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WASTE NEED ASSESSMENT

HEREFORDSHIRE MINERALS AND WASTE LOCAL PLAN

FEBRUARY 2017

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1. Introduction

1.1 Background and Purpose of Document

1.1.1 Herefordshire Council has commenced preparation of the Minerals and Waste Local Plan to guide development related to minerals and waste within Herefordshire up to 2031.

1.1.2 A first step in preparing the Local Plan in relation to waste is to understand key factors such as the amount and type of waste management infrastructure currently operating within the county and future demands for it - this is achieved through an assessment of the need for waste management facilities within Herefordshire set out within this report. A comparable report has also been prepared for minerals.

1.1.3 The National Planning Policy for Waste (published October 2014, the NPPW) identifies that positive planning should play a pivotal role in delivering waste ambitions through:

- delivery of sustainable development and resource efficiency, including provision of modern infrastructure, local employment opportunities and wider climate change benefits, by driving waste management up the waste hierarchy;
- ensuring that waste management is considered alongside other spatial planning concerns, such as housing and transport, recognising the positive contribution that waste management can make to the development of sustainable communities;
- providing a framework in which communities and businesses are engaged with and take more responsibility for their own waste, including by enabling waste to be disposed of or, in the case of mixed municipal waste from households, recovered, in line with the proximity principle;
- helping to secure the re-use, recovery or disposal of waste without endangering human health and without harming the environment; and
- ensuring the design and layout of new residential and commercial development and other infrastructure (such as safe and reliable transport links) complements sustainable waste management, including the provision of appropriate storage and segregation facilities to facilitate high quality collections of waste.

1.1.4 The NPPW requires waste planning authorities to prepare a local plan addressing waste management that: is based on a proportionate evidence base; will identify the level of need of their area; and will identify sites and/or areas for new or enhanced waste management facilities.

1.1.5 A range of wastes are generated and managed within Herefordshire and these are all addressed as relevant within this need assessment.

1.1.6 The Minerals and Waste Local Plan will be applicable across all of Herefordshire and is intended to have a plan period to 2031. Once adopted, it will sit with the Herefordshire Core Strategy[1] and be part of the development plan.

[1] Herefordshire Local Plan Core Strategy 2011-2031, Herefordshire Council, October 2015

1.1.7 This assessment has been undertaken to gain an understanding of current waste management infrastructure within Herefordshire and to consider potential future demand so as to prepare comprehensive, compelling and long-lasting policy.

Structure

1.1.8 This report is structured as follows:

- Introduction;
- Section 2 - Context: setting out key definitions for waste and the sources of data used in this report;
- Section 3 - Permitted facilities in Herefordshire: an overview of the current waste management infrastructure operating within the county;
- Section 4 - Waste Arisings: estimating waste arisings in the baseline year of 2015;
- Section 5 - Waste Forecasts: estimating future waste arisings, up to 2031; and
- Section 6 - Capacity Needs: considering the need for new waste management capacity.

2. Context

2.1 Explanations for Waste Terminology

2.1.1 Waste terminology has changed over time as a result of greater understanding of different waste streams, changes to waste classification systems and the adoption of common European definitions. This section explains some key definitions used within this report.

Municipal waste, local authority collected waste and household waste

2.1.2 In 2011, the UK adopted the European definition of municipal waste, which is '*waste from households, as well as other waste which, because of its nature or composition, is similar to waste from households'*. This definition is quite broad and includes those wastes not collected by a local authority (principally commercial and industrial wastes).

2.1.3 To provide consistency with the data recorded pre-2011 and to provide clarity over the different waste streams, the term 'local authority collected waste', abbreviated to 'LACW' is used to refer to all waste collected by a local authority.

2.1.4 Within this report, LACW is further categorised as:

- household waste - waste collected from households within the local authority;
- trade waste - the commercial and industrial waste collected by the local authority (eg from local businesses);
- other municipal wastes - for example waste from parks and gardens, or fly tipping; and
- non-municipal fractions - principally construction and demolition waste.

Commercial and industrial waste

2.1.5 Commercial waste is generated from the business sector, including the activities of wholesalers, catering establishments, shops and offices. Industrial waste is generated by factories and industrial facilities.

2.1.6 These wastes have different properties but are often, and within this report, considered together, using the abbreviation 'C&I waste'.

2.1.7 The majority of C&I waste is managed directly through contracts held between the business and the waste management industry, however some is collected by the local authority. This report makes clear the C&I waste generated within Herefordshire and whether it is managed through a private contractor as LACW.

Construction, demolition and excavation waste

2.1.8 Construction and demolition wastes are those generated through building projects; whilst excavation waste refers to wastes produced from earth moving activities. The abbreviation used is 'CD&E waste'.

2.1.9 Again, these wastes are generally managed through private contracts held directly with the waste management industry. However, a small amount is captured in LACW, principally through deposits made at household waste recycling centres (HWRC) or civic amenity (CA) sites.

Agricultural waste

2.1.10 Agricultural waste is that generated by the agriculture sector, principally farms. Most of this waste is natural and can be managed on-farm, eg soiled animal bedding; non-natural wastes (eg plastic wrapping) is generally managed through the private sector.

Hazardous waste

2.1.11 Hazardous waste relates to wastes that could cause harm to human health or the environment.

2.1.12 Hazardous wastes are usually a component of other wastes stream, i.e. hazardous wastes can arise in households, from industrial premises, at construction sites etc.

Radioactive waste

2.1.13 Radioactive waste is not a controlled waste under UK legislation. However, waste planning authorities are required to consider disposal requirements that may arise for this waste stream time in preparing their development plans.

Waste management hierarchy

2.1.14 The waste hierarchy is set out at Article 4 of the revised Waste Framework Directive (Directive 2008/98/EC). The definitions of each of the stages can be found in Article 3 of the Directive. Non-exhaustive lists of disposal and recovery operations can be found in Annexes I and II of the Directive, respectively.

2.1.15 Directive 2008/98/EC sets out the priority actions for waste management, seeking to avoid waste creation in the first place, but when waste is created it gives priority to preparing it for re-use, then recycling, then recovery, and last of all disposal.

- Preparing for reuse – checking, cleaning, repairing and refurbishing items that have become waste so that they can be re-used without any other pre-processing.
- Recycling - the reprocessing of waste materials into products, materials or substances whether for the original or other purposes. It includes composting provided that the output meets the required quality standards.
- Other Recovery - which includes incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling, for example when soils are used as the daily cover material at a landfill facility.
- Disposal - principally to a landfill facility.

2.2 Data Sources

Arisings data

2.2.1 In 2012, the UK generated an estimated 200 million tonnes of waste across various sectors. However, there are notable gaps in our knowledge and we cannot be certain about the total amount of commercial and industrial, construction, demolition and excavation or agricultural wastes because currently data are not captured from all waste management facilities or about waste producing sectors.

2.2.2 The only waste stream where the total waste generation is accurately known is Local Authority Collected Waste (LACW). This is as a result of the detailed data set collected through WasteDataFlow (WDF).

2.2.3 WasteDataFlow is the web based system for municipal waste data reporting by UK local authorities to government. The system went live over ten years ago on 30 April 2004 and validated information held on WasteDataFlow can be downloaded by the general public.

2.2.4 For most other waste streams and data on permitted facilities, the Waste Data Interrogator (WDI) run by the Environment Agency, is the data source point. Data on hazardous waste are available from the Hazardous Waste Data Interrogator (HWDI) also run by the Environment Agency. Both these data sets require information to be submitted by the waste management facility operator.

2.2.5 In relation to waste streams other than LACW, there are limitations in the data available for waste generation:

- C&I waste. Data gaps result from the lack of reporting associated with exempt activities and it is difficult to allocate waste accurately to the producing sectors. In addition, most recent estimates have been at the national level and the data has not been broken down to the regional or waste planning authority level.
- CD&E waste. Significant quantities of waste are processed at the site of production and/or managed at exempt facilities. This has resulted in this waste stream historically being estimated through surveys, but there has been some limited new research available in 2010, when WRAP published "Construction, demolition and excavation waste arisings, use and disposal for England 2008". The WRAP report looked at national level arisings rather than waste generated within regions or waste planning authority.
- Agricultural waste. Limited data is captured on natural and non-natural agricultural wastes as wastes generated on farms are often managed under exemptions.

Facility data

2.2.6 Some caution also needs to be applied in using data relating to waste management capacity. The Environmental Permitting (England and Wales) Regulations 2010 provide the system for environmental permits (EP) for industrial activities and waste operations, including treating, keeping and disposing of waste. EP set out conditions under which waste management facilities must operate.

2.2.7 The first principle to establish is that this needs assessment only considers those **waste management facilities that are operational**. In many authority areas, planning permission is gained for new or enhanced waste management facilities that are not implemented for a variety of reasons. This capacity is considered only to have been consented but not operational and is not incorporated into this waste need assessment.

2.2.8 Within this assessment, it has been assumed that if a facility has an EP, i.e. if it is permitted, it is operational and should be considered as part of the current capacity operating within Herefordshire. However, there remains a further **complication between permitted and operational capacity**.

2.2.9 When applying for an EP, an operator is required to state the facility's annual capacity. This is considered by the Environment Agency during the application process and a maximum input is stated within the EP. The maximum input is related to the type of EP and the risks

associated with the type of facility (e.g. Standard Rules Permit "SR2015 No21: Materials Recycling Facility up to 75kte per annum"); the maximum input is often set within pre-defined bands. The maximum input set out in the EP is the facility's permitted capacity; however, this may not reflect the actual quantity of waste that the facility could handle in a year.

2.2.10 In many cases, the permitted capacity is higher than the actual throughput a facility can handle. Therefore, care is needed when considering available capacity, an assumption that the permitted capacity is the available capacity may result in capacity being over-estimated.

2.2.11 Certain activities, generally related to recovery and temporary storage of waste, can be exempt from the requirement to hold an environmental permit. Part 1 of Schedule 3 to the Environmental Permitting (England and Wales) Regulations 2010 lists and describes the waste operations which do not require an environmental permit, providing that the establishment or undertaking carrying them out has registered the exemption(s) with the Environment Agency.

2.2.12 **Exempt activities** are those considered to be low risk due to the type and quantity of waste handled. There is no requirement for the operator of exempt activities to report on the type or quantity of waste handled, resulting in an incomplete data set.

2.2.13 The WDI contains details of all waste deposited and removed from permitted waste facilities in England; this includes wastes handled through **transfer stations.** Therefore, care is needed when collating tonnages handled through transfer stations to avoid double counting.

3. Waste Management Facilities in Herefordshire

3.1 Permitted Waste Facilities

3.1.1 All operators of permitted waste management facilities must provide the Environment Agency with details of the quantities and types of waste handled i.e. waste received onto site, the process it went through on site, and waste sent from site on to other destinations.

3.1.2 This data is collated in the WDI, which provides the detail of all permitted facilities by waste planning authority (WPA) area.

3.1.3 Whilst 2015 is the base year for this assessment, Table 3.1 summarises the type and number of waste management facilities permitted in Herefordshire over the years 2013 to 2015, providing some context to the capacity provided.

Number and type of permitted facilities and the type of wastes accepted

3.1.4 Table 3.1 shows that in 2015 there were 35 permitted facilities operating in Herefordshire, an increase of nine from 2013 (line 19). Whilst most waste management capacity stayed fairly constant over the three years there are three changes of note:

- there was a decrease of one non-hazardous waste transfer facility (line 1) and one material recycling facility (line 4) both of which ceased operating after 2013;
- the use of anaerobic digestion to treat on farm waste grew significantly from 2013 to 2015 (line 15); and
- there was a decrease in capacity provided for use of waste in construction activity, however these operations are often quite transient (lines 16 and 17) but a new facility opened to provide for the physical treatment of soil (line 18). This facility may take the construction waste from those sites that have ceased operations.

3.1.5 Table 3.1 also demonstrates that whilst there is a range of waste management collection, re-use and recycling capacity permitted in Herefordshire addressing a variety of wastes, there are no residual waste management facilities such as energy from waste plant or landfill sites.

Table 3.1: Number of permitted facilities in Hereford, 2013-2015

	Facility type	Site Category	Site Type	2013	2014	2015
1	A11: Household, Commercial & Industrial WTS	Transfer	Non-hazardous waste transfer	3	2	2
2	A11: Household, Commercial & Industrial WTS and A13: Household Waste Amenity Site	Transfer	Non- hazardous waste transfer and civic amenity site	2	2	2
3	A13: Household Waste Amenity Site	Transfer	Civic amenity site	3	3	3
4	A15: Material Recycling Treatment Facility	Treatment	Material recycling facility	1	n/r	n/r
5	A16 : Physical Treatment Facility	Treatment	Physical treatment	1	-	3
6	A19: Metal Recycling Site (Vehicle Dismantler)	Metal Recycling Site	Car breaker	3	4	4
7	A19a: End of Life Vehicle Facility	Metal Recycling Site	Car breaker	1	1	1
8	A20: Metal Recycling Site	Metal Recycling Site	Metal recycling	2	2	2
9	A23: Biological Treatment Facility	Treatment	Biological treatment	2	3	4
10	A25: Deposit of waste to land as a recovery operation	On/In Land	Deposit of waste to land (recovery)	1	1	1
11	S0803: Household, Commercial & Industrial Waste TS/Treatment[1]	Treatment	Non- hazardous waste transfer / treatment	1	1	1
12	S0807: Household, Commercial & Industrial Waste TS/Treatment/Asbestos[1,2]	Treatment	Haz hazardous waste transfer / treatment	1	1	1
13	S0821: Metal recycling site	Metal Recycling Site	Metal recycling	1	1	1
14	S0824: Clinical Waste Transfer Station (A12: Clinical Waste Transfer Station in 2013)	Transfer	Clinical waste transfer	1	1	1
15	S1210: On-farm AD using farm wastes only	Treatment	Anaerobic digestion	1	5	8
16	SR2010 No7: Use of waste in construction <50ktps	Use of Waste	Construction	1	n/r	n/r
17	SR2010 No8: Use of waste in construction <100ktps	Use of Waste	Construction	1	n/r	n/r
18	SR2010 No12: Treatment of waste to produce soil <75ktpa	Treatment	Physical treatment	n/r	1	1
19			**Total**	**26**	**28**	**35**

n/r: no active sites reported ktps: kilo tonnes per site ktpa: kilo tonnes per annum

1. Treatment consisting only of manual sorting, separation, screening, baling, shredding, crushing or compaction of waste into different components for disposal (no more than 50 tonnes per day) or recovery. 2. No treatment of asbestos, storage only.

3.1.6 Table 3.2 (over the page) summarises the types and quantities of waste accepted at those permitted facilities in 2015. The waste types are categorised using the List of Wastes[2] (LoW) chapter headings (see Annex A).

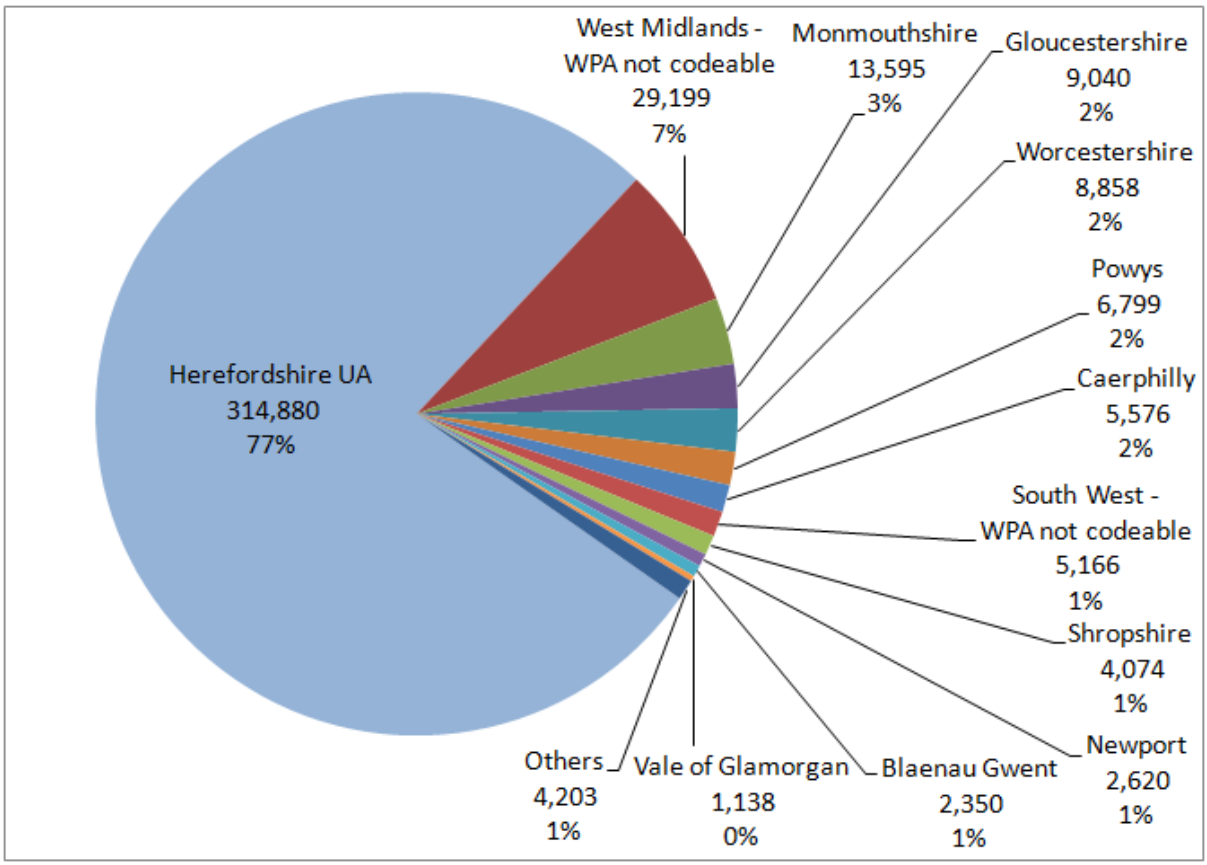
3.1.7 Table 3.2 shows that in 2015, nearly 407,500 tonnes of waste were managed at permitted facilities located in Herefordshire. Full details are provided in Annexes B to D.

3.1.8 The single largest tonnage is municipal waste (principally wastes from households) followed by agriculture and processing wastes. These wastes are materially larger than the other waste types, which is perhaps not surprising considering the county is very rural.

3.1.9 Figure 3.1 shows the origin of that waste, over 75% of which originated in Herefordshire. This suggests that Herefordshire is reasonably self-sufficient in managing wastes produced, although as noted above there is no residual waste management capacity.

3.1.10 The remaining wastes originate from adjacent and nearby authorities. Full details are provided in Annex E.

Figure 3.1: Origin of waste received at permitted facilities in Herefordshire, 2015



[2] Commission Decision 2000/532/EC, as amended, most recently by Commission Decision 2014/955/EU), formally known as the European Waste Catalogue (EWC). The LoW is the system used for classifying waste, required by law and used in most waste regulatory and data reporting systems.

