



hendeca



Waste Need Assessment 2019

Report



Herefordshire Minerals and Waste Local Plan

March 2020
HENDECA LTD

Contents

1. Introduction.....	1-0
1.1 Background and Purpose of this Report.....	1-1
1.2 Structure.....	1-2
2. Context.....	2-1
2.1 Explanations for Waste Terminology.....	2-1
2.2 Data Sources.....	2-4
3. Waste Management Facilities in Herefordshire.....	3-1
3.1 Facilities Operating under an Environmental Permit.....	3-1
3.3 Facilities exempt from environmental permitting	3-25
4. Waste Arisings.....	4-1
4.1 Local Authority Collected Waste ('LACW').....	4-1
4.2 Commercial and Industrial (C&I) waste	4-6
4.3 Construction, Demolition and Excavation Waste (CD&E waste)	4-23
4.4 Agricultural Waste.....	4-30
4.5 Hazardous Waste.....	4-34
4.6 Radioactive waste.....	4-42
4.7 Summary of estimates for waste generated in Herefordshire.....	4-44
5. Waste Forecasts	5-1
5.1 Local Authority Collected Wastes (LACW).....	5-1
5.2 Commercial and Industrial Waste (C&I waste)	5-6
5.3 Construction, Demolition and Excavation Waste (CD&E waste)	5-11
5.4 Agricultural Waste.....	5-14
5.5 Hazardous Waste.....	5-14
5.6 Summary of Waste Forecasts	5-14
6. Capacity Needs.....	6-1
6.1 Introduction.....	6-1
6.2 Local Authority Collected Waste (LACW).....	6-1
6.3 Commercial and Industrial Waste (C&I waste)	6-6
6.4 Construction, Demolition and Excavation Waste (CD&E waste)	6-11
6.5 Agricultural Waste.....	6-14
6.6 Hazardous Waste.....	6-15
6.7 Summary of Capacity Requirements	6-16

Annex

Annex A Permitted waste facilities, Herefordshire, 2018

Annex B Origin of waste at permitted facilities in Herefordshire, 2018, by WPA or Region

Annex C European List of Wastes (LoW)

Annex D Wastes accepted at permitted facilities by LoW Chapter heading, Herefordshire, 2015 to 2018

Annex E Exemption descriptions

Annex F Not on a Farm Exemptions

Annex G Assumptions for non-farm exempt activities

Annex H Tonnage discounted to prevent double counting for years 2013 to 2018

Annex I Breakdown of generic hazardous waste management methods by LoW Chapter heading, Herefordshire, 2015 to 2018

Annex J Figure 3.3, Figure 3.4 and Figure 3.5 (all A3 format)

1. Introduction

1.1 Background and Purpose of this Report

- 1.1.1 Herefordshire Council is preparing the Minerals and Waste Local Plan (MWLP) to guide development related to minerals and waste within Herefordshire up to 2041.
- 1.1.2 The original Waste Need Assessment was produced in February 2017 (the 'WNA 2017') to provide an understanding of waste management infrastructure within Herefordshire and to consider potential future demand, so as to prepare comprehensive, compelling and long-lasting policy. The WNA 2017 considered base data up to year 2015. This work was updated by the Waste Need Assessment Update 2018 (the 'WNA Update 2018', March 2018) that considered base data up to year 2017. The WNA Update 2018 also undertook further analysis to understand the movement of wastes into and out of Herefordshire. However, it relied on the WNA 2017 data for other matters, e.g. consideration of exempt activities.
- 1.1.3 The key data sources used in all the WNA, principally WasteDataFlow (the local authority collected waste data base) and the Environment Agency's Waste Data Interrogator (WDI) are updated each year, with the data for 2018 becoming available in Autumn 2019.
- 1.1.4 This report (the/this 'WNA 2019' or 'this Assessment') returns to the source data to consider all matters afresh, including those such as exempt activities.
- 1.1.5 This WNA 2019 is consequently a complete analysis, using the most up to date information. It has been prepared to be a discrete report, so the reader does not need to refer back to previous WNA; where there are interesting comparisons to be made cross referencing is provided as appropriate.
- 1.1.6 Despite being finalised in March 2020, this report is dated 2019 primarily to reflect more closely the time period that it is reporting and to continue the sequencing with the previous reports.

Plan making context

- 1.1.7 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.
- 1.1.8 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.
- 1.1.9 A range of wastes are generated and managed within Herefordshire and these are all addressed as relevant within this need assessment.
- 1.1.10 The Herefordshire MWLP will be applicable across all of Herefordshire and is intended to have a plan period to 2041. Once adopted, it will sit with the Herefordshire Core Strategy and be part of the development plan.

1.2 Structure

- 1.2.1 This report is structured as follows:
- Section 1 - Introduction;
 - Section 2 - Context: the key definitions for waste and the sources of data used;
 - Section 3 - Permitted facilities in Herefordshire: the current waste management infrastructure operating within the county;
 - Section 4 - Waste Arisings: estimating waste arisings for year 2018 where data is available and drawing comparisons with previous data;
 - Section 5 - Waste Forecasts: estimating future waste arisings, up to 2041; 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 Assessment.

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 (e.g. 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 the waste management industry or 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) also known as 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, e.g. soiled animal bedding; non-natural wastes (e.g. 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 due to the presence or concentration of dangerous substances.
- 2.1.12 Hazardous wastes are a component of other waste streams, 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 in preparing their development plans.

Municipal waste

- 2.1.14 Directive 2018/851 of the European Parliament and of the Council¹ (which came into force on 4 July 2018, the 'rWFD') amends Directive 2008/98/EC on waste. The rWFD gives Member States two years in which to transpose the agreed amendments, which the UK Government has indicated it will implement in full.

- 2.1.15 Article 1 of the rWFD amends the definitions presented in Directive 2008/98/EC on waste, updating the definition for 'municipal waste' at Article 1(3) to:

'(a) mixed waste and separately collected waste from households, including paper and cardboard, glass, metals, plastics, bio-waste, wood, textiles, packaging, waste electrical and electronic equipment, waste batteries and accumulators, and bulky waste, including mattresses and furniture;

(b) mixed waste and separately collected waste from other sources, where such waste is similar in nature and composition to waste from households;

Municipal waste does not include waste from production, agriculture, forestry, fishing, septic tanks and sewage network and treatment, including sewage sludge, end-of-life vehicles or construction and demolition waste.'

- 2.1.16 Municipal waste will consequently comprise both LACW and elements of C&I wastes.

Waste management hierarchy

- 2.1.17 Directive 2008/98/EC on waste established the overarching framework for the management of waste across the EU. It required Member States to '*bring into force the laws, regulations and administrative provisions necessary to comply with this Directive*' within two years of its entry into force, i.e. by December 2010. The Directive brought together existing elements of waste legislation and introduced a new approach to waste management that focused more strongly on the prevention of waste.

¹ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_2018.150.01.0109.01.ENG
[07.11.2019@10:37]

- 2.1.18 Article 4(1) Directive 2008/98/EC included the five point waste hierarchy, based on the priority order of:
- prevention (preferred option);
 - preparing for re-use;
 - recycling;
 - other recovery (e.g. energy recovery); and
 - disposal (i.e. landfilling or incineration without energy recovery).
- 2.1.19 The rWFD also makes changes to how waste is managed, including incorporation of measures required to achieve the Circular Economy Package and amendments to Article 4, adding a requirement for Member States to make use of economic instruments and other measures to provide incentives for the application of the waste hierarchy.
- 2.1.20 Consequently, the requirement on Member States to apply the hierarchy as a priority order '*in waste prevention and management legislation and policy*' remains following EU-wide agreement on the Circular Economy Package (described in more detail below).

Waste technology and future trends

- 2.1.21 There are several methods available for the treatment of waste, information on which is available from Defra and WRAP².
- 2.1.22 WRAP designs and delivers grant programmes to promote and encourage waste prevention, resource efficiency, renewable energy and the sustainability of products and materials. Information on resource efficiency and waste management initiatives are available on its website.
- 2.1.23 In June 2011, Defra published a report titled 'Guidance on applying the Waste Hierarchy'³. This provides information on dealing with waste in line with the hierarchy. Over the past 10 years or so waste management in the UK has already shifted significantly to recycling and recovering waste rather than dispose of it to landfill; this is likely to continue into the future. Looking forward there is likely to be a focus on those wastes that would have greatest impact on carbon emissions, primarily plastics and biodegradable wastes (e.g. food waste).
- 2.1.24 In February 2014, Defra updated a document titled 'Energy from waste, A guide to the debate' that was accompanied by waste technology briefs to provide more detail on specific energy from waste technologies. These are all available at the GOV.UK website:
<https://www.gov.uk/government/publications/energy-from-waste-a-guide-to-the-debate>.
- 2.1.25 Locally, the EnviRecover Facility at Hartlebury in Worcestershire commenced operation in 2017. This enables a further 230,000 tonnes per annum (tpa) to be diverted from landfill.
- 2.1.26 However, there is also a greater focus on the Circular Economy, an alternative approach to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

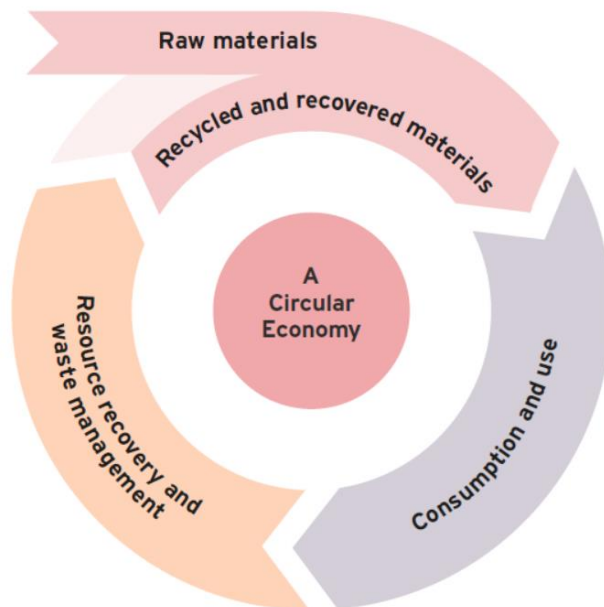
² Waste and Resources Action Programme. <http://www.wrap.org.uk/> [07.11.2019@10:42]

³ <https://www.gov.uk/government/publications/guidance-on-applying-the-waste-hierarchy> [07.11.2019@10:45]

2.1.27 In December 2018, Defra published 'Our Waste, Our Resources: A Strategy for England'⁴ (the 'Resources and Waste Strategy' or 'RWS') the first significant waste policy intervention by the Government in over a decade, with the Circular Economy as a central strand.

2.1.28 Figure 2.1 is taken from page 8 of the RWS. The MWLP has been developed to help the Circular Economy thrive in Herefordshire.

Figure 2.1 Graphic representation of the Circular Economy



2.2 Data Sources

Arisings Data

2.2.1 In 2018, the year for which the most recent statistics are available, England generated an estimated 213 million tonnes of waste, predominantly managed through transfer, treatment and disposal to landfill⁵.

2.2.2 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 waste producing sectors.

2.2.3 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.

⁴ <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england> [07.11.2019@10:48]

⁵ <https://data.gov.uk/dataset/312ace0a-ff0a-4f6f-a7ea-f757164cc488/waste-data-interrogator-2018> [27.11.2019@11:18]

- 2.2.4 WasteDataFlow is the web-based system for LACW data reporting by UK local authorities to government, which went live over ten years ago on 30 April 2004. Validated information held on WasteDataFlow can be downloaded by the general public.
- 2.2.5 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.
- 2.2.6 In relation to waste streams other than LACW, there are limitations in the data available on 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 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

- 2.2.7 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. Environmental Permits set out conditions under which waste management facilities must operate.
- 2.2.8 The first principle to establish is that this 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.
- 2.2.9 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.
- 2.2.10 However, there remains a further complication **between permitted and operational capacity**.
- 2.2.11 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.

- 2.2.12 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.
- 2.2.13 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 2016 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.
- 2.2.14 **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.
- 2.2.15 At the time of writing this report (November 2019) the Government had undertaken a consultation on proposals to tackle crime and poor performance in the waste sector and introduce a new fixed penalty for waste duty of care offences⁶. This may change how waste management activities are registered to be exempt activities in the future but has not affected the estimation contained in this Assessment.
- 2.2.16 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.

⁶ https://consult.defra.gov.uk/waste/crime-and-poor-performance-in-the-waste-sector/supporting_documents/Waste_Crime_Cons_English.pdf [27.11.2019@11:26]

3. Waste Management Facilities in Herefordshire

3.1 Facilities Operating under an Environmental Permit

- 3.1.1 All operators of permitted waste management facilities must provide the EA 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. This data is collated in the WDI, which provides the detail of all permitted facilities by waste planning authority (WPA) area.
- 3.1.2 Table 3.1 summarises the type and number of waste management facilities permitted in Herefordshire over the years 2013 to 2018, providing some context to the changes in the number of facilities permitted.
- 3.1.3 Within this WNA, data analysis is sometimes focused on calendar years 2015 to 2018. This provides four years of data to consider, which is considered to be both proportionate and manageable; too much data presented in this report would simply become unwieldy. Further, the earlier years have already been considered in the previous WNA, with this Assessment building on that understanding.

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

- 3.1.4 Table 3.1 shows that in 2018 there were 34 permitted facilities operating in Herefordshire, compared to 35 in 2015, 39 in 2016 and 38 in 2017 (line 22).
- 3.1.5 Whilst most waste management capacity has stayed fairly constant, there are a few changes of note:
- there is now only one hazardous waste transfer facility (line 1); this is not a new facility but a change of permit type from S0807: Household, Commercial & Industrial Waste TS/Treatment/Asbestos in 2016 (line 13). An animal funeral service became operational in 2017, however it is not listed as an active site in the 2018 data;
 - a new material recycling facility to handle construction and demolition wastes commenced operation in 2016 (line 5);
 - an additional physical treatment facility became operational in 2016 (line 6);
 - the number of vehicle dismantlers has fluctuated since 2013, increasing to four in 2014 and five by 2016, following by a reduction back to three in 2017 and 2018 (line 7); and
 - the clinical waste transfer facility (line 16) was not operational in 2017 and 2018.
- 3.1.6 The use of anaerobic digestion to treat on-farm waste grew significantly from 2013 to 2015, with a couple of additional facilities becoming operational over the past three years (line 17).
- 3.1.7 Table 3.1 still highlights that whilst there is a range of waste management, 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, Herefordshire, 2013 to 2018

ROW	Facility type	Site Category	Site Type	2013	2014	2015	2016	2017	2018
1	A9: Haz Waste Transfer Station ^a	Transfer	Hazardous Waste Transfer	n/r	n/r	n/r	1	2	1
2	A11: Household, Commercial & Industrial WTS	Transfer	Non-hazardous waste transfer	3	2	2	3	3	2
3	A11: Household, Commercial & Industrial WTS and A13: Household Waste Amenity Site	Transfer	Non- hazardous waste transfer and civic amenity site	2	2	2	2	2	2
4	A13: Household Waste Amenity Site	Transfer	Civic amenity site	3	3	3	3	3	3
5	A15: Material Recycling Treatment Facility	Treatment	Material recycling facility	1	n/r	n/r	1	1	1
6	A16 : Physical Treatment Facility	Treatment	Physical treatment	1	-	3	4	4	4
7	A19: Metal Recycling Site (Vehicle Dismantler)	Metal Recycling Site	Car breaker	3	4	4	5	3	3
8	A19a: End of Life Vehicle Facility	Metal Recycling Site	Car breaker	1	1	1	1	1	n/r
9	A20: Metal Recycling Site	Metal Recycling Site	Metal recycling	2	2	2	2	2	2
10	A23: Biological Treatment Facility	Treatment	Biological treatment	2	3	4	4	4	4
11	A25: Deposit of waste to land as a recovery operation	On/In Land	Deposit of waste to land (recovery)	1	1	1	1	1	n/r
12	S0803: Household, Commercial & Industrial Waste TS/Treatment	Treatment	Non- hazardous waste transfer / treatment	1	1	1	1	1	n/r
13	S0807: Household, Commercial & Industrial Waste TS/Treatment/Asbestos ¹	Treatment	Hazardous waste transfer / treatment	1	1	1	n/r	n/r	n/r
14	S0813: Non-hazardous & hazardous HWA Site	Transfer	CA Site	n/r	n/r	n/r	1	1	1
15	S0821: Metal recycling site	Metal Recycling Site	Metal recycling	1	1	1	n/r	n/r	n/r
16	S0824: Clinical Waste Transfer Station (A12: Clinical Waste Transfer Station in 2013)	Transfer	Clinical waste transfer	1	1	1	1	n/r	n/r
17	S1210: On-farm AD using farm wastes only	Treatment	Anaerobic digestion	1	5	8	8	9	10

row	Facility type	Site Category	Site Type	2013	2014	2015	2016	2017	2018
18	SR2010 No7: Use of waste in construction <50ktps	Use of Waste	Construction	1	n/r	n/r	n/r	n/r	n/r
19	SR2010 No8: Use of waste in construction <100ktps	Use of Waste	Construction	1	n/r	n/r	n/r	n/r	n/r
20	SR2010 No12: Treatment of waste to produce soil <75ktpa	Treatment	Physical treatment	n/r	1	1	1	n/r	n/r
21	SR2010 No16: On-farm anaerobic digestion <75,000tpa	Treatment	Anaerobic digestion					1	1
22	Total			26	28	35	39	38	34
<p>Abbreviations: n/r: no active sites reported ktps: kilo tonnes per site ktpa: kilo tonnes per annum a: A9: Haz Waste Transfer Station was previously S0807: Household, Commercial & Industrial WTS/Treatment/asbestos</p>									
<p>Annexes: Annex A of this Assessment provides the detail for year 2018 Annexes B and C of the WNA Update 2018 provide the detail for years 2016 and 2017 respectively Annexes B to D of the WNA 2017 provide the detail for years 2013 to 2015 respectively</p>									

3.1.8 Table 3.2 shows the origin of waste received at permitted facilities in Herefordshire from 2015 to 2018.

Table 3.2 Origin of waste received at permitted facilities, Herefordshire, 2015 to 2018

row	WPA / Local Authority	2015		2016		2017		2018	
		Tonnage	%	Tonnage	%	Tonnage	%	Tonnage	%
1	Herefordshire	314,880	77.3%	356,692	85.7%	388,240	87.5%	417,211	90.1%
2	West Midlands – WPA not codeable	29,199	7.2%	7,208	1.7%	(a)		(a)	
3	Monmouthshire	13,595	3.3%	9,520	2.3%	8,521	1.9%	6,713	1.4%
4	Gloucestershire	9,040	2.2%	7,099	1.7%	8,802	2.0%	3,258	0.7%
5	Worcestershire	8,858	2.2%	8,178	2.0%	4,624	1.0%	3,111	0.7%
6	Powys	6,799	1.7%	7,750	1.9%	10,108	2.3%	11,171	2.4%
7	Caerphilly	5,576	1.4%	3,324	0.8%	(b)		(a)	
8	South West - WPA not codeable	5,166	1.3%	(b)		(b)		(c)	
9	Shropshire	4,074	1.0%	4,993	1.2%	8,761	2.0%	7,544	1.6%
10	Newport	2,620	0.6%	5,377	1.3%	3,609	0.8%	4,783	1.0%
11	Blaenau Gwent	2,350	0.6%	1,463	0.4%	1,944	0.4%	1,468	0.3%
12	Vale of Glamorgan	1,138	0.3%	1,005	0.2%	1,768	0.4%	2,323	0.5%
13	Staffordshire	(a)		1,038	0.2%	(b)		(b)	
14	Hertfordshire	(b)		(b)		2,670	0.6%	(a)	
15	Other (less than 1,000 tonnes)	4,203	1.0%	2,450	0.6%	4,450	1.0%	5,627	1.2%
16	Total	407,498	100%	416,097	100%	443,498	100%	463,209	100%

Note:

^a Less than 1,000 tonnes and included in 'Other (less than 1,000 tonnes)'

^b Less than 100 tonnes and included in 'Other (less than 1,000 tonnes)'

^c None reported

Annexes

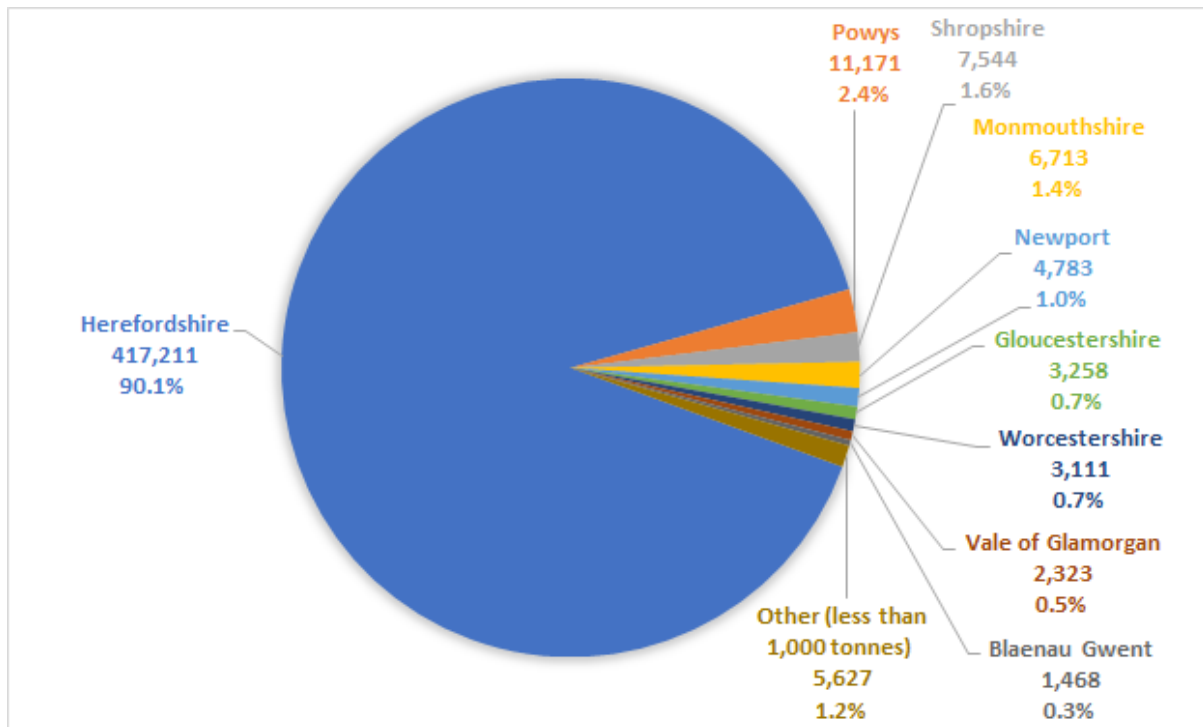
Annex B of this Assessment provides the detail for year 2018

Annexes D and E of the WNA Update 2018 provide the detail for years 2016 and 2017 respectively

Annexes E of the WNA 2017 provides the detail for year 2015

3.1.10 Figure 3.1 presents the data for 2018 (from Table 3.2) graphically

Figure 3.1 Origin of waste received at permitted facilities, Herefordshire, 2018



3.1.11 Table 3.2 shows that between 2015 and 2018, the waste received at permitted facilities in Herefordshire, that had its origin reported as Herefordshire, increased from 77% to 90% (line 1).

3.1.12 Whilst this suggests that Herefordshire is managing more wastes within the county than previous years, it could also be a result of an apparent improvement in reporting, with 'West Midlands - WPA not codeable' being less than 1,000 tonnes in 2017 and 2018 (line 2). If the wastes with their origin identified as 'West Midlands - WPA not codeable' were assumed to arise in Herefordshire, then the waste with its origin in Herefordshire would be 84.5% in 2015 and 87.4% in 2016.

3.1.13 This apparent improvement in reporting also has implications for estimating C&I wastes, as the methodology assumes that a proportion of waste reported as 'West Midlands - WPA not codeable' arises in Herefordshire and attributes this to the C&I waste estimates. If there has been an improvement in the reporting of waste origins by the sites in Herefordshire, then the amount of attributed to 'West Midlands - WPA not codeable' could be an overestimate, which in turn could lead to an overestimate of C&I arisings.

3.1.14 The data also suggests that Herefordshire is reasonably self-sufficient, at least in waste transfer capacity; although as noted above there is no residual waste management capacity.

3.1.15 The remaining wastes originate from adjacent and nearby authorities.

Capacity and waste input at the permitted facilities

- 3.1.16 Table 3.3 provides a summary of the permitted capacity and actual input by waste management facility category between years 2013 and 2018, showing that the 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.
- 3.1.17 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 by waste management facility category, Herefordshire, 2013 to 2018

Category	Facility Type	2013		2014		2015		2016		2017		2018		row
		Capacity	Input	Capacity	Input	Capacity	Input	Capacity	Input	Capacity	Input	Capacity	Input	
		tonnes		tonnes		tonnes		tonnes		tonnes		tonnes		
Transfer	Haz Waste Transfer	n/r	n/r	n/r	n/r	n/r	n/r	75,000	40,824	80,000	41,053	75,000	43,593	1
	Non-Haz WTS	74,997	35,909	49,998	35,024	49,998	40,605	106,239	44,923	106,239	41,491	99,999	47,360	2
	Non-Haz WTS & CA Site	109,550	76,344	109,550	79,202	109,550	80,613	109,550	81,821	109,550	82,592	109,550	80,589	3
	CA Site	34,349	8,338	34,349	8,673	34,349	8,691	109,348	10,075	109,348	10,626	109,348	10,290	4
	Clinical WTS	520	153	75,000	84	75,000	38	75,000	23	n/r	n/r	n/r	n/r	5
Metal Recycling Site	Car Breaker	64,897	1,820	138,397	23,581	138,397	24,691	149,597	26,917	105,997	31,765	103,498	44,877	6
	Metal Recycling	88,768	11,062	88,768	7,336	88,768	7,455	77,568	1,823	77,568	3,274	77,568	3,702	7
Treatment	Non-Haz WTS / Treatment	74,999	172	74,999	115	74,999	22	74,999	19	74,999	1	n/r	n/r	8
	Haz Waste WTS / Treatment	75,000	53,338	75,000	70,389	75,000	52,399	n/r	n/r	n/r	n/r	n/r	n/r	9
	Biological Treatment	283,999	52,326	299,998	73,699	333,998	106,282	333,998	77,713	333,998	59,040	333,998	48,537	10
	AD (farm wastes only)	36,499	807	166,413	6,574	339,413	52,497	339,413	56,370	450,912	58,810	479,512	66,294	11
	Material Recycling Facility	24,999	6,789	n/r	n/r	n/r	n/r	70,000	2,950	70,000	3,657	70,000	5,152	12
	Physical Treatment	5,000	2,949	75,000	22,020	99,999	22,086	174,998	63,531	334,999	101,290	334,999	112,813	13

Category	Facility Type	2013		2014		2015		2016		2017		2018		row
		Capacity	Input	Capacity	Input	Capacity	Input	Capacity	Input	Capacity	Input	Capacity	Input	
		tonnes		tonnes		tonnes		tonnes		tonnes		tonnes		
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	94,000	9,108	94,000	9,898	n/r	n/r	14
	Use of waste in construction	149,998	30,662	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	15
Total		1,081,575	304,069	1,245,472	345,702	1,513,471	407,499	1,789,710	416,097	1,947,610	443,497	1,793,472	463,207	16
<p>Abbreviations: Capacity: EP capacity Input: Waste input n/r: no reported tonnage AD: Anaerobic Digestion WTS: Waste Transfer Station HWS: Household Waste Site</p> <p>Annexes: Annex A of this Assessment provides the detail for year 2018 Annexes B and C of the WNA Update 2018 provide the detail for years 2016 and 2017 respectively Annexes B to D of the WNA 2017 provide the detail for years 2013 to 2015 respectively</p>														

3.1.18 Table 3.4 presents both the permitted capacity and the annual input for each operational site over years 2013 to 2018 and provides additional detail to supplement the summary provided in Table 3.3.

3.1.19 For ease of cross reference, each facility in Table 3.4 has been numbered to reflect the numbering used in previous WNA and the Site and Spatial Context Report. Facilities that have not reported for more than two years are not numbered. All of the numbered facilities are mapped at Figure 3.3, presented in this report at the end of this section and provided, in full A3 size, at Annex J.

