision assumptions]

10.3.6 There are continuing initiatives to reduce the amount of waste created by businesses though there is no empirical evidence of the overall impact on arisings. This is likely to be the result of a lack of systematic monitoring but also the difficulty of distinguishing between the positive impacts of the initiatives and the negative impacts of recession on output and productivity.

10.3.7 It appears logical to expect some beneficial impacts are occurring and therefore a reduction of 2% per year is assumed over the period which is equivalent to the rate assumed for LACW waste over this period. This assumption is illustrative only and the lack of information about reduction rates means it is not appropriate to extend it beyond 2020.

10.3.8 The same approach is applied to forecasting future CD&E waste arisings using employment levels or output from sectors 2 and 5 as shown above. No assumption is made about waste reduction.

10.4 Approach to Forecasting Growth: Other Wastes

10.4.1 Figure 5.1 has shown the recent trends in ***hazardous*** waste creation, imports and exports which have informed the decision on the rates to be used. These are:

- Arisings will fall at -0.6% per year;
- Levels of imports and exports will remain unchanged.

10.4.2 The reduction in arisings is assumed to persist for a further five years with no change thereafter. Due to the technical and economic constraints on managing hazardous wastes it is assumed that the current pattern of cross-boundary movements will continue and therefore capacity assessment is based on the quantity of material being managed locally rather than on total local arisings as it would be unrealistic to expect the necessary infrastructure to emerge. No alternative growth rate is modelled.

10.4.3 As explained in Chapter 6, the Needs Assessment assumes there will be no significant change in the scale, intensity or methods of ***agricultural*** activity over the Plan period and as a result the quantity of arisings will be unchanged.

10.5 Changes to the Management Mix

10.5.1 Although the quantity of all streams now being diverted from landfill is substantial there is scope in most cases for further improvement whether to achieve statutory or non-statutory targets or to exploit the intrinsic value of waste as a secondary material rather than treating it as worthless residues.

10.5.2 Assumptions have been developed about future changes to the management mix (ie. proportions recycled, composted, recovered and landfilled) except in those cases where landfill diversion rates are extremely high already, or there are other reasons for assuming the proportions of

recovery, recycling and re-use are unlikely to change significantly. Where these differences exist two scenarios have been developed: a 'Best case' and a 'Pragmatic case'. The former models achievement of higher rates of recycling and recovery than the latter which assume that EU, national and local landfill diversion performance is delivered.

10.5.3 The model is currently configured to only model all the 'Best Case' assumptions for the different streams or all the 'Pragmatic Case' assumptions.

10.5.4 Table 10.4 summarises the assumptions used. (Some cells may not add to 100% due to rounding.)

Table 10.4 – Overview of Management Mix Assumptions

	Best case rate achieved by 2020	Best case rate achieved by 2030	Pragmatic case rate achieved by 2020	Pragmatic case rate achieved by 2030
LACW (household)	55% recycled/composted 33.5% recovered 11.5% landfilled	70% recycled/composted 30% recovered 0% landfilled	50% recycled/composted 30% recovered 20% landfilled	66% recycled/composted 27% recovered 7% landfilled
C&I waste	61% recycled/composted 17% energy recovery 7% other recovery 17% landfilled	72% recycled/composted 8% energy recovery 12% other recovery 8% landfilled	55% recycled/composted 8% energy recovery 13% other recovery 24% landfilled	60% recycled/composted 8% energy recovery 14% other recovery 18% landfilled
C&D waste	90% recycled/composted 0% energy recovery 10% landfilled	No further change	As for best case	As for best case
'E' waste	28% recycled/re-use 72% landfilled or spread	No further change	20% recycled/re-used 80% landfilled or spread	28% recycled/re-used 72% landfilled or spread
Haz. waste	0% recycled 0% incinerated 97% to transfer station 3% landfilled	No further change	As for best case	As for best case

[Sources: National Waste Plan for England; Cumbria Joint Waste Management Strategy; Defra; Urban Vision assumptions]