Table 3.2: Wastes accepted at permitted facilities in Herefordshire, 2015

	Operator	Site Name	Facility Type	02: Agriculture and Food Processing Wastes	03: Furniture, Paper and Cardboard Manufacturing Wastes	08: Paint, Adhesive, Sealant and Ink Manufacturing Waste	10: Thermal Processes Waste	12: Shaping and Physical Treatment Of Metals And Plastics	13: Oil Wastes and Wastes of Liquid Fuels	15: Packaging, Absorbents, Wiping Cloths etc N.O.S.	16: Wastes Not Otherwise Specified	17: Construction and Demolition Wastes	18: Human and Animal Health Care Waste	19: Waste and Water Treatment Wastes	20: Municipal Wastes	Grand Total
1	Lively Joseph Henry	Quickskip (Hereford) WTS	Non-Haz Waste Transfer												31,244	**31,244**
2	M S & E M Patrick Ltd	Marlbrook Farm	Non-Haz Waste Transfer												9,361	**9,361**
3	Mercia Waste Management Ltd	Leominster HWRC & WTS	CA Site								3	82			24,869	**24,955**
4	Mercia Waste Management Ltd	Rotherwas HWRC, WTS & MRF	CA Site								5	238			55,414	**55,658**
5	Mercia Waste Management Ltd	Ledbury HWRC	CA Site								1				2,492	**2,493**
6	Mercia Waste Management Ltd	Ross on Wye HWRC	CA Site								1				4,346	**4,347**
7	Mercia Waste Management Ltd	Bromyard HWRC	CA Site								1				1,850	**1,851**
8	Balfour Beatty Living Places Ltd	Land Adjacent to Unit 3	Physical Treatment	1							1	1,632			2,106	**3,740**
9	Hereford Quarries Limited	Former Lugg Bridge Quarry	Physical Treatment									5,655				**5,655**
10	Kingspan Insulation Ltd	Kingspan Insulation Ltd	Physical Treatment							3		138				**141**
11	Avalon Metals Limited	Eastside Recycling Facility	Car Breaker	861				0			7,273	4,110		2,898	7,430	**22,572**
12	Jason Baker and Richard Baker	J & R Recovery	Car Breaker								70					**70**
13	Morris F G	City Spares M R S Site	Car Breaker								266					**266**
14	P & T Moore Limited	P&T Moore Vehicle Dismantlers	Car Breaker								1,514					**1,514**
15	U K Bus Dismantlers Ltd	Streamhall Garage	Car Breaker								269					**269**

	Operator	Site Name	Facility Type	02: Agriculture and Food Processing Wastes	03: Furniture, Paper and Cardboard Manufacturing Wastes	08: Paint, Adhesive, Sealant and Ink Manufacturing Waste	10: Thermal Processes Waste	12: Shaping and Physical Treatment Of Metals And Plastics	13: Oil Wastes and Wastes of Liquid Fuels	15: Packaging, Absorbents, Wiping Cloths etc N.O.S.	16: Wastes Not Otherwise Specified	17: Construction and Demolition Wastes	18: Human and Animal Health Care Waste	19: Waste and Water Treatment Wastes	20: Municipal Wastes	Grand Total
16	Avalon Metals Limited	R Smith Metals	Metal Recycling								20			2,097		**2,117**
17	Evans R	Cobhall Cottage	Metal Recycling								4	172				**176**
18	Mayglothling Waste Ltd	Yaidon Farm	Biological Treatment	7,092						70	223			27	16,847	**24,258**
19	Mr N & Mrs S Green	Much Fawley Farm	Biological Treatment	12,560												**12,560**
20	S T L Energy Ltd	S T L Energy Ltd	Biological Treatment	28,826												**28,826**
21	Tradebe Gwent Limited	Eign Waste Treatment Centre	Biological Treatment	15,963							2,802		52	16,606	5,215	**40,638**
22	The Pipe Corporation Limited	Land At Lower Vern	Deposit of waste to land (recovery)									12,120				**12,120**
23	Gelpack Excelsior Ltd	Gelpack Excelsior Ltd	Non-Haz Waste Transfer/Treatment							22						**22**
24	Eastside 2000 Limited	Eastside Recycling Facility	Haz Waste Transfer / Treatment	79	222	2	36		6	692	180	33,164	0	2	18,015	**52,399**
25	Avalon Metals Limited	Former E M R Facility	Metal Recycling					300			679	397		1,199	2,586	**5,162**
26	Sodexo Property Solutions Ltd	County Hospital	Clinical Waste Transfer										38			**38**
27	Assured Energy Llp	Two Hoots Farm A D Plant	Anaerobic Digestion	8,985												**8,985**
28	Bowley Storage and Marketing Ltd	Bowley Court	Anaerobic Digestion	200												**200**
29	David And Helen Morgan	Penllan A D	Anaerobic Digestion	4,464												**4,464**
30	Herefordshire Biogas Limited	Herefordshire Biogas	Anaerobic Digestion	13,669												**13,669**
31	M & M Power Limited	The Biogas Facility	Anaerobic Digestion	10,965												**10,965**

	Operator	Site Name	Facility Type	02: Agriculture and Food Processing Wastes	03: Furniture, Paper and Cardboard Manufacturing Wastes	08: Paint, Adhesive, Sealant and Ink Manufacturing Waste	10: Thermal Processes Waste	12: Shaping and Physical Treatment Of Metals And Plastics	13: Oil Wastes and Wastes of Liquid Fuels	15: Packaging, Absorbents, Wiping Cloths etc N.O.S.	16: Wastes Not Otherwise Specified	17: Construction and Demolition Wastes	18: Human and Animal Health Care Waste	19: Waste and Water Treatment Wastes	20: Municipal Wastes	Grand Total
32	Mr D, Mrs E & Mr R Pursey	Trevase Farm a D	Anaerobic Digestion	1,460												**1,460**
33	P T Baker Farms Limited	Eardisley Park Farm Facility	Anaerobic Digestion	1,391												**1,391**
34	Shed Field Growers Limited	The Leen Digester	Anaerobic Digestion	11,363												**11,363**
35	Quickskip Hereford Limited	Fir Tree Lane Site	Physical Treatment (Soil Production)												12,550	**12,550**
36			**Total**	**117,879**	**222**	**2**	**36**	**301**	**6**	**786**	**13,312**	**57,708**	**90**	**22,830**	**194,325**	**407,499**

Capacity and waste input at the permitted facilities

3.1.11 Table 3.3 provides a summary of the permitted capacity and actual throughput by waste management facility category in recent years.

3.1.12 Table 3.3 shows that annual permitted capacity of each site is generally materially greater than the actual input to the facility. This may be due to a number of reasons, with the most likely being that the permitted capacity is simply the closest band available or that the facility is just starting operations and so building up to full capacity.

3.1.13 This demonstrates the need to exercise caution in relying on the permitted capacity; some sites may never be able to accept the maximum amount of waste set out in their EP and this would inflate the amount of useful, operational capacity available within Herefordshire.

Table 3.3: Summary of permitted capacity and waste input for all facilities in Herefordshire, 2013-2015

Category	Facility Type	2013		2014		2015	
		Capacity	Input	Capacity	Input	Capacity	Input
		tonnes		tonnes		tonnes	
Transfer	Non-Haz Waste Transfer	74,997	35,909	49,998	35,024	49,998	40,605
	Non-Haz Waste Transfer and CA Site	109,550	76,344	109,550	79,202	109,550	80,613
	CA Site	34,349	8,338	34,349	8,673	34,349	8,691
	Clinical Waste Transfer	520	153	75,000	84	75,000	38
Metal Recycling Site	Car Breaker	64,897	1,820	138,397	23,581	138,397	24,691
	Metal Recycling	88,768	11,062	88,768	7,336	88,768	7,455
Treatment	Non-Haz Waste Transfer / Treatment	74,999	172	74,999	115	74,999	22
	Haz Waste Transfer / Treatment	75,000	53,338	75,000	70,389	75,000	52,399
	Biological Treatment	283,999	52,326	299,998	73,699	333,998	106,282
	Anaerobic Digestion (farm wastes only)	36,499	807	166,413	6,574	339,413	52,497
	Material Recycling Facility	24,999	6,789	n/r	n/r	n/r	n/r
	Physical Treatment	5,000	2,949	75,000	22,020	99,999	22,086
Recovery in/on land and use in construction	Deposit of waste to land (recovery)	58,000	23,400	58,000	19,005	94,000	12,120
	Use of waste in construction	149,998	30,662	n/r	n/r	n/r	n/r
Total		**1,081,575**	**304,069**	**1,245,472**	**345,702**	**1,513,471**	**407,499**

Capacity: EP capacity Input: Waste input n/r: no reported tonnage

3.1.14 Table 3.4 (over the page) presents both the permitted capacity and the annual input for each operational site over years 2013 to 2015. Full details are provided in Annexes B to D.

3.1.15 Table 3.4 provides additional detail to supplement the summary provided in Table 3.1. For example, it shows that the loss of a non-hazardous waste transfer site (Table 3.1, line 1) does not equate to a loss of capacity, instead it appears to be a rationalisation of operations (Table 3.4, lines 1 and 2).

Table 3.4: Permitted capacity and waste input for all facilities in Herefordshire, 2013-2015

Operator	Site Name	Site Type	Annual Permitted Capacity	2013 Input	2014 Input	2015Input
			Tonnes			
Lively Joseph Henry	Quickskip Transfer Station	Non-Haz Waste Transfer	24,999	6,000	n/r	n/r
Lively Joseph Henry	Quickskip (Hereford) Transfer Station	Non-Haz Waste Transfer	24,999	19,780	27,636	31,244
MS & EM Patrick Ltd	Marlbrook Farm	Non-Haz Waste Transfer	24,999	10,129	7,388	9,361
Mercia Waste Management Ltd	Leominster HWRC & WTS	Non-Haz Waste Transfer	39,050	9,324	10,335	18,354
		CA Site		6,227	6,400	6,601
Mercia Waste Management Ltd	Rotherwas HWRC, WTS & MRF	Non-Haz Waste Transfer	70,500	50,583	49,521	41,869
		CA Site		10,210	12,946	13,789
Mercia Waste Management Ltd	Ledbury HWRC	CA Site	4,350	2,276	2,462	2,493
Mercia Waste Management Ltd	Ross On Wye HWRC	CA Site	25,000	4,210	4,334	4,347
Mercia Waste Management Ltd	Bromyard HWRC	CA Site	4,999	1,852	1,877	1,851
The Mann Organisation Ltd	Mann Organisation Ltd	Material Recycling Facility	24,999	6,789	n/r	n/r
Balfour Beatty Living Places Ltd	Land Adjacent To Unit 3	Physical Treatment	5,000	2,949	n/r	3,740
Hereford Quarries Limited	Former Lugg Bridge Quarry	Physical Treatment	14,999	n/r	n/r	5,655
Kingspan Insulation Ltd	Kingspan Insulation Ltd	Physical Treatment[1]	74,999	172	115	141
Avalon Metals Ltd	Eastside Recycling Facility	Car Breaker	73,500	n/r	21,369	22,572
Jason and Richard Baker	J & R Recovery	Car Breaker	2,499	74	85	70
Morris F G	City Spares MRS Site	Car Breaker	32,400	154	194	266
P & T Moore Ltd	P & T Moore Vehicle Dismantlers	Car Breaker	4,999	1,376	1,708	1,514
UK Bus Dismantlers Ltd	Streamhall Garage	Car Breaker	24,999	216	225	269
Evans R	Cobhall Cottage	Metal Recycling	2,568	190	163	176
Avalon Metals Ltd (Pre 2015 Smith R)	R Smith Metals	Metal Recycling	11,200	3,358	2,742	2,117
Mayglothling Waste Ltd	Yaidon Farm	Biological Treatment	49,999	25,626	25,503	24,258
Mr N Green & Mrs S Green	Much Fawley Farm	Biological Treatment	15,999	n/r	11,887	12,560
STL Energy Ltd	STL Energy Ltd	Biological Treatment	34,000	n/r	n/r	28,826
Tradebe Gwent Ltd	Eign Waste Treatment Centre	Biological Treatment	234,000	26,700	36,309	40,638

Operator	Site Name	Site Type	Annual Permitted Capacity	2013 Input	2014 Input	2015Input
			Tonnes			
The Pipe Corporation Ltd	Land At Lower Vern	Deposit of waste to land (recovery)	58,000	23,400	19,005	12,120
Gelpack Excelsior Ltd	Gelpack Excelsior Ltd	Non-Haz Waste Transfer/ Treatment	74,999	n/r	n/r	22
Eastside 2000 Ltd.	Eastside Recycling Facility	Haz Waste Transfer/Treatment	75,000	53,338	70,389	52,399
Avalon Metals Ltd (Pre 2015 European Metal Recycling Ltd)	Former EMR Hereford	Metal Recycling	75,000	7,514	4,431	5,162
Sodexo Property Solutions Ltd	County Hospital	Clinical Waste Transfer	75,000	153	84	38
Assured Energy LLP	Two Hoots Farm AD Plant	Anaerobic Digestion	28,314	n/r	1,773	8,985
Bowley Storage and Marketing Ltd	Bowley Court	Anaerobic Digestion	100,000	n/r	n/r	8,985
David And Helen Morgan	Penllan AD	Anaerobic Digestion	36,500	n/r	n/r	200
Herefordshire Biogas Ltd	Herefordshire Biogas	Anaerobic Digestion	36,500	n/r	394	13,669
M & M Power Limited	The Biogas Facility	Anaerobic Digestion	28,600	n/r	2,210	10,965
Mr D, Mrs E & Mr R Pursey	Trevase Farm AD	Anaerobic Digestion	36,500	n/r	368	1,460
PT Baker Farms Ltd	Eardisley Park Farm Facility	Anaerobic Digestion	36,499	807	1,829	1,391
Shed Field Growers Limited	The Leen Digester	Anaerobic Digestion	36,500	n/r	n/r	11,363
Quickskip Hereford Ltd	Fir Tree Lane Site	Physical Treatment (Soil Production)	75,000	n/r	22,020	12,550
Eastside 2000 Ltd	The Valletts	Use of waste in construction	49,999	6,990	n/r	n/r
Smiths (Gloucester) Ltd	Land At Netherton Road	Use of waste in construction	99,999	23,672	n/r	n/r

1. Prior to 2015 was classified as Non-Hazardous Waste Transfer/Treatment

n/r: no reported tonnage

Key points on permitted waste capacity

3.1.16 The data highlights a number of key points about the permitted capacity operating in Herefordshire that should be considered within this need assessment:

- Whilst there is transfer with basic treatment and biological treatment capacity in the county, there is no residual waste treatment or disposal capacity such as mechanical biological treatment (MBT), refuse derived fuel (RDF) production, incineration (with or without energy recovery) or landfill. This means there is a reliance on such facilities outside the county, including a significant proportion of strategic capacity that has been jointly procured with Worcestershire County Council to manage LACW (see section 6.2).
- Over the last three years there has been a notable increase in the capacity of and waste inputs to permitted facilities. This is predominately driven by an increase in biological treatment and anaerobic digestion facilities, with permitted capacity increasing by approximately 350kt and waste inputs by 105kt. This increase is consistent with the increases in waste inputs across England (+4,800kt since 2013) and the West Midlands (+360kt since 2013)[3].
- The increase in the biological treatment and anaerobic digestion capacity is predominantly being utilised for the treatment of agriculture and food preparation and processing wastes.
- Between 2013 and 2014, there were 25kt reductions in both non-hazardous waste transfer and material recycling capacity due to two facilities no longer being operational/ permitted.
- Use of waste in construction is a transient activity, so annual capacity and inputs can (and do) fluctuate significantly.
- Over 75% of waste received at permitted facilities in Herefordshire in 2015 originates from Herefordshire.

3.1.17 As discussed further in section 6.2, LACW is managed through permitted capacity that is located in Worcestershire.

3.1.18 Permitted facilities are mapped, over the page.

[3] EA WDI 2013 and 2015

Herefordshire Minerals and Waste Local Plan

Herefordshire Waste Facilitiies

Site Input 2015 (Tonnes)

- < 5,000
- 5,001 - 10,000
- 10,001 - 20,000
- 20,001 - 40,000
- > 40,000
- Herefordshire County Boundary

N

0 5 10 15

Kilometres

SCALE
1:250,000@ A3

DATE
13/01/2017

hendeca

Herefordshire Minerals and Waste Local Plan

Herefordshire Waste Facilitiies

Annual Capacity 2015 (Tonnes)

- < 10,000
- 10,001 - 20,000
- 20,001 - 50,000
- 50,001 - 100,000
- > 100,000
- Herefordshire County Boundary

N

0 5 10 15

Kilometres

SCALE 1:250,000 @ A3

DATE 13/01/2017

hendeca

3.2 Facilities exempt from Environmental Permitting

3.2.1 Exemptions can be gained for the use, treatment, disposal and storage of waste. In 2010 there was a significant change to the waste exemptions system that brought greater clarity over the types and quantities of waste that can be handled under each exemption.

3.2.2 The revised system required all exempt operations to be newly registered and limits each exemption to three years from the date of registration, at which point there is a need to re-register the exemption if an operator wants to continue to benefit from the exemption.

3.2.3 Under the old system, there was no requirement to remove an exemption from the register once an operation had ceased, so the new system results in a "cleaner" data set in that the exemption expires after three years. However, there is no requirement for an exemption that is completed within the three-year registration period to be removed from the register. This is a potential issue for estimating capacity for exemptions related to construction activities, which would not normally accept waste for the full three years.

3.2.4 There is no reporting of waste tonnage inputs to exempt facilities. However, the details provided in the waste exemption registrations can be used to estimate waste arisings and capacity.

3.2.5 Exempt activities are split into four categories:

- Using waste (U codes);
- Treating waste (T codes);
- Disposing of waste (D codes); and
- Storing waste (S codes).

3.2.6 However not all exempt activities are important to the waste need assessment on the basis that:

- they do not contribute to the waste management capacity in the county;
- they do not significantly affect C&I or CD&E waste estimates; or
- the wastes handled through a particular exemption would be captured in other exemptions/permitted facilities once moved on (and so recognising them would result in double counting).

3.2.7 A summary of all exemptions is provided in Annex F along with comments and assumptions about which exemptions need to be considered in terms of waste arisings and capacity estimates.

3.2.8 An extract from the Environment Agency's EP exemptions database for Shropshire, Herefordshire, Worcestershire and Gloucestershire has been obtained. The currently available extract covers active exemptions as of September 2016, and provides the details of each exemption registered at a site. The data provided needed to be cleansed to:

- Identify exemptions within Herefordshire where the county was not identified in the address field, by using "HR" postcodes where the county was missing from the address;
- Remove the exemptions from Shropshire, Worcestershire and Gloucestershire;
- Split the exemptions into non-farm and on-farm exemptions, as the latter are unlikely to affect overall capacity or have a significant impact on C&I and CD&E waste estimates;

- Identify the exemptions registered at each site, as multiple exemptions are often registered at a given site; and
- Remove duplicate registrations.

Non-farm exemptions

3.2.9 Within Herefordshire, there are 35 non-farm locations with registered exemptions in the Environment Agency exemptions database, with a total of 68 exemptions registered across these locations (see Annex G).

3.2.10 However, when this data set is rationalised there remain 18 locations covering 43 exempt activities that should be considered in arisings estimates and/or capacity estimates. Rationalisation is achieved by the removal of:

- duplicate registrations;
- storage only exemptions;
- treatment exemptions where the outputs are likely to be captured at a permitted facility once moved on (e.g. T28 - Sorting and denaturing of controlled drugs for disposal, T17 - Crushing waste fluorescent tubes); and
- activities where the tonnage involved is likely to be insignificant are excluded (e.g. D6 - Disposal by incineration).

3.2.11 Table 3.5 presents a summary of the relevant data.

Table 3.5: Relevant non-farm exempt activities, Herefordshire, September 2016

Exemption	Description	Number
D1	Deposit of waste from dredging of inland waters	4
D4	Deposit of agricultural waste consisting of plant tissue under a Plant Health Notice	1
D7	Burning waste in the open	12
T6	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising	3
T9	Recovery of scrap metal	2
T32	Treatment of waste in a biobed or biofilter	1
U1	Use of waste in construction	5
U4	Burning of waste as a fuel in a small appliance	4
U8	Use of waste for a specified purpose	4
U10	Spreading waste on agricultural land to confer benefit	2
U12	Use of mulch	2
U13	Spreading of plant matter to confer benefit	1
U14	Incorporation of ash into soil	2
Total		43
Note: It should be noted that some of these exemptions could be on-farm activities based on the address provided for certain exemptions (see Annex F)		

3.2.12 The detail of these exempt activities has been reviewed so as to estimate the waste tonnages that should be used within this waste need assessment. Table 3.6 shows how the exemptions have been considered and are proposed to be used.

3.2.13 There are a number of exemptions that are appropriately considered as agricultural (on-farm) wastes. They have been reported in the non-farm data set as an entry error by the operator.

Table 3.6: Assumptions from non-farm exempt activities

Code	Explanation	Assumption
D1	Relates to the deposit of dredging material at the point of production and therefore would not contribute to the CD&E waste stream nor does it provide capacity to manage other CD&E waste. Dredging often occurs on agricultural and would be capture in agricultural waste estimates.	Assumed within agricultural waste
D4	Only applies to agricultural plant tissue waste, the disposal of which is required under a Plant Health notice. It is limited to 250 tonnes and would be captured within agricultural waste estimates.	Assumed within agricultural waste
D7	Allows organisations such as landscape gardeners to burn hedge trimmings, branches, etc on a bonfire at the place of production. It does not provide capacity to manage other wastes.	The annual tonnage assumed through each D7 exemption is 10 tonnes Added to C&I waste stream
T6	Allows waste wood and waste plant matter to be chipped, shredded, cut or pulverised to make it easier to store and transport, or to convert it into a suitable form for use. The maximum throughput under the exemption is 500 tonnes of plant tissue waste, wood and untreated wooden packaging in any 7-day period.	The annual tonnage assumed through each T6 exemption is 2,000 tonnes Added to C&I waste stream
T9	Relates to the small-scale recovery of metals only, and the quantity of material is likely to be captured when the material is deposited at larger MRS. T6 exemptions do provide treatment capacity.	Not considered further as tonnage captured elsewhere
T32	Allows the treatment of up to 15 tonnes per annum of non-hazardous pesticides washings at the place of production. The majority of these wastes are assumed to come from agricultural sources and would be captured in agricultural waste estimates.	Assumed within agricultural waste
U1	Allows the use of suitable wastes for small scale construction instead of using virgin raw materials. Suitable wastes include: up to 5,000 tonnes of mainly inert materials for general construction; up to 1,000 tonnes of soil; up to 1,000 tonnes of wood chip for paths, bridleways or car parks; and 50,000 tonnes soil, stone and road plannings for road construction. This exemption can therefore provide a notable outlet for CD&E wastes and exemption needs to be considered in CD&E waste capacity. However, it cannot be considered as a guaranteed capacity to manage CD&E wastes.	The annual tonnages assumed through each U1 exemption is between 100 to 1,000 tonnes Considered in the capacity for CD&E wastes
U4	Relates to the burning of plant tissue waste, wood and untreated wooden packaging in appliances with a net rated thermal input of less than 0.4 megawatts.	The annual tonnage assumed through each U4 exemption is 10 tonnes Added to C&I waste stream
U8	Allows a range of direct uses for waste without treatment, the most relevant being: untreated wood and paper from paper manufacturing; and end of life tyres, used for horse ménages, ornamental purposes, animal bedding, weighting cover sheeting on agricultural premises. Varying quantities apply for the different specific uses e.g. use in horse ménages 1,000 tonnes; use in animal bedding 100 tonnes; end of life tyres 40 tonnes.	The annual tonnage assumed through each U8 exemption is 250 tonnes Added to C&I waste stream

Code	Explanation	Assumption
U10	Allows specified wastes (mainly waste from food production and arising from treatment exemption) to be spread on agricultural land to replace manufactured fertilisers or virgin materials. Limits are based on tonnes per hectare, therefore it is difficult to estimate annual tonnages handled under this exemption. Given the waste type allowed, the exemption is likely to be used to manage on-farm generated waste which would be captured in agricultural waste estimates.	Assumed within agricultural waste
U12	Allows landscapers and farmers to spread mulch as a protective covering onto land around trees, bushes, or plants. The maximum throughput under the exemption is 100 tonnes of untreated wood and plant matter per month	The annual tonnage assumed through each U12 exemption is 200 tonnes Added to C&I waste stream
U13	Allows the spreading of plant matter at the place of production to confer benefit, with a limit of 50 tonnes per hectare in a 12-month period. Given the waste type allowed, the exemption is likely to be used to manage on-farm generated waste which would be captured in agricultural waste estimates.	Assumed within agricultural waste
U14	Allows ash from the burning of plant tissues to be incorporated back into the soil returning nutrients to the soil. Given the limited tonnage and the nature of the exemption, this has been excluded from C&I and CD&E waste estimates.	Not considered further

On-farm exemptions

3.2.14 Many everyday activities on farms need to be carried out under an exemption. These include:

- using hardcore/road planings/woodchip to improve tracks;
- using tyres on a silage pit;
- using paper or woodchip as bedding;
- using railway sleepers in farmyard construction;
- clearing drainage ditches;
- treatment of waste in biobeds;
- burning waste in the open;
- storing sewage sludge before spreading; and
- washing out spray containers.