Table 3.4 Permitted capacity and waste input for each operational facility, Herefordshire, 2013 to 2018

row	Operator	Site Name	Site Type	Annual Permitted Capacity ^a	Input					
					2013	2014	2015	2016	2017	2018
					Tonnes					
1	Eastside 2000 Ltd.	Eastside Recycling Facility	Haz Waste Transfer ^b	75,000	53,338	70,389	52,399	40,824	41,035	43,593
	Rachael Slaughter	Animal Funeral Services	Haz Waste Transfer	5,000	n/r	n/r	n/r	n/r	18	n/r
	Lively Joseph Henry	Quickskip Transfer Station	Non-Haz Waste Transfer	24,999	6,000	n/r	n/r	n/r	n/r	n/r
2	Lively Joseph Henry	Quickskip (Hereford) Transfer Station	Non-Haz Waste Transfer	75,000 ^c	19,780	27,636	31,244	34,780	31,739	35,114
3	Wye Valley Skips	Wye Valley Skips	Non-Haz Waste Transfer	6,240	n/r	n/r	n/r	296	51	n/r
4	MS & EM Patrick Ltd	Marlbrook Farm	Non-Haz Waste Transfer	24,999	10,129	7,388	9,361	9,847	9,701	12,246
5	Mercia Waste Management Ltd	Leominster HWRC & WTS	Non-Haz Waste Transfer	39,050	9,324	10,335	18,354	19,167	17,804	17,939
			CA Site		6,227	6,400	6,601	6,551	6,522	6,211
6	Mercia Waste Management Ltd	Rotherwas HWRC, WTS & MRF	Non-Haz Waste Transfer	70,500	50,583	49,521	41,869	41,807	44,826	43,972
			CA Site		10,210	12,946	13,789	14,296	13,440	12,467
7	Mercia Waste Management Ltd	Ledbury HWRC	CA Site	4,350	2,276	2,462	2,493	2,585	2,531	2,423
8	Mercia Waste Management Ltd	Ross on Wye HWRC	CA Site	25,000	4,210	4,334	4,347	4,573	4,641	4,451
9	Mercia Waste Management Ltd	Bromyard HWRC	CA Site	4,999	1,852	1,877	1,851	2,067	2,093	1,992
10	Severn Waste Services Ltd	Kington Household Recycling Centre	CA Site	74,999	n/r	n/r	n/r	850	1,361	1,424
	The Mann Organisation Ltd	Mann Organisation Ltd	Material Recycling Facility	24,999	6,789	n/r	n/r	n/r	n/r	n/r

row	Operator	Site Name	Site Type	Annual Permitted Capacity ^a	Input					
					2013	2014	2015	2016	2017	2018
				Tonnes						
11	Hereford Crushing and Demolition Limited	HCD Limited	Material Recycling Facility	70,000	n/r	n/r	n/r	2,950	3,657	5,152
12	Balfour Beatty Living Places Ltd	Land Adjacent to Unit 3	Physical Treatment	5,000	2,949	n/r	3,740	3,345	3,747	3,097
13	Hereford Quarries Limited	Lugg Bridge Quarry	Physical Treatment	250,000 ^d	n/r	n/r	5,655	50,956	87,409	100,355
14	Kingspan Insulation Ltd	Kingspan Insulation Ltd	Physical Treatment ^e	5,000 ^f	172	115	141	205	144	175
15	Quickskip Hereford Ltd	Quickskip Hereford Limited	Physical Treatment ^e	74,999	n/r	n/r	n/r	6,825	9,990	9,186
16	Quickskip Hereford Ltd	Fir Tree Lane Site	Physical Treatment (Soil Production)	75,000	n/r	22,020	12,550	2,200	n/r	n/r
17	Avalon Metals Ltd	Eastside Recycling Facility	Car Breaker	73,500	n/r	21,369	22,572	24,340	29,950	42,731
18	Jason and Richard Baker	J & R Recovery	Car Breaker	2,499	74	85	70	76	9	n/r
19	Mr D Craddock & Mrs J Evans (Pre 2016 Morris F G)	City Spares MRS Site	Car Breaker	32,400	154	194	266	30	n/r	n/r
20	P & T Moore Ltd	P & T Moore Vehicle Dismantlers	Car Breaker	4,999	1,376	1,708	1,514	1,478	1,658	1,835
21	UK Bus Dismantlers Ltd	Streamhall Garage	Car Breaker	24,999	216	225	269	201	148	311
22	Avalon Metals Ltd (Pre 2015 Smith R)	R Smith Metals	Car Breaker ^g	11,200	3,358	2,742	2,117	792	n/r	n/r
23	Avalon Metals Ltd (Pre 2015 European Metal Recycling Ltd)	Former EMR Hereford	Metal Recycling	75,000	7,514	4,431	5,162	1,607	3,034	3,443
24	Evans R	Cobhall Cottage	Metal Recycling	2,568	190	163	176	216	240	259
25	Mayglothling Waste Ltd	Yaidon Farm	Biological Treatment	49,999	25,626	25,503	24,258	28,590	28,159	23,888
26	Mr N Green & Mrs S Green	Much Fawley Farm	Biological Treatment	15,999	n/r	11,887	12,560	12,432	12,350	11,650
27	STL Energy Ltd	STL Energy Ltd	Biological Treatment	34,000	n/r	n/r	28,826	5,977	4,437	2,724
28	Welsh Water Organic Waste Limited (was Tradebe Gwent Ltd)	Hereford Liquid Waste Treatment Centre (was Eign Waste Treatment Centre)	Biological Treatment	234,000	26,700	36,309	40,638	30,714	14,094	10,275

row	Operator	Site Name	Site Type	Annual Permitted Capacity ^a	Input					
					2013	2014	2015	2016	2017	2018
				Tonnes						
29	Gelpack Excelsior Ltd	Gelpack Excelsior Ltd	Non-Haz Waste Transfer/ Treatment	74,999	n/r	n/r	22	19	1	n/r
30	Sodexo Property Solutions Ltd	County Hospital	Clinical Waste Transfer	75,000	153	84	38	23	n/r	n/r
31	Assured Energy LLP	Two Hoots Farm AD Plant	Anaerobic Digestion	28,314	n/r	1,773	8,985	4,477	806	237
32	Bowley Storage and Marketing Ltd	Bowley Court	Anaerobic Digestion	100,000	n/r	n/r	8,985	3,807	6,023	7,420
33	David and Helen Morgan	Penllan AD	Anaerobic Digestion	36,500	n/r	n/r	200	4,466	4,658	3,714
34	Herefordshire Biogas Ltd	Herefordshire Biogas	Anaerobic Digestion	36,500	n/r	394	13,669	12,155	13,792	12,708
35	M & M Power Limited	The Biogas Facility	Anaerobic Digestion	28,600	n/r	2,210	10,965	11,810	13,290	12,985
36	Mr D, Mrs E & Mr R Pursey	Trevase Farm AD	Anaerobic Digestion	36,500	n/r	368	1,460	1,468	1,462	1,463
37	PT Baker Farms Ltd	Eardisley Park Farm Facility	Anaerobic Digestion	36,499	807	1,829	1,391	1,475	1,996	1,672
38	Shed Field Growers Ltd	The Leen Digester	Anaerobic Digestion	36,500	n/r	n/r	11,363	16,712	15,626	22,597
41	R Edwards & Co (Staunton) Ltd	R Edwards & Co (Staunton) Limited	Anaerobic Digestion	36,500	n/r	n/r	n/r	n/r	200	589
42	Mr P Mann, Mr M Mann & Ms J Mann	Heath Farm	Anaerobic Digestion	74,999	n/r	n/r	n/r	n/r	957	2,101
43	M F G Generation Limited	The Farm Biogas Facility	Anaerobic Digestion	28,600	n/r	n/r	n/r	n/r	n/r	808
	Eastside 2000 Ltd	The Valletts	Use of waste in construction	49,999	6,990	n/r	n/r	n/r	n/r	n/r
	Smiths (Gloucester) Ltd	Land at Netherton Road	Use of waste in construction	99,999	23,672	n/r	n/r	n/r	n/r	n/r
39	The Pipe Corporation Ltd	Land at Lower Vern	Deposit of waste to land (recovery)	58,000	23,400	19,005	12,120	9,108	9,898	n/r

Note:

a: Annual Permitted Capacity in most recent operational year

b: Prior to 2016 was classified as Haz Waste Transfer / Treatment with a S0807: HCI Waste TS + treatment + asbestos, now has an A9: Haz Waste Transfer Station permit

row	Operator	Site Name	Site Type	Annual Permitted Capacity ^a	Input					
					2013	2014	2015	2016	2017	2018
Tonnes										
<p>c: Permitted capacity increased from 24,999 tonnes to 75,000 tonnes in 2016</p> <p>d: Permitted capacity increased from 14,999 tonnes to 250,000 tonnes in 2017</p> <p>e: Prior to 2015 was classified as Non-Hazardous Waste Transfer/Treatment</p> <p>f: Permitted capacity decreased from 74,999 tonnes to 5,000 tonnes in 2015</p> <p>g: Prior to 2016 was classified as A20: Metal Recycling Site (mixed MRS's), now has an A19: Metal Recycling Site (Vehicle Dismantler) permit</p> <p>n/r: no reported tonnage</p> <p>Annexes: Annex A of this Assessment provides the detail for year 2018 Annexes B and C of the WNA Update 2018 provide the detail for years 2016 and 2017 respectively Annexes B to D of the WNA 2017 provide the detail for years 2013 to 2015 respectively</p>										

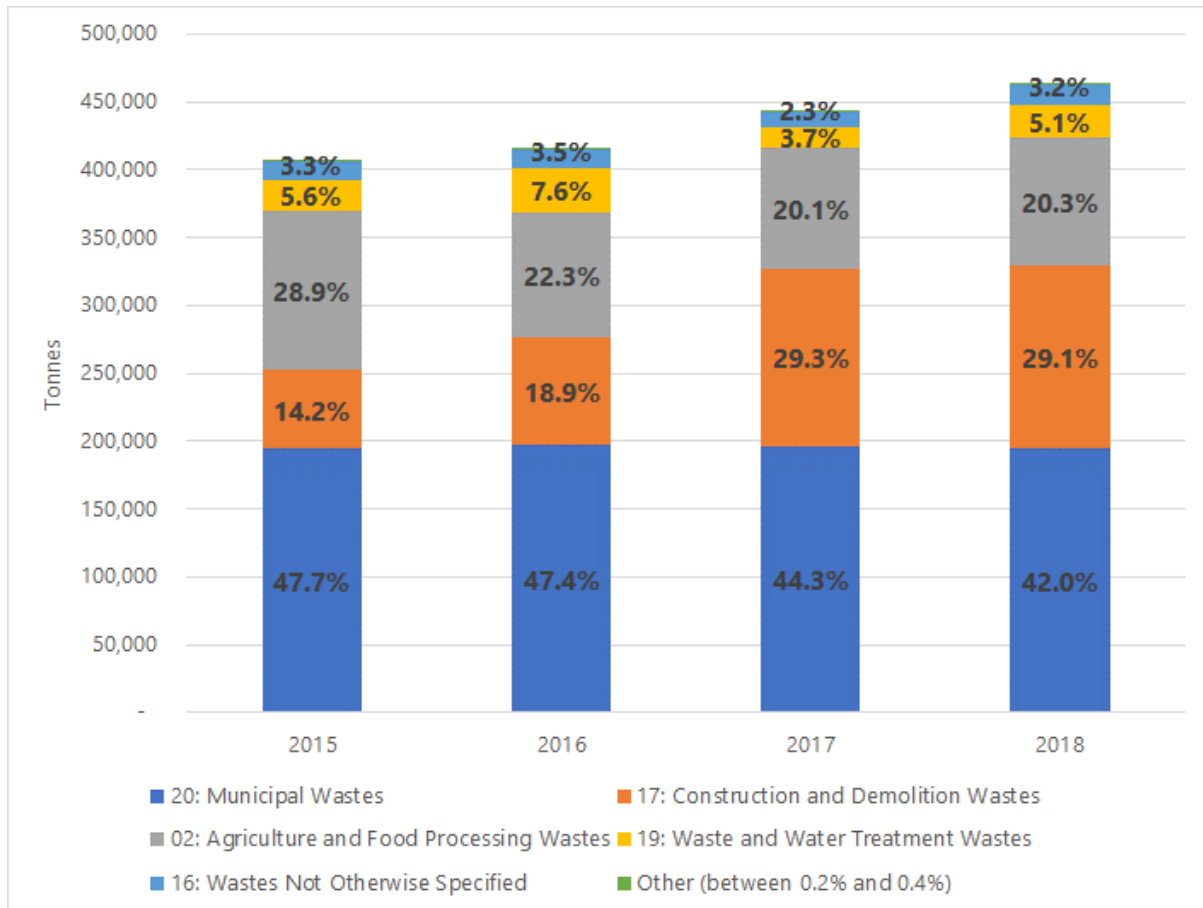
3.1.20 Table 3.5 and Figure 3.2 provide a summary of the types and quantities of waste, by European List of Wastes⁷ (LoW) chapter headings (Annex C), accepted at the permitted facilities between 2015 and 2018. Annex D provides the data by permitted facility.

Table 3.5 Types and quantities of waste received at permitted facilities in Herefordshire by LoW Chapter, 2015 to 2018

row	LoW Chapter	2015		2016		2017		2018	
		Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%
1	01: Mine and Quarry Wastes	n/r	-	n/r	-	n/r	-	2	<0.1%
2	02: Agriculture and Food Processing Wastes	117,879	28.9%	92,814	22.3%	88,966	20.1%	93,953	20.3%
3	03: Furniture, Paper and Cardboard Manufacturing Wastes	222	0.1%	61	<0.1%	n/r	-	n/r	-
4	08: Paint, Adhesive, Sealant and Ink Manufacturing Waste	2	<0.1%	2	<0.1%	<1	0.0%	1	<0.1%
5	10: Thermal Processes Waste	36	<0.1%	82	<0.1%	83	<0.1%	75	<0.1%
6	12: Shaping and Physical Treatment of Metals and Plastics	301	0.1%	322	0.1%	601	0.1%	402	0.1%
7	13: Oil Wastes and Wastes of Liquid Fuels	6	<0.1%	1	<0.1%	5	<0.1%	10	<0.1%
8	15: Packaging, Absorbents, Wiping Cloths etc N.O.S.	786	0.2%	741	0.2%	560	0.1%	578	0.1%
9	16: Wastes Not Otherwise Specified	13,312	3.3%	14,430	3.5%	10,404	2.3%	14,776	3.2%
10	17: Construction and Demolition Wastes	57,708	14.2%	78,657	18.9%	130,101	29.3%	134,968	29.1%
11	18: Human and Animal Health Care Waste	90	<0.1%	57	<0.1%	28	<0.1%	<1	<0.1%
12	19: Waste and Water Treatment Wastes	22,830	5.6%	31,712	7.6%	16,273	3.7%	23,851	5.1%
13	20: Municipal Wastes	194,325	47.7%	197,218	47.4%	196,478	44.3%	194,591	42.0%
14	Grand Total	407,498		416,097		443,498		463,209	

⁷ 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.

Figure 3.2 Types and quantities of waste received at permitted facilities in Herefordshire by LoW Chapter, 2015 to 2018



Review of wastes received at permitted facilities

3.1.21 Table 3.3 shows that between 2013 and 2018, the amount of waste managed at permitted facilities located in Herefordshire increased from just over 300,000 tonnes in 2013 to just over 460,000 tonnes by 2018 (line 16).

3.1.22 There are three principal reasons for the increases:

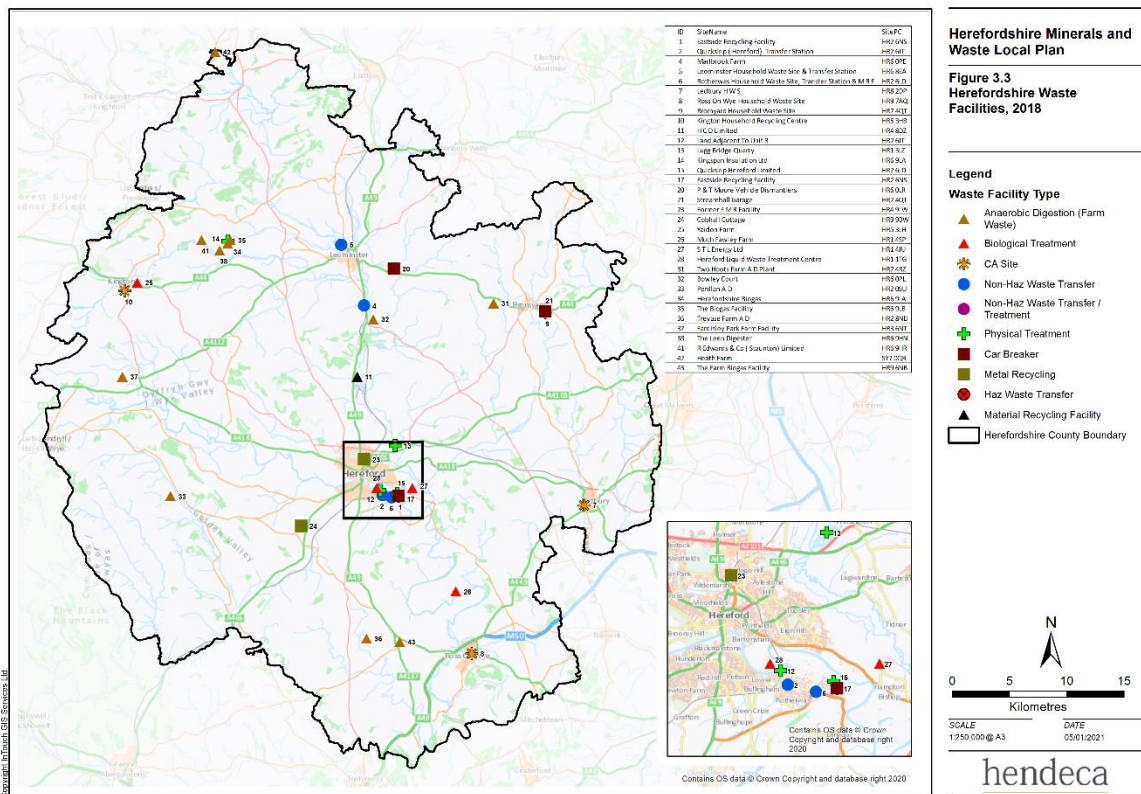
- a net increase of 35,000 tonnes of waste received at metal recycling sites between 2013 and 2018 (lines 6 and 7);
- an increase in on-farm AD, with a 65,000 tonne increase in the amount managed between 2013 and 2018 (line 11); and
- the development of a physical treatment facility at Lugg Bridge Quarry, which became operational in 2015 and by 2018 was receiving 100,000 tonnes of CD&E wastes for treatment (line 13).

3.1.23 Table 3.5 and Figure 3.2 show that the single largest tonnage is municipal waste (principally wastes from households); representing 42% to 48% of the wastes managed at permitted facilities in Herefordshire between 2015 and 2018. The second largest tonnage, by 2018, is formed by construction and demolition wastes (29% in 2018) followed by agriculture and food processing wastes (20% in 2018). If all the other wastes are added together, they still only

represent about 6% to 11% of all wastes managed at permitted facilities in Herefordshire, depending on the year being considered.

- 3.1.24 This is different to the picture seen nationally, where construction and demolition wastes generally make up about 50% of total arisings, with C&I waste at around 25%, municipal waste at around 20% and other wastes making up the remainder.
- 3.1.25 That municipal and agriculture wastes continue to dominate is perhaps not surprising considering the county is very rural. The increase in construction and demolition wastes may be attributed to development growth in the county and/or that CD&E recovery facilities have commenced operations and are drawing these wastes in, whereas they may previously have gone out of Herefordshire.

Figure 3.3 Herefordshire Waste Facilities, 2018



Movement of waste

- 3.1.26 Figure 3.1 shows that in 2018, 90% of wastes received at permitted facilities operating in Herefordshire originated in the county. Of the waste imported from outside of Herefordshire: c. 6% came from authorities in Wales; 3% is attributable to each of the West Midlands, Worcestershire, Shropshire and Gloucestershire; and smaller amounts from elsewhere. Individually these are not significant tonnages of waste.
- 3.1.27 The data in Table 3.2 indicates that there has been an increase in the proportion of waste received at permitted facilities which originated in the county i.e. 77% in 2015 compared to 90% by 2018 (line 1). However, the 2015 and 2016 tonnages had notable quantities of waste which were identified as 'West Midlands - WPA not codeable' (line 2). It is reasonable to assume that the waste identified as 'West Midlands - WPA not codeable' actually arose in Herefordshire, given there is no significant change in the waste with its origins in Worcestershire, Shropshire and Gloucestershire in 2018 when there is no 'West Midlands - WPA not codeable' reported. Using this assumption, the amount of waste received at permitted facilities which originated in the county would fall within the range 84% to 90% between 2015 and 2018.
- 3.1.28 Table 3.6 provides a summary of the waste removed from permitted facilities operating in Herefordshire in 2016 to 2018, identifying both the destination waste planning authority and fate of the waste.
- 3.1.29 Care is needed when considering these figures. Operators are asked to report 'Fate' from a list limited to six options: incineration; landfill; recovery; transfer; treatment; and unknown. The quality of reporting is reliant upon the operator's knowledge of the destination and its location.
- 3.1.30 The potential for error is highlighted by the indication that approximately 31,000 tonnes of waste are reported to have been sent to landfill in Herefordshire in 2016, 58,000 tonnes in 2017 and 60,000 tonnes in 2018; there are no operational landfill facilities in Herefordshire. The site known as Land at Lower Vern (Table 3.4, line 39) is permitted for the deposit of waste to land as a recovery operation, however it received less waste than was reported as being disposed to landfill in 2016 and 2017 and was an inactive site in 2018.
- 3.1.31 Whilst recognising the potential for error in the reporting of the data presented in Table 3.6, it provides useful context for the management of wastes from Herefordshire.
- 3.1.32 Around half of the waste in Table 3.6 is indicated to remain within Herefordshire. The greatest tonnage exported is sent to Worcestershire. This is not surprising as the Herefordshire and Worcestershire waste disposal authorities have a joint municipal waste management contract and jointly procured capacity which is located in Worcestershire (a materials recovery facility, EnviroSort and a residual waste energy recovery facility, EnviRecover).
- 3.1.33 In addition to Worcestershire, waste is exported, at a level of more than 10,000 tonnes, to other locations:
- in 2016, to WPA Not Codeable locations, Vale of Glamorgan, and Doncaster; in 2017, only the Vale of Glamorgan;
 - in 2017, to Vale of Glamorgan; and
 - in 2018, to Vale of Glamorgan, Cardiff, West Midlands Not Codeable and Gloucestershire.

3.1.34 Waste exports of 5,000 to 10,000 tonnes were sent:

- in 2016, to Bristol and Gloucestershire;
- in 2017, to Cardiff, Bristol, Gloucestershire and Doncaster; and
- in 2018, to Bristol.

3.1.35 The other export amounts are less than 5,000 tonnes each and are not considered material to consider individually.

3.1.36 After 2016, the only exports of more than 10,000 tonnes are made to a fate of: Incinerator; Landfill; or Recovery. In 2016, the export of more than 10,000 tonnes made to a fate of Treatment was sent to destination WPA Not Codeable. It is possible that a reasonable proportion of this waste was treated in Herefordshire, but the fact that it disappears in years 2017 and 2018 reflects the increase in operational tonnage of the physical treatment facility at Lugg Bridge Quarry (Table 3.4, line13).

Table 3.6 Tonnage of waste removed from permitted facilities in Herefordshire by destination fate and waste planning authority, 2016 to 2018

		YEAR 2016						
row	Waste Planning Authority Area	Incinerator	Landfill	Recovery	Transfer	Treatment	Unknown	Total
1	Herefordshire		30,718	72,708	5,107	49,842	2,033	160,409
2	Worcestershire	6,905	42,384	21,452			12	70,753
3	WPA Not Codeable ^a			1,437		29,055		30,492
4	Vale of Glamorgan		1,049	23,383	27			24,459
5	Doncaster	12,862						12,862
6	Bristol		921	8,557		40		9,518
7	Gloucestershire		1,027	6,062			8	7,097
8	Birmingham City			4,222				4,222
9	Liverpool			3,993				3,993
10	Monmouthshire			3,939				3,939
11	Wales Not Codeable ^b			3,295				3,295
12	Newport UA			120	26	3,119		3,264
13	West Midlands Not Codeable ^c			1,370	30		383	1,783
14	Scottish WPA			1,566				1,566
15	Warwickshire			1,513				1,513
16	Other ^d (<1,000 tonnes)	23	-	5,476	318	2	6	5,826
17	Total	19,790	76,099	159,094	5,507	82,058	2,443	344,991
<p>Notes:</p> <p>a: It is not possible to identify the destination of the waste</p> <p>b: It is not possible to identify the destination of this waste within Wales</p> <p>c: It is not possible to identify the destination of this waste within the West Midlands</p> <p>d: Culmination of all waste movements of less than 1,000 tonnes</p> <p>e: It is not possible to identify the destination of this waste within Merseyside</p>								

YEAR 2017								
row	Waste Planning Authority Area	Incinerator	Landfill	Recovery	Transfer	Treatment	Unknown	Total
18	Herefordshire	4	57,775	86,313	3,366	52,170	329	199,956
19	Worcestershire	38,569	10,570	25,030		102	4	74,274
20	Vale of Glamorgan		49	33,532				33,582
21	Cardiff	6,966		2,965		27		9,958
22	Bristol		890	7,800		185		8,874
23	Gloucestershire		93	5,760		18	96	5,967
24	Doncaster	5,120						5,120
25	West Midlands Not Codeable ^c			3,524	2		661	4,188
26	Merseyside Not Codeable ^e			3,487				3,487
27	Monmouthshire			3,035				3,035
28	Wales Not Codeable ^b			2,190				2,190
29	Newport			141	336	990		1,467
30	Kent			1,081				1,081
31	Other ^d (<1,000 tonnes)	46	67	9,331	37	189	1,139	10,810
32	Total	50,705	69,443	184,189	3,741	53,681	2,230	363,989
<p>Notes:</p> <p>a: It is not possible to identify the destination of the waste</p> <p>b: It is not possible to identify the destination of this waste within Wales</p> <p>c: It is not possible to identify the destination of this waste within the West Midlands</p> <p>d: Culmination of all waste movements of less than 1,000 tonnes</p> <p>e: It is not possible to identify the destination of this waste within Merseyside</p>								

YEAR 2018								
row	Waste Planning Authority Area	Incinerator	Landfill	Recovery	Transfer	Treatment	Unknown	Total
33	Herefordshire		60,609	75,854	2,531	68,273		207,266
34	Worcestershire	33,477	13,683	25,357		223		72,740
35	Vale of Glamorgan			31,145				31,145
36	Cardiff	13,772		12,628		81		26,481
37	West Midlands Not Codeable ^c			10,784				10,784
38	Gloucestershire		50	9,860	4	662		10,575
39	Bristol			5,488		164		5,652
40	Monmouthshire			2,676				2,676
41	Newport			227	308	2,136		2,670
42	Wales Not Codeable ^b			2,523		99		2,622
43	Manchester	1,437		241				1,679
44	Other ^d (<1,000 tonnes)	559	65	5,756	5	311		6,696
45	Total	49,245	74,406	182,537	2,847	71,949		380,985
<p>Notes:</p> <p>a: It is not possible to identify the destination of the waste</p> <p>b: It is not possible to identify the destination of this waste within Wales</p> <p>c: It is not possible to identify the destination of this waste within the West Midlands</p> <p>d: Culmination of all waste movements of less than 1,000 tonnes</p> <p>e: It is not possible to identify the destination of this waste within Merseyside</p>								

3.1.37 Table 3.7 considers the base data presented in Table 3.6, with adjustments made for key known elements, i.e. that there is no landfill within Herefordshire and that Herefordshire's LACW goes for energy recovery (Incinerator) and materials recovery (Recovery) at jointly procured capacity located within Worcestershire.

3.1.38 These factors have been considered within Table 3.7 such that:

- total wastes exported from Herefordshire is derived by subtracting waste with a destination in Herefordshire from the total waste presented in Table 3.6;
- landfill does not remain within Herefordshire, but is exported, and so the tonnage is retained (added back in) to our understanding of total wastes exported;
- incineration and recovery within Worcestershire is assumed as having a destination of Herefordshire, so the tonnage is subtracted from the total wastes exported. It is recognised that not all of the waste sent to Recovery in Worcestershire is LACW.