10.5.5 The rationale for these assumptions can be summarised as follows:

- **LACW**: 'Best Case' performance reflects the achievement of the current Joint Waste Management Strategy target by 2020 (recognising this is higher than that in the Waste Plan for England) and the newly-proposed EU target for 2030 (recognising this is not yet formally adopted or transposed into UK law). The 'Pragmatic Case' still achieves the national recycling target by 2020 and assumes further improvement can be delivered over the next 10 years. A small amount of residual waste continues to be landfilled reflecting the possibility that 'zero waste to landfill' cannot be achieved and some material can only be managed this way. Both scenarios assume the proportion of the stream going to recovery will fall gently though this may not necessarily mean the tonnage diverted falls also.

- **C&I waste**: the Council has no pre-existing assumptions about the likely future change in the way these wastes are managed. The 2009 regional survey provides some estimates of the scope to recycle or recover materials that are still being landfilled. There are also difficulties distinguishing between material that can be recycled but not recovered (or vice versa) and material for which either approach is feasible. Past experience of using these assumptions suggests that using this approach can lead to over-ambitious expectations of diversion rates. In both cases the scope to divert more of these wastes is not limited by the characteristics of the materials but by whether there would be recycling facilities or processing them into RDF/SRF. This circular argument is not helpful and instead the assumptions used in the Needs Assessment are based on two scenarios from recent

analysis undertaken for Defra of likely diversion rates for C&I wastes[19]. The scenario which assumed no further improvement was rejected as there is little to suggest diversion rates will stagnate while residual waste still contains some materials that could be recycled or recovered. One scenario assumed an increased development of centralised EfW capacity but this appears unlikely to given the existing lack of thermal facilities locally and the presence of several planned large facilities elsewhere in the North West.

- **C&D waste**: the analysis reported in chapter 4 indicates a fairly high level of landfill diversion is being achieved already. It is assumed there is some limited scope for further improvement to a maximum of 90% by 2020. This assumption is consistent with those used in other needs assessments.

- **Excavation waste**: the management options for this sub-stream are more limited and it is likely the current diversion rate reflects the limited opportunities to recycle the material. A 'Best Case' is proposed in which the current diversion rate improves from 28% to 35% by 2020 and stays at that level thereafter, with all residual material going to landfill.

- **Hazardous waste**: the assumptions reflect the management mix identified in chapter 5 and there is no reason to believe this will change. However separate assumptions (not shown) would apply if the analysis models how local waste arisings are managed regardless of where this occurs. The reasons for not using this approach are explained elsewhere in this report.

[19] Defra, Economics of Waste and Waste Policy, 2013, see Figure A9. The best case reflects performance under the 'Sustainability Turn' scenario; the other reflects that defined as the 'Reference Scenario'.

11 CAPACITY GAPS & SITE REQUIREMENTS

11.1 Introduction

11.1.1 The Waste Needs Assessment model allows up to 16 different scenarios to be modelled as a result of different combinations of assumptions about dwelling growth, economic growth and the management mix for the waste streams. In each case the broad approach defines an upper and lower forecast bound which defines an 'envelope'. The upper bound will reflect maximised landfill diversion rates whereas the lower bound will reflect some continued landfill disposal waste as it is unlikely all waste can be diverted at some stage in the future.

11.1.2 This chapter reports on these upper and lower bounds only which are defined as follows:

- Upper bound: 'Best Case' management mix scenario (zero LACW to landfill and low fill rates for other streams by 2030); highest dwelling growth assumption with no vacancies; C&I and CD&E waste growth driven by employment forecasts;
- Lower bound: 'Pragmatic Case' management mix scenarios (lower rates of landfill diversion for LACW and recycling for C&I wastes); dwelling growth based on recent history (ca. 30% below target); C&I and CD&E waste growth driven by employment.

11.1.3 The analysis does not consider the effect of dwelling vacancies because there is so little difference in the rates. Similarly, Output forecasts were originally intended to be used as an alternative way of driving C&I and CD&E waste growth but the rates derived from the Experian forecasts look excessively high for this purpose. That is not to say that the forecasts are incorrect but that if they are used as a proxy for waste growth the resulting facility requirement forecast is excessive and is considered unrealistic.