3.2.15 This means that most farms have to register for numerous exemptions. In Herefordshire, 635 farms/locations on farms have registered exemptions, with multiple exemptions registered at many farms.

3.2.16 Table 3.7 lists the top 20 most registered exemptions by farms in Herefordshire. Table 3.7 highlights that the majority of registered exemptions relate to handling wastes generated on-farm, which would be captured within agricultural waste estimates.

Table 3.7: Top 20 on-farm exemptions, Herefordshire, September 2016

Exemption	Description	Number
D7	Burning waste in the open	520
U10	Spreading waste on agricultural land to confer benefit	386
D1	Deposit of waste from dredging of inland waters	367
U1	Use of waste in construction	318
T6	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising	308
U8	Use of waste for a specified purpose	297
S2	Storage of waste in a secure place	181
S1	Storage of waste in secure containers	151
U4	Burning of waste as a fuel in a small appliance	147
U13	Spreading of plant matter to confer benefit	145
D4	Deposit of agricultural waste consisting of plant tissue under a Plant Health Notice	131
U12	Use of mulch	111
U14	Incorporation of ash into soil	94
T14	Crushing and emptying vehicle waste oil filters	84
T1	Cleaning, washing, spraying or coating relevant waste	83
T23	Aerobic composting and associated prior treatment	72
D6	Disposal by incineration	71
T4	Preparatory treatments (baling, sorting, shredding etc)	64
T9	Recovery of scrap metal	49
U15	Pig and poultry ash	43

3.2.17 However, there are a small number of on-farm exemptions that will import C&I and CD&E wastes and need to be considered further. The key exemptions are:

- U10 (Spreading waste on agricultural land to confer benefit) which would mainly relate to materials such as paper pulp and sewage sludge, which are both commonly used to improve the condition of soil.
- U1 (Use of waste in construction) which would mainly relate to the use of hardcore/road planings/woodchip to improve tracks.
- U8 (Use of waste for a specified purpose) which would mainly relate to using tyres to weight down cover sheeting or the use of paper or woodchip as bedding.

3.3 Summary

3.3.1 Permitted capacity within the county is limited to facilities that offer transfer with basic treatment or provide biological treatment; there is no residual waste treatment or disposal capacity such as MBT, RDF production, incineration (with or without energy recovery) or landfill. This means there is a reliance on such facilities that are located outside of Herefordshire, including a significant proportion of strategic capacity that has been jointly procured with Worcestershire County Council to manage LACW (see section 6.2).

3.3.2 Over the last three years there has been a notable increase in the capacity and waste inputs to permitted facilities. This is predominately driven by an increase in biological treatment and anaerobic digestion facilities, with permitted capacity increasing by approximately 350kt and waste inputs by 105kt.

3.3.3 Whilst there are a significant number (approximately 670) of exemption activities/sites across Herefordshire:

- the majority are on-farm exemptions which cover many everyday on-farm activities, such as burning waste in the open, spreading waste on agricultural land to confer benefit, deposit of waste from dredging of inland waters etc;
- there are a small number of non-farm exemptions, which provide some treatment capacity for C&I and CD&E wastes;
- there are over 300 locations with U1 exemptions (use of waste in construction); these do provide important capacity for CD&E wastes but cannot be considered as guaranteed capacity.

4. Waste Arisings

4.1 Introduction

4.1.1 The baseline year for the assessment is 2015 and data is presented on a calendar year basis.

4.2 Local Authority Collected Waste (LACW)

4.2.1 In 2014, Defra's Waste Statistics team split LACW into 'waste from households' and 'waste not from households' for statistical purposes to provide a harmonised UK indicator with a comparable calculation in each of the four UK countries.

4.2.2 Whilst waste from households is the Government's statistical measure it does not truly reflect waste *generated* by households as it excludes construction, demolition and excavation (CD&E) waste collected at civic amenity sites, which will predominately be generated by householders.

4.2.3 Therefore, when considering LACW arisings and forecasts, it can be useful to consider waste generated by households, i.e. the LACW only excluding trade waste and other municipal wastes collected by the local authority.

Historical LACW arisings

4.2.4 In 2015, approximately 86,650 tonnes of LACW was produced in Herefordshire, of which 75,550 tonnes was waste from households. Table 4.1 and Figure 4.1 show Herefordshire's LACW arisings broken down into waste from households and waste not from households and the generic waste management method used, during years 2011 to 2015.

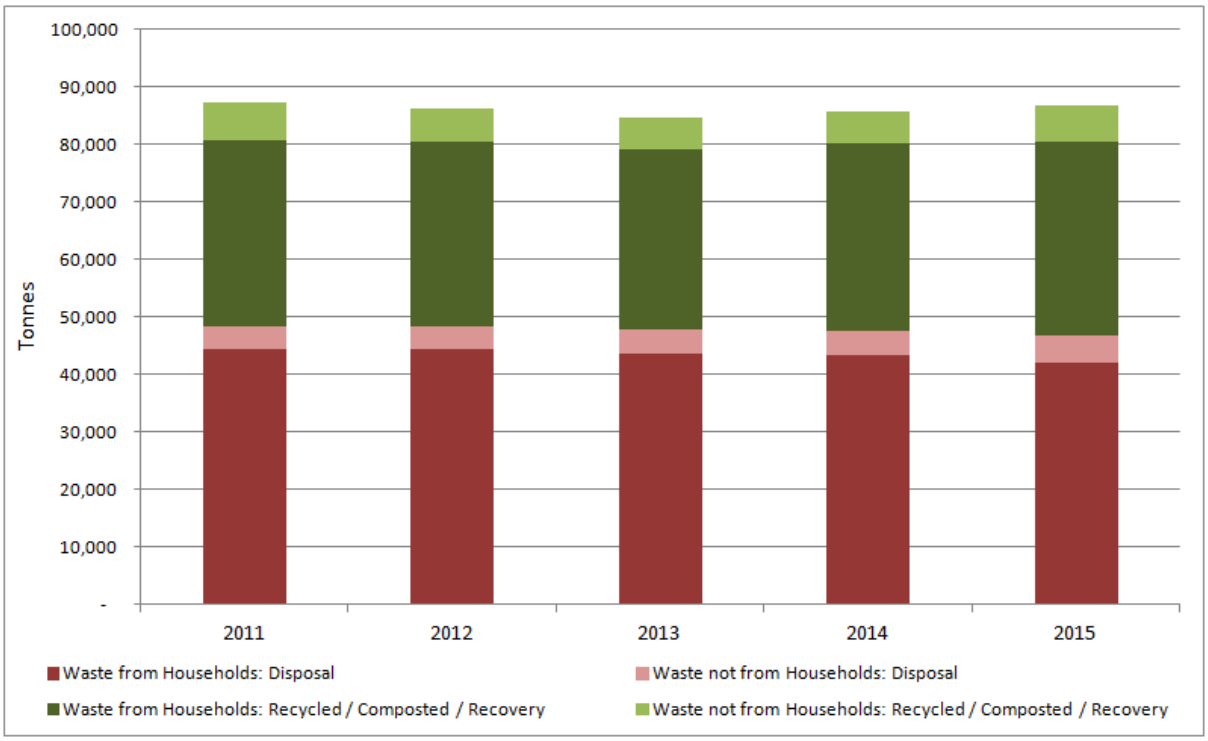
4.2.5 LACW has a good dataset available and it is useful to consider previous years to inform assumptions about potential future arisings. Table 4.1 also summarises the number of households and waste generation rates for those years. This is also useful information in considering future arisings.

Table 4.1: LACW arisings in Herefordshire, 2011 to 2015

		2011	2012	2013	2014	2015
Waste from Households	Recycled / composted / recovery	32,454	32,054	31,210	32,610	33,717
	Disposal	44,399	44,335	43,563	43,251	42,039
	Total waste from households	**76,854**	**76,389**	**74,773**	**75,861**	**75,755**
Waste not from households	Recycled / composted / recovery	6,395	5,713	5,732	5,592	6,212
	Disposal	3,133	3,367	3,452	3,636	3,933
	Total waste not from households	**9,528**	**9,079**	**9,184**	**9,228**	**10,145**
Total LACW		**87,184**	**86,146**	**84,723**	**85,800**	**86,631**
Total waste generated by households[2]		83,337	82,180	80,548	81,470	81,984
Number of households[3]		78,454	79,215	79,829	80,526	81,244
Waste from households per household (tonnes/household)		0.980	0.964	0.937	0.942	0.932
LACW per household (tonnes/household)		1.111	1.087	1.061	1.065	1.066
Waste generated by households per household (tonnes/household)		1.062	1.037	1.009	1.012	1.009

Notes:
1. Tonnage data source, Herefordshire Council
2 LACW excluding trade waste collected by the local authority and other municipal wastes collected by the local authority (e.g. parks and gardens waste, fly tipping etc.)
3. CLG Household projections

Figure 4.1: LACW arisings in Herefordshire, 2011 to 2015



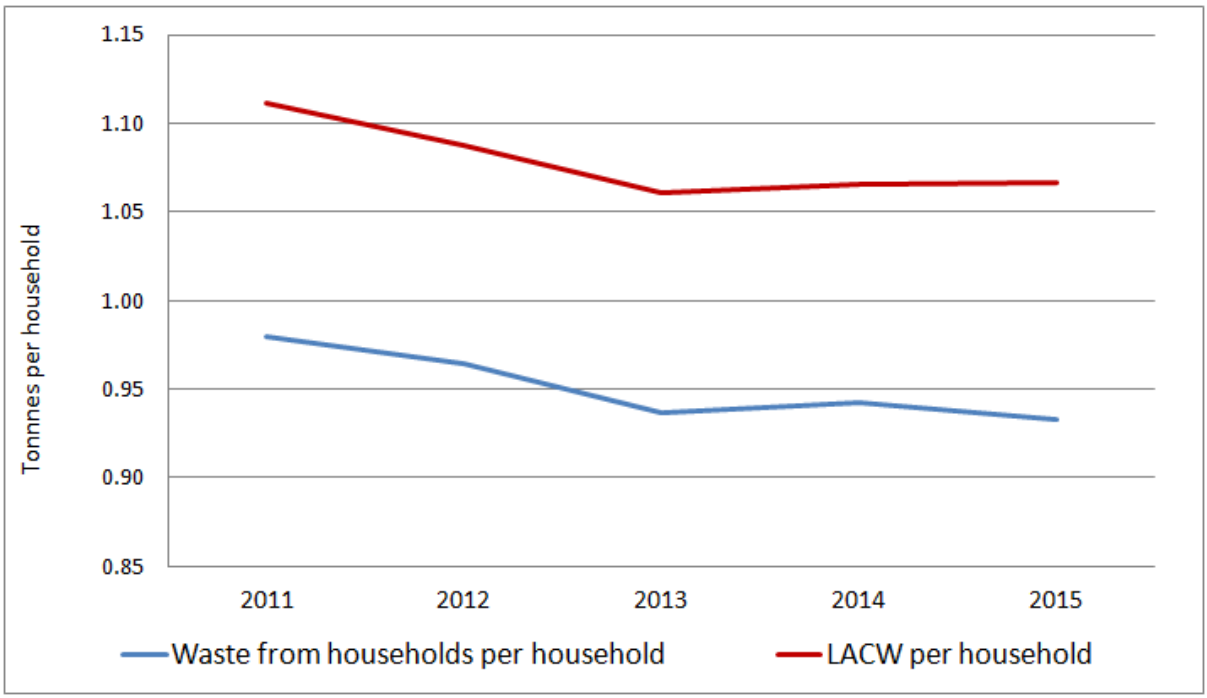
4.2.6 The trend in the annual LACW arisings in Herefordshire is consistent with the trend in LACW arisings at the England level, with total arisings dropping to a low point in 2013 followed by a gradual increase since then of about 1% per annum.

4.2.7 Waste generated could be expected to increase if households (and population) are projected to grow. However, economic growth and changing consumption habits will also influence waste production. Therefore, the two key influences on waste arisings are:

- the number of households (and to a lesser extent population), the growth in which could result in an increase in total household waste arisings; and
- the state of the economy, as economic decline and growth directly affect public consumption, purchasing habits and changes in consumption patterns which may lead to an increase or decrease in per capita or per household waste generated.

4.2.8 Table 4.1 and Figure 4.2 show that both Waste from Households per household and LACW per household have stayed relatively constant over the last five years. This would suggest that, historically, waste generation in Herefordshire is more closely linked to change in the number of households rather than economic growth. A more significant growth in LACW per household would indicate that economic growth had a greater influence.

Figure 4.2: Trends in LACW and waste from households per household, Herefordshire, 2011 to 2015



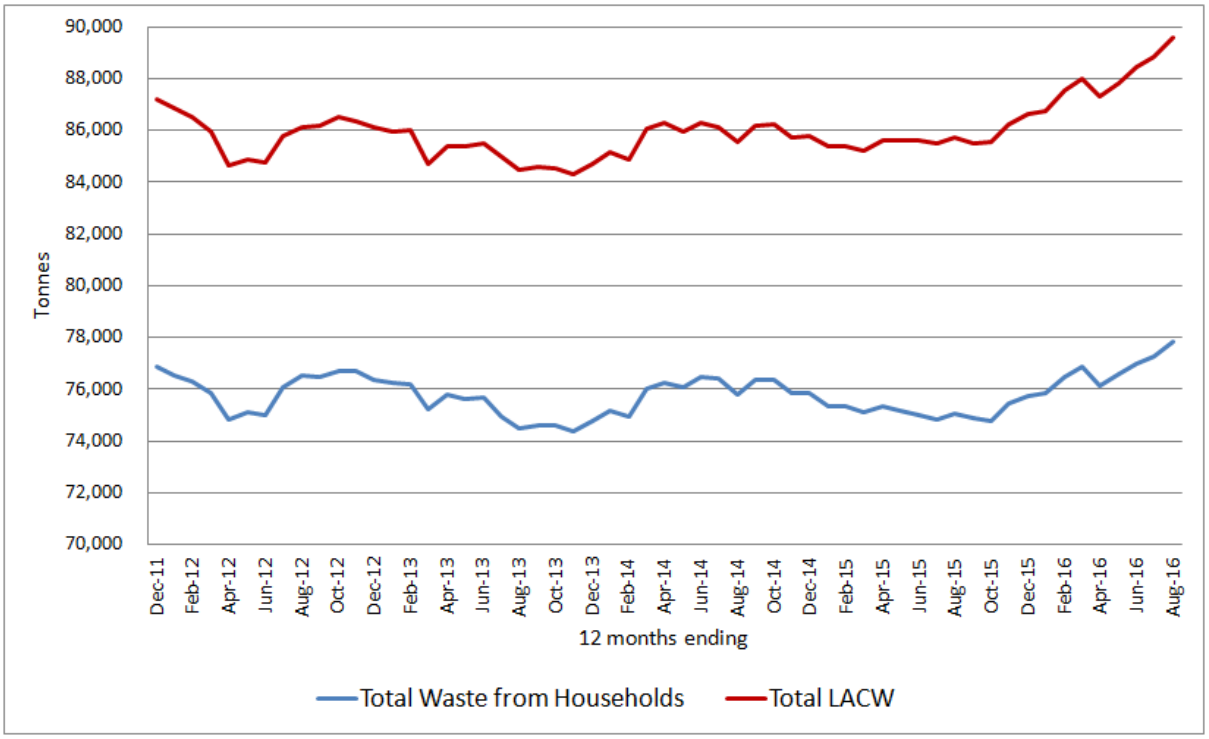
4.2.9 However, whilst annual waste arising data provide an indication of the trends, using a rolling 12-month tonnage helps to take account of seasonal variations and provides a clearer understanding of trends. In addition, using the 12 month rolling tonnages also means that it is possible to look beyond the full annual data set by using the most up-to-date data held by Herefordshire Council, which covers the period up to August 2016.

4.2.10 Figure 4.3 provides the rolling 12-month tonnage data[4] for total LACW arisings using monthly data from January 2011 to August 2016.

[4] Each data point presents the tonnage for the preceding 12 months, so that each data point represents a full year's tonnage

4.2.11 Figure 4.3 shows a trend that is consistent with the annual tonnages figures up to Quarter 3 of 2015 (July to September), at which point there is a notable increase in the arisings. For the 12 months ending August 2015, the total LACW was 85,725 tonnes; the equivalent tonnage for the period ending August 2016 was 89,600 tonnes. This is equivalent to an annual growth rate of 4.5%.

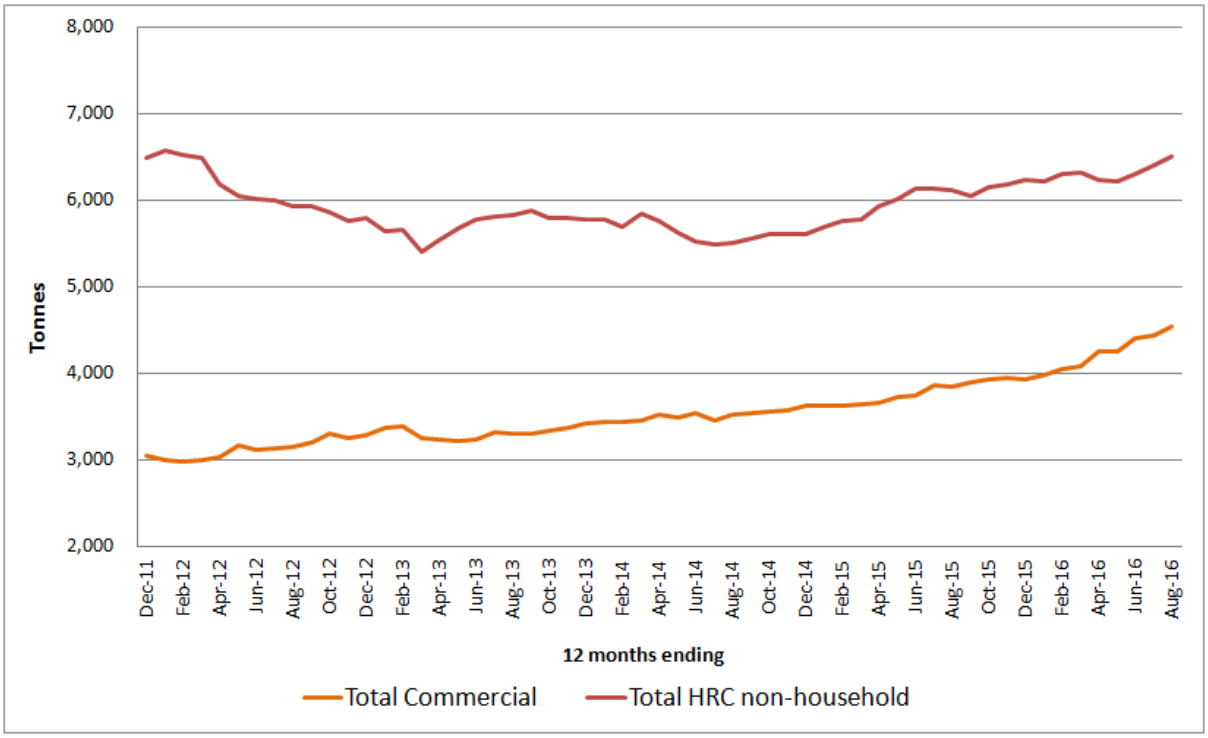
Figure 4.3: Total LACW and waste from household, rolling 12-month tonnage, January 2011 to August 2016



4.2.12 Whilst all elements of the LACW stream increased over this period, the largest percentage increases were in commercial waste and non-household waste received at HWRC.

4.2.13 Figure 4.4 shows the rolling 12-month tonnage data for commercial waste and the HWRC non-household waste from January 2011 to August 2016.

Figure 4.4: Total commercial and non-household HRC waste arisings, rolling 12 month tonnage, January 2011 to August 2016



4.3 Commercial and Industrial Waste (C&I waste)

Introduction

4.3.1 The most recent C&I waste arisings estimates (2014) were made at the national level and were not broken down to the regional or individual WPA level. Therefore C&I waste arisings need to be estimated using a number of datasets. The approach used in this report is based on the methodology developed by Defra in 2014 [5].

4.3.2 However, it should be noted that the Defra methodology was designed to estimate arisings at the national level and so did not need to consider the origin of the waste. Therefore, the methodology has been adapted for use at the WPA level but the basic steps remain similar.

4.3.3 The method calculates the total amount of C&I waste by adding up:

- inputs to permitted facilities with Herefordshire as the origin and adjusting for waste handled through transfer stations and from waste management facilities;
- incineration inputs;
- inputs to exemption facilities;

and subtracting LACW, CD&E waste, hazardous and agricultural wastes.

[5] Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England, Defra, 2014

Inputs to permitted facilities

4.3.4 Operators of permitted waste facilities are asked to provide information on the 'origins' of the waste accepted at their sites. Where data is supplied, the entry is normally completed showing the town or county where the waste came from.

4.3.5 However, where operators do not provide accurate information on the origin of waste, the WDI reports the origin as "Not Codeable". If possible "Not Codeable" waste is assigned to the region of origin. So, after the waste with Herefordshire as the origin has been assessed, there is a need to consider the potential for "Not Codeable" waste arising in Herefordshire.

4.3.6 The WDI for 2013 to 2015 were used to identify wastes received at permitted facilities which have the origin of waste identified as Herefordshire. The data were extracted by LoW 6-digit waste code (i.e. the classification codes for individual wastes) and by receiving site. The extracts from the WDI for the quantities of waste received by sites in England with the origin of identified as Herefordshire are summarised in Table 4.2 by LoW Chapter heading.