Table 3.7 Adjustments to Table 3.6 to clarify wastes exported from Herefordshire, 2016 to 2018

row	2016	Incinerator	Landfill	Recovery	Transfer	Treatment	Unknown	Total
1	Total Waste (Table 3.6, line 17)	19,790	76,099	159,094	5,507	82,058	2,443	344,991
2	Destination Herefordshire (Table 3.6, line 1)	0	30,718	72,708	5,107	49,842	2,033	160,409
3	Exported waste (Calculated: line 1 minus line 2)	19,790	45,381	86,386	400	32,216	410	184,582
4	Landfill, Herefordshire (Table 3.6, line 1)		30,718					
5	Incinerator and Recovery, Worcestershire (Table 3.6, line 2)	6,905		21,452 ^a				
6	Total exported (Calculated: line 3 plus line 4, minus line 5)	12,885	76,099	64,934	400	32,216	410	186,944
	^a 19,082 tonnes LACW to Worcestershire							
row	2017	Incinerator	Landfill	Recovery	Transfer	Treatment	Unknown	Total
7	Total Waste (Table 3.6, line 32)	50,705	69,443	184,189	3,741	53,681	2,230	363,989
8	Destination Herefordshire (Table 3.6, line 18)	4	57,775	86,313	3,366	52,170	329	199,956
9	Exported waste (Calculated: line 7 minus line 8)	50,701	11,668	97,876	375	1,511	1,901	164,033
10	Landfill, Herefordshire (Table 3.6, line 18)		57,775					
11	Incinerator and Recovery, Worcestershire (Table 3.6, line 19)	38,569		25,030 ^b				
12	Total exported (Calculated: line 9 plus line 10, minus line 11)	12,132	69,443	72,846	375	1,511	1,901	158,208
	^b 18,940 tonnes LACW to Worcestershire							
row	2018	Incinerator	Landfill	Recovery	Transfer	Treatment	Unknown	Total
13	Total Waste (Table 3.6, line 45)	49,245	74,406	182,537	2,847	71,949		380,985
14	Destination Herefordshire (Table 3.6, line 33)		60,609	75,854	2,531	68,273		207,266
15	Exported waste (Calculated: line 13 minus line 14)	49,245	13,797	106,683	316	3,676		173,719
16	Landfill, Herefordshire (Table 3.6, line 33)		60,609					
17	Incinerator and Recovery, Worcestershire (Table 3.6, line 34)	33,477		25,357 ^c				
18	Total exported (Calculated: line 15 plus line 16, minus line 17)	15,768	74,406	81,326	316	3,676	0	175,492
	^c 18,944 tonnes LACW to Worcestershire							

- 3.1.39 Looking strictly at the data presented in Table 3.6, the dominant (assumed as more than 10,000 tonnes) fates for wastes exported from Herefordshire would be Incinerator, Landfill and Recovery, with Treatment appearing in 2016 only.
- 3.1.40 However, this does not consider the local relevance of landfill (there being none in the plan but it being reported within Herefordshire) and LACW management (benefitting from jointly procured incineration and recovery capacity located in Worcestershire). Table 3.7, lines 6, 12 and 18 does this respectively for years 2016, 2017 and 2018. Waste exports of more than 10,000 tonnes remains to be made to Incinerator, although this has activity substantially dropped in recognition of the LACW capacity located in Worcestershire.
- 3.1.41 However, waste exports significantly in excess of 10,000 tonnes remain to be made to Landfill and Recovery suggesting that these are key elements of waste management infrastructure not available within (or to) Herefordshire. This conclusion is exacerbated by recognising that not all the waste sent for Recovery in Worcestershire is LACW, but other waste streams that do not benefit from the jointly procured capacity.
- 3.1.42 This analysis corroborates the earlier reflection of the waste management facilities that are operational with Herefordshire; that this infrastructure is missing residual waste capacity.

Key points on permitted capacity

- 3.1.43 The permitted facilities data for 2016 to 2018 shows transfer (with basic treatment) capacity, biological treatment and recovery capacity, and CD&E waste recovery capacity operating in Hereford. However, there is no residual waste treatment capacity for other waste streams, such as mechanical biological treatment (MBT) refuse derived fuel (RDF) production, incineration (with or without energy recovery) and no disposal capacity (landfill) beyond one land recovery operation.
- 3.1.44 There remains some reliance on residual waste management and disposal capacity outside the county, including a significant proportion of strategic capacity that has been jointly procured with Worcestershire County Council to manage LACW.
- 3.1.45 Permitted facilities are mapped, at Figure 3.4 and Figure 3.5:
- Figure 3.4 shows each facility represented by its capacity under the Environmental Permit, in 2018;
 - Figure 3.5 shows each facility represented by the tonnage of waste received, in 2018.

Figures 3.4 and 3.5 are provided here within this report, but also in full A3 size at Annex J.

Figure 3.4 Herefordshire waste facilities by Environmental Permit capacity, 2018

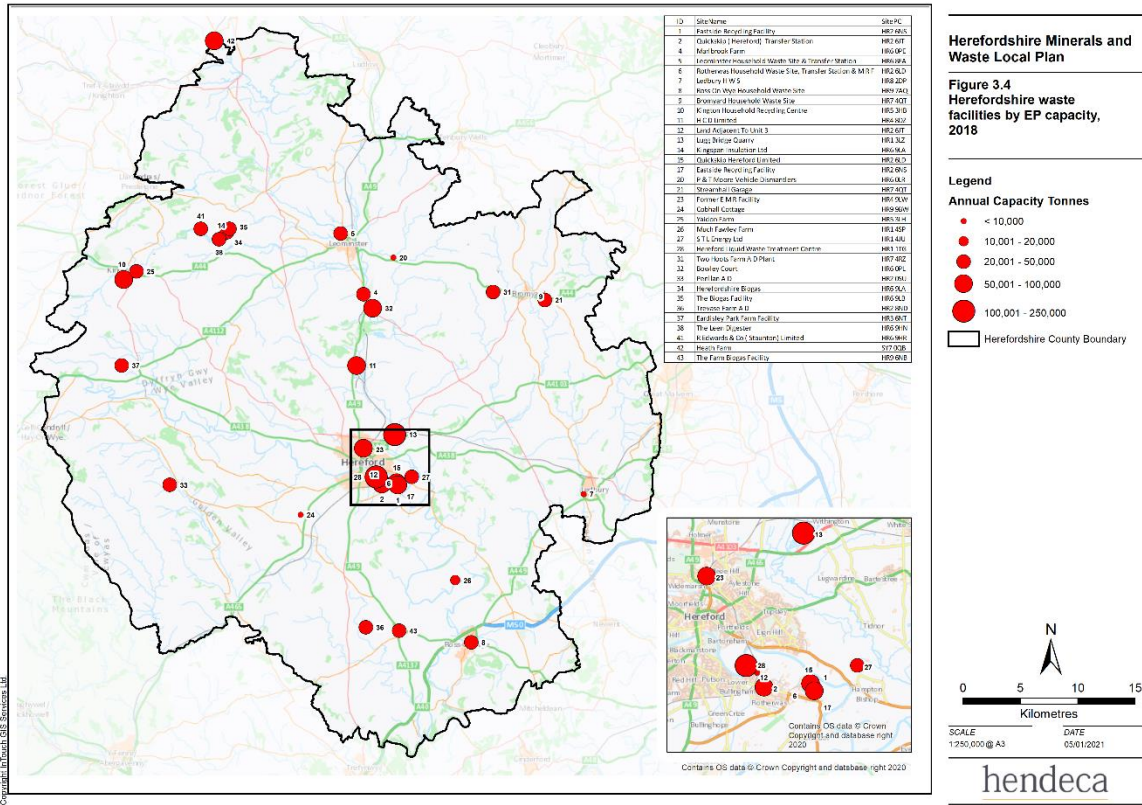
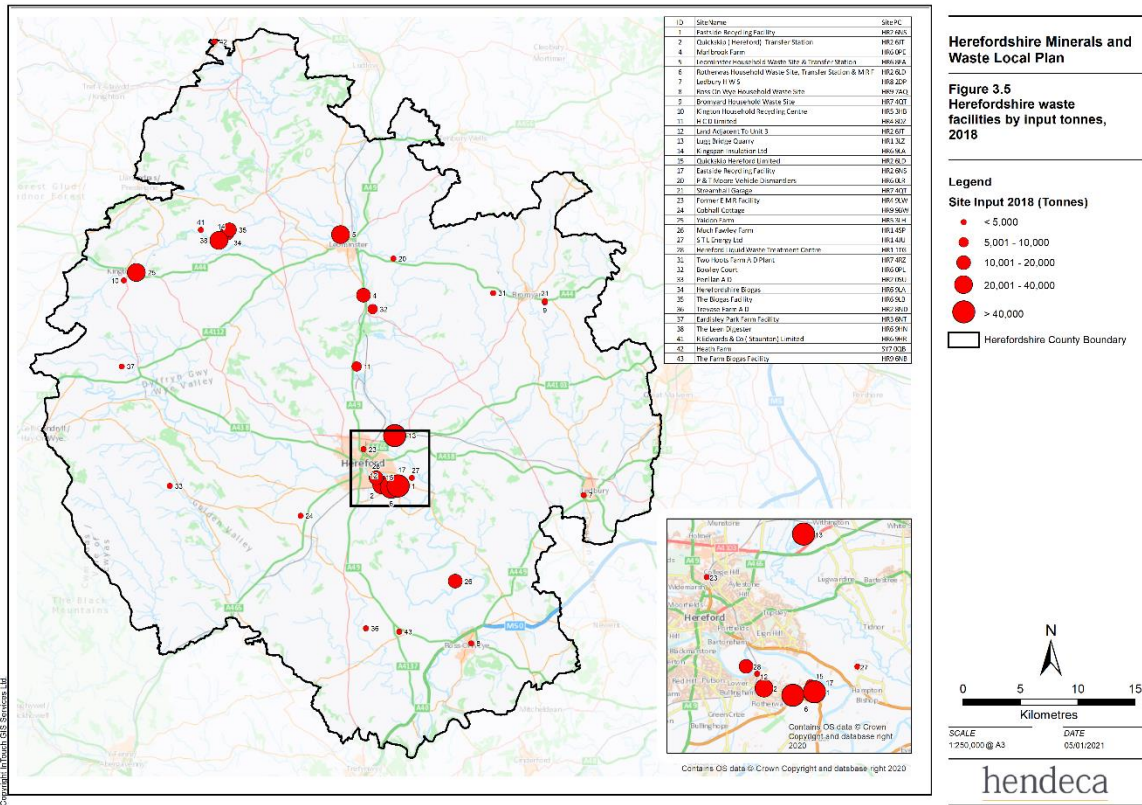


Figure 3.5 Herefordshire waste facilities by input tonnes, 2018



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 requires 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 this 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 E, 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 Environmental Permit Exemptions Database for Shropshire, Herefordshire, Worcestershire and Gloucestershire (the 'EP Exemptions Database') was obtained from the Environment Agency for the WNA 2017, providing the details of each exemption registered at a site as of September 2016. This data was also use for the WNA Update 2018.
- 3.2.9 At this time the EP Exemptions Database used inconsistent terminology with regards to the type of exemption. 'Non-farm' and 'non-agricultural waste only' exemptions are assumed to be the same; as are 'on-farm' and 'agricultural waste only' exemptions; and 'both agricultural

and non-agricultural waste' are generally activities on farms where waste is brought onto a farm e.g. CD&E wastes such as rubble to repair farm roads/tracks.

- 3.2.10 The EP Exemptions Database⁸ can now be downloaded from the data.gov website. The currently available data covers active exemptions as of the end of June 2019 and provides the details of each exemption registered at a site. The database includes a field for Environment Agency Areas, the relevant Environment Agency Area being Shropshire, Herefordshire, Worcestershire & Gloucestershire. However, there are a notable number of entries where this field is blank. In addition, the inconsistent terminology with regards to farm and non-farm exemptions has been simplified, with exemptions now identified as 'On a farm' exemptions or 'Not on a farm' exemptions.
- 3.2.11 Therefore, the data in the EP Exemptions Database needed to be analysed and cleansed to:
- identify exemptions within Herefordshire by using GIS to locate exemptions based in the county by reference to the grid reference given in the database;
 - identify the exemptions registered at each site, as multiple exemptions are often registered at a given site; and
 - remove duplicate registrations, which can occur for a number of reasons⁹:
 - exemption holders renewing their registration before the existing registration has expired, resulting in identical registrations for the same location between two and a half and three years apart;
 - the same exemption being registered more than once for the same activity/location e.g. two doctors at the same surgery applying for a T28 exemption (Sorting and denaturing of controlled drugs for disposal); or
 - multiple registrations of the same exemption at the same location, resulting in multiple registration for the same location; and
 - split the exemptions into 'On a farm' exemptions and 'Not on a farm' exemptions.

Not on a farm exemptions

3.2.12 Within Herefordshire, there are 131 'Not on a farm' exemptions in the EP Exemptions Database as of the end of June 2019, with a total of 343 exemptions registered across these 131 locations (Annex F).

3.2.13 However, when this data set is rationalised there remain 83 locations covering 179 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

⁸ <https://data.gov.uk/dataset/fe546d38-408d-4275-8e74-55e197c6f11a/exemptions> accessed 9th October 2019

⁹ To overcome these issues the grid reference was used to identify individual locations with an exemption only counted once at each location.

- activities where the tonnage involved is likely to be insignificant are excluded (e.g. D6 - Disposal by incineration).

3.2.14 Table 3.8 presents a summary of the relevant data.

Table 3.8 Relevant 'Not on a farm' exempt activities, Herefordshire, June 2019

Exemption	Description	Number
D7	Burning waste in the open	38
T1	Cleaning, washing, spraying or coating relevant waste	5
T2	Recovery of textiles	1
T4	Preparatory treatments (baling, sorting, shredding etc)	8
T5	Screening and blending of waste	2
T6	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising	18
T8	Mechanical treatment of end-of-life tyres	1
T9	Recovery of scrap metal	8
T10	Sorting mixed waste	2
T12	Manual treatment of waste	4
T16	Treatment of waste toner cartridges and waste ink cartridges by sorting, dismantling, cleaning or refilling	1
T19	Physical and chemical treatment of waste edible oil and fat to produce biodiesel	1
T23	Aerobic composting and associated prior treatment	6
T25	Anaerobic digestion at premises not used for agriculture and burning of resultant biogas	2
U1	Use of waste in construction	35
U4	Burning of waste as a fuel in a small appliance	13
U8	Use of waste for a specified purpose	13
U9	Use of waste to manufacture finished goods	2
U11	Spreading waste on non-agricultural land to confer benefit	7
U12	Use of mulch	12

Note: Some of these exemptions could be on-farm activities based on the address provided for certain exemptions (Annex F)

3.2.15 The detail of these exempt activities has been reviewed so as to estimate the waste tonnages that should be used within this WNA (the assumptions used are presented at Annex G). This review shows how the exemptions have been considered and are proposed to be used in the assessment.

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

'On a farm' exemptions

3.2.17 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.

3.2.18 This means that most farms have to register for numerous exemptions. In Herefordshire, 1,470 farms/locations on farms have registered exemptions in June 2019, with multiple exemptions registered at many farms. This is a significant increase from the 635 locations recorded in the EP Exemptions Database at the end of September 2016. Whilst the requirement for farms to register exemptions came into effect in 2013, the Environment Agency only launched the digital service for registering waste exemptions in 2016 and there could have been a delay in farms using the system, which could explain the uplift in numbers.

3.2.19 Table 3.9 lists the top 20 most registered exemptions by farms in Herefordshire. Table 3.9 highlights that the majority of registered exemptions relate to handling wastes generated on-farm, which would be captured within agricultural waste estimates.

Table 3.9 Top 20 On a farm exempt activities, Herefordshire, June 2019

Exemption	Description	Number
D7	Burning waste in the open	1,407
U10	Spreading waste on agricultural land to confer benefit	1,125
D1	Deposit of waste from dredging of inland waters	999
U1	Use of waste in construction	991
T6	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising	887
U8	Use of waste for a specified purpose	823
S2	Storage of waste in a secure place	642
S1	Storage of waste in secure containers	536
U13	Spreading of plant matter to confer benefit	429
T14	Crushing and emptying vehicle waste oil filters	387
U4	Burning of waste as a fuel in a small appliance	334
U12	Use of mulch	310
D4	Deposit of agricultural waste consisting of plant tissue under a Plant Health Notice	278
U14	Incorporation of ash into soil	250
T23	Aerobic composting and associated prior treatment	232
S3	Storage of sludge	217

Exemption	Description	Number
T1	Cleaning, washing, spraying or coating relevant waste	210
D6	Disposal by incineration	160
T9	Recovery of scrap metal	159
T4	Preparatory treatments (baling, sorting, shredding etc)	150

3.2.20 There are a small number of on-farm exemptions that will import C&I and CD&E wastes and consequently are considered further (Annex G). 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.

Summary of Capacity Operating in Herefordshire

3.2.21 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 (section 6.2).

3.2.22 Over the last four 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 800kt and waste inputs by 115kt;
- the permitting and increased operation of a physical treatment facility at Lugg Bridge Quarry, with a capacity of 250kt and an input of 100kt.

3.2.23 In 2018, there was permitted capacity of 1,793,472 tonnes provided across facilities that actually received 463,209 tonnes.

3.2.24 Whilst there are a significant number (approximately 1,600) of locations with exemptions across Herefordshire:

- the majority are On a 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; and
- there are over 1000 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 Local Authority Collected Waste ('LACW')

- 4.1.1 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.
- 4.1.2 Whilst 'waste from households' is the Government's statistical measure it does not truly reflect waste generated by households as it excludes CD&E waste collected at CA sites that will predominately be generated by householders.
- 4.1.3 Therefore, when considering LACW arisings and forecasts, it can be useful to consider waste generated by households discretely from other LACW such as trade waste and parks waste etc.

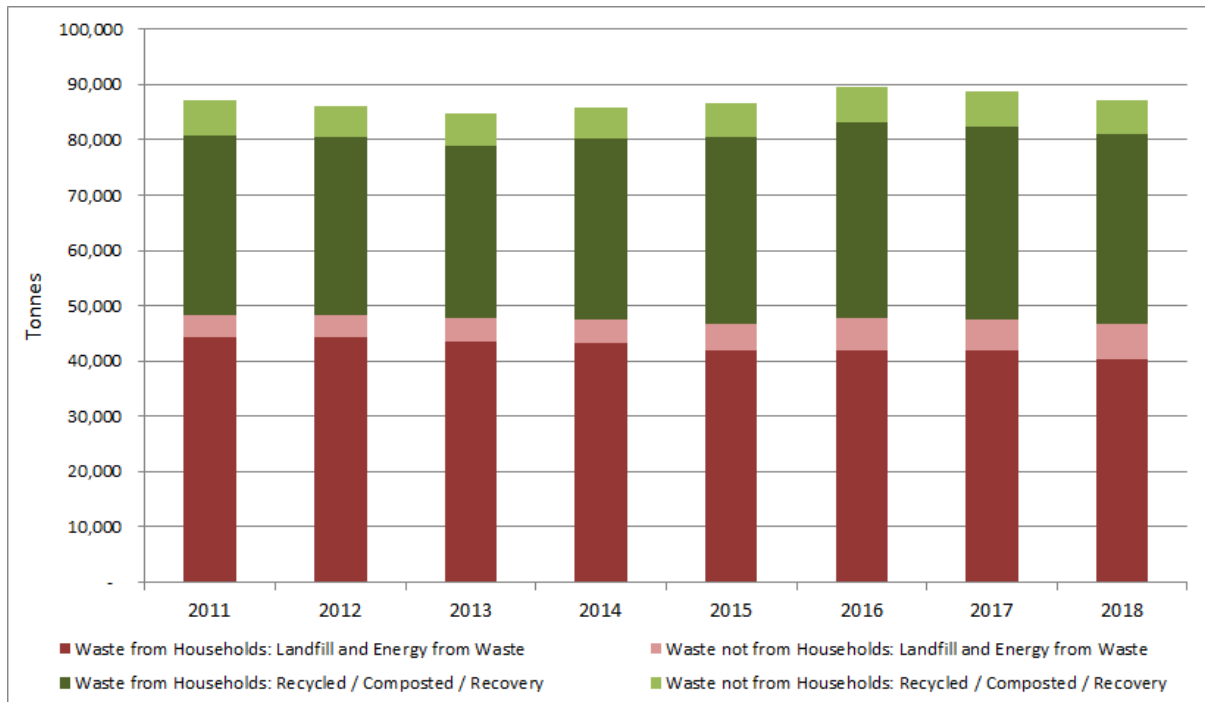
LACW arisings in Herefordshire

- 4.1.4 In 2016, approximately 89,650 tonnes of LACW was produced in Herefordshire, of which 77,350 tonnes was 'waste from households'. This is consistent with LACW growth scenarios 2 and 4a (section 5.2).
- 4.1.5 By 2017, approximately 88,870 tonnes of LACW was produced in Herefordshire, of which 76,750 tonnes was 'waste from households'. This is a slight reduction in both the LACW and 'waste from households' arisings compared to 2016.
- 4.1.6 2018 saw a further reduction in the amount of LACW produced in Herefordshire, with approximately 87,050 tonnes produced, of which 74,850 tonnes was 'waste from households'. The reduction was due to a decrease in residual waste (both at the kerbside and Household Waste Recycling Centres (HWRC)) and garden waste, rubble and scrap metal collected at HWRC. These reductions are slightly offset by an increase in the tonnages of residual commercial waste collected.
- 4.1.7 So, whilst 2016 arisings sit between the LACW growth scenarios 2 and 4a, and scenarios 1 and 4 (section 5.2), 2018 arisings are slightly below the LACW growth scenarios 2 and 4a, which are the lowest forecasts.
- 4.1.8 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 2018.
- 4.1.9 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 based on data published by the Ministry for Housing, Communities and Local Government (MHCLG, formerly DCLG). This is useful information in considering future arisings.
- 4.1.10 However, the responsibility for household projections subsequently transferred to the Office for National Statistics (ONS), which published its first projections at the end of September 2018. Therefore, Table 4.1 also includes waste generation rates based on the ONS household projections. The ONS household projections are fractionally lower than the MHCLG projections, which means the resultant waste generation rates are fractionally higher.

Table 4.1 LACW arisings, Herefordshire, 2011 to 2018

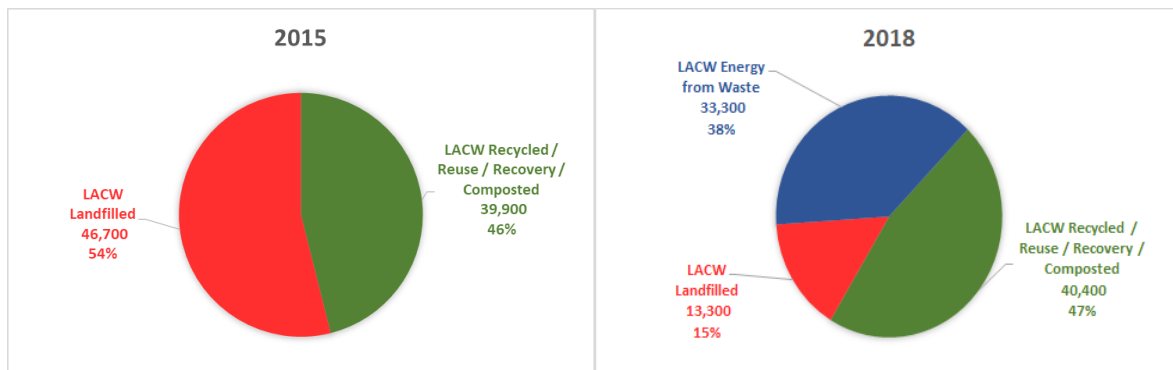
Description		2011	2012	2013	2014	2015	2016	2017	2018	row
Waste from households ^a	Recycled / composted / recovery	32,454	32,054	31,210	32,610	33,717	35,325	34,883	34,426	1
	Landfill and Energy from Waste	44,399	44,335	43,563	43,251	42,039	42,033	41,870	40,429	2
	Total waste from households	76,854	76,389	74,773	75,861	75,755	77,358	76,753	74,855	3
Waste not from households ^a	Recycled / composted / recovery	6,395	5,713	5,732	5,592	6,212	6,464	6,430	6,000	4
	Landfill and Energy from Waste	3,133	3,367	3,452	3,636	3,933	5,808	5,688	6,190	5
	Total waste not from households	9,528	9,079	9,184	9,228	10,145	12,273	12,118	12,190	6
Total LACW		87,184	86,146	84,723	85,800	86,631	89,631	88,871	87,045	7
Total waste generated by households ^b		83,337	82,180	80,548	81,470	81,984	83,841	83,164	80,777	8
MHCLG Number of households ^c		78,454	79,215	79,829	80,526	81,244	81,961	82,653	83,388	9
Waste from households per household (tonnes/household)		0.980	0.964	0.937	0.942	0.932	0.944	0.929	0.898	10
LACW per household (tonnes/household)		1.111	1.087	1.061	1.065	1.066	1.094	1.075	1.044	11
Waste generated by households per household (tonnes/household)		1.062	1.037	1.009	1.012	1.009	1.023	1.006	0.969	12
ONS Number of households ^d		78,192	78,865	79,328	79,944	80,463	81,102	81,570	82,047	13
Waste from households per household (tonnes/household)		0.983	0.969	0.943	0.949	0.941	0.954	0.941	0.912	14
LACW per household (tonnes/household)		1.115	1.092	1.068	1.073	1.077	1.105	1.090	1.061	15
Waste generated by households per household (tonnes/household)		1.066	1.042	1.015	1.019	1.019	1.034	1.020	0.985	16
Notes:										
a:Tonnage data source, Herefordshire Council										
b: 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.)										
c: Ministry for Housing, Communities and Local Government (MHCLG) Household projections (formerly DCLG)										
d: ONS Household projections in England: 2016-based, accessed October 2019										

Figure 4.1 LACW arisings, Herefordshire, 2011 to 2018



4.1.11 Figure 4.1 is not able to show the shift in the management routes used for Herefordshire’s LACW since the EnviRecover Facility started operating in 2017. For information, this is shown in Figure 4.2.

Figure 4.2 LACW management methods, Herefordshire, 2015 and 2018



4.1.12 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 and a long period of relative stabilisation.

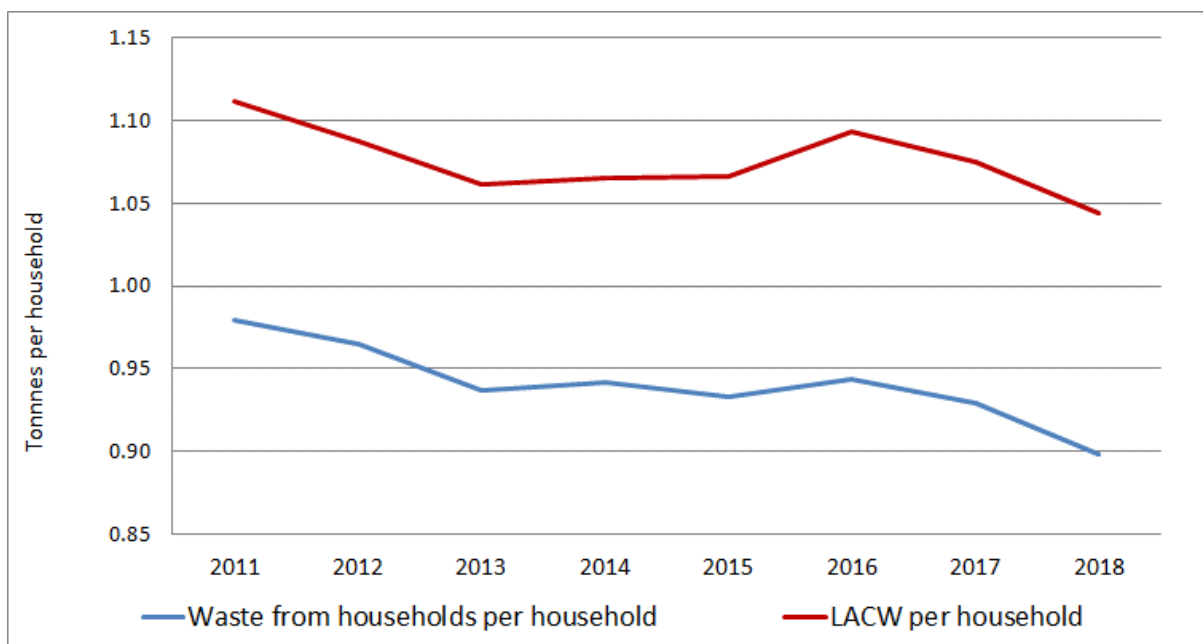
4.1.13 Waste generated could be expected to increase if households (and population) are projected to grow. However, economic growth and changing consumption habits will also influence waste production. Therefore, the two key influences on waste arisings are:

- the number of households (and to a lesser extent population) the growth of 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.

4.1.14 Table 4.1 and Figure 4.3 show that both ‘waste from households’ per household and LACW per household have stayed relatively constant over the last seven years, with no significant shifts up or down. However, overall waste generation is showing a slight decrease. This would suggest that, historically, waste generation in Herefordshire is more closely linked to a change in the number of households rather than economic growth. A growth in LACW per household would indicate that economic growth had a greater influence.

4.1.15 A greater upturn is experienced in 2016 in LACW per household, which would imply economic growth is having an influence on LACW in Herefordshire. However, from 2017 the data shows waste generation levels reverting to those seen in years 2013 to 2015, with continued reduction in 2018.