11.2 Summary of Requirements and Gap Analysis

11.2.1 Table 11.1 summarises the total capacity Requirement for the principal waste management functions over the Plan period.

Table 11.1: Summary of Total Capacity Required – 2013 to 2030

BUILT FACILITIES	***UPPER***	***LOWER***
Non-inert waste		
Mixed waste recycling	8154	7532
Specialised waste recycling	736	671
Composting	1327	1239
Non-thermal treatment	2141	2146
Thermal treatment	1825	1783
Inert waste		
Recycling	5036	4521
Hazardous waste		
Recycling	<1	<1
Transfer station	271	271
LANDFILL		
Non-hazardous, non-inert	2585	3370
Non-hazardous, inert	4620	5135
Hazardous	8	8

Source: Waste Needs Assessment model – all quantities in thousands; landfill in m3; built facilities in tonnes

Capacity Gap Analysis – Built Facilities

11.2.2 Tables 11.2 and 11.3 summarise the capacity gaps forecast from running the combinations of assumptions that define the Upper bound and Lower bound analyses respectively as defined in paragraph 11.1.2 above. In both cases the gaps and surpluses are shown for the base year of 2013 and then at five year intervals from 2015 to 2030. There are no significant changes to the gaps or surpluses between 2030 and the end of the Plan period the following year.

Table 11.2: Capacity Gaps for Built Facilities – Upper Bound (Best Case) Scenario

Facility type	Waste type	2013	2015	2020	2025	2030
Mixed recycling (LACW)	Non-inert	348	411	249	233	218
Mixed recycling (C&I)	Non-inert	-50	-43	-40	-43	-50
Specialised recycling	Non-inert	374	375	375	372	369
Composting (LACW)	Non-inert	2	4	2	-40	-42
Composting (C&I / Agri.)	Non-inert	51	51	26	-11	-12
Non-thermal treatment (LACW)	Non-inert	132	128	133	142	139
Non-thermal treatment (C&I)	Non-inert	402	389	374	374	374
Thermal treatment (LACW)	Non-inert	-36	-38	-35	-31	-33
Thermal treatment (C&I)	Non-inert	-10	-56	-88	-74	-62
Recycling / re-use	Inert	424	409	375	355	350
Energy recovery	Inert	0	0	0	0	0
Recovery	Hazardous	55	55	55	55	55
Incineration	Hazardous	0	0	0	0	0
Transfer station	Hazardous	412	412	412	412	412

Source: Waste Needs Assessment model; all figures in 000 tonnes

Table 11.3: Capacity Gaps – Lower Bound (Pragmatic Case) Scenario

Facility type	Waste type	2013	2015	2020	2025	2030
Mixed recycling (LACW)	Non-inert	348	409	255	240	224
Mixed recycling (C&I)	Non-inert	-50	-35	-10	-2	2
Specialised recycling	Non-inert	374	376	378	377	375
Composting (LACW)	Non-inert	2	3	6	-36	-39
Composting (C&I / Agri.)	Non-inert	51	52	29	-8	-8
Non-thermal treatment (LACW)	Non-inert	132	128	141	142	146
Non-thermal treatment (C&I)	Non-inert	402	382	368	371	374
Thermal treatment (LACW)	Non-inert	-36	-38	-32	-31	-29
Thermal treatment (C&I)	Non-inert	-10	-56	-76	-76	-72
Recycling / re-use	Inert	424	417	401	400	395
Energy recovery	Inert	0	0	0	0	0
Recovery	Hazardous	55	55	55	55	55
Incineration	Hazardous	0	0	0	0	0
Transfer station	Hazardous	412	412	412	412	412

Source: Waste Needs Assessment model; all figures in 000 tonnes

11.2.3 The two analyses identify the same facility capacity gaps and are not very different in terms of the scale of shortfall or when the gaps develop. This outcome is not particularly surprising as there are modest differences to the management mixes for LACW and C&I wastes.