Table 4.2: Waste received at permitted facilities in England with Herefordshire origin 2013 to 2015 bv LoW Chapter heading (rounded to nearest 100 tonnes)

LoW Chapter	Chapter Description	Tonnes		
		2013	2014	2015
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	30,130	38,620	95,970
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	180	220	270
04	Wastes from the leather, fur and textile industries			3
06	Wastes from inorganic chemical processes	8	30	2
07	Wastes from organic chemical processes	1	1	1
08	Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks	255	150	250
09	Wastes from the photographic industry	23	20	7
10	Wastes from thermal processes	7	40	90
11	Wastes from chemical surface treatment and coating of metals and other materials, non-ferrous hydro-metallurgy	997	80	220
12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics	363	150	330
13	Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)	1,880	1,630	1,100
14	Waste organic solvents, refrigerants and propellants (except 07 and 08)	121	20	20
15	Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	1,683	2,040	2,220
16	Wastes not otherwise specified in the list	6,865	24,760	11,570
17	Construction and demolition wastes (including excavated soil from contaminated sites)	104,462	111,710	72,960
18	Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)	1,299	420	360
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use	63,090	43,030	52,350

LoW Chapter	Chapter Description	Tonnes		
		2013	2014	2015
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	178,997	182,600	209,590
Total		390,360	405,520	447,310
Tonnages rounded to nearest 10 tonnes, unless the tonnages was less than 10 tonne, for which tonnage round to the nearest 1 tonne				

4.3.7 The next step was to start to isolate the C&I waste fraction, filtering the data to remove:

- Waste coded under LoW sub-chapter 02 01 "Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing", to exclude agricultural waste.
- Waste coded under LoW Chapter 17 "Construction and demolition wastes (including excavated soil from contaminated sites)" to exclude CD&E waste.
- Waste coded under LoW Chapter 19 "Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use" to prevent the double counting of wastes handled at waste management facilities.
- Waste deposited at Leominster HWRC & WTS, Rotherwas HWRC, WTS & MRF and Ledbury, Ross on Wye and Bromyard HWRC, as this is predominately household waste with the exception of commercial waste collected by Herefordshire Council which needs to be factored back into the estimates and CD&E waste received at HWRC (which would have been filtered out under LoW Chapter 17).

4.3.8 These steps reduced the tonnage by approximately 250,000 to 270,000 tonnes.

Waste Transfer Stations

4.3.9 There is a significant risk of double counting waste handled through waste transfer stations. Depending on how waste is handled the outgoing waste may or may not be assigned the same waste code. In addition, the sites receiving waste from a waste transfer station may assign the waste a different code(s) to that used by the waste transfer station.

4.3.10 An example of this is highlighted by the potential double counting of LACW handled through the Mercia Waste Management facilities. In 2015, approximately 47,600 tonnes of LACW was sent from the Mercia Waste Management facilities to Severn Waste Services' Hill and Moor Landfill, Pershore, coded under LoW Chapter 20. However, the waste received at the Hill and Moor Landfill from Herefordshire was recorded as:

- 39,500 tonnes under LoW code 19 12 12, which related to the waste received from the waste transfer station; and
- 8,100 tonnes under LoW 20 03 01 which related to the waste received from the HWRC.

4.3.11 So, whilst Step 3 above would have prevented the double counting of the waste coded under LoW Chapter 19, the waste coded under LoW Chapter 20 could be double counted. Therefore, a more detailed review of waste handled through waste transfer stations is needed.

4.3.12 Table 4.3 summarises the key tonnages that need to be discounted to prevent double counting based on the detailed review. However, it should be noted that due to the

complexity of C&I waste flows it is not possible to definitively identify all potential occurrences of double counting.

Table 4.3: Tonnages discounted to prevent double counting for years 2013 to 2015

Year	Potential Double Counting
2013	For LACW: All waste sent from the Mercia Waste Management facilities to landfill was coded under LoW 20 03 01, however the receiving sites appear to have used LoW code 19 12 12. Therefore, this waste will have already been discounted by the initial Step 2 above 15,730 tonnes coded under LoW 20 03 01 deposited at Severn Waste Services' Envirosort MRF, Norton, Worcestershire, which is assumed to be the mixed dry recyclables sent from Mercia Waste Management facilities in Herefordshire. 1,870 tonnes of garden waste sent to Bennion's Rose Hill Farm, Gloucestershire from HWRC. Although 1,640 tonnes of scrap metal were removed from the Mercia Waste Management facilities, it has not been possible to identify from the EA WDI which sites may have received the waste. 2,860 tonnes of timber sent to Quickskip (Hereford) Transfer Station from HWRC. For Waste Transfer Stations: 9,250 tonnes of septic tank sludge received at Eign Waste Treatment Centre and Yaidon Farm is assumed to be from the Marlbrook Farm Transfer Station. This is because all waste removed from Marlbrook Farm is transferred for recovery/treatment to other sites in Herefordshire and Eign Waste Treatment Centre and Yaidon Farm are the only sites in Herefordshire accepting septic tank sludge for treatment. Quickskip (Hereford) Transfer Station record all waste received under LoW code 20 03 01 (mixed municipal waste) with an origin of Herefordshire. Of the waste removed from the site, 9,590 tonnes were removed under LoW code 20 03 01 to other transfer stations in Herefordshire and therefore needs to be discounted to prevent double counting. A further 2,000 tonnes of waste was removed under LoW code 20 03 01 to other transfer stations in Gloucestershire from another Quickskip site on the Rotherwas Industrial Estate, which also needs to be discounted to prevent double counting. Balfour Beatty Living Places sent 1,725 tonnes of waste coded as LoW 20 03 03 to other transfer stations in Herefordshire and therefore needs to be discounted to prevent double counting. Approximately 83% of the waste received at the Eastside Recycling Facility in CD&E waste and has already been discounted by the initial Step 2 above. Of the remainder 3,175 tonnes under LoW code 20 03 01 need to be discounteded to prevent double counting.
2014	For LACW: 49,720 tonnes coded under LoW 20 03 01 were sent to landfill in Worcestershire from the five Mercia Waste Management facilities in Herefordshire. Herefordshire Council records show it was deposited at Hill and Moor Landfill, however there are no recorded inputs to the Hill and Moor Landfill in the 2014 EA WDI. Whilst this means this tonnage will not be double counted, it does highlight some of the data quality errors with the EA WDI. 17,320 tonne coded under LoW 20 03 01 deposited at Severn Waste Services' Envirosort MRF, Norton, Worcestershire, which is assumed to be the mixed dry recyclables sent from Mercia Waste Management facilities in Herefordshire. 4,410 tonnes of garden waste sent to Bennion's Rose Hill Farm, Gloucestershire from HWR. 1,700 tonnes of scrap metal sent to Wye Valley Waste's Eastside Recycling Facility from HWRC. Although 3,100 tonnes of timber were sent to Quickskip (Hereford) Transfer Station from HWRC, in 2014 Quickskip recorded timber and wood waste under code 17 02 01. This would have been discounted by the initial Step 2 above. For Waste Transfer Stations:

Year	Potential Double Counting
	7,820 tonnes of septic tank sludge received at Eign Waste Treatment Centre and Yaidon Farm is assumed to be from the Marlbrook Farm Transfer Station, as all waste removed from Marlbrook Farm is transferred for recovery/treatment at other sites in Herefordshire and Eign Waste Treatment Centre and Yaidon Farm are the only sites accepting septic tank sludge for treatment. Quickskip (Hereford) Transfer Station received 17,190 tonnes of waste under LoW code 20 03 01 (mixed municipal waste) with an origin of Herefordshire. Of the waste removed from the site 2,500 tonnes were removed under LoW code 20 03 01 to sites in Wales, which would not be captured in the EA WDI. The remaining tonnage needs to be discounted to prevent double counting. In addition, Quickskip operate a soil production site at Fir Tree Lane and in the EA WDI 11,000 tonnes were removed from the site to locations in Herefordshire. It is therefore assumed that the material is transferred between the two Quickskip sites and needs to be discounted to prevent the material being counted multiple times. Approximately 83% of the waste received at the Eastside Recycling Facility in CD&E waste and has already been discounted by the initial Step 2 above. Of the remainder 1,000 tonnes were removed under various LoW codes (mainly 20 03 01) to sites in Wales, which would not be captured in the EA WDI. Once LoW Chapter 17 and 19 wastes are discounted only a further 770 tonnes need to be discounted to prevent double counting.
2015	For LACW: 8,100 tonnes coded under LoW 20 03 01 deposited at Hill and Moor Landfill. 17,670 tonnes coded under LoW 20 03 01 deposited at Severn Waste Services' Envirosort MRF, Norton, Worcestershire, which is assumed to be the mixed dry recyclables sent from Mercia Waste Management facilities in Herefordshire. 3,450 tonnes of garden waste sent to Bennion's Rose Hill Farm, Gloucestershire from HWRC. 1,960 tonnes of scrap metal sent to Wye Valley Waste's Eastside Recycling Facility from HWRC. 3,130 tonnes of timber sent to Quickskip (Hereford) Transfer Station from HWRC. 135 tonnes of fridges/freezers sent to Aqua Force Recycling, Wolverhampton from HWRC. For Waste Transfer Stations: 9,040 tonnes of septic tank sludge received at Eign Waste Treatment Centre and Yaidon Farm is assumed to be from the Marlbrook Farm Transfer Station, as all waste removed from Marlbrook Farm is transferred for recovery/treatment at other sites in Herefordshire and Eign Waste Treatment Centre and Yaidon Farm are the only sites accepting septic tank sludge for treatment. Quickskip (Hereford) Transfer Station record all waste received under LoW code 20 03 01 (mixed municipal waste) with an origin of Herefordshire. Of the waste removed from the site 12,750 tonnes were removed under LoW code 20 03 01 to sites in Wales, which would not be captured in the EA WDI. The remaining tonnage needs to be discounted to prevent double counting. In addition, Quickskip operate a soil production site at Fir Tree Lane and in the EA WDI 11,550 tonnes were both accepted and removed from the site to and from locations in Herefordshire. It is therefore assumed that the material is transferred between the two Quickskip sites and needs to be discounted to prevent the material being counted multiple times. All the waste received at Balfour Beatty Living Places was sent to other transfer stations in Herefordshire and therefore needs to be discounted to prevent double counting. Approximately 65% of the waste received at the Eastside Recycling Facility is CD&E waste and has already been discounted by the initial Step 2 above. Of the remainder, 11,000 tonnes were removed under various LoW codes (mainly 20 03 01) to sites in Wales, which would not be captured in the EA WDI. Once LoW Chapter 17 and 19 wastes are discounted only a further 780 tonnes need to be discounted to prevent double counting.

4.3.13 As highlighted above, commercial waste collected by Herefordshire Council needs to be factored back into the estimates. The commercial waste tonnages collected, which would be coded under LoW Chapter 20, were:

- 3,409 tonnes in 2013;
- 3,619 tonnes in 2014;
- 3,916 tonnes in 2015.

Metals Recycling Sites

4.3.14 Metals recycling site/vehicle dismantlers generally use LoW codes 19 12 02 and 19 12 03 for the ferrous metal and non-ferrous metal removed from sites, however a combination of other codes are also used to describe the metals and components removed. In addition, small vehicle dismantlers often send their processed scrap metal to larger metals recycling site for bulking and onward shipment for recovery.

4.3.15 A detailed review of the waste removed from metals recycling site/vehicle dismantlers in 2013 highlighted 5,560 tonnes of waste that would not have been excluded by removing LoW Chapter 17 & 19 wastes as part of the initial analysis. However, the processes at metals recycling site/vehicle dismantlers generate additional wastes streams, for example when a car is dismantled components within the car such as oils, lead-acid batteries etc. are separated as individual waste streams. In addition, 90 tonnes were transferred to another facility in Herefordshire which means it is likely to be double counted twice.

4.3.16 A detailed review of the waste removed from metals recycling site/vehicle dismantlers in 2014 highlighted 4,260 tonnes of waste that would not have been excluded by removing LoW Chapter 17 & 19 wastes as part of the initial analysis. In addition, 130 tonnes were transferred to another facility in Herefordshire which means it is likely to be double counted twice. There also appears to be a data entry error with 5,600 tonnes of lead-acid batteries being removed from P & T Moore Vehicle Dismantlers, when the site only received 1,700 tonnes of waste in total. It is assumed that the figure had been entered as kg i.e. 5.6 tonnes, which would be consistent with the other tonnes of this material removed from the site.

4.3.17 The detailed review of the waste removed from metals recycling site/vehicle dismantlers in 2015 highlighted 5,640 tonnes of waste that would not have been excluded by removing LoW Chapter 17 & 19 wastes as part of the initial analysis. In addition, 310 tonnes were transferred to another facility in Herefordshire which means it is likely to be double counted twice.

Estimated C&I waste arisings managed through permitted facilities in England with Herefordshire identified as origin

4.3.18 Table 4.4 draws together the analysis above to provide an estimate of the C&I waste arisings managed through permitted facilities in England with Herefordshire identified as origin, concluding an interim total of 104,000 tonnes in 2015.

Table 4.4: Estimated C&I waste arisings managed through permitted facilities in England with Herefordshire identified as the origin, years 2013 to 2015

LoW Chapter	Chapter Description	Tonnes		
		2013	2014	2015
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	29,900	18,460	40,830
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	180	220	270
04	Wastes from the leather, fur and textile industries	-	-	3
06	Wastes from inorganic chemical processes	8	30	2
07	Wastes from organic chemical processes	1	1	1
08	Wastes from the MFSU of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks	250	150	250
09	Wastes from the photographic industry	23	20	7
10	Wastes from thermal processes	7	40	90
11	Wastes from chemical surface treatment and coating of metals and other materials, non-ferrous hydro-metallurgy	1,000	80	220
12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics	360	150	330
13	Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)	1,870	1,630	1,100
14	Waste organic solvents, refrigerants and propellants (except 07 & 08)	120	20	20
15	Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	1,680	2,040	2,210
16	Wastes not otherwise specified in the list	6,860	24,750	11,430
18	Wastes from human or animal health care and/or related research (except kitchen & restaurant wastes not arising from immediate health care)	1,300	420	360
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	56,970	45,010	52,090
Total following exclusion of LoW Sub-chapters 0201, Chapters 17 and 19, LACW and the estimated double counted wastes passing through WTS		100,530	93,010	109,210
Potential double counting at metal recycling sites		-5,560	-4,260	-5,640
Estimated C&I waste arisings managed through permitted facilities in England with Herefordshire identified as origin (rounded to nearest 1,000 tonnes)		**95,000**	**89,000**	**104,000**
Chapter tonnages rounded to nearest 10 tonnes unless the tonnage is less than 10 tonnes, for which the tonnage is rounded to the nearest tonne.				

"Not Codeable" waste

4.3.19 The origin of waste is normally recorded at the sub-region or WPA level, however when the origin of the waste is not known to this level the term "Not Codeable" is used and the origin attribute to the region of origin. This means that wastes can be identified as arising in the West Midlands but "Not Codeable" to a sub-region or WPA level. This in turn means that there is the potential for wastes that arise in Herefordshire to be included in the "Not Codeable" wastes at the West Midlands level.

4.3.20 "Not Codeable" tonnages within the WDI can be significant and therefore need to be considered.

4.3.21 Table 4.5 presents the tonnage of waste with the origin identified as the West Midlands, along with the tonnage from the West Midlands that could not be coded to the sub-region or WPA levels.

Table 4.5: Quantity of Not Codeable waste in West Midlands, 2013 to 2015

	Tonnes		
	2013	2014	2015
Origin identified as the West Midlands	12,827,289	14,148,269	15,884,277
"Not Codeable" to sub-region or WPA level	3,944,825	3,574,756	4,633,702
Percentage "Not Codeable"	30.8%	25.3%	29.2%

4.3.22 The figures show that for waste with the origin identified as the West Midlands 25% to 30% of the waste cannot be attributed to the sub-region or WPA level. Therefore, if Herefordshire is typical of the region as a whole in this regard, C&I, waste estimates for Herefordshire could be 25% to 30% higher as a result of the "Not Codeable" data at the West Midlands level within the WDI, which is equivalent to 20,000 to 30,000 tonnes waste, depending on which year is being considered.

Waste handled at exempt facilities

4.3.23 Section 3.2 summarises the exempt activities registered in Herefordshire and the potential contribution to the C&I waste estimates is shown in Table 4.6.

Table 4.6: Potential C&I waste quantities handled through exempt facilities

Exemption	Contribution to the C&I waste estimates	Number of Exemptions	Estimate C&I waste managed through exemption
D7 - Burning waste in the open	10 tonnes annum per exemption	12	120
T6 Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising	2,000 tonnes per annum per exemption	3	6,000
U4 - Burning of waste as a fuel in a small appliance	10 tonnes annum per exemption	4	40
U8 - Use of waste for a specified purpose	250 tonnes per annum per exemption	4	1,000
U12 - Use of mulch	200 tonnes per annum per exemption	2	400
Total			**7,560**

Waste sent directly to permitted facilities in Wales

4.3.24 Waste sent from Herefordshire directly to permitted facilities in Wales are not captured in the 2013 to 2015 WDI. To provide an understanding of the waste potentially sent directly to permitted facilities in Wales, data from the 2011 and 2012 WDI (which included Welsh data) were reviewed. Table 4.7 presents the tonnages received at permitted facilities in Wales with Herefordshire identified as the origin for both 2011 and 2012.

4.3.25 The data show that majority of the waste is coded under LoW Chapter 19 (wastes from waste management facilities) and that there is a limited amount of C&I waste, in the region of 3,000 tonnes in 2011 and 2,000 tonnes in 2012, which was sent to permitted facilities in Wales. The

choice of where to send waste is a business decision often based on cost but if it is assumed that a similar proportion of waste is still sent directly to permitted facilities in Wales, then the C&I waste estimates for Herefordshire could increase by about 3,000 tonnes for each year between 2013 and 2015.

Table 4.7: Waste sent to permitted facilities in Wales from Herefordshire, 2011 and 2012

LoW Chapter	Chapter Description	Tonnes	
		2011	2012
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	0.04	20.2
06	Wastes from inorganic chemical processes	206.7	8.0
07	Wastes from organic chemical processes	-	6.7
08	Wastes from the MFSU of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks	-	0.4
09	Wastes from the photographic industry	0.05	0.001
11	Wastes from chemical surface treatment and coating of metals and other materials, non-ferrous hydro-metallurgy	565.3	654.3
12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics	66.2	27.9
13	Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)	188.8	123.6
14	Waste organic solvents, refrigerants and propellants (except 07 and 08)	0.8	0.01
15	Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	7.9	3.2
16	Wastes not otherwise specified in the list	448.2	719.9
17	Construction and demolition wastes (including excavated soil from contaminated sites)	18.6	1.2
18	Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)	55.3	32.6
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use	18,294.6	15,810.4
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	1,440.5	418.9
Total		21,292.9	17,827.2

Total C&I waste arisings

4.3.26 Based on the method set out above, Table 4.8 summarises the estimated C&I waste arisings for Herefordshire for years 2013 to 2015.

Table 4.8: Estimated C&I waste arisings for Herefordshire, 2013 to 2015

Element	Tonnes		
	2013	2014	2015
Estimated C&I waste arisings managed through permitted facilities in England with Herefordshire identified as origin	95,000	89,000	104,000
"Not Codeable" Waste	0 to 29,300	0 to 22,500	0 to 30,400
Waste handled at Exemption Facilities	8,000	8,000	8,000

Waste sent directly to permitted facilities in Wales	3,000	3,000	3,000
Total (rounded to nearest 1,000 tonnes)	106,000 to 135,000	100,000 to 123,000	115,00 to 145,000

4.3.27 The estimated C&I waste arisings for England in 2012 was 43.8 million tonnes.[6] However, in December 2016, Defra[7] published a statistical notice to summarise waste estimates for the UK which have been calculated for European reporting purposes (the December 2016 Notice).

4.3.28 The December 2016 Notice presents a revised estimate for 2012 along with estimates for 2013 and 2014 based on a revised methodology. The revised estimates are:

- England 2012: 24.4 million tonnes of C&I waste
- England 2013: 21.9 million tonnes of C&I waste
- England 2014: 19.8 million tonnes of C&I waste

4.3.29 The December 2016 Notice states that the changes are due to the removal of tonnages that were likely to have been double counted. However, no further explanation is provided in the Notice. Initial discussions with Defra about the changes in methodology advise that:

- due to the uncertainty over the quantity of waste potentially handled through exemptions and the potential for such wastes to be subsequently handled at permitted facilities, Defra has decided to exclude waste handled through exemptions from the new estimates; and
- the tonnage handled through HWRC may not have been excluded resulting in the potential for double counting of some household waste; therefore, all HWRC tonnages have also been excluded. However, around 15% of waste received at HWRC is sent to transfer stations and would have been excluded from the previous estimates, which means that the exclusion of all HWRC tonnages is likely to overestimate any double counting.

4.3.30 The estimates for Herefordshire set out in Table 4.8 exclude waste received at HWRC and, due to the limited number of non-farm exemptions, the tonnage handled at exempt sites is unlikely to significantly distort the estimates.

4.3.31 Based on the current waste data reporting systems and the uncertainty over the total generation levels, the evidence base for quantifying the contributions from different business sectors is limited.

4.3.32 The Office for National Statistics (ONS) holds data on enterprises/local units[8] by SIC, employment size band and local authority, which can be used to give a broad indication of the number of enterprise/local units in Herefordshire compared to England.

[6] Defra, Digest of Waste and Resources Statistics, 2016 (March 2016)
[7] Defra, UK Statistics on Waste Notice, December 2016
[8] Local units identify each location in which a company operates. Eg. Marks and Spencers - all stores, food stores, warehouses and offices at different locations will be separately identified and the number of employees at each reported.