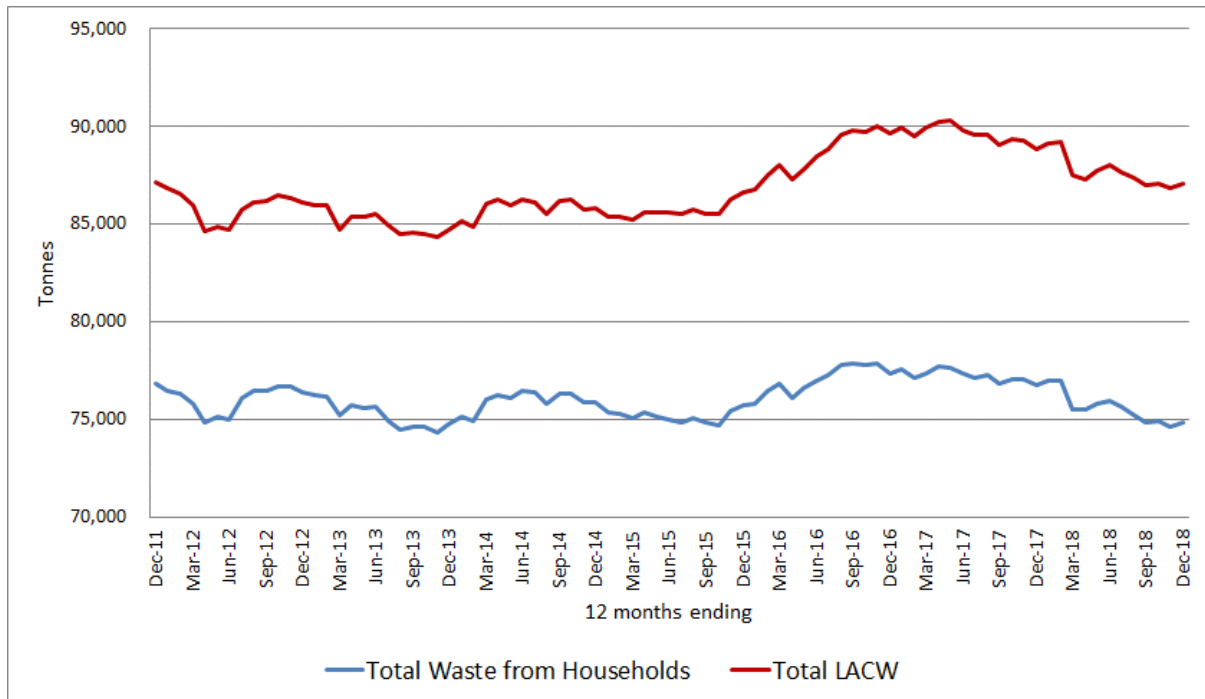
Figure 4.3 Trends in LACW and waste from households per household, Herefordshire, 2011 to 2018



4.1.16 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. Figure 4.4 provides the rolling 12-month tonnage data¹⁰ for total LACW arisings using monthly data from December 2011 to December 2018 inclusive.

¹⁰ Each data point presents the tonnage for the preceding 12 months, so that each data point represents a full year's tonnage.

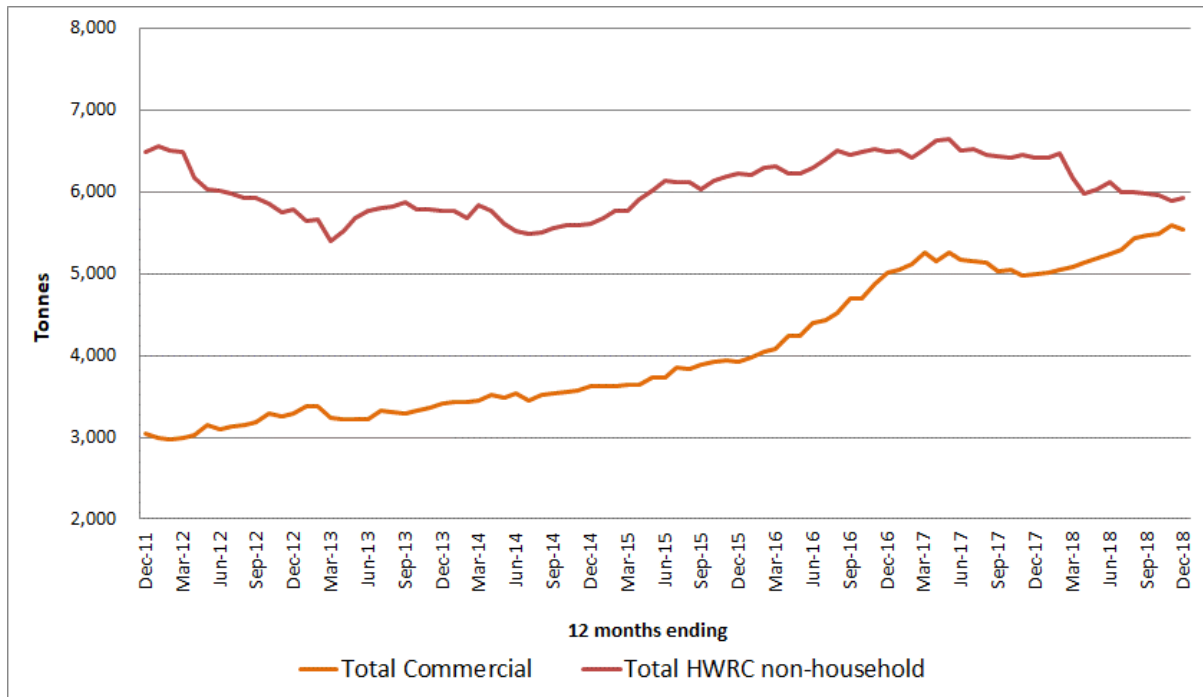
Figure 4.4 Total LACW and 'waste from households', rolling 12-month tonnage, Herefordshire, December 2011 to December 2018



4.1.17 Figure 4.4 shows a notable increase in Total LACW from September 2015 to September 2016, which then appears to stabilise through the first half of 2017. This is followed by a gradual reduction toward the end of 2017, and a more substantial drop by March 2018. Between August 2016 and August 2017, there have been some minor decreases in most elements of the LACW stream. However, there was a reduction in the 'waste from households' in the first two quarters of 2018.

4.1.18 However, as shown in Figure 4.5, the commercial waste element of LACW continued to grow until the end of 2016, before stabilising during 2017 and then rising again during 2018.

Figure 4.5 Total commercial and non-household CA site waste arisings, rolling 12-month tonnage, Herefordshire, December 2011 to December 2018



4.2 Commercial and Industrial (C&I) waste

Introduction

4.2.1 Over recent years C&I waste arisings estimates made at the national level have not been 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 Waste Need Assessment is based on the methodology developed by Defra in 2014¹¹ that takes account of revisions made by Defra since 2014.

4.2.2 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.

4.2.3 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; and
- inputs to exemption facilities;

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

¹¹ Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England, Defra, 2014

Inputs to permitted facilities

- 4.2.4 Operators of permitted waste facilities are requested to provide information on the 'origin' 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.
- 4.2.5 However, where operators do not provide accurate information on the origin of waste, the WDI reports the origin as 'Not Codeable'; where possible, 'Not Codeable' waste is assigned to the region of origin. Having considered wastes identified as originating in Herefordshire, there is a need to consider the potential tonnage of 'Not Codeable' waste that can reasonably be assumed to have been generated in Herefordshire.
- 4.2.6 The WDI data for 2013 to 2018 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. Table 4.2 summarises the data extracted to show the quantities of waste received by sites in England with the origin identified as Herefordshire.

**Table 4.2 Waste received at permitted facilities in England with Herefordshire origin 2013 to 2018 by LoW Chapter heading
(rounded to nearest 10 tonnes)**

LoW Chapter	Chapter Description	Tonnes					
		2013	2014	2015	2016	2017	2018
01	Mine and Quarry Wastes	-	-	-	-	-	2
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	30,130	38,620	95,970	121,710	134,170	126,020
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	180	220	270	250	5	3
04	Wastes from the leather, fur and textile industries	-	-	3	-	-	-
06	Wastes from inorganic chemical processes	8	30	2	40	3	5
07	Wastes from organic chemical processes	1	1	1	30	100	60
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	350	600	480
09	Wastes from the photographic industry	23	20	7	2	<1	-
10	Wastes from thermal processes	7	40	90	150	120	80
11	Wastes from chemical surface treatment and coating of metals and other materials, non-ferrous hydro-metallurgy	997	80	220	60	1,580	1,670
12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics	363	150	330	550	550	580
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	1,190	1,750	1,730
14	Waste organic solvents, refrigerants and propellants (except 07 and 08)	121	20	20	30	100	110
15	Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	1,683	2,040	2,220	2,230	2,080	1,670
16	Wastes not otherwise specified in the list	6,865	24,760	11,570	14,990	13,790	15,050

LoW Chapter	Chapter Description	Tonnes					
		2013	2014	2015	2016	2017	2018
17	Construction and demolition wastes (including excavated soil from contaminated sites)	104,462	111,710	72,960	77,750	122,140	143,930
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	450	410	300
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	81,330	25,900	32,620
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	178,997	182,600	209,590	221,940	231,140	236,460
Total		390,360	405,520	447,310	523,050	534,440	560,770
Tonnage rounded to nearest 10 tonnes, unless the tonnage was less than 10 tonnes, for which the tonnage rounded to the nearest 1 tonne							

4.2.7 There are three notable differences between the 2015 and 2016 datasets:

- Under LoW Chapter 2, 28,000 tonnes of waste with LoW code 02 07 04, 'materials unsuitable for consumption or processing from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)', was sent to Netheridge Sewage Treatment Works in Gloucestershire. It is possible that this is a one-off arising.
- An additional 29,000 tonnes were reported under LoW Chapter 19. The change is predominantly due to the increase in the following waste types; however, they will be filtered out at the next stage:
 - LoW code 19 07 03 (+2,000 tonnes), non-hazardous landfill leachate;
 - LoW code 19 12 02 (+4,650 tonnes), ferrous metal from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified;
 - LoW code 19 12 09 (+8,900 tonnes), minerals (for example sand, stones) from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified, which is likely to be from the processing of CD&E wastes;
 - LoW code 19 12 12 (+11,675 tonnes), other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11 (for example sorting, crushing, compacting, pelletising), which is potentially from increased processing of wastes at transfer stations.
- An additional 11,700 tonnes were reported under LoW Chapter 20, which will partly be as a result of the increase in LACW and some potential double counting of that waste when handled through transfer stations.

4.2.8 There are also some notable differences between the 2016 and 2017 datasets:

- Under LoW Chapter 2, the tonnage report against LoW code 02 07 04, 'materials unsuitable for consumption or processing from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)' was not a one-off arising. In 2017, 28,670 tonnes with LoW code 02 07 04, were sent to Netheridge Sewage Treatment Works in Gloucestershire.
- An additional 12,500 tonnes were reported under LoW Chapter 02, which is made up of some increase and decrease across the sub-sectors covered under LoW Chapter 02. The predominant change was an increase of 18,000 tonnes in the 'waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing' which was off-set by reductions in the wastes from:
 - the preparation and processing of meat, fish and other foods of animal origin (-1,300 tonnes);
 - fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation (-3,150 tonnes); and
 - the dairy products industry (-1,250 tonnes).

The increases in the 'waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing' are principally from the two waste streams LoW code 02 01 03 'plant-tissue waste' (+10,600 tonnes) and LoW code 02 01 03 'animal faeces, urine and manure' (+ 7,500 tonnes).

Both of these waste streams are likely to be handled through on-farm anaerobic digestion systems (for which there has been a significant increase in capacity over the last 5 years) and would not normally contribute to C&I waste arisings.

- An additional 44,400 tonnes were reported from the under LoW Chapter 17, C&D waste. The change is predominantly due to the increase in the following waste types; however, they will be filtered out at the next stage:
 - LoW code 17 01 07 (+9,400 tonnes), non-hazardous mixtures of concrete, bricks, tiles and ceramics;
 - LoW code 17 05 04 (+27,700 tonnes), non-hazardous soil and stones;
 - LoW code 17 08 02 (+3,150 tonnes), non-hazardous gypsum-based construction materials minerals; and
 - LoW code 17 09 04 (+3,500 tonnes), non-hazardous mixed construction and demolition wastes.
- A reduction of 55,400 tonnes reported under LoW Chapter 19. The change is predominantly due to the reduction in two waste types; however, they will be filtered out at the next stage:
 - LoW code 19 12 09 (-7,500 tonnes), minerals (for example sand, stones) from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified, which is likely to be related to the processing of CD&E wastes;
 - LoW code 19 12 12 (-42,000 tonnes), other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11 (for example sorting, crushing, compacting, pelletising), which is potentially from a change in coding by transfer stations processing of wastes.

4.2.9 There are also a number of changes between the 2017 and 2018 datasets:

- Under LoW Chapter 2, there was a reduction of just over 8,000 tonnes in the total amount of waste reported under LoW Chapter 02, which again is made up of some increases and decreases across the sub-sectors covered under LoW Chapter 02:
 - a 10,000 tonne reduction in 'waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing', which reversed half the increase seen between 2016 and 2017;
 - an increase of 4,700 tonnes reported from 'fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation';
 - an increase of 6,000 tonnes in 'wastes from the dairy products industry'; and
 - an 8,700 tonne reduction in tonnes in 'wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)'.
- An additional 21,800 tonnes were reported the under LoW Chapter 17, C&D waste. The change is predominantly due to the increase in two waste types, much of which was received at Lugg Bridge Quarry; again, they will be filtered out at the next stage:
 - LoW code 17 01 07 (+16,300 tonnes), non-hazardous mixtures of concrete, bricks, tiles and ceramics; and

- LoW code 17 09 04 (+7,400 tonnes), non-hazardous mixed construction and demolition wastes.
 - There were also increases in the wastes reported under LoW Chapter 19 and LoW Chapter 20; 6,700 tonnes and 5,300 tonnes respectively
- 4.2.10 The next step aims to isolate the C&I waste fraction by 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; and
 - waste deposited at Leominster HWRC & WTS, Rotherwas HWRC, WTS & MRF and Ledbury, Ross on Wye, Bromyard HWRC and Kington 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).
- 4.2.11 For the years 2013 to 2015, these steps reduced the tonnage by approximately 250,000 to 270,000 tonnes. Using the 2016 data, these steps reduced the tonnage by approximately 300,000 tonnes, for 2017 the tonnage was reduced by approximately 310,000 tonnes and for 2018 the tonnage was reduced by approximately 325,000 tonnes.

Waste Transfer Stations

- 4.2.12 There is a significant risk of double counting waste handled through waste transfer stations. Not least, 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.
- 4.2.13 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 Mercia Waste Management facilities in Herefordshire 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.
- 4.2.14 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.
- 4.2.15 Annex H 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.

4.2.16 As highlighted above, commercial waste collected by Herefordshire Council needs to be factored back into the estimate of C&I waste arisings. 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;
- 5,020 tonnes in 2016;
- 4,910 tonnes in 2017; and
- 5,530 tonnes in 2018.

Metals Recycling Sites

4.2.17 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.

4.2.18 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 waste 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.

4.2.19 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 appeared 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 kilograms i.e. 5.6 tonnes, which would be consistent with the other tonnes of this material removed from the site.

4.2.20 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.

4.2.21 The detailed review of the waste removed from metals recycling site/vehicle dismantlers in 2016 highlighted 5,650 tonnes of waste that would not have been excluded by removing LoW Chapter 17 & 19 wastes as part of the initial analysis. In addition, 360 tonnes were transferred to another facility in Herefordshire, which means it is likely to be double counted twice.

- 4.2.22 The detailed review of the waste removed from metals recycling site/vehicle dismantlers in 2017 highlighted 3,600 tonnes of waste that would not have been excluded by removing LoW Chapter 17 & 19 wastes as part of the initial analysis. In addition, 440 tonnes were transferred to another facility in Herefordshire, which means it is likely to be double counted twice.
- 4.2.23 The detailed review of the waste removed from metals recycling site/vehicle dismantlers in 2018 highlighted 5,960 tonnes of waste that would not have been excluded by removing LoW Chapter 17 & 19 wastes as part of the initial analysis. In addition, 420 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

- 4.2.24 In collating the data from the analysis, it was noticed that in 2017 there was a significant tonnage of waste (9,550 tonnes) coded under LoW 20 01 08 'biodegradable kitchen and canteen waste', when in previous years less than 500 tonnes of waste were attributed to this LoW code. LoW 20 01 08 is normally used for separately collected food waste, and as Herefordshire Council does not collect separated food waste for households, the source of this waste was investigated further.
- 4.2.25 The waste was received at Cumberlow Green Farm (Permit No. EPR/QP3097NT) a composting facility in Buntingford, Hertfordshire. This indicated a potential error in the coding of the origin of the waste.
- 4.2.26 WDF was used to determine if any local authorities use Cumberlow Green Farm for the treatment of organic waste. In 2016 (the last full calendar year available in WDF) the data from WDF showed that the local authorities of Hertfordshire sent 29,800 tonnes of food and garden wastes to Cumberlow Green Farm, which is comparable to the 30,470 tonnes of food and garden wastes reported in the WDI 2016 with Herefordshire as the origin.
- 4.2.27 This would suggest that a proportion of the waste received at Cumberlow Green Farm has been incorrectly coded to Herefordshire as opposed to Hertfordshire in the WDI 2017. Therefore, waste received at Cumberlow Green Farm with an origin of Herefordshire has been excluded from the data.
- 4.2.28 Similarly, in 2018, there was a significant increase in the tonnage of waste reported under LoW Chapter 20 with its origin reported as Herefordshire.
- 4.2.29 Pearce Recycling Company Ltd (Permit No. EPR/FP3394SL), which operates a MRF in St Albans, Hertfordshire, was identified as receiving 16,600 tonnes of LoW 20 01 01 (paper and cars) and LoW 20 01 38 (non-hazardous wood waste) from Herefordshire. This indicated a potential error in the coding of the origin of the waste.
- 4.2.30 Again, WDF was used to determine if any local authorities use Pearce Recycling. The data for Q1 of 2018 showed that Hertfordshire County Council sent approximately 3,200 tonnes of paper, card and wood to Pearce Recycling. This would suggest waste has been incorrectly coded to Herefordshire as opposed to Hertfordshire in the WDI 2018. Therefore, waste received at Pearce Recycling with an origin of Herefordshire has been excluded from the data.
- 4.2.31 Table 4.3 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 the origin, concluding an interim total of 148,300 tonnes in 2017 and 158,000 tonnes in 2018. This indicates growth in the C&I waste arisings over the study period.

Table 4.3 Estimated C&I waste arisings managed through permitted facilities in England with Herefordshire identified as the origin, 2013 to 2018

LoW Chapter	Chapter Description	Tonnes					
		2013	2014	2015	2016	2017	2018
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	29,900	18,460	40,830	68,890	63,370	65,520
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	180	220	270	250	10	-
04	Wastes from the leather, fur and textile industries	-	-	3	-	-	-
06	Wastes from inorganic chemical processes	8	30	2	40	-	-
07	Wastes from organic chemical processes	1	1	1	30	100	60
08	Wastes from the MFSU of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks	250	150	250	350	600	480
09	Wastes from the photographic industry	23	20	7	2	-	-
10	Wastes from thermal processes	7	40	90	150	120	80
11	Wastes from chemical surface treatment and coating of metals and other materials, non-ferrous hydro-metallurgy	1,000	80	220	60	1,580	1,670
12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics	360	150	330	550	550	580
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	1,190	1,750	1,690
14	Waste organic solvents, refrigerants and propellants (except 07 & 08)	120	20	20	30	100	110
15	Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	1,680	2,040	2,210	2,110	2,080	1,670
16	Wastes not otherwise specified in the list	6,860	24,750	11,430	14,830	13,640	14,820
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	450	410	300
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	56,970	45,010	52,090	63,010	67,580	77,420
Total following exclusion of LoW Sub-chapters 0201, Chapters 17 and 19, LACW, the estimated double counted wastes passing through WTS and mis-coded origins		100,530	93,010	109,210	151,930	151,900	164,400
Potential double counting at metal recycling sites		-5,560	-4,260	-5,640	-5,650	-3,600	-5,960
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	146,000	148,000	158,000
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.							

- 4.2.32 The 2016 and 2017 estimated arisings for C&I waste show a notable increase from that at 2015. Part of this increase is due to 28,000 to 29,000 tonnes of materials unsuitable for human consumption or processing from the production of alcoholic and non-alcoholic beverages being sent to a wastewater treatment facility.
- 4.2.33 In 2018, the quantity handled at waste water treatment plants has reduced to approximately 19,800 tonnes and despite this reduction the estimated arisings for C&I waste has increased by 10,000 tonnes to 158,000 tonnes. The 10,000 tonne increase is predominantly due to the increase in LoW Chapter 20 wastes, which was driven by increases in the following waste streams:
- LoW 200140 code 'metals' (+4,100 tonnes) which can be prone to double counting due to movements between MRS;
 - LoW code 20 02 01 'biodegradable waste' (+1,500 tonnes)
 - LoW code 20 03 01 'mixed municipal waste' (+3,000 tonnes);
 - LoW code 20 03 04 'septic tank sludge' (+3,800 tonnes), which could potentially be due to the requirement to prevent discharges from septic tanks directly to a surface water. If a septic tank discharges directly to surface water, it must be replaced or upgraded by 1 January 2020. So, the increase in septic tank sludge could relate to the emptying of old septic tanks prior to replacement.
- 4.2.34 However, there has been a steady increase in the quantity of waste, with origins in the West Midlands, handled through permitted facilities between 2013 and 2018 (Table 4.5 below). This suggests that overall waste arisings are increasing, which is potentially linked to the improvement in the economy as it recovers from the recession.
- 4.2.35 Consequently, if the C&I waste estimate for forecasting purposes is assumed to be waste managed through permitted facilities minus the materials unsuitable for consumption or processing handled at waste water treatment plants (28,670 tonnes in 2017 and 19,800 tonnes in 2018) the estimates would be:
- 120,000 tonnes (rounded to the nearest 1,000 tonnes) in 2017; and
 - 138,000 tonnes (rounded to the nearest 1,000 tonnes) in 2018.

'Not Codeable' waste

- 4.2.36 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 attributed 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.
- 4.2.37 'Not Codeable' tonnages within the WDI can be significant and therefore need to be considered.
- 4.2.38 Table 4.4 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 4.4 Quantity of 'Not Codeable' waste in West Midlands, 2013 to 2018

	Description	Tonnes					
		2013	2014	2015	2016	2017	2018
1	Origin identified as the West Midlands	12,827,289	14,148,269	15,884,277	17,172,672	18,461,852	17,592,373
2	'Not Codeable' to sub-region or WPA level	3,944,825	3,574,756	4,633,702	5,270,077	5,825,810	5,625,866
3	Percentage 'Not Codeable'	30.8%	25.3%	29.2%	30.7%	30.7%	32.0%

4.2.39 The figures show that for waste with the origin identified as the West Midlands, 25% to 32% 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, the C&I waste estimates for Herefordshire could be 25% to 32% higher as a result of the 'Not Codeable' data at the West Midlands level within the WDI. This is equivalent to 20,000 to 45,000 tonnes waste, depending on which year is being considered.

4.2.40 However, as highlighted in paragraphs 3.1.12/13 there appears to have been an apparent improvement in reporting by the sites in Herefordshire, which could mean the amount of attributed to 'West Midlands - WPA not codeable' could be an overestimate, which in turn could lead to an overestimate of C&I arisings.

Waste handled at exempt facilities

4.2.41 Section 3.2 summarises the exempt activities registered in Herefordshire with the detailed analysis of the potential contribution from different exemptions set out in Table 3.8. The contribution to the C&I waste estimates is summarised in Table 4.5.

Table 4.5 Potential C&I waste quantities handled through exempt facilities in 2018

Exemption	Contribution to the C&I waste estimates	Number of Contributing Exemptions	Estimate C&I waste managed through exemption (tonnes)
D7 - Burning waste in the open	10 tonnes annum per exemption	38	380
T4 - Preparatory treatments (baling, sorting, shredding etc)	5,000 tonnes annum per contributing exemption	1	5,000
T23 - Aerobic composting and associated prior treatment	250 tonnes annum per exemption	6	1,500
U4 - Burning of waste as a fuel in a small appliance	10 tonnes annum per exemption	13	130
U8 - Use of waste for a specified purpose	50 tonnes per annum per exemption	13	650
Total			7,660

Waste sent directly to permitted facilities in Wales

- 4.2.42 Waste sent from Herefordshire directly to permitted facilities in Wales are not captured in the 2013 to 2015 WDI data. To provide an understanding of the waste potentially sent directly to permitted facilities in Wales for the WNA 2017, data from the 2011 and 2012 WDI (which included Welsh data) were reviewed.
- 4.2.43 Since the WNA 2017 was published, Natural Resources Wales ('NRW') has published waste permit returns for 2013 to 2018, which provides comparable data to the Environment Agency's WDI. This Assessment has consequently analysed the data from 2011 to 2018 to provide an understanding of the waste potentially sent directly to permitted facilities in Wales. This is presented in Table 4.6.
- 4.2.44 The data highlight that there are some potential issues with the coding of waste, particularly in years 2014 and 2015, with notable quantities coded under LoW 20 03 01 (mixed municipal waste). A detailed review of the waste received at permitted facilities in Wales and the waste removed from permitted facilities in Herefordshire highlighted the following points:
- The quantities and waste types removed from facilities in Herefordshire do not match the quantities and waste types received at facilities in Wales. There are a number of potential reasons for this, e.g. some wastes may be sent to facilities not covered by the Natural Resources Wales permit returns (e.g. exempt sites) the receiving site may use different LoW codes, the receiving site may not code the origin of the waste or code it incorrectly. This means it is difficult to actually determine waste potentially sent directly to permitted facilities in Wales.
 - In 2016, over 70% of the waste removed from permitted facilities in Herefordshire was from the Eastside Recycling Facility and was predominantly coded under LoW Chapter 19. 5,150 tonnes of waste under LoW Chapter 20 was removed from facilities in Herefordshire and identified with Wales as the destination; however only 4,460 tonnes of waste was received at permitted facilities in Wales under LoW Chapter 20 with the origin identified as Herefordshire.
 - In 2015, almost 22,000 tonnes of waste from the Eastside Recycling Facility and Quickskip (Hereford) Transfer Station was coded as LoW 20 03 01, as opposed to under LoW Chapter 19. In addition, 3,350 tonnes of biodegradable garden and park wastes (LoW 20 02 01) was sent to Wales from the Rotherwas Household HWRC/Transfer Station/MRF. So, whilst these wastes have been accounted for through the assessment as wastes received at permitted facilities in England, there is a risk of double counting them as they have been coded under Chapter 20.
 - In 2014, 6,280 tonnes of waste under LoW Chapter 20 was removed from facilities in Herefordshire and identified with Wales as the destination; however, 13,070 tonnes of waste were received at permitted facilities in Wales under LoW Chapter 20 with the origin identified as Herefordshire. Equally 35,490 tonnes of waste under LoW Chapter 19 was removed from facilities in Herefordshire and identified with Wales as the destination; however only 7,570 tonnes of waste were received at permitted facilities in Wales under LoW Chapter 19 with the origin identified as Herefordshire.
 - In the 2018 NRW Waste Permit Returns Data Interrogator, there are over 18,300 tonnes of waste with its origin as Herefordshire, which is sent to a Clinical Waste Transfer Station in Newport. This is the first time since 2013 and 2014 that waste has been reported as being

sent to a Clinical Waste Transfer Station in Wales from Herefordshire. A detailed review of this data highlighted the following information:

- the total tonnage was sent to a single facility Summerleaze Pet Crematorium, operated by Time Right Limited (Permit Number CP3595SX);
- the waste sent from Herefordshire consisted of:
 - 37 tonnes of waste coded under LoW Chapter 9 - Photographic Industry Wastes;
 - 100 tonnes of waste coded under LoW Chapter 15 - Waste Packaging; Absorbents, Wiping Cloths Etc N.O.S.;
 - 16,925 tonnes of waste coded under LoW Chapter 18 - Human and Animal Health Care Waste; and
 - 1,281 tonnes of waste coded under LoW Chapter 20 – Municipal Wastes.
- a total of just under 345,000 tonnes of waste were reported as being accepted at the Summerleaze Pet Crematorium in 2018.
- The NRW permitted wastes sites database¹² indicates that the permitted capacity of the Summerleaze Pet Crematorium is 1,950 tonnes per annum. Based on this information, it has been concluded that the waste received tonnages in the 2018 NRW Waste Permit Returns Data Interrogator are incorrect and that it is most likely the figures have been reported in kilograms as opposed to tonnes. This would mean that the figures are overstated by a factor of 1,000. Consequently, the tonnages in the 2018 data for waste received at Summerleaze Pet Crematorium from Herefordshire have been adjust accordingly with the tonnage being 18.3 tonnes.