11.2.4 The following observations can be made about the identified gaps:

- *Mixed C&I recycling*: there is a need for a single additional facility which is unsurprising in the light of the need for further increases in recycling especially of industrial wastes;
- *Composting for LACW and C&I wastes*: A gap develops early in the next decade as a result of the expiry of permissions for two facilities. The shortfall could be addressed by

allocating an additional site although capacity could be maintained if time extensions for one of the sites are sought and granted;

- *LACW thermal treatment*: This gap reflects the need to be net self-sufficient in all aspects of waste capacity. RDF produced by the two MBT facilities is currently sent to a number of locations outside the county and some is understood to be exported. The gap defines the total quantity of RDF forecast and appears unlikely to be enough to make it economically viable to develop a facility solely to meet this local need (however see the next bullet point). With permitted facilities in service or under construction elsewhere in the North West region (and also on Teesside) it may be prudent to assume external capacity could be used, though this matter would need to be corroborated through Duty to Cooperate dialogue. Note also that thermal treatment would also give rise to small quantities of residual ash. An average figure of 40,000 tonnes of RDF will produce around 10,000 tonnes of residual ash. Virtually all of this material will be non-hazardous Incinerator Bottom Ash (IBA) with an additional very small quantity of hazardous Air Pollution Control (APC) residues. Facilities for recycling IBA already exist in the North West region and the relatively small quantity of material produced implies it is unlikely that a small facility dealing with local materials only would be economically viable. Some techniques are emerging for treating and recycling APC residues but the most likely route for this material is disposal to hazardous landfill. The Lillyhall site is not permitted to take this type of hazardous waste and therefore the nearest destination is likely to be Clifton Marsh landfill west of Preston. Again, the availability of capacity would need to be checked through Duty to Cooperate dialogue.
- *C&I waste thermal treatment*: This gap occurs because both scenarios assume the current low level of energy recovery (<2% for both streams) will increase substantially over the Plan period. The issue about the viability of a facility built to meet local need only applies here as it does to LACW. However there is a possibility that a facility handling between 70,000 and 100,000 tonnes of the combined streams could be viable. Operation on this scale is likely to involve advanced thermal technology (pyrolysis or gasification) but this might enable construction of a facility on a scale sufficient to meet local needs but not one so large that it would attract imported material.

11.2.5 Table 11.4 summarises the number of sites required to addressed the capacity gaps for built facilities only. Note that the sites needed by 2015 are required as soon as possible.

Table 11.4: Summary of Site and Land Requirements

				UPPER BOUND				LOWER BOUND			
Facility type	**Stream**	**Capacity (tonnes)**	**Area (hectares**	**2015**	**2020**	**2025**	**2030**	**2015**	**2020**	**2025**	**2030**
Mixed recycling (LACW)	Non-inert	75	2								
Mixed recycling (C&I)	Non-inert	75	2	1				1			
Specialised recycling	Non-inert	25	0.5								
Composting (LACW)	Non-inert	25	2.5		2				2		
Composting (C&I)	Non-inert	25	2.5		1				1		
Non-thermal treatment (LACW)	Non-inert	75	2								
Non-thermal treatment (C&I)	Non-inert	75	2								
Thermal treatment (LACW)	Non-inert	75	2	1				1			
Thermal treatment (C&I)	Non-inert	75	2	1	1			1			
Recycling / re-use	Inert	15	0.5								
Energy recovery	Inert	50	2								
Recovery	Hazardous	10	2.5								
Incineration	Hazardous	25	2								
Transfer station	Hazardous	5	1								

Source: Waste Needs Assessment model

11.2.6 Table 11.4 shows there is a total requirement for a maximum of seven additional built facilities if all the future capacity requirement is provided locally and there is no use of external capacity for at least some of the Plan period. This requirement would require 16ha. of land. The higher recycling rate modelled by the Upper Bound reduces the site requirement to 6 and the land requirement to 14ha.