4.3.33 The ONS data indicates that 0.45% of local units in England are in Herefordshire; if it is assumed that C&I waste is directly proportional to the number of local units, arisings in Herefordshire would equate to:

- between 89,000 to 110,000 tonnes of the C&I waste arising in England between 2013 and 2015, based on Defra's revised methodology (December 2016); or
- approximately 195,000 tonnes of the C&I waste arisings in England based on the 2014 methodology.

4.3.34 Therefore, given the uncertainty over the national C&I waste estimates and the lack of granularity at a region or county level, the estimates based on the Herefordshire-specific analysis above provide a range of tonnages to forecast future C&I waste arisings.

4.3.35 It should also be noted that historically waste generation has been linked to economic growth; however, the latest Defra estimates suggest that the correlation between economic growth and waste growth in the C&I sector may no longer exist. Until there is a better understanding of the revised Defra methodology (December 2016) it would be prudent to base future estimates on the assumption that the link between economic growth and waste growth remains, as this would provide a "worst case" assessment.

4.4 Construction, Demolition and Excavation Waste (CD&E waste)

Introduction

4.4.1 The construction and demolition sector produces the largest amount of waste in the UK. However, the data on CD&E waste is limited and historically estimates of arisings have been based on industry surveys. In addition, there has been limited new research on CD&E waste arisings since 2010 and information published over the last few years has only been at the national level (UK or England). Furthermore, significant quantities of CD&E waste are not managed at permitted waste facilities which mean the data in the WDI only provides a limited picture of CD&E waste arisings and management.

Historic CD&E waste arisings in Herefordshire

4.4.2 The last national study to breakdown CD&E waste estimates to the region and sub-regional level was the CLG Report, Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005 Construction, Demolition and Excavation Waste (February 2007).

4.4.3 The report provided an estimate of the CD&E waste arisings in Herefordshire and Worcestershire for 2005, which is summarised in Table 4.9. Unfortunately, the estimates were not disaggregated to the Herefordshire level.

Table 4.9: CD&E waste arisings in Herefordshire and Worcestershire, 2005

Component	Tonnes
Estimated production of recycled graded aggregate	404,814
Estimated production of recycled ungraded aggregate	374,770
Estimated production of recycled soil (excl. topsoil)	69,349
Estimated tonnage of unprocessed CDEW entering licensed landfills for engineering, capping, disposal	335,602
Estimated weight of waste materials (mainly excavation waste) used on registered exempt sites	155,157
Total	1,339,693
Source: Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005 Construction, Demolition and Excavation Waste, CLG (February 2007).	

4.4.4 A report prepared for the West Midlands Regional Assembly, West Midlands Waste Facilities Phase 2: Future Capacity Requirements[9] in 2004, did provide an estimate for C&D wastes in Herefordshire of 351,000 tonnes per annum of the period up to 2007. The estimate was based on the relative levels of housing development in the West Midlands region.

4.4.5 A further report for the West Midlands Regional Assembly, A Study into Future Landfill Capacity in the West Midlands[10] in 2007, provided estimates for the cumulative construction and demolition waste arisings for the period 2002/03 to 2025/26. The cumulative estimates for Herefordshire ranged from 6,250,585 tonnes to 7,423,664 tonnes for the period, which is equivalent to an average annual tonnage of between 260,000 and 310,000 tonnes.

Defra, Digest of Waste and Resources Statistics, January 2015 and March 2016

4.4.6 The March 2016 Digest of Waste and Resources Statistics (at Figure 2.1) provides an estimate of all waste arisings in the UK between 2004 and 2012, with CD&E waste estimated to be in the region of 100 million tonnes in 2012. The data behind that Figure are summarised in Table 4.10.

Table 4.10: Digest of Waste and Resources Statistics, March 2016 - CD&E waste arisings

Year	Waste Arisings (million tonnes)
2004	99.2
2006	109.5
2008	101.0
2010	102.2
2012	100.2

4.4.7 This data, different to later data estimates set out below, *includes* excavation waste and dredging spoils. Another point to note is that whilst the 2010 and 2012 figures are produced on a consistent basis; the older figures are less well documented so there is uncertainty over the consistency with the 2010 and 2012 estimates.

[9] West Midlands Waste Facilities Phase 2: Future Capacity Requirements. Report for West Midlands Regional Assembly, Shropshire County Council (2004)

[10] A Study into Future Landfill Capacity in the West Midlands Report for West Midlands Regional Assembly, Scott Wilson (May 2007)

4.4.8 The March 2016 Digest continues the headline tonnage data presented in January 2015 Digest, however this earlier source also includes an estimated of waste generation per capita, of 1,573kg per capita in 2012, based on the UK CD&E estimate of 100.2 million tonnes.

4.4.9 However, it should be noted that in mid-December Defra published an updated UK Statistics on Waste Notice (see below), which again revised the methodology used to estimate CD&E waste arisings, which resulted in new estimates for CD&E waste arisings in the UK.

Defra, UK Statistics on Waste Notice, August 2016 and December 2016

4.4.10 In August 2016, Defra published a Statistics on Waste Notice to summarise waste estimates for the UK calculated for European reporting purposes; this data is reproduced in Table 4.11. It provides data on non-hazardous construction and demolition waste for both the UK and England for 2010 to 2012. These figures *exclude* excavation waste and dredging spoils, so are a subset of the data reported in the Digest of Waste and Resources Statistics.

4.4.11 In addition, the August 2016 Statistics on Waste Notice states '*Accurately quantifying C&D waste is challenging and whilst the absolute tonnage figures are subject to a relatively high level of uncertainty, there is not a significant impact on the final recovery rate*.'

Table 4.11: Statistics on Waste Notice, August 2016 - Non-Hazardous Construction and Demolition Waste, UK and England, 2010 to 2012

Year	UK			England		
	Generation (000 tonnes)	Recovery (000 tonnes)	Recovery rate (%)	Generation (000 tonnes)	Recovery (000 tonnes)	Recovery rate (%)
2010	45,419	39,129	86.2%	39,832	35,480	89.1%
2011	47,067	40,622	86.3%	41,152	36,754	89.3%
2012	44,786	38,759	86.5%	38,938	34,714	89.2%
Source: UK Statistics on Waste Notice, August 2016 Figures exclude excavation waste						

4.4.12 In December 2016, a revised Statistics on Waste Notice was published, presenting a revised set of estimates for 2010 to 2012, along with estimates for 2013 and 2014 calculated using a revised methodology. These data are reproduced in Table 4.12.

4.4.13 The revised estimates show an estimated increase in non-hazardous construction and demolition wastes (again, *excluding* excavation waste and dredging spoils):

- 2010: +4.1 million tonnes;
- 2011: +2.9 million tonnes;
- 2012: +6.4 million tonnes.

Table 4.12: Statistics on Waste Notice, December 2016 - Non-Hazardous Construction and Demolition Waste, UK and England, 2010 to 2014

Year	UK			England		
	Generation (000 tonnes)	Recovery (000 tonnes)	Recovery rate (%)	Generation (000 tonnes)	Recovery (000 tonnes)	Recovery rate (%)
2010	49,499	43,378	87.6%	43,912	39,729	90.5%
2011	49,995	43,803	87.6%	44,080	39,934	90.6%
2012	51,178	45,322	88.6%	45,331	41,278	91.1%
2013	51,930	46,622	89.8%	46,267	42,140	91.1%
2014	54,960	49,436	89.9%	49,109	44,887	91.4%
Source: UK Statistics on Waste Notice, December 2016 Figures exclude excavation waste						

Summary of Defra CD&E waste estimates

4.4.14 Table 4.13 collates the Defra CD&E waste estimates for England and UK between 2010 and 2014 and provides an estimation of waste generation per capita for each element: non-hazardous C&D waste; hazardous C&D waste; and excavation waste and dredging spoils.

4.4.15 Table 4.14 highlights that CD&E waste generation is increasing and that the total tonnage estimates are greatly influenced by the levels of excavation waste and dredging spoils.

Table 4.13: Summary of Defra CD&E waste data for England and UK, 2010 to 2014

England	**2010**	**2011**	**2012**	**2013**	**2014**
Non-hazardous C&D generation ('000 tonnes)	43,912	44,080	45,331	46,267	49,109
Hazardous C&D generation ('000 tonnes)			744		620
Excavation waste/dredging spoils ('000 tonnes)			47,773		57,829
Total CD&E waste generation ('000 tonnes)			**93,848**		**107,558**
Population ('000)[1]	52,642.5	53,107.5	53,493.7	53,865.8	54,316.6
Non-hazardous C&D kg per capita	834	830	847	859	904
Hazardous C&D kg per capita			14		11
Excavation waste/dredging spoils kg per capita			893		1,065
Total CD&E waste kg per capita			**1,754**		**1,980**
UK	**2010**	**2011**	**2012**	**2013**	**2014**
Non-hazardous C&D generation ('000 tonnes)	49,499	49,995	51,178	51,930	54,960
Hazardous C&D generation ('000 tonnes)			919		747
Excavation waste/dredging spoils ('000 tonnes)			56,741		64,687
Total CD&E waste generation ('000 tonnes)	**102,231**[3]		**108,838**		**120,394**
Population ('000)[2]	62,759.5	63,285.1	63,705.0	64,105.7	64,596.8
Non-hazardous C&D kg per capita	789	790	803	810	851
Hazardous C&D kg per capita			14		12
Excavation waste/dredging spoils kg per capita			891		1,001
Total CD&E waste kg per capita	**1,605**		**1,708**		**1,864**

1. ONS England population mid-year estimate
2. ONS United Kingdom population mid-year estimate
3. Based on old methodology

CD&E waste arisings estimates

4.4.16 The published data highlights the limited information on which to base CD&E waste arisings estimates and whilst the historical data for Herefordshire provides an indication of the levels of CD&E waste, it does not reflect the impacts of the recession or changes in CD&E waste management practices.

4.4.17 Therefore, the CD&E waste generation per capita figures, based on the most recent national data, have been used as the basis of the CD&E waste estimates.

4.4.18 Herefordshire's population in 2014 was 187,200[11] which would give an estimated CD&E waste arising of:

- 370,000 tonnes (rounded) in 2014, based on the England CD&E waste per capita estimates of 1,980kg/capita; or
- 348,000 tonnes (rounded) in 2014, based on the UK CD&E waste per capita estimates of 1,864kg/capita.

4.4.19 Table 4.14 provides a breakdown of these estimates by the headline CD&E waste streams.

Table 4.14: CD&E waste generation estimates for Herefordshire 2014 (rounded to nearest 1,000 tonnes)

CD&E waste streams	England kg/capita	Estimate arisings (tonnes)	UK kg/capita	Estimate arisings (tonnes)
Non-hazardous C&D	904	169,000	851	159,000
Hazardous C&D	11	2,000	12	2,000
Excavation waste/dredging spoils	1,065	199,000	1,001	187,000
Total	1,980	370,000	1,864	348,000
Based on a population of 187,200 in 2014 for Herefordshire.				

4.4.20 Whilst Table 4.14 relies upon national averages, the estimates can be related back to Herefordshire by using population data. The estimates could still overestimate the CD&E waste generated in Herefordshire in 2014, which may be below the national average particularly in relation to the excavation waste and dredging spoils.

4.4.21 Historically arisings of CD&E waste have been assumed to be strongly related to the level of construction outputs or economic growth in the construction sector. Table 4.15 shows the Office of National Statistics (ONS) construction outputs and compares them against the most recent national CD&E wastes estimates, i.e. 2012 to 2014. Table 4.15 shows there is a correlation between construction outputs and CD&E waste estimates.

Table 4.15: Comparison of construction outputs and national CD&E waste estimates

Year	2012	2013	2014
UK ONS construction outputs[1], £ (millions)	£116,732	118,429	£128,072
Annual growth		1.5%	8.1%
Average growth between 2012 and 2014			4.7%
UK CD&E waste estimate[2], tonnes (millions)	108,838		120,394

[11] https://factsandfigures.herefordshire.gov.uk/about-a-topic/population-and-demographics

Year	2012	2013	2014
Average growth between 2012 and 2014			5.2%
UK C&D waste estimate[2], tonnes (millions)[3]	51,178	51,930	54,960
Annual growth		1.5%	5.8%
Average growth between 2012 and 2014			3.6%
Output in the Construction Industry: 'September and Q3 2016, ONS (November 2016) Defra, UK Statistics on Waste Notice, December 2016 Figures exclude excavation waste			

4.4.22 Therefore, reference was made to the ONS historic construction outputs and construction sector GVA growth to update the 2014 estimate and provide an estimate for the Minerals and Waste Local Plan baseline year of 2015.

4.4.23 The percentage change in construction outputs for the West Midlands region between 2014 and 2015 was 3.7%[12]. However, construction outputs data are not presented to Herefordshire level, so the Hereford and Worcestershire GVA data[13] was reviewed, which showed a 2.5% increase in GVA for the construction sector between 2014 and 2015.

4.4.24 Applying the Hereford and Worcestershire GVA growth figure to the 2014 estimates in Table 4.14 result in a range of 357,000 to 379,000 tonnes for 2015 depending on whether the England or UK estimates of kg/capita are used. However, as highlighted above, this could be an overestimate of the CD&E waste in Herefordshire.

4.5 Agricultural waste

Published agricultural waste data

4.5.1 There is limited published data on agricultural waste. Defra does estimate the amount of agricultural waste generated for reporting under the EC Waste Framework Directive and EC Waste Statistics Regulations.

4.5.2 Table 4.16 shows the Defra estimates of the waste produced by the agriculture, forestry and fishing sector for 2010, 2012 and 2014. However, there is no breakdown by the three sectors or below the England level. In addition, these estimates relate to non-natural agricultural waste. There are no published estimates of naturally occurring agricultural waste, which is managed on farms.

Table 4.16: Estimates of waste produced by the agriculture, forestry and fishing sector in England, 2010, 2012 and 2014

EWC-STAT description	Tonnes		
	2010	2012	2014
Used oils	21,571	22,067	20,591
Chemical wastes	103,009	95,281	105,708
Health care & biological wastes	1,021	1,015	1,025
Metallic wastes, mixed	954	4,254	4,449
Paper & cardboard wastes	5,843	5,678	5,629

[12] Output in the Construction Industry: September and Q3 2016 - Table 6: Construction output: Value non-seasonally adjusted current prices by region, ONS (November 2016)
[13] Source: Experian ©

EWC-STAT description	Tonnes		
	2010	2012	2014
Rubber wastes	21,798	10,696	11,316
Plastic wastes	82,291	82,293	82,268
Discarded equipment	9	9	10
Discarded vehicles	31,071	38,798	26,742
Batteries & accumulators' wastes	3,110	3,176	3,363
Animal & mixed food waste	14,348	14,169	14,109
Household & similar wastes	478	777	777
Mixed & undifferentiated materials	2,986	8,947	11,711
Other mineral wastes		21,293	19,919
Mineral waste from waste treatment & stabilised waste	20,919		
Total waste generation	309,409	308,454	307,617
Source: Defra, UK Statistics on Waste, December 2016 https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management			

4.5.3 Defra also publishes information on the number of commercial agricultural holdings and the area farmed by County/Unitary Authority, which can be used as a means of proportioning the estimated arisings to a county level. Table 4.17 presents this data.

Table 4.17: Commercial agricultural holdings and the area farmed for Herefordshire and England 2010 and 2013

	2010			2013		
	England	Herefordshire	%	England	Herefordshire	%
Number of holdings	105,449	2,649	2.51%	102,836	2,664	2.59%
Farmed area (hectares)	8,887,289	172,246	1.94%	9,086,480	182,470	2.01%
Source: Defra, Structure of the agricultural industry https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june						

4.5.4 If it is assumed that the amount of waste generated is proportional to the number of commercial agricultural holdings or area farmed, it would mean that between 2% and 2.5% of the non-natural agricultural waste would be produced in Herefordshire. This equates to 6,000 to 8,000 tonnes of non-natural agricultural waste.

4.5.5 Waste coded under LoW sub-chapter 02 01 "Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing" which is handled at permitted facilities can be extracted from the WDI. The data were extracted by LoW 6-digit waste code (i.e. the classification codes for individual wastes) and by receiving site. The extracts from the WDI for the quantities of waste coded under LoW sub-chapter 02 01 received at sites in England with the origin identified as Herefordshire are summarised in Table 4.18.

Table 4.18: Waste coded under LoW sub-chapter 02 01 received at permitted facilities in England with Herefordshire origin, 2013 to 2015

LoW code	Description	Tonnes		
		2013	2014	2015
02 01 01	Sludges from washing and cleaning	147	2,719	1,360
02 01 02	Animal-tissue waste			0.8
02 01 03	Plant-tissue waste		840	21,262
02 01 04	Waste plastics (except packaging)			2.6
02 01 06	Animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site	63	16,150	31,746
02 01 07	Wastes from forestry			0.1
02 01 08*	Agrochemical waste containing hazardous substances	0.02	11	3
02 01 09	Agrochemical waste other than those mentioned in 02 01 08		136	
02 01 10	Waste metal	15	266	701
02 01 99	Wastes not otherwise specified		33	68
Total		**224**	**20,156**	**55,144**
For hazardous wastes the six-digit codes in the LoW have an asterisk (*) next to them.				

4.5.6 The data show that there has been a significant increase in the waste received at permitted facilities, which will be as a result of the development of on-farm anaerobic digestion (AD) systems (see section 3.2) being used to treat plant-tissue waste and animal faeces, urine and manure. Historically these wastes would have been managed by methods such as spreading on land and would not have been captured in waste management data.

4.5.7 In addition, wastes such as packaging, discarded vehicles and oils etc. would be captured under LoW Chapters 13, 15 and 16 and included in the C&I wastes estimates; it is not possible to identify the generating sector.

4.5.8 Of the waste coded under LoW sub-chapter 02 01 received at permitted facilities in Herefordshire, 65% had origins identified as Herefordshire and 34% had origins identified as the West Midlands but not codeable to the WPA level.

4.6 Hazardous waste

4.6.1 The EA has a requirement to monitor movements of hazardous waste in England and the data obtained from the hazardous tracking system is made available through the EA's Hazardous Waste Interrogator (HWI), which is a Microsoft Access database.

4.6.2 Hazardous waste may move between facilities and these movements are recorded separately; therefore, there is some double counting of hazardous waste in the database that needs to be taken into account when using this data.

Hazardous waste arisings

4.6.3 The HWI for 2011 to 2015 were used to identify the hazardous waste that arose in Herefordshire. Table 4.19 summarises the hazardous waste arisings by LoW Chapter heading.

Table 4.19: Hazardous waste arising in Herefordshire 2011 to 2015 (including transfer stations)

LoW Chapter	Tonnes				
	2011	2012	2013	2014	2015
01: Mining and Minerals	-	-	-	-	0.2
02: Agricultural and Food Production	1	1	0.04	0.8	2.7
03: Wood and Paper Production	303	27	-	22	27
06: Inorganic Chemical Processes	-	71	149	124	87
07: Organic Chemical Processes	1	-	0.2	1.6	1.2
08: MFSU Paints, Varnish, Adhesive and Inks	867	831	759	729	665
09: Photographic Industry	11	10	11	8.6	8.0
10: Thermal Process Waste (inorganic)	5	6	4.6	0.7	0.9
11: Metal Treatment and Coating Processes	1,782	2,122	1,772	1,238	1,321
12: Shaping/Treatment of Metals and Plastics	138	131	248	116	77
13: Oil and Oil/Water Mixtures	2,096	2,281	1,891	2,273	1,718
14: Solvents	94	60	78	62	59
15: Packaging, Cloths, Filter Materials	285	220	280	332	326
16: Not Otherwise Specified	3,828	3,550	3,567	1,209	1,238
17: CD&E waste and Asbestos	1,432	1,132	1,137	2,547	4,765
18: Healthcare	743	649	464	469	432
19: Waste/Water Treatment Industry	8	7	5.9	9.1	10
20: Municipal and Similar Commercial Wastes	1,012	1,028	642	361	328
Total	**12,607**	**12,125**	**11,009**	**9,500**	**11,066**

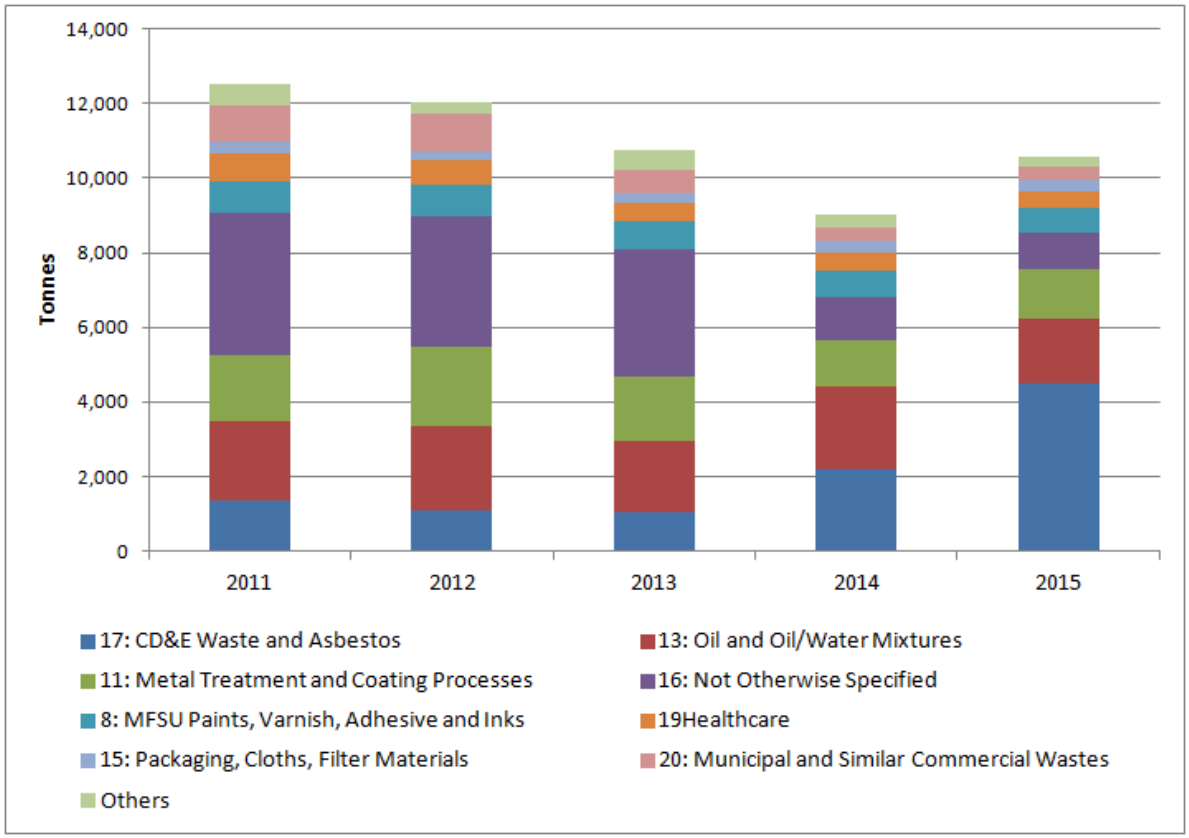
4.6.4 However, the figures need to be adjusted to take account of waste handled through transfer stations in Herefordshire, which is the principal type of hazardous waste facility in the county with the exception of metal recycling/ vehicle de-polluting sites. Table 4.20 presents the hazardous waste arisings for Herefordshire from 2011 to 2015, excluding waste arising and deposited at transfer stations in Herefordshire, and this is presented graphically in Figure 4.5.