Table 4.6 Waste sent to permitted facilities in Wales from Herefordshire, 2011 to 2018

LoW Chapter	Tonnes							
	2011	2012	2013	2014	2015	2016	2017	2018
02: Agriculture and food processing wastes	0.04	20	1,191	0.001	30	66	1,138	7,876
03: Furniture, paper and cardboard manufacturing wastes	-	-	-	-	0.01	0.04	-	-
06: Inorganic chemical process waste	207	8	15	6	7	5	2	10
07: Wastes from organic chemical processes	-	7	-	-	-	-	-	0.2
08: Paints, adhesives, sealants and ink manufacturing waste	-	0.4	0.3	1	0.3	1	1	4
09: Photographic industry wastes	0.05	0.001	0.004	-	0.001	-	-	0.04
10: Thermal Processes Waste								2
11: Chemical surface treatment and coating of metals waste	565	654	505	1,622	1,226	884	556	684
12: Shaping and physical treatment of metals and plastics	66	28	36	307	78	43	115	39

¹² <https://naturalresources.wales/evidence-and-data/maps/find-details-of-permitted-waste-sites/?lang=en>
[27.11.2019@14:44]

LoW Chapter	Tonnes							
	2011	2012	2013	2014	2015	2016	2017	2018
13: Oil wastes and wastes of liquid fuels	189	124	237	451	239	12	91	90
14: Organic solvent, refrigerant and propellant waste	1	0.01	1	0.5	2	-		3
15: Waste packaging; absorbents, wiping cloths etc not otherwise specified.	8	3	11	11	8	149	74	318
16: Wastes not otherwise specified in the list	448	720	1,377	249	162	111	50	548
17: Construction and demolition wastes	19	1	373	1,495	359	212	626	3,360
18: Human and animal health care waste	55	33	51	369	13	-		17
19: Waste and water treatment wastes	18,295	15,810	5,051	7,569	2,438	10,437	21,658	31,371
20: Municipal wastes	1,441	419	1,227	13,070	27,444	4,464	2,939	1,259
Total	21,293	17,827	10,074	25,151	32,007	16,385	27,250	45,581
Total minus LoW Chapters 17 and 19	2,980	2,016	4,650	16,087	29,210	5,735	4,966	10,851

- 4.2.45 Wastes coded under LoW Chapters 17 (CD&E waste) and 19 (wastes from waste management facilities) received at permitted facilities in Wales with the origin identified as Herefordshire need to be discounted because they are not C&I waste or have already been considered in the wastes received at sites in Herefordshire. In addition, the data for 2014 and 2015 potentially needs to be discounted due to the issues with the coding of waste highlighted above.
- 4.2.46 Applying these steps to the data results in a range of 2,000 to 6,000 tonnes of waste that may have been sent directly to permitted facilities in Wales between 2011 and 2017. Given the uncertainty prevalent in the data, it is assumed that 4,000 tonnes (the midpoint in that range) of waste arising in Herefordshire was sent directly to Wales in 2014 and 2015.
- 4.2.47 However, in 2018 there was a notable increase in the estimated waste arisings from Herefordshire sent directly to Wales, to almost 11,000 tonnes. The increase was predominately due to an increase of 6,700 tonnes in the waste reported under LoW Chapter 02: Agriculture and food processing wastes. Almost 5,000 tonnes of the increase were wastes sent to Grosmont Lagoon at Grosmont Wood Farm near Abergavenny which is a non-hazardous waste transfer station permitted in May 2017. The site is operated by Whites Recycling Ltd, which specialise in liquid waste management and recycling to agricultural land of a variety of liquid wastes, such as food manufacture process liquid and brewery sludge.

C&I waste arisings estimates for Herefordshire

4.2.48 Having undertaken the steps described above to analyse the available data, Table 4.7 summarises the estimated C&I waste arisings estimated for Herefordshire for years 2013 to 2018.

Table 4.7 Estimated C&I waste arisings, Herefordshire, 2013 to 2018

	Description	Tonnes					
		2013	2014	2015	2016	2017	2018
1	Estimated C&I waste arisings managed through permitted facilities in England with Herefordshire identified as origin	95,000	89,000	104,000	118,000	120,000	138,000
2	'Not Codeable' waste	0 to 29,300	0 to 22,500	0 to 30,400	0 to 36,200	0 to 36,800	0 to 44,200
3	Waste handled at exempt facilities	8,000	8,000	8,000	8,000	8,000	8,000
4	Waste sent directly to permitted facilities in Wales	4,650	4,000	4,000	5,740	4,960	10,850
5	Total (rounded to nearest 1,000 tonnes)	108,000 to 137,000	101,000 to 124,000	116,000 to 146,000^a	132,000 to 168,000	133,000 to 170,000	157,000 to 201,000

a. The reference to 115,000 to 145,000 tonnes in the WNA 2017 was erroneous; the correct tonnage is stated here

Review of C&I waste arisings in Herefordshire against national data

- 4.2.49 Due to the calculation necessary to estimate C&I waste generation in Herefordshire, it was considered useful to review relevant national waste data sources.
- 4.2.50 The estimated C&I waste arisings for England in 2012 was 43.8 million tonnes¹³. However, in December 2016, Defra¹⁴ published a statistical notice to summarise waste estimates for the UK which have been calculated for European reporting purposes (the December 2016 Notice).
- 4.2.51 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
- 4.2.52 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.
- 4.2.53 The estimates for Herefordshire set out in Table 4.7 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.
- 4.2.54 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.
- 4.2.55 The Office for National Statistics (ONS) holds data on enterprises/local units¹⁵ 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.
- 4.2.56 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:

¹³ Defra, Digest of Waste and Resources Statistics, 2016 (March 2016)

¹⁴ Defra, UK statistics on Waste Notice, December 2016

¹⁵ Local units identify each location in which a company operates. E.g. 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.

- 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.

4.2.57 However, in October 2018 Defra published a further revised figure for C&I waste arisings in England¹⁶. The C&I arisings estimate for England in 2016 was 33.1 million tonnes. Applying the proportion of local units, as above, to the latest Defra estimate would equate to a C&I waste arising for Herefordshire of 149,000 tonnes, which is in approximately the mid-point of the Herefordshire-specific analysis above of 2016.

4.2.58 In March 2019 Defra published an estimate for the C&I waste arisings for England in 2017¹⁷. The C&I waste arisings estimate for England in 2017 was 37.9 million tonnes. Again, applying the proportion of local units, as above, to the latest Defra estimate would equate to a C&I waste arising for Herefordshire of 170,000 tonnes, which is close to the mid-point of the Herefordshire-specific analysis for 2018.

4.2.59 In the March 2019 publication Defra states '*2017 figures are not completely directly comparable with earlier years. Caution should generally be exercised in interpreting apparent year-on-year changes in the C&I data, owing to inherent uncertainties in the underlying data and methodology*'.

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

4.2.61 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.

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

Introduction

4.3.1 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.

¹⁶ Defra, UK Statistics on Waste, 9th October 2018

¹⁷ Defra, UK Statistics on Waste, 7th March 2019

CD&E waste arisings in Herefordshire

- 4.3.2 The last national study to break down 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).
- 4.3.3 The report provided an estimate of the CD&E waste arisings in Herefordshire and Worcestershire for 2005, which is summarised in Table 4.8. Unfortunately, the estimates were not disaggregated to the Herefordshire level.

Table 4.8 CD&E waste arisings, Herefordshire and Worcestershire, 2005

row	Description	Tonnes
1	Estimated production of recycled graded aggregate	404,814
2	Estimated production of recycled ungraded aggregate	374,770
3	Estimated production of recycled soil (excluding topsoil)	69,349
4	Estimated tonnage of unprocessed CDEW entering licensed landfill for engineering, capping, disposal	335,602
5	Estimated weight of waste materials (mainly excavation waste) used on registered exempt sites	155,157
6	Total	1339,692

Source: Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005 Construction, Demolition and Excavation Waste, CLG (February 2007).

- 4.3.4 A report prepared for the West Midlands Regional Assembly, West Midlands Waste Facilities Phase 2: Future Capacity Requirements¹⁸ 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.
- 4.3.5 A further report for the West Midlands Regional Assembly, A Study into Future Landfill Capacity in the West Midlands¹⁹, 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.

National CD&E waste arisings estimates

- 4.3.6 To provide some context to the uncertainty over C&E waste arisings, estimates at the national level set out below are the estimates published by Defra between 2015 and 2019.

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

- 4.3.7 The March 2016 Digest of Waste and Resources Statistics (at Figure 2.1 of that Digest) 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 4.9.

¹⁸ West Midlands Waste Facilities Phase 2: Future Capacity Requirements. Report for West Midlands Regional Assembly, Shropshire County Council (2004)

¹⁹ A Study into Future Landfill Capacity in the West Midlands Report for West Midlands Regional Assembly, Scott Wilson (May 2007)

Table 4.9 CD&E waste arisings, Digest of Waste and Resources Statistics, March 2016

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

- 4.3.8 This data, different from 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.
- 4.3.9 The March 2016 Digest continues the headline tonnage data presented in the January 2015 Digest; however, this earlier source also includes an estimated waste generation per capita, of 1,573kg per capita in 2012, based on the UK CD&E estimate of 100.2 million tonnes.
- 4.3.10 However, in mid-December Defra published an updated UK Statistics on Waste Notice (Table 4.11), 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

- 4.3.11 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 4.10. 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.
- 4.3.12 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 4.10 Non-hazardous Construction and Demolition Waste, UK and England, 2010 to 2012, Statistics on Waste Notice, August 2016

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

4.3.13 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 4.11.

4.3.14 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 4.11 Non-hazardous Construction and Demolition Waste, UK and England, 2010 to 2014, Statistics on Waste Notice, December 2016

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

Defra, Digest of Waste and Resource Statistics – 2017 and 2018 Editions, March 2017/May 2018

4.3.15 Defra did release Digests of Waste and Resource Statistics in 2017 and 2018, but these did not contain information relevant to estimating CD&E waste arisings in Herefordshire.

Defra, UK Statistics on Waste Notice, March 2019

4.3.16 In March 2019 Defra published revised CD&E waste estimates from 2010 to 2016²⁰; these data are reproduced in Table 4.12.

Table 4.12 Non-hazardous Construction and Demolition Waste, UK and England, 2010 to 2016, UK Statistics on Waste Notice, March 2019

Year	UK			England		
	Generation (million tonnes)	Recovery (million tonnes)	Recovery rate (%)	Generation (million tonnes)	Recovery (million tonnes)	Recovery rate (%)
2010	59.2	53.1	89.7%	53.6	49.4	92.2%
2011	60.2	55.0	91.4%	54.9	50.8	92.5%
2012	55.8	50.8	91.1%	50.5	46.4	92.0%
2013	57.1	52.0	91.2%	51.7	47.6	92.0%
2014	61.5	56.3	91.5%	55.9	51.7	92.4%
2015	63.8	58.1	91.1%	57.7	53.3	92.3%
2016	66.2	60.2	91.0%	59.6	55.0	92.1%

Source: Defra UK Statistics on Waste Notice, March 2019, Figures exclude excavation waste and hazardous C&D waste estimates.

4.3.17 In the statistics notice Defra highlights that *'Revisions made to all figures, in line with updates made to underlying Mineral Products Association data. This has increased absolute tonnages for both generation and recovery by 10-20% each year in comparison to previously published figures, but had little impact on the recovery rate, which has remained around 90% throughout the timeseries'*.

Summary of Defra CD&E waste estimates

4.3.18 Table 4.13 presents the collation of the Defra CD&E waste estimates for England and UK between 2010 and 2016 using both the data in the March 2019 UK Statistics on Waste Notice and the accompanying statistical data set²¹, which covers the waste generation and management figures for the whole of the UK compiled for EU reporting purposes. The table also 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.

4.3.19 The data indicates 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.

4.3.20 The waste per capita estimates have increased from those used in the WNA 2017 due to the increased arising estimates published by Defra in March 2019:

- England CD&E waste per capita estimate for 2014 has increased from 1,980kg/capita to 2,151kg/capita (+171kg/capita); and
- UK CD&E waste per capita estimate for 2014 has increased from 1,864kg/capita to 2,017kg/capita (+153kg/capita).

²⁰ Defra, UK Statistics on Waste, 7th March 2019

²¹ <https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management#history> [27.11.2019@14:55]

Table 4.13 Summary of Defra CD&E waste data, England and UK, 2010 to 2016

	England	2010	2011	2012	2013	2014	2015	2016
1	Non-hazardous C&D generation ('000 tonnes)	53,600	54,900	50,500	51,700	55,900	57,700	59,600
2	Hazardous C&D generation ('000 tonnes)	566		744		620		684
3	Excavation waste/dredging spoils ('000 tonnes)	47,436		48,856		60,297		60,014
4	Total CD&E waste generation ('000 tonnes)	101,602		100,100		116,817		120,298
5	Population ('000) ^a	52,642,500	53,107,200	53,493,700	53,865,800	54,316,600	54,786,300	55,268,100
6	Non-hazardous C&D kg per capita	1,018	1,034	944	960	1,029	1,062	1,078
7	Hazardous C&D kg per capita	11		14		11		12
8	Excavation waste/dredging spoils kg per capita	901		913		1,110		1,086
9	Total CD&E waste kg per capita	1,930		1,871		2,151		2,177
	UK	2010	2011	2012	2013	2014	2015	2016
10	Non-hazardous C&D generation ('000 tonnes)	59,200	60,200	55,800	57,100	61,500	63,800	66,200
11	Hazardous C&D generation ('000 tonnes)	688		924		743		801
12	Excavation waste/dredging spoils ('000 tonnes)	59,022		57,397		68,041		69,196
13	Total CD&E waste generation ('000 tonnes)	118,911		114,121		130,284		136,196
14	Population ('000) ^b	62,759,500	63,285,100	63,705,000	64,105,700	64,596,800	65,110,000	65,648,100
15	Non-hazardous C&D kg per capita	943	951	876	891	952	988	1,008
16	Hazardous C&D kg per capita	11		15		11		12
17	Excavation waste/dredging spoils kg per capita	940		901		1,053		1,054
18	Total CD&E waste kg per capita	1,895		1,791		2,017		2,075
<p>^a ONS England population mid-year estimate, accessed 22nd October 2019 https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/timeseries/enpop/pop</p> <p>^b ONS United Kingdom population mid-year estimate, accessed 22nd October 2019 https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/timeseries/ukpop/pop</p>								

CD&E waste arisings estimates for Herefordshire

- 4.3.21 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.
- 4.3.22 The 2019 Defra estimates are the first national estimates for CD&E wastes that have been published since the WNA 2017 and consequently the analysis of arisings has been updated to reflect the revised estimates and the new national estimates for 2016.
- 4.3.23 Herefordshire's population in 2016 was 189,500²² which would give an estimated CD&E waste arising of:
- 412,000 tonnes (rounded) in 2016, based on the England CD&E waste per capita estimates of 2,177kg/capita; or
 - 393,000 tonnes (rounded) in 2016, based on the UK CD&E waste per capita estimates of 2,075kg /capita.
- 4.3.24 Table 4.14 provides a breakdown of these estimates by the headline CD&E waste streams.

Table 4.14 CD&E waste generation estimates, Herefordshire, 2016
(rounded to nearest 1,000 tonnes)

	CD&E waste stream	England kg/capita	Estimate arisings (tonnes)	UK kg/capita	Estimate arisings (tonnes)
1	Non-hazardous C&D	1,078	204,000	1,008	191,000
2	Hazardous C&D	12	2,000	12	2,000
3	Excavation waste/dredging spoils	1,086	206,000	1,054	200,000
4	Total	2,177	412,000	2,075	393,000

Based on a population of 189,500 in 2016 for Herefordshire.

- 4.3.25 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 2016, which may be below the national average particularly in relation to the excavation waste and dredging spoils.
- 4.3.26 The WNA 2017 estimated Herefordshire's CD&E arising to be in a range of 357,000 to 379,000 tonnes for 2016, depending on whether the England or UK estimates of kg/capita are used. This compares to a range of 393,000 to 412,000 tonnes for 2016 based on the revised Defra estimates. This equates to a 9% to 10% increase in the previous estimate which is consistent with the change in the Defra estimates.

²² [https://understanding.herefordshire.gov.uk/population/Spreadsheet '2018-mid-year-population-estimates-for-herefordshire' \[23.10.2019@16:15\]](https://understanding.herefordshire.gov.uk/population/Spreadsheet%20'2018-mid-year-population-estimates-for-herefordshire%20[23.10.2019@16:15])

4.4 Agricultural Waste

Published agricultural waste data

- 4.4.1 There is limited published data on agricultural waste, with this assessment relying upon Defra estimates of agricultural waste generated for reporting under the EC Waste Framework Directive and EC Waste Statistics Regulations.
- 4.4.2 Table 4.15 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 4.15 Estimates of waste produced by the agriculture, forestry and fishing sector, England, 2010, 2012 and 2014

	EWC-STAT description	Tonnes		
		2010	2012	2014
1	Used oils	21,571	22,067	20,591
2	Chemical wastes	103,009	95,281	105,708
3	Health care & biological wastes	1,021	1,015	1,025
4	Metallic wastes, mixed	954	4,254	4,449
5	Paper & cardboard wastes	5,843	5,678	5,629
6	Rubber wastes	21,798	10,696	11,316
7	Plastic wastes	82,291	82,293	82,268
8	Discarded equipment	9	9	10
9	Discarded vehicles	31,071	38,798	26,742
10	Batteries & accumulators' wastes	3,110	3,176	3,363
11	Animal & mixed food waste	14,348	14,169	14,109
12	Household & similar wastes	478	777	777
13	Mixed & undifferentiated materials	2,986	8,947	11,711
14	Other mineral wastes		21,293	19,919
15	Mineral waste from waste treatment & stabilised waste	20,919		
16	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>

- 4.4.3 In the Defra UK Statistics on Waste Notice March 2019 and the accompanying statistical data set²³, the data on the waste produced by the agriculture, forestry and fishing sector was updated, to include estimates for 2016. In addition, the 2016 Notice did not include data for discarded vehicles, with the tonnages for discarded vehicles excluded from the figures for 2010, 2012 and 2014. Consequently, revised total generation figures for those years were provided, that simply excluded the discarded vehicles tonnages for those years. For completeness the revised datasets are presented in Table 4.16.

²³ <https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management#history>
[27.11.2019@15:12]

Table 4.16 Estimates of waste produced by the agriculture, forestry and fishing sector, England, 2010, 2012, 2014 and 2016

	EWC-STAT description	Tonnes			
		2010	2012	2014	2016
1	Used oils	21,571	22,067	20,591	20,514
2	Chemical wastes	103,009	95,281	105,708	109,003
3	Health care & biological wastes	1,021	1,015	1,025	1,005
4	Metallic wastes, mixed	954	4,254	4,449	4,578
5	Paper & cardboard wastes	5,843	5,678	5,629	5,638
6	Rubber wastes	21,798	10,696	11,316	11,738
7	Plastic wastes	82,291	82,293	82,268	82,266
8	Discarded equipment	9	9	10	<1
9	Batteries & accumulators' wastes	3,110	3,176	3,363	3,488
10	Animal & mixed food waste	14,348	14,169	14,109	13,122
11	Household & similar wastes	478	777	777	779
12	Mixed & undifferentiated materials	2,986	8,947	11,711	12,063
13	Other mineral wastes		21,293	19,919	19,872
14	Mineral waste from waste treatment & stabilised waste	20,919			0
15	Total waste generation	278,337	269,656	280,874	284,067

Source: Defra UK Statistics on Waste Notice, March 2019,

<https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management>

4.4.4 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 an administrative level. This is presented in Table 4.17.

Table 4.17 Commercial agricultural holdings and the area farmed, Herefordshire and England, 2010, 2013 and 2016

	2010			2013			2016		
	England	H'shire	%	England	H'shire	%	England	H'shire	%
Number of holdings	105,449	2,649	2.51%	102,836	2,664	2.59%	106,853	2,812	2.63%
Farmed area (hectares)	8,887,289	172,246	1.94%	9,086,480	182,470	2.01%	9,120,623	176,862	1.94%

Source: Defra, Structure of the agricultural industry in England and the UK at June

Spreadsheet 'structure_june_eng_county_01oct19' accessed 23rd October 2019

<https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june>

4.4.5 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 2.6% of the non-natural agricultural waste would be produced in Herefordshire. For 2016, this equates to 5,700 to 7,400 tonnes of non-natural agricultural waste, which compares to 6,000 to 8,000 tonnes of non-natural agricultural waste estimated in the WNA 2017.

- 4.4.6 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 2018

LoW code	Description	Tonnes					
		2013	2014	2015	2016	2017	2018
02 01 01	Sludges from washing and cleaning	147	2,719	1,360	597	455	739
02 01 02	Animal-tissue waste	-	-	0.8	-		2
02 01 03	Plant-tissue waste	-	840	21,262	20,423	31,039	19,606
02 01 04	Waste plastics (except packaging)	-	-	2.6	2	1	0
02 01 06	Animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site	63	16,150	31,746	31,118	38,605	39,090
02 01 07	Wastes from forestry	-	-	0.1	-		
02 01 08*	Agrochemical waste containing hazardous substances	0.02	11	3	0.1	0.04	0.1
02 01 09	Agrochemical waste other than those mentioned in 02 01 08		136				
02 01 10	Waste metal	15	266	701	531	578	814
02 01 99	Wastes not otherwise specified		33	68	147	118	247
Total		224	20,156	55,144	52,818	70,795	60,498

For hazardous wastes the six-digit codes in the LoW have an asterisk (*) next to them.

- 4.4.7 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 systems (section 3.1) being used to treat plant-tissue waste and animal faeces, urine and manure.
- 4.4.8 Historically these wastes would have been managed by methods such as spreading on land and would not have been captured in waste management data. Table 4.18 does not reflect the total quantity of natural agricultural waste generated in Herefordshire, only that which enters a permitted facility.
- 4.4.9 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.
- 4.4.10 In 2015, 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.
- 4.4.11 In 2016, 88% had origins identified as Herefordshire, with all but 250 tonnes having origins identified as Staffordshire or the West Midlands, but not codeable to the WPA level.
- 4.4.12 By 2017 and 2018, over 95% had origins identified as Herefordshire, with the remainder predominantly from the West Midlands.

4.5 Hazardous Waste

- 4.5.1 The HWI for 2011 to 2018 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, Herefordshire, 2011 to 2018 (including transfer stations)

LoW Chapter	Tonnes							
	2011	2012	2013	2014	2015	2016	2017	2018
01: Mining and Minerals	-	-	-	-	0.2	-	-	-
02: Agricultural and Food Production	1	1	0.04	0.8	2.7	0.4	4	2
03: Wood and Paper Production	-	27	-	22	27	9	1	19
05: Petroleum, Gas and Coal Processing Wastes	-	-	-	-	-	0.4	1	1
06: Inorganic Chemical Processes	303	71	149	124	87	95	6	6
07: Organic Chemical Processes	1	-	0.2	1.6	1.2	1	-	0.2
08: MFSU Paints, Varnish, Adhesive and Inks	867	831	759	729	665	589	655	783
09: Photographic Industry	11	10	11	8.6	8.0	5	3	3
10: Thermal Process Waste (inorganic)	5	6	4.6	0.7	0.9	5	3	3
11: Metal Treatment and Coating Processes	1,782	2,122	1,772	1,238	1,321	1,384	1,419	1,578
12: Shaping/Treatment of Metals and Plastics	138	131	248	116	77	158	95	82
13: Oil and Oil/Water Mixtures	2,096	2,281	1,891	2,273	1,718	1,927	1,790	2,040
14: Solvents	94	60	78	62	59	59	114	111
15: Packaging, Cloths, Filter Materials	285	220	280	332	326	217	263	242
16: Not Otherwise Specified	3,828	3,550	3,567	1,209	1,238	1,672	4,364	5,082
17: CD&E waste and Asbestos	1,432	1,132	1,137	2,547	4,765	1,160	800	2,040
18: Healthcare	743	649	464	469	432	424	406	343
19: Waste/Water Treatment Industry	8	7	5.9	9.1	10	73	11	7
20: Municipal Wastes	1,012	1,028	642	361	328	352	288	307
Total	12,607	12,125	11,009	9,500	11,066	8,130	10,224	12,648

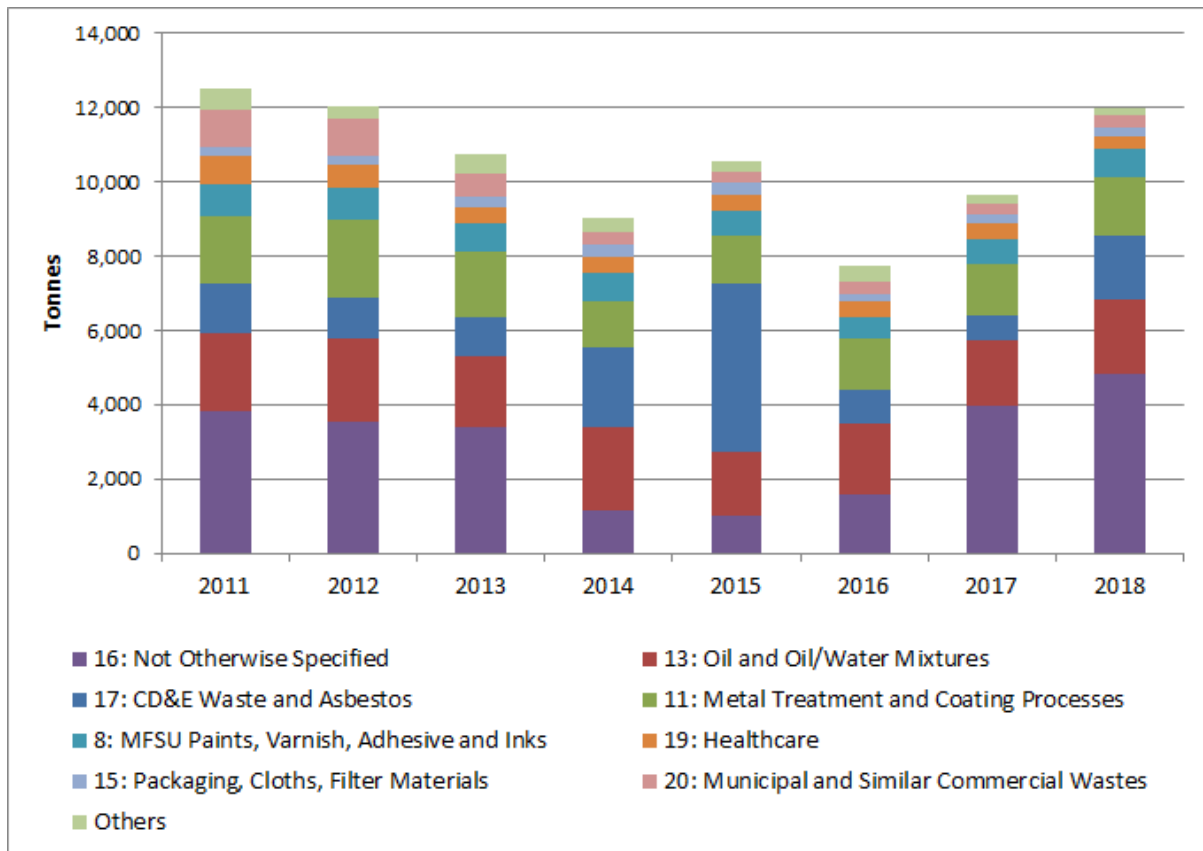
4.5.2 However, the figures need to be adjusted to take account of waste handled through transfer stations in Herefordshire, which is the principal type of hazardous waste facility in the county with the exception of metal recycling/vehicle de-polluting sites. Table 4.20 presents the hazardous waste arisings for Herefordshire from 2011 to 2018, excluding waste arising and deposited at transfer stations in Herefordshire.

Table 4.20 Hazardous waste arising, Herefordshire, 2011 to 2018 (excluding waste arising and deposited at transfer stations in Herefordshire)

LoW Chapter	Tonnes							
	2011	2012	2013	2014	2015	2016	2017	2018
01: Mining and Minerals	-	-	-	-	0.2	-	-	-
02: Agricultural and Food Production	1.0	0.7	0.0	0.2	2.7	0.4	4.2	2.1
03: Wood and Paper Production	-	27	-	22	27	8.7	0.8	19
05: Petroleum, Gas and Coal Processing Wastes	-	-	-	-	-	0.4	0.6	1.5
06: Inorganic Chemical Processes	303	71	149	124	87	95	5.5	5.9
07: Organic Chemical Processes	1.4	-	0.2	1.6	1.2	1.0	-	0.2
08: MFSU Paints, Varnish, Adhesive and Inks	867	831	756	728	665	587	655	782
09: Photographic Industry	11	10	11	8.6	8.0	5.1	2.7	2.6
10: Thermal Process Waste (inorganic)	4.6	5.7	4.6	0.7	0.9	5.3	2.8	2.9
11: Metal Treatment and Coating Processes	1,782	2,122	1,772	1,238	1,321	1,384	1,419	1,578
12: Shaping/Treatment of Metals and Plastics	138	131	248	116	77	158	95	82
13: Oil and Oil/Water Mixtures	2,093	2,280	1,880	2,251	1,709	1,921	1,759	2,010
14: Solvents	94	60	78	62	59	59	114	111
15: Packaging, Cloths, Filter Materials	282	218	279	331	324	216	263	241
16: Not Otherwise Specified	3,819	3,519	3,405	1,130	1,015	1,580	3,978	4,808
17: CD&E waste and Asbestos	1,370	1,077	1,048	2,177	4,512	876	647	1,711
18: Healthcare	743	649	464	468	429	414	406	343
19: Waste/Water Treatment Industry	8.4	7	5.9	9.1	10	73	11	6.8
20: Municipal Wastes	1,001	1,021	637	340	316	343	282	302
Total	12,520	12,028	10,739	9,006	10,565	7,727	9,646	12,009

4.5.3 Figure 4.6 presents the data from Table 4.20.

Figure 4.6 Hazardous waste arising, Herefordshire, 2011 to 2018



4.5.4 The data show that hazardous waste arisings 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.). There was a small increase between 2014 and 2015, followed by a further decrease in 2016. This was mainly driven by the increases/decreases in hazardous waste generated from construction and demolition activities. In 2017, the arisings increased again, with the increase driven by a notable increase in LoW Chapter 16 'Not Otherwise Specified', back to the levels seen in years 2011 to 2013. In 2018, there was a further increase driven by:

- a further increase in LoW Chapter 16 'Not Otherwise Specified' (namely end-of-life vehicles LoW code 16 01 04*); and
- what would appear to be a one-off large arising of 1,137 tonnes of a construction and demolition waste LoW code 17 03 01* bituminous mixtures containing coal tar.