11.2.7 The key conclusion from Table 11.4 is that moderate differences in future landfill diversion performance have very little impact on the number of sites and land requirement that the Plan must provide for.

11.2.8 Finally, it is important to recognise that the site requirements are based on managing each stream independently and are sensitive to the assumed reference capacities shown in the fourth column of Table 11.4. For example, it may not be necessary to provide two plants for thermal treatment of C&I waste if it is assumed that a single site with a capacity of 100,000 tonnes (rather than 75,000 tonnes) is built. As noted above, the composting capacity gap occurs as a result of the closure of two sites around the end of the current decade. The largest of these has a capacity of 75,000 tonnes and therefore if the site does close at that time then a single new site with the same capacity would address the capacity gap for both LACW and C&I wastes.

11.2.9 At this time it is not possible to determine the size of new facilities with any certainty and it appears prudent to take a pragmatic view about the capacity they may offer. However the comments in the preceding paragraph suggest that the site and land requirement forecast could be less than that shown in Table 11.4.

Capacity Gap Analysis – Landfill

11.2.10 Table 11.5 identifies the gap analysis of landfill capacity in the county over the Plan period and identifies no additional capacity is required. This is a slight simplification because a number of the sites currently operating waste are scheduled to close during the Plan period however the Council has advised that the likelihood of further planning consents to extend some of the operations to make full use of permitted voidspace will be addressed as part of the Local Plan. Comments following the table clarify the current position.

Table 11.5: Comparison of Landfill Void Capacity

	2013	2015	2020	2025	2030
UPPER BOUND					
Non-inert	3,370	2,803	1,905	1,413	1,129
Inert	1,941	1,692	1,341	790	750
Hazardous	18	17	14	12	10
LOWER BOUND					
Non-inert	3,370	2,803	1,720	941	344
Inert	1,941	1,688	1,295	662	21
Hazardous	18	17	14	12	10

Source: Waste Needs Assessment model; all figures in 000 m^3

11.2.11 Table 11.5 shows no difference in overall requirement immediately. As expected the difference in diversion rates assumed for C&I and Excavation wastes in particular results in more rapid reduction in void in the Lower Bound forecast but there is no capacity gap in any facility type during the Plan period. The relatively high level of landfill disposal of C&I wastes (affected by the high rate for industrial wastes) may overstate the likely reduction of non-inert void over the Plan period. A limited sensitivity test was applied to the Lower Bound scenario assuming C&I waste landfilling fell to 20% by 2020 and 10% by 2030. The resulting void surpluses were estimated to

be 1.79 million m3 at 2020 (+73); 1.14 million m3 at 2025 (+198); and 0.72 million m3 (+380) suggesting that any reduction in the level of landfilling of these wastes will maintain a substantial void throughout the life of the Plan.

11.2.12 The Lower Bound forecast also assumes the current high disposal rate for Excavation wastes will not change throughout the Plan period and this is the principal factor reducing the available inert landfill void. A gap of just over 100,000m^3 for this capacity develops in 2031 (ie. just after the end of the Plan period) under the Lower Bound scenario whereas it does not occur until 2033 under the Upper Bound assumptions.

11.2.13 The Upper Bound forecast shows a significant level of non-inert void would be maintained throughout the Plan period provided that time extensions are granted for any sites that reach the end of their current permissions with unfilled void remaining. The following sites are subject to expiry of their permits during the Plan period and the accompanying comments identify the Council's current expectations:

- Bennett Bank (non-inert) – expected to close in 2016 with material diverted to other sites;
- Hespin Wood (non-inert) – permission expires in 2020 and submission of an application for a time extension to make use of any remaining unused is expected;
- Lillyhall (non-inert) – permission expires in 2029 very close to the end of the Plan period at which point progress in waste reduction and its implication for landfill capacity would be reviewed;
- Roan Edge (inert) - permission expires in 2016 and application for a time extension is expected.