Table 4.20: Hazardous waste arising in Herefordshire, 2011 to 2015 (excluding waste arising and deposited at transfer stations in Herefordshire)

LoW Chapter	Tonnes				
	2011	2012	2013	2014	2015
01: Mining and Minerals	-	-	-	-	0.2
02: Agricultural and Food Production	1.0	0.7	0.0	0.2	2.7
03: Wood and Paper Production	303	27	-	22	27
06: Inorganic Chemical Processes	-	71	149	124	87
07: Organic Chemical Processes	1.4	-	0.2	1.6	1.2
08: MFSU Paints, Varnish, Adhesive and Inks	867	831	756	728	665
09: Photographic Industry	11	10	11	8.6	8.0
10: Thermal Process Waste (inorganic)	4.6	5.7	4.6	0.7	0.9
11: Metal Treatment and Coating Processes	1,782	2,122	1,772	1,238	1,321
12: Shaping/Treatment of Metals and Plastics	138	131	248	116	77

LoW Chapter	Tonnes				
	2011	2012	2013	2014	2015
13: Oil and Oil/Water Mixtures	2,093	2,280	1,880	2,251	1,709
14: Solvents	94	60	78	62	59
15: Packaging, Cloths, Filter Materials	282	218	279	331	324
16: Not Otherwise Specified	3,819	3,519	3,405	1,130	1,015
17: CD&E waste and Asbestos	1,370	1,077	1,048	2,177	4,512
18: Healthcare	743	649	464	468	429
19: Waste/Water Treatment Industry	8.4	7	5.9	9.1	10
20: Municipal and Similar Commercial Wastes	1,001	1,021	637	340	316
Total	**12,520**	**12,028**	**10,739**	**9,006**	**10,565**

Figure 4.5: Hazardous waste arising in Herefordshire, 2011 to 2015



4.6.5 The data show that hazardous waste arisings have decreased between 2011 and 2014, believed to be mainly due to the reduction in waste coded under LoW Chapter 16 "Not Otherwise Specified" (which includes end of life vehicles, WEEE, batteries etc.). However, there has been a small increase between 2014 and 2015, driven by an increase in the hazardous waste from construction and demolition activities.

4.6.6 A more detailed analysis of the specific wastes streams highlight that over the last 5 years the hazardous waste arisings have been dominated by 11 wastes types, which have made up approximately 70% or more of the hazardous waste generated in the county. These waste streams are summarised in Table 4.21 and show that:

- Prior to 2014, there was processing of waste electrical and electronic equipment, which has now ceased;
- There has been a change in the types of wastes generated from chemical surface treatment and coating of metals and other materials (LoW Chapter 11), which would suggest that some treatment processes have been added at the point of production to neutralise some of the acid wastes generated;
- Over the last couple of years, generation levels across 10 of the 11 waste streams are relatively constant, or showing a slight decrease. The increasing trend in arisings overall is driven by the greater tonnage of hazardous waste produced by the construction and demolition sector.

Table 4.21: Main hazardous waste types in Herefordshire, 2011 to 2015

LoW Code	Description	Tonnes				
		2011	2012	2013	2014	2015
17 05 03	Soil and stones containing hazardous substances	179	42	8	750	3,232
17 06 05	Construction materials containing asbestos	1,151	869	929	1,309	1,296
13 02 05	Mineral-based non-chlorinated engine, gear and lubricating oils	1,184	1,282	1,022	1,084	940
11 01 05	Pickling acids	1,211	1,738	1,550	728	613
16 01 04	End-of-life vehicles	85	186	1,038	511	532
08 03 12	Waste ink containing hazardous substances	678	609	626	602	492
11 01 11	Aqueous rinsing liquids containing hazardous substances	128	24	48	473	444
18 01 03	Healthcare wastes whose collection and disposal is subject to special requirements in order to prevent infection	723	628	451	449	412
16 06 01	Lead batteries	1,106	436	372	282	343
20 01 35	Discarded electrical and electronic equipment	708	625	436	309	279
16 02 15	Hazardous components removed from discarded equipment (WEEE)	2,011	2,502	1,565	1	1

Hazardous wastes management

4.6.7 Figure 4.6 provides the breakdown of the generic waste management methods used to manage the hazardous waste arisings in Herefordshire in 2015, with Table 4.22 providing the breakdown by LoW Chapter heading.

Figure 4.6: Breakdown of generic hazardous waste management methods, 2015

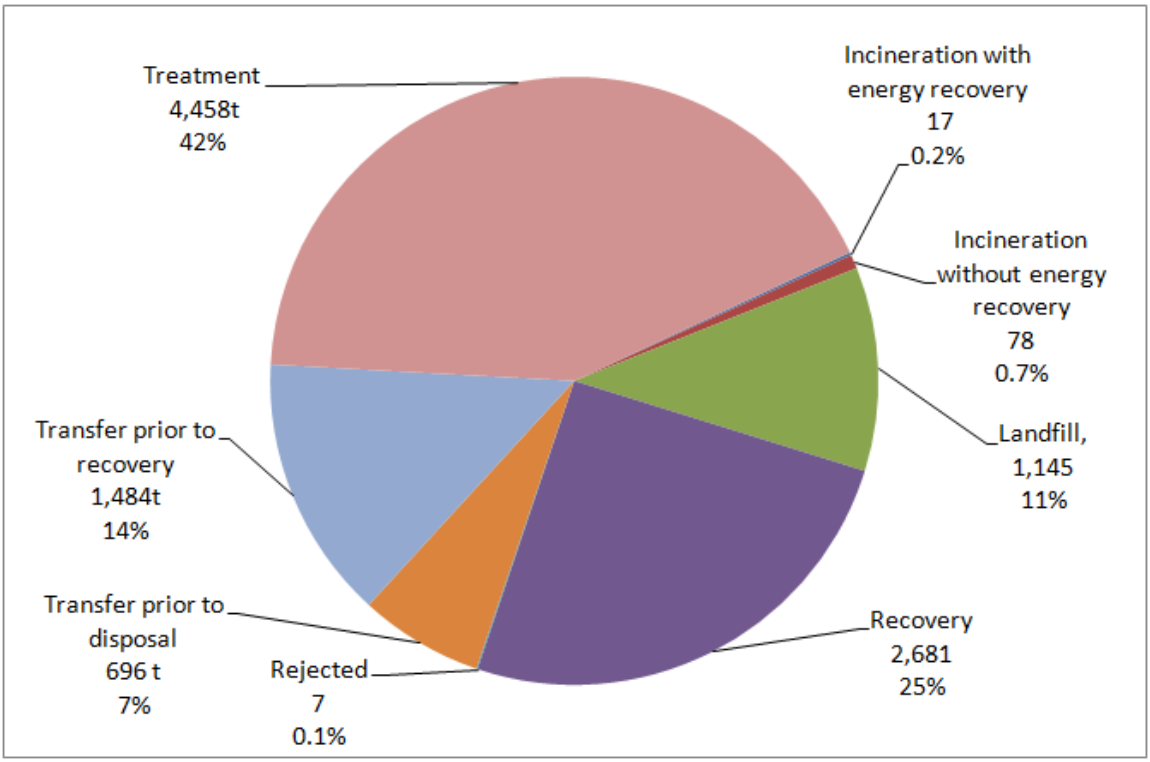


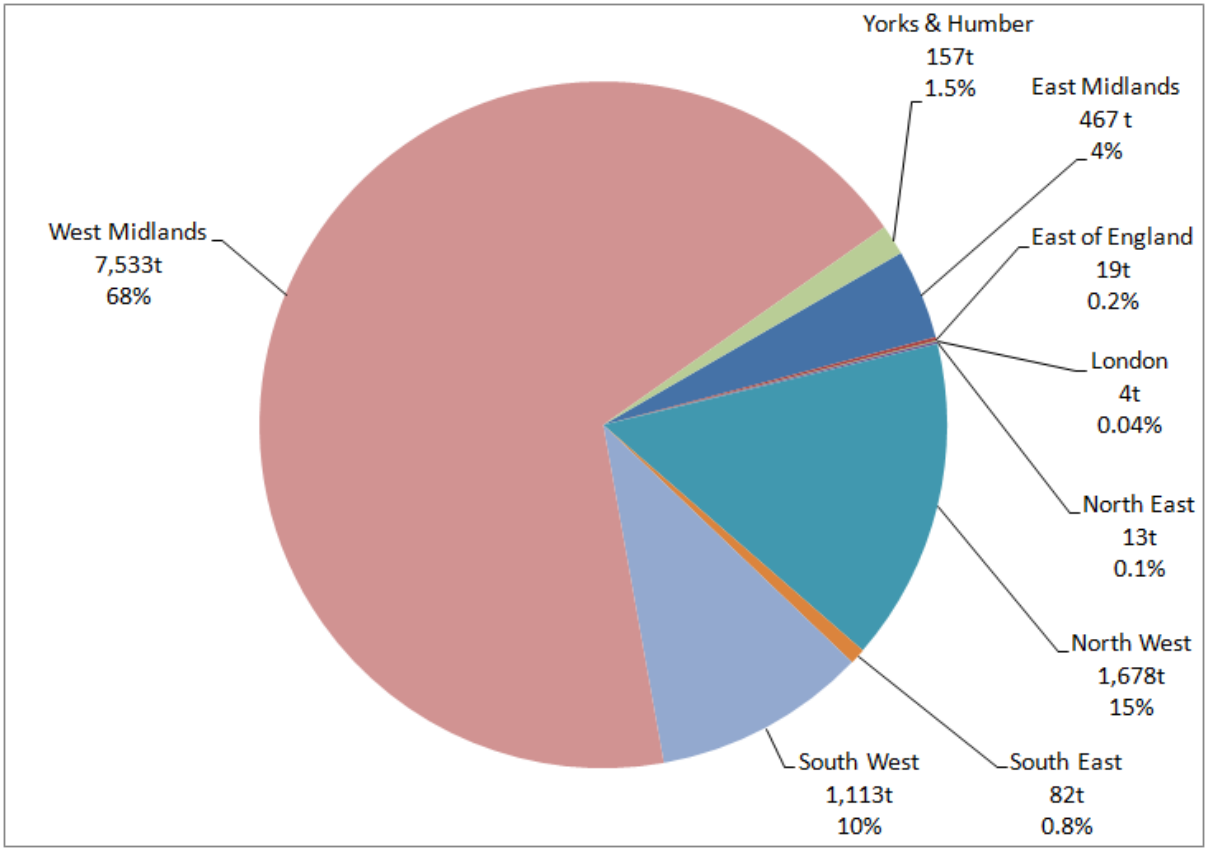
Table 4.22: Breakdown of generic hazardous waste management methods by LoW Chapter Heading, 2015

LoW Chapter	Incineration with energy recovery	Incineration without energy recovery	Landfill	Recovery	Rejected	Transfer prior to disposal	Transfer prior to recovery	Treatment
01: Mining and Minerals							0	
02: Agricultural and Food Production						0	3	
03: Wood and Paper Production						27		
06: Inorganic Chemical Processes						3	85	
07: Organic Chemical Processes							1	
08: MFSU Paints, Varnish, Adhesive and Inks				492		86	86	0
09: Photographic Industry				5		1	1	
10: Thermal Process Waste (inorganic)						1		
11: Metal Treatment and Coating Processes				314	7	97	221	681
12: Shaping/Treatment of Metals and Plastics		25		2		12	8	30
13: Oil and Oil/Water Mixtures				888		169	524	128
14: Solvents				3		1	35	21
15: Packaging, Cloths, Filter Materials		0	0	14		134	162	14
16: Not Otherwise Specified		0	20	587		45	319	44
17: CD&E waste and Asbestos	16	6	1,124	103		29	1	3,232

LoW Chapter	Incineration with energy recovery	Incineration without energy recovery	Landfill	Recovery	Rejected	Transfer prior to disposal	Transfer prior to recovery	Treatment
18: Healthcare	0	47		1		83	4	295
19: Waste/Water Treatment Industry								10
20: Municipal and Similar Commercial Wastes			0	273		8	34	1
Total	**17**	**78**	**1,145**	**2,681**	**7**	**696**	**1,484**	**4,458**

4.6.8 Figure 4.7 provides the breakdown of the English regions of deposit for hazardous waste arisings in 2015, which highlights that two third of the hazardous waste was deposited in the West Midlands.

Figure 4.7: Hazardous waste by deposit region, 2015



4.7 Radioactive waste

4.7.1 Radioactive waste is not "controlled waste" under UK legislation; however, WPA should make note in their Local Development Framework that disposal requirements for such wastes may arise from time to time.

4.7.2 The EA regulates the disposal of radioactive waste. Two organisations within Herefordshire have permits (known as authorisations) that allow the accumulation and disposal of radioactive waste. For completeness, details of the organisations holding authorisations are

included in Table 4.23. However, the need for future treatment/disposal capacity for radioactive waste is not considered in this report as materials are normally, and most appropriately, managed at the national level.

Table 4.23: Authorisations in Herefordshire for the keeping and use of radioactive material and/or disposal of radioactive waste

Organisation	Location	Permission No.	Approved
Wye Valley NHS Trust	Hereford County Hospital, Stonebow Road, Hereford, HR1 2ER	BF6973	06/05/1999
		BW8623	01/01/2004
Sequani Ltd	Bromyard Road Industrial Estate, Ledbury, HR8 1LH	CE5429	10/11/2010
		CE5437	10/11/2010
Source: Environment Agency Public Registers, accessed 21st November 2016 http://epr.environment-agency.gov.uk/ePRInternet/HomePage.aspx			

4.8 Summary

4.8.1 The estimated arisings for the baseline year of the assessment, 2015, are:

- Local authority collected waste: 86,600 tonnes
- Commercial and industrial waste: 115,00 to 145,000 tonnes
- Construction, demolition and excavation waste: 357,000 to 379,000 tonnes
- Agricultural waste (non-natural): 6,000 to 8,000 tonnes
- Hazardous waste: 10,500 tonnes
- Total 575,100 to 629,100 tonnes

5. Waste Forecasts

5.1 Introduction

5.1.1 Based on the waste arisings estimates in Section 4, a series of waste forecasts have been developed for each waste stream.

5.2 Local Authority Collected Wastes (LACW)

5.2.1 As highlighted above, future waste arisings are primarily linked to two main factors:

- the state of the economy; and
- changes in household numbers.

5.2.2 In addition, there are several policy and regulatory initiatives designed to impact on future waste generation, including:

- producer responsibility initiatives for packaging, recently extended to other products, e.g. batteries, electrical goods and electronic equipment and vehicles;
- waste prevention initiatives (e.g. light-weighting of packaging within industry and commerce) and national and local campaigns to encourage the public to use food and resources more efficiently and to reduce the waste they generate;
- possible effects of end-markets for recycled materials; and
- increased collections and services for recycling and composting.

5.2.3 Therefore, when selecting long-term growth/reduction rates there is a need to consider:

- potential reduction in the rate of waste growth (or absolute reduction in waste arisings), as a result of the factors described above;
- factors that have, or will, distort trend analysis such as a change of collection systems, legislation (e.g. Landfill Tax) or seasonal factors (e.g. exceptionally dry years result in lower levels of garden waste); and
- the elements of the waste stream to be included or excluded in the trend analysis to ensure consistency (e.g. exclusion of commercial waste collected by the Council and fly-tipped waste).

5.2.4 To forecast waste from households up to 2031, the trends in the waste generated per household have been used to produce a number of waste growth scenarios, which are then combined with household projections provided by the Department for Communities and Local Government (DCLG).

5.2.5 To forecast the remainder of LACW, future non-household waste generation needs to be factored into the estimates. The non-household waste stream predominantly comprised commercial waste and non-household CD&E waste collected at HWRC. Figure 4.4 shows that whilst the HWRC non-household waste fraction has increased over the past 12 months, it is still equivalent to the 2011 tonnage, whereas the commercial waste fraction has steadily increased since 2011 with over half the increase occurring in the last 15 months.

5.2.6 Table 5.1 presents the series of waste per household growth scenarios used to provide an estimate of future waste from households, along with assumptions about the non-household waste fraction.

5.2.7 There are a number of factors, in addition to the above, which will affect the quantities of non-household waste collected by local authorities in the future. These include:

- number, type of businesses and productivity/levels of waste generated;
- level of commercial waste service local authorities want to deliver;
- number of small and medium enterprises (SME) in different local authorities;
- nature and drivers of business types e.g. what their business activities are and the type of waste they generate;
- policy drivers, such as packaging e.g. light-weighting of packaging; and
- private sector waste collection companies seeking to maintain market share of commercial waste collections.

5.2.8 Due to the number of variables in the above factors, it is difficult to forecast any significant increase or decrease in the quantity of non-household waste collected by local authorities. It has therefore been assumed that the tonnage of non-household waste will remain constant within a scenario.

Table 5.1: LACW growth scenarios

Scenario	Waste per household assumptions	Non-household assumptions
1	Static waste from households per household based on the average of annual arisings over the last three year of 0.937 tonnes/household.	Waste not from households remains static at 2015 level of 10,875 tonnes per annum.
2	Static waste from households per household based on the 12 months ending August 2016 of 0.95 tonnes per household.	Waste not from households remains static at the 12 months ending August 2016 level of 11,775 tonnes per annum.
3	To reflect the growth over the last 12 months, waste from households per household increases by 1.9% per annum from the 12 months ending August 2016 figure of 0.95 tonnes per household up to 2020, then static.	Waste not from households remains static at the 12 months ending August 2016 level of 11,775 tonnes per annum.
3a	Same as Scenario 3, but with waste from households per household continuing to increase beyond 2020 but at half the rate of the period up to 2020, i.e. 0.95% per annum.	Waste not from households remains static at the 12 months ending August 2016 level of 11,775 tonnes per annum.
4	This scenario, uses the waste generated by households (i.e. include CD&E wastes) and applies a waste per household figure of 1.01 tonnes to the CLG household projections, which is based on the average in annual arisings over the last three years.	Remaining non-household waste remains static at 4,650 tonnes per annum.
4a	Same as Scenario 4 but based on 12 months ending August 2016, using a figure of 1.03 tonnes per household.	Same as Scenario 4 but based on 12 months ending August 2016, with the remaining non-household waste static at 5,250 tonnes per annum.

5.2.9 The resulting LACW forecasts are presented in Table 5.2 and Figure 5.1. Figure 5.1 includes historic LACW arisings back to 2005/06[14], not least to highlight the impact of the recession on LACW and to show the predicted forecasts in context with previous years.

5.2.10 The forecasts show that if household waste generation rates do not increase from either the 2015 tonnages or mid-2016 estimates, LACW could increase to between 96,800 to 100,000 tonnes per annum (Scenarios 1, 2 and 4), driven only by the increasing number of households.

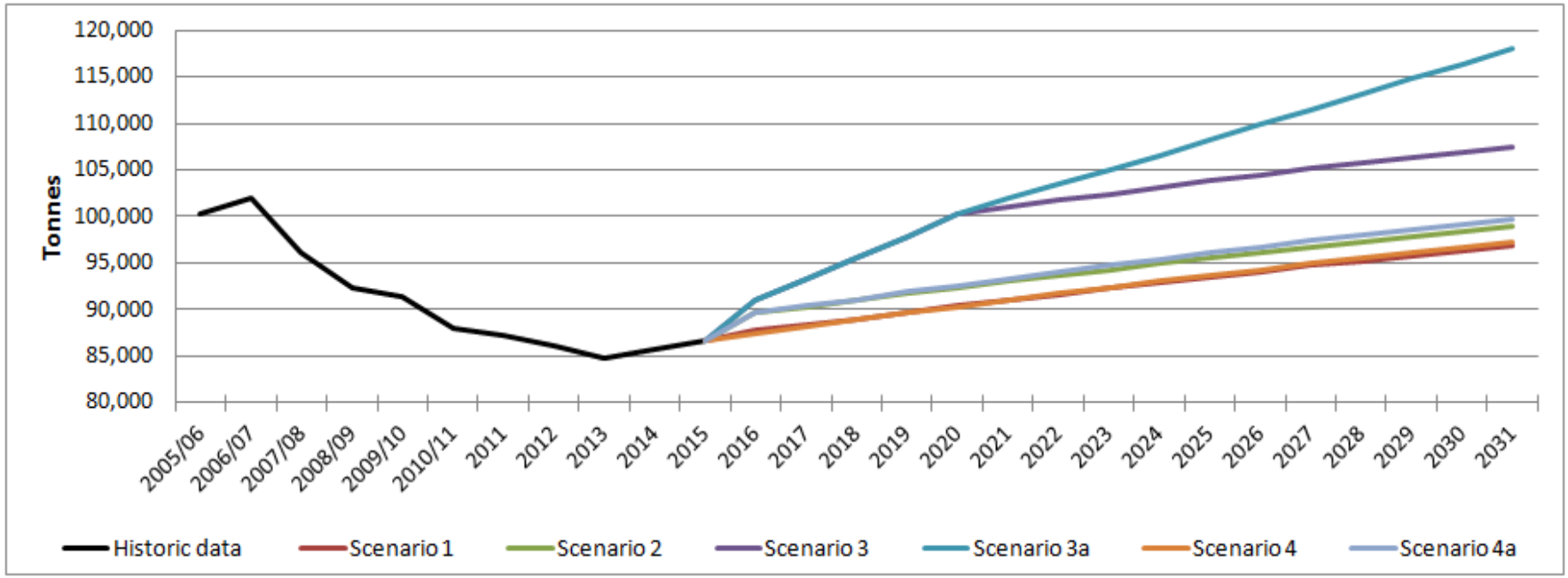
5.2.11 However, if the growth in waste over the last 12 months is factored into the forecasts either as short term increases up to 2020 (Scenario 3) or prolonged growth up to 2031 (Scenario 3a), total LACW could increase to between 107,500 to 118,000 tonnes per annum by 2031.