4.5.5 A more detailed analysis of the specific wastes streams highlights that over the last 7 years the hazardous waste arisings have been dominated by 12 wastes types, which have made up between 70% to 80% of the hazardous waste generated in the county.

4.5.6 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, hence the reduction in LoW code 16 02 15* 'Hazardous components removed from discarded equipment (WEEE)'.

- 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.
- During 2014 and 2015, there was an increase in the hazardous waste produced by the construction and demolition sector (LoW codes 17 05 03* and 17 06 05*). The generation of hazardous C&D waste is dependent on the nature of the developments being undertaken at any one time e.g. demolition of building containing asbestos or the removal of contaminated soils etc. Therefore, the quantities of hazardous C&D waste can fluctuate significantly year on year, as highlighted by the generation of LoW code 17 03 01* bituminous mixtures containing coal tar in 2018 (as mentioned in paragraph 4.4.4).
- Over the last four years, generation levels across 9 of the 12 waste streams are relatively constant. The exceptions are:
 - hazardous C&D waste (LoW codes 17 05 03* and 17 06 05*), discussed above; and
 - end-of-life vehicles (LoW code 16 01 04*) where there has been a significant increase in 2017 and 2018.

Table 4.21 Main hazardous waste types, Herefordshire, 2011 to 2018

LoW Code	Description	Tonnes							
		2011	2012	2013	2014	2015	2016	2017	2018
08 03 12*	Waste ink containing hazardous substances	678	609	626	602	492	425	400	526
11 01 05*	Pickling acids	1,211	1,738	1,550	728	613	852	871	815
11 01 11*	Aqueous rinsing liquids containing hazardous substances	128	24	48	473	444	486	411	388
13 02 05*	Mineral-based non-chlorinated engine, gear and lubricating oils	1,184	1,282	1,022	1,084	940	1,260	1,060	1,217
13 05 08*	Mixtures of wastes from grit chambers and oil/water separators	339	210	239	280	151	172	292	325
16 01 04*	End-of-life vehicles	85	186	1,038	511	532	1,042	3,508	4,309
16 02 15*	Hazardous components removed from discarded equipment (WEEE)	2,011	2,502	1,565	1	1	0.2	0.001	2
16 06 01*	Lead batteries	1,106	436	372	282	343	202	497	432
17 05 03*	Soil and stones containing hazardous substances	179	42	8	750	3,232	40	254	17
17 06 05*	Construction materials containing asbestos	1,151	869	929	1,309	1,296	870	368	720
18 01 03*	Healthcare wastes whose collection and disposal is subject to special requirements in order to prevent infection	723	628	451	449	412	410	387	318
20 01 35*	Discarded electrical and electronic equipment	708	625	436	309	279	327	211	19

Hazardous wastes management

4.5.7 Table 4.22 and Figure 4.7 provide the breakdown of the generic waste management methods used to manage the hazardous waste arisings in Herefordshire between 2015 and 2018, with the breakdown of generic waste management methods by LoW Chapter heading for 2015 to 2018 provided in Annex I, to show the comparison of management method and generic waste type.

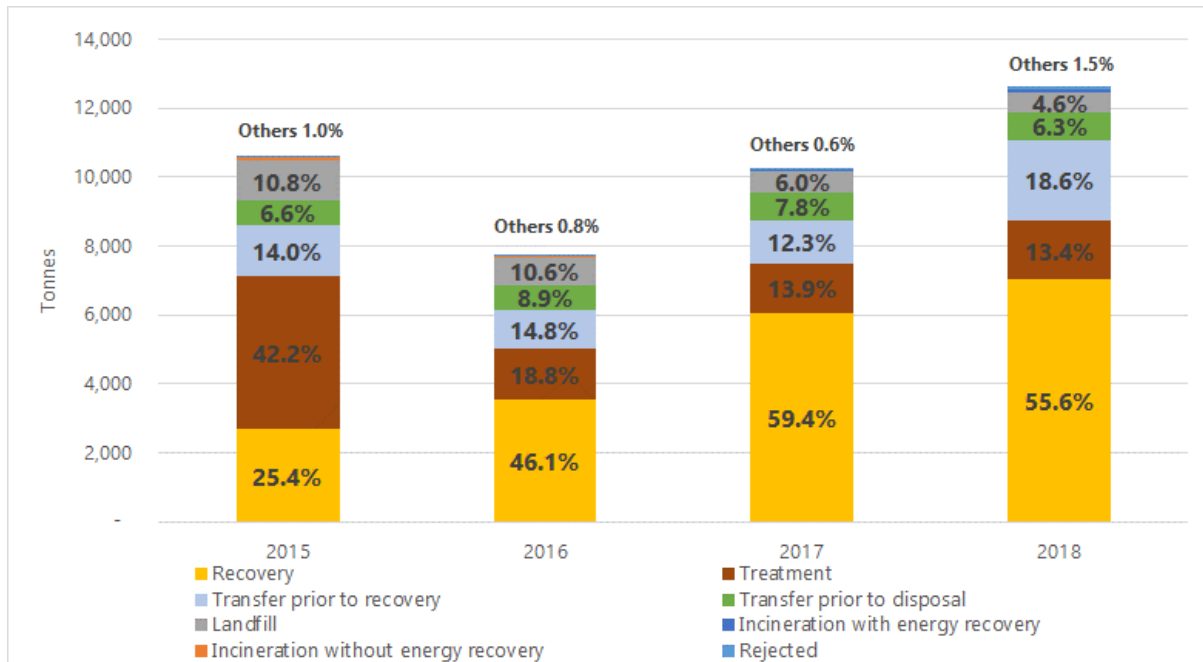
Table 4.22 Breakdown of generic hazardous waste management methods, 2015 to 2018

	Generic Waste Management Method	2015		2016		2017		2018	
		Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%
1	Incineration with energy recovery	17	0.2%	18	0.2%	36	0.3%	69	0.5%
2	Incineration without energy recovery	78	0.7%	38	0.5%	21	0.2%	8	0.1%
3	Landfill	1,145	10.8%	817	10.6%	614	6.0%	584	4.6%
4	Recovery	2,681	25.4%	3,564	46.1%	6,070	59.4%	7,036	55.6%
5	Rejected	7	0.1%	2	0.03%	2	0.02%	110	0.9%
6	Transfer prior to disposal	696	6.6%	691	8.9%	797	7.8%	801	6.3%
7	Transfer prior to recovery	1,484	14.0%	1,145	14.8%	1,259	12.3%	2,351	18.6%
8	Treatment	4,458	42.2%	1,451	18.8%	1,425	13.9%	1,690	13.4%

4.5.8 The data shows that the management method is driven by the proportion of different waste types generated each year. For example, in 2015 the proportion of 'treatment' was highest due the quantity of hazardous C&D waste sent for treatment, where in 2017 and 2018 the proportion of 'recovery' was highest due the quantity of end-of-life vehicles.

4.5.9 The variations generally relate to the levels of recovery and treatment with the other management methods remaining broadly consistent from one year to the next.

Figure 4.7 Breakdown of generic hazardous waste management methods, 2015 to 2018



4.5.10 Table 4.23 and Figure 4.8 provide the breakdown of the regions of deposit for hazardous waste arisings in Herefordshire between 2015 and 2018.

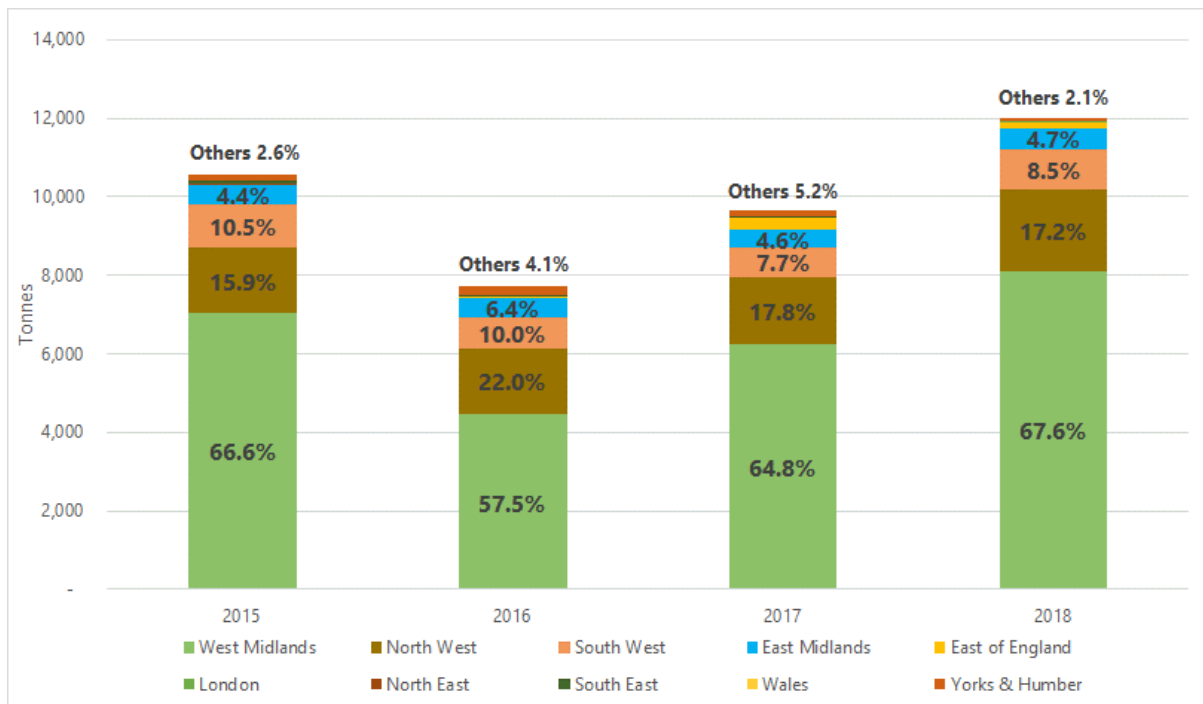
Table 4.23 Hazardous waste by deposit region, 2015 to 2018

	Deposit Region	2015		2016		2017		2018	
		Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%
1	East Midlands	467	4.4%	496	6.4%	447	4.6%	563	4.7%
2	East of England	19	0.2%	53	0.7%	324	3.4%	152	1.3%
3	London	4	0.0%	5	0.1%	3	0.0%	7	0.1%
4	North East	13	0.1%	4	0.1%	5	0.0%	3	0.0%
5	North West	1,678	15.9%	1,697	22.0%	1,713	17.8%	2,064	17.2%
6	South East	82	0.8%	20	0.3%	11	0.1%	20	0.2%
7	South West	1,113	10.5%	769	10.0%	741	7.7%	1,017	8.5%
8	Wales	n/r	-	n/r	-	3	0.0%	n/r	-
9	West Midlands	7,032	66.6%	4,447	57.5%	6,246	64.8%	8,113	67.6%
10	Yorks & Humber	157	1.5%	235	3.0%	154	1.6%	70	0.6%

4.5.11 The data highlight that approximately 60% to 70% of hazardous waste was deposited in the West Midlands.

4.5.12 The quantities sent to each region, other than the West Midlands, remain broadly consistent from one year to the next, with the West Midlands accommodating the variations in the tonnages generated in Herefordshire.

Figure 4.8 Hazardous waste by deposit region, 2015 to 2018



4.6 Radioactive waste

- 4.6.1 Radioactive waste is not 'controlled waste' under UK legislation; however, WPA should plan for the sustainable management of low level radioactive waste.
- 4.6.2 The Environment Agency regulates the disposal of radioactive waste. In 2016, two organisations within Herefordshire held permits (known as authorisations) that allow the accumulation and disposal of radioactive waste. However, by 2018 there was only one active authorisation.
- 4.6.3 For completeness, details of the organisations holding authorisations in 2016, 2018 and 2019 are included in Table 4.24. However, the need for future treatment/disposal capacity for radioactive waste is not considered in this assessment as materials are normally, and most appropriately, managed at the national level.

Table 4.24 Authorisations in Herefordshire for the keeping and use of radioactive material and/or disposal of radioactive waste

Organisation	Location	Permission No.	Approved	Active in 2016	Active in 2018	Active in 2019
Wye Valley NHS Trust	Hereford County Hospital, Stonebow Road, Hereford, HR1 2ER	BF6973	06/05/1999	Yes	Yes	Yes
		BW8623	01/01/2004	Yes	Yes	Yes
Sequani Ltd	Bromyard Road Industrial Estate, Ledbury, HR8 1LH	CE5429	10/11/2010	Yes	No	No
		CE5437	10/11/2010	Yes	No	No
Source: Environment Agency Public Registers, accessed 21 st November 2016, 31 st October 2018 and 8 th October 2019 https://environment.data.gov.uk/public-register/view/search-radioactive-substances-permits						

4.7 Summary of estimates for waste generated in Herefordshire

4.7.1 Table 4.25 provides a summary of the estimated waste arisings in Herefordshire between 2015 and 2018.

Table 4.25 Estimated waste generation in Herefordshire, 2015 to 2018

row	Waste Stream	2015 (tonnes)	2016 (tonnes)	2017 (tonnes)	2018 (tonnes)
1	LACW	86,600	89,650	88,870	87,050
2	C&I waste	116,000 to 146,000 ^a	132,000 to 168,000	133,000 to 170,000	157,000 to 201,000
3	CD&E waste ^b	357,000 to 379,000 ^c	393,000 to 412,000 ^d	393,000 to 412,000	393,000 to 412,000
4	Agricultural waste (non-natural) ^e	6,000 to 8,000	5,700 to 7,400	6,000 to 8,000	6,000 to 8,000
5	Total (rounded to nearest 100 tonnes)^{f,g}	565,000 to 619,600	620,400 to 677,100	620,900 to 678,900	643,100 to 708,100
6	Hazardous waste ^h	10,500	7,750	9,650	12,000

Notes:

^a The reference to 115,000 to 145,000 tonnes in the WNA 2017 was erroneous, the correct tonnages are stated here. The total for 2015 is also corrected.

^b In March 2019 Defra published revised estimates for CD&E wastes which increases national CD&E wastes estimates by between 10% and 20%.

^c Estimate from WNA 2017.

^d Estimate based on 2016 Defra estimates.

^e In March 2019 Defra published 2016 data, which excluded discarded vehicles from the total generations figure for agricultural waste (non-natural). This change is reported for that year in this table, but otherwise the higher estimated arising is used.

^f The total has been updated from the WNA 2017 and WNA Update 2018 to recognise that hazardous wastes are a subset of the other waste streams.

^g For CD&E waste and Agricultural waste in 2017 and 2018, where the most recent estimates are based on 2016 data, the highest values from 2015 or 2016 have been used to estimate the total arisings for 2017 and 2018

^h Hazardous wastes are reported for information only. Within the Assessment they are assumed as a subset of the other waste streams

4.7.2 This Waste Need Assessment indicates:

- an increase of 55,000 to 58,000 tonnes from 2015 to 2016, predominantly as a result of the revised estimate for C&I and CD&E wastes;
- followed by an increase of 500 to 1,900 tonnes from 2016 to 2017; and
- finally, an increase of 22,000 to 29,000 tonnes between 2017 and 2018, again predominantly as a result of the revised estimate for C&I and CD&E wastes.

4.7.3 With the exception of the increase in CD&E wastes, based on Defra's revised estimates, these are not significant increases and are reflective of the different tonnage that may be received into any one facility across different years. It is important to remember that the available data can only be used to give a broad understanding of wastes generated in Herefordshire; it is generally not possible to be certain or specific.

Difference between tonnage managed through permitted facilities and estimated arisings

4.7.4 Of greater interest to plan making is consideration of the difference in tonnage between the amount of waste that was managed through permitted facilities and the estimated arisings. Table 3.2, line 16) identifies that permitted facilities in Herefordshire accepted 416,097 tonnes of waste in 2016; most of which (86%) originated in Herefordshire. In 2017, the permitted facilities accepted 443,498 tonnes (Table 3.2, line 16) 88% of which originated in Herefordshire. In 2018, permitted facilities accepted 463,209 tonnes (Table 3.2, line 16) 90% of which originated in Herefordshire.

4.7.5 This indicates a difference of some 200,000 tonnes (across all three years) between the wastes managed within Herefordshire and the wastes estimated to have arisen.

4.7.6 This may be due to a number of reasons including: data imprecision; wastes going directly out of Herefordshire; double counting of wastes at waste transfer stations; and exclusion of the exempt activities.

5. Waste Forecasts

5.1 Local Authority Collected Wastes (LACW)

- 5.1.1 As previously identified, future waste arisings are primarily linked to two main factors:
- the state of the economy; and
 - changes in household numbers.
- 5.1.2 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.
- 5.1.3 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).
- 5.1.4 To forecast waste from households up to 2041, the trends in the waste generated per household were used to produce a number of waste growth scenarios, which were then combined with household projections provided by the Department for Communities and Local Government (now named the MHCLG).
- 5.1.5 To forecast the remainder of LACW, future non-household waste generation needed to be factored into the estimates. The non-household waste stream predominantly comprised commercial waste and non-household CD&E waste collected at HWRC. Figures 4.4 and 4.5 show that whilst the HWRC non-household waste fraction has remained relatively constant over the past 12 months (it is still equivalent to the 2011 tonnage) the commercial waste fraction has steadily increased since 2011 up to the end of 2016, since when it has stayed relatively constant.
- 5.1.6 Table 5.1 presents the series of waste per household growth scenarios originally used in the WNA 2017, to provide an estimate of future waste from households, along with assumptions about the non-household waste fraction.

5.1.7 There are a number of factors, in addition to those presented 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 a local authority wishes 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.

5.1.8 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 period 2013 to 2015 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 12 month period ending August 2016, 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 DCLG household projections, which is based on the average in annual arisings over the period 2013 to 2015.	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.

- 5.1.9 The resulting LACW forecasts are presented in Table 5.2 and Figure 5.1, up to 2035. Figure 5.1 includes historic LACW arisings back to 2005/06²⁴, not least to highlight the impact of the recession on LACW and to show the predicted forecasts in context with previous years.
- 5.1.10 Paragraph 4.1.4 highlights that the 2016 LACW actual arisings are consistent with LACW growth scenarios 2 and 4a, with the figure sitting at the midpoint of the forecasts for 2016. However, the 2017 actual arisings data shows a small reduction in the overall arisings. Consequently, the forecast arisings sit between the LACW growth scenarios 2 and 4a, and scenarios 1 and 4.
- 5.1.11 In 2018, there was a further reduction in actual arisings of total LACW, being fractionally higher than the 2015 arisings but sitting just below the LACW growth scenarios 1 and 4 based on ONS household projections. Although there has been a reduction in LACW arisings in 2017 and 2018, it would be prudent to see if the arisings reduce further or stabilise before revising the forecasts used for waste planning purposes.
- 5.1.12 However, an additional growth scenario has been added in Table 5.3 and Figure 5.2 to show the impact of applying the average annual growth in LACW between 2013 and 2018 of 0.5% per annum (Scenario 5).
- 5.1.13 In addition, the waste forecasts for the ONS household projections has been extended to 2041. As the scenarios are mainly driven by housing growth, the forecasts based on the ONS household projections are lower than those based on the MHCLG household projections, by between 2,000 and 2,400 tonnes by 2035.
- 5.1.14 The forecasts based on the ONS household projections have been used as the ONS data is the most recent dataset. The figures show that if household waste generation rates do not increase from either the 2015 tonnages or mid-2016 estimates, LACW could increase to between 98,8500 to 101,700 tonnes per annum (Scenarios 1, 2 and 4) by 2041, driven only by the increasing number of households.
- 5.1.15 However, if the higher growth in waste experienced between August 2015 and August 2016 is factored into the forecasts, either as short term increases up to 2020 (Scenario 3) or prolonged growth up to 2041 (Scenario 3a), total LACW could increase to between 110,000 to 131,500 tonnes per annum by 2041.
- 5.1.16 When, the average growth between 2013 and 2018 is considered, (the new Scenario 5) the total LACW could increase to 98,500 tonnes by 2041, which is broadly consistent with Scenarios 1, 2 and 4. Hence, it is confirmed to be prudent to see if the arisings reduce further or stabilise before revising the forecasts used for waste planning purposes.

²⁴ Defra Local Authority Collected and Household Waste Statistics

Table 5.2 LACW forecast based on MHCLG household projections, Herefordshire, 2016 to 2035 (rounded to nearest 100 tonnes)

Scenario	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	86,600	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	97,300	97,800	98,200	98,600
2	86,600	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	99,400	99,900	100,300	100,700
3	86,600	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	108,000	108,500	109,000	109,500
3a	86,600	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	119,600	121,200	122,800	124,400
4	86,600	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	97,800	98,300	98,800	99,200
4a	86,600	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	100,200	100,700	101,200	101,700

Figure 5.1 LACW forecast based on MHCLG household projections, Herefordshire, 2016 to 2035 (rounded to nearest 100 tonnes)

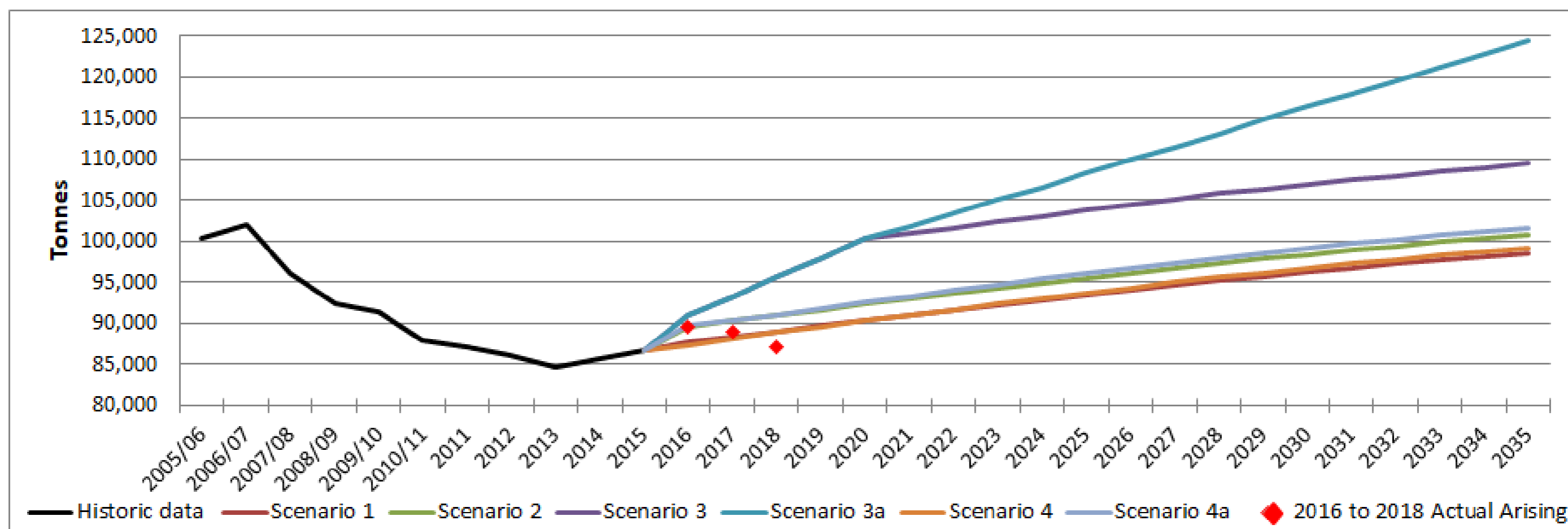
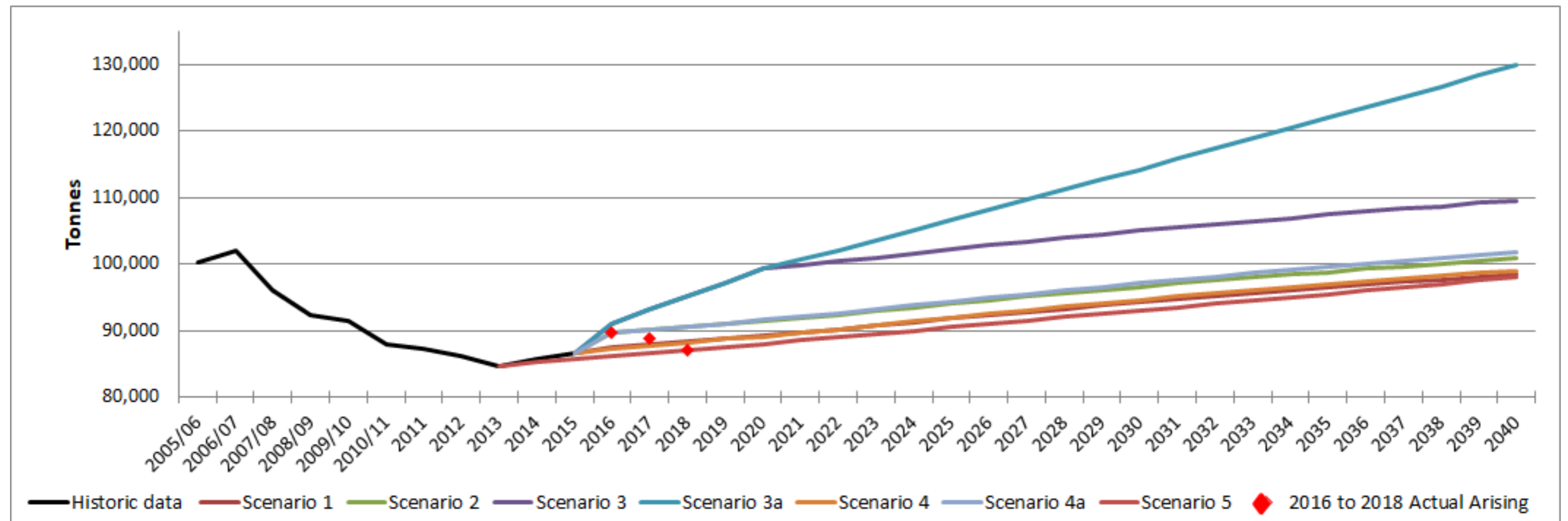


Table 5.3 LACW forecast based on ONS household projections, Herefordshire, 2016 to 2041 (rounded to nearest 100 tonnes)

Scen	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
1	86,600	87,400	87,900	88,300	88,800	89,200	89,600	90,200	90,700	91,300	91,800	92,300	92,800	93,300	93,800	94,300	94,700	95,200	95,600	96,100	96,500	96,900	97,300	97,700	98,000	98,400	98,800
2	86,600	89,600	90,100	90,500	91,000	91,400	91,800	92,400	93,000	93,500	94,100	94,600	95,100	95,600	96,100	96,600	97,100	97,500	98,000	98,400	98,800	99,300	99,600	100,000	100,400	100,800	101,100
3	86,600	91,100	93,100	95,100	97,200	99,300	99,800	100,400	101,000	101,600	102,200	102,800	103,300	103,900	104,500	105,000	105,500	106,000	106,500	106,900	107,400	107,900	108,300	108,700	109,200	109,500	110,000
3a	86,600	91,100	93,100	95,100	97,200	99,300	100,600	102,100	103,600	105,100	106,600	108,100	109,600	111,200	112,700	114,200	115,800	117,300	118,900	120,400	122,000	123,600	125,100	126,700	128,300	129,900	131,500
4	86,600	87,200	87,700	88,200	88,700	89,100	89,600	90,200	90,800	91,400	91,900	92,500	93,000	93,600	94,100	94,600	95,100	95,600	96,100	96,500	97,000	97,400	97,800	98,200	98,600	99,000	99,400
4a	86,600	89,600	90,100	90,600	91,100	91,600	92,000	92,600	93,200	93,800	94,400	95,000	95,500	96,100	96,600	97,100	97,700	98,100	98,600	99,100	99,500	100,000	100,400	100,900	101,300	101,700	102,100
5	85,644	86,109	86,576	87,045	87,500	88,000	88,500	89,000	89,500	90,000	90,500	91,000	91,500	92,000	92,500	93,000	93,500	94,000	94,500	95,000	95,500	96,000	96,500	97,000	97,500	98,000	98,500

Figure 5.2 LACW forecast based on ONS household projections, Herefordshire, 2016 to 2041 (rounded to nearest 100 tonnes)



5.2 Commercial and Industrial Waste (C&I waste)

- 5.2.1 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.
- 5.2.2 However, as with any form of forecasting, predicting economic performance over a 20 year period is difficult due to the range of external factors that affect economic growth. In addition, as highlighted previously, 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

- 5.2.3 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'²⁵ website states that '*Herefordshire's economic output is low compared to regionally and nationally when measured per head of population*'. Therefore, applying national or regional forecasts is likely to result in an overestimate of future waste arisings.
- 5.2.4 GVA²⁶ forecasts specific to Herefordshire and Worcestershire were obtained from Experian for the WNA 2017. 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.
- 5.2.5 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 of 0.65% in GVA.
- 5.2.6 Herefordshire Council²⁷ now reports that in 2017, '*Herefordshire's Gross Value Added (a measure of the value of the economy) was £3,878 million; representing 8% growth since 2016 and the third highest annual growth of all the West Midlands local authority areas*'.
- 5.2.7 In addition, the Marches Local Enterprise Partnership (LEP), which covers Shropshire, Herefordshire and Telford & Wrekin, published a Strategic Economic Plan²⁸ ('SEP') in 2019. The vision of the SEP is to grow the economy from £8.78 billion 2016 to 23.8 billion by 2038, which is equivalent to an average annual growth of 2.3% per annum in GVA. However, SEP Evidence Base²⁹ (October 2018) reports that the GVA growth between 2014 and 2016 was only 0.9%, which highlights the ambitious nature of the SEP. In addition, the SEP Evidence

²⁵ <https://factsandfigures.herefordshire.gov.uk/about-a-topic/economy/productivity-and-gross-value-added.aspx> [27.11.2019@16:12]

²⁶ 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.