11.2.14 The range of outcomes under the two scenarios and the potential requirement for time extensions for both inert and non-inert landfills should be taken into account in the development of policies in the Plan. Some waste removed from the county is deposited in landfills outside Cumbria. Dialogue with the receiving authorities has identified that two of the sites that receive substantial quantities of waste are due to close during the Plan period. However the Council estimates that the available void in the local landfills is sufficient to accommodate this exported material and if it can be managed locally it will help to deliver a more self-sufficient solution, which is also a reason for permitting future time extensions to fully exploit the permitted capacity.

GLOSSARY OF TERMS AND ABBREVIATIONS

APC	Air Pollution Control residues – an ash residue recovered from infrastructure in a thermal treatment plant that traps hazardous residues in exhaust gases. Most APC residues are either sent for high temperature incineration or long-term deep storage although technologies to allow them to be decontaminated and recycled are emerging.
C&D waste	Construction & Demolition waste – typically comprises crushed brick, concrete and asphalt as well as quantities of glass, plastics such as uPVC, metal, wood and hazardous waste (insulation materials containing asbestos)
C&I waste	Commercial & Industrial waste – all wastes produced by businesses with the exception of those produced by the construction and demolition sectors and by agricultural premises
E waste	Excavation waste – all waste produced by excavation comprising soil and stones, a proportion of which may be contaminated and is therefore treated as hazardous waste
HWRC	Household Waste Recycling Centre – facilities also referred to as Civic Amenity Sites
IBA	Incinerator Bottom Ash – material recovered from the combustion chamber in a thermal treatment facility. It is non-hazardous, often contains some metals, and is normally recycled into a secondary building material.
LACW	Local Authority Collected Waste – comprises all household waste collected at the kerbside or taken to HWRCs as well as small quantities of trade waste (see separate entry) and other non-household wastes such as street and gully sweepings, park litter, etc.
MBT	Mechanical-Biological Treatment – waste management technology that typically involves shredding, part-composting and drying residual non-hazardous, non-inert waste to produce RDF (see separate entry)
MRF	Materials Recycling (or Recovery) Facility – waste facility that received mixed wastes and separates them into different recoverable or recyclable materials which are then sent to a reprocessing facility. Confusingly that facility actually performs the recycling function in turning the waste material into a new or secondary product
MRS	Metal Recycling Site – waste facilities more commonly referred to as scrap metal merchants, but which also include vehicle dismantlers.
NPPF	National Planning Policy Framework – the overarching simplified legislative framework defining the scope, content and other requirements for local plans produced in England. A separate National Planning Policy for Waste was published in October 2014
Pyrolysis / gasification	There are advanced thermal treatment technologies. Unlikely conventional incineration, the technologies involve combustion of waste within a high temperature vessel.
RDF / SRF	Refuse-Derived Fuel or Solid Recovered Fuel – material produced, usually in pellet form, as a fuel stock used in Energy from Waste facilities. RDF is the basic product with a calorific value typically in the range 9-11GJ/tonne, whereas SRF is a bespoke product processed to deliver a fuel with a significantly higher calorific value needed for certain high temperature industrial processes such as cement manufacture
Recovery	In this study the term is used to identify facilities that treat or process residual material that cannot otherwise be recycled, changing its form in the process
Recycling	In this study the term recycling is applied to activities and sites where mixed wastes are separated into material streams so that they can be sent to material

	reprocessing facilities and converted into secondary products
Specialised recycling	In this study this term identified recycling facilities that handle a single type of materials such as plastics, wood, metals, etc. but which are not equipped to manage mixed wastes. Therefore the capacity they offer needs to be distinguished from that at MRFs and similar facilities
Trade waste	Waste collected by a local authority typically from small businesses. It is a component of LACW though it is actually a type of C&I waste
Transfer station	In this study this term applies to facilities that merely take in wastes to bulk it onto larger loads before the material is sent to a recycling facility. These sites play a role in waste management but are not assumed to contribute to moving material up the Waste Hierarchy.
WDI	Waste Data Interrogator – a database facility published annually in October by the Environment Agency that provides a comprehensive set of information about the type, quantities, destination and fate of controlled wastes moved in England and Wales in the previous full calendar year.