[14] Defra Local Authority Collected and Household Waste Statistics

Table 5.2: LACW forecast 2016 to 2031, rounded to nearest 100 tonnes

Scenario	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	87,700	88,300	89,000	89,700	90,400	91,000	91,600	92,300	92,900	93,500	94,100	94,700	95,200	95,800	96,300	96,800
2	89,600	90,300	91,000	91,700	92,400	93,000	93,600	94,300	94,900	95,500	96,100	96,700	97,300	97,900	98,400	98,900
3	91,100	93,300	95,600	97,900	100,300	101,000	101,700	102,400	103,100	103,800	104,500	105,100	105,800	106,400	106,900	107,500
3a	91,100	93,300	95,600	97,900	100,300	101,900	103,400	105,000	106,600	108,300	109,900	111,500	113,100	114,800	116,400	118,000
4	87,400	88,100	88,900	89,600	90,300	91,000	91,700	92,400	93,000	93,700	94,300	95,000	95,600	96,200	96,700	97,300
4a	89,700	90,400	91,100	91,900	92,600	93,300	94,000	94,700	95,400	96,100	96,700	97,400	98,000	98,600	99,200	99,700

Figure 5.1: LACW forecast 2016 to 2031



5.3 Commercial and Industrial Waste (C&I waste)

5.3.1 If future C&I waste arisings are assumed to be predominantly linked to the number and types of businesses within Herefordshire, economic growth forecasts can be used as a means of estimating future C&I waste arisings.

5.3.2 However, as with any form of forecasting, predicting economic performance over a 15 year period is difficult due to the range external factors that affect economic growth. In addition, as highlighted above, the quality and lack of granularity of C&I waste data means it is not possible to produce estimates for the waste produced by different sectors and businesses, which could then be applied to the business profile of the county. This means that any C&I waste forecast needs to be viewed as a broad estimate, which should be reviewed periodically.

Herefordshire economic growth forecasts

5.3.3 There are no publicly available economic growth forecasts specifically for Herefordshire. Whilst national and regional forecasts could be applied, the Council's Facts and Figures about Herefordshire website states that '*Herefordshire's economic output is low compared to regionally and nationally when measured per head of population*'.[15] Therefore, applying national or regional forecasts is likely to result in an overestimate of future waste arisings.

5.3.4 Consequently, GVA[16] forecasts specific to Herefordshire and Worcestershire have been obtained from Experian. These forecasts are considered more likely to better reflect the potential economic growth in Herefordshire but could again result in overestimates if the economic growth in Worcestershire is stronger than in Herefordshire.

5.3.5 At the Herefordshire level, the Economic Development Strategy, Invest Herefordshire: Herefordshire's Economic Vision, December 2016, includes an aim for economic growth of an '*increase GVA per head by 10% in real terms, from £19,500 to £21,500 by 2031 (at 2015 prices)*'. This level of growth is equivalent to an average annual growth 0.65% in GVA.

5.3.6 If it is assumed that businesses and therefore C&I waste will grow in line with GVA, these economic growth forecasts can be used to develop scenarios to estimate future C&I waste arisings.

Table 5.3: C&I waste growth scenarios

Scenario	Basis	Forecast Starting Point
1a	C&I waste growth in line with Hereford and Worcestershire GVA forecast	Lower 2015 C&I waste estimate (i.e. 115,000 tonnes)
1b	C&I waste growth in line with the Invest Herefordshire GVA growth target of 10% by 2031 (equivalent to an average annual growth of 0.65%)	
2a	C&I waste growth in line with Hereford and Worcestershire GVA forecast	Higher 2015 C&I waste estimate (i.e. 145,000 tonnes)

[15] https://factsandfigures.herefordshire.gov.uk/about-a-topic/economy/productivity-and-gross-value-added.aspx [09.01.2017@17:09]

[16] Gross Value Added (GVA) measures the contribution to the economy of each individual producer, industry or sector in the United Kingdom and is a headline measure used to monitor economic performance.

Scenario	Basis	Forecast Starting Point
2b	C&I waste growth in line with the Invest Herefordshire GVA growth target of 10% by 2031 (equivalent to an average annual growth of 0.65%)	

5.3.7 The resulting C&I waste forecasts are presented in Table 5.4 and Figure 5.2. The forecast estimates reflect the uncertainty in the C&I waste arisings estimates and the impact of differing economic growth forecasts. This degree of uncertainty makes assessing the future capacity need for C&I waste difficult.

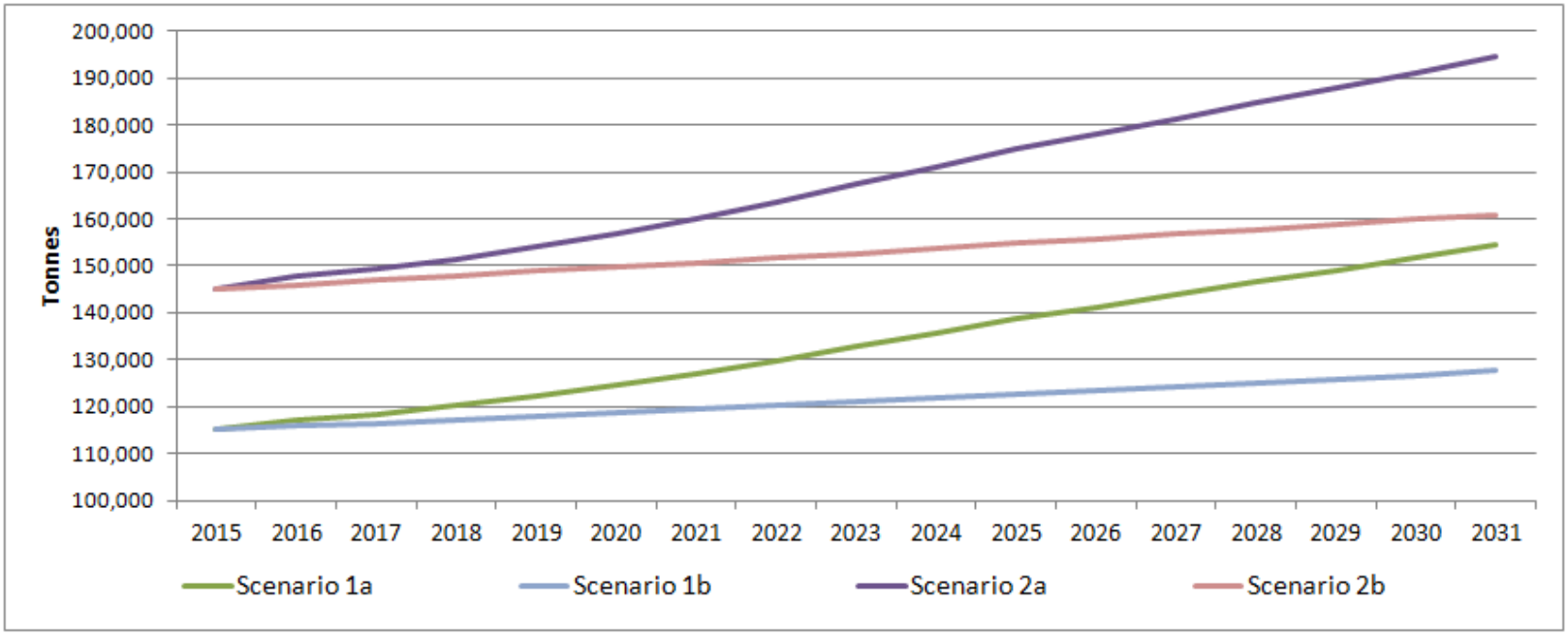
5.3.8 For the purposes of assessing future capacity need it is recommended that a range of C&I waste arisings between Scenarios 1a and 2b are assumed, which is equivalent to between 150,000 and 160,000 tonnes by 2031. However, it is also recommended that C&I waste forecasts are kept under review as the Minerals and Waste Local Plan is developed.

Table 5.4: C&I waste Estimates 2016 to 2031 (rounded to nearest 1,000 tonnes)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
C&I sectors GVA forecast (£millions)[1]	10,892	11,101	11,212	11,379	11,569	11,787	12,027	12,295	12,586	12,860	13,128	13,378	13,625	13,871	14,111	14,363	14,626
GVA forecast % growth		1.9%	1.0%	1.5%	1.7%	1.9%	2.0%	2.2%	2.4%	2.2%	2.1%	1.9%	1.8%	1.8%	1.7%	1.8%	1.8%
Invest Herefordshire GVA growth target[2]		0.65%															
Scenario 1a	115,000	117,000	118,000	120,000	122,000	124,000	127,000	130,000	133,000	136,000	139,000	141,000	144,000	146,000	149,000	152,000	154,000
Scenario 1b	115,000	116,000	117,000	117,000	118,000	119,000	120,000	120,000	121,000	122,000	123,000	123,000	124,000	125,000	126,000	127,000	128,000
Scenario 2a	145,000	148,000	149,000	151,000	154,000	157,000	160,000	164,000	168,000	171,000	175,000	178,000	181,000	185,000	188,000	191,000	195,000
Scenario 2b	145,000	146,000	147,000	148,000	149,000	150,000	151,000	152,000	153,000	154,000	155,000	156,000	157,000	158,000	159,000	160,000	161,000

1. Hereford and Worcestershire GVA forecast for C&I sectors (Source: Experian ©)
2. Invest Herefordshire GVA growth target of 10% by 2031 (equivalent to an average annual growth of 0.65%)

Figure 5.2: C&I waste Estimates 2016 to 2031



5.4 Construction, Demolition and Excavation Waste (CD&E waste)

5.4.1 To forecast future CD&E waste arisings, the link between CD&E waste and construction sector growth, based on the Hereford and Worcestershire GVA data, has been used. Two scenarios have been considered:

- Scenario 1: Growth based on Hereford and Worcestershire construction sector GVA growth and a baseline figure of 357,000 tonnes in 2015 (based on UK waste per capita); and
- Scenario 2: Growth based on Hereford and Worcestershire construction sector GVA growth and a baseline figure of 379,000 tonnes in 2015 (based on England waste per capita).

5.4.2 The resulting forecasts are presented in Table 5.5 and Figure 5.3. The forecasts have been broken down into the key elements of the CD&E waste stream based on relative proportions estimated in 2014 and assuming that these remain constant.

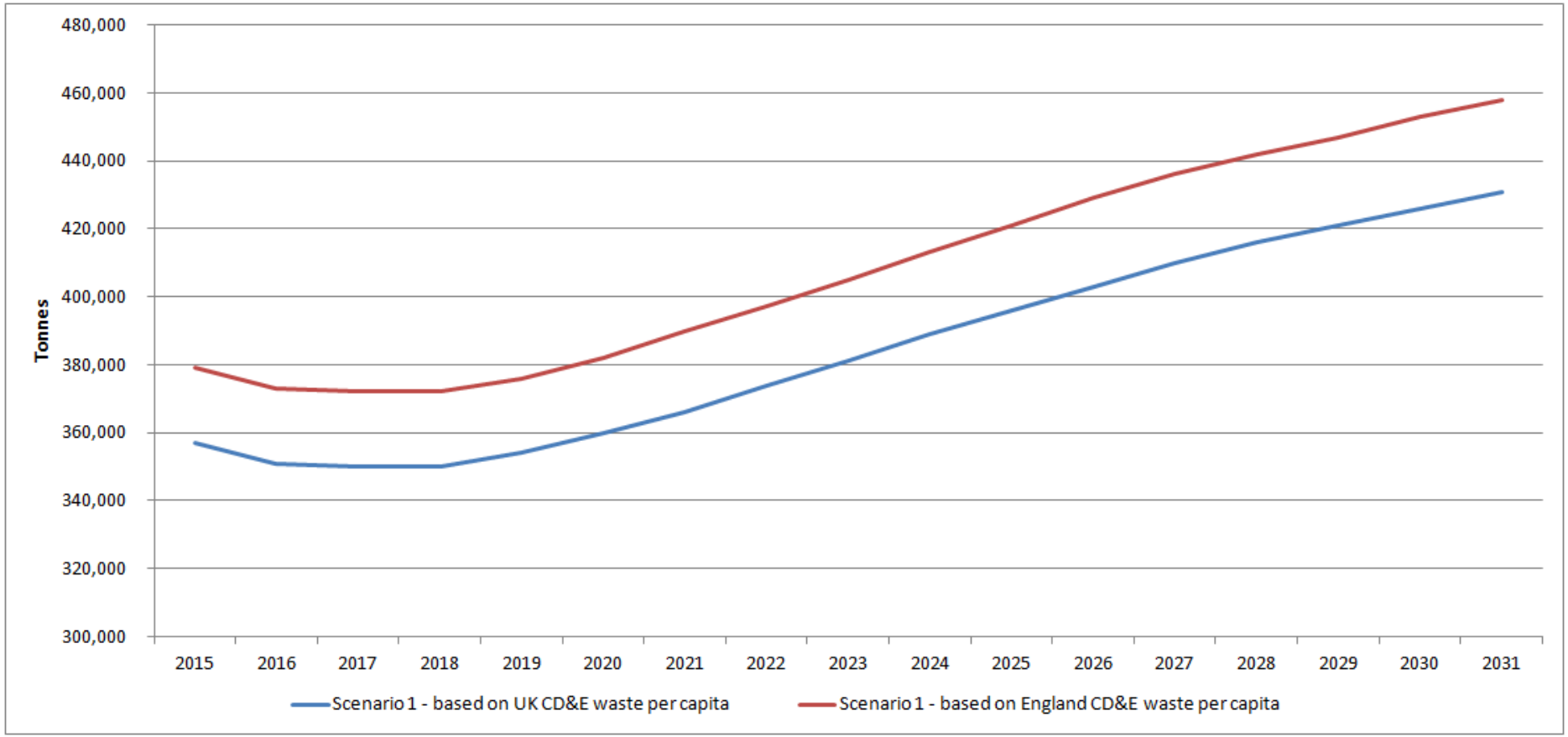
5.4.3 As highlighted above, the forecasts could overestimate future CD&E waste generation in Herefordshire, particularly in relation to excavation waste and dredging spoils. It might be considered unlikely, given the rural nature of Herefordshire, that approximately 200,000 tonnes of excavation waste would be produced every year. Therefore, as with the C&I waste forecasts, it is recommended that the CD&E waste forecasts are kept under review as the Minerals and Waste Local Plan is developed.

Table 5.5: CD&E waste forecast 2016 to 2031 (rounded to nearest1000 tonnes)

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Hereford and Worcestershire construction sector GVA (£ millions)[1]		937.4	923.0	919.8	920.1	929.4	945.0	962.8	982.3	1002.4	1021.4	1041.5	1060.6	1077.8	1093.1	1106.7	1120.1	1133.9
Hereford and Worcestershire construction sector GVA growth			-1.5%	-0.3%	0.0%	1.0%	1.7%	1.9%	2.0%	2.0%	1.9%	2.0%	1.8%	1.6%	1.4%	1.2%	1.2%	1.2%
Scenario 1	Non-hazardous C&D	163,000	160,000	160,000	160,000	162,000	164,000	167,000	171,000	174,000	178,000	181,000	184,000	187,000	190,000	192,000	195,000	197,000
	Hazardous C&D	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
	Excavation waste/ dredging spoils	192,000	189,000	188,000	188,000	190,000	194,000	197,000	201,000	205,000	209,000	213,000	217,000	221,000	224,000	227,000	229,000	232,000
	Total	**357,000**	**351,000**	**350,000**	**350,000**	**354,000**	**360,000**	**366,000**	**374,000**	**381,000**	**389,000**	**396,000**	**403,000**	**410,000**	**416,000**	**421,000**	**426,000**	**431,000**
Scenario 2	Non-hazardous C&D	173,000	170,000	170,000	170,000	172,000	174,000	178,000	181,000	185,000	189,000	192,000	196,000	199,000	202,000	204,000	207,000	209,000
	Hazardous C&D	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
	Excavation waste/ dredging spoils	204,000	201,000	200,000	200,000	202,000	206,000	210,000	214,000	218,000	222,000	227,000	231,000	235,000	238,000	241,000	244,000	247,000
	Total	**379,000**	**373,000**	**372,000**	**372,000**	**376,000**	**382,000**	**390,000**	**397,000**	**405,000**	**413,000**	**421,000**	**429,000**	**436,000**	**442,000**	**447,000**	**453,000**	**458,000**

Source: Experian ©

Figure 5.3: CD&E waste forecast 2016 to 2031



5.5 Agricultural Waste

5.5.1 Future waste arising will be dictated by the nature of agricultural activity within Herefordshire. However, as highlighted in the River Wye Special Area of Conservation Nutrient Management Plan produced by the Environment Agency and Natural England, it is not possible to predict the future when it comes to agriculture in the River Wye catchment.

5.5.2 Therefore, it is assumed that the non-natural agricultural waste will remain in the range 6,000 to 8,000 tonnes and that the amount of natural agricultural waste which is managed at permitted facilities will be dictated by the development of on-farm AD systems.

5.5.3 Between 2014 and 2016, there were six planning permissions granted for AD systems. These are not listed as permitted facilities in the 2015 EA data, and so have the potential to increase the anaerobic digestion capacity in the county in the future.

5.6 Hazardous Waste

5.6.1 The analysis of hazardous waste arisings highlights that over the last couple of years generation levels of hazardous wastes have, on the whole, been relatively constant and that the trend in arisings is now mainly affected by the level of hazardous waste produced by the construction and demolition sector.

5.6.2 Therefore, based on this analysis of the arisings between 2011 and 2015, it is estimated that the annual hazardous waste arising in the future will be in the range 9,000 to 12,000 tonnes, with the actual tonnage being dependent on the quantity of contaminated soil and asbestos containing waste generated by the construction and demolition sector.

5.6.3 In addition, the generation levels of different waste streams are relatively small and are unlikely to warrant the development of specialist waste treatment capacity.

5.7 Summary

5.7.1 Table 5.6 summaries the wastes forecast for Herefordshire for years 2020, 2025 and 2030

Table 5.6: Summary of waste forecasts for years 2020, 2025 and 2030 (rounded to nearest 1000 tonnes)

Waste Stream		Tonnes			
		Baseline	Forecast		
		2015	2020	2025	2030
Local authority collected waste		86,600	90,300 to 100,300	93,500 to 108,300	96,300 to 116,400
Commercial and industrial waste		115,00 to 145,000	124.000 to 150.000	139.000 to 155.000	152,000 to 160,000
Construction, demolition and excavation waste	Total	357,000 to 379,000	360,000 to 382,000	396,000 to 421,000	426,000 to 453,000
	Non-hazardous C&D	163,000 to 173,000	194,000 to 206,000	213,000 to 227,00	229,000 to 244,000
Agricultural waste (non-natural)		6,000 to 8,000	6,000 to 8,000		
Hazardous waste		10,500	9,000 to 12,000		

6. Capacity Needs

6.1 Introduction

6.1.1 The different waste streams considered within this report can have quite different management methods and expectations, particularly in relation to recycling and recovery targets. This section considers the policy relevant to each waste stream to consider future waste management capacity requirements.

6.2 Local Authority Collected Waste (LACW)

6.2.1 At the national level (England) there are two principal targets relating to the management of LACW:

- recycling and composting of household waste: 50% by 2020
- recovery of municipal waste: 75% by 2020.

6.2.2 These are national targets, but are not formally cascaded down to local authorities. The Waste Strategy for Herefordshire and Worcestershire: Managing Waste for a Brighter Future[17] does reflect these targets, and seeks to exceed them through achieving a more challenging recovery target of recovering value from a minimum of 78% of municipal waste by 2015. Whilst this target was not achieved in 2015, once the EnviRecover Facility (see paragraph 6.2.7) is operational, it should be achieved.

6.2.3 Recycling and recovery targets are still to be set for the period beyond 2020. However, current proposals by the European Commission include:

- A preparation for re-use and recycling (including composting/anaerobic digestion) target of 60% of municipal waste[18] by 2025.
- A preparation for re-use and recycling (including composting/anaerobic digestion) target of 65% of municipal waste by 2030.
- A gradual limitation on landfilling of municipal waste, to 10% by 2030.
- A requirement for the separate collection of bio-waste[19] for recycling (although no date is specified in the proposals).

6.2.4 As a result of the June 2016 decision to leave the European Union, it is unclear whether these targets would be adopted in the UK. However, in the absence of any future proposal for England they have been used to consider future management capacity requirements for LACW, not least because:

- these targets are consistent with those adopted in Wales and Scotland; and

[17] The Joint Municipal Waste Management Strategy for Herefordshire and Worcestershire 2004 - 2034, First review August 2011

[18] As explained in section 2.1 of this report, the term municipal waste is wider than LACW and includes wastes from other sources that is comparable to household waste in nature, composition and quantity. Consequently this target would apply to a proportion of C&I waste.