²⁷ <https://understanding.herefordshire.gov.uk/economy-place/topics-relating-to-the-economy/> [29.11.2019@16:18]

²⁸ https://www.marcheslep.org.uk/download/economic_plans/strategic-economic-plan-update-2019/The-Marches-LEP-Strategic-Economic-Plan-2019.pdf [30.11.2019@16:19]

²⁹ https://www.marcheslep.org.uk/download/economic_plans/strategic-economic-plan-update-2019/The-Marches-SEP-Evidence-Base.pdf [30.11.2019@16:21]

Base highlights the change in the UK GVA between 2014 and 2016 as 2.2%, which would appear to reinforce the view that 'Herefordshire's economic output is low compared to regionally and nationally when measured per head of population'.

- 5.2.8 The Experian GVA forecasts are now around two years old. However, recognising the ongoing economic uncertainty caused by Brexit, it is not considered that any greater degree of certainty would be achieved by seeking an update on these forecasts from Experian. Therefore, the Experian GVA forecasts have been retained and used again in this Assessment.
- 5.2.9 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. It is recognised that the Experian GVA forecasts only run to 2037; for the period 2038 to 2041, the percentage GVA growth between 2034 and 2037 has been used.
- 5.2.10 Due to the lack of certainty in the available data, this WNA has been undertaken using the same scenarios presented in the WNA 2017, but separately using the data from 2015, 2017 and 2018, extended to 2041. Tables 5.4 to 5.6 present the scenarios considered individually for each year.

Table 5.4 C&I waste growth scenarios based on 2015 C&I waste estimates

Scenario	Basis	Forecast Starting Point ^a
1a	C&I waste growth in line with Hereford and Worcestershire GVA forecast	Lower 2015 C&I waste estimate 116,000 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 146,000 tonnes
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%)	

^a The references to 115,000 to 145,000 tonnes in the WNA 2017 was erroneous, the correct tonnages are stated here.

Table 5.5 C&I waste growth scenarios based on 2017 C&I waste estimates

Scenario	Basis	Forecast Starting Point
1a	C&I waste growth in line with Hereford and Worcestershire GVA forecast	Lower 2017 C&I waste estimate 133,000 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 2017 C&I waste estimate 170,000 tonnes
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%)	

Table 5.6 C&I waste growth scenarios based on 2018 C&I waste estimates

Scenario	Basis	Forecast Starting Point
1a	C&I waste growth in line with Hereford and Worcestershire GVA forecast	Lower 2018 C&I waste estimate (157,000 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 2018 C&I waste estimate 201,000 tonne)
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%)	

5.2.11 The resulting C&I waste forecasts are presented in Table 5.7 (for 2015 estimates), Table 5.8 (for 2017 estimates) and Table 5.9 (for 2018 estimates). These tables are presented graphically at Figure 5.3 (for 2015 estimates), Figure 5.4 (for 2017 estimates) and Figure 5.5 (for 2018 estimates)

Table 5.7 C&I waste estimates based on 2015 C&I waste estimate, Herefordshire, 2015 to 2041 (rounded to nearest 1,000 tonnes)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
C&I sectors GVA forecast (£millions) ^a	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	14,891	15,156	15,418	15,685	15,956	16,233	n/a	n/a	n/a	n/a	
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%	1.8%	1.8%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	
Invest Herefordshire GVA growth target ^b	0.65%																											
Scenario 1a	116,000	118,000	119,000	121,000	123,000	126,000	128,000	131,000	134,000	137,000	140,000	142,000	145,000	148,000	150,000	153,000	156,000	159,000	161,000	164,000	167,000	170,000	173,000	176,000	179,000	182,000	185,000	
Scenario 1b	146,000	149,000	150,000	153,000	155,000	158,000	161,000	165,000	169,000	172,000	176,000	179,000	183,000	186,000	189,000	193,000	196,000	200,000	203,000	207,000	210,000	214,000	218,000	221,000	225,000	229,000	233,000	
Scenario 2a	116,000	117,000	118,000	118,000	119,000	120,000	121,000	121,000	122,000	123,000	124,000	125,000	125,000	126,000	127,000	128,000	129,000	130,000	130,000	131,000	132,000	133,000	134,000	135,000	136,000	136,000	137,000	
Scenario 2b	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	162,000	163,000	164,000	165,000	166,000	167,000	168,000	169,000	171,000	172,000	173,000	

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

Table 5.8 C&I waste estimates based on 2017 C&I waste estimate, Herefordshire, 2017 to 2041 (rounded to nearest 1,000 tonnes)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
C&I sectors GVA forecast (£millions) ^a		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	14,891	15,156	15,418	15,685	15,956	16,233	n/a	n/a	n/a	n/a	
GVA forecast % growth				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%	1.8%	1.8%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	
Invest Herefordshire GVA growth target ^b	0.65%																											
Scenario 1a			133,000	135,000	137,000	140,000	143,000	146,000	149,000	153,000	156,000	159,000	162,000	165,000	167,000	170,000	173,000	177,000	180,000	183,000	186,000	189,000	193,000	196,000	199,000	203,000	206,000	
Scenario 1b			170,000	173,000	175,000	179,000	182,000	186,000	191,000	195,000	199,000	203,000	207,000	210,000	214,000	218,000	222,000	226,000	230,000	234,000	238,000	242,000	246,000	250,000	255,000	259,000	264,000	
Scenario 2a			133,000	134,000	135,000	136,000	136,000	137,000	138,000	139,000	140,000	141,000	142,000	143,000	144,000	145,000	146,000	147,000	148,000	148,000	149,000	150,000	151,000	152,000	153,000	154,000	155,000	
Scenario 2b			170,000	171,000	172,000	173,000	174,000	176,000	177,000	178,000	179,000	180,000	181,000	183,000	184,000	185,000	186,000	187,000	189,000	190,000	191,000	192,000	194,000	195,000	196,000	197,000	199,000	

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

Table 5.9 C&I waste estimates based on 2018 C&I waste estimate, Herefordshire, 2018 to 2041 (rounded to nearest 1,000 tonnes)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
C&I sectors GVA forecast (£millions) ^a		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	14,891	15,156	15,418	15,685	15,956	16,233	n/a	n/a	n/a	n/a	
GVA forecast % growth				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%	1.8%	1.8%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	
Invest Herefordshire GVA growth target ^b	0.65%																											
Scenario 1a				157,000	160,000	163,000	166,000	170,000	174,000	177,000	181,000	185,000	188,000	191,000	195,000	198,000	202,000	205,000	209,000	213,000	216,000	220,000	224,000	228,000	232,000	236,000	240,000	
Scenario 1b				201,000	204,000	208,000	212,000	217,000	222,000	227,000	232,000	236,000	241,000	245,000	249,000	254,000	258,000	263,000	268,000	272,000	277,000	282,000	287,000	292,000	297,000	302,000	307,000	
Scenario 2a				157,000	158,000	159,000	160,000	161,000	162,000	163,000	164,000	165,000	166,000	168,000	169,000	170,000	171,000	172,000	173,000	174,000	175,000	176,000	178,000	179,000	180,000	181,000	182,000	
Scenario 2b				201,000	202,000	204,000	205,000	206,000	208,000	209,000	210,000	212,000	213,000	214,000	216,000	217,000	219,000	220,000	222,000	223,000	224,000	226,000	227,000	229,000	230,000	232,000	233,000	

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

Figure 5.3 C&I waste estimates 2015 to 2041, based on 2015 data

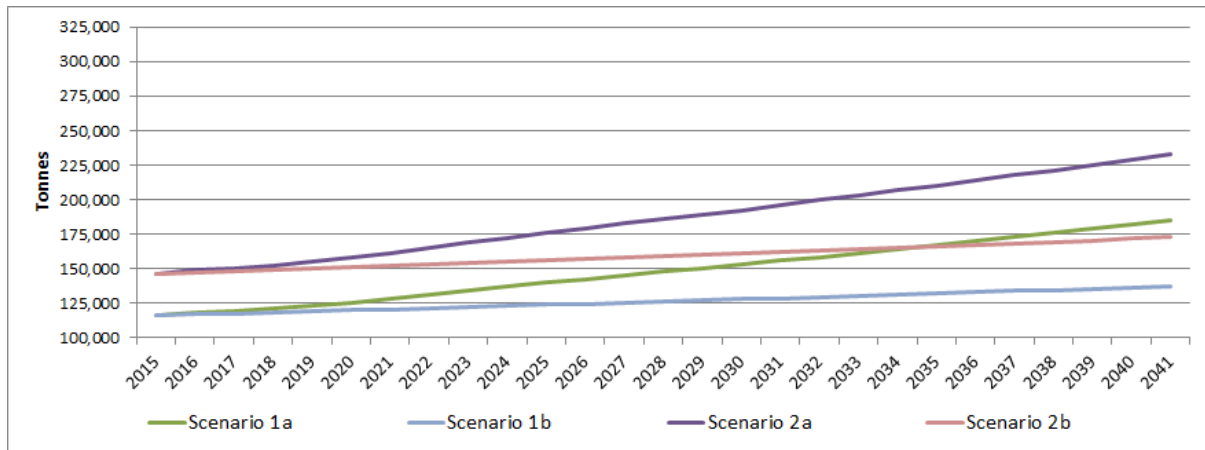


Figure 5.4 C&I waste estimates 2017 to 2041, based on 2017 data

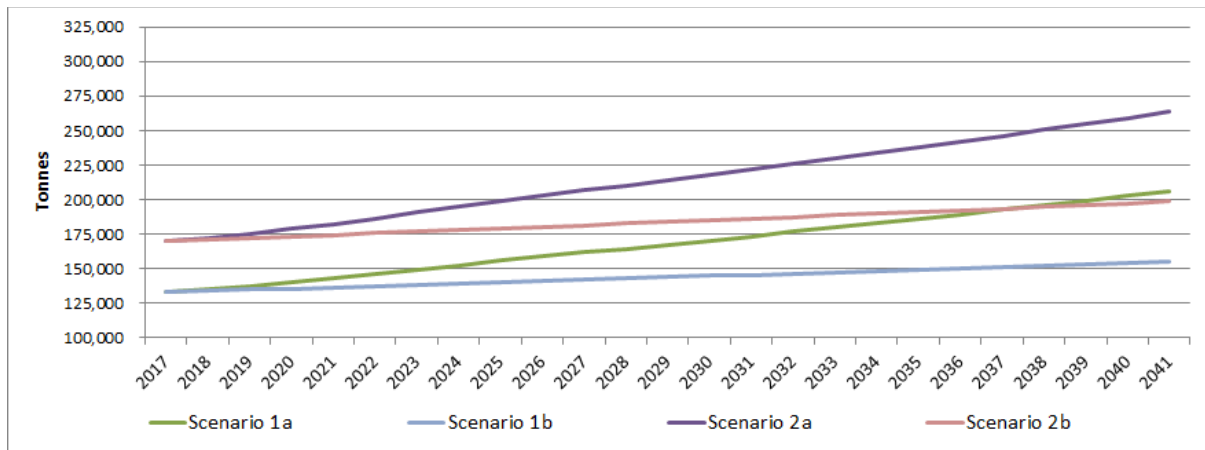
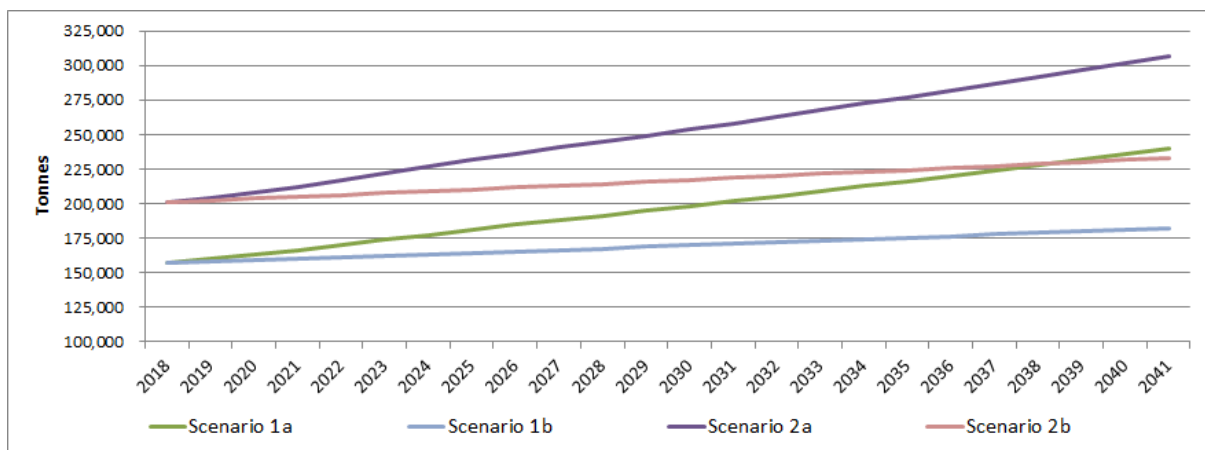


Figure 5.5 C&I waste estimates 2018 to 2041, based on 2018 data



- 5.2.12 For the purposes of assessing future capacity demand it is concluded that a range of C&I waste arisings between Scenarios 1a and 2b should be used, taking account of the estimated arisings calculated for 2015 to 2018, which is equivalent to between 185,000 and 233,000 tonnes by 2041. Scenarios 1a and 2b appear to be the more realistic forecasts, with 1b and 2a potentially acting as outliers.
- 5.2.13 It would be beneficial to keep these waste forecasts under review as the MWLP is developed. However, the C&I waste forecasts to be taken into assessing future capacity need are:
- Scenario 1a, using 2015 data, to give a minimum tonnage; and
 - Scenario 2b, using 2017 data, to give a medium tonnage.
 - Scenario 2b, using 2018 data, to give a maximum tonnage.

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

- 5.3.1 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 as gained from Experian, 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 original 2014 UK waste per capita estimates); 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 original 2014 England waste per capita estimates).
- 5.3.2 The Experian GVA forecasts are now around two years old. However, recognising the ongoing economic uncertainty caused by Brexit, it is not considered that any greater degree of certainty would be achieved by seeking an update on these forecasts from Experian. Therefore, the Experian GVA forecasts have been retained and used again in this Assessment. It is recognised that the Experian GVA forecasts only run to 2037; for the period 2038 to 2041, the percentage GVA growth between 2036 and 2037 has been used.
- 5.3.3 The resulting forecasts are presented in Table 5.10. 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.

Table 5.10 CD&E waste forecast, Herefordshire, 2016 to 2041 (rounded to nearest 1,000 tonnes)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
Hereford and Worcestershire construction sector GVA (£ millions) ^a	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	1147.8	1161.5	1174.9	1189.4	1204.5	1219.8	n/a	n/a	n/a	n/a	
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%	1.2%	1.2%	1.2%	1.2%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	
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	200,000	202,000	204,000	207,000	209,000	212,000	215,000	218,000	220,000	223,000
	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	2,000	2,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
	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	235,000	238,000	241,000	244,000	247,000	250,000	253,000	256,000	259,000	263,000
	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	437,000	442,000	448,000	454,000	459,000	465,000	471,000	477,000	482,000	489,000
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	212,000	214,000	217,000	220,000	222,000	225,000	228,000	231,000	234,000	237,000
	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	2,000	2,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	
	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	250,000	253,000	256,000	259,000	262,000	265,000	269,000	272,000	276,000	279,000
	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	464,000	469,000	476,000	482,000	487,000	493,000	500,000	506,000	513,000	519,000

^a Source: Experian ©

5.3.4 However, as highlighted previously Defra revised its CD&E waste estimates, with the effect of increasing the total CD&E waste estimates by between 10% and 20%. Therefore, the scenarios have been re-run using a revised 2016 baseline figure:

- Scenario 1a: Baseline figure of 393,000 tonnes in 2016 (based on 2016 England waste per capita estimates); and
- Scenario 2a: Baseline figure of 412,000 tonnes in 2016 (based on 2016 England waste per capita estimates).

5.3.5 The resulting forecasts are presented in Table 5.11. The forecasts have been broken down into the key elements of the CD&E waste stream based on relative proportions estimated in 2016 and assuming that these remain constant.

5.3.6 Both sets of estimates are presented in Figure 5.6 and show that the net impact of the revised Defra figures is to increase the forecast estimates by approximately 55,000 tonnes by 2041.

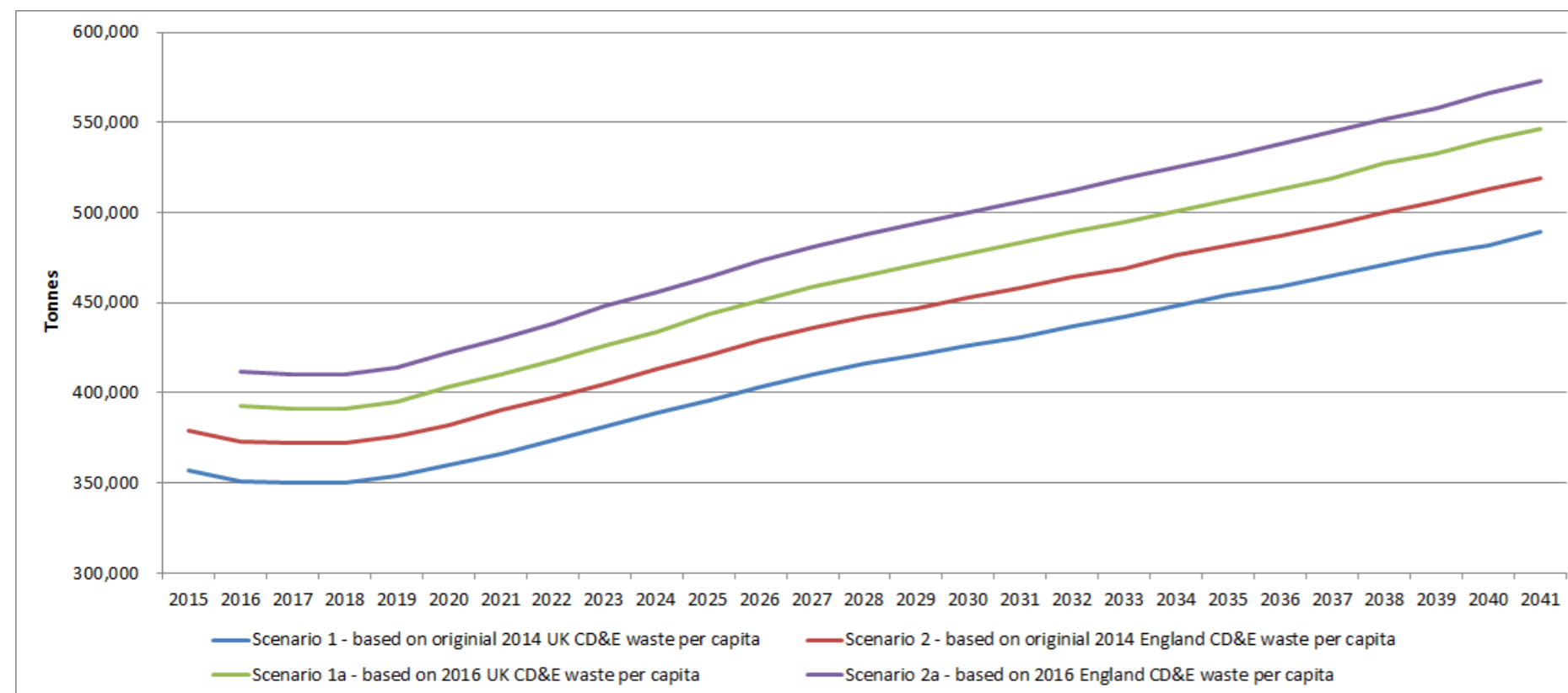
5.3.7 As highlighted above, the forecasts could overestimate future CD&E waste generation in Herefordshire, particularly in relation to excavation waste and dredging spoils. It might be considered unlikely, given the rural nature of Herefordshire, that approximately 200,000 250,000 tonnes of excavation 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 MWLP is developed.

Table 5.11 Revised CD&E waste forecast based on updated Defra CD&E waste estimates, Herefordshire, 2016 to 2041 (rounded to nearest 1,000 tonnes)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Hereford and Worcestershire construction sector GVA (£ millions) ^a	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	1147.8	1161.5	1174.9	1189.4	1204.5	1219.8	n/a	n/a	n/a	n/a
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%	1.2%	1.2%	1.2%	1.2%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%
1 Non-hazardous C&D		191,000	190,000	190,000	192,000	196,000	199,000	203,000	207,000	211,000	216,000	219,000	223,000	226,000	229,000	232,000	235,000	238,000	240,000	243,000	246,000	249,000	252,000	256,000	259,000	262,000	265,000
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	2,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Excavation waste/ dredging spoils		200,000	199,000	199,000	201,000	205,000	209,000	213,000	217,000	221,000	226,000	230,000	234,000	237,000	240,000	243,000	246,000	249,000	252,000	255,000	258,000	261,000	264,000	268,000	271,000	275,000	278,000
Total		393,000	391,000	391,000	395,000	403,000	410,000	418,000	426,000	434,000	444,000	451,000	459,000	465,000	471,000	477,000	483,000	489,000	495,000	501,000	507,000	513,000	519,000	527,000	533,000	540,000	546,000
2 Non-hazardous C&D		204,000	203,000	203,000	205,000	209,000	213,000	217,000	222,000	226,000	230,000	234,000	238,000	242,000	245,000	248,000	251,000	254,000	257,000	260,000	263,000	266,000	270,000	273,000	276,000	280,000	284,000
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	2,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Excavation waste/ dredging spoils		206,000	205,000	205,000	207,000	211,000	215,000	219,000	224,000	228,000	232,000	237,000	241,000	244,000	247,000	250,000	253,000	256,000	259,000	262,000	265,000	269,000	272,000	276,000	279,000	283,000	286,000
Total		412,000	410,000	410,000	414,000	422,000	430,000	438,000	448,000	456,000	464,000	473,000	481,000	488,000	494,000	500,000	506,000	512,000	519,000	525,000	531,000	538,000	545,000	552,000	558,000	566,000	573,000

^a Source: Experian ©

Figure 5.6 CD&E waste forecasts, Herefordshire, 2016 to 2041



5.4 Agricultural Waste

- 5.4.1 Future waste arisings will be dictated by the nature of agricultural activity within Herefordshire. However, as highlighted in the River Wye SAC Nutrient Management Plan, Evidence base and options appraisal³⁰, it is not possible to predict the future when it comes to agriculture in the River Wye catchment.
- 5.4.2 In the WNA 2017, the range for non-natural agricultural waste was 6,000 to 8,000 tonnes. However, using the most recent Defra data, for 2016, slightly reduces the estimated range to 5,700 to 7,400 tonnes, predominately due to the exclusion of discarded vehicles from the total generations figure by Defra.
- 5.4.3 Therefore, for prudence, 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.
- 5.4.4 Between 2014 and 2016, there were six planning permissions granted for AD systems. These are not listed as permitted facilities in the 2015 EA WDI, and so have the potential to increase the AD capacity in the county in the future. There were no new AD sites accepting waste in 2016 but two new sites accepted waste in 2017 and a further site in 2018.

5.5 Hazardous Waste

- 5.5.1 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.
- 5.5.2 Therefore, based on this analysis of the arisings between 2011 and 2018, it is estimated that the annual hazardous waste arising in the future will be in the range 8,000 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.
- 5.5.3 In addition, the generation levels of different waste streams are relatively small and are unlikely to warrant the development of specialist waste treatment capacity.

5.6 Summary of Waste Forecasts

- 5.6.1 This WNA has sought to incorporate any relevant fresh evidence to forecast future waste arisings and compare the data from 2015, 2017 and 2018.
- 5.6.2 Consequently, the forecasts based on each dataset are presented:
- Table 5.12 summarises the waste forecasts for Herefordshire for years 2020, 2025, 2030, 2035 and 2041 based on the 2015 data, used in the WNA 2017. These forecasts have not been extended to 2041 because the LACW forecasts were based on the DCLG/ MHCLG household projections at the time, which did not extend to 2041;

³⁰ <https://www.gov.uk/government/publications/nutrient-management-plan-river-wye> [13.11.2019@10:54]

- Table 5.13 summarises the waste forecasts for Herefordshire for years 2020, 2025, 2030, 2035 and 2041 based on the updated 2017 data (where it was available) and as reported in the WNA Update 2018; and
- Table 5.14 summarises the waste forecasts for Herefordshire for years 2020, 2025, 2030, 2035 and 2041 based on the 2018 data, which includes analysis based on new Defra estimates for CD&E and agricultural wastes. For this it should be noted that the baseline figures are based on the most recent Defra dataset, which is for 2016.

Table 5.12 Summary of waste forecasts for years 2020, 2025, 2030 and 2035, based on 2015 data

Waste Stream		Tonnes (rounded to nearest 1,000 tonnes)							
		Baseline	Forecast						
		2015	2020	2025	2030	2035	2041		
Local authority collected waste		86,600	90,300 to 100,300	93,500 to 108,300	96,300 to 116,400	98,600 to 124,400	n/a	1	
Commercial and industrial waste		116,000 to 146,000	126,000 to 151,000	140,000 to 156,000	153,000 to 161,000	166,000 to 167,000	n/a	2	
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	454,000 to 482,000	n/a	3	
	Non-hazardous C&D	163,000 to 173,000	164,000 to 174,000	181,000 to 192,000	195,000 to 207,000	207,000 to 220,000	n/a	4	
Agricultural waste (non-natural)		6,000 to 8,000	6,000 to 8,000						5
Hazardous waste (subset of other waste streams)		10,500	9,000 to 12,000						6

Table 5.13 Summary of waste forecasts for years 2020, 2025, 2030, 2035 and 2041, based on 2017 data

Waste Stream		Tonnes (rounded to nearest 1,000 tonnes)						
		Baseline	Forecast					
		2017	2020	2025	2030	2035	2041	
Local authority collected waste		88,900	89,100 to 99,300	91,800 to 106,600	94,300 to 114,200	95,500 to 122,000	98,800 to 131,500	1
Commercial and industrial waste		133,000 to 170,000	140,000 to 173,000	156,000 to 179,000	170,000 to 185,000	186,000 to 191,000	186,000 to 191,000	2
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	454,000 to 482,000	489,000 to 519,000	3
	Non-hazardous C&D	163,000 to 173,000	164,000 to 174,000	181,000 to 192,000	195,000 to 207,000	207,000 to 220,000	223,000 to 237,000	4
Agricultural waste (non-natural)		6,000 to 8,000	6,000 to 8,000					5
Hazardous waste (subset of other waste streams)		9,500	8,000 to 12,000					6

Table 5.14 Summary of waste forecasts for years 2020, 2025, 2030, 2035 and 2041, based on 2018 data

Waste Stream		Tonnes (rounded to nearest 1,000 tonnes)						
		Baseline	Forecast					
		2018	2020	2025	2030	2035	2041	
Local authority collected waste		87,000	88,000 to 99,300	90,500 to 106,600	93,000 to 114,200	95,500 to 122,000	98,500 to 131,500	1
Commercial and industrial waste		157,000 to 201,000	163,000 to 204,000	181,000 to 210,000	198,000 to 217,000	216,000 to 224,000	233,000 to 240,000	2
Construction, demolition and excavation waste	Total	393,000 to 412,000	403,000 to 422,000	444,000 to 464,000	477,000 to 500,000	507,000 to 531,000	546,000 to 573,000	3
	Non-hazardous C&D	191,000 to 204,000	196,000 to 209,000	216,000 to 230,000	232,000 to 248,000	246,000 to 263,000	265,000 to 284,000	4
Agricultural waste (non-natural)		5,700 to 7,400	6,000 to 8,000					5
Hazardous waste (subset of other waste streams)		12,000	8,000 to 12,000					6

- 5.6.3 Largely due to data constraints, a difference in tonnage is not seen in the CD&E or agricultural waste streams between the 2015 and 2017 data. However, the 2018 does reflect the most recent Defra estimates for the CD&E or agricultural waste streams.
- 5.6.4 LACW data confirms that, overall, there has been a slight increase in waste generated between 2015 and 2018, which incorporates an increase in 2016 followed by decreases in 2017 and 2018. Whilst the 2018 arisings sit just below the LACW growth scenarios 1 and 4 based on ONS household projections, it has been considered prudent to retain the existing growth scenarios to see if the arisings reduce further or stabilise before revising the forecasts used for waste planning purposes. However, the lower end of the LACW growth scenarios have been adjusted in the 2018 forecasts to reflect the fractionally lower minimum tonnage resulting from Scenario 5. The variations within the forecast scenario for 2015 and 2017 are due to the 2017 forecast being based on more recent ONS household projections as opposed to the MHCLG household projections.
- 5.6.5 C&I waste forecasts grow in line with the uplift in the estimated arisings calculated for 2017 and 2018.
- 5.6.6 Hazardous waste continues to remain in the range identified in the WNA 2017.

6. Capacity Needs

6.1 Introduction

6.1.1 The different waste streams considered within this Assessment 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
- recovery³¹ 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 Future³² 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 or 2016, it was met since 2017 as the EnviRecover Facility commenced operating.

6.2.3 Recycling and recovery targets are still to be set for the period beyond 2020. The WNA 2017 relied upon the concurrent European Commission proposals set out in the EU Circular Economy Package (CEP) of:

- a preparation for re-use and recycling (including composting/anaerobic digestion) target of 60% of municipal waste³³ 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 2035; and
- a requirement for the separate collection of bio-waste³⁴ for recycling (although no date is specified in the proposals).

6.2.4 Recognising the June 2016 decision to leave the European Union, it was unclear whether these targets would be adopted in the UK. However, in the absence of any future proposal for England at the time, they were used to consider future management capacity requirements for LACW.

³¹ Recovery encompasses reuse, recycling, composting and energy recovery.

³² The Joint Municipal Waste Management Strategy for Herefordshire and Worcestershire 2004 - 2034, First review August 2011

³³ 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.

³⁴ 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.

6.2.5 These recycling targets were later softened, with several countries, including the UK, recognising that they may not be achievable. In Spring 2018, following much debate between Member States, the European Commission and representatives of the European Parliament, agreement was reached on the revisions to the Waste Framework Directive and the Landfill Directive, including the following targets:

- a preparation for re-use and recycling (including composting/anaerobic digestion) target of 55% of municipal waste by 2025;
- a preparation for re-use and recycling (including composting/anaerobic digestion) target of 60% of municipal waste by 2030;
- a preparation for re-use and recycling (including composting/anaerobic digestion) target of 65% of municipal waste by 2035;
- a gradual limitation on landfilling of municipal waste, to 10% by 2035;
- a requirement for the separate collection of textiles and hazardous waste from households, by 2025; and
- a requirement for the separate collection of bio-waste for recycling by 2024.

6.2.6 The UK government had previously signalled that these measures will be incorporated within UK legislation, even after the UK leaves the EU. The RWS (the latest national waste strategy) confirms the Government's intention to adopt the targets in the EU CEP stating, in Section 6.1.1:

'The EU (Withdrawal) Act 2018 will ensure existing EU environmental law continues to have effect in UK law after we leave the EU, providing businesses and stakeholders with maximum certainty. This includes any commitments from the Circular Economy Package (CEP) in relation to waste and recycling that are part of UK legislation when we leave.'

6.2.7 Consequently, Table 6.1 presents the potential future capacity required to manage Herefordshire's LACW using the targets set out in the EU CEP, which means reducing the recycling and composting targets for 2025 (from 60% to 55%) and 2030 (65% to 60%) whilst retaining 65% recycling and composting by 2035. In addition, the maximum allowed landfill has also been adjusted to reflect a more gradual reduction i.e. a maximum of 20% by 2025, 15% by 2030 and again retaining the 10% by 2035.

6.2.8 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 Forecast LACW waste management requirement (rounded to nearest 100 tonnes)

Description	2020	2025	2030	2035	2041	
LACW Forecasts						
Minimum	88,000	90,500	93,000	95,500	98,500	1
Maximum	99,300	106,600	114,200	122,000	131,500	2
Recycling and composting						
Potential recycling and composting targets	50%	55%	60%	65%	65%	3
Recycling and composting capacity requirement						
Minimum (tonnes)	44,000	49,800	55,800	62,100	64,000	4
Maximum (tonnes)	49,700	58,600	68,500	79,300	85,500	5
Landfill						
Maximum allowed landfill assuming 75% municipal waste recovery by 2020 and gradual limitation to 2035 target	25%	20%	15%	10%	10%	6
Landfill capacity requirement						
Minimum (tonnes)	22,000	18,100	14,000	9,600	9,900	7
Maximum (tonnes)	24,800	21,300	17,100	12,200	13,200	8
Residual treatment requirement						
Minimum assuming maximum allowed landfill is utilised (tonnes)	22,000	22,600	23,200	23,800	24,600	9
Maximum assuming maximum allowed landfill is utilised (tonnes)	24,800	26,700	28,600	30,500	32,800	10
Minimum assuming no LACW direct to landfilled (tonnes)	44,000	40,700	37,200	33,400	34,500	11
Maximum assuming no LACW direct to landfilled (tonnes)	49,600	48,000	45,700	42,700	46,000	12

Increased recycling

- 6.2.9 Consultation responses have sought a reduction in waste growth and increased recycling rates. A reduction in waste growth is not considered appropriate, as the MWLP is principally a land use document, seeking to provide opportunities for new development. Increased recycling levels have been considered, with the consequent capacity requirements.
- 6.2.10 It is worth remembering that the LACW management routes are already potentially higher than has been ratified by the European Commission. However, a further scenario of 70% recycling and composting and a maximum of 5% residual waste to landfill by 2030 has been modelled, and the results reported in Table 6.2.

Table 6.2 Forecast LACW management requirement, high recycling & composting (rounded to nearest 100 tonnes)

Description	2020	2025	2030	2035	2041	
LACW Forecasts						
Minimum	88,000	90,500	93,000	95,500	98,500	1
Maximum	99,300	106,600	114,200	122,000	131,500	2
Recycling and composting						
Potential recycling and composting targets	50%	65%	70%	70%	70%	3
Recycling and composting capacity requirement						
Minimum (tonnes)	44,600	59,700	66,000	67,600	69,000	4
Maximum (tonnes)	49,700	69,300	79,900	85,400	92,100	5
Landfill						
Maximum allowed landfill assuming 75% municipal waste recovery by 2020 and gradual limitation to 5% landfill by 2035	25%	10%	5%	5%	5%	6
Landfill capacity requirement						
Minimum (tonnes)	22,300	9,200	4,700	4,800	4,900	7
Maximum (tonnes)	24,800	10,700	5,700	6,100	6,600	8
Residual treatment requirement						
Minimum assuming maximum allowed landfill is utilised (tonnes)	22,200	22,900	23,600	24,100	24,600	9
Maximum assuming maximum allowed landfill is utilised (tonnes)	24,800	26,600	28,600	30,500	32,800	10
Minimum assuming no LACW direct to landfilled (tonnes)	44,500	32,100	28,300	28,900	29,500	11
Maximum assuming no LACW direct to landfilled (tonnes)	49,600	37,300	34,300	36,600	39,400	12

6.2.11 This scenario indicates an increased demand for recycling/composting capacity of c.10,000 tonnes over years 2020 and 2025, which drops to c.5,000 to 6,000 tonnes over the later years of the plan period, with consequent reductions in landfill and residual waste management capacity. This recycling/composting capacity demand is not considered to be significant in plan making terms.

Potential future LACW management capacity demand

- 6.2.12 Table 3.1 identifies that 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.
- 6.2.13 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 and became operational in 2017.
- 6.2.14 Consequently, whilst these facilities are not located in Herefordshire, long term capacity is available to manage Herefordshire's LACW; the contract is live until 2024, with the potential for a five-year extension. At the end of the contract period, the facilities revert to the two authorities; EnviRecover to shared ownership and EnviroSort to Worcestershire County Council. 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 throughout the plan period, or after.
- 6.2.15 Conclusions in relation to future LACW management capacity focus on the following:
- **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 2035 there could be 31,000 to 39,500 tonnes of bio-waste to manage, which could increase to 32,000 to 42,750 tonnes by 2041. 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) 334,000 tonnes between 2015 and 2018, of which approximately 106,000 tonnes was utilised in 2015, 78,000 tonnes in 2016, 60,000 tonnes in 2017 and 49,000 tonnes in 2018. This would suggest there should be sufficient capacity to handle the increase in bio-waste, although this will be dependent on the design/configuration of the biological treatment facilities.
 - **Sufficient MRF capacity:** It is not possible to accurately predict the future composition of LACW, due to the limited data currently available, that composition changes with time and policy evolves over 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 2035 there could be 31,000 to 39,500 tonnes of material to be recycled, which could increase to 32,000 to 42,750 tonnes by 2041.

- However, it is uncertain how much material would need to be handled at a MRF with proposed policy changes encouraging greater source separation. It is possible more materials will be collected separately and sent directly (or via transfer station) to reprocessors, for example the scrap metal, cardboard, timber etc. Also materials will continue to be collected at HWRC. The current split between kerbside and HWRC recycling is approximately 70:30. If this split is maintained, between 22,500 and 30,000 tonnes³⁵ of additional material from Herefordshire may need to be handled through a MRF by 2041.
- 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. It is also dependent on the configuration of the EnviroSort Facility, which is likely to change over the plan period.
- **Sufficient EfW Facility capacity by 2030:** The EnviRecover Facility capacity is 230,000 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, across both Herefordshire and Worcestershire.
- Currently, Herefordshire and Worcestershire generate a total of just 390,000 tonnes per annum³⁶. Even with growth in LACW arisings and assuming a 65% recycled or composted rate is achieved, there should remain sufficient capacity to handle the residual LACW generated by 2041. There would need to be a growth of 1.6% per annum in LACW arisings for the 230,000 tonne capacity at the EnviRecover Facility to be exceeded by 2041, if the 65% recycled or composted rate is achieved.

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 (section 6.2). Recognising that the Commission's use of the term '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 at the Herefordshire level.
- 6.3.3 As with LACW, EU CEP targets have been 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.

³⁵ 70% of the 32,000 to 42,750 tonnes of waste assumed to be recycled.

³⁶ Defra, LACW Statistic, 2018/19

- 6.3.4 It is assumed that hazardous C&I waste will be handled through specialist hazardous waste management facilities (section 6.6). Table 6.3 presents the potential future capacity required to manage Herefordshire's non-hazardous C&I waste.
- 6.3.5 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.

Increased recycling

- 6.3.6 As with the LACW waste capacity requirements, a further scenario of 70% recycling and composting and a maximum of 5% to landfill by 2030 has been modelled and the results are presented in Table 6.4.
- 6.3.7 This increased recycling scenario indicates an increased demand of 8,300 to 9,500 tonnes of recycling/composting capacity, and consequent reductions in landfill and residual waste manage capacity.

Table 6.3 Forecast C&I waste management requirement (rounded to nearest 1,000 tonnes)

Description	2020	2025	2030	2035	2041	
C&I Forecasts						
Minimum (Scenario 1a) using 2015 data	126,000	140,000	153,000	167,000	185,000	1
Medium (Scenario 2b) using 2017 data	173,000	179,000	185,000	191,000	199,000	2
Maximum (Scenario 2b) using 2018 data	204,000	210,000	217,000	224,000	233,000	3
Recycling and composting						
Potential recycling and composting targets	50%	55%	60%	65%	65%	
Recycling and composting capacity required						
Minimum (tonnes)	63,000	77,000	91,800	108,600	120,300	4
Medium (tonnes)	86,500	98,500	111,000	124,200	129,400	5
Maximum (tonnes)	102,000	115,500	130,200	145,600	151,500	6
Landfill						
Maximum allowed landfill assuming 75% C&I waste recovery by 2020 and gradual limitation to 2035 target	25%	20%	15%	10%	10%	
Landfill capacity required						
Minimum (tonnes)	31,500	28,000	23,000	16,700	18,500	7
Medium (tonnes)	43,300	35,800	27,800	19,100	19,900	8
Maximum (tonnes)	51,000	42,000	32,600	22,400	23,300	9
Residual treatment requirement						
Minimum assuming maximum allowed landfill is utilised	31,500	35,000	38,200	41,700	46,200	10
Medium assuming maximum allowed landfill is utilised	43,200	44,700	46,200	47,700	49,700	11
Maximum assuming maximum allowed landfill is utilised	51,000	52,500	54,200	56,000	58,200	12
Minimum assuming no C&I waste direct to landfilled	63,000	63,000	61,200	58,400	64,700	13
Medium assuming no C&I waste direct to landfilled	86,500	80,500	74,000	66,800	69,600	14
Maximum assuming no C&I waste direct to landfilled	102,000	94,500	86,800	78,400	81,500	15

Table 6.4 Forecast C&I waste management requirement, high recycling and composting (rounded to nearest 1,000 tonnes)

Description	2020	2025	2030	2035	2041	
C&I Forecasts						
Minimum (Scenario 1a) using 2015 data	126,000	140,000	153,000	167,000	185,000	1
Medium (Scenario 2b) using 2017 data	173,000	179,000	185,000	191,000	199,000	2
Maximum (Scenario 2b) using 2018 data	204,000	210,000	217,000	224,000	233,000	3
Recycling and composting						
Potential recycling and composting targets	50%	65%	70%	70%	70%	
Recycling and composting capacity required						
Minimum (tonnes)	63,000	91,000	107,100	116,900	129,500	4
Medium (tonnes)	86,500	116,400	129,500	133,700	139,300	5
Maximum (tonnes)	102,000	136,500	151,900	156,800	163,100	6
Landfill						
Maximum allowed landfill assuming 75% C&I waste recovery by 2020 and gradual limitation to 2035 target	25%	10%	5%	5%	5%	
Landfill capacity required						
Minimum (tonnes)	31,500	14,000	7,700	8,400	9,300	7
Medium (tonnes)	43,300	17,900	9,300	9,600	10,000	8
Maximum (tonnes)	51,000	21,000	10,900	11,200	11,700	9
Residual treatment requirement						
Minimum assuming maximum allowed landfill is utilised	31,500	35,000	38,200	41,700	46,200	10
Medium assuming maximum allowed landfill is utilised	43,200	44,700	46,200	47,700	49,700	11
Maximum assuming maximum allowed landfill is utilised	51,000	52,500	54,200	56,000	58,200	12
Minimum assuming no C&I waste direct to landfilled	63,000	49,000	45,900	50,100	55,500	13
Medium assuming no C&I waste direct to landfilled	86,500	62,600	55,500	57,300	59,700	14
Maximum assuming no C&I waste direct to landfilled	102,000	73,500	65,100	67,200	69,900	15

Potential future C&I waste management capacity demand

- 6.3.8 Recognising the lack of clarity available within the C&I waste data sets, forecasting the future level of new waste management capacity cannot be precise.
- 6.3.9 This Assessment suggests that to meet the assumed recycling and composting targets, across the whole of the C&I waste stream, would require 92,000 to 130,000 tonnes of capacity at 2030 (Table 6.3, rows 4 and 6) which would increase to a maximum demand of 151,500 tonnes at 2041 (Table 6.3, row 6). Comparing this to the calculated requirement at 2020 would indicate a requirement for an additional c.30,000³⁷ to 60,000³⁸ tonnes of recycling/composting capacity (by 2030 and 2041 respectively).
- 6.3.10 If the higher recycling and composting targets are applied, requires 107,000 to 152,000 tonnes of capacity at 2030 (Table 6.4, rows 4 and 6) which would increase to a maximum demand of 163,000 tonnes at 2041 (Table 6.4, row 6). Again, comparing this to the calculated requirement at 2020 would indicate a requirement for an additional c.44,000³⁹ to 66,500⁴⁰ tonnes of recycling/composting capacity (by 2030 and 2041 respectively).
- 6.3.11 Section 3.1 (Table 3.3) identifies that there is, potentially, unused capacity within Herefordshire that would be sufficient to accommodate this additional requirement:
- transfer with basic treatment (84,000 tonnes in 2018);
 - metal recycling (132,000 tonnes in 2018); and
 - biological treatment capacity (285,000 tonnes in 2018).
- 6.3.12 Consequently, no additional capacity is required to handle the increased levels of recycling and compost needed to achieve the targets, even the higher rates. However, the ability of the existing facilities to treat additional materials for recycling and biological treatment will depend on the nature of the material diverted from the residual waste and any physical constraints at the sites (i.e. facilities not being able to handle waste up to their permit limit).
- 6.3.13 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. Consequently, if Herefordshire is to achieve equivalent self-sufficiency in managing its residual C&I wastes, additional capacity will need to be delivered.
- 6.3.14 Furthermore, that capacity will need to incorporate the wastes calculated to otherwise be disposed to landfill. Table 6.3 (rows 13 and 15) indicates that 61,200 to 86,800 tonnes of residual C&I waste treatment/disposal capacity could be required by 2030, if the assumed

³⁷ Table 6.3 (row 4) identifies a minimum of 91,800 tonnes of capacity required at 2030, an increase of 28,800 tonnes on 2020. Row 6 identifies a maximum of 130,200 tonnes at 2030, an increase of 28,200 tonnes. This gives the lower calculated increase of c.30,000 at 2030.

³⁸ Table 6.3 (row 4) identifies a minimum of 120,300 tonnes of capacity required at 2041, an increase of 57,300 tonnes on 2020. Row 6 identifies a maximum need for 151,500 tonnes at 2041, an increase of 49,500 tonnes on 2020. This gives the upper range of c.60,000 at 2041.

³⁹ Table 6.4 (row 4) identifies a minimum of 107,100 tonnes of capacity required at 2030, an increase of 44,100 tonnes on 2020. Row 6 identifies a maximum of 151,900 tonnes at 2030, an increase of 49,900 tonnes. This gives the lower calculated increase of c.44,000 at 2030.

⁴⁰ Table 6.4 (row 4) identifies a minimum of 129,500 tonnes of capacity required at 2030, an increase of 66,500 tonnes on 2020. Row 6 identifies a maximum of 163,100 tonnes at 2041, an increase of 61,100 tonnes. This gives the lower calculated increase of c.66,500 at 2041.

targets are applied to the whole C&I waste stream; at 2041 the level of demand would be between 64,700 and 81,500 tonnes (there is a decrease in residual demand because recycling has increased).

- 6.3.15 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. This would be the case even if increased recycling/composting targets are applied.

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

- 6.4.1 Article 11(2)(b) of the European Waste Framework Directive⁴¹ 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 2014⁴².
- 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.
 - Hazardous C&D waste will be handled through specialist hazardous waste management facilities (section 6.5).
 - 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 Tables 6.5 and 6.6. There is a high level of uncertainty associated with CD&E wastes estimates and forecasts, which is explained in section 4.4

⁴¹ Directive 2008/98/EC

⁴² UK Statistics on Waste, Defra, December 2016

Table 6.5 Forecast waste management capacity required for forecast non-hazardous CD&E waste based on 2015 waste arisings estimates (tonnes)

Description	2020	2025	2030	2035	2041	
Backfilling capacity of excavation waste / dredging spoils						
Minimum	194,000	213,000	229,000	244,000	263,000	1
Maximum	206,000	227,00	244,000	259,000	279,000	2
Non-hazardous C&D forecasts						
Minimum	164,000	181,000	195,000	207,000	223,000	3
Maximum	174,000	192,000	207,000	220,000	237,000	4
Non-hazardous C&D recovery						
Assumed recovery target of 70% for non-hazardous C&D waste	70%	70%	70%	70%	70%	
Recovery capacity required						
Minimum (tonnes)	114,800	126,700	136,500	144,900	156,100	5
Maximum (tonnes)	121,800	134,400	144,900	154,000	165,900	6
Maximum required if the current UK recovery rate of 90% for non-hazardous C&D is maintained	90%	90%	90%	90%	90%	
Recovery capacity required						
Minimum (tonnes)	147,600	162,900	175,500	186,300	200,700	7
Maximum (tonnes)	156,600	172,800	186,300	198,000	213,300	8
Non-hazardous C&D landfill						
Maximum allowed landfill assuming 70% of non-hazardous C&D is recovered	30%	30%	30%	30%	30%	
Landfill capacity required						
Minimum (tonnes)	49,200	54,300	58,500	62,100	66,900	9
Maximum (tonnes)	52,200	57,600	62,100	66,000	71,100	10
Maximum required if the current UK recovery rate of 90% for non-hazardous C&D is maintained	10%	10%	10%	10%	10%	
Landfill capacity required						
Minimum (tonnes)	16,400	18,100	19,500	20,700	22,300	11
Maximum (tonnes)	17,400	19,200	20,700	22,000	23,700	12

Table 6.6 Forecast waste management capacity required for forecast non-hazardous CD&E waste based on 2018 waste arisings estimates (tonnes)

Description	2020	2025	2030	2035	2041	
Backfilling capacity of excavation waste / dredging spoils						
Minimum	205,000	226,000	243,000	258,000	278,000	1
Maximum	211,000	232,000	250,000	265,000	286,000	2
Non-hazardous C&D forecasts						
Minimum	196,000	216,000	232,000	246,000	265,000	3
Maximum	209,000	230,000	248,000	263,000	284,000	4
Non-hazardous C&D recovery						
Assumed recovery target of 70% for non-hazardous C&D waste	70%	70%	70%	70%	70%	
Recovery capacity required						
Minimum (tonnes)	137,200	151,200	162,400	172,200	185,500	5
Maximum (tonnes)	146,300	161,000	173,600	184,100	198,800	6
Maximum required if the current UK recovery rate of 90% for non-hazardous C&D is maintained	90%	90%	90%	90%	90%	
Recovery capacity required						
Minimum (tonnes)	176,400	194,400	208,800	221,400	238,500	7
Maximum (tonnes)	188,100	207,000	223,200	236,700	255,600	8
Non-hazardous C&D landfill						
Maximum allowed landfill assuming 70% of non-hazardous C&D is recovered	30%	30%	30%	30%	30%	
Landfill capacity required						
Minimum (tonnes)	58,800	64,800	69,600	73,800	79,500	9
Maximum (tonnes)	62,700	69,000	74,400	78,900	85,200	10
Maximum required if the current UK recovery rate of 90% for non-hazardous C&D is maintained	10%	10%	10%	10%	10%	
Landfill capacity required						
Minimum (tonnes)	19,600	21,600	23,200	24,600	26,500	11
Maximum (tonnes)	20,900	23,000	24,800	26,300	28,400	12

6.4.5 Section 3.1 identifies that there is treatment/recovery capacity available for handling CD&E waste, with annual permitted capacity (in 2016) 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 By 2018, both the deposit of waste to land (recovery) and soil production sites had closed. Instead, a CD&E physical treatment facility had opened with a permitted capacity of 250,000 tonnes per annum, which received approximately 100,000 tonnes in 2018.
- 6.4.7 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 that also receive LACW and C&I waste e.g. household, commercial and industrial transfer stations;
 - handled at exempt facilities/sites; or
 - processed at the site of production by mobile screening, crushing and grading equipment.
- 6.4.8 In terms of exemption facilities/sites, there are over 320 U1 exemptions (Use of waste in construction) registered in Herefordshire in 2016, which can be an outlet for CD&E wastes. By 2018, the number of U1 exemptions increased to 1,025. However, these exemptions cannot be considered as a guaranteed capacity to manage CD&E wastes because:
- some exemptions could be short term but remain on the register for 3 years; or
 - in terms of on farm exemptions (which account for over 96.5% 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.
- 6.4.9 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 500 tonnes, the registered exemptions could provide between 50,000 to 250,000 tonnes of recovery capacity. As highlighted in section 5.4, it is considered unlikely, given the rural nature of Herefordshire, that arisings in the region of 200,000 tonnes (the upper end of the range) 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): 185,000 to 250,000 tonnes per annum by 2041, based on the most recent Defra estimate, through permitted and exempt facilities/sites. 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 100,000 tonnes is handled at permitted physical treatment and waste transfer/treatment facilities.
 - Landfill: 20,000 to 85,000 tonnes per annum, depending on the level of recovery achieved.
 - 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.
- 6.4.11 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 SAC NMP, 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 that is managed at permitted facilities will be dictated by the development of on-farm AD systems. Between 2013 and 2018, the number of on-farm AD systems increased from one to ten sites, with a combined permitted capacity of 479,500 tonnes in 2018 and an input of 66,300 tonnes.
- 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 manure⁴³.
- 6.5.5 The very low tonnages forecast to arise indicate that agricultural wastes should continue to be appropriately managed by the private sector; the MWLP 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, 10,500 tonnes in 2015, 8,000 tonnes in 2016 and 12,000 tonnes in 2018 (a very small fraction of the 4 million tonnes consigned in England)⁴⁴.
- 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 considers that the waste industry has the expertise necessary to determine where infrastructure should be located and the most appropriate technologies to use⁴⁵. 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 facility⁴⁶.
- 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:

⁴³ Defra, Anaerobic Digestion Strategy and Action Plan, 2011

⁴⁴ Waste Management Plan for England, December 2013

⁴⁵ Principle 2 of the Strategy for Hazardous Waste Management in England, 2010

⁴⁶ National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure, Defra, June 2013

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

6.7.1 Table 6.7 summarises the key capacity requirements concluded from the assessment for each waste stream.

Table 6.7 Summary of key points from capacity need assessment

Waste Stream	Capacity Need Assessment – Key Points
LACW	<p>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. 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 (through the EnviSort and EnviRecover Facilities).</p> <p>If the separate collection of bio-waste for recycling becomes a requirement, capacity would be necessary to handle separately collected food and garden waste, calculated to be in the region of 32,000 to 42,750 tonnes by 2041. There is currently significant capacity at biological treatment facilities in Herefordshire, which should offer sufficient capacity to handle separately collected local authority collected bio-waste.</p> <p>This Assessment calculates an additional 22,500 to 30,000 tonnes of material that may require handling through a MRF. This additional tonnage may place some pressure on the EnviroSort Facility, depending on how it is configured and how much waste is sent to it from Worcestershire. The EnviRecover Facility is considered to have sufficient capacity throughout the plan period. The available capacity at these sites should be monitored to understand any pressure points on this capacity, particularly towards the end of the plan period.</p> <p>This Assessment concludes that there will be sufficient capacity to manage LACW though the plan period, with no immediate demand for new facilities.</p>
C&I waste	<p>Permitted capacity within the county is limited to facilities that offer transfer with basic treatment, metal recycling and biological treatment capacity. There is no residual waste treatment or disposal capacity such as MBT, RDF production, energy from waste or landfill facilities. The treatment and disposal of residual C&I waste is reliant on facilities outside Herefordshire.</p> <p>This Assessment suggests that by 2030, depending on the levels of recycling and composting achieved 30,000 to 44,000 tonnes of additional recycling/composting capacity would be required, potentially increased to 60,000 to 65,000 tonnes by 2041. However, it has also been identified that there is a substantial amount of unused capacity at permitted sites already operating within Herefordshire.</p> <p>If Herefordshire is to achieve equivalent self-sufficiency in managing its residual C&I wastes, additional capacity will need to be delivered to manage residual C&I waste. This capacity will need to incorporate the wastes calculated to, otherwise, be disposed to landfill, resulting in a need for 61,200 to 86,800 tonnes by 2030 or 64,700 and 81,500 tonnes by 2041.</p> <p>However, this conclusion is made on the recognised uncertainties inherent with the data.</p>

Waste Stream	Capacity Need Assessment – Key Points
CD&E waste	<p>Permitted capacity within the county is focussed on the recovery of CD&E wastes, with limited disposal options.</p> <p>Based on this assessment the following capacity demand for CD&E waste should be considered:</p> <p>Recovery (including recycling and re-use): 195,000 to 250,000 tonnes per annum by 2041 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 100,000 tonnes is handled at permitted physical treatment and waste transfer/treatment facilities.</p> <p>Landfill: 20,000 to 85,000 tonnes per annum, depending on the level of recovery achieved; and</p> <p>However, this conclusion is made on the recognised uncertainties inherent with the data.</p>
Agricultural waste (non-natural)	<p>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, and likely within the C&I waste stream.</p> <p>On-farm anaerobic digestion provides a method of managing natural agricultural wastes, including manures and slurries.</p>
Hazardous waste	<p>Small quantities of hazardous waste are generated within Herefordshire, estimated at 10,500 tonnes in 2015, 8,000 tonnes in 2016 and 12,000 tonnes in 2018 (a very small fraction of the 4 million tonnes consigned in England).</p> <p>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.</p> <p>Therefore, based on the small quantities generated in Herefordshire, there would not appear to be a need for the MWLP 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.</p>

Important Notice

This report has been prepared by hendeca ltd exclusively for the benefit of Herefordshire Council and no other parties may act or rely on it. hendeca ltd excludes liabilities to all third parties.

Kirsten Berry and Nigel Naisbitt **authors**

hendeca ltd
9601610 **company number**
4 Witan Way, Witney, Oxfordshire, OX28 6FF **registered address**

© hendeca ltd 2020 **all rights reserved**