[19] Bio-waste means biodegradable garden and parks waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants.

- the UK may be required to adopt European environmental standards as part of any trade agreement.

6.2.5 Table 6.1 presents the potential future capacity required to manage Herefordshire's LACW. Two scenarios are used to consider the residual waste fraction (i.e. that remaining after recycling):

- assuming that the maximum allowable level of landfill is fully utilised; and
- assuming that all residual LACW is sent directly to a residual waste treatment facility.

Table 6.1: Future waste management capacity required for forecast LACW

	2020	2025	2030
LACW Forecasts			
Minimum	90,300	93,500	96,300
Maximum	100,300	108,300	116,400
Recycling and composting			
Potential recycling and composting targets	50%	60%	65%
Recycling and composting capacity requirement			
Minimum (tonnes)	45,150	56,100	62,595
Maximum (tonnes)	50,150	64,980	75,660
Landfill			
Maximum allowed landfill assuming 75% municipal waste recovery by 2020 and gradual limitation to 2030 target	25%	12.5%	10%
Landfill capacity requirement			
Minimum (tonnes)	22,575	11,688	9,630
Maximum (tonnes)	25,075	13,538	11,640
Residual treatment			
Minimum assuming maximum allowed landfill is utilised (tonnes)	22,575	25,713	24,075
Maximum assuming maximum allowed landfill is utilised (tonnes)	25,075	29,783	29,100
Minimum assuming no LACW direct to landfilled (tonnes)	45,150	37,400	33,705
Maximum assuming no LACW direct to landfilled (tonnes)	50,150	43,320	40,740

6.2.6 Section 3.1 identifies that there is transfer with basic treatment and biological treatment capacity within Herefordshire, but there is no residual waste treatment or disposal capacity such as mechanical biological treatment (MBT), refuse derived fuel (RDF) production, energy from waste or landfill facilities.

6.2.7 However, Herefordshire Council has historically worked with Worcestershire County Council to manage effectively the authorities' LACW jointly. This collaboration has resulted in the production of a Joint Municipal Waste Management Strategy and joint procurement of strategic waste management capacity, namely:

- a materials recovery facility (MRF) at Norton, near Worcester. The EnviroSort Facility has a permitted capacity of 105,000 tonnes per year; and
- an energy from waste (EfW) facility at Hartlebury, near Stourport. The EnviRecover Facility has a permitted capacity of 200,000 tonnes per year. Construction has nearly finished and the Facility is due to commence operation in 2017.

6.2.8 Consequently, whilst these facilities are not located in Herefordshire, long term capacity is available to manage Herefordshire's LACW. The use of these facilities for waste generated within both Worcestershire and Herefordshire has been considered carefully through the planning process and there is no planning reason why this should change in the foreseeable future.

6.2.9 Conclusions in relation to future LACW management capacity focus on the following:

- **Sufficient MRF capacity by 2030:** It is not possible accurately to predict the future composition of LACW, due to the limited data currently available and that composition changes with time. Consequently, the proportion of material that will need to be recycled or composted to achieve a 65% recycling and composting target is not clear. If it is assumed that there will a 50:50 split between recycling and composting, by 2030 there could be 31,000 to 38,000 tonnes of material to be recycled.
- However, it is unlikely that all the material would need to be handled at a MRF as some material is collected separately and sent directly (or via transfer station) to reprocessors, for example the scrap metal, cardboard, timber etc. collected at HWRC. The current split between kerbside and HWRC recycling is approximately 70:30. If this split is maintained, between 22,000 and 27,000 tonnes of material from Herefordshire may need to be handled through a MRF by 2030.
- There may be pressure on the current contracted MRF capacity by the end of the Plan period, depending on the amount of recyclable material sent to the EnviroSort Facility from Worcestershire.
- **Management of separately collected bio-waste:** Currently, the only form of bio-waste separately collected for composting is the garden waste collected at HWRC. Therefore, if the separate collection of bio-waste for recycling becomes a requirement, capacity would be necessary to handle separately collected food and garden waste.
- Based on the assumption above of a 50:50 between recycling and composting, by 2030 there could be 31,000 to 38,000 tonnes of bio-waste to manage. The type and size of biological treatment capacity would depend on how the bio-waste is collected e.g. separate food and garden waste or mixed food and garden waste.
- There is currently significant capacity at biological treatment facilities in Herefordshire (not including on-farm AD systems) over 334,000 tonnes in 2014, of which approximately 107,000 tonnes was utilised. This would suggest there should be sufficient capacity to handle a 25,000 to 30,000 tonne increase in bio-waste.
- **Sufficient EfW Facility capacity by 2030:** The EnviRecover Facility capacity is 200,000 tonnes per annum. If it is assumed that this equates to 35% of the LACW generated, because 65% of the waste will be recycled or composted by 2030, this would be equivalent to a total LACW arising of approximately 575,000 tonnes.
- Currently, Herefordshire and Worcestershire generate a total of approximately 400,000 tonnes per annum. So even with growth in LACW arising and assuming a 65% recycled or composted rate is achieved, there should remain sufficient capacity to handle the residual LACW generated by 2030.

6.3 Commercial and Industrial Waste (C&I waste)

6.3.1 There are no specific targets for the management of C&I waste. Beyond 2020, the European Commission proposes to set recycling and recovery targets for municipal waste (see section 6.2). Recognising that the Commission's use of municipal waste includes wastes from other sources that is comparable to household waste in nature, composition and quantity, some C&I waste would become subject to these targets.

6.3.2 Given the nature of current data capture systems and the inability to track flows of C&I waste, it is not possible to quantify accurately either: the C&I fraction of municipal waste; or how much is recycled or recovered at the national level, let alone the Herefordshire level. Again, uncertainty over the UK's relationship with European policy means that is unclear whether the targets proposed by the European Commission will be adopted in the UK.

6.3.3 As with LACW, in the absence of any future proposal for England, the proposed European targets are used to assess future management capacity requirements for non-hazardous C&I waste. Whilst this may overestimate the recycling/recovery requirement and underestimate the landfill need, as a municipal waste target would only apply to the waste comparable to household waste in nature, composition and quantity, it is likely that the Landfill Tax will continue to drive other C&I wastes away from landfill.

6.3.4 It is assumed that hazardous C&I waste will be handled through specialist hazardous waste management facilities (see section 6.6).

6.3.5 Table 6.2 presents the potential future capacity required to manage Herefordshire's non-hazardous C&I waste. Again, two scenarios are used to consider the residual waste fraction (i.e. that remaining after recycling):

- assuming that the maximum allowable level of landfill is fully utilised; and
- assuming that all residual C&I waste is sent directly to a residual waste treatment facility.

Table 6.2: Future waste management capacity required for forecast non-hazardous C&I waste

	2020	2025	2030
C&I Forecasts			
Minimum (Scenario 1a)	124.000	139.000	152,000
Maximum (Scenario 2b)	150.000	155.000	160,000
Recycling and composting			
Potential recycling and composting targets	50%	60%	65%
Recycling and composting capacity required			
Minimum (tonnes)	62,000	83,400	98,800
Maximum (tonnes)	75,000	93,000	104,000
Landfill			
Maximum allowed landfill assuming 75% C&I waste recovery by 2020 and gradual limitation to 2030 target	25%	12.5%	10%
Landfill capacity required			
Minimum (tonnes)	31,000	17,375	15,200
Maximum (tonnes)	37,500	19,375	16,000

	2020	2025	2030
Residual treatment			
Minimum assuming maximum allowed landfill is utilised (tonnes)	31,000	38,225	38,000
Maximum assuming maximum allowed landfill is utilised (tonnes)	37,500	42,625	40,000
Minimum assuming no C&I waste direct to landfilled (tonnes)	62,000	55,600	53,200
Maximum assuming no C&I waste direct to landfilled (tonnes)	75,000	62,000	56,000

6.3.6 Section 3.1 identifies that there is transfer with basic treatment, metal recycling and biological treatment capacity within Herefordshire, with the biological treatment facilities receiving over 25,000 tonnes of waste from the food and drink production sector in 2015.

6.3.7 However, there is no residual waste treatment or disposal capacity such as MBT, RDF production, energy from waste or landfill facilities. The treatment/disposal of residual C&I waste is reliant on facilities outside Herefordshire.

6.3.8 The assessment suggests that by 2030, 50,000 to 60,000 tonnes of residual C&I waste treatment/disposal capacity could be required, if the assumed targets are applied to the whole C&I waste stream. However, as indicated in section 4.3, there is a notable degree of uncertainty in the C&I waste estimates and forecasts that makes assessing the future capacity need for C&I waste particularly difficult.

6.3.9 Whilst the remaining potential capacity requirement is not insignificant, it is not particularly large; such capacity could be provided within a single facility or through a small number of facilities operating on an industrial estate.

6.4 Construction, Demolition and Excavation Waste (CD&E waste)

6.4.1 Article 11(2)(b) of the European Waste Framework Directive[20], sets a target to recover at least 70% of non-hazardous C&D Waste by 2020. This is a national target, but it is not formally cascaded down to local authorities. In December 2016, Defra reported that this target is already being met within the UK, with a recovery rate of over 90% for each year between 2010 and 2014[21].

6.4.2 Beyond 2020 recovery targets for CD&E waste are still to be set. The European Commission's current proposals do not make any change to the current recovery target for non-hazardous construction and demolition waste but do require Member States to '*take measures to promote sorting systems for construction and demolition waste and for at least the following: wood, aggregates, metal, glass and plaster'.*

6.4.3 In considering future capacity requirements for CD&E waste, the following assumptions have been made:

- Clean uncontaminated excavation wastes will be predominately be used for backfilling, which is defined as a recovery operation where suitable waste is used for reclamation purposes in excavated areas or for engineering purposes in landscaping or construction instead of other non-waste materials which would otherwise have been used for that purpose.

[20] Directive 2008/98/EC

[21] UK Statistics on Waste, Defra, December 2016

- Hazardous C&D waste will be handled through specialist hazardous waste management facilities (see section 6.6).
- At least 70% of non-hazardous C&D waste will be recovered per annum during the Plan period

6.4.4 Based on these assumptions the potential future waste treatment capacity required to handle Herefordshire's CD&E waste is summarised in Table 6.3.

Table 6.3: Future waste management capacity required for forecast non-hazardous CD&E waste

	2020	2025	2030
Backfilling capacity of excavation waste / dredging spoils			
Minimum	194,000	213,000	229,000
Maximum	206,000	227,00	244,000
Non-hazardous C&D forecasts			
Minimum	194,000	213,000	229,000
Maximum	206,000	227,00	244,000
Non-hazardous C&D recovery			
Assumed recovery target of 70% for non-hazardous C&D waste	70%	70%	70%
Recovery capacity required			
Minimum (tonnes)	136,000	149,000	160,000
Maximum (tonnes)	144,000	159,000	171,000
Non-hazardous C&D landfill			
Maximum allowed landfill assuming 70% of non-hazardous C&D is recovered	30%	30%	30%
Landfill capacity required			
Minimum (tonnes)	58,000	64,000	69,000
Maximum (tonnes)	62,000	68,000	73,000
Maximum required if the current UK recovery rate of 90% for non-hazardous C&D is maintained	10%	10%	10%
Landfill capacity required			
Minimum (tonnes)	14,000	15,000	16,000
Maximum (tonnes)	14,000	16,000	17,000
Note: There is a high level of uncertainty associates with CD&E wastes estimates and forecasts. See section 4.4 for further explanation.			

6.4.5 Section 3.1 identifies that there is treatment/recovery capacity available for handling CD&E waste, with annual permitted capacity of:

- 58,000 tonnes for the deposit of waste to land (recovery);
- 75,000 tonnes of soil production; and
- approximately 100,000 tonnes of physical treatment capacity, although it should be noted that one site with 75,000 tonnes of permitted capacity has accepted less than 200 tonnes per annum for the last 3 years.

6.4.6 However, it is difficult to isolate the treatment capacity required for CD&E waste as some of the CD&E waste will be:

- handled at facilities which also receive LACW and C&I waste e.g. household, commercial and industrial transfer stations;
- handled at exemption facilities/sites; or
- processed at the site of production by mobile screening, crushing and grading equipment.

6.4.7 In terms of exemption facilities/sites, there are over 320 U1 exemptions (Use of waste in construction) registered in Herefordshire, which can be an outlet for CD&E wastes. However, these exemptions cannot be considered as a guaranteed capacity to manage CD&E wastes because:

- some exemption could be short term but remain on the register for 3 years; or
- in terms of on-farm exemptions (which account for almost 100% of the U1 exemptions) the need for material may be periodic, e.g. for the repair of farm tracks, and the exemption has been registered just in case material is required.

6.4.8 If it is assumed that half the U1 exemptions are active in any given year and the tonnage received at each exemption ranges from 100 to 1,000 tonnes, the registered exemptions could provide between 18,000 to 180,000 tonnes of recovery capacity.

6.4.9 In addition, as highlighted in section 5.4, it is considered unlikely, given the rural nature of Herefordshire, that in the region of 200,000 tonnes of excavation waste would be produced every year.

6.4.10 Based on this assessment the following capacity demand for CD&E waste should be considered:

- Recovery (including recycling and re-use): 140,000 to 170,000 tonnes per annum through permitted and exempt facilities/sites, although this is potentially covered by the existing facilities and exemptions, for example the use of waste under U1 exemptions would be considered as recovery and over 40,000 tonnes is handled at permitted physical treatment and waste transfer/treatment facilities.
- Landfill: 15,000 to 70,000 tonnes per annum, depending on the level of recovery achieved; and
- For any developments that will generate significant quantities of excavation waste, the developer would need to demonstrate that there is sufficient capacity to handle the proposed arisings e.g. through backfilling or quarry restoration.
- It is likely that some thought will need to be given to identifying strategic locations for the future management of non-hazardous CD&E waste.

6.5 Agricultural Waste

6.5.1 It is estimated that small quantities of non-natural agricultural waste are generated in Herefordshire, between 6,000 to 8,000 tonnes. This waste will consist of materials such as used oils, scrap metal, paper, cardboard and plastic wastes etc. much of which will be captured in the C&I waste estimates. These wastes will be coded under LoW Chapters 13, 15 and 16 and consequently the agricultural element cannot be differentiated.

6.5.2 Future waste arisings will be dictated by the nature of agricultural activity within Herefordshire. However, as highlighted in the River Wye Special Area of Conservation Nutrient Management Plan produced by the Environment Agency and Natural England, it is not possible to predict the future when it comes to agriculture in the River Wye catchment.

6.5.3 Therefore, it is assumed that the non-natural agricultural waste will remain in the range of 6,000 to 8,000 tonnes and that the amount of natural agricultural waste which is managed at permitted facilities will be dictated by the development of on-farm AD systems. Between 2014 and 2016, there were six planning permissions granted for AD systems. These are not listed as permitted facilities in the 2015 EA data, and so have the potential to increase the anaerobic digestion capacity in the county in the future.

6.5.4 If manures and slurries are not used appropriately within a farm there is the potential for over-application of nitrogen and other minerals, and also for potential impacts upon water resources. On-farm AD systems provide a method of managing such materials and the digestate produced has a lower biological oxygen demand that can be used as a more uniform, easily calibrated fertiliser than the original untreated manure[22].

6.5.5 The very low tonnages forecast to arise indicate that agricultural wastes should continue to be appropriate managed by the private sector; the Minerals and Waste Local Plan does not need to identify strategic locations for its management.

6.6 Hazardous Waste

6.6.1 Small quantities of hazardous waste are generated within Herefordshire, 12,000 tonnes in 2012 (a very small fraction of the 4 million tonnes consigned in England)[23].

6.6.2 Whilst there is a legal requirement for England to have in place a range of facilities for the recovery of hazardous wastes, this is a national requirement that is not cascaded down to local authorities. The Government's considers that the waste industry has the expertise necessary to determine where infrastructure should be located and the most appropriate technologies to use[24]. In part this recognises that there is a need to account for economies of scale, as treatment facilities will only be economically viable above a certain capacity. Whilst this principle holds true across all waste management facilities, it is particularly relevant to hazardous waste as this is normally generated in very small tonnages at any one location. Furthermore, the cumulative effect of a number of smaller facilities, may, in some cases, be larger than those for one large facility[25].

6.6.3 The National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure was published in June 2013 (the Hazardous Waste NPS). It sets out policy for nationally significant infrastructure projects that comprise:

- final recovery/disposal hazardous waste facilities with a permitted hazardous waste throughput capacity in excess of 30,000 tonnes per annum; or

[22] Defra, Anaerobic Digestion Strategy and Action Plan, 2011
[23] Waste Management Plan for England, December 2013
[24] Principle 2 of the Strategy for Hazardous Waste Management in England, 2010
[25] National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure, Defra, June 2013

- hazardous waste landfill or deep storage facility with a permitted hazardous waste throughput or acceptance capacity in excess of 100,000 tonnes per annum; or
- alterations to existing plant with an increase in capacity of 30,000 tonnes per annum or 100,000 tonnes for landfill.

6.6.4 The Hazardous Waste NPS does not preclude the provision of smaller scale facilities and applications for developments below the thresholds will continue to be considered by waste planning authorities under the existing planning system. However, the policy set out in the NPS may be a material consideration when determining any such application.

6.6.5 In conclusion, there would not appear to be a need for the Minerals and Waste Local Plan to identify strategic locations for the management of hazardous waste within Herefordshire. Due to the location of the county, it is unlikely to be a destination chosen for a nationally significant infrastructure project, whilst smaller facilities should be capable of being accommodated on industrial estates and similar locations.

6.7 Summary

6.7.1 Table 6.4 summaries the key points from the assessment by wastes stream

Table 6.4: Summary of key points from the capacity need assessment

Waste Stream	Capacity Need Assessment – Key Points
Local authority collected waste	There is no residual waste treatment or disposal capacity such as mechanical biological treatment (MBT), refuse derived fuel (RDF) production, energy from waste or landfill facilities for LACW in Herefordshire. Herefordshire Council has historically worked with Worcestershire County Council to manage effectively the authorities' LACW. This collaboration has resulted in the production of a Joint Municipal Waste Management Strategy and joint procurement of strategic waste management capacity. Whilst these facilities are not located in Herefordshire, long term capacity is available to manage Herefordshire's LACW. However, the available capacity at these sites needs to be monitored during the Plan as there may be pressure on the current contracted capacity towards the end of the Plan period. In addition, if the separate collection of bio-waste for recycling becomes a requirement, capacity would be necessary to handle separately collected food and garden waste. There is currently significant capacity at biological treatment facilities in Herefordshire, which should be sufficient capacity to handle separately collected local authority collected bio-waste.
Commercial and industrial waste	There is transfer with basic treatment, metal recycling and biological treatment capacity within Herefordshire, with the biological treatment facilities receiving over 25,000 tonnes of waste from the food and drink production sector in 2015. However, there is no residual waste treatment or disposal capacity such as MBT, RDF production, energy from waste or landfill facilities. The treatment/disposal of residual C&I waste is reliant on facilities outside Herefordshire. The assessment suggests that by 2030, 50,000 to 60,000 tonnes of residual C&I waste treatment/disposal capacity could be required, if the assumed targets are applied to the whole C&I waste stream. However, there is a notable degree of uncertainty in the C&I

Waste Stream	Capacity Need Assessment – Key Points
	waste estimates and forecasts that makes assessing the future capacity need for C&I waste particularly difficult.
Construction, demolition and excavation waste	Like C&I waste, there is a notable degree of uncertainty in the CD&E waste estimates. This is recognised by Defra, who in their December 2016 Statistics on Waste Notice state '*Accurately quantifying C&D waste is challenging and whilst the absolute tonnage figures are subject to a relatively high level of uncertainty, there is not a significant impact on the final recovery rate*.' Based on this assessment the following capacity demand for CD&E waste should be considered: ▪ Recovery (including recycling and re-use): 140,000 to 170,000 tonnes per annum through permitted and exempt facilities /sites, although this is potentially covered by the existing facilities and exemptions, for example the use of waste under U1 exemptions would be considered as recovery and over 40,000 tonnes is handled at permitted physical treatment and waste transfer/treatment facilities. ▪ Landfill: 15,000 to 70,000 tonnes per annum, depending on the level of recovery achieved; and ▪ For any developments that will generate significant quantities of excavation waste, the developer would need to demonstrate that there is sufficient capacity to handle the proposed arisings e.g. through backfilling or quarry restoration. It is likely that some thought will need to be given to identifying strategic locations for the future management of non-hazardous CD&E waste.
Agricultural waste (non-natural)	It is estimated that small quantities of non-natural agricultural waste are generated in Herefordshire, between 6,000 to 8,000 tonnes. Based on this level of generation, non-natural agricultural wastes should continue to be appropriately managed by the private sector; the Minerals and Waste Local Plan does not need to identify strategic locations for its management. On-farm anaerobic digestion provides a method of managing manures and slurries and the ongoing development of on-farm AD systems should be considered in the Minerals and Waste Local Plan.
Hazardous waste	Small quantities of hazardous waste are generated within Herefordshire, 12,000 tonnes in 2012 (a very small fraction of the 4 million tonnes consigned in England). In general, hazardous waste treatment and disposal facilities are considered at a national level because of the need to account for economies of scale. This is reflected in the Hazardous Waste NPS which requires final recovery/disposal hazardous waste facilities with capacity in excess of 30,000 tonnes per annum to be considered as nationally significant infrastructure projects. Therefore, based on the small quantities generated in Herefordshire, there would not appear to be a need for the Minerals and Waste Local Plan to identify strategic locations for the management of hazardous waste within Herefordshire. Due to the location of the county, it is unlikely to be a destination chosen for a nationally significant infrastructure project, whilst smaller facilities should be capable of being accommodated on industrial estates and similar locations.